TRANSPORTATION PLANNING REPORT

WASHINGTON PIKE/MILLERTOWN PIKE

Section One – Millertown Pike from I-640 to City of Knoxville Boundary

Section Two- Washington Pike from I-640 to Murphy Road

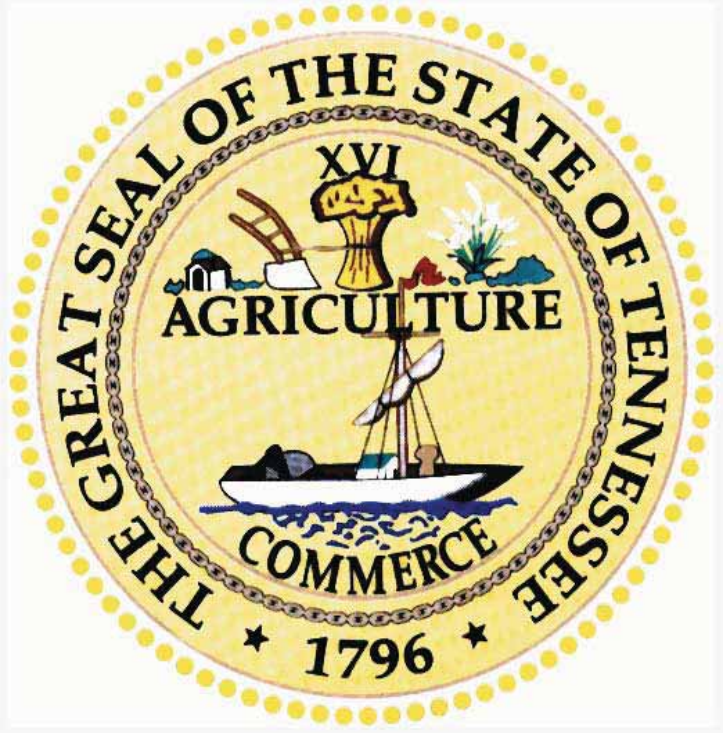
Section Three- Washington Pike from Millertown Pike to I-640

Section Four- Millertown Pike from Washington Pike to I-640

City of Knoxville

Knox County, Tennessee

PIN# 043090.00



PREPARED BY:
WILBUR SMITH ASSOCIATES
For the CITY OF KNOXVILLE
AND THE
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Recommended by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING		
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION		
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION		

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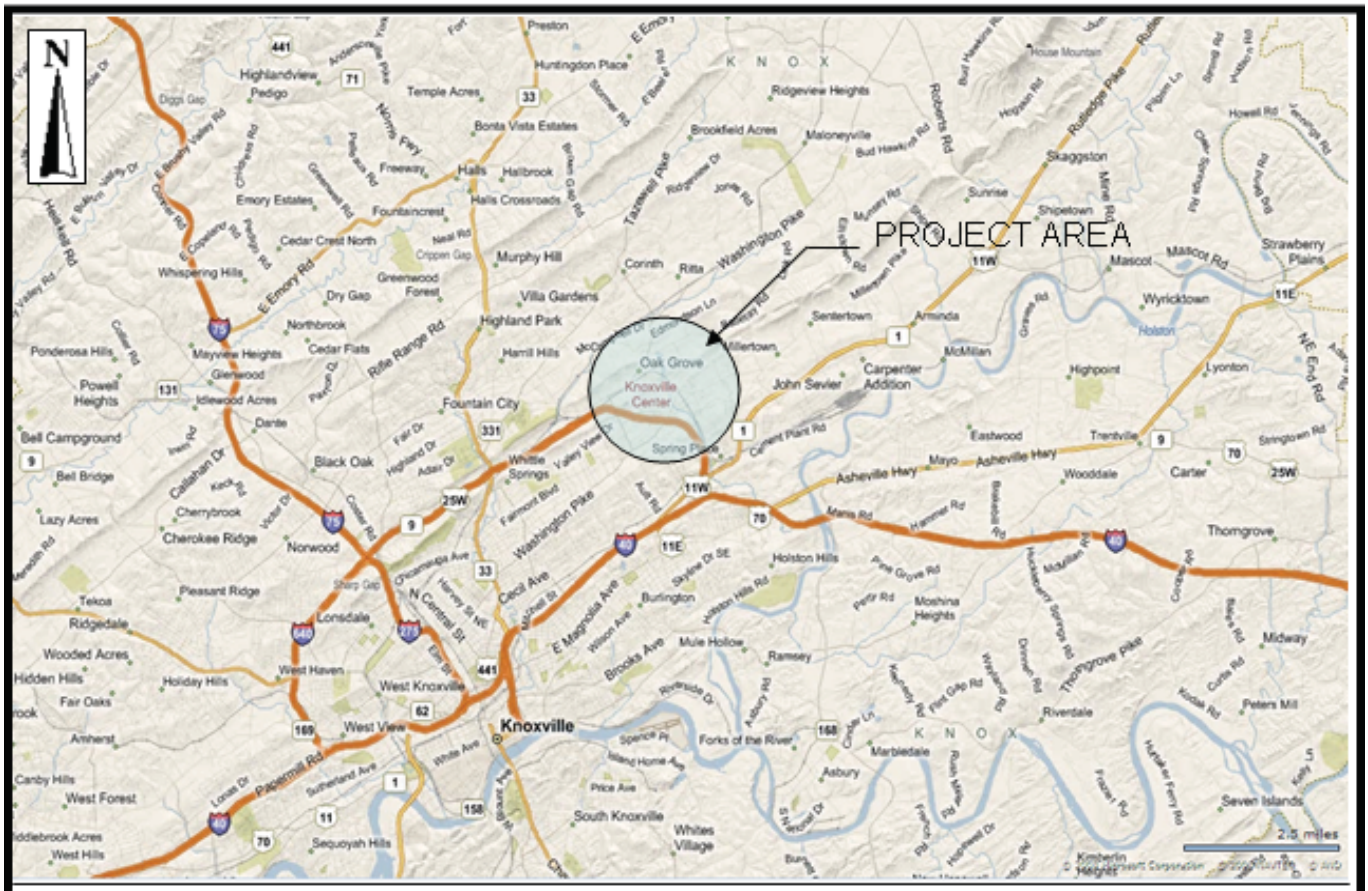
PROJECT VICINITY MAP

Washington Pike/Millertown Pike
Transportation Planning Report
Knoxville, Knox County, Tennessee



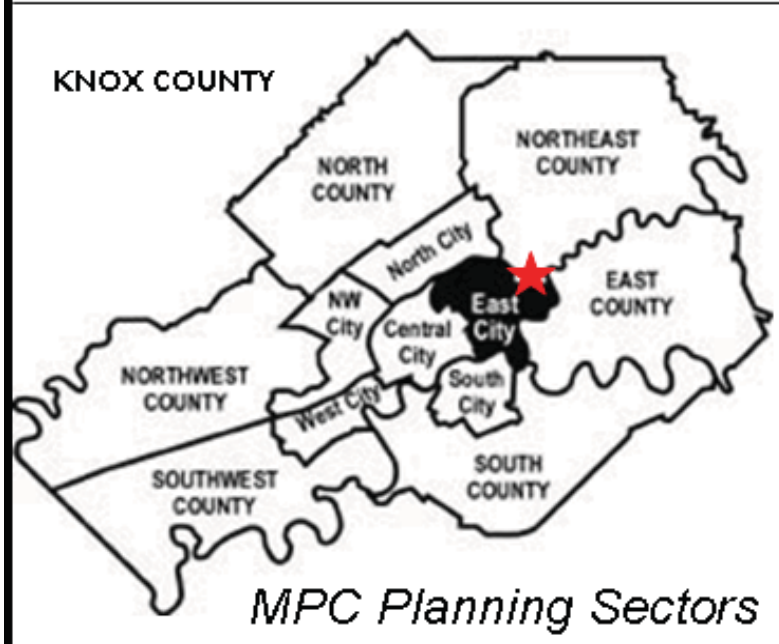


Figure 1

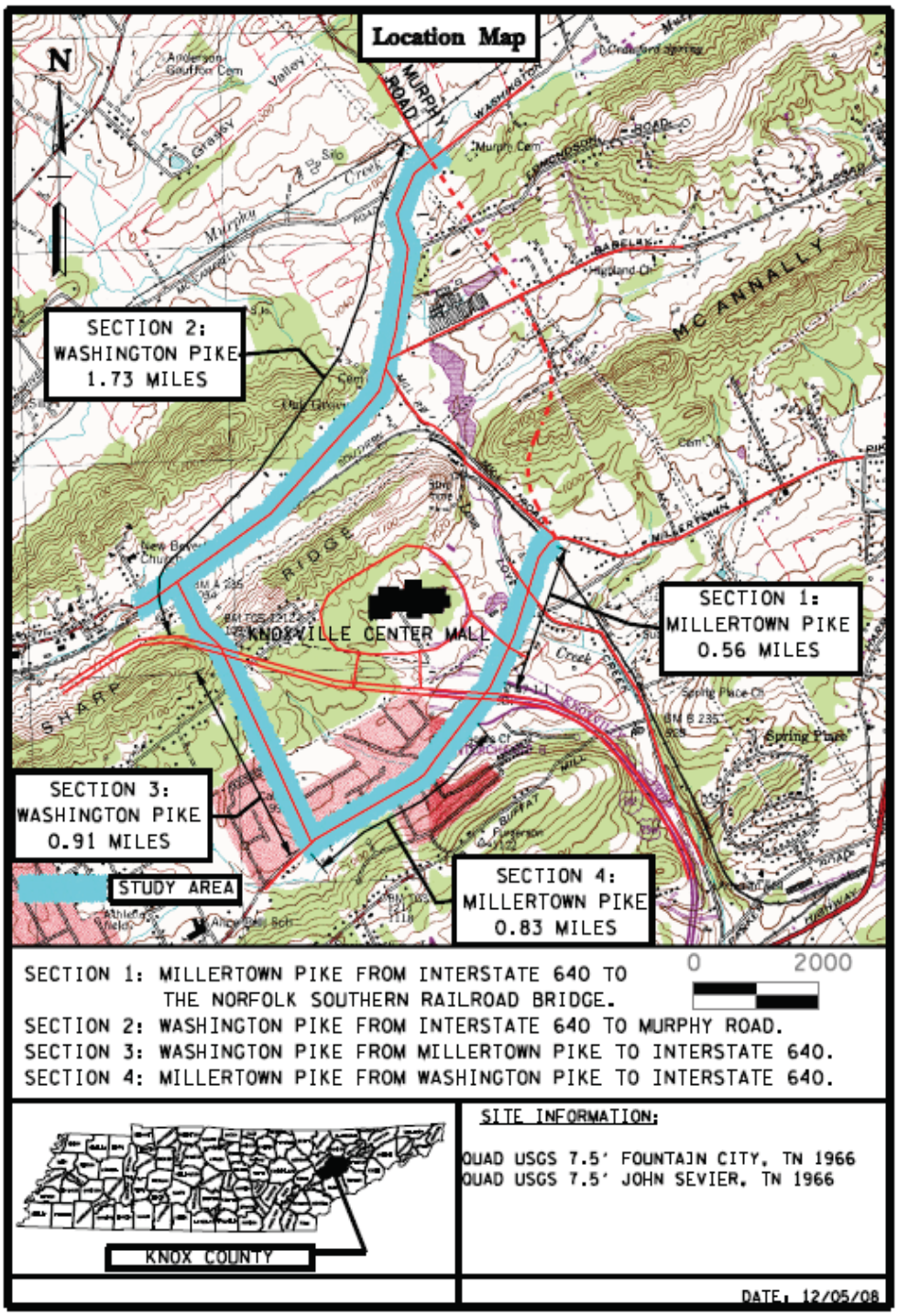


Figure 2

PROJECT LOCATION MAP
WASHINGTON PIKE AND MILLERTOWN PIKE

AREA LOCATION MAP

WASHINGTON PIKE AND MILLERTOWN PIKE
Knoxville, Knox County, Tennessee

Existing Route

Figure 3

COMMUNITY PROFILE

Knoxville is the third-largest city (behind Nashville and Memphis) in the state of Tennessee and is the county seat of Knox County. Of Tennessee's four major cities, Knoxville, founded in 1791, is second oldest to Nashville. After Tennessee's admission into the Union in 1796, Knoxville was the state's first capital, in which capacity it served until 1819. The site for the capital then moved to Murfreesboro, prior to Nashville receiving the final designation. Knoxville was named in honor of the first Secretary of War, Henry Knox. Knoxville is located in a broad valley between the Cumberland Mountains to the northwest and the Great Smoky Mountains to the southeast. These two mountain ranges help provide the City its moderate climate. Knoxville, Tennessee is a rapidly growing city accessible from an international waterway. Located in the South Central region of the United States, Knoxville sits at the head of the Tennessee River navigation channel. Interstates 40, 75 and 81 converge in Knoxville allowing 53% of the nation's marketplace to be within a 650-mile radius of Knoxville. Knoxville, Tennessee is located near three national parks: Great Smoky Mountains National Park, Big South Fork National Park, and Cherokee National Forest.

As of the 2000 United States Census, Knoxville had a total population of 173,890 with a metropolitan population of 616,080. By 2008, the metropolitan population had increased to 689,695 (a 12 percent increase). Knoxville was noted as the best medium sized metropolitan area in the nation as published in the 2007 Best Cities for Relocating Families. In April 2008, *Forbes Magazine* named Knoxville among the Top 10 Metropolitan Hotspots in the United States. The Knoxville MSA includes Anderson, Blount, Knox, Loudon, and Union counties.

Over time, Knoxville has acquired several nicknames. In the early 20th century, the city was nicknamed *The Marble City* as a result of the number of quarries active in the city that supplied Tennessee pink marble to much of the country. In the 1930s, the city was labeled as the *Underwear Capital of the World* with over twenty textile and clothing mills. From 1930-1960, this industry was the city's largest employer. Since then, economic changes caused the closing of many mills in the Knoxville area resulting in the relocation of some Knoxville area residents.

Knoxville is home to the University of Tennessee's primary campus (UTK). The university's sports teams, called the "Volunteers" or "Vols" are extremely popular throughout the Southeastern region. In 2008, UTK had an average enrollment of 26,000 students ranking 45th among 164 public institutions by *US News and World Report*.

Moreover, Knoxville's economy is largely fueled by the regional location of the main campus of the University of Tennessee, the Oak Ridge National Laboratory (ORNL) and other Department of Energy (DOE) facilities (in nearby Oak Ridge, Tennessee), the National Transportation Research Center, and the Tennessee Valley Authority (TVA). These facilities make Knoxville the heart of the high-tech Tennessee Valley Corridor, which extends from Blacksburg, Virginia to Huntsville, Alabama.

As depicted on the Project Vicinity Map (Figure 1), the study area is partially within the City's East City Sector with portions in the East and Northeast Knox County Sectors. These sector plans, adopted by the Metropolitan Planning Organization, City of Knoxville and Knox County in 2002, focus on physical development, land use, transportation and community facilities. The sector plans serve as a tool to help the community identify development opportunities and plan for the future. The sector plans include proposals for land use and transportation improvements. An evaluation of the existing conditions in each sector includes information on environmental resources, development trends and characteristics of the population. The Knoxville Center District was defined by the city as a "Special Development Opportunity Area". With the area experiencing growth in retail and commercial development there has been a loss of low-density residential land use for the area. The City's vision for the Knoxville Center area includes recommendations for mixed-use developments and the redevelopment of those parcels where the existing low density residential land uses are no longer appropriate. The City proposes to create mixed-used developments with pedestrian-friendly facilities. Most commercial areas are easily accessible by a 5-10 minute walk; however continued pedestrian facility improvements are necessary on Washington Pike and Millertown Pike to address the needs of pedestrians and bicyclists in the area. The City's public transit provider, Knoxville Area Transit (KAT), currently provides transit service to the Knoxville Center area to address the needs of non-motorized users.

The City of Knoxville encompasses an area of 103.7 square miles of the 526 square mile total for Knox County. Residential land occupies the largest portion of developed land

in Knoxville which accounts for the abundance of subdivisions located adjacent to the city's major arterial roads and collector streets. In terms of acreage, most of the East City Sector is single-family residential. Within the last few years, sections of East and Northeast Knox County showed a dramatic increase in subdivision activity. Between 1990 and 2000, population for northeast Knox County increased by 14.9 percent.

Knoxville Center Mall is a super-regional shopping mall serving the Knoxville metropolitan area. The mall is located at Exit 8 on Interstate 640. Since the construction of the Knoxville Center Mall, this portion of the City has experienced more retail and commercial development resulting in more traffic from outlying areas of Knox and surrounding counties entering into this area. The mall and several surrounding commercial properties including Sam's Club, Kohl's, Wal-Mart, Target and Circuit City, are not located within the city sector but have a great deal of influence on the livability of adjacent East City neighborhoods. East Towne Crossing (Home Depot and Food Lion) and Isaiah's Landing (Lowe's, Cracker Barrel, and O'Charleys) are within the East City Sector, and located within close proximity to well-established Valley View, Buffat Mill, Spring Hill and Alice Bell neighborhoods. Food City, a regional supermarket is located at the intersection of Millertown Pike and Loves Creek Road. Directly across from Food City is the Millertown Plaza with several retail and office spaces. Redevelopment of the former Farmer's Market site at Washington Pike and Greenway Drive incorporated the County's vision for a community-friendly retail center with multi-functional public space and pedestrian amenities. The retail area contains a Super Target store as an anchor tenant along with several other regional retail chains. The Farmer's Market has been relocated next door to New Harvest Park. The Farmer's Market continually provides locally-grown produce and homemade arts, crafts and specialty items to buyers seasonally from May to November. New Harvest Park, which opened in 2007, is approximately 43 acres and includes a playground setting to look like a farm. The park includes a community building and a picnic/amphitheater and a ¼ - mile walking trail. The redevelopment of the former Farmers Market site spawned intersection improvements at the Washington Pike and Greenway Drive intersection. Additional roadway modifications along the entire Washington Pike corridor could improve the traffic circulation system within the environs of Interstate 640 and Washington Pike minimizing potential conflicts between pedestrians and vehicles.

PURPOSE OF STUDY

This Transportation Planning Report (TPR) is being prepared to identify the purpose and evaluate the need for and feasibility of construction of the proposed widening along Washington Pike and Millertown Pike. This report is being prepared in response to a request of the City of Knoxville in cooperation with Tennessee Department of Transportation and the Knoxville Regional Transportation Planning Organization (TPO). This TPR report is an update of an Advance Planning Report for both Washington and Millertown Pikes that was approved in 2001. The 2001 APR was a portion of a larger study to review the roadway network in the City's northeast sector surrounding the Knoxville Center Mall.

The updated TPR will discuss the City's need to make roadway improvements within the project area. The study discusses the opportunity to widen Washington Pike and Millertown Pike as well as the possibility of extending Murphy Road on new location from Washington Pike to a new intersection with Millertown Pike near Loves Creek Road. The study is divided into the following sections:

Section 1-Millertown Pike from Interstate 640 to the Norfolk Southern Railroad Bridge
Section 2-Washington Pike from Interstate 640 to Murphy Road
Section 3-Washington Pike from Millertown Pike to Interstate 640
Section 4-Millertown Pike from Washington Pike to Interstate 640

A Project Vicinity Map is shown in Figure 1. A Project Location Map (USGS Map Fountain City/John Sevier, TN Quadrangle) and an Area Location Map depict the study corridors and define the locations and termini of the four sub-sections of Washington and Millertown Pikes in Figure 2 and Figure 3 respectively.

This project is listed in the *Knoxville Regional Transportation Planning Organization's 2005-2030 Long Range Transportation Plan* as well as being listed as a requested project in the Transportation Improvement Project (TIP) for fiscal years 2008-2011. The City of Knoxville, as sponsor, has provided initial funding for planning, environmental, and concept engineering processes.

In addition to geometric and safety deficiencies, this study will evaluate the existing traffic conditions (2008) and analyze the base year (2013) and design year (2033) "Level of Service" (LOS) for the study area. The LOS analysis and projected traffic volumes for the base and design year are included in this report and are depicted in the Project Data Table and the traffic schematic. Other baseline data include a field investigation of the eighteen principal intersections to include traffic counts, overview of environmental considerations, design recommendations, estimate of construction costs and an update to the functional roadway plans submitted with the previous APR.

Traffic information gathered within the project area was submitted to TDOTs Project Planning Office for review and approval for use in the study. The figures relative to the traffic information are described later in the report and contained in the Appendix.

Relative to the study area is the Murphy Road Extension project. This new roadway would extend from the Millertown Pike/Mill Road intersection to Washington Pike at Murphy Road. The extension of Murphy Road has been proposed as a means to provide some traffic relief for the Tazewell Pike area and to relieve long-term unmitigated traffic congestion on Washington Pike. Although, this project is not within the City Limits, it is anticipated that when built there would be a considerable amount of traffic along the new corridor extending into the Knoxville Center area. Therefore, traffic analysis of the Murphy Road extension project will be provided in this report for informational purposes only.

PURPOSE AND NEED FOR THE PROJECT

The purpose of this Transportation Planning Report is to analyze existing and projected traffic data and determine the feasibility of improving the roadway system within the Knoxville Center Mall area. Washington Pike and Millertown Pike are the two primary non-interstate highway routes within the project area. Improvements to these facilities would not only increase traffic mobility in the Knoxville Center area, but would also provide a transportation solution that improves safety for vehicles and pedestrians; reduces travel delays for through traffic; enhances regional and local economic development opportunities; and improves transportation system linkages throughout the northeastern quadrant of the City.

As a result of current traffic conditions, this TPR was requested by the City of Knoxville with direction from TDOT to evaluate the need for and feasibility of constructing road improvements on Washington and Millertown Pikes to service the anticipated development growth and associated traffic demands of the Knoxville Center environs.

The Knoxville Center area and its environs have experienced significant residential, retail and commercial development in the last several years which has outpaced roadway improvements. As a result, there has been an increase in traffic congestion, abnormal delays and traffic accidents on both Washington Pike and Millertown Pike, two major routes that link east and northeast Knox County to Interstate 640. Extremely long delays are experienced at many key intersections along both Washington Pike and Millertown Pike, particularly near Knoxville Center Mall. These delays are most noticeable during the afternoon peak hours as motorists pass through the area to go home from work and Saturdays when motorists are shopping at the mall or in the adjacent retail and commercial developments.

Both Washington Pike and Millertown Pike are minor east-west arterials extending northeast into Knox County and southwest of the Interstate 640 interchange. Regional access to the Knoxville Center area is provided by Interstate 640 with ramps to and from the east from Millertown Pike and ramps to and from the west from Washington Pike. As a point of clarification, Interstate 640 and its interchanges with Washington Pike and Millertown Pike are not included in this project (related to the interchange itself).

Traffic volumes within the study area are anticipated to grow quite rapidly with the continuing development of new subdivisions and businesses locating in the Knoxville Center area, particularly within the environs of the Washington Pike and Millertown Pike corridors. Population declined by four percent in the City's sector (Census Tract 52.02) between 1990 (2,797 people) and 2000 (2,690 people); however Northeast Knox County that borders the study area (Census Tract 52.01) has seen an eleven percent increase in residents (4,002 persons to 4,467 persons) from 1990 to 2000.. The south side of Millertown Pike, outside the City, is a growing residential corridor. Currently in Knox County's planned growth area, there is discussion to extend the growth boundary to include the north side of Millertown Pike. A goal is to include recreational amenities such as walking trails when developing subdivisions.

Development opportunities have increased in the northeast portion of Knoxville and Knox County resulting in the construction of more residential subdivisions and large parcel developments for big box retailers. Consequently, minor roadway improvements have been made at various intersections near these developments to address the immediate need to alleviate traffic congestion and improve traffic operations along both Washington and Millertown Pikes. Short-term improvements including roadway widening, adding left-turn lanes and traffic signal installation or modification were essential to mitigate the traffic impacts brought on by these developments; however long-term improvement is necessary to improve the transportation linkages between Washington Pike and Millertown Pike.

A facility with adequate and consistent roadway width is needed to safely accommodate current and anticipated traffic volumes on Washington and Millertown Pikes. With improvements, motorist would have improved east-west mobility from the City's east sector to Interstate 640.

PROJECT HISTORY AND BACKGROUND

This TPR document is a re-examination of an earlier Advance Planning Report (APR) commissioned by the City of Knoxville and TDOT which was approved in 2001. This update will revise the previous document with new traffic counts and revisions of the functional plans.

This report documents analyses undertaken to evaluate the opportunities for improving traffic conditions in northeast Knoxville within the Knoxville Center area on Washington and Millertown Pikes. Both arterials serve as important regional connectors linking people in the area to Interstate 640, employment and commercial centers and local, regional and state recreational areas. The proposed improvements to Washington Pike and Millertown Pike will help improve mobility and enhance existing connections. Several roadway deficiencies are identified along both Washington Pike and Millertown Pike including substandard lane and shoulder widths, sharp curves, and inadequate sight distances. New residential and commercial development has added more vehicles to the area escalating safety concerns due to the increased number of crashes on both Washington Pike and Millertown Pike. This increase in traffic volumes has caused a decrease in levels of service.

Over the years, numerous transportation planning studies have been conducted in the project area ranging from isolated traffic impact studies to intersection improvement analyses. A substantial number of localized projects in Knoxville and Knox County have been undertaken over the past several years as a result of the traffic impacts from residential, retail and commercial development particularly in the Knoxville Center area. These studies include:

- *Washington Pike/Millertown Pike Advance Planning Report (2001)- Proposed improvements include upgrading Washington Pike to a five-lane facility northeast of the Greenway Drive intersection. Between Greenway Drive and Murphy Road, a four-lane divided typical section is proposed. To further improve the Washington Pike and I-640 interchange operation, Valley View Drive would be relocated to intersect Washington Pike opposite Centerline Drive. New traffic signals would be anticipated on Washington Pike at Millertown Pike, Centerline Drive and Mill Road. Millertown Pike would transition from the existing two lane to a five-lane undivided section with a continuous left-turn lane south of the Interstate 640 interchange and to a six lane facility near Knoxville Center, north of the interchange to Love's Creek Road. The project also includes the Murphy Road Extension from Washington Pike to Millertown Pike providing a new primary movement between Tazewell Pike and the I-640 interchange.*
- *Knoxville North Traffic Impact Study (2004)-To address the impact and access of a proposed shopping center at the Farmer's Market site located in the Knoxville Center area of Knoxville. This study addressed the potential impacts to Washington Pike as a result of the proposed commercial development.*
- *Food City/Loves Creek Development Traffic Impact Study (2005)-To evaluate the development of a 46,000 s.f. supermarket development off of Millertown Pike at its intersection with Loves Creek Road. This project is located one-half mile east of the I-640/Washington Pike interchange.*
- *Knoxville Center/Lowe's Home Center Access Evaluation (2001)- The evaluation of the 135,000 s.f Lowe's Home Center and 160,000 s.f . of outparcel retail located adjacent to Millertown Pike. The site proposed*

two driveways on South Mall Road and three on Millertown Pike. The study included the evaluation of the driveway operations, capacity and levels of service on Millertown Pike.

- *Tazewell Pike Advance Planning Report (2001)-The APR recommends widening Tazewell Pike to a multilane facility between Broadway (US 441) and Jacksboro Pike. Additional improvements were recommended at the intersection of Tazewell Pike at the Jacksboro Pike/Sanders Road intersection.*
- *Operational Improvement Recommendations Long Range Transportation Plan, I-640/Millertown Pike/Washington Pike Interchange Area to I-640/Broadway Interchange Area (2001)-This document contained results from the Advance Planning Reports conducted on Tazewell Pike from Broadway to Jacksboro Pike and the 2001 Washington Pike/ Millertown Pike APR. The study recommendations proposed short- and long-term improvements on several arterials for greater access and mobility to the Knoxville Center area. Some recommendations were based on potential development in the area which required more detailed studies.*
- *Farmers Market Property Reuse Study- A reevaluation of the 39 acres Farmers Market site located on Washington Pike at Greenway Drive.. Knox County initiated the study with interest to redevelop the property with a use that would provide a greater economic return and employment opportunities for Knox County.*
- *Coventry Creek Traffic Impact Study-A traffic impact study for a proposed mixed use development on Washington Pike in the vicinity of Knoxville Center. This development is approximately 34 acres and contains a neighborhood shopping center, banks, office space, restaurants and residential condominiums. The primary access point lies within the project limits of this TPR study. The proposed development will generate more traffic within the study area and will require additional intersection improvements on Washington Pike for site access.*

EXISTING TRANSPORTATION CONDITIONS

Typically in this portion of the city, the main traffic arteries with the exception of Broadway (US441, SR33) run east/west. Increased development within the environs of

the Knoxville Center area has fueled a steady increase in traffic volumes on Washington and Millertown Pikes.

Millertown Pike is classified as an urban minor arterial street. Millertown Pike extends northeast from Washington Pike beyond the study area into Northeast Knox County. In 2004, average daily traffic on Millertown Pike varied from approximately 6,500 vehicles per day (vpd) east of Spring Hill Road to approximately 20,000 vpd at the I-640 westbound exit ramp. In 2008, traffic volumes at those same locations had risen to approximately 8,000 vpd and 23,000 vpd respectively. Millertown Pike, northeast of the interchange is multi-lane through the Knoxville Center/ Wal-Mart access and averages 17,800 vpd before it transitions back to a two-lane facility of approximately 22 feet in width prior to crossing the Norfolk Southern Railroad. Continuing on Millertown Pike beyond the study area, ADT volumes averaged nearly 6,400 vpd east of the railroad bridge. Traffic signals exist at the intersections of Loves Creek Road, Knoxville Center/Wal-Mart and the I-640 ramps.

Washington Pike is also classified as an urban minor arterial street, extending northeast and southwest of the I-640 interchange. The facility provides a two-lane section south of I-640 and a multilane section north from the I-640 interchange to Greenway Drive. At Greenway Drive, Washington Pike turns to the right and continues as a two-lane facility. The ADT volumes on this section of Washington Pike range from nearly 12,000 vpd west of Mill Road to over 9,100 vpd east of Murphy Road. Traffic signals exist at its intersections with the I-640 interchange ramps, Greenway Drive, Mill Road and Murphy Road. Heading southwest, Washington Pike intersects Millertown Pike and continues as Washington Pike where it intersects Broadway (US 441, SR 33). This portion of Washington Pike heading into the City averages 9,800 vpd west of the Shelbourne Road intersection. Washington Pike, north and south of the I-640 interchange had average daily traffic volumes of 19,000 vpd and 10,200 vpd respectively.

Loves Creek Road is a two-lane collector street with an approximate ADT of 5,800 vpd. This road extends north and south between Rutledge Pike (US 11W/SR-1) and Millertown Pike.

Mill Road is a two-lane north-south facility with a stop-controlled intersection at Millertown Pike. To the north, the intersection of Mill Road at Washington Pike has been improved with additional left turn lanes and signalization. Average daily traffic on Mill Road between Millertown Pike and Washington Pike is estimated at 9,000 vpd.

Murphy Road is another two-lane facility that recently underwent intersection improvements to alleviate congestion at its intersection with Washington Pike. Improvements included the addition of left turn lanes from southbound Murphy Road to Washington Pike and an eastbound left turn lane from Washington Pike onto Murphy Road. Average daily traffic on Murphy Road between Washington Pike and Tazewell Pike averages 11,000 vpd.

Truck traffic in the project area is relatively normal at two percent with most being delivery trucks to the mall and the commercial and retail stores in the Knoxville Center area. Washington Pike and Millertown Pike are not state routes; therefore heavy truck traffic is minimal in the area.

Segments of Millertown Pike and Washington Pike bordering the City's sector may operate at a volume under capacity but still have problems with excessive speeds and poor sight distance. In some areas, significant development has led to increased traffic without the necessary infrastructure improvements and efforts are underway to provide more acceptable operations.

For this study, the *2005-2030 Travel Demand Model (TDM)* was obtained from the *Knoxville Regional Transportation Planning Organization* (TPO). The model was developed in accordance with the *Year 2005-2030 Long Range Transportation Plan*, which is currently being updated. The model was utilized to predict how travel patterns will change in the future based on land use, population and other factors. Results of the traffic model, turning movement volumes and growth rates were reviewed and discussed with TDOT's Project Planning Division.

When comparing the 2030 TDM generated traffic volumes with the 2005 base year traffic volumes, it became apparent that a uniform annual growth rate of 3.5 percent was most appropriate. The previously mentioned 2001 study identified an annual growth rate

of 7 percent for the area, based on historical traffic counts and the trend of residential and commercial development in the area. Although, commercial and residential construction is assumed to continue in the area, it is expected to be at a slower rate than in the past several years.

Both Washington Pike and Millertown Pike provide regional access to Interstate 640. Interstate 640, a bypass of the downtown section of Interstate 40, connects to Interstate 40 east and west of the Knoxville CBD and also Interstate 75 to the west. The bypass first opened in anticipation of the traffic generated by the 1982 World's Fair. Today, the bypass continues to greatly relieve traffic congestion in downtown Knoxville. Interstate 640, east of Washington Pike has a 2007 ADT of 41,400. Interstate 40 is an east-west facility extending between Nashville, Tennessee and Asheville, North Carolina. The approximate 2007 ADT for I-40/75 west of I-640 is 166,206. To the east US11E, I-40 has a 2007 ADT of 98,600. Interstate 75 extends north towards Lexington, Kentucky and to the west; I-75 turns south towards Chattanooga, Tennessee.

Since the completion of the I-640 bypass and the construction of the Knoxville Center Mall in 1984, the City of Knoxville is continuing to experience an increase in office, retail/ commercial development along the Washington Pike and Millertown Pike corridors. Figure 4 is a map of the study area identifying many of the major traffic generators in the area.

TABLE 1-Major Traffic Generators in the Knoxville Center Area

- Knoxville Center Mall and outparcels
- Sam's Club
- Wal-Mart Supercenter
- Lowe's Home Improvement Store
- Home Depot
- Carmike Cinemas
- McDonald's
- Office Depot
- Kohl's Department Store
- Target
- New Harvest Center
- O'Charleys
- Cracker Barrel
- Isaiah's Landing outparcels
- Food City

Source: Knoxville-Knox County Metropolitan Planning Commission

During the public involvement phases for the previous APR study, citizens addressed concerns and offered suggestions regarding the potential traffic impacts on Washington and Millertown Pikes due to the recent increase in retail and commercial development.

Traffic congestion and delays were experienced mostly at key intersections on both Washington and Millertown Pikes. Previous traffic studies recommended a series of short- and long- term improvements to improve traffic circulation between the mall area and the other nearby shopping centers.

MAJOR TRAFFIC GENERATORS IN THE KNOXVILLE CENTER AREA

Figure 4

Both the City and County have invested in several capital projects for some short-term relief and/or spot improvements, widening, realignments, and expanded lanes to improve safety and capacity within the Knoxville Center environs. Numerous transportation planning studies have been conducted that address isolated intersection improvements. Some of these localized improvements have been undertaken over the past several years in response to the City's and County's economic activity near the project area. These improvements include:

- Washington Pike at Greenway Dr- This project included intersection improvements and traffic signal modifications
- Millertown Pike at Loves Creek Road- This project included intersection improvements with traffic signal modifications.
- Washington Pike at Mill Road-. The project included widening of Washington Pike from a 2-lane roadway to a 3-lane facility providing separate left-turn lanes on Washington Pike and Mill Road. The project also includes realignment of the Mill Road intersection and Babelay Drive intersection for better sight distance. The limits of the project extend from 500' south of the Mill Road intersection to north of the intersection of Aylesbury Road. The total length of the project was approximately 0.36 miles (1,900 L.F.)
- Millertown Pike at Knoxville Center/Kinzel Way- This project included an update of the traffic signal timing and lane modifications.
- Washington Pike at Murphy Road-Knox County reconstructed Murphy Road and its intersection with Washington Pike as part of its Capital Improvement Project in 1999. Prior to construction the intersection was a two-way stop controlled intersection with no turn lanes. Improvements included the addition of an eastbound left turn lane on Washington Pike and separate left and right turn lanes on Murphy Road onto Washington Pike and signalization.

These short-term improvements help to recognize the priority role Washington Pike and Millertown Pike play as major east-west corridors. More substantial improvement to provide capacity for through travel should be undertaken through a coordinated strategy of major roadway widening and improvement with additional operational improvements where warranted in the mean time.

ALTERNATIVE MODE CONSIDERATIONS

The City of Knoxville and Knox County are partnered in efforts to provide citizens a cohesive and connected system of parks, greenways and sidewalks throughout Knox County. The City of Knoxville currently has 17 segments totaling over 30 miles of greenway. Knox County has eight segments totaling 15 miles of greenway. Through various public meetings, citizens' interest in the creation and maintenance of greenways continues to be significant. Many greenway users have indicated a greater desire to utilize greenways to get from one place to another both for recreation and transportation purposes.

Within the project area, the City of Knoxville proposes to construct an East Knoxville Greenway Trail System. A portion of the trail running along Loves Creek was constructed as part of the Wal-Mart expansion project in 2005. The City plans to develop this portion of the greenway running from the Holston River northwest to Asheville Highway and Interstate 40. There are opportunities to connect Loves Creek and the Knoxville Center area north to New Harvest Park and its retail center. The Northeast County Sector Plan proposes preserving the floodplain protection area around Loves Creek headwaters to limit future flooding in the area. The plan recommends the acquisition of low-lying areas by the county to be utilized for recreational purposes. Acquiring easements for greenway connections and future community amenities should be done in coordination with right-of-way purchases for the road improvements. Connecting these segments of greenway requires commitment by both City and County and the affected communities. Further recommendations can be reviewed in the *Draft Knoxville, Knox County, Comprehensive Park, Recreation and Greenways Plan, January 2008,* which was prepared by the Metropolitan Planning Commission.

There are few alternative modes of transportation available in the study area. Bicycle and pedestrian facilities are very limited in the area but more are being planned as outlined in the City's sector plan. Sidewalks installed as part of the interstate project are located adjacent to both Washington Pike and Millertown Pike interchange ramps with I-640. Certain areas of the City's east sector are dense enough to support public transit. Additionally, Knoxville Area Transit (KAT) has a bus transfer point located at the main entrance to the Knoxville Center Mall. A rail line operated by Norfolk Southern Railway roughly parallels Loves Creek Road and portions of Washington Pike in the study area.

This rail line provides freight services but no passenger service. An illustration of the locations of bicycle, rail, sidewalks, and bus facilities within the city's east sector is contained in Figure 5 of this report. The highlighted circle indicates the transportation facilities located within the study area.

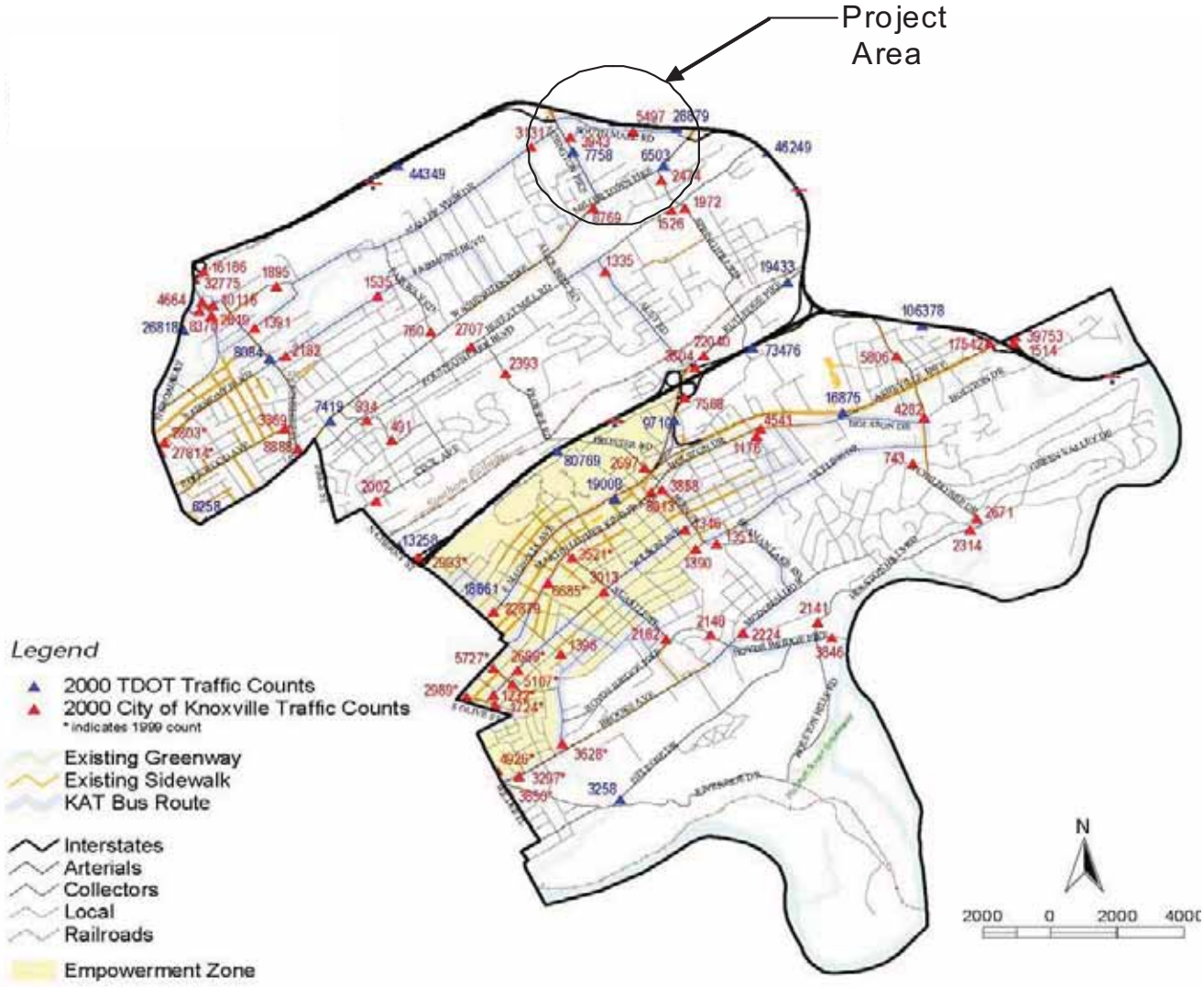
In addition to these alternative transportation modes in the study area, McGhee Tyson Airport is the premier air facility in East Tennessee. Daily, the airport handles commercial airline, air cargo, military aviation and general aviation air traffic. Located 12 miles south of downtown Knoxville, the airport occupies more than 2,000 acres of land with space for additional air cargo facilities or economic development. McGhee Tyson Airport provides non-stop service to 15 major airline hub cities.

SAFETY

Traffic crash information for Washington Pike and Millertown Pike was obtained from TDOTs Safety Planning Division for the years 2004 through 2006 to study the number and types of crashes in the area. Over, the three-year period, 236 total crashes were recorded on Millertown Pike between Spring Hill Road (Log Mile 4.71) and Mill Road (Log Mile 5.57). A majority of these crashes were at the eastbound and westbound interchange ramps to I-640. Sixty-six of these crashes occurred at the ramp to I-640 eastbound and forty-eight crashes were recorded at the I-640 westbound ramp. Nearly fifty percent of the accidents at both intersections were reported as angled or "t-bone" type crashes. Rear-end collisions were recorded as well at both intersections, this type of crash is typical of signalized intersections. Forty-eight accidents were recorded at the Knoxville Center Mall/Kinzel Way and Millertown Pike intersection. Twenty-two of these crashes were angled accidents occurring at the signalized intersection; whereas 15 crashes were reported as rear-end collisions.

The segment of Washington Pike north from the I-640 interchange to the Murphy Road intersection had reported 188 total crashes from 2004-2006. On average, one out of every four crashes (47 out of 188) involved an injury. One fatality was recorded at the intersection of Mill Road at Washington Pike in 2004. The intersection underwent improvements in 2005 to include traffic signalization and exclusive left turn lanes on Mill Road and westbound Washington Pike. Approximately 46 percent of the crashes

EAST CITY SECTOR PLAN
Transportation System



Source: Knoxville-Knox County Metropolitan Planning Organization, January 2002

Figure 5

(87 out of 188) that occurred on this portion of Washington Pike were rear-end collisions with approximately one-third (66 out of 188) of the crashes involving angled collisions at intersections.

The segment of Washington Pike south of the I-640 interchange to the Millertown Pike intersection recorded a total of 24 crashes. A majority of traffic accidents (54 percent) along this route were the result of angled accidents at Valley View Drive and Centerline Drive. Proposed improvements to relocate Valley View Drive several hundred feet south to a point opposite Centerline Drive may improve the traffic operation at the nearby Washington Pike interchange.

CAPACITY AND LEVEL OF SERVICE

A "Level of Service" (LOS) index was used to gauge the operational performance at each intersection/roadway segment. The LOS is a qualitative measure that describes traffic conditions related to speed and travel times, freedom to maneuver, traffic interruptions, etc. There are six levels ranging from "A" to "F" with "F" being the worst. Each level represents a range of operating conditions. Table 2 shows the traffic flow conditions and approximate driver comfort level at each level of service.

In order to evaluate traffic conditions, capacity and level of service (LOS) were calculated using the ***2000 Highway Capacity Manual, Special Report 209*** published by the Transportation Research Board (TRB). Signalized and unsignalized intersections are evaluated based on estimated delays, which are related to level of service.

The LOS analysis completed for this route utilized the projected base year (2013) design hour volumes (DHV) and design year (2033) DHV with existing geometry (the No-Build Option) as well as with the proposed build optional improvements for the four sections. The results are compared on the Project Data Table and discussed later in this report. Eighteen existing study intersections were identified including:

Washington Pike at Murphy Road
Washington Pike at McCampbell Drive
Washington Pike at Edmondson Lane
Washington Pike at Babelay Road
Washington Pike at Mill Road
Washington Pike at Greenway Drive

Table 2

LOS Criteria

LOS	Traffic Flow Conditions
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B	Reasonable free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is still high.
C	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension.
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E	At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.
F	Breakdowns in traffic flow. The number of vehicles entering the highway section exceed the capacity or ability of the highway to accommodate that number of vehicles. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Source: 2000 Highway Capacity Manual, Special Report 209 , Transportation Research Board (TRB)

Washington Pike at North Mall Road

Washington Pike at I-640, Exit 8 interchange

Washington Pike at Valley View Drive

Washington Pike at Centerline Drive

Washington Pike at Pinehurst Drive

Washington Pike at Millertown Pike

Millertown Pike at Springhill Road

Millertown Pike at South Mall Road

Millertown Pike at I-640 interchange

Millertown Pike at Knoxville Center/Kinzel Way

Millertown Pike at Loves Creek Road

Millertown Pike at Mill Road

An illustration of the principal intersections and its existing geometry is shown in Figure A1 of the Appendix. The existing averaged daily traffic volumes within the study area are

shown as Figure A2 in the Appendix. Anticipated ADT volumes for the base year (2013) and design year (2033) are shown in the Appendix on Figures A3 and A4 respectively. Traffic counts, which were conducted for an eight-hour period thereby providing morning and afternoon peak-hour traffic volumes, are illustrated in Figures A5 and A6. Capacity and level of service analysis were conducted for the principal intersections and the results illustrated in Figure A7 and A8 for existing AM and PM traffic conditions. Based on the 2008 traffic counts conducted, design hour volumes (DHV) and levels of service analysis were developed for the base year (2013) and are illustrated in Figures A9 through A12. Design Year 2033 traffic volumes and levels of service analysis are shown in Figures A13 through A16. Figure A15 and A16 reveal the continued failure in levels of service if no improvements are implemented.

Existing traffic characteristics revealed that the section of Millertown Pike from the interstate to the Norfolk Southern Railroad Bridge operates at a marginally acceptable to poor level of service during both AM and PM peak hour periods. The worst congestion and delays occur during the PM period at the Interstate 640, westbound exit ramp and at the Loves Creek Road intersection, both of which are signalized. The right-turn movement from the I-640 westbound off-ramp at Millertown Pike which has a v/c ratio of 0.64 and a LOS F during the PM peak hour, meters the traffic demand to the extent that the other intersections are demonstrating demands that are less than or equal the capacity of the off-ramp's right-turn movement thereby resulting in better LOS. The northbound movement on Millertown Pike through Loves Creek Road experiences a v/c ratio in excess of 0.90 suggesting great sensitivity to variations in traffic conditions. Volume to capacity ratios in excess of 0.90 indicate saturated conditions and vehicle delays will increase rapidly with small increases in traffic. Long queues will often be reflected with saturated conditions and may spill over to adjacent lanes depending on the available storage. These capacity ratios and resulting adverse traffic queues suggest the need for intersection and other geometric improvements for Millertown Pike.

Moreover, poor traffic conditions occur on weekends and holidays along this segment of Millertown Pike. Although examination of the intersection V/C ratio and LOS for Millertown Pike suggest that a signal timing deficiency exists for the interstate ramp, the traffic demand on the ramp exceeds the approach capacity. Thus resulting in excessive ramp queuing.

The unsignalized intersection of Millertown Pike at Mill Road experiences some delay during both morning and afternoon periods for motorists turning from Mill Road onto Millertown Pike. Southbound on Washington Pike from the interstate to Millertown Pike, motorists experience acceptable traffic conditions during both AM and PM peak periods.

The existing traffic conditions on Washington Pike reflect very directional traffic flows, operating at capacity for critical movements, during the morning peak hour. Both Greenway and Murphy Road intersections with Washington Pike are experiencing LOS E conditions and v/c ratios of 0.98 and 1.08, respectively. For the southbound right-turn movement from Murphy Road to Washington Pike has a v/c ratio of 1.05 and a LOS E, and the left-turn movement from Washington Pike at Greenway to the I-640 interchange is experiencing a capacity ratio (v/c) of 1.04. Both these movements during the AM peak hour result in long traffic queues which may spill over into the adjacent traffic lanes resulting in more congestion and increased delays.

For the PM peak hour, the intersection of Washington Pike and Mill Road approaches capacity with the northbound approach having a capacity ratio of 1.09 resulting in a LOS F and extensive queues. The capacity for the right-turn movement from Mill Road is also approached with a v/c ratio of 0.88. Capacity ratios in excess of 0.90 suggest unstable traffic conditions. These intersection capacity and levels of service indicate the need for a 4-lane facility for Washington Pike, between the I-640 interchange and Murphy Road.

PROPOSED IMPROVEMENTS

Proposed improvements for the Knoxville Center area include the widening of both Washington and Millertown Pikes and the future prospect of extending Murphy Road on new location from Washington Pike to a new intersection with Millertown Pike (not directly included in this proposed project). To prepare for the growth anticipated in some areas of the sector, improvements to Tazewell Pike are also being considered. However, improvements to the part of Tazewell Pike located within the Northeast County Sector are not currently scheduled.

Some recommended improvements require minimal and/or spot improvements, widening, realignments, widened shoulders, and expanded lanes. Spot improvements address problems at specific locations such as intersections, short lengths of roadways,

or access points and could improve safety and capacity. A better-connected network of streets will help relieve traffic growth along heavily used Washington and Millertown Pikes and reduce congestion at major choke points and intersections. Such improvements will also provide more safety to the overall transportation network, allowing people to access nearby destinations on smaller-scaled, walkable, bikeable, and transit-friendly roadways.

In order to provide residents and businesses safe, efficient, and truly usable transportation choices, the MPO plans include considerable funding options to provide for bike, pedestrian, transit and traffic calming projects. The overarching goal is to create a balanced, multi-modal transportation network, by 1) Improving regional connections; 2) Improving mobility for residents of adjacent neighborhoods; and 3) Making transportation choices which help foster livable communities.

There are two optional improvements proposed for this project. This includes a No-Build Option, which as the name implies, would retain the existing facilities with no improvements on Washington Pike and/or Millertown Pike and no plan for the new Murphy Road extension.

The No-Build Option as the name implies, denotes that only minor improvements (such as safety improvements and normal maintenance) would be made to the existing road and/or intersection areas. The No-Build does not meet the purpose and need of the study, and it will not provide the needed capacity to handle future traffic demands or the needed connectivity to Washington Pike, Millertown Pike and the Knoxville Center area.

The Build Option was developed with careful consideration of the study area keeping in mind the City's objective to provide an efficient transportation link from the city's eastern edge to Interstate 640 and the Knoxville Center area. Listed below are brief descriptions of the Build Option which are divided into four sections for the Washington Pike and Millertown Pike corridor alignments.

Section One- Millertown Pike from Interstate 640 to the Norfolk Southern Railroad Bridge is proposed as a 6-lane facility consisting of shoulders/bike lanes, curb and gutters and sidewalks. However for Section One, if shoulders are preferred, available

shoulder width could be utilized for pedestrians and bicycle mobility. The project will begin just north of Mall Road and extend past the Knoxville Center to the existing three-lane bridge at Mill Road. The project length of this section is approximately 0.56 miles (2,950 feet). Due to the complexity of traffic patterns at this location, multiple design options may be considered. A 300 foot corridor width is used for the proposed design of this section.

Section Two-Washington Pike, north from Interstate 640 to Murphy Road is proposed as four-lane facility with a raised median. This section consists of four traffic lanes (two in each direction), curb and gutter, sidewalks, and bike lanes. The typical section design for this section is guided by the City's request for first flush capability as guided by the City's storm water quality ordinance. As an option, this design may eliminate or reduce some curb and gutter sections with construction of grass swales. The project length of Section Two is approximately 1.73 miles (9130 feet). A 200 feet corridor width is suggested for the proposed roadway design for this section. A consistent multi-lane section is recommended in order to provide adequate future capacity.

Section Three - Washington Pike, south from Interstate 640 to Millertown Pike. This section proposes a three-lane facility with curb and gutter, sidewalks and bikeways on both sides. Proposed design options include a roundabout alternate and a T-intersection alternate for the intersection of Washington Pike and Millertown Pike. The project length is 0. 91 miles (4800 feet). A 300 feet corridor width was used during the development of the typical section. The plan assumes completion of the pending realignment of Valley View Drive with Centerline Drive (construction scheduled for Spring 2009).

Section Four- Millertown Pike from Washington Pike to Interstate 640. A two-lane urban section with, curb and gutter, sidewalks, and bike lanes is recommended. This proposal presents a better two lane facility to safely accommodate the anticipated traffic volumes yet increase mobility for residents in the nearby neighborhoods along this route. The project length for this section is approximately 0.83 miles (4380 feet). A 300 foot wide corridor was utilized during the design of the typical section. As previously mentioned, multiple design options (roundabout or standard) will be considered for the existing three-legged Millertown/Washington intersection. Future improvements would encounter

several parcels of the adjacent Vaughn Dyer subdivision along the north side of the Millertown Pike/Washington Pike intersection. The acquisition of at least two properties are likely to construct the detention basins and for culvert relocations. The construction of a box culvert under Millertown Pike may require partial acquisition.

As previously noted, I-640 and its interchanges with Washington Pike and Millertown Pike are excluded from this project.

Potentially, the Build Option incorporates eleven-foot travel lanes in tight spots for each section. The proposed centerlines for each section will tie back to existing centerlines at the section termini; however there may be some shifting of the proposed centerline within each section to attain its recommended typical section width. The City requests that accommodations for bicyclists and pedestrians be provided on all four sections of this project, if possible.

Because development activities including roadways may contribute discharge to stormwater channels, the City has established ordinances and standards to protect water resources as outlined in its Best Management Practices (BMP) Manual during the design and implementation of new facilities. The City's Land Development Manual (LDM) is another useful resource which focuses on providing good stormwater and street design to satisfy City requirements. Stormwater design is essential in reducing and controlling erosion, nonpoint source pollution, flooding and other drainage problems. Detention basins and areas for natural filtration are present in the project area. Therefore, additional stormwater quality designs should be considered in the typical section designs. Moreover, the City has indicated a design option which shows a five foot berm placed between the sidewalks and curb and gutter sections for drainage purposes. The preferred typical section design for all sections must be supported by the City's Stormwater Engineering Division which has the primary responsibility for preventing pollution in natural creeks and streams in Knoxville and the adjacent portions of the Tennessee River.

Projected Levels of Service

The proposed road widening improvements should mitigate most of the poor service levels anticipated in Year 2033. However, unmitigated poor service levels along

Washington Pike could be mitigated by extending Murphy Road. The two most noteworthy poor service levels that could be improved upon are Washington Pike at Mill Road and Washington Pike at Murphy Road. Figures A13-A16 depicts the traffic volumes and levels of service analysis for Year 2033. Even with improvements, some of the side street movements at unsignalized intersections are expected to operate at LOS F. By 2033, some of these intersections may warrant a traffic signal. By Spring 2009, the City will be improving the traffic operations at the Valley View intersection with Washington Pike. Valley View Drive will be realigned with Centerline Drive to create a new four-legged intersection. Part of these improvements includes installing a traffic signal at this new intersection.

At the intersections of Washington Pike at McCampbell Drive /Edmonson Lane, a proposed mixed use development is being constructed that should necessitate the need for traffic signals. Without this development, traffic signals cannot be justified at these locations. Finally, the intersection of Millertown Pike and Mill Road should meet the criteria for signalization in 2033.

Spot Improvements

Additionally, the City has suggested funding small-scale projects which would improve the traffic operations and travel environment by way of “spot improvements”. The City is placing emphasis on performing two short-term improvements particularly on Section 4, Millertown Pike, at the Washington Pike/Millertown Pike intersection and a bridge replacement project east of Springhill Road. These short-term improvements will help to bridge physical and functional gaps in the area’s transportation system to maximize the effectiveness of existing transportation investments.

Although the City has indicated that Sections 3 and 4 are a lesser priority, these isolated improvements recommended at this time offer safer travel conditions, particularly at these locations, which would otherwise be delayed until the whole section is built. The City is requesting funding for its FY 2009-2010 Capital Improvement Program for these spot improvements. A brief description of the spot improvements is located in the Appendix.

Pedestrians and Bicycles

The proposed cross-section for both Millertown and Washington Pikes will have accommodations for pedestrians and bicycles. The minimum paved shoulder recommended for bike lanes is 4-feet wide. This, in conjunction with the recommended eleven-foot wide travel lanes (in tight spots), is adequate for pedestrian and bicycle use. The City recommends a five- foot sidewalk for pedestrian connectivity that is accessible and convenient to nearby neighborhoods. These areas include major and minor arterials, major and minor collectors, and any connections critical to the pedestrian network (e.g. greenways, pedestrian generators). The City of Knoxville has long understood the need to develop alternate transportation modes and is continually adding new sidewalks, greenways and bike lanes as an ongoing mission to improve pedestrian and bike safety. The *Knoxville TPO Regional Bicycle Plan* encourages that appropriate bicycle and pedestrian facilities be implemented as a part of city and county capital improvement (new and reconstruction) projects in order to address the present and future needs of bicyclists and pedestrians. The opportunity to provide better pedestrian and bicycle facilities would:

- Significantly improve the access, safety and quality of experience for cyclists and pedestrians as well as persons with disabilities in the Knoxville Center project area
- Create a connected, convenient and accessible facility that would be compatible with transit alternatives and which makes bicycling and walking viable transportation and recreation choices
- Enhance the value of the existing transportation system by successfully integrating bicycle/pedestrian facilities into the street system
- Be compatible with and serve the needs of the surrounding neighborhoods

An investment in transit provides the opportunity to reduce congestion, improve air quality and offer an alternate choice of travel. Although less than one percent of residents in the project area do not drive, the existing transit routes in the area can continue to improve mobility and provide feasible travel options to major generators like the mall, Target and other shopping destinations. The Knoxville Regional Transportation Plan provides substantial opportunities in both operational support and capital improvements for transit. Travel Demand Management (TDM) strategies like Ride Share, Guaranteed Ride Home, Park and Ride lots and other commuter information

provide viable transportation choices as outlined in the *KAT Action Plan 2010*. As a major destination attraction, Knoxville Center Mall is a designated transfer point for riders and could be considered as a location for park and ride opportunities if the need arises for users. Factors such as commuting patterns and regional destinations for shopping point to the need for a coordinated, multi-modal regional transportation plan.

OPTIONS CONSIDERED

Table 3 below describes the pros and cons of the Build Option. The No Build Option provides no improvements and serves as a baseline option against which the Build Option is compared.

Table 3: Comparison of No-Build and Build Option

PRO	NO-BUILD	BUILD OPTIONS
Meets purpose and need		X
Concurrence of the community		X
Less disruption of existing land use	X	
Direct Route		X
CON	**NO-BUILD**	**BUILD OPTIONS**
Right-of -Way Acquisition		X
Utility Relocation		X
Residential or Business Displacements		X

The Build Option may require some residential and/or business displacements while the No Build Option will not. Also, the Build Option will result in right-of-way acquisition and utility relocations in residential and business areas along both Washington Pike and Millertown Pike. The necessary right-of-way to build the project will vary depending on the typical roadway section, terrain, proposed land uses, and environmental considerations.

The Build Option would have some primary adverse effects including: 1) Loss of land and property due to right-of-way acquisition; 2) temporary construction impacts (siltation, dust, equipment, noise, etc.) during the construction period; and 3) impacts to the environment to be assessed in detail during the environmental phase of the project.

The advantages of the No Build Option includes less disruption of the existing land use patterns within the project area and no disruption in the area due to construction. Also mitigation measures to reduce environmental impacts within the project area would not be needed. However, the No Build Option would deliver increasingly inadequate operational conditions and safety concerns as a result of deficient roadway geometrics and increased traffic volumes. Furthermore, the No Build Option fails to address the long-term need to improve connectivity between the study area and Interstate 640.

The baseline traffic condition (2013) is projected five years from the existing traffic count year, 2008. The future traffic condition (2033) is projected twenty years from the baseline year. The 2013 Average Daily Traffic (ADT) volumes along Washington Pike from Millertown Pike to Greenway Drive are anticipated to range from approximately 12,000 to 22,000 vpd. On Millertown Pike from Spring Hill Road to Loves Creek Road the traffic ranges from approximately 9,500 to 21,000 vpd. Along Washington Pike towards Mill Road, nearly 14,300 vehicles are expected to travel in this area. By 2033, these ADT projections will increase to approximately 20,300 to 35,200 vpd on Washington Pike from Millertown Pike to Greenway Drive, from 15,000 to 33,300 vpd on Millertown Pike from Spring Hill Road to Loves Creek, and approximately 33,000 vpd on Washington Pike near Mill Road.

Today, it is common to observe that most unsignalized intersections have movements operating at LOS E or F and the signalized intersections have an overall operation of LOS E or F. The LOS for the No Build Option in both the base year and design year was calculated as an “F” at most intersections. Also, the disadvantages of the No Build Option include inadequate operating conditions and safety concerns inherent with increased traffic volumes, inadequate roadway geometrics and poor horizontal and vertical alignments.

Figure A17 shows that added lanes are necessary to provide capacity for the intersections to operate at an acceptable LOS based on future traffic volumes. Several intersections may experience unacceptable levels of service even with proposed improvements. Thus, the Murphy Road extension should be pursued to better mitigate the area's traffic congestion. Figure A18 and A19 depict the resulting LOS's if the recommendations shown in Figure A17 are implemented. Traffic reassignments and final volumes for 2033 are shown in Figures A20 through A23 if Murphy Road is extended. This new road would mitigate the remaining poor LOS's that are unmitigated with just the widening of Washington and Millertown Pikes.

PREFERRED OPTION

The most significant recommendations include the widening of the existing two-lane portions of Washington Pike to multi-lane facilities as outlined in the Build Option. Recommendations on Millertown Pike include a multi-lane facility from the I-640 interchange to the Norfolk Southern Railroad Bridge. Short-term or immediate improvements are recommended for the "triangular" portion of Millertown Pike to a roundabout alternate and a T-intersection alternate for the intersection of Washington Pike and Millertown Pike.

PRELIMINARY COST ESTIMATE

The preliminary cost estimates for the four sections of the Build Option are based on information available at the planning level. The cost estimates are summarized in the Summary Data Tables and Cost Data Sheet and provided in detailed in the Appendix.

DISPOSITION OF EXISTING ROUTE

The proposed improvements for both Washington Pike and Millertown Pike will be under the jurisdiction of the local governing agency for future maintenance responsibility. No portion of Washington Pike or Millertown Pike is proposed to be closed or abandoned as a result of this proposed construction.

ASSESSMENT OF OPTIONS WITH TDOTs SEVEN GUIDING PRINCIPLES

The Tennessee Department of Transportation has adopted seven guiding principles against which all transportation projects are to be evaluated. These guiding principles address concerns for system management, mobility, economic growth, safety,

community, environmental stewardship, and fiscal responsibility. These guiding principles are discussed in the following paragraphs as they relate to the Build Option discussed in this report.

Guiding Principle 1: Preserve and Manage the Existing Transportation System

Substantial residential, retail and commercial development has been ongoing within the Knoxville Center area for several years. Development opportunity has expanded in the east and northeast portions of Knox County, which border the project area. Trips generated from these new developments have caused the need for transportation improvements in the City's east sector, particularly on Washington Pike and Millertown Pike. These roads experience failing conditions today, and by 2033 without improvements, traffic conditions on these corridors are expected to deteriorate very substantially. Preserving the existing transportation network and replacing failed systems are tasks critical to the promotion and effective management to provide better regional mobility. The City's mission is to establish priorities on projects that maintain, repair and modernize existing infrastructure and to support projects and programs that improve the operation of the existing transportation system through transportation systems management.

Guiding Principle 2: Move a Growing, Diverse, and Active Population

The Build Option discussed in this report will provide the capacity needed to address the future travel demands anticipated on Washington and Millertown Pikes. Current traffic operations are poor at key intersections particularly during the afternoon when motorists are returning home from work and on Saturdays during peak shopping visits to the mall. New subdivision developments in the area have the potential to place more traffic on both Washington Pike and Millertown Pike provided they serve as the main arterials for local and regional access into the city. Emphasis to increase capacity and improve traffic operations along both corridors are necessary to accommodate the travel demands anticipated by residential growth in the area.

Guiding Principle 3: Support the State's Economy

Recent new developments around the Knoxville Center Mall area have stimulated an increase in economic growth leading to demands on the area's transportation system. Roadway widening improvements for Washington Pike and Millertown Pike will be

needed to allow for better east-west traffic operations and mobility. Additionally, improvements could offer more opportunity for economic investments in the project area.

Guiding Principle 4: Maximize Safety and Security

The safety of the Washington Pike and Millertown Pike corridors will be greatly improved by constructing facilities with adequate and consistent roadway widths and design standards. Proposed improvements will provide increased safety for vehicles and pedestrians and better transportation linkages in the northeast quadrant of the City.

Guiding Principle 5: Build Partnerships for Livable Communities

The previous APR document reported various workshops and public meetings to address citizens concerns with the project. Public meetings and coordination with City of Knoxville, TDOT staff, the general public and other governing agencies will continue throughout the development of this Transportation Planning Report (TPR). Several of these meetings were mentioned in the Existing Transportation Conditions section of this report. The public involvement process will continue as mandated by the provisions of the National Environmental Policy Act (NEPA).

Guiding Principle 6: Promote Stewardship of the Environment

A preliminary field review of the study area identified areas that may be environmentally sensitive. These areas include cemeteries, churches, public parks as well as floodplains, streams and creeks where permits may be required. These areas are noted on the functional plans. The study area contains several creeks and blue line streams. Depending on the design of the Build Option, several stream crossings may be considered. The exact number of stream crossings is not known with certainty due to the preliminary nature of the alignment corridor. A more comprehensive environmental evaluation to determine any potential impacts (natural and man-made) will be completed at a later date to comply with the National Environmental Policy Act (NEPA). The NEPA document will include an assessment of additional environmental disciplines including social, economic, farmland, displacements, and land use impacts.

As noted, this proposed project may require a few resident or business displacements. All displacements will be noted for each section of roadway as the typical section is determined during the environmental/preliminary engineering (PE) stage.

Guiding Principle 7: Emphasize Financial Responsibility

This principle addresses the financial responsibility, efficiency, and accountability of the project especially when involving both City and State functions involving funding programs, project development, project priorities and project implementation. Preliminary construction cost estimates were prepared for the four sections of the Build Option. These estimates should be considered as opinions of probable costs based on planning level information which will be refined over time based on more detailed information, inflation and other future circumstances. The goal is to follow a comprehensive transportation planning process, promote coordination among public and private stakeholders of transportation systems, and support efforts to provide stable funding for the public component of the transportation system. This requires exercising financial responsibility in the development and implementation of roadway projects and minimizing costs to taxpayers.

EARLY ENVIRONMENTAL SCREENING

The previously approved APR document contained Phase I investigations to identify any potential archaeological, architectural, and ecological resources within the project right-of-way. Each of the supplementary environmental documents were reviewed by TDOT's Environmental Planning Division and approved as part of the earlier APR process. Based on information submitted to TDOT, no defined archaeological sites or cultural resources of interest were found during the assessment. This is most likely due to ongoing residential, commercial and retail development within the project area, which would have removed any and all traces of previous settlement and use.

Presently, for Transportation Planning Reports (TPR) documentation, the Tennessee Department of Transportation (TDOT) has introduced an environmental screening process for the project study area. By screening the latest available Geographic Information Systems (GIS) environmental data during the early stages of project planning TDOT and the public will be better prepared to anticipate potential environmental issues and mitigation requirements. This screening process involves using GIS to assess environmental data as it spatially relates to the project's Area of Potential Effect (APE). In broad terms, the GIS environmental data reviewed in this TPR include the following layers:

1,000 ft EES Corridor

- Community Impact-

  Cemetery Sites- A 2000 Phase 1 Archaeological Survey performed shovel testing on the property of the Oak Grove Church and Oak Grove Community Center. Results from the tests indicated no recovery of cultural materials. No other sites were defined within the project area. Results of the survey suggest that the proposed improvements and new construction will have no impact on significant archaeological resources.

  Institutions(Church)- Fullwood Church, North Acres Church and Oak Grove Church are within the project vicinity. A 2000 Phase 1 Archaeological Survey performed shovel testing on the property of the Oak Grove Church and Oak Grove Community Center. Results from the tests indicated no recovery of cultural materials. No other sites were defined within the project area. Results of the survey suggest that the proposed improvements and new construction will have no impact on significant archaeological resources.

  Sensitive Community Populations-There are several residential neighborhoods located within the project study area and corridor. Severe impact to sensitive community populations cannot be avoided. Preliminary maps reveal that the study area contains a minority population of 24 percent. The maps also revealed that 13.5 percent of area residents live below the state poverty level.

- Ecology- Rare and Protected Species-Bats

  No project impact is anticipated.

- Railroads and Public Lands

  Railroad- A rail line operated by Norfolk Southern Railway roughly parallels Loves Creek Road and portions of Washington Pike in the study area. This rail line provides freight services but no passenger service. Great impact on the project is anticipated as the railroad lies within the project study area or corridor. The railroad bridge on Millertown Pike, east of Loves Creek Road serves as the project terminus (and the City boundary) for Section One. Minimal impact in the vicinity of the railroad bridge is anticipated due to the Section One terminus location.

  Park- New Harvest Park is a public park, owned by Knox County, located adjacent to the proposed project study area. There is a possibility that the park entrance would be disturbed during the widening on Washington Pike, however no impact to the

park, itself is anticipated. Additionally, there are no wildlife management areas observed within or adjacent to the proposed project corridor.

2, 000 ft EES Corridor

National Register Sites- None located within the project study area or corridor. At the time of the investigation, there were no concentrations of pre-1958 properties meeting the National Register district criteria identified as being potentially eligible for the National Register of Historic Places (NRHP) along Washington and Millertown Pikes. If properties are identified later as being eligible for the National Register, they may also need to be avoided to prevent adverse effects or potential 4(f) impacts.

- Hazardous Substances and Geology

  Superfund Sites-No project impact is anticipated as there are no known contaminated land tracts abutting or within the project study area or corridor.

  Pyritic Rock/ Geotechnical-Limestone (symbolized as dark green) and dolomite (symbolized as light green) are present within the project study area or corridor.
- Public Lands-No TWRA Lakes or other Public Lands are present within project study area or corridor.

4,000 ft EES Corridor

- Rare and Protected Species

  Minimal impact on the project is predicted as there are two known rare or state protected terrestrial species (*Lillium canadense* and *Pituophis melanoleucus melanoleucus*) located within the property study area or corridor. A survey for the species may be required.
- TDEC Conservation Sites and TDEC Scenic Waterways- None located within the project study area or corridor
- Large Wetland Impacts-Eleven Large Wetland areas are listed within the project study area. A substantial impact to the project is probable as there is greater than two acres of wetlands within the project study area or corridor. Compensatory mitigation will be required. Design effort will be needed to avoid and minimize impacts to wetlands to the maximum extent practicable. If a floodplain is crossed by the project, floodplain culverts may be necessary.
- Stream Impacts- There is potential for six streams to be affected by the proposed project. Loves Creek and four unnamed tributaries are located within the proposed

project corridor. Murphy Creek lies outside the project limits, but may be impacted by sediment and run-off from construction activities. Short-term adverse impacts to the stream water quality and aquatic communities may occur during construction through increased water turbidity associated with soil erosion during storm water run-off periods. No long-term significant adverse water quality impacts are expected to the streams as a result of the project implementation.

10,000 ft EES Corridor

- Aquatic Species-No project impact is anticipated in the project study area or corridor
- Caves- No project impact is anticipated as there are no caves in the project study area or corridor.

As of the publication of this document, the GIS data within each layer was up to date relevant to date of its publication. This data will be updated as part of the ongoing project development process.

SUMMARY

The recommendations for the proposed improvements contained in the Knoxville Center environs include widening of both Washington Pike and Millertown Pike corridors that include both short-term relatively low cost improvements and long-term potential improvements. Improvements to the Washington Pike and Millertown Pike corridors are needed to:

- Improve the east-west mobility primarily in the Knoxville Center area
- Provide a transportation solution that improves safety for vehicles and pedestrians
- Reduce travel delays for through traffic
- Enhance regional and local economic development opportunities
- Improve transportation system linkages throughout the northeastern quadrant of the City

The Build Option consists of four sections. Each section, described below, will be improved to service the anticipated development growth and associated traffic demands of the Knoxville Center area.

Millertown Pike (Section One) would transition from its existing two lanes to a six-lane facility consisting of bike lanes, curb and gutter and sidewalks, beginning south of the I-640 interchange tieing in to the existing three-lane Norfolk Southern Railroad Bridge at Mill Road. The proposed project length for Section One is approximately 0.56 miles (2,950 feet).

Washington Pike (Section Two), north of Interstate 640 to Murphy Road would be upgraded to a four-lane facility with a raised median, curb and gutter, sidewalks and bike lanes. This typical section includes the design of infiltration trenches, swales, and catch basins as measures to prevent and control erosion, sediment, and other forms of stormwater pollution as part of the City's goal for effective stormwater quality management. The proposed project length for Section Two is approximately 1.73 miles (9,130 feet).

Washington Pike (Section 3), south from Interstate 640 to Millertown Pike proposes a three-lane facility with curb and gutter, sidewalks, and bike lanes. As a short-term improvement, the City suggests two improvement options: a roundabout option and T-intersection option as a means to reduce backups at the intersection of Washington Pike and Millertown Pike. The proposed project length for Section Three is approximately 0.91 miles (4800 feet).

> *Note: By Spring 2009, the roadway improvements to relocate Valley View Drive with Centerline Drive will be underway to provide better traffic operations at the I-640/ Washington Pike interchange.*

Millertown Pike (Section 4) from Washington Pike to Interstate 640 proposes a better two-lane urban section with curb and gutter, sidewalks and bike lanes. A short-term improvement option is to reconstruct the bridge east of Springhill Road that would maintain or improve traffic operations on this existing section. The proposed project length for Section 4 is approximately 0.83 miles (4380 feet).

Beyond the TPR stage, each section of the Build Option will be further evaluated with additional studies and design phases to include horizontal and vertical alignments, right-of-way, utilities (relocation), structures and environmental mitigations. The primary adverse effects of the proposed Build Option include:

- Right-of-way acquisition
- Utility relocation
- Residential or Business Displacements
- Temporary construction impacts (dust, siltation, equipment noise, etc.)
- Traffic noise
- Potential environmental impacts

A preliminary construction estimate is prepared for each of the four sections of the Build Option. As of 2008, historic inflation costs averaged a 6% increase per year. Therefore, inflation costs were applied to the total costs at a rate of approximately 6% per year over five years.

The estimated total costs for each section of the proposed Build Option are:

- Section One=$6,471,100
- Section Two=$13,896,100
- Section Three=$8,222,200
- Section Four=$5,964,300

The proposed road widening improvements along Washington Pike and Millertown Pike should mitigate most of the poor service levels anticipated in Year 2033. However, unmitigated poor service levels along Washington Pike could be mitigated by additional long-term improvements which may include extending Murphy Road from Washington Pike to Millertown Pike. A new Murphy Road Extension would provide a new primary movement between Tazewell Pike and the I-640 interchange which would reduce the continuing traffic congestion and delays experienced on Washington Pike and Millertown Pike. The comparable LOS for the No-Build Option reveals LOS F or worse.

In the meantime, the City has identified several areas being fast-tracked for improvements. The City plans to obtain funds for spot improvements from its 2009-2010 Capital Improvement Program. Two particularly problematic sections, the three-legged intersection of Washington Pike and Millertown Pike and a structure east of Springhill Road will undergo improvements as part of the City's charge to improve congestion and better regulate traffic in the area. Once completed, residents and motorists can expect to see immediate benefits, including improved traffic flow, reduced congestion and increased public safety. The estimated costs for these recommended short term improvements along Section 4 (Millertown Pike) are shown below.

Section Four- Washington Pike and Millertown Pike (Roundabout Option) =$1,005,400
Section Four- Washington Pike and Millertown Pike (T-intersection Option) =$805,400
Section Four-Millertown Pike (Bridge Replacement) =$215,100

The No-Build Option was initially considered but was not studied further because it would not fulfill the purpose and need of the project. The No Build Option has some advantages including less disruption of existing land use patterns and no disruption to the area as a result of construction noise. Also mitigation measures to reduce environmental impacts would not be needed. However, the No Build Option would not serve future traffic demands for regional access to Interstate 640; and would continue inadequate operational conditions and safety concerns that would extend beyond the project area as a result of deficient roadway geometrics and increase traffic volumes.

In conclusion, the Build Option addresses the purpose and need for roadway improvements on Washington Pike and Millertown Pike. The No-Build Option does not meet the purpose and need. Therefore, the Build Option should proceed into further environmental documentation to satisfy the NEPA planning process.

WASHINGTON PIKE /MILLERTOWN PIKE TPR

APPENDIX

VOLUME I

KICK-OFF MEETING MINUTES

WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

MEMO

To: Tom Clabo, Hollis Loveday

C: Thanh Duong, Bob Bowers

Date: April 25, 2008

From: Dawn Michelle Foster

Subject: Washington Pike/Millertown Pike TPR

This project is an update of the previous Washington Pike/Millertown Pike Advance Planning Report (APR) performed by Wilbur Smith Associates and approved in 2001. A kick-off meeting was held on Friday, April 25, 2008 for the Washington Pike/Millertown Pike Transportation Planning Study (Study) to discuss the scope of work, traffic methodology, report preparation and documentation. A sign in sheet is attached.

Bob Bowers facilitated the meeting beginning with a brief introduction of WSA staff and assigned project duties. The meeting continued with an overview of the proposed schedule and to identify key elements including scheduling meetings with TDOT representatives and the public.

A PowerPoint presentation was utilized during the meeting to show the study area , proposed schedule and to discuss the existing conditions of key intersections..

Several items of discussion included the following:

- **Report Preparation and Documentation-** This report is an update of an approved document with functional plans. For the new study, further discussion with TDOT on report documentation is vital. Tom Clabo will have further discussion with Nancy Sartor (TDOT- Local Programs) for more detail on report preparation. The City will look at project priorities:
  - Washington Pike – Target to Murphy Road
  - Millertown Pike-I-640 to Loves Creek Road and railroad
  - Washington /Millertown- south of I-640 including a roundabout option

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A major outcome of this study is to confirm the priority order of project development.

- Discussion of the project purpose and need will be included in the new document. The study will include an overview of the environmental resources in the area derived primarily from the previous APR. However it should be noted that any NEPA document on the natural and cultural environment is only considered valid for five years-after that a new or updated document would have to be prepared in order for the project to advance.
- **Traffic Data Collections and Analysis-** The data collection, which consists of turning movement counts and site investigations has been completed on 22 intersections on the Washington Pike/Millertown project and 4 intersections on Tazewell Pike. It is understood that Tazewell Pike is not part of this particular study, however improvements to Washington Pike/Millertown Pike may potentially have some impact on traffic conditions along Tazewell Pike between Murphy Road and Smithwood. Steve King noted that there is a Tazewell Pike Task Force Committee in place to stay abreast of issues of concerns and potential traffic improvements along the Tazewell Pike corridor. Two additional intersections were added to the Tazewell Pike study including Tazewell Pike at Shannondale and Tazewell Pike at Villa. The City asked that WSA have all six turning movement counts on Tazewell Pike completed with analysis for the upcoming task force meeting.

- **TDOT Traffic Coordination-** WSA will be developing traffic information based on TDOT's published TPR standards. This study will consist of existing traffic conditions (2008), base year conditions (2013) and projected year conditions (2033). We are also working with Mike Conger (Knoxville TPO) to update the traffic and land use model. Results of the traffic model, turning movement volumes and growth rates will be discussed with Steve Allen (TDOT-Nashville) for approval before proceeding with analyses. Approval of traffic data is necessary in order to proceed with the functional plans.

- **Field Review-**An early step in the study process is the coordination of a field review of the project. The TDOT coordinator will advise the City of the representatives that need to be present at the field review.

- **Public Meetings**-Based on the project schedule, two public meetings are listed. The City stated that the Public Meetings will be driven by TDOT but that one public meeting which would focus on presentation of priority projects is currently envisioned.
- **Roadway Design and Functional Plans-** Thanh Duong led the discussion of the street design criteria based on the City's Land Development Manual to produce the functional plans. The previous APR used a design speed of 45 mph but it was pointed out that the sections of Millertown Pike and Washington Pike south of I-640 contains several residences and therefore the design speed in that area should be considered less than 45 mph.

  The previous APR was approved with detailed functional plans which will be updated as part of this study. Since this is a locally managed project, typical sections need to be approved by TDOT

  - Design speed- 45 MPH appears to be acceptable for section of Washington Pike between I-640 and Murphy Road.
  - On the triangle, look at both 35 MPH and 40 MPH
  - Typical Sections-A 4-lane divided section with sidewalk and curb and gutter is currently envisioned for the Washington Pike section north of I-640. If supported by traffic analysis, Millertown Pike and Washington Pike south of I-640 will likely be 3-lane sections with roundabouts considered at some locations.
  - Millertown Pike from I-640 to Loves Creek Road will likely be a 6-lane urban section. Multiple options for the Millertown/Loves Creek Road/ Mill Road/ Future Murphy Road Extension will be considered.
  - Consider using 11 ft lanes
  - City will look into how the bike lanes fit in to the typical section
  - Water Quality- the typical section design will be guided by the storm water quality ordinance which may eliminate some curb and gutter sections with replacement by grass swales and grass medians. WSA will work closely with the City to meet the recommended guidelines.
  - Proposed Alignment (Washington Pike south of I-640)-WSA to contact Home Depot to find out their intention. The City would like

to consider their needs, but is not going to move the centerline on its own.

- Detention Basin- Need to plan large enough ROW for detention basins to accommodate not just detention basins per se, but for "natural" filtration.
- Roundabouts- As mentioned earlier, look at the options for roundabouts at the Millertown Pike intersections with Washington Pike and Spring Hill Road.

ACTION ITEMS:

CITY

-Tom Clabo to have further discussion with Nancy Sartor (TDOT-Local Programs)
-Determine how the bike lanes will fit in the typical section

WSA

-Conduct two additional turning movement counts for Tazewell Pike Study
- All six Tazewell Pike counts completed with analysis
-Contact Home Depot

WSA and CITY

-Meeting with TDOT to review traffic analysis and projections
-Coordinate Field Review

WASHINGTON PIKE/MILLERTOWN PIKE TPR
KICK-OFF MEETING
APRIL 25, 2008
10:00AM

NAME	ORGANIZATION	CONTACT INFORMATION(EMAIL/PHONE)
TOM CLABO	CITY OF KNOXVILLE ENGINEERING	tclabo@cityofknoxville.org 215-6100
Mark Geldmeier	" " "	mgeldmeier@ " "
Stephen J. King	" "	sking@cityofknoxville.org
BRENT JOHNSON	" "	bjohnson@cityofknoxville.org
BOB BOWERS	" "	rbowers@wilbursmith.com

WASHINGTON PIKE/MILLERTOWN PIKE TPR
KICK-OFF MEETING
APRIL 25, 2008
10:00AM

NAME	ORGANIZATION	CONTACT INFORMATION(EMAIL/PHONE)
Stephanie Hargrove	Wilbur Smith	shargrove@wilbursmith.com/963-4376
Thanh Duong	" "	tduong@ " " " /963-4300
David Foster	" "	dfoster@wilbursmith.com/963-4300
[redacted]	" "	
Hollis Loveday	" "	hloveday@wilbursmith.com/963-4302

Agenda Points

I. Introduce Project
- Project Location
- Project Scope

II. Background
- Previous APR Report (Approved)
- Included functional plans and Phase I Historical/Architectural, Archaeological
- Can we use environmental reports as supporting information?

III. Need to talk with TPR Coordinator
- TDOT TPR Coordinator has not been identified, so we will work solely with City
- Until a TPR Coordinator is appointed.
- Determine format
- What does it need to include
- Functionals (update?)
- Environmental Screening
- Do we use standard TPR guidelines or do we modified accordingly

III. Traffic Forecasting
- Introduce Project
- Traffic Methodology
  - Existing Year (2008)
  - Base Year (2013)
  - Projected Year (2033)
- Determine if the methodology is different from what was used in the previous APR
- Approval of Traffic information by TDOT
- Coordinate meeting with Steve Allen (TDOT) and staff
- Check for methodology
  - *Design Year DHV – Do we have to derived from quadrant turns or can we take turning movement that we had done?*
  - *We would like to take results of travel demand model and produce a growth rate and apply the rates to existing turning movement volumes. (This method has to be approved by TDOT)*
  - *Does TDOT require an ADT map to include quadrant turns?*

IV. Traffic Modeling
- Talk with Mike Conger (MPC) for traffic model run
- Land Use – if not consistent may need to adjust model

PROJECT MEETING UPDATE

WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

MEMO

To: Tom Clabo

C: Steve King, Brent Johnson, Bill Cole,
Bob Bowers, Hollis Loveday, Thanh Duong, Mike Clevenger, Stephanie Hargrove,

Date: September 10, 2008

From: Dawn Michelle Foster

Subject: Washington Pike/Millertown Pike TPR Update

This meeting was for the discussion of the traffic analysis and recommendations for the above referenced project. A sign-in sheet of attendees and meeting agenda is attached.

Hollis Loveday facilitated the meeting beginning with a brief project overview of Tazewell Pike and the Washington Pike/Millertown Pike TPR. Discussions of the traffic methodology and project traffic volumes for Year 2013 and 2033 and their analysis were also discussed to define recommendations for both projects.

Tazewell Pike

It was discussed that when motorists divert from Tazewell Pike to Washington Pike that most will utilize Murphy Road. It has been experienced that this diversion creates more congestion and delays resulting in traffic back-up from I-640 at Washington Pike to Murphy Road. Also, with plans for the I-640/Broadway improvements it is possible for more traffic to find Tazewell Pike attractive.

During both AM and PM peak hours, most of the side streets experience long delays at unsignalized intersections.

Using information from TPO's TDM (2005-2030) projected growth did not seem significant on Tazewell Pike, however the model is being updated. It was noted that the TDM projects the same amount of traffic on Tazewell Pike with or without Murphy Road Extension. Ultimately, a 2.5 percent annual growth rate was used to grow traffic for 2013 and 2033.

A signal warrant analysis of various intersections on Tazewell Pike revealed that Beverly Road and Briarcliff Road did meet Signal Warrants for 8-hr, 4-hr and peak

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hour scenarios but Villa Road and Shannondale Road did not meet the signal warrants..

Recommendations included adding turn lanes on Tazewell Pike at Briarcliff Road, Beverly Road and Shannondale Road intersections to reduce the rear end collisions. .

A comprehensive summary of the recommendations include:
Beverly Road- Add left and right turn lanes at its approach to Tazewell Pike; add a left turn lane on westbound Tazewell Pike; and do not install a signal.
Briarcliff Road-Add left and right turn lanes at its approach to Tazewell Pike; add a eastbound left turn lane on Tazewell Pike and do not install a traffic signal.
Shannondale Road- Add a eastbound left turn lane on Tazewell Pike and do not install a traffic signal.
Villa Road- No recommendations

The concept relative to adding a left turn lane on Tazewell pike at Beverly Road, Briarcliff Road, and Shannondale Road is to minimize the number of rear-end collisions on Tazewell Pike. This recommendation will eliminate the need for a continuous three-lane roadway as a compromise to the neighborhood. Also, this seems to be a logical progression toward a signal.

Further discussion on levels of conflicts with multiple lanes led to the discussion of a roundabout option. The discussion and recommendation of roundabouts at these intersections should include property acquisition, number of parcels affected and driveways affected. Wilbur Smith Associates was asked by the City to run analysis with the roundabout option and have further discussions.

WASHINGTON PIKE/MILLERTOWN PIKE TPR

This discussion included an update of the traffic methodology. An evaluation of the existing traffic conditions and 2013 Base Year and 2033 Design Hour Volumes were submitted to TDOT for approval. An approval letter from TDOT was received on September 11, 2008 for the existing system traffic volumes. The traffic volumes and analysis for the Murphy Road extension will be submitted to TDOT for review and approval. A 3.5 percent annual growth rate was used to project future traffic.

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An evaluation of the existing conditions revealed that side streets on both Millertown and Washington Pike experience long delays. However the "triangle" area of Millertown Pike operates at an acceptable LOS.

The long delays in front of the mall on Millertown Pike and on Washington Pike from Murphy Road were discussed.

Recommendations:

Washington Pike

Washington Pike- from I-640 interchange north to Target
6-lane facility with divided median,
Washington Pike from I-640 interchange to Home Depot Main Entrance
5-lane section
Washington Pike from Greenway Drive to Murphy Road (terminus)
4-lane divided
Washington Pike from Millertown Pike to Home Depot Entrance
3-lane

Millertown Pike

Millertown Pike from Washington Pike to Lowe's south entrance-3-lane section
Millertown Pike from Lowe's south entrance to I-640 ramps- 5 lane section
Millertown Pike from I-640 ramps to Bridge near Love Creek Road- 6-lane divided section
Love Creek Road to RR Bridge(terminus)- 3-lanes

In hopes to alleviate traffic within the project area, the City is determining which section is more of a priority.
The City wishes to establish the priorities as:

Priority 1- Washington Pike from the I-640 interchange north towards Target (Greenway Drive) and then to Murphy Road
Priority 2- Millertown Pike from the I-640 interchange to the City Limits (RR Bridge)
Priority 3- Washington Pike from the I-640 interchange south to Millertown Pike
Priority 4- Millertown Pike from Washington Pike to the Lowe's south entrance and I-640 interchange

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The City considers the Millertown Pike "triangle" area to be a lesser priority. However, the City hopes that if City funding is available that they will be able to make some spot (short-term) improvements for the triangle section of Millertown Pike. These will consist of improvements to the Washington/Millertown Pike intersection, which may include a roundabout. Other short term improvements may include the widening of some bridges on the Millertown Pike corridor.

Murphy Road Extension

Discussion of tieing Murphy Road into Loves Creek Road or further to the east.. Ongoing Development of the Church and school on Mill Road may make this alignment unlikely.

The City needs is to tie into the existing Millertown Road bridge near Mill Road but they want a functional design with 2 alternatives

1) Tie Murphy Road in on top of Loves Creek Road
2) Tie Murphy Road in further east of Millertown Pike

The City wants to build on the recommendations that will tie into City limits (buildable now) with additional improvements

Typical Sections:

- Typical Sections-A 4-lane divided section with sidewalk and curb and gutter is currently envisioned for the Washington Pike section north of I-640. If supported by traffic analysis, Millertown Pike and Washington Pike south of I-640 will likely be 3-lane sections
- Millertown Pike from I-640 to Loves Creek Road will likely be a 6-lane urban section. Multiple options for the Millertown/Loves Creek Road/ Mill Road/ Future Murphy Road Extension will be considered.
- Consider using 11 ft lanes
- Bike lanes and sidewalks will be in typical section.
- A five foot berm will be placed between sidewalk and curb and gutter for drainage.
- Water Quality- the typical section design will be guided by the storm water quality ordinance which may eliminate some curb and gutter sections with replacement by grass swales and grass medians.

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WSA will work closely with the City to meet the recommended guidelines.

- The Home Depot expansion will not affect the typical section. Home Depot plans to expand east toward the Food Lion store.
- Detention Basin- Need to plan large enough ROW for detention basins to accommodate not just detention basins per se, but for "natural" filtration.
- Roundabouts- WSA will look at the options for roundabouts at the Millertown Pike intersection with Washington Pike.

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WASHINGTON PIKE/MILLERTOWN PIKE TPR

September 10, 2008
2:00PM

NAME	ORGANIZATION	CONTACT INFORMATION EMAIL /PHONE
BRENT JOHNSON	COK ENGR	bjohnson@cityofknoxville.org / 215-2148
Bill Cole	City of Knoxville	bcole@cityofknoxville.org / 215-6117
TOM CLABO	CITY OF KNOXVILLE	tclabo@cityofknoxville.org / 215-6106
STEPHANIE HARGROVE	WSA	shargrove@wilbursmith / 963-4300
BOB BOWERS	WSA	rbowers@wilbursmith.com / 963-4300
HOLLIS COVEDAY	WSA	hloveday@wilbursmith.com / 963-4300
DAWN MICHELLE FOSTER	WSA	dfoster@wilbursmith.com / 963-4300
Steve King	City	sKing@cityofknoxville.org

PUBLIC MEETING MINUTES

MILLERTOWN PIKE/WASHINGTON PIKE ROADWAY IMPROVEMENTS

JULY 18, 2006 WORKING GROUP MEETING

ATTENDEES

NAME	ORGANIZATION	TELEPHONE	E-MAIL
Brent Johnson	City of Knoxville	215-2148	bjohnson@cityofknoxville.org
Charles Haun	Alice Bell-S-H	524-0038	C_haun@comcast.net
Tommy Vann	Mall Area Businesses	675-0038	TOM0038@aol.com
Mark Donaldson	MPC	215-2500	mark.donaldson@knoxmpc.org
Cindy Pionke	Knox County	215-5804	cindy.pionke@knoxcounty.org
Jeff Welch	Knox TPO	215-3790	jeff.welch@knoxtrans.org
Tom Clabo	City of Knoxville	215-6100	tclabo@cityofknoxville.org
Bob Bowers	Wilbur Smith Assoc.	963-4300	rbowers@wilbursmith.com
Lisa Starbuck	NEKPA	659-5708	lisa@aobe.com
Michael Kane	Ftn. City Town Hall	241-7587	makane1@bellsouth.net
Dave Hill	City of Knoxville	215-3764	dhill@cityofknoxville.org
Jeff Turner	TDOT-Knoxville	594-2442	jeff.d.turner@state.tn.us
Steve King (Not Present)	City of Knoxville	215-6100	sking@cityofknoxville.org
Bruce Wuethrich (Not Present)	Knox County	215-5800	bruce.wuethrich@knoxcounty.org

MILLERTOWN PIKE / WASHINGTON PIKE ROADWAY IMPROVEMENTS

WORKING GROUP AGENDA

August 15, 2006

A. Review of the MPC Sector Plan and Major Road Plan

B. Discussion of Current Project Recommendations

1. Washington Pike between Millertown Pike and I-640
2. Washington Pike between Greenway Drive and Mill Road
3. Millertown Pike between Washington Pike and I-640
4. Millertown Pike between I-640 and Norfolk Southern RR

C. Discussion of the Murphy Road Extension

D. Report from Alice Bell-Spring Hill Association

E. Amendment Process for the Transportation Improvement Plan

F. Group Discussion

MILLERTOWN PIKE / WASHINGTON PIKE ROADWAY IMPROVEMENTS

WORKING GROUP AGENDA

July 18, 2006

A. Introduction
   a) Attendees introduction
   b) Purpose of Working Group

B. Discussion of Advanced Planning Report

C. Current Projects within the Transportation Improvement Program

D. Current Project Recommendations

E. Group Discussion

Next Meetings: Tuesday, August 15 at 3:00 pm
Tuesday, September 12 at 3:00 pm

MILLERTOWN PIKE/WASHINGTON PIKE
ROADWAY IMPROVEMENTS

JULY 18, 2006
WORKING GROUP MEETING
MINUTES

The minutes of this meeting are provided in an effort to document discussions that occurred during the course of the working group meeting. Please review the minutes and if any additions or corrections are required, please forward these to Tom Clabo at tclabo@cityofknoxville.org.

Dave Hill with the City of Knoxville gave a brief introduction to begin the meeting.

Bob Bowers with Wilbur Smith Associates gave a brief overview of the Advanced Planning Report (APR) that Wilbur Smith Associates prepared for the City of Knoxville in 2001. Bob described in detail the recommended roadway sections that were developed from the 2001 APR.

Jeff Welch with the Knoxville Regional Transportation Planning Organization (TPO) described the current projects included within the TPO's Transportation Improvement plan (TIP). The TIP has two projects currently programmed. The first is called "Washington Pike/Millertown Pike" and is described as the widening of Washington Pike from I-640 to Millertown Pike and the widening of Millertown Pike from I-640 to Washington Pike to a five-lane section. This project is programmed with a construction cost of $9,324,827.00. The second programmed project is called "Millertown Pike, I-640 to Loves Creek" and is described as the widening and improving of this roadway as specified in the APR. This project is programmed with an Engineering cost of $800,000.00.

Jeff mentioned that the current two programmed projects could be amended once projects in this area are prioritized.

Bob Bowers discussed the current project proposals. The changes to the roadway sections with the current proposal included constructing the Washington Pike and Millertown Pike roadways south of I-640 with a 3-lane typical section, but acquiring the right-of-way for the 5-lane typical section. This alternative was discussed because the growth rate projected within the 2001 APR had not occurred for the area south of I-640.

Bob also discussed the configuration of Millertown Pike north of I-640. Specifically the need to determine the alignment of Loves Creek Road and Millertown Pike in relation to the proposed Murphy Road extension.

Charles Haun with the Alice Bell-Spring Hill Association expressed the importance of completing the Valley View Drive realignment project in a timely manner. Dave Hill commented that this project was funded within the City's current capital improvement program for design and right-of-way acquisition. Tom Clabo commented that the intent was to have the project ready to bid for construction in July of 2007. Dave Hill commented that the City is committed to completing this realignment project, but the project is contingent upon the transfer of the necessary right-of-way to the City from the Byrd property.

Charles Haun is going to discuss with the Alice Bell-Springhill Association their thoughts on the need for 5-lanes vs. 3-lanes for Washington Pike and Millertown Pike south of I-640.

Tommy Vann with the Mall area businesses expressed his concern for improvements to Millertown Pike north of I-640. He thought improvements should be made as soon as possible. He mentioned that he had discussed these projects with other area businesses. He said the Knoxville Center Mall would like Millertown Pike extend to the north to at least Mill Road to allow for a new mall entrance that would connect to the new Millertown Pike. He also expressed the need for the Murphy Road extension and voiced his support for this project. Mr. Vann also supported the direct connection of Loves Creek Road to the proposed Millertown Pike/Murphy Road extension, with improvements to Loves Creek Road occurring along the existing Loves Creek Road alignment.

Mark Donaldson with the Metropolitan Planning Commission was asked to investigate the current sector plan for the property located within the triangle bound by Washington Pike and Millertown Pike and south of I-640. He was also asked to provide a current copy of the Major Road Plan for this area.

Cindy Pionke with Knox County Engineering discussed capital projects currently funded and programmed by Knox County. Cindy expressed that this area is not currently programmed for any roadway improvements and the roadway priorities for Knox County have been set for the next 5 years.

Lisa Starbuck with the Northeast Knox Preservation Association expressed concern for placing priority on the projects north of I-640. She supported the Murphy Road extension. She was also supportive of short-term improvements to Millertown Pike between Mill Road and I-640.

Michael Kane with Fountain City Town Hall expressed support for the Murphy Road Extension as a means to alleviate some traffic congestion on Tazewell Pike.

Dave Hill expressed the need to utilize the existing funding in an expedient manner and the need to get projects programmed that would accomplish this.

It was generally agreed that the projects south of I-640, improvements to Washington Pike and Millertown Pike, and the improvements to Washington Pike from Greenway Drive to the city limits could be accomplished in a more timely manner due to less environmental concerns and their relative ease of construction.

Tom Clabo with the City of Knoxville was asked to investigate the cost involved to construct the Washington Pike and Millertown Pike roadway improvements south of I-640 with a 3-lane roadway section and acquiring right-of-way for a future 5-lane roadway section. Tom was also asked to investigate the cost involved in constructing improvements to Millertown Pike from Mill Road to I-640.

The next working group meeting is scheduled for August 15, 2006 at 3:00 pm at the City County Building, room 549.

East Knoxville Transportation Program
Millertown Pike/Washington Pike Improvements
October 9, 2006

A series of working group meetings including members from the City of Knoxville, Knox County, Metropolitan Planning Commission, Wilbur Smith Associates, Tennessee Department of Transportation, Alice Bell-Spring Hill Neighborhood Association, Knoxville Center Mall Area Businesses, Fountain City Town Hall and Northeast Knox Preservation Association occurred on July 18, 2006 and August 15, 2006 to discuss proposed improvements to Millertown Pike, Washington Pike and Murphy Road.

The purpose of the meetings was to set priorities for roadway improvements within this area. Jeff Welch with the Knoxville Regional Transportation Planning Organization (TPO) described the current projects included within the TPO's Transportation Improvement plan (TIP). The TIP has two projects currently programmed. The first is called "Washington Pike/Millertown Pike" and is described as the widening of Washington Pike from I-640 to Millertown Pike and the widening of Millertown Pike from I-640 to Washington Pike to a five-lane section. This project is programmed with a construction cost of $9,324,827.00. The second programmed project is called "Millertown Pike, I-640 to Loves Creek" and is described as the widening and improving of this roadway as specified in the APR. This project is programmed with an Engineering cost of $800,000.00.

Bob Bowers with Wilbur Smith Associates gave a brief overview of the Advanced Planning Report (APR) that Wilbur Smith Associates prepared for the City of Knoxville in 2001. Bob described in detail the recommended roadway sections that were developed from the 2001 APR. Bob discussed the current project proposals. The changes to the roadway sections with the current proposal included constructing the Washington Pike and Millertown Pike roadways south of I-640 with a 3-lane typical section. This alternative was discussed because the growth rate projected within the 2001 APR had not occurred for the area south of I-640. Bob also discussed the configuration of Millertown Pike north of I-640. Specifically the need to determine the alignment of Loves Creek Road and Millertown Pike in relation to the proposed Murphy Road extension. Below are the descriptions for the current proposed projects:

Washington Pike / Millertown Pike Improvements

Widen Washington Pike between Millertown Pike and I-640

Widen to a 3-lane section with center two way left turn lane. Typical section would be a 70-foot minimum R.O.W. with three 12-foot lanes, 3-foot bicycle lane, 2-foot curb and gutter and 7-foot sidewalk on both sides. Realign Valley View Drive with Centerline Drive.

Widen Washington Pike between Greenway Drive and Mill Road

Widen to a divided 4-lane section with median. Typical section would be a 104-foot minimum R.O.W. with a 22-foot median, four 12-foot travel lanes, 3-foot bicycle lane, 2-foot curb and gutter and 7-foot sidewalk on both sides.

Widen Millertown Pike between Washington Pike and I-640
Widen to a 3-lane section with center two way left turn lane. Typical section would be a 70-foot minimum R.O.W. with three 12-foot lanes, 3-foot bicycle lane, 2-foot curb and gutter and 7-foot sidewalk on both sides.

Widen Washington Pike between Mill Road and Murphy Road (County)
Widen to a divided 4-lane section with median. Typical section would be a 104-foot minimum R.O.W. with a 22-foot median, four 12-foot travel lanes, 3-foot bicycle lane, 2-foot curb and gutter and 7-foot sidewalk on both sides.

Murphy Road / Millertown Pike Improvements

Widen Millertown Pike between I-640 and Loves Creek Road
Widen to a divided 6-lane section with median. Millertown Pike would transition to a divided 5-lane undivided section with center two way left turn lane between Loves Creek Road and Mill Road. The typical 6-lane section would include 128-foot minimum R.O.W. with a 22-foot median, six 12-foot travel lanes, 3-foot bicycle lane, 2-foot curb and gutter and 7-foot sidewalk on both sides. The typical 5-lane undivided section would include 94-foot minimum R.O.W. with five 12-foot travel lanes, 3-foot bicycle lane, 2-foot curb and gutter and 7-foot sidewalk on both sides.

Construct new Murphy Road between Mill Road and Washington Pike
Construct a new 5-lane undivided section with center two way left turn lane. The typical 5-lane section would include 94-foot minimum R.O.W. with five 12-foot lanes, 3-foot bicycle lane, 2-foot curb and gutter and 7-foot sidewalk on both sides.

Charles Haun with the Alice Bell-Spring Hill Association expressed the importance of completing the Valley View Drive realignment project in a timely manner. Dave Hill commented that this project was funded within the City's current capital improvement program for design and right-of-way acquisition. Tom Clabo commented that the intent was to have the project ready to bid for construction in July of 2007. Dave Hill commented that the City is committed to completing this realignment project, but the project is contingent upon the transfer of the necessary right-of-way to the City from the Byrd property.

Tommy Vann with the Mall area businesses expressed his concern for improvements to Millertown Pike north of I-640. He thought improvements should be made as soon as possible. He mentioned that he had discussed these projects with other area businesses. He said the Knoxville Center Mall would like Millertown Pike extend to the north to at least Mill Road to allow for a new mall entrance that would connect to the new Millertown Pike. He also expressed the need for the Murphy Road extension and voiced his support for this project. Mr. Vann also supported the direct connection of Loves Creek Road to the proposed Millertown Pike/Murphy Road extension, with improvements to Loves Creek Road occurring along the existing Loves Creek Road alignment.

Cindy Pionke with Knox County Engineering discussed capital projects currently funded and programmed by Knox County. Cindy expressed that this area is not currently programmed for any roadway improvements and the roadway priorities for Knox County have been set for the next 5 years. Bruce Wuetrich with Knox County Engineering agreed that improvements to

Washington Pike and Millertown Pike/Murphy Road Extension would be supported by Knox County.

Lisa Starbuck with the Northeast Knox Preservation Association expressed concern for placing priority on the projects north of I-640. She supported the Murphy Road extension. She was also supportive of short-term improvements to Millertown Pike between Mill Road and I-640.

Michael Kane with Fountain City Town Hall expressed support for the Murphy Road Extension as a means to alleviate some traffic congestion on Tazewell Pike.

Dave Hill expressed the need to utilize the existing funding in an expedient manner and the need to get projects programmed that would accomplish this.

It was generally agreed that the projects south of I-640, improvements to Washington Pike and Millertown Pike, and the improvements to Washington Pike from Greenway Drive to the city limits could be accomplished in a more timely manner due to less environmental concerns and their relative ease of construction.

The City of Knoxville will work with the TPO in order to amend the current Transportation Improvement Program to incorporate the new project limits within the plan. Jeff Welch has outlined this process below:

Agency	Task	Completion Date
Knox TPO and TDOT	Amend TIP to provide funds to begin planning study and environmental assessment ($500,000); submit TIP amendment to FHWA for approval	December 2006
City of Knoxville and TDOT	Scope of Work to TDOT for planning and environmental studies and enter into a contract with TDOT; contract approved by City Council and TDOT issues notice to proceed for planning study and environmental assessment	February 2007
City of Knoxville and Knox TPO	Select consultant for planning study and environmental assessment and City Council approval; consultant conducts planning study and preliminary environmental assessment, public meetings; City Council and TPO approval; amend TIP to set new project priorities, descriptions and costs	December 2007
City of Knoxville	Consultant finalizes environmental assessment and all necessary parties approve document	Spring 2008

CONCLUSION

The City of Knoxville supports improvements to the roadways within the East Knoxville Transportation Program. The City funded the design of the Valley View Drive Realignment Project within the current Capital Improvement Program. Once the design is complete and the necessary right-of-way is donated by the Byrd property, the City will move forward to fund the construction of this roadway improvement within the next Capital Improvement Program budget.

Once the TIP is amended and TDOT provides approval of funds for the planning study and environmental assessment, the City of Knoxville will utilize a design consultant to perform a transportation planning report for the projects. This report will be phased to allow the improvements to Washington Pike and Millertown Pike south of I-640, Washington Pike from Greenway Drive to the city limits and Millertown Pike from I-640 to Mill Road to proceed, while a more detailed study of the Murphy Road Extension is expected. The study will determine the roadway section required for the projects and will also analyze alternative alignments for the Murphy Road extension. A public meeting will be included in the transportation planning report process and public comments will be considered in the project alternatives.

The connection of a new Murphy Road extension to Millertown Pike is a critical piece of information that will effect any major improvements to Millertown Pike between I-640 and Mill Road. Since the Murphy Road extension is anticipated to occur in several years, the City of Knoxville is pursuing the use of grant funds from the Tennessee Department of Transportation for operational improvements to Millertown Pike from I-640 to Mill Road. These funds will be applied for through TDOT's Local Interstate Connector (LIC) Improvements Program.

After the transportation study is complete and the TIP is amended to reflect the new project priorities, the City of Knoxville will begin the project design process for the prioritized projects. Given the ease of construction and minimal environmental clearance issues, Washington Pike and Millertown Pike south of I-640 and Washington Pike from Greenway Drive to the city limits will be the first projects prioritized for design and construction.

EARLY ENVIRONMENTAL SCREENING (EES)

EES Report

PIN 040090.00
1,000 Foot Corridor
March 13, 2009

Community Impact

Cemetery Sites

Cemetery	There are none.
Cemetery Property	There are none.

Institutions

Total= 2

Fullwood Chapel	Church
North Acres Church	Church

Sensitive Community Populations

No Population Present	Present
Population 65 & Over	Not Present
Disability	Not Present
Households without Vehicle	Not Present
Minority Populuation-24%	Not Present
Linguistically Isolated	Not Present
Below Poverty-13.5%	Not Present
Below Poverty-27%	Not Present

Ecology

Rare & Protected Species

Bats	There are none.

Railroads & Public Lands

Railroads	Present

EES Report

PIN 040090.00
2,000 Foot Corridor
March 13, 2009

Historic Architecture & Archaeology

Historic Architecture

National Register Sites — There are none.

Hazardous Substances & Geology

Superfund Sites

There are none.

Geology

Pyritic Rock	Total= 6	Classification
Middle and Lower Portion of Chickamauga Group	Limestone	
Maryville Limestone, Rogersville Shale and Rutledge Limestone	Limestone	
Mascot, Longview, and Chepultepec Dolomite, and Kingstport and Newala Formations	Dolomite	
Conasauga Group	Limestone	
Middle and Lower Portion of Chickamauga Group	Limestone	
Maynardville Limestone	Limestone	

Railroads & Public Lands

Public Lands

TWRA Lakes — There are none.

Other Public Lands — There are none.

EES Report

PIN 040090.00
4,000 Foot Corridor
March 13, 2009

Ecology

Rare & Protected Species

	Total= 2	USESA	SPROT
Terrestrial Species			
Lilium canadense			T
Pituophis melanoleucus melanoleucus			T

TDEC Conservation Sites

There are none.

TDEC Scenic Waterways

There are none.

Large Wetland Impacts

Total= 11

PUBHh
PUBHh
PUBHh
PUBHh
PUBHh
PUBHx
PUBHx
PUBHh
PUBHh
PUBHh
PUBHh

Railroads & Public Lands

Public Lands

Tennessee Natural Areas Program — There are none.

Wildlife Management Areas — There are none.

EES Report

PIN 040090.00

10,000 Foot Corridor
March 13, 2009

Ecology

Rare & Protected Species

Aquatic Species	There are none.

Hazardous Substances & Geology

Geology

Caves	There are none.

PROJECT DATA SHEETS

DATA TABLE
Section 1- Millertown Pike

EXISTING CONDITIONS

From: Interstate 640
To: Norfolk Southern Railroad Bridge (City Limits)

Item	
Functional Class	Urban Minor Arterial
System Class	STP
Length - Miles	0.56
Cross Section Feet	Variable
Present ADT (2008)	17,800
Projected Future ADT (2033)	33,300
Percent Trucks	2%

DATA TABLE
Section 1- Millertown Pike

From: Interstate 640
To: Norfolk Southern Railroad Bridge (City Limits)

Item	Existing	Proposed
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	STP	STP
Length - Miles		0.55
Cross Section Feet		Variable
Present ADT (2008)		17,800
Projected Future ADT (2033)		33,300
Percent Trucks		2
Estimated Right-of-Way (Business Average= $12.70 s.f.) Acquisition(Acres)		1.864
Estimated Right-of-Way Tracts Affected		9
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Right-of-Way Cost	$	1,031,200
Estimated Utility Cost Reimbursable	$	0
Estimated Utility Cost Non-Reimbursable	$	969,500
Estimated Construction Cost	$	3,127850
Estimated Preliminary Engineering Cost	$	284,350
Total Estimated Section Cost	$	5,412,900*

*No Inflation Costs added

TENNESSEE DEPARTMENT OF TRANSPORTATION

DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE

ROUTE:	MILLERTOWN PIKE	**ALTERNATE:**	
SECTION:	1	**REGION:**	
COUNTY:	KNOX	**PROJECT #:**	

LOCATION

From:	I-640
To:	Norfolk-Southern Railroad (City Limits)

PARAMETER	CRITERIA
2008 ADT	17,800
2033 ADT	33,300
PERCENT TRUCKS(DHV)	2
DHV(10% ADT 2033)	3,330
FUNCTIONAL CLASSIFICATION	Urban Minor Arterial
MINIMUM DESIGN SPEED	40 mph
ACCESS CONTROL	N/A
MAXIMUM CURVE	600'
MAXIMUM GRADE	7%
MINIMUM STOPPING DISTANCE	275'/325'
SURFACE WIDTH	41'/77'
NUMBER OF LANES	3/7
USABLE SHOULDER WIDTH	0'/12'
MEDIAN WIDTH	6' to 12' Flush
MINIMUM RIGHT-OF-WAY	68'/150'
SIGNALIZATION	1 New/2 Modifications

REMARKS: Roadway varies from 6 lane section near Knoxville Center to 3 lane section at existing bridge over Norfolk-Southern Railroad. Curb and gutter and stabilized shoulders will be utilized in this area because of future development potential.

PROJECT COST SHEET
(Millertown Pike-Section 1)

Section: 1
Length: 0.55 miles

Right-of-Way471,

Land, (1.864 acres) --	$ 1,031,200.00	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (residences)	$ 0	
(business & farm)		
(non-profits)		
Total Right-of-Way Cost		**$ 1,031,200.00**

Utility Relocation

Reimbursable	$ 0	
Non-reimbursable	$ 969,500.00	
Total Adjustment Cost		**$ 969,500.00**

Construction

Clear and Grubbing	$ 34,650.00	
Earthwork	$ 171,000.00	
Pavement Removal	$ 36,450.00	
Drainage (Includes Erosion Control)	$ 219,000.00	
Structures(Bridge over Love's Creek)	$ 711,500.00	
Railroad Crossing or Separation	$ 0	
Paving	$ 1,092,000.00	
Retaining Walls	$ 0	
Maintenance of Traffic	$ 22,500.00	
Topsoil	$ 6,750.00	
Seeding	$ 4,650.00	
Sodding	$ 12,000.00	
Signing	$ 5,000.00	
Lighting	$ 0	
Signalization	$ 230,000.00	
Fence	$ 0	
Guardrail	$ 11,000.00	
Rip Rap or Slope Protection	$ 20,000.00	
Other Construction Items(8.5%)	$ 219,000.00	
Mobilization	$ 48,000.00	
Construction Cost	$ 2,843,500.00	
10% Eng. And Cont.	$ 284,350.00	
Total Construction Cost		**$ 3,127,850.00**
*Inflation Adjustment (6% Over 5 Years)		**$ 1,058,150.00**
Preliminary Engineering (10%)		**$ 284,350.00**

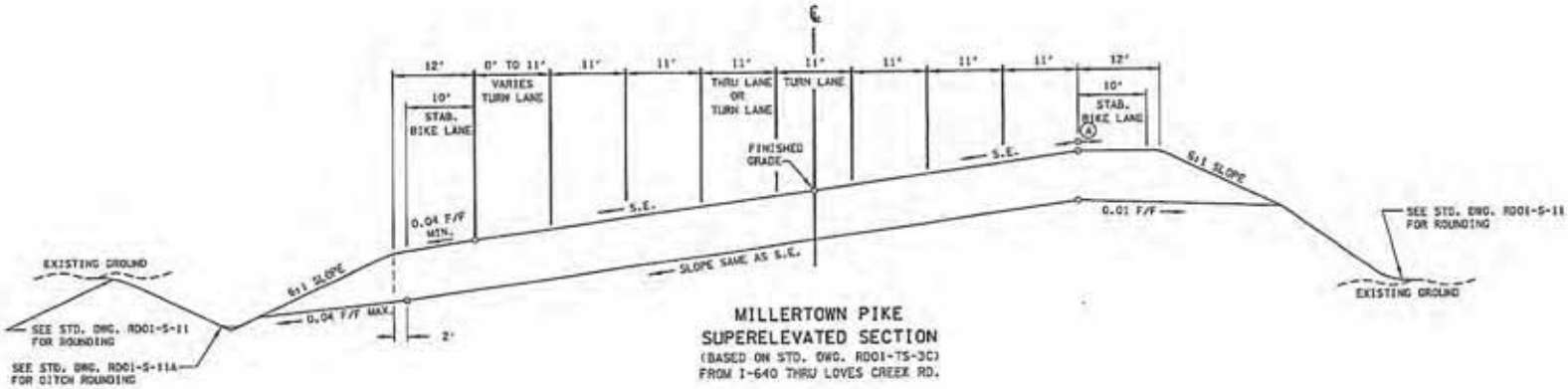
Total Cost ---------- **$ 6,471,050.00***

*Inflation Costs Added

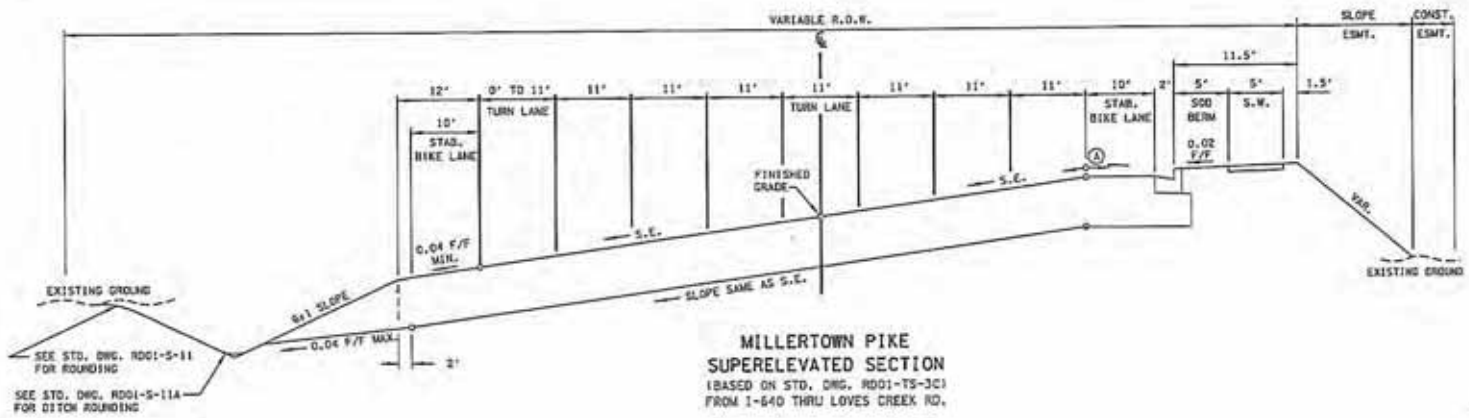
TENNESSEE D.O.T.	DESIGN DIVISION	FILE NO.

Sect. 1

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2005	-	2
-	-	-	-
-	-	-	-
-	-	-	-



MILLERTOWN PIKE
SUPERELEVATED SECTION
(BASED ON STD. DWG. RD01-TS-3C)
FROM I-640 THRU LOVES CREEK RD.



MILLERTOWN PIKE
SUPERELEVATED SECTION
(BASED ON STD. DWG. RD01-TS-3C)
FROM I-640 THRU LOVES CREEK RD.

SECTION I

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

DATA TABLE
Section 2- Washington Pike

EXISTING CONDITIONS

From: Interstate 640
To: Murphy Road

Item	
Functional Class	Urban Minor Arterial
System Class	STP
Length - Miles	1.73
Cross Section Feet	22'
Present ADT(2008)	12,200
Projected Future ADT(2033)	22,880
Percent Trucks	2%

DATA TABLE
Section 2-Washington Pike
PROPOSED

From: Interstate 640
To: Murphy Road

Item		Proposed
Functional Class		Urban Minor Arterial
System Class		STP
Length - Miles		1.736
Cross Section Feet		94'
Present ADT(2008)		12,200
Projected Future ADT(2033)		22,880
Percent Trucks		2%
Estimated Right-of-Way (Business=11) Acquisition(8.272 Acres) (Residences=40) (Non-Profit=1)		8.272
Estimated Right-of-Way Tracts Affected		52
Estimated Family Displacements		3
Estimated Business Displacements		0
Estimated Right-of-Way Cost	$	1,891,790
Estimated Utility Cost Reimbursable	$	0
Estimated Utility Cost Non-Reimbursable	$	2,756,455
Estimated Construction Cost	$	5,371,050
Estimated Preliminary Engineering Cost	$	488,300
Total Estimated Section Cost	$	10,432,595*

* no inflation costs added

TENNESSEE DEPARTMENT OF TRANSPORTATION

DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE

ROUTE:	WASHINGTON PIKE	**ALTERNATE:**	
SECTION:	2	**REGION:**	1
COUNTY:	KNOX	**PROJECT #:**	

LOCATION

From:	Washington Pike
To:	Murphy Road

PARAMETER	CRITERIA
2008 ADT	12,200
2033 ADT	22,800
PERCENT TRUCKS(DHV)	2
DHV(10% ADT 2033)	229
FUNCTIONAL CLASSIFICATION	Urban Minor Arterial
MINIMUM DESIGN SPEED	40 MPH
ACCESS CONTROL	N/A
MAXIMUM CURVE	600'
MAXIMUM GRADE	7%
MINIMUM STOPPING DISTANCE	275-325
SURFACE WIDTH	94'
NUMBER OF LANES	4
USABLE SHOULDER WIDTH	0
MEDIAN WIDTH	22
MINIMUM RIGHT-OF-WAY	108
SIGNALIZATION	3

REMARKS: Signals at Washington Pike with Washington Pike, Washington Pike @ Mill Road and Washington Pike @ Murphy Road.

PROJECT COST SHEET
(Section 2-Washington Pike)

Section: 2
Length: 1.736 Miles

Right-of-Way

Land, (8.272acres)	$ 1,816,790	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (3 residences) (business & farm) (non-profits)	$ 75,000.00	
Total Right-of-Way Cost		**$ 1,891,790.00**

Utility Relocation

Reimbursable	$ 0	
Non-reimbursable	$ 2,756,455.00	
Total Adjustment Cost		**$ 2,756,455.00**

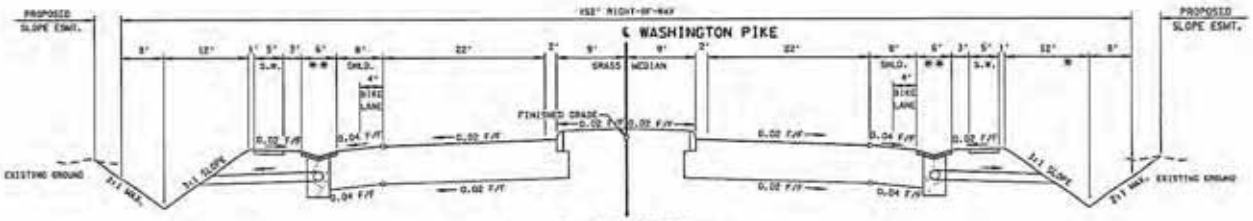
Construction

Clear and Grubbing	$ 80,000.00	
Earthwork	$ 390,000.00	
Pavement Removal	$ 4,400.00	
Drainage (Includes Erosion Control)	$ 833,965.00	
Structures	$ 0	
Railroad Crossing or Separation	$ 0	
Paving	$ 2,429,000.00	
Retaining Walls	$ 216,000.00	
Maintenance of Traffic	$ 86,800.00	
Topsoil	$ 25,900.00	
Seeding	$ 17,900.00	
Sodding	$ 30,555.00	
Signing	$ 8,680.00	
Lighting	$ 0	
Signalization	$ 300,000.00	
Fence	$ 0	
Guardrail	$ 5,500.00	
Rip Rap or Slope Protection	$ 10,000.00	
Other Construction Items(8.5%)	$ 379,500.00	
Mobilization	$ 68,500.00	
Construction Cost	$ 4,882,750.00	
10% Eng. And Cont.	$ 488,300.00	
Total Construction Cost		**$ 5,371,050.00**
Inflation Adjustment (6% Over 5 Years)		**$ 3,388,500.00***
Preliminary Engineering (10%)		**$ 488,300.00**

Total Cost ---------- **$ 13,896,095.00***

*Inflation Costs Included

TYPE	YEAR	PROJECT	SHEET NO.
FUNC.	2008	WASHWILLER	



TANGENT SECTION
(BASED ON STD. ENG. R001-TS-6 & R001-TS-3C)

* INFILTRATION BASIN
GRASS FILTER SWALE

** INFILTRATION TRENCH

KNOXVILLE, TN

WASHINGTON PIKE

TYPICAL SECTIONS

SCALE = 1" = 10'

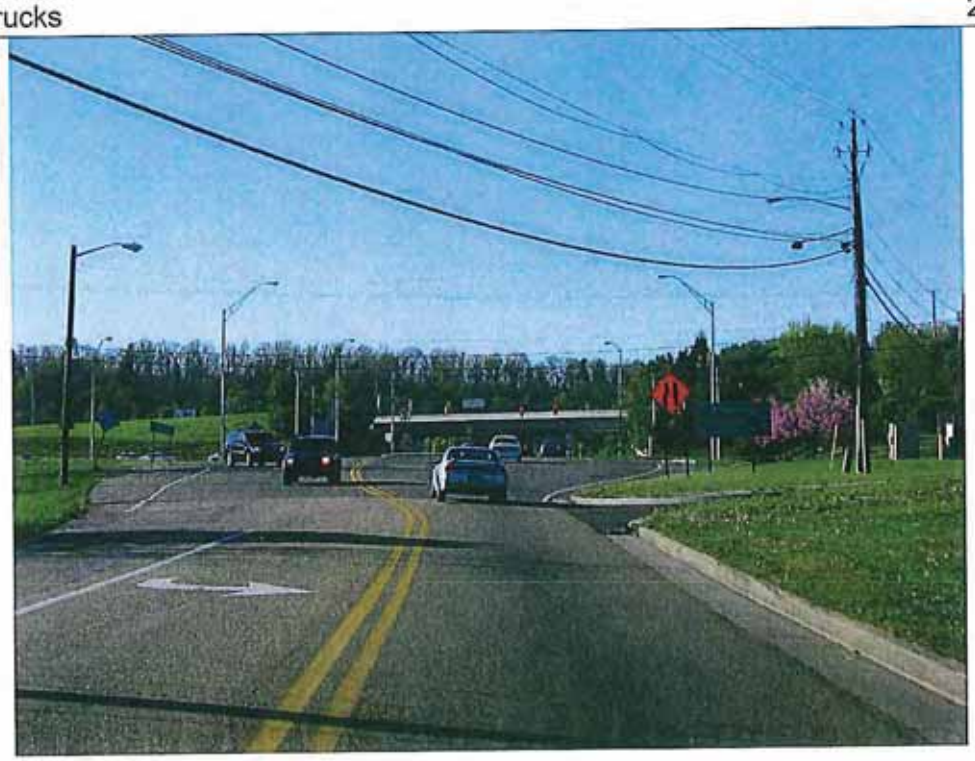
WilburSmith ASSOCIATES

DATA TABLE
Section 3 –Washington Pike

EXISTING CONDITIONS

From: Millertown Pike
To: Interstate 640

Item	
Functional Class	Urban Minor Arterial
System Class	STP
Length - Miles	0.91
Cross Section Feet	20'/84'
Present ADT(2008)	10,180
Projected Future ADT(2033)	11,960
Percent Trucks	2%



DATA TABLE
Section 3-Washington Pike

From: Millertown Pike
To: I-640

Item	Existing	Proposed
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	STP	STP
Length - Miles	0.9	0.9
Cross Section Feet	20'/84'	41'/116'
Present ADT(2007)		
Projected Future ADT(2027)		
Percent Trucks		
Estimated Right-of-Way Acquisition(Acres)	(Business=$13.75 s.f.) (Res.=$5.20 s.f.)	1.38
Estimated Right-of-Way Tracts Affected	(19 Residential) (6 Business)	23
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Right-of-Way Cost	$	762,520
Estimated Utility Cost Reimbursable	$	0
Estimated Utility Cost Non-Reimbursable	$	1,042,500
Estimated Construction Cost	$	4,063,175
Estimated Preliminary Engineering Cost	$	369,400
Total Estimated Section Cost	$	6,237,595*

* No inflation costs added

TENNESSEE DEPARTMENT OF TRANSPORTATION

DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE

ROUTE:	WASHINGTON PIKE	**ALTERNATE:**	
SECTION:	3	**REGION:**	
COUNTY:	KNOX	**PROJECT #:**	

LOCATION

From:	Millertown Pike
To:	I-640

PARAMETER	CRITERIA
2008 ADT	10,180
2033 ADT	11,960
PERCENT TRUCKS(DHV)	2
DHV(10% ADT 2027)	1196
FUNCTIONAL CLASSIFICATION	Urban Minor Arterial
MINIMUM DESIGN SPEED	40
ACCESS CONTROL	N/A
MAXIMUM CURVE	600'
MAXIMUM GRADE	7%
MINIMUM STOPPING DISTANCE	275'/325'
SURFACE WIDTH	41'/77'
NUMBER OF LANES	3/7
USABLE SHOULDER WIDTH	0/12'
MEDIAN WIDTH	Flush/11'
MINIMUM RIGHT-OF-WAY	
SIGNALIZATION	2 Modifications

REMARKS:

PROJECT COST SHEET
(Washington Pike Pike-Section 3)

Section: 3
Length: 0.9

Right-of-Way

Land, (1.38acres)	$ 762,520.00
Improvements	$ 0
Damages	$ 0
Incidentals	$ 0
Relocation Payments (residences)	$ 0
(business & farm)	
(non-profits)	
Total Right-of-Way Cost	**$ 762,520.00**

Utility Relocation

Reimbursable	$ 0
Non-reimbursable	$ 1,042,500.00
Total Adjustment Cost	**$ 1,042,500.00**

Construction

Clear and Grubbing	$ 89,100.00	
Earthwork	$ 510,000.00	
Pavement Removal	$ 57,400.00	
Drainage (Includes Erosion Control)	$ 378,360.00	
Structures	$ 0	
Railroad Crossing or Separation	$ 0	
Paving	$ 1,474,500.00	
Retaining Walls	$ 538,200.00	
Maintenance of Traffic	$ 46,400.00	
Topsoil	$ 13,850.00	
Seeding	$ 9,565.00	
Sodding	$ 60,000.00	
Signing	$ 5,000.00	
Lighting	$ 0	
Signalization	$ 120,000.00	
Fence	$ 0	
Guardrail	$ 0	
Rip Rap or Slope Protection	$ 50,000.00	
Other Construction Items(8.5%)	$ 285,000.00	
Mobilization	$ 56,400.00	
Construction Cost	$ 3,693,775.00	
10% Eng. And Cont.	$ 369,400.00	
Total Construction Cost		**$ 4,063,175.00**
*Inflation Adjustment (6% Over 5 Years)		**$ 1,984,625.00**
Preliminary Engineering (10%)		**$ 369,400.00**

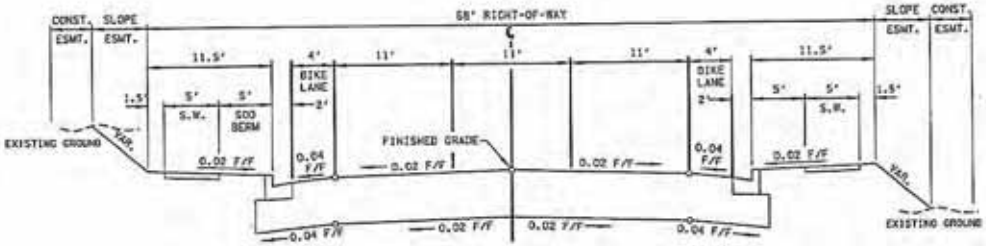
Total Cost ---------- **$ 8,222,220.00***

*With inflation costs added

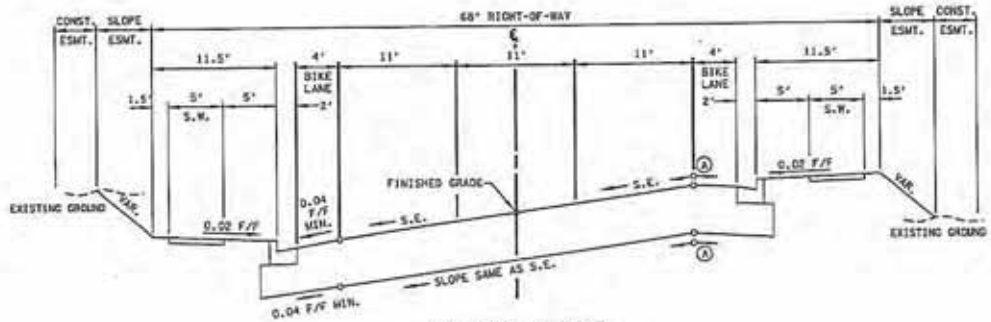
TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2006	-	2
-	-	-	-
-	-	-	-
-	-	-	-

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

Sect. 3



WASHINGTON PIKE
TANGENT SECTION
(BASED ON STD. DWG. RD01-TS-7A)
FROM MILLERTOWN PIKE TO I-640



WASHINGTON PIKE
SUPERELEVATED SECTION
(BASED ON STD. DWG. RD01-TS-7A)
FROM MILLERTOWN PIKE TO I-640

SECTION III

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

DATA TABLE
Section 4 –Millertown Pike

EXISTING CONDITIONS

From: Washington Pike
To: Interstate 640

Item	
Functional Class	Urban Minor Arterial
System Class	STP
Length - Miles	0.83
Cross Section Feet	
Present ADT(2008)	8,040
Projected Future ADT(2033)	15,080
Percent Trucks	2

DATA TABLE
Section 4 –Millertown Pike

From: Washington Pike
To: Interstate 640

Item	Existing	Proposed
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	STP	STP
Length - Miles	0.63	0.63
Cross Section Feet		
Present ADT(2008)	8,040	
Projected Future ADT(2033)		15,075
Percent Trucks		
Estimated Right-of-Way Acquisition(Acres)		3.20
Estimated Right-of-Way Tracts Affected	(Business=3) (Residence=27)	30
Estimated Family Displacements		2
Estimated Business Displacements		0
Estimated Right-of-Way Cost	$	422,000
Estimated Utility Cost Reimbursable	$	0
Estimated Utility Cost Non-Reimbursable	$	1,440,500
Estimated Construction Cost	$	2,425,485
Estimated Preliminary Engineering Cost	$	226,135
Total Estimated Section Cost	$	4,514,120*

*No inflation costs added

Note: Channel changes, will cause the displacements of 2 families for this section but, could be contained within retaining walls. The proposed detention area near the intersection of Washington Pike and Millertown Pike will require some special design consideration to lessen impact.

TENNESSEE DEPARTMENT OF TRANSPORTATION

DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE

ROUTE:	MILLERTOWN PIKE	**ALTERNATE:**	
SECTION:	4	**REGION:**	
COUNTY:	KNOX	**PROJECT #:**	

LOCATION

From:	Washington Pike
To:	I-640

PARAMETER	CRITERIA
2008 ADT	8,040
2033 ADT	15,075
PERCENT TRUCKS(DHV)	2
DHV(10% ADT 2027)	1507
FUNCTIONAL CLASSIFICATION	Urban Minor Arterial
MINIMUM DESIGN SPEED	40
ACCESS CONTROL	N/A
MAXIMUM CURVE	600'
MAXIMUM GRADE	7%
MINIMUM STOPPING DISTANCE	275'/325'
SURFACE WIDTH	41'/66'
NUMBER OF LANES	2/6
USABLE SHOULDER WIDTH	0'/12'
MEDIAN WIDTH	Flush/11'
MINIMUM RIGHT-OF-WAY	68'
SIGNALIZATION	1 Modification

REMARKS:

PROJECT COST SHEET
(Millertown Pike-Section 4)

Section: 4
Length: 0.63 miles

Right-of-Way

Land, (3.2 acres)	$ 372,300.00	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (2 residences) (business & farm) (1 non-profits)	$ 50,000.00	
Total Right-of-Way Cost		**$ 422,000.00**

Utility Relocation

Reimbursable	$ 0	
Non-reimbursable	$ 1,440,500.00	
Total Adjustment Cost		**$ 1,440,500.00**

Construction

Clear and Grubbing	$ 39,600.00	
Earthwork	$ 120,000.00	
Pavement Removal	$ 25,000.00	
Drainage (Includes Erosion Control)	$ 324,600.00	
Structures (3 Culverts)	$ 130,000.00	
Railroad Crossing or Separation	$ 0	
Paving	$ 1,168,150.00	
Retaining Walls	$ 0	
Maintenance of Traffic	$ 36,000.00	
Topsoil	$ 28,600.00	
Seeding	$ 14,000.00	
Sodding	$ 44,100.00	
Signing	$ 3,150.00	
Lighting	$ 0	
Signalization	$ 60,000.00	
Fence	$ 0	
Guardrail	$ 3,850.00	
Rip Rap or Slope Protection	$ 30,000.00	
Other Construction Items(8.5%)	$ 172,300.00	
Mobilization	$ 62,000.00	
Construction Cost	$ 2,261,350.00	
10% Eng. And Cont.	$ 226,135.00	
Total Construction Cost		**$ 2,425,485.00**
*Inflation Adjustment (6% Over 5 Years)		**$ 1,450,196.00**
Preliminary Engineering (10%)		**$ 226,135.00**

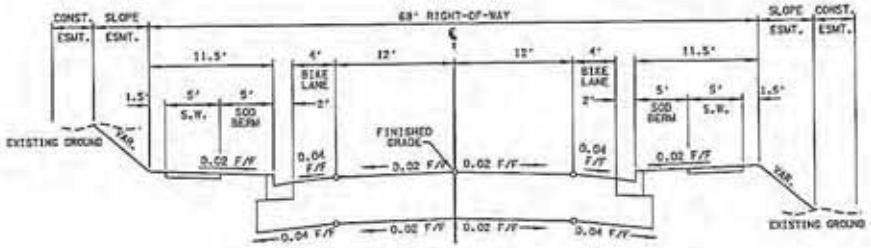
Total Cost ---------- **$ 5,964,316.00***

*Inflation Costs Added

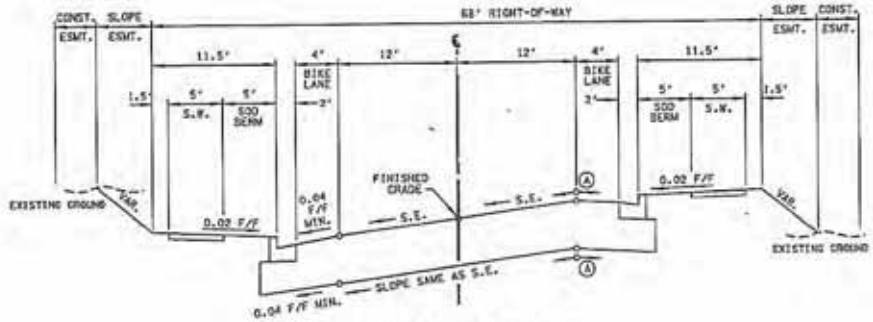
TIME	YEAR	PROJECT NO.	SHEET NO.
EURCT.	2009		28

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO. ---

Sect. 4



MILLERTOWN PIKE
TANGENT SECTION
(BASED ON STD. DWG. R001-TS-TA)



MILLERTOWN PIKE
SUPERELEVATED SECTION
(BASED ON STD. DWG. R001-TS-TA)

SECTION IV

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROJECT COST SHEET
(Millertown Pike-Option "A" Roundabout)

Section: 4
Length: 0.20 miles

Right-of-Way

Land, (1.74acres)	$ 169,938.00	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (residences)	$ 50,000.00	
(business & farm)		
(non-profits)		
Total Right-of-Way Cost		**$ 219,938.00**

Utility Relocation

Reimbursable	$ 0	
Non-reimbursable	$ 116,000.00	
Total Adjustment Cost		**$ 116,000.00**

Construction

Clear and Grubbing	$ 5,000.00	
Earthwork	$ 18,000.00	
Pavement Removal	$ 3,000.00	
Drainage (Includes Erosion Control)	$ 40,175.00	
*Structures (3 Box Culverts)	$ 163,000.00	
Railroad Crossing or Separation	$ 0	
Paving	$ 94,425.00	
Retaining Walls	$ 0	
Maintenance of Traffic	$ 15,000.00	
Topsoil	$ 3,400.00	
Seeding	$ 2,000.00	
Sodding	$ 5,900.00	
Signing	$ 400.00	
Lighting	$ 0	
Signalization	$ 0	
Fence	$ 0	
Guardrail	$ 4,400.00	
Rip Rap or Slope Protection	$ 30,000.00	
Other Construction Items(8.5%)	$ 32,700.00	
Mobilization	$ 8,400.00	
Construction Cost	$ 425,800.00	
10% Eng. And Cont.	$ 42,580.00	
Total Construction Cost		**$ 468,380.00**
*Inflation Adjustment (6% Over 5 Years)		**$ 158,500.00**
Preliminary Engineering (10%)		**$ 42,580.00**
Total Cost		**$ 1,005,398.00***

* Inflation Costs Added

PROJECT COST SHEET
(Millertown-Pike Section 4 Option "B")
"T" Intersection

Section: 4
Length: 0.20 miles

Right-of-Way

Land, (0.457acres)	$ 74,380.00	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (residences)	$ 0	
(business & farm)		
(non-profits)		
Total Right-of-Way Cost		**$ 74,380.00**

Utility Relocation

Reimbursable	$ 0	
Non-reimbursable	$ 116,000.00	
Total Adjustment Cost		**$ 116,000.00**

Construction

Clear and Grubbing	$ 5,000.00	
Earthwork	$ 18,000.00	
Pavement Removal	$ 5,000.00	
Drainage (Includes Erosion Control)	$ 64,175.00	
Structures (2 Box Culverts)	$ 105,000.00	
Railroad Crossing or Separation	$ 0	
Paving	$ 100,550.00	
Retaining Walls	$ 0	
Maintenance of Traffic	$ 15,000.00	
Topsoil	$ 4,700.00	
Seeding	$ 2,250.00	
Sodding	$ 8,200.00	
Signing	$ 600.00	
Lighting	$ 0	
Signalization	$ 0	
Fence	$ 0	
Guardrail	$ 4,950.00	
Rip Rap or Slope Protection	$ 20,000.00	
Other Construction Items(8.5%)	$ 30,050.00	
Mobilization	$ 7,700.00	
Construction Cost	$ 391,175.00	
10% Eng. And Cont.	$ 39,120.00	
Total Construction Cost		**$ 430,295.00**
*Inflation Adjustment (6% Over 5 Years)		**$ 145,600.00**
Preliminary Engineering (10%)		**$ 39,120.00**

Total Cost ---------- **$ 805,395.00***

* Inflation Costs Added

SPOT IMPROVEMENTS

Spot Improvements

Roundabout Option- Millertown Pike and Washington Pike

This project involves the construction of a traffic circle to replace the existing three-legged intersection. The intersection will extend approximately 400 feet east and west of the intersection of Washington Pike and Millertown Pike. There will be ten tracts affected by this construction, nine residential and one non-profit. Because of the construction of box culverts and channel relocation at the intersection of Washington Pike and Millertown Pike, two total acquisitions will be made to correspond with the construction of the traffic circle and could also become involved during culvert construction.

Springhill Bridge Relocation Project-Millertown Pike, east of Springhill Road

This project involves the replacement of a double 3' X 3' concrete box culvert sized for appropriate storm. The construction will take place between the intersections of Brookwood at Millertown Pike and Springhill at Millertown Pike for approximately 100 feet. The culvert will be built for proposed future widening of Millertown Pike in this area but will be constructed to current conditions. No widening will take place on Millertown Pike. There will be acquisitions from one business and three residential tracts. Utility replacements will be minimal.

PROJECT COST SHEET
(Millertown Pike-Option "A" Roundabout)

Section: 4
Length: 0.20 miles

Right-of-Way

Land, (1.74acres)	$ 169,938.00	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (residences)	$ 50,000.00	
(business & farm)		
(non-profits)		
Total Right-of-Way Cost		**$ 219,938.00**

Utility Relocation

Reimbursable	$ 0	
Non-reimbursable	$ 116,000.00	
Total Adjustment Cost		**$ 116,000.00**

Construction

Clear and Grubbing	$ 5,000.00	
Earthwork	$ 18,000.00	
Pavement Removal	$ 3,000.00	
Drainage (Includes Erosion Control)	$ 40,175.00	
*Structures (3 Box Culverts)	$ 163,000.00	
Railroad Crossing or Separation	$ 0	
Paving	$ 94,425.00	
Retaining Walls	$ 0	
Maintenance of Traffic	$ 15,000.00	
Topsoil	$ 3,400.00	
Seeding	$ 2,000.00	
Sodding	$ 5,900.00	
Signing	$ 400.00	
Lighting	$ 0	
Signalization	$ 0	
Fence	$ 0	
Guardrail	$ 4,400.00	
Rip Rap or Slope Protection	$ 30,000.00	
Other Construction Items(8.5%)	$ 32,700.00	
Mobilization	$ 8,400.00	
Construction Cost	$ 425,800.00	
10% Eng. And Cont.	$ 42,580.00	
Total Construction Cost		**$ 468,380.00**
Inflation Adjustment (6% Over 5 Years)		**$ 158,500.00***
Preliminary Engineering (10%)		**$ 42,580.00**

Total Cost ---------- **$ 1,005,398.00***

*Inflation Costs Added

WASHINGTON
LERTOWN PIKE
4710
4709
4706
4705
4701
4509
4505
4513
4517
4521
4527
4508
PARKING
4629
4625
4628
4621
2709
0
PROP.ROW.
PRES.ROW.
THOMAS BOYCE MCCALL JR.
WILLIAM C. & LOIS U. BEEKER
CLARENCE PAUL LEWIS
PAUL W. & OPAL S. CALLOWAY
WESLEYAN MEMORIAL CHURCH
STUART VANDERGRIFF JR.
BEN D. & THELMA DAVIS

PROJECT COST SHEET
(Millertown-Pike Section 4 Option "B")
"T" Intersection

Section: 4
Length: 0.20 miles

Right-of-Way

Land, (0.457acres)	$ 74,380.00	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (residences)	$ 0	
(business & farm)		
(non-profits)		
Total Right-of-Way Cost		**$ 74,380.00**

Utility Relocation

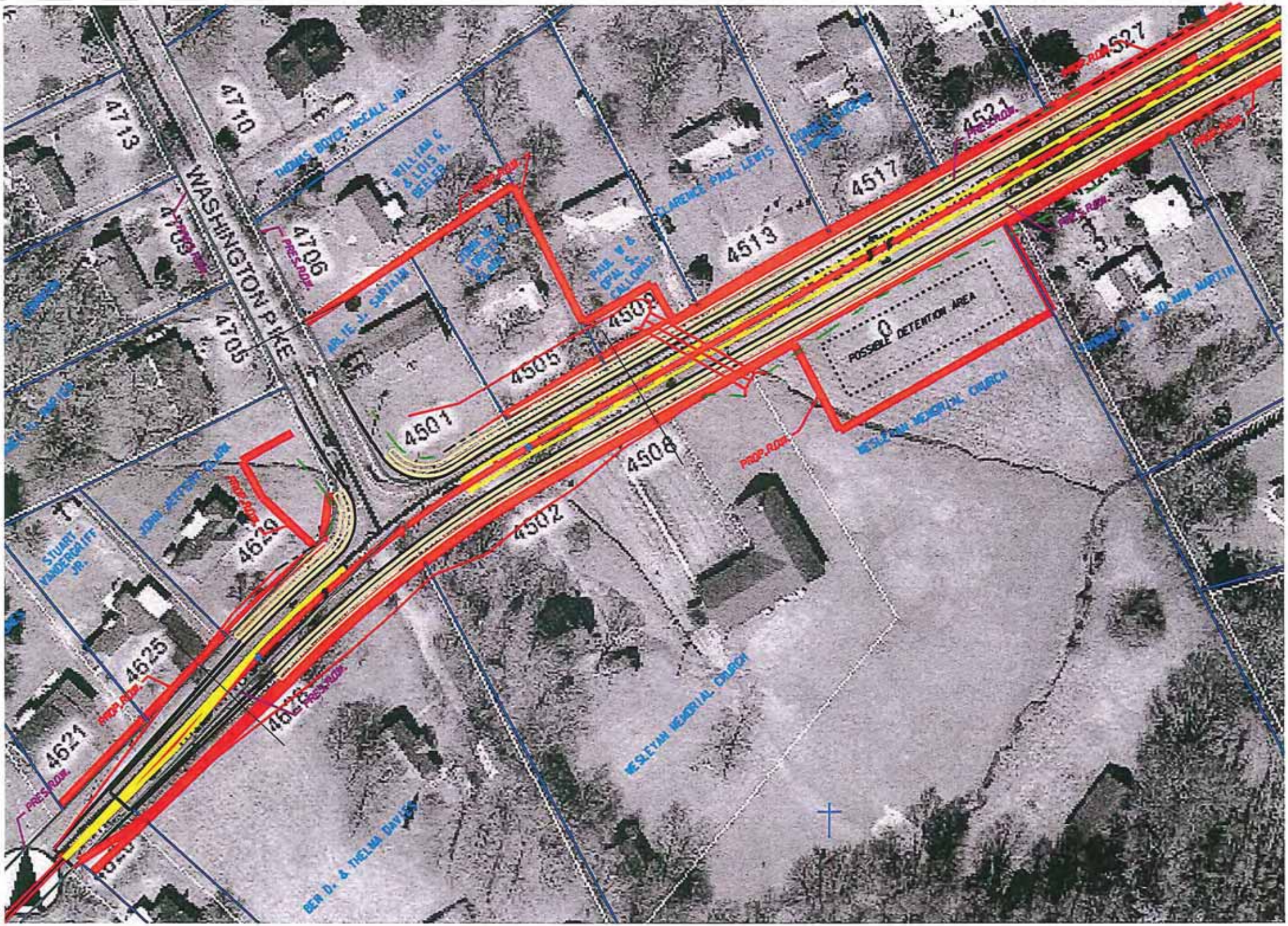
Reimbursable	$ 0	
Non-reimbursable	$ 116,000.00	
Total Adjustment Cost		**$ 116,000.00**

Construction

Clear and Grubbing	$ 5,000.00	
Earthwork	$ 18,000.00	
Pavement Removal	$ 5,000.00	
Drainage (Includes Erosion Control)	$ 64,175.00	
Structures (2 Box Culverts)	$ 105,000.00	
Railroad Crossing or Separation	$ 0	
Paving	$ 100,550.00	
Retaining Walls	$ 0	
Maintenance of Traffic	$ 15,000.00	
Topsoil	$ 4,700.00	
Seeding	$ 2,250.00	
Sodding	$ 8,200.00	
Signing	$ 600.00	
Lighting	$ 0	
Signalization	$ 0	
Fence	$ 0	
Guardrail	$ 4,950.00	
Rip Rap or Slope Protection	$ 20,000.00	
Other Construction Items(8.5%)	$ 30,050.00	
Mobilization	$ 7,700.00	
Construction Cost	$ 391,175.00	
10% Eng. And Cont.	$ 39,120.00	
Total Construction Cost		**$ 430,295.00**
Inflation Adjustment (6% Over 5 Years)		**$ 145,600.00***
Preliminary Engineering (10%)		**$ 39,120.00**

Total Cost ---------- **$ 805,395.00***

*Inflation Cost Added


WASHINGTON PIKE
4713
4710
4706
4705
4709
4601
4505
4509
4513
4517
4521
4527
4508
4502
4629
4625
4621
4618
THOMAS BOYCE MCCALL JR.
WILLIAM C & LOIS H. BEELER
CLARENCE PAUL LEWIS
PAUL W. & OPAL S. CALLOWAY
ARLIE J. SAPIAHN
JOHN JEFFERY COLLIER
STUART VANDERCLIFF JR.
WESLEYAN MEMORIAL CHURCH
BEN D. & THELMA DAVIES
POSSIBLE DETENTION AREA
PROP. ROW
PRES. ROW

DATA TABLE (Springhill)
Section 4 –Millertown Pike
Spot Improvement-Bridge Replacement

From: Washington Pike
To: Interstate 640

Item	Existing	Proposed
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	STP	STP
Length - Miles		
Cross Section Feet		
Present ADT(2008)	8,040	
Projected Future ADT(2033)		15,075
Percent Trucks		
Estimated Right-of-Way Acquisition(Acres)		
Estimated Right-of-Way Tracts Affected	(Business=0) (Residence=4)	4
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Right-of-Way Cost	$	22,000
Estimated Utility Cost Reimbursable	$	0
Estimated Utility Cost Non-Reimbursable	$	30,000
Estimated Construction Cost	$	111,705
Estimated Preliminary Engineering Cost	$	10,155
Total Estimated Section Cost	$	173,860

Note: Channel change will need to occur to line up for additional work in future. This aspect will involve permitting. The permitting is not included in the Estimate.

PROJECT COST SHEET (Springhill)
Section 4 – Millertown Pike
Spot Improvement- Bridge Replacement Project

Section: 4
Length: 0.02 Miles

Right-of-Way

Land, (0.144acres)	$ 22,000.00	
Improvements	$ 0	
Damages	$ 0	
Incidentals	$ 0	
Relocation Payments (residences) (1 business) (3 residences)	$ 0	
Total Right-of-Way Cost		**$ 22,000.00**

Utility Relocation

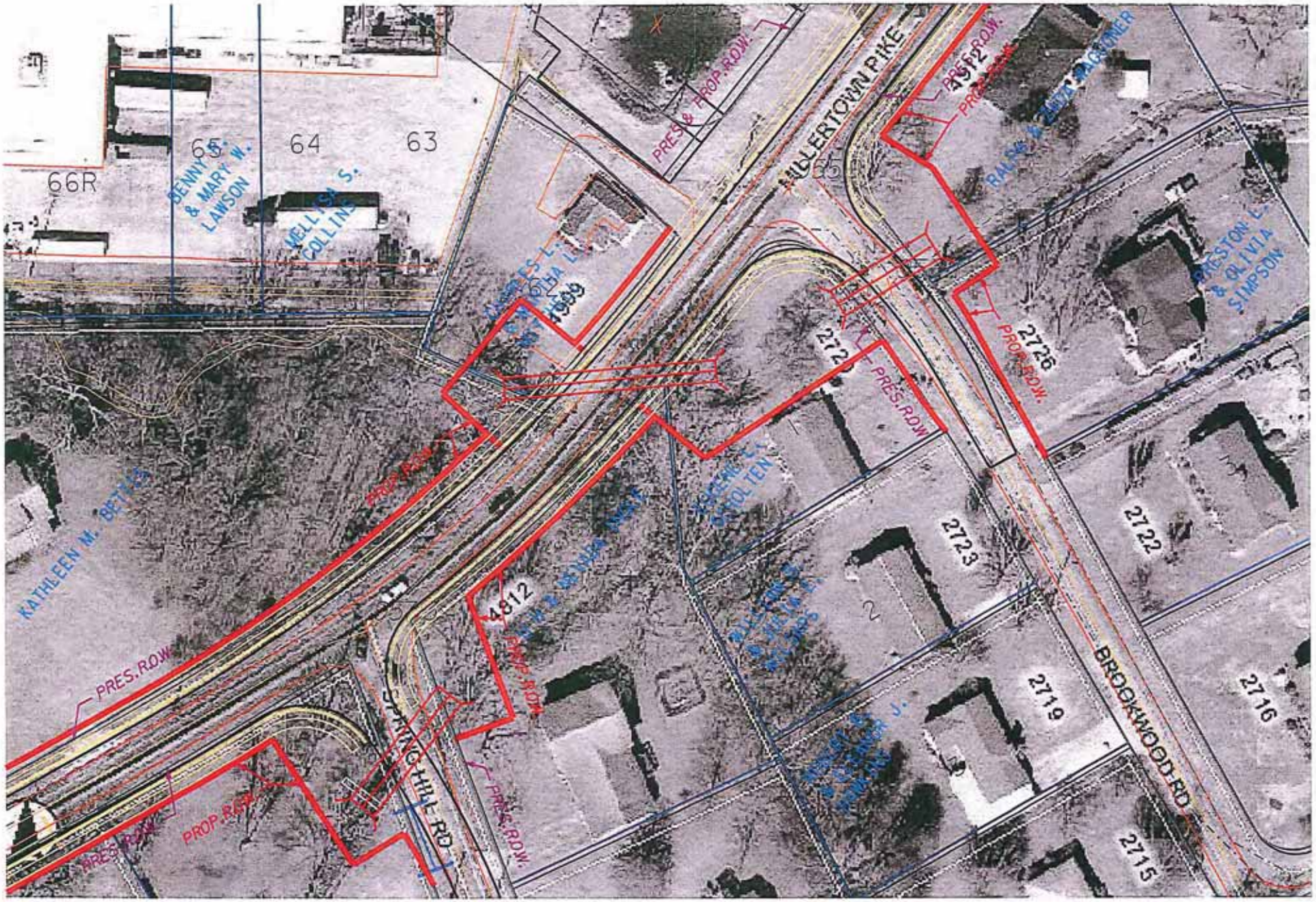
Reimbursable	$ 0	
Non-reimbursable	$ 30,000.00	
Total Adjustment Cost		**$ 30,000.00**

Construction

Clear and Grubbing	$ 2,000.00	
Earthwork	$ 2,400.00	
Pavement Removal	$ 0	
Drainage (Includes Erosion Control)	$ 49,200.00	
Structures	$ 0	
Railroad Crossing or Separation	$ 0	
Paving	$ 7,500.00	
Retaining Walls	$ 0	
Maintenance of Traffic	$ 15,000.00	
Topsoil	$ 300.00	
Seeding	$ 200.00	
Sodding	$ 0	
Signing	$ 0	
Lighting	$ 0	
Signalization	$ 0	
Fence	$ 0	
Guardrail	$ 3,300.00	
Rip Rap or Slope Protection	$ 10,000.00	
Other Construction Items(8.5%)	$ 7,650.00	
Mobilization	$ 4,000.00	
Construction Cost	$ 101,550.00	
10% Eng. And Cont.	$ 10,155.00	
Total Construction Cost		**$ 111,705.00**
Inflation Adjustment (6% Over 5 Years)		**$ 41,250.00***
Preliminary Engineering (10%)		**$ 10,155.00**

Total Cost ---------- **$ 215,110.00***

*Inflation Costs Added


66R
65
64
63
BENNY & MARY W. LAWSON
MELLISA S. COLLINS
PRES. & PROP. R.O.W.
HOLLERTOWN PIKE
PRES. R.O.W.
PROP. R.O.W.
RALPH & ZOZA BLOXNER
PRESTON L. & OLIVIA SIMPSON
2726
2722
2723
2719
2716
2715
BROOKWOOD RD
PRES. R.O.W.
PROP. R.O.W.
KATHLEEN M. BETTES
PRES. R.O.W.
PROP. R.O.W.
PRES. R.O.W.
SPRING HILL RD
4812
PROP. R.O.W.
PRES. R.O.W.

WASHINGTON PIKE /MILLERTOWN PIKE TPR

APPENDIX

VOLUME II

TRAFFIC SCHEMATICS

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING OFFICE
SUITE 1000, JAMES K. POLK BUILDING
NASHVILLE, TENNESSEE 37243-0344

September 8, 2008

Dawn Michelle Foster
Wilbur Smith Associates
1100 Marion Street, Suite 200
Knoxville Tennessee 37921

Subject: Traffic Figures for Washington Pike-Millertown Pike
Knoxville, Knox County

Dear Dawn:

We have reviewed the revised traffic schematics you submitted on September 3, 2008 for the subject project. These figures on the existing system have our approval for your use in the study.

Further coordination should be directed to Mr. Bill Hart's office. If I can be of further assistance, please advice.

Sincerely,

Tony Armstrong
Transportation Manager 1

Cc: Mr. Bill Hart

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING OFFICE
SUITE 1000, JAMES K. POLK BUILDING
NASHVILLE, TENNESSEE 37243-0344

October 9, 2008

Ms. Dawn Michelle Foster
Wilbur Smith Associates
1100 Marion Street, Suite 200
Knoxville Tennessee 37921

Subject: Traffic Figures for Washington Pike-Millertown Pike
Knoxville, Knox County

Dear Dawn,

We have reviewed the proposed system [Murphy Road Extension] traffic schematics submitted on October 3, 2008 for the subject project. These traffic figures have our approval for your use in the study. The existing system traffic was approved on September 8, 2008.

If I can be of further assistance, please advice.

Sincerely,

Tony Armstrong
Transportation Manager I

Cc: Mr. Bill Hart

Your Company Name Here

This is your address
Your City, State ZipCode
Your Tagline Here

File Name : No 1 Washington Pk with Murphy Rd
Site Code : 00000001
Start Date : 4/14/2008
Page No : 1

Groups Printed- Unshifted

	Murphy Rd			Washington Pk						Washington Pk			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	9	8	164	0	90	1	0	3	0	20	23	1	319
07:15 AM	14	5	193	1	200	7	4	2	0	46	41	5	518
07:30 AM	24	5	234	0	217	14	11	4	0	32	45	5	591
07:45 AM	21	13	229	0	186	16	0	2	0	45	51	1	564
Total	68	31	820	1	693	38	15	11	0	143	160	12	1992
08:00 AM	3	13	218	0	176	10	8	4	1	65	48	2	548
08:15 AM	3	4	168	0	99	8	3	2	0	64	18	1	370
08:30 AM	3	4	130	0	77	16	9	1	0	52	27	1	320
08:45 AM	7	9	117	0	86	11	4	3	0	45	20	9	311
Total	16	30	633	0	438	45	24	10	1	226	113	13	1549
11:15 AM	2	3	51	1	41	1	6	0	0	23	40	1	169
11:30 AM	3	2	42	0	34	5	4	2	0	42	19	7	160
11:45 AM	6	5	53	0	63	3	4	4	0	56	24	6	224
Total	11	10	146	1	138	9	14	6	0	121	83	14	553
12:00 PM	2	6	82	1	45	7	2	3	1	48	27	5	229
12:15 PM	2	4	62	0	32	5	0	2	0	58	25	2	192
12:30 PM	4	5	66	0	49	10	0	5	0	56	28	0	223
12:45 PM	2	4	83	0	37	4	8	4	0	59	32	7	240
Total	10	19	293	1	163	26	10	14	1	221	112	14	884
01:00 PM	8	4	81	0	44	10	2	5	0	55	44	4	257
Total	8	4	81	0	44	10	2	5	0	55	44	4	257
02:15 PM	10	1	72	0	60	9	2	3	0	65	39	3	264
02:30 PM	7	5	63	0	64	7	9	2	0	104	53	1	315
02:45 PM	11	6	71	0	23	14	3	4	0	76	60	2	270
Total	28	12	206	0	147	30	14	9	0	245	152	6	849
03:00 PM	10	2	60	0	96	15	8	4	0	117	55	0	367
03:15 PM	9	2	107	0	50	4	5	6	0	103	63	2	351
03:30 PM	3	3	85	0	58	11	2	4	0	130	60	3	359
03:45 PM	12	1	86	1	39	5	6	3	0	141	62	2	358
Total	34	8	338	1	243	35	21	17	0	491	240	7	1435
04:00 PM	9	3	98	0	48	4	1	0	0	173	78	2	416
04:15 PM	8	1	138	0	41	7	3	3	0	141	85	1	428
04:30 PM	3	3	150	0	64	6	4	4	0	162	106	2	504
04:45 PM	9	2	110	0	47	20	3	2	2	152	108	13	468
Total	29	9	496	0	200	37	11	9	2	628	377	18	1816
05:00 PM	6	9	89	0	55	7	9	8	0	150	133	17	483
05:15 PM	7	7	80	0	80	11	3	6	0	179	160	13	546
05:30 PM	12	7	93	0	38	12	4	6	0	161	151	9	493
05:45 PM	12	5	53	0	52	7	8	13	0	177	142	7	476
Total	37	28	315	0	225	37	24	33	0	667	586	46	1998
06:00 PM	7	5	96	0	51	9	2	10	0	171	138	4	493
Grand Total	248	156	3424	4	2342	276	137	124	4	2968	2005	138	11826
Apprch %	6.5	4.1	89.4	0.2	89.3	10.5	51.7	46.8	1.5	58.1	39.2	2.7	
Total %	2.1	1.3	29	0	19.8	2.3	1.2	1	0	25.1	17	1.2	

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File Name : No 1 Washington Pk with Murphy Rd
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	Murphy Rd				Washington Pk								Washington Pk				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	14	5	193	212	1	200	7	208	4	2	0	6	46	41	5	92	518
07:30 AM	24	5	234	263	0	217	14	231	11	4	0	15	32	45	5	82	591
07:45 AM	21	13	229	263	0	186	16	202	0	2	0	2	45	51	1	97	564
08:00 AM	3	13	218	234	0	176	10	186	8	4	1	13	65	48	2	115	548
Total Volume	62	36	874	972	1	779	47	827	23	12	1	36	188	185	13	386	2221
% App. Total	6.4	3.7	89.9		0.1	94.2	5.7		63.9	33.3	2.8		48.7	47.9	3.4		
PHF	.646	.692	.934	.924	.250	.897	.734	.895	.523	.750	.250	.600	.723	.907	.650	.839	.940
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	6	9	89	104	0	55	7	62	9	8	0	17	150	133	17	300	483
05:15 PM	7	7	80	94	0	80	11	91	3	6	0	9	179	160	13	352	546
05:30 PM	12	7	93	112	0	38	12	50	4	6	0	10	161	151	9	321	493
05:45 PM	12	5	53	70	0	52	7	59	8	13	0	21	177	142	7	326	476
Total Volume	37	28	315	380	0	225	37	262	24	33	0	57	667	586	46	1299	1998
% App. Total	9.7	7.4	82.9		0	85.9	14.1		42.1	57.9	0		51.3	45.1	3.5		
PHF	.771	.778	.847	.848	.000	.703	.771	.720	.667	.635	.000	.679	.932	.916	.676	.923	.915

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File Name : No 2 Washington Pk with McCampbell Dr
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Groups Printed- Unshifted

	McCampbell Dr				Washington Pk								Washington Pk				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	0	0	0	0	246	0	0	0	0	0	0	0	39	0	0	286
07:15 AM	2	0	1	0	0	323	4	0	0	0	0	0	0	96	0	0	426
07:30 AM	0	0	0	0	0	387	10	0	0	0	0	0	0	109	1	0	507
07:45 AM	0	0	1	0	1	386	5	0	0	0	0	0	0	113	0	0	506
Total	3	0	2	0	1	1342	19	0	0	0	0	0	0	357	1	0	1725
08:00 AM	0	0	1	0	0	367	4	0	0	0	0	0	0	117	0	0	489
08:15 AM	1	0	1	0	0	255	3	0	0	0	0	0	0	93	0	0	353
08:30 AM	1	0	0	0	0	206	0	0	0	0	0	0	0	99	0	0	306
08:45 AM	1	0	3	0	0	203	2	0	0	0	0	0	0	74	0	0	283
Total	3	0	5	0	0	1031	9	0	0	0	0	0	0	383	0	0	1431
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	93	2	0	0	0	0	0	0	60	0	0	155
11:30 AM	3	0	1	0	0	72	5	0	0	0	0	0	1	59	0	0	141
11:45 AM	0	0	1	0	0	88	11	0	1	6	2	0	2	77	0	0	188
Total	3	0	2	0	0	253	18	0	1	6	2	0	3	196	0	0	484
12:00 PM	1	0	0	0	0	138	1	0	0	0	0	0	3	95	0	0	238
12:15 PM	2	0	1	0	0	88	2	0	0	0	0	0	2	108	5	0	208
12:30 PM	0	0	3	0	0	119	3	0	0	0	0	0	1	97	0	0	223
12:45 PM	0	0	2	0	0	157	0	0	0	3	0	0	1	120	0	0	283
Total	3	0	6	0	0	502	6	0	0	3	0	0	7	420	5	0	952
01:00 PM	2	0	0	0	1	124	2	0	0	0	0	0	4	109	0	0	242
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	1	124	2	0	0	0	0	0	4	109	0	0	242
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	2	0	0	0	0	138	3	0	0	0	0	0	1	110	0	0	254
02:30 PM	0	0	0	0	0	140	5	0	0	0	0	0	11	144	0	0	300
02:45 PM	0	0	1	0	0	101	3	0	0	0	0	0	1	156	0	0	262
Total	2	0	1	0	0	379	11	0	0	0	0	0	13	410	0	0	816
03:00 PM	1	0	2	0	0	159	1	0	1	0	0	0	2	171	1	0	338
03:15 PM	6	0	2	0	0	169	1	0	0	0	0	0	6	161	0	0	345
03:30 PM	3	0	0	0	0	127	6	0	0	0	0	0	0	196	0	0	332
03:45 PM	0	0	2	0	0	137	3	0	0	0	0	0	1	210	0	0	353
Total	10	0	6	0	0	592	11	0	1	0	0	0	9	738	1	0	1368
04:00 PM	1	0	3	0	0	156	2	0	0	0	0	0	15	262	0	0	439
04:15 PM	0	0	5	0	0	122	43	1	0	1	0	0	4	226	0	0	402
04:30 PM	2	0	4	0	0	173	4	0	0	0	0	0	4	247	0	0	434
04:45 PM	1	0	3	0	0	182	5	0	0	0	0	0	20	270	0	0	481
Total	4	0	15	0	0	633	54	1	0	1	0	0	43	1005	0	0	1756

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File Name : No 2 Washington Pk with McCampbell Dr
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Groups Printed- Unshifted

	McCampbell Dr				Washington Pk								Washington Pk				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
05:00 PM	3	0	5	0	0	160	5	0	0	0	0	0	0	334	0	0	507
05:15 PM	1	0	5	0	0	206	2	0	0	0	0	0	3	388	0	0	605
05:30 PM	3	0	5	0	0	155	3	0	0	0	0	0	2	370	0	0	538
05:45 PM	1	0	1	0	0	135	11	0	0	0	0	0	6	357	0	0	511
Total	8	0	16	0	0	656	21	0	0	0	0	0	11	1449	0	0	2161
Grand Total	38	0	53	0	2	5512	151	1	2	10	2	0	90	5067	7	0	10935
Apprch %	41.8	0	58.2	0	0	97.3	2.7	0	14.3	71.4	14.3	0	1.7	98.1	0.1	0	
Total %	0.3	0	0.5	0	0	50.4	1.4	0	0	0.1	0	0	0.8	46.3	0.1	0	

	McCampbell Dr					Washington Pk										Washington Pk					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	**2**	0	**1**	0	**3**	0	323	4	0	327	0	0	0	0	0	0	96	0	0	96	426
07:30 AM	0	0	0	0	0	0	**387**	**10**	0	**397**	0	0	0	0	0	0	109	**1**	0	110	**507**
07:45 AM	0	0	1	0	1	**1**	386	5	0	392	0	0	0	0	0	0	113	0	0	113	506
08:00 AM	0	0	1	0	1	0	367	4	0	371	0	0	0	0	0	0	**117**	0	0	**117**	489
Total Volume	2	0	3	0	5	1	1463	23	0	1487	0	0	0	0	0	0	435	1	0	436	1928
% App. Total	40	0	60	0		0.1	98.4	1.5	0		0	0	0	0		0	99.8	0.2	0		
PHF	.250	.000	.750	.000	.417	.250	.945	.575	.000	.936	.000	.000	.000	.000	.000	.000	.929	.250	.000	.932	.951
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	**3**		**5**		**8**																
05:15 PM	1	0	5	0	6	0	**206**	2	0	**208**	0	0	0	0	0	3	**388**	0	0	**391**	**605**
05:30 PM	3	0	5	0	8	0	155	3	0	158	0	0	0	0	0	2	370	0	0	372	538
05:45 PM	1	0	1	0	2	0	135	**11**	0	146	0	0	0	0	0	**6**	357	0	0	363	511
Total Volume	8	0	16	0	24	0	656	21	0	677	0	0	0	0	0	11	1449	0	0	1460	2161
% App. Total	33.3	0	66.7	0		0	96.9	3.1	0		0	0	0	0		0.8	99.2	0	0		
PHF	.667	.000	.800	.000	.750	.000	.796	.477	.000	.814	.000	.000	.000	.000	.000	.458	.934	.000	.000	.934	.893

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File Name : No 3 Washington Pk with Edmonson Ln
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Groups Printed- Unshifted

	Washington Pk				Edmonson Ln				Washington Pk								
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	1	297	0	0	4	0	4	0	0	85	1	0	392
07:15 AM	0	0	0	0	3	369	0	0	6	0	2	0	0	82	2	0	464
07:30 AM	0	0	0	0	2	369	0	0	4	0	9	0	0	100	1	0	485
07:45 AM	0	0	0	0	5	374	0	0	4	0	1	0	0	104	1	0	489
Total	0	0	0	0	11	1409	0	0	18	0	16	0	0	371	5	0	1830
08:00 AM	0	0	0	0	1	290	0	0	6	0	1	0	0	97	2	0	397
08:15 AM	0	0	0	0	2	288	0	0	1	0	1	0	1	123	1	0	417
08:30 AM	0	0	0	0	5	233	0	0	4	0	3	0	0	104	1	0	350
08:45 AM	0	0	0	0	1	198	0	0	2	0	1	0	0	89	0	0	291
Total	0	0	0	0	9	1009	0	0	13	0	6	0	1	413	4	0	1455
11:00 AM	0	0	0	0	2	131	0	0	3	0	3	0	0	64	3	0	206
11:15 AM	0	0	0	0	1	123	0	0	2	0	0	0	2	96	2	0	226
11:45 AM	0	0	0	0	2	146	0	0	1	0	0	0	0	92	1	0	242
Total	0	0	0	0	5	400	0	0	6	0	3	0	2	252	6	0	674
12:00 PM	0	0	0	0	1	125	0	0	2	0	2	0	0	92	1	0	223
12:15 PM	0	0	0	0	0	113	0	0	5	0	1	0	0	113	2	0	234
12:30 PM	0	0	0	0	0	103	0	0	0	0	1	0	0	98	2	0	204
12:45 PM	0	0	0	0	0	150	0	0	2	0	2	0	0	149	1	0	304
Total	0	0	0	0	1	491	0	0	9	0	6	0	0	452	6	0	965
01:00 PM	0	0	0	0	1	133	0	0	6	0	2	0	0	123	3	0	268
Total	0	0	0	0	1	133	0	0	6	0	2	0	0	123	3	0	268
02:00 PM	0	0	0	0	2	110	0	0	2	0	4	0	0	153	1	0	272
02:15 PM	0	0	0	0	0	119	0	0	2	0	2	0	0	150	1	0	274
02:30 PM	0	0	0	0	0	144	0	0	3	0	7	0	1	139	2	0	296
02:45 PM	0	0	0	0	5	147	0	0	3	0	3	0	0	173	4	0	335
Total	0	0	0	0	7	520	0	0	10	0	16	0	1	615	8	0	1177
03:00 PM	0	36	0	0	1	85	0	0	3	28	1	0	0	112	1	0	267
03:15 PM	0	0	0	0	2	160	1	0	5	0	1	0	0	189	4	0	362
03:30 PM	0	0	0	0	2	125	0	0	2	0	1	0	0	201	4	0	335
03:45 PM	0	0	0	0	5	140	0	0	2	0	0	0	2	257	2	0	408
Total	0	36	0	0	10	510	1	0	12	28	3	0	2	759	11	0	1372
04:00 PM	0	0	0	0	0	146	0	0	2	0	1	0	0	284	2	0	435
04:15 PM	0	0	0	0	1	166	0	0	2	0	0	0	3	286	8	0	466
04:30 PM	0	0	0	0	3	137	0	0	4	0	1	0	1	295	5	0	446
04:45 PM	0	0	0	0	1	176	0	0	2	0	2	0	0	312	3	0	496
Total	0	0	0	0	5	625	0	0	10	0	4	0	4	1177	18	0	1843
05:00 PM	0	0	0	0	4	156	0	0	2	0	1	0	0	352	5	0	520
05:15 PM	0	0	0	0	1	124	0	0	1	0	0	0	0	351	3	0	480
05:30 PM	0	0	0	0	3	134	0	0	1	0	5	0	0	313	5	0	461
05:45 PM	0	0	0	0	1	159	0	0	1	0	1	0	0	332	3	0	497
Total	0	0	0	0	9	573	0	0	5	0	7	0	0	1348	16	0	1958
Grand Total	0	36	0	0	58	5670	1	0	89	28	63	0	10	5510	77	0	11542
Apprch %	0	100	0	0	1	99	0	0	49.4	15.6	35	0	0.2	98.4	1.4	0	
Total %	0	0.3	0	0	0.5	49.1	0	0	0.8	0.2	0.5	0	0.1	47.7	0.7	0	

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Site Code : 00000003
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						Washington Pk					Edmonson Ln					Washington Pk					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	3	369	0	0	372	6	0	2	0	8	0	82	2	0	84	464
07:30 AM	0	0	0	0	0	2	369	0	0	371	4	0	9	0	13	0	100	1	0	101	485
07:45 AM	0	0	0	0	0	5	374	0	0	379	4	0	1	0	5	0	104	1	0	105	489
08:00 AM	0	0	0	0	0	1	290	0	0	291	6	0	1	0	7	0	97	2	0	99	397
Total Volume	0	0	0	0	0	11	1402	0	0	1413	20	0	13	0	33	0	383	6	0	389	1835
% App. Total	0	0	0	0		0.8	99.2	0	0		60.6	0	39.4	0		0	98.5	1.5	0		
PHF	.000	.000	.000	.000	.000	.550	.937	.000	.000	.932	.833	.000	.361	.000	.635	.000	.921	.750	.000	.926	.938
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	4				160	2						352	5		357	520
05:15 PM	0	0	0	0	0	1	124	0	0	125	1	0	0	0	1	0	351	3	0	354	480
05:30 PM	0	0	0	0	0	3	134	0	0	137	1	0	5	0	6	0	313	5	0	318	461
05:45 PM	0	0	0	0	0	1	159	0	0	160	1	0	1	0	2	0	332	3	0	335	497
Total Volume	0	0	0	0	0	9	573	0	0	582	5	0	7	0	12	0	1348	16	0	1364	1958
% App. Total	0	0	0	0		1.5	98.5	0	0		41.7	0	58.3	0		0	98.8	1.2	0		
PHF	.000	.000	.000	.000	.000	.563	.901	.000	.000	.909	.625	.000	.350	.000	.500	.000	.957	.800	.000	.955	.941

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File Name : No 4 Washington Pk with Babelay Rd
Site Code : 00000004
Start Date : 4/15/2008
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Groups Printed- Unshifted

	Babelay Rd				Washington Pk				Babelay Rd								
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	2	0	0	285	0	0	7	0	2	0	0	59	3	0	358
07:15 AM	1	0	0	0	0	360	0	0	15	0	4	0	1	86	3	0	470
07:30 AM	0	0	7	0	1	388	1	0	21	0	4	0	1	108	5	0	536
07:45 AM	0	0	1	0	7	374	0	0	22	0	7	0	0	113	7	0	531
Total	1	0	10	0	8	1407	1	0	65	0	17	0	2	366	18	0	1895
08:00 AM	0	0	2	0	0	344	0	0	12	0	3	0	0	110	4	0	475
08:15 AM	2	0	3	0	4	240	0	0	7	0	1	0	0	101	6	0	364
08:30 AM	0	0	3	0	0	223	0	0	13	0	2	0	0	89	4	0	334
08:45 AM	0	0	0	0	0	187	0	0	11	0	1	0	2	78	4	0	283
Total	2	0	8	0	4	994	0	0	43	0	7	0	2	378	18	0	1456
11:00 AM	0	0	1	0	1	105	0	0	7	0	0	0	0	93	8	0	215
11:15 AM	0	0	1	0	2	98	0	0	10	0	1	0	0	74	6	0	192
11:30 AM	1	0	0	0	1	117	1	0	6	0	4	0	0	94	7	0	231
11:45 AM	0	0	0	0	1	114	0	0	11	0	2	0	1	96	3	0	228
Total	1	0	2	0	5	434	1	0	34	0	7	0	1	357	24	0	866
12:00 PM	0	0	4	0	0	123	0	0	6	0	0	0	1	106	5	0	245
12:15 PM	0	0	1	0	0	100	0	0	7	0	2	0	1	112	10	0	233
12:30 PM	0	0	0	0	3	122	0	0	5	0	6	0	2	119	12	0	269
12:45 PM	0	0	1	0	0	114	0	0	9	0	1	0	0	134	10	0	269
Total	0	0	6	0	3	459	0	0	27	0	9	0	4	471	37	0	1016
02:15 PM	0	0	0	0	0	111	2	0	9	0	2	0	1	154	15	0	294
02:30 PM	0	0	3	0	4	108	0	0	6	0	3	0	0	155	9	0	288
02:45 PM	0	0	0	0	2	128	1	0	8	0	2	0	1	166	8	0	316
Total	0	0	3	0	6	347	3	0	23	0	7	0	2	475	32	0	898
03:00 PM	0	0	0	0	0	152	0	0	8	0	2	0	0	156	9	0	327
03:15 PM	1	0	0	0	1	135	0	0	13	0	1	0	1	178	17	0	347
03:30 PM	0	0	0	0	0	126	0	0	5	0	3	0	4	193	13	0	344
03:45 PM	1	0	2	0	0	123	0	0	5	0	1	0	3	245	20	0	400
Total	2	0	2	0	1	536	0	0	31	0	7	0	8	772	59	0	1418
04:00 PM	0	0	0	0	3	164	0	0	4	0	3	0	0	251	16	0	441
04:15 PM	0	0	1	0	2	127	1	0	11	0	4	0	0	257	15	0	418
04:30 PM	0	0	1	0	3	147	0	0	3	0	2	0	0	289	11	0	456
04:45 PM	0	0	1	0	1	177	1	0	4	0	5	0	1	298	19	0	507
Total	0	0	3	0	9	615	2	0	22	0	14	0	1	1095	61	0	1822
05:00 PM	0	0	0	0	1	118	0	0	5	0	2	0	4	331	19	0	480
05:15 PM	2	0	4	0	1	132	1	0	5	0	1	0	1	358	16	0	521
05:30 PM	0	0	0	0	1	115	1	0	5	0	1	0	1	384	21	0	529
05:45 PM	0	0	0	0	3	132	2	0	4	0	2	0	0	326	17	0	486
Total	2	0	4	0	6	497	4	0	19	0	6	0	6	1399	73	0	2016
06:00 PM	1	0	0	0	4	136	0	0	7	0	1	0	2	286	15	0	452
Grand Total	9	0	38	0	46	5425	11	0	271	0	75	0	28	5599	337	0	11839
Apprch %	19.1	0	80.9	0	0.8	99	0.2	0	78.3	0	21.7	0	0.5	93.9	5.7	0	
Total %	0.1	0	0.3	0	0.4	45.8	0.1	0	2.3	0	0.6	0	0.2	47.3	2.8	0	

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	Babelay Rd					Washington Pk					Babelay Rd										
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	1	0	0	0	1	0	360	0	0	360	15	0	4	0	19	1	86	3	0	90	470
07:30 AM	0	0	7	0	7	1	388	1	0	390	21	0	4	0	25	1	108	5	0	114	536
07:45 AM	0	0	1	0	1	7	374	0	0	381	22	0	7	0	29	0	113	7	0	120	531
08:00 AM	0	0	2	0	2	0	344	0	0	344	12	0	3	0	15	0	110	4	0	114	475
Total Volume	1	0	10	0	11	8	1466	1	0	1475	70	0	18	0	88	2	417	19	0	438	2012
% App. Total	9.1	0	90.9	0		0.5	99.4	0.1	0		79.5	0	20.5	0		0.5	95.2	4.3	0		
PHF	.250	.000	.357	.000	.393	.286	.945	.250	.000	.946	.795	.000	.643	.000	.759	.500	.923	.679	.000	.913	.938
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	1	118	0	0	119	5		2		7	4					
05:15 PM	2	0	4	0	6	1	132	1	0	134	5	0	1	0	6	1	358	16	0	375	521
05:30 PM	0	0	0	0	0	1	115	1	0	117	5	0	1	0	6	1	384	21	0	406	529
05:45 PM	0	0	0	0	0	3	132	2	0	137	4	0	2	0	6	0	326	17	0	343	486
Total Volume	2	0	4	0	6	6	497	4	0	507	19	0	6	0	25	6	1399	73	0	1478	2016
% App. Total	33.3	0	66.7	0		1.2	98	0.8	0		76	0	24	0		0.4	94.7	4.9	0		
PHF	.250	.000	.250	.000	.250	.500	.941	.500	.000	.925	.950	.000	.750	.000	.893	.375	.911	.869	.000	.910	.953

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Groups Printed- Unshifted

	MILL RD				WASINGTON PIKE				MILL RD				WASINGTON PIKE				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	93	132	0	0	6	0	27	0	0	27	1	0	286
07:15 AM	0	0	0	0	134	183	0	0	4	0	36	0	0	42	3	0	402
07:30 AM	0	0	0	0	117	295	0	0	6	0	68	0	0	42	5	0	533
07:45 AM	0	0	0	0	111	268	0	0	9	0	64	0	0	58	3	0	513
Total	0	0	0	0	455	878	0	0	25	0	195	0	0	169	12	0	1734
08:00 AM	0	0	0	0	147	238	0	0	3	0	58	0	0	44	4	0	494
08:15 AM	0	0	0	0	128	197	0	0	3	0	61	0	0	52	4	0	445
08:30 AM	0	0	0	0	80	141	0	0	4	0	64	0	0	54	2	0	345
08:45 AM	0	0	0	0	73	154	0	0	6	0	41	0	0	48	5	0	327
Total	0	0	0	0	428	730	0	0	16	0	224	0	0	198	15	0	1611
11:00 AM	0	0	0	0	57	68	1	0	4	0	51	0	0	50	6	0	237
11:15 AM	0	0	0	0	57	67	0	0	5	0	56	0	0	59	5	0	249
11:30 AM	0	0	0	0	68	72	0	0	7	0	91	0	0	58	7	0	303
11:45 AM	0	0	0	0	62	68	0	0	6	0	70	0	0	63	18	0	287
Total	0	0	0	0	244	275	1	0	22	0	268	0	0	230	36	0	1076
12:00 PM	0	0	0	0	86	77	0	0	3	0	55	0	0	78	19	0	318
12:15 PM	0	0	0	0	70	79	0	0	10	0	91	0	0	69	13	0	332
12:30 PM	0	0	0	0	60	72	0	0	5	0	84	0	0	79	9	0	309
12:45 PM	0	0	0	0	54	53	0	0	7	0	66	0	0	80	7	0	267
Total	0	0	0	0	270	281	0	0	25	0	296	0	0	306	48	0	1226
02:00 PM	0	0	0	0	62	74	0	0	9	0	66	0	0	98	9	0	318
02:15 PM	0	0	0	0	62	94	0	0	7	0	103	0	0	99	11	0	376
02:30 PM	0	0	0	0	68	77	2	0	8	0	79	0	0	79	15	0	328
02:45 PM	0	0	0	0	45	63	0	0	3	0	99	0	3	112	17	0	342
Total	0	0	0	0	237	308	2	0	27	0	347	0	3	388	52	0	1364
03:00 PM	0	0	0	0	68	72	1	0	4	0	118	0	0	105	4	0	372
03:15 PM	0	0	0	0	89	118	0	0	10	1	92	0	0	119	13	0	442
03:30 PM	0	0	0	0	67	88	0	0	7	0	95	0	0	125	14	0	396
03:45 PM	0	0	0	0	70	79	0	0	2	0	106	0	0	133	12	0	402
Total	0	0	0	0	294	357	1	0	23	1	411	0	0	482	43	0	1612
04:00 PM	0	1	0	0	79	72	0	0	15	0	147	0	0	167	14	0	495
04:15 PM	0	0	0	0	82	114	1	0	5	0	148	0	0	230	9	0	589
04:30 PM	0	0	0	0	86	92	0	0	8	1	148	0	0	234	21	0	590
04:45 PM	0	0	0	0	73	81	0	0	9	0	193	0	0	243	21	0	620
Total	0	1	0	0	320	359	1	0	37	1	636	0	0	874	65	0	2294
05:00 PM	0	0	0	0	67	61	0	0	10	0	157	0	0	264	12	0	571
05:15 PM	0	0	0	0	75	64	0	0	2	0	140	0	0	251	12	0	544
05:30 PM	0	0	0	0	70	83	0	0	9	0	179	4	0	213	8	0	566
05:45 PM	0	0	0	0	67	68	0	0	7	0	197	0	0	228	5	0	572
Total	0	0	0	0	279	276	0	0	28	0	673	4	0	956	37	0	2253
Grand Total	0	1	0	0	2527	3464	5	0	203	2	3050	4	3	3603	308	0	13170
Apprch %	0	100	0	0	42.1	57.8	0.1	0	6.2	0.1	93.6	0.1	0.1	92.1	7.9	0	
Total %	0	0	0	0	19.2	26.3	0	0	1.5	0	23.2	0	0	27.4	2.3	0	

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	MILL RD					WASINGTON PIKE					MILL RD					WASINGTON PIKE					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	134	183	0	0	317	4	0	36	0	40	0	42	3	0	45	402
07:30 AM	0	0	0	0	0	117	295	0	0	412	6	0	68	0	74	0	42	5	0	47	533
07:45 AM	0	0	0	0	0	111	268	0	0	379	9	0	64	0	73	0	58	3	0	61	513
08:00 AM	0	0	0	0	0	147	238	0	0	385	3	0	58	0	61	0	44	4	0	48	494
Total Volume	0	0	0	0	0	509	984	0	0	1493	22	0	226	0	248	0	186	15	0	201	1942
% App. Total	0	0	0	0		34.1	65.9	0	0		8.9	0	91.1	0		0	92.5	7.5	0		
PHF	.000	.000	.000	.000	.000	.866	.834	.000	.000	.906	.611	.000	.831	.000	.838	.000	.802	.750	.000	.824	.911
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	67	61	0	0	128	10						264	12		276	
05:15 PM	0	0	0	0	0	75	64	0	0	139	2	0	140	0	142	0	251	12	0	263	544
05:30 PM	0	0	0	0	0	70	83	0	0	153	9	0	179	4	192	0	213	8	0	221	566
05:45 PM	0	0	0	0	0	67	68	0	0	135	7	0	197	0	204	0	228	5	0	233	572
Total Volume	0	0	0	0	0	279	276	0	0	555	28	0	673	4	705	0	956	37	0	993	2253
% App. Total	0	0	0	0		50.3	49.7	0	0		4	0	95.5	0.6		0	96.3	3.7	0		
PHF	.000	.000	.000	.000	.000	.930	.831	.000	.000	.907	.700	.000	.854	.250	.864	.000	.905	.771	.000	.899	.985

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	Target Ent-Exit				Washinton Pk				WASHINGTON PIKE				GREENWAY				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	1	0	162	12	2	0	27	8	30	0	0	2	44	0	288
07:15 AM	0	1	0	0	200	3	1	0	22	1	35	0	0	5	71	0	339
07:30 AM	0	3	0	0	251	12	1	0	31	5	66	0	0	16	84	0	469
07:45 AM	0	3	1	0	295	12	0	0	34	4	72	0	0	11	134	0	566
Total	0	7	2	0	908	39	4	0	114	18	203	0	0	34	333	0	1662
08:00 AM	0	1	0	0	253	11	2	0	33	12	61	0	3	13	150	0	539
08:15 AM	0	4	2	0	194	17	2	0	42	9	60	1	1	7	70	0	409
08:30 AM	0	8	1	0	145	8	2	0	25	8	52	0	1	7	79	0	336
08:45 AM	0	6	5	0	146	9	4	0	13	8	39	0	3	5	53	0	291
Total	0	19	8	0	738	45	10	0	113	37	212	1	8	32	352	0	1575
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	1	19	3	0	64	13	2	0	44	32	30	0	4	10	52	0	274
11:15 AM	1	31	5	0	71	10	5	0	40	29	49	0	11	8	69	1	330
11:30 AM	1	33	9	0	61	3	1	0	45	43	42	0	5	6	58	0	307
11:45 AM	5	31	7	0	54	13	0	0	46	30	45	0	3	6	55	0	295
Total	8	114	24	0	250	39	8	0	175	134	166	0	23	30	234	1	1206
12:00 PM	2	37	4	0	64	8	1	0	58	30	46	1	11	10	58	0	330
12:15 PM	4	37	3	0	60	20	2	0	52	42	54	0	4	9	54	0	341
12:30 PM	3	29	10	0	58	17	6	0	34	43	50	0	6	6	63	0	325
12:45 PM	5	46	7	0	64	14	3	0	60	43	51	0	4	8	59	0	364
Total	14	149	24	0	246	59	12	0	204	158	201	1	25	33	234	0	1360
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	42	8	0	42	14	2	0	51	42	52	0	12	14	51	0	330
02:15 PM	3	42	9	0	59	15	0	0	48	34	60	0	4	13	61	0	348
02:30 PM	1	32	14	0	65	13	1	0	47	31	85	0	6	16	55	0	366
02:45 PM	4	32	8	0	78	12	1	0	64	36	67	0	1	16	40	0	359
Total	8	148	39	0	244	54	4	0	210	143	264	0	23	59	207	0	1403
03:00 PM	4	39	5	0	77	12	5	0	66	22	83	0	7	11	64	0	395
03:15 PM	3	32	3	0	74	17	3	0	67	37	79	0	3	10	65	0	393
03:30 PM	4	45	11	0	81	9	2	0	48	51	97	0	6	16	89	0	459
03:45 PM	6	32	4	0	78	11	0	1	45	35	89	0	5	22	56	0	384
Total	17	148	23	0	310	49	10	1	226	145	348	0	21	59	274	0	1631
04:00 PM	4	37	8	0	55	11	1	0	44	37	115	0	2	19	79	0	412
04:15 PM	6	28	8	0	78	12	1	0	54	38	143	0	4	16	86	0	474
04:30 PM	6	53	4	0	98	12	0	0	85	49	162	0	3	29	77	1	579
04:45 PM	6	43	6	0	58	10	1	0	63	53	202	0	5	22	96	0	565
Total	22	161	26	0	289	45	3	0	246	177	622	0	14	86	338	1	2030

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	Target Ent-Exit				Washinton Pk				WASHINGTON PIKE				GREENWAY				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
05:00 PM	11	35	5	0	75	7	4	1	66	50	229	0	1	18	76	0	578
05:15 PM	8	35	13	0	88	13	2	0	60	37	182	0	4	26	91	0	559
05:30 PM	4	44	2	0	74	16	1	0	75	37	208	0	2	13	63	0	539
05:45 PM	10	57	14	0	76	13	1	0	61	26	212	0	5	26	55	0	556
Total	33	171	34	0	313	49	8	1	262	150	831	0	12	83	285	0	2232
Grand Total	102	917	180	0	3298	379	59	2	1550	962	2847	2	126	416	2257	2	13099
Apprch %	8.5	76.5	15	0	88.2	10.1	1.6	0.1	28.9	17.9	53.1	0	4.5	14.9	80.6	0.1	
Total %	0.8	7	1.4	0	25.2	2.9	0.5	0	11.8	7.3	21.7	0	1	3.2	17.2	0	

	Target Ent-Exit					Washinton Pk					WASHINGTON PIKE					GREENWAY					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	1	0	0	1	200	3	1	0	204	22	1	35	0	58	0	5	71	0	76	339
07:30 AM	0	3	0	0	3	251	12	1	0	264	31	5	66	0	102	0	16	84	0	100	469
07:45 AM	0	3	1	0	4	295	12	0	0	307	34	4	72	0	110	0	11	134	0	145	566
08:00 AM	0	1	0	0	1	253	11	2	0	266	33	12	61	0	106	3	13	150	0	166	539
Total Volume	0	8	1	0	9	999	38	4	0	1041	120	22	234	0	376	3	45	439	0	487	1913
% App. Total	0	88.9	11.1	0		96	3.7	0.4	0		31.9	5.9	62.2	0		0.6	9.2	90.1	0		
PHF	.000	.667	.250	.000	.563	.847	.792	.500	.000	.848	.882	.458	.813	.000	.855	.250	.703	.732	.000	.733	.845

Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	11							4	1			50	229		345						578
05:15 PM	8	35	13	0	56	88	13	2	0	103	60	37	182	0	279	4	26	91	0	121	559
05:30 PM	4	44	2	0	50	74	16	1	0	91	75	37	208	0	320	2	13	63	0	78	539
05:45 PM	10	57	14	0	81	76	13	1	0	90	61	26	212	0	299	5	26	55	0	86	556
Total Volume	33	171	34	0	238	313	49	8	1	371	262	150	831	0	1243	12	83	285	0	380	2232
% App. Total	13.9	71.8	14.3	0		84.4	13.2	2.2	0.3		21.1	12.1	66.9	0		3.2	21.8	75	0		
PHF	.750	.750	.607	.000	.735	.889	.766	.500	.250	.900	.873	.750	.907	.000	.901	.600	.798	.783	.000	.785	.965

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File Name : No 7 Washington Pk with N Mall Rd
Site Code : 00000000
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Groups Printed- Unshifted

	WASHPK				NMALLRD				WASHPK				NMALLRD				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	76	196	1	4	85	7	0	50	47	2	0	0	0	0	0	468
07:15 AM	0	72	303	0	9	114	31	0	69	77	0	0	0	0	0	0	675
07:30 AM	0	118	337	0	8	127	33	0	54	100	0	0	0	0	0	0	777
07:45 AM	0	134	347	0	4	111	36	0	59	78	2	0	0	0	0	0	771
Total	0	400	1183	1	25	437	107	0	232	302	4	0	0	0	0	0	2691
08:00 AM	0	79	217	0	3	89	33	0	68	91	0	0	0	0	0	0	580
08:15 AM	0	72	175	0	10	53	19	0	43	76	0	0	0	0	0	0	448
08:30 AM	0	80	153	0	9	59	13	0	38	53	0	0	0	0	0	0	405
08:45 AM	0	47	92	0	9	51	32	0	43	60	0	0	0	0	0	0	334
Total	0	278	637	0	31	252	97	0	192	280	0	0	0	0	0	0	1767
11:00 AM	1	95	61	1	15	91	42	0	37	84	0	0	0	0	0	0	427
11:15 AM	0	106	50	0	26	88	34	0	45	104	0	0	0	0	0	0	453
11:30 AM	0	97	66	0	20	98	43	0	21	77	0	0	0	4	3	0	429
11:45 AM	1	102	54	1	17	61	65	0	26	112	0	0	0	0	0	0	439
Total	2	400	231	2	78	338	184	0	129	377	0	0	0	4	3	0	1748
12:00 PM	0	106	64	0	37	97	59	0	22	95	0	0	0	0	0	0	480
12:15 PM	0	82	77	0	30	104	52	0	35	103	0	0	0	0	0	0	483
12:30 PM	0	122	54	1	22	131	51	0	27	87	0	0	0	0	1	0	496
12:45 PM	0	124	67	0	22	85	66	0	39	103	0	0	0	0	0	0	506
Total	0	434	262	1	111	417	228	0	123	388	0	0	0	0	1	0	1965
02:00 PM	0	118	63	1	17	88	40	0	43	106	1	0	0	0	6	0	483
02:15 PM	0	96	82	0	24	109	51	0	38	116	0	0	0	0	0	0	516
02:30 PM	0	97	68	0	27	104	66	0	38	146	0	0	0	0	1	0	547
02:45 PM	7	128	86	0	23	83	50	0	47	142	0	0	1	0	0	0	567
Total	7	439	299	1	91	384	207	0	166	510	1	0	1	0	7	0	2113
03:00 PM	0	94	59	0	8	101	48	0	46	123	0	0	0	0	0	0	479
03:15 PM	0	124	78	0	17	78	47	1	39	154	0	0	0	0	0	0	538
03:30 PM	1	94	80	0	26	102	45	1	63	135	0	0	0	0	0	0	547
03:45 PM	0	118	65	0	22	106	63	0	46	181	0	0	0	0	0	0	601
Total	1	430	282	0	73	387	203	2	194	593	0	0	0	0	0	0	2165
04:00 PM	0	100	85	0	36	95	68	0	46	199	0	0	0	0	0	0	629
04:15 PM	0	99	75	0	13	98	80	0	43	215	0	0	0	0	1	0	624
04:30 PM	2	90	81	0	30	83	77	0	44	235	0	0	0	0	0	0	642
04:45 PM	0	100	72	0	22	98	69	1	46	239	0	0	0	0	0	0	647
Total	2	389	313	0	101	374	294	1	179	888	0	0	0	0	1	0	2542
05:00 PM	0	87	79	0	24	125	76	0	55	261	0	0	0	0	0	0	707
05:15 PM	0	130	66	0	25	90	103	0	39	289	0	0	0	0	0	0	742
05:30 PM	0	113	59	0	19	81	67	0	31	249	1	0	0	0	0	0	620
05:45 PM	0	85	88	0	20	82	68	0	49	197	0	0	0	0	0	0	589
Total	0	415	292	0	88	378	314	0	174	996	1	0	0	0	0	0	2658
Grand Total	12	3185	3499	5	598	2967	1634	3	1389	4334	6	0	1	4	12	0	17649
Apprch %	0.2	47.5	52.2	0.1	11.5	57	31.4	0.1	24.2	75.7	0.1	0	5.9	23.5	70.6	0	
Total %	0.1	18	19.8	0	3.4	16.8	9.3	0	7.9	24.6	0	0	0	0	0.1	0	

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	WASHPK					NMALLRD					WASHPK					NMALLRD					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	72	303	0	375	9	114	31	0	154	69	77	0	0	146	0	0	0	0	0	675
07:30 AM	0	118	337	0	455	8	127	33	0	168	54	100	0	0	154	0	0	0	0	0	777
07:45 AM	0	134	347	0	481	4	111	36	0	151	59	78	2	0	139	0	0	0	0	0	771
08:00 AM	0	79	217	0	296	3	89	33	0	125	68	91	0	0	159	0	0	0	0	0	580
Total Volume	0	403	1204	0	1607	24	441	133	0	598	250	346	2	0	598	0	0	0	0	0	2803
% App. Total	0	25.1	74.9	0		4	73.7	22.2	0		41.8	57.9	0.3	0		0	0	0	0		
PHF	.000	.752	.867	.000	.835	.667	.868	.924	.000	.890	.906	.865	.250	.000	.940	.000	.000	.000	.000	.000	.902
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	87	79	0	166	24	125			225	55										
05:15 PM	0	130	66	0	196	25	90	103	0	218	39	289	0	0	328	0	0	0	0	0	742
05:30 PM	0	113	59	0	172	19	81	67	0	167	31	249	1	0	281	0	0	0	0	0	620
05:45 PM	0	85	88	0	173	20	82	68	0	170	49	197	0	0	246	0	0	0	0	0	589
Total Volume	0	415	292	0	707	88	378	314	0	780	174	996	1	0	1171	0	0	0	0	0	2658
% App. Total	0	58.7	41.3	0		11.3	48.5	40.3	0		14.9	85.1	0.1	0		0	0	0	0		
PHF	.000	.798	.830	.000	.902	.880	.756	.762	.000	.867	.791	.862	.250	.000	.893	.000	.000	.000	.000	.000	.896

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Groups Printed- Unshifted

	Washington Pk								Washington Pk				I-640 EB Off Ramp				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	12	27	0	0	0	0	0	0	0	47	6	0	19	21	20	0	152
07:15 AM	23	48	0	0	0	0	0	0	0	67	7	0	57	33	24	0	259
07:30 AM	30	54	0	0	0	0	0	0	0	70	7	0	40	33	40	0	274
07:45 AM	28	81	0	0	0	0	0	0	0	122	16	0	58	27	42	1	375
Total	93	210	0	0	0	0	0	0	0	306	36	0	174	114	126	1	1060
08:00 AM	42	84	0	0	0	0	0	0	0	89	15	0	29	45	40	0	344
08:15 AM	31	51	0	0	0	0	0	0	0	66	14	0	46	64	29	0	301
08:30 AM	27	50	0	0	0	0	0	0	0	67	19	0	46	48	47	0	304
08:45 AM	41	56	0	0	0	0	0	0	0	66	15	0	33	49	22	0	282
Total	141	241	0	0	0	0	0	0	0	288	63	0	154	206	138	0	1231
11:00 AM	55	48	0	0	0	0	0	0	0	65	22	0	36	104	30	0	360
11:15 AM	57	63	0	0	0	0	0	0	0	86	18	0	44	92	22	0	382
11:30 AM	46	49	0	0	0	0	0	0	0	69	30	0	46	106	30	0	376
11:45 AM	71	60	0	0	0	0	0	0	0	95	24	0	49	113	30	0	442
Total	229	220	0	0	0	0	0	0	0	315	94	0	175	415	112	0	1560
12:00 PM	55	57	0	0	0	0	0	0	0	90	36	0	63	97	36	0	434
12:15 PM	59	63	0	0	0	0	0	0	0	71	28	0	49	114	48	0	432
12:30 PM	59	70	0	0	0	0	0	0	0	106	27	0	44	92	32	0	430
12:45 PM	68	68	0	0	0	0	0	0	0	91	29	0	65	108	31	0	460
Total	241	258	0	0	0	0	0	0	0	358	120	0	221	411	147	0	1756
02:00 PM	47	63	0	0	0	0	0	0	0	67	20	0	66	112	26	0	401
02:15 PM	63	71	1	0	0	0	0	0	0	74	25	0	67	103	34	0	438
02:30 PM	51	72	1	0	0	0	0	0	0	74	20	0	66	101	41	0	426
02:45 PM	70	71	0	0	0	0	0	0	0	88	25	0	62	95	39	0	450
Total	231	277	2	0	0	0	0	0	0	303	90	0	261	411	140	0	1715
03:00 PM	57	75	0	0	0	0	0	0	0	93	18	0	88	97	54	0	482
03:15 PM	66	72	0	0	0	0	0	0	0	120	12	0	83	115	54	0	522
03:30 PM	71	65	0	0	0	0	0	0	0	106	32	0	86	125	58	0	543
03:45 PM	62	83	3	0	0	0	0	0	0	126	16	0	112	123	46	0	571
Total	256	295	3	0	0	0	0	0	0	445	78	0	369	460	212	0	2118
04:00 PM	53	83	0	0	0	0	0	0	0	136	20	0	107	118	44	0	561
04:15 PM	47	85	0	0	0	0	0	0	2	135	23	0	115	137	58	0	602
04:30 PM	64	82	0	0	0	0	0	0	0	118	19	0	144	121	55	0	603
04:45 PM	57	48	0	0	0	0	0	0	0	111	36	0	162	146	64	0	624
Total	221	298	0	0	0	0	0	0	2	500	98	0	528	522	221	0	2390
05:00 PM	66	71	0	0	0	0	0	0	0	128	22	0	164	139	61	0	651
05:15 PM	69	75	0	0	0	0	0	0	0	152	37	0	164	127	56	0	680
05:30 PM	75	63	1	0	0	0	0	0	0	137	34	0	190	132	53	0	685
05:45 PM	57	74	0	0	0	0	0	0	0	122	9	0	154	119	41	0	576
Total	267	283	1	0	0	0	0	0	0	539	102	0	672	517	211	0	2592
Grand Total	1679	2082	6	0	0	0	0	0	2	3054	681	0	2554	3056	1307	1	14422
Apprch %	44.6	55.3	0.2	0	0	0	0	0	0.1	81.7	18.2	0	36.9	44.2	18.9	0	
Total %	11.6	14.4	0	0	0	0	0	0	0	21.2	4.7	0	17.7	21.2	9.1	0	

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	Washington Pk										Washington Pk					I-640 EB Off Ramp					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	23	48	0	0	71	0	0	0	0	0	0	67	7	0	74	57	33	24	0	114	259
07:30 AM	30	54	0	0	84	0	0	0	0	0	0	70	7	0	77	40	33	40	0	113	274
07:45 AM	28	81	0	0	109	0	0	0	0	0	0	122	16	0	138	58	27	42	1	128	375
08:00 AM	42	84	0	0	126	0	0	0	0	0	0	89	15	0	104	29	45	40	0	114	344
Total Volume	123	267	0	0	390	0	0	0	0	0	0	348	45	0	393	184	138	146	1	469	1252
% App. Total	31.5	68.5	0	0		0	0	0	0		0	88.5	11.5	0		39.2	29.4	31.1	0.2		
PHF	.732	.795	.000	.000	.774	.000	.000	.000	.000	.000	.000	.713	.703	.000	.712	.793	.767	.869	.250	.916	.835
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	66	71	0	0	137	0	0	0	0	0	0	128	22	0	150	164	139	61			
05:15 PM	69	75	0	0	144	0	0	0	0	0	0	152	37	0	189	164	127	56	0	347	680
05:30 PM	75	63	1	0	139	0	0	0	0	0	0	137	34	0	171	190	132	53	0	375	685
05:45 PM	57	74	0	0	131	0	0	0	0	0	0	122	9	0	131	154	119	41	0	314	576
Total Volume	267	283	1	0	551	0	0	0	0	0	0	539	102	0	641	672	517	211	0	1400	2592
% App. Total	48.5	51.4	0.2	0		0	0	0	0		0	84.1	15.9	0		48	36.9	15.1	0		
PHF	.890	.943	.250	.000	.957	.000	.000	.000	.000	.000	.000	.887	.689	.000	.848	.884	.930	.865	.000	.933	.946

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File Name : No 9 Washington Pk with Valley View Dr
Site Code : 00000000
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Groups Printed- Unshifted

	WASHPK				VALLEYVIEW				WASHPK				VALLEYVIEW				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	60	7	1	2	1	6	0	6	35	6	0	16	1	7	0	149
07:15 AM	9	77	10	0	5	1	8	0	8	62	9	0	16	3	8	0	216
07:30 AM	10	117	10	0	5	1	9	0	10	70	14	0	15	0	17	1	279
07:45 AM	7	81	15	0	6	3	6	0	6	98	8	0	11	1	4	0	246
Total	27	335	42	1	18	6	29	0	30	265	37	0	58	5	36	1	890
08:00 AM	10	49	33	0	3	2	10	0	5	58	7	0	19	1	16	0	213
08:15 AM	7	71	8	0	3	0	9	0	7	28	1	0	21	2	7	0	164
08:30 AM	6	58	6	0	3	1	3	0	3	35	2	0	8	2	4	0	131
08:45 AM	6	74	8	0	5	1	7	0	5	46	9	0	17	2	9	0	189
Total	29	252	55	0	14	4	29	0	20	167	19	0	65	7	36	0	697
11:00 AM	4	44	14	1	2	0	2	0	7	49	2	0	19	2	10	0	156
11:15 AM	7	65	10	0	7	3	6	0	8	54	8	0	13	2	10	0	193
11:30 AM	10	71	15	0	4	1	6	0	8	63	2	0	18	4	12	0	214
11:45 AM	6	83	17	0	5	2	7	0	4	64	8	0	18	2	11	0	227
Total	27	263	56	1	18	6	21	0	27	230	20	0	68	10	43	0	790
12:00 PM	4	69	18	0	4	1	4	0	15	85	7	0	16	1	7	0	231
12:15 PM	6	63	10	0	0	0	6	0	8	69	5	0	12	4	5	0	188
12:30 PM	4	75	14	0	2	1	10	0	6	54	5	0	23	3	7	0	204
12:45 PM	8	98	23	0	3	2	12	0	10	68	6	0	15	2	14	0	261
Total	22	305	65	0	9	4	32	0	39	276	23	0	66	10	33	0	884
02:00 PM	11	81	18	1	2	2	10	0	11	81	11	0	25	1	11	0	265
02:15 PM	7	90	14	0	4	4	2	0	8	82	9	0	17	3	16	0	256
02:30 PM	5	59	18	0	2	1	0	0	4	57	6	0	13	4	8	1	178
02:45 PM	4	93	18	0	5	1	4	0	6	56	11	0	4	0	3	0	205
Total	27	323	68	1	13	8	16	0	29	276	37	0	59	8	38	1	904
03:00 PM	3	85	15	0	3	2	2	0	13	91	10	0	8	0	10	1	243
03:15 PM	7	74	12	0	1	1	0	0	5	69	1	0	4	3	6	0	183
03:30 PM	2	67	15	0	8	1	3	0	9	88	3	0	12	0	10	1	219
03:45 PM	8	75	14	0	6	3	4	0	13	98	9	0	27	3	13	0	273
Total	20	301	56	0	18	7	9	0	40	346	23	0	51	6	39	2	918
04:00 PM	9	67	13	0	4	0	2	0	3	92	7	0	7	0	11	0	215
04:15 PM	7	83	24	0	3	1	7	0	21	107	7	0	19	1	10	0	290
04:30 PM	16	80	22	1	4	2	7	0	14	111	7	0	23	2	17	0	306
04:45 PM	12	113	27	0	2	3	8	0	11	98	6	0	17	1	7	0	305
Total	44	343	86	1	13	6	24	0	49	408	27	0	66	4	45	0	1116
05:00 PM	1	44	7	0	1	1	2	0	8	81	3	0	9	0	12	0	169
05:15 PM	5	89	17	0	3	0	0	0	10	72	6	0	12	4	10	0	228
05:30 PM	12	80	19	0	4	0	9	0	16	85	7	0	15	1	19	0	267
05:45 PM	7	80	14	0	5	4	7	0	12	77	7	0	34	8	16	0	271
Total	25	293	57	0	13	5	18	0	46	315	23	0	70	13	57	0	935
Grand Total	221	2415	485	4	116	46	178	0	280	2283	209	0	503	63	327	4	7134
Apprch %	7.1	77.3	15.5	0.1	34.1	13.5	52.4	0	10.1	82.4	7.5	0	56.1	7	36.5	0.4	
Total %	3.1	33.9	6.8	0.1	1.6	0.6	2.5	0	3.9	32	2.9	0	7.1	0.9	4.6	0.1	

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	WASHPK					VALLEYVIEW					WASHPK					VALLEYVIEW					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	9	77	10	0	96	5	1	8	0	14	8	62	9	0	79	16	3	8	0	27	216
07:30 AM	10	117	10	0	137	5	1	9	0	15	10	70	14	0	94	15	0	17	1	33	279
07:45 AM	7	81	15	0	103	6	3	6	0	15	6	98	8	0	112	11	1	4	0	16	246
08:00 AM	10	49	33	0	92	3	2	10	0	15	5	58	7	0	70	19	1	16	0	36	213
Total Volume	36	324	68	0	428	19	7	33	0	59	29	288	38	0	355	61	5	45	1	112	954
% App. Total	8.4	75.7	15.9	0		32.2	11.9	55.9	0		8.2	81.1	10.7	0		54.5	4.5	40.2	0.9		
PHF	.900	.692	.515	.000	.781	.792	.583	.825	.000	.983	.725	.735	.679	.000	.792	.803	.417	.662	.250	.778	.855
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	44	7	0	52	1	1	2	0	4	8	81	3	0	92	9	0	12	0	21	169
05:15 PM	5	89			111																
05:30 PM	12	80	19	0	111	4	0	9	0	13	16	85	7	0	108	15	1	19	0	35	267
05:45 PM	7	80	14	0	101	5	4	7	0	16	12	77	7	0	96	34	8	16	0	58	271
Total Volume	25	293	57	0	375	13	5	18	0	36	46	315	23	0	384	70	13	57	0	140	935
% App. Total	6.7	78.1	15.2	0		36.1	13.9	50	0		12	82	6	0		50	9.3	40.7	0		
PHF	.521	.823	.750	.000	.845	.650	.313	.500	.000	.563	.719	.926	.821	.000	.889	.515	.406	.750	.000	.603	.863

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	Washington Pike				Centerline Drive				Washington Pike								
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	15	43	0	0	0	0	2	0	0	48	0	0	0	0	0	0	108
07:15 AM	7	79	0	0	1	0	5	0	0	61	3	0	0	0	0	0	156
07:30 AM	8	107	1	0	1	0	2	0	0	86	2	0	0	0	0	0	207
07:45 AM	19	97	0	0	1	0	11	0	0	99	7	0	0	0	0	0	234
Total	49	326	1	0	3	0	20	0	0	294	12	0	0	0	0	0	705
08:00 AM	23	61	0	0	0	0	5	0	0	67	8	0	0	0	0	0	164
08:15 AM	13	54	0	0	3	0	6	0	0	52	2	0	0	0	0	0	130
08:30 AM	15	41	0	0	1	0	13	0	0	42	6	0	0	0	0	0	118
08:45 AM	17	60	0	0	1	0	15	0	0	48	5	0	0	0	0	0	146
Total	68	216	0	0	5	0	39	0	0	209	21	0	0	0	0	0	558
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	16	66	0	0	2	0	17	0	0	49	4	0	0	0	0	0	154
11:15 AM	23	37	0	0	1	0	15	0	0	53	5	0	0	0	0	0	134
11:30 AM	18	61	0	0	1	0	23	0	0	55	5	0	0	0	0	0	163
11:45 AM	30	83	0	0	4	0	28	0	0	69	9	0	0	0	0	0	223
Total	87	247	0	0	8	0	83	0	0	226	23	0	0	0	0	0	674
12:00 PM	26	72	0	0	5	0	30	0	0	62	3	0	0	0	0	0	198
12:15 PM	24	73	0	0	2	0	33	0	0	68	5	0	0	0	0	0	205
12:30 PM	21	76	0	0	6	0	21	0	0	68	10	0	0	0	0	0	202
12:45 PM	20	70	0	0	3	0	27	0	0	58	5	0	0	0	0	0	183
Total	91	291	0	0	16	0	111	0	0	256	23	0	0	0	0	0	788
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	28	55	0	0	6	0	47	0	0	65	8	0	0	0	0	0	209
02:15 PM	27	86	0	0	3	0	22	0	0	60	4	0	0	0	0	0	202
02:30 PM	24	79	0	0	4	0	25	0	0	73	13	0	0	0	0	0	218
02:45 PM	16	83	0	0	7	0	24	0	0	62	13	0	0	0	0	0	205
Total	95	303	0	0	20	0	118	0	0	260	38	0	0	0	0	0	834
03:00 PM	23	90	0	0	2	0	20	0	0	98	2	0	0	0	0	0	235
03:15 PM	14	79	0	0	7	0	24	0	0	107	4	0	0	0	0	0	235
03:30 PM	26	83	0	0	4	0	30	0	0	95	5	0	0	0	0	0	243
03:45 PM	26	94	0	0	2	0	31	0	0	82	7	0	0	0	0	0	242
Total	89	346	0	0	15	0	105	0	0	382	18	0	0	0	0	0	955
04:00 PM	31	85	0	0	4	0	35	0	0	89	5	0	0	0	0	0	249
04:15 PM	26	73	0	0	4	0	34	0	0	84	2	0	0	0	0	0	223
04:30 PM	19	92	0	0	2	0	28	0	0	89	1	0	0	0	0	0	231
04:45 PM	26	85	0	0	2	0	33	0	0	73	8	0	0	0	0	0	227
Total	102	335	0	0	12	0	130	0	0	335	16	0	0	0	0	0	930

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	Washington Pike				Centerline Drive				Washington Pike								
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
05:00 PM	30	86	0	0	4	0	30	0	0	118	4	0	0	0	0	0	272
05:15 PM	32	97	0	0	5	0	30	0	0	99	2	0	0	0	0	0	265
05:30 PM	28	89	0	0	1	0	16	0	0	73	7	0	0	0	0	0	214
05:45 PM	15	80	0	0	0	0	26	0	0	83	4	0	0	0	0	0	208
Total	105	352	0	0	10	0	102	0	0	373	17	0	0	0	0	0	959
Grand Total	686	2416	1	0	89	0	708	0	0	2335	168	0	0	0	0	0	6403
Apprch %	22.1	77.9	0	0	11.2	0	88.8	0	0	93.3	6.7	0	0	0	0	0	
Total %	10.7	37.7	0	0	1.4	0	11.1	0	0	36.5	2.6	0	0	0	0	0	

	Washington Pike					Centerline Drive					Washington Pike										
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	7	79	0	0	86	**1**	0	5	0	6	0	61	3	0	64	0	0	0	0	0	156
07:30 AM	8	**107**	**1**	0	**116**	1	0	2	0	3	0	86	2	0	88	0	0	0	0	0	207
07:45 AM	19	97	0	0	116	1	0	**11**	0	**12**	0	**99**	7	0	**106**	0	0	0	0	0	**234**
08:00 AM	**23**	61	0	0	84	0	0	5	0	5	0	67	**8**	0	75	0	0	0	0	0	164
Total Volume	57	344	1	0	402	3	0	23	0	26	0	313	20	0	333	0	0	0	0	0	761
% App. Total	14.2	85.6	0.2	0		11.5	0	88.5	0		0	94	6	0		0	0	0	0		
PHF	.620	.804	.250	.000	.866	.750	.000	.523	.000	.542	.000	.790	.625	.000	.785	.000	.000	.000	.000	.000	.813
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	30	86	0	0	116	**4**	0	**30**				**118**			**122**						**272**
05:15 PM	**32**	**97**	0	0	**129**	**5**	0	30	0	**35**	0	99	2	0	101	0	0	0	0	0	265
05:30 PM	28	89	0	0	117	1	0	16	0	17	0	73	**7**	0	80	0	0	0	0	0	214
05:45 PM	15	80	0	0	95	0	0	26	0	26	0	83	4	0	87	0	0	0	0	0	208
Total Volume	105	352	0	0	457	10	0	102	0	112	0	373	17	0	390	0	0	0	0	0	959
% App. Total	23	77	0	0		8.9	0	91.1	0		0	95.6	4.4	0		0	0	0	0		
PHF	.820	.907	.000	.000	.886	.500	.000	.850	.000	.800	.000	.790	.607	.000	.799	.000	.000	.000	.000	.000	.881

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	Washington Pike								Washington Pike				Pinehurst Dr				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	48	1	0	0	0	0	0	1	44	0	0	2	0	2	0	98
07:15 AM	0	75	1	0	0	0	0	0	0	67	0	0	2	0	0	0	145
07:30 AM	0	105	0	0	0	0	0	0	1	85	0	0	2	0	1	0	194
07:45 AM	0	102	0	0	0	0	0	0	2	122	0	0	7	0	0	0	233
Total	0	330	2	0	0	0	0	0	4	318	0	0	13	0	3	0	670
08:00 AM	0	59	0	0	0	0	0	0	0	83	0	0	2	0	0	0	144
08:15 AM	0	47	1	0	0	0	0	0	0	49	0	0	0	0	0	0	97
08:30 AM	0	54	2	0	0	0	0	0	0	44	0	0	1	0	0	0	101
08:45 AM	0	44	1	0	0	0	0	0	0	50	0	0	1	0	1	0	97
Total	0	204	4	0	0	0	0	0	0	226	0	0	4	0	1	0	439
11:00 AM	0	59	1	0	0	0	0	0	0	63	0	0	0	0	0	0	123
11:15 AM	0	50	2	0	0	0	0	0	0	69	0	0	1	0	1	0	123
11:30 AM	0	51	1	0	0	0	0	0	1	69	0	0	0	0	1	0	123
11:45 AM	0	67	0	0	0	0	0	0	0	79	0	0	2	0	0	0	148
Total	0	227	4	0	0	0	0	0	1	280	0	0	3	0	2	0	517
12:00 PM	0	74	2	0	0	0	0	0	1	75	0	0	0	0	1	0	153
12:15 PM	0	67	1	0	0	0	0	0	2	95	0	0	1	0	2	0	168
12:30 PM	0	77	2	0	0	0	0	0	0	97	0	0	0	0	1	0	177
12:45 PM	0	56	0	0	0	0	0	0	1	99	0	0	1	0	0	0	157
Total	0	274	5	0	0	0	0	0	4	366	0	0	2	0	4	0	655
02:00 PM	0	65	4	0	0	3	0	0	0	78	0	0	5	0	2	0	157
02:15 PM	0	67	1	0	0	0	0	0	2	89	0	0	0	0	1	0	160
02:30 PM	0	70	4	0	0	0	0	0	1	99	0	0	4	0	2	0	180
02:45 PM	0	90	1	0	0	0	0	0	1	90	0	0	0	0	0	0	182
Total	0	292	10	0	0	3	0	0	4	356	0	0	9	0	5	0	679
03:00 PM	0	80	0	0	0	0	0	0	0	101	0	0	3	0	0	0	184
03:15 PM	0	84	5	0	0	0	0	0	0	109	0	0	3	0	0	0	201
03:30 PM	0	64	3	0	0	0	0	0	1	94	0	0	2	0	0	0	164
03:45 PM	0	60	6	0	0	0	0	0	0	94	0	0	4	0	0	0	164
Total	0	288	14	0	0	0	0	0	1	398	0	0	12	0	0	0	713
04:00 PM	0	97	0	0	0	0	0	0	0	93	0	0	0	0	0	0	190
04:15 PM	0	91	3	0	0	0	0	0	0	120	0	0	2	0	0	0	216
04:30 PM	0	89	4	0	0	0	0	0	1	96	0	0	2	0	1	0	193
04:45 PM	0	75	2	0	0	0	0	0	0	110	0	0	1	0	0	0	188
Total	0	352	9	0	0	0	0	0	1	419	0	0	5	0	1	0	787
05:00 PM	0	94	2	0	0	0	0	0	0	120	0	0	2	0	0	0	218
05:15 PM	0	68	4	0	0	0	0	0	1	117	0	0	3	0	0	0	193
05:30 PM	0	78	3	0	0	0	0	0	0	117	0	0	2	0	1	0	201
05:45 PM	0	79	1	0	0	0	0	0	1	90	0	0	4	0	0	0	175
Total	0	319	10	0	0	0	0	0	2	444	0	0	11	0	1	0	787
Grand Total	0	2286	58	0	0	3	0	0	17	2807	0	0	59	0	17	0	5247
Apprch %	0	97.5	2.5	0	0	100	0	0	0.6	99.4	0	0	77.6	0	22.4	0	
Total %	0	43.6	1.1	0	0	0.1	0	0	0.3	53.5	0	0	1.1	0	0.3	0	

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	Washington Pike										Washington Pike					Pinehurst Dr					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	75	1	0	76	0	0	0	0	0	0	67	0	0	67	2	0	0	0	2	145
07:30 AM	0	105	0	0	105	0	0	0	0	0	1	85	0	0	86	2	0	1	0	3	194
07:45 AM	0	102	0	0	102	0	0	0	0	0	2	122	0	0	124	7	0	0	0	7	233
08:00 AM	0	59	0	0	59	0	0	0	0	0	0	83	0	0	83	2	0	0	0	2	144
Total Volume	0	341	1	0	342	0	0	0	0	0	3	357	0	0	360	13	0	1	0	14	716
% App. Total	0	99.7	0.3	0		0	0	0	0		0.8	99.2	0	0		92.9	0	7.1	0		
PHF	.000	.812	.250	.000	.814	.000	.000	.000	.000	.000	.375	.732	.000	.000	.726	.464	.000	.250	.000	.500	.768
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	94			96							120			120						218
05:15 PM	0	68	4	0	72	0	0	0	0	0	1	117	0	0	118	3	0	0	0	3	193
05:30 PM	0	78	3	0	81	0	0	0	0	0	0	117	0	0	117	2	0	1	0	3	201
05:45 PM	0	79	1	0	80	0	0	0	0	0	1	90	0	0	91	4	0	0	0	4	175
Total Volume	0	319	10	0	329	0	0	0	0	0	2	444	0	0	446	11	0	1	0	12	787
% App. Total	0	97	3	0		0	0	0	0		0.4	99.6	0	0		91.7	0	8.3	0		
PHF	.000	.848	.625	.000	.857	.000	.000	.000	.000	.000	.500	.925	.000	.000	.929	.688	.000	.250	.000	.750	.903

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	WASHPK				MILLERTN				WASHPK				WASHPK				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	15	0	32	1	0	26	23	0	0	0	0	0	24	31	0	0	152
07:15 AM	29	0	50	0	0	33	33	0	0	0	0	0	43	33	0	0	221
07:30 AM	34	0	73	0	0	47	50	0	0	0	0	0	55	49	0	0	308
07:45 AM	27	1	69	0	0	39	36	0	0	0	0	0	60	23	0	0	255
Total	105	1	224	1	0	145	142	0	0	0	0	0	182	136	0	0	936
08:00 AM	17	0	31	0	0	29	31	0	0	0	0	0	25	29	0	0	162
08:15 AM	12	0	31	0	0	39	19	0	0	0	0	0	25	26	0	0	152
08:30 AM	14	0	45	0	0	28	39	0	0	0	0	0	25	32	0	0	183
08:45 AM	13	0	38	1	0	29	45	0	0	0	0	0	32	34	0	0	192
Total	56	0	145	1	0	125	134	0	0	0	0	0	107	121	0	0	689
11:00 AM	27	0	32	1	0	48	38	0	0	0	0	0	52	49	0	0	247
11:15 AM	29	0	38	0	0	36	43	0	0	0	0	0	35	36	0	0	217
11:30 AM	38	0	33	0	0	47	47	0	0	0	0	0	42	36	0	0	243
11:45 AM	36	0	35	0	0	37	39	0	0	0	0	0	47	41	0	0	235
Total	130	0	138	1	0	168	167	0	0	0	0	0	176	162	0	0	942
12:00 PM	35	0	44	0	0	32	43	0	0	0	0	0	37	48	0	0	239
12:15 PM	38	0	47	0	0	41	37	0	0	0	0	0	37	48	0	0	248
12:30 PM	26	0	31	0	0	55	59	0	0	0	0	0	44	42	0	0	257
12:45 PM	38	0	42	0	0	41	55	0	0	0	0	0	39	41	0	0	256
Total	137	0	164	0	0	169	194	0	0	0	0	0	157	179	0	0	1000
02:00 PM	47	0	47	1	0	39	37	0	0	0	0	0	40	50	0	0	261
02:15 PM	40	0	39	0	0	59	52	0	0	0	0	0	51	49	0	0	290
02:30 PM	48	0	48	0	0	44	43	0	0	0	0	0	43	54	0	0	280
02:45 PM	30	1	48	0	0	44	50	0	0	0	0	0	44	37	0	0	254
Total	165	1	182	1	0	186	182	0	0	0	0	0	178	190	0	0	1085
03:00 PM	28	0	57	0	0	62	39	0	0	0	0	0	79	58	0	0	323
03:15 PM	41	0	59	0	0	44	42	0	0	0	0	0	84	49	0	0	319
03:30 PM	38	0	56	0	0	54	54	0	0	0	0	0	54	52	0	0	308
03:45 PM	38	0	40	0	0	45	37	0	0	0	0	0	50	49	0	0	259
Total	145	0	212	0	0	205	172	0	0	0	0	0	267	208	0	0	1209
04:00 PM	41	1	37	1	0	33	27	0	0	0	0	0	56	39	0	0	235
04:15 PM	42	0	21	0	2	40	56	0	0	0	0	0	57	59	0	0	277
04:30 PM	37	0	50	0	0	36	45	0	0	0	0	0	57	59	0	0	284
04:45 PM	52	0	50	0	0	58	55	0	0	0	0	0	65	66	0	0	346
Total	172	1	158	1	2	167	183	0	0	0	0	0	235	223	0	0	1142
05:00 PM	50	0	49	0	0	46	45	0	0	0	0	0	62	66	0	0	318
05:15 PM	58	0	38	0	0	45	40	0	0	0	0	0	70	45	0	0	296
05:30 PM	34	0	52	0	0	36	33	0	0	0	0	0	64	68	0	0	287
05:45 PM	40	0	43	0	0	41	42	0	0	0	0	0	35	42	0	0	243
Total	182	0	182	0	0	168	160	0	0	0	0	0	231	221	0	0	1144
Grand Total	1092	3	1405	5	2	1333	1334	0	0	0	0	0	1533	1440	0	0	8147
Apprch %	43.6	0.1	56.1	0.2	0.1	49.9	50	0	0	0	0	0	51.6	48.4	0	0	
Total %	13.4	0	17.2	0.1	0	16.4	16.4	0	0	0	0	0	18.8	17.7	0	0	

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	WASHPK					MILLERTN					WASHPK					WASHPK					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	29	0	50	0	79	0	33	33	0	66	0	0	0	0	0	43	33	0	0	76	221
07:30 AM	34	0	73	0	107	0	47	50	0	97	0	0	0	0	0	55	49	0	0	104	308
07:45 AM	27	1	69	0	97	0	39	36	0	75	0	0	0	0	0	60	23	0	0	83	255
08:00 AM	17	0	31	0	48	0	29	31	0	60	0	0	0	0	0	25	29	0	0	54	162
Total Volume	107	1	223	0	331	0	148	150	0	298	0	0	0	0	0	183	134	0	0	317	946
% App. Total	32.3	0.3	67.4	0		0	49.7	50.3	0		0	0	0	0		57.7	42.3	0	0		
PHF	.787	.250	.764	.000	.773	.000	.787	.750	.000	.768	.000	.000	.000	.000	.000	.763	.684	.000	.000	.762	.768
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	50	0	49	0	99		46	45		91											318
05:15 PM	58	0	38	0	96	0	45	40	0	85	0	0	0	0	0	70	45	0	0	115	296
05:30 PM	34	0	52	0	86	0	36	33	0	69	0	0	0	0	0	64	68	0	0	132	287
05:45 PM	40	0	43	0	83	0	41	42	0	83	0	0	0	0	0	35	42	0	0	77	243
Total Volume	182	0	182	0	364	0	168	160	0	328	0	0	0	0	0	231	221	0	0	452	1144
% App. Total	50	0	50	0		0	51.2	48.8	0		0	0	0	0		51.1	48.9	0	0		
PHF	.784	.000	.875	.000	.919	.000	.913	.889	.000	.901	.000	.000	.000	.000	.000	.825	.813	.000	.000	.856	.899

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Groups Printed- Unshifted

	SPGHILLRD				MILLERTNPK				SPGHILLRD				MILLERTNPK				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	1	11	38	0	0	15	0	9	0	0	33	19	0	126
07:15 AM	0	0	0	0	16	40	0	0	20	0	11	0	0	32	37	0	156
07:30 AM	0	0	0	0	25	52	0	0	40	1	10	0	0	33	49	0	210
07:45 AM	0	0	0	0	17	52	0	0	25	1	25	0	0	35	15	1	171
Total	0	0	0	1	69	182	0	0	100	2	55	0	0	133	120	1	663
08:00 AM	0	0	0	0	4	39	0	0	17	0	5	0	0	29	5	0	99
08:15 AM	0	0	0	0	5	37	0	0	9	0	7	0	0	34	9	0	101
08:30 AM	0	0	0	0	3	40	0	0	5	0	6	0	0	33	9	0	96
08:45 AM	0	0	0	0	10	36	0	0	7	0	16	0	0	41	4	0	114
Total	0	0	0	0	22	152	0	0	38	0	34	0	0	137	27	0	410
11:00 AM	0	0	0	1	12	56	0	0	7	0	23	0	0	40	9	0	148
11:15 AM	0	0	0	0	10	54	1	0	13	0	15	0	0	57	9	0	159
11:30 AM	0	0	0	0	7	73	0	0	9	0	20	0	0	47	8	0	164
11:45 AM	0	0	0	0	13	60	0	0	6	0	11	0	0	55	7	0	152
Total	0	0	0	1	42	243	1	0	35	0	69	0	0	199	33	0	623
12:00 PM	0	0	0	0	11	39	0	0	1	0	17	0	1	51	10	0	130
12:15 PM	0	0	0	0	8	60	0	0	9	0	19	0	0	48	13	0	157
12:30 PM	0	0	0	0	17	64	0	0	4	0	13	0	1	49	13	0	161
12:45 PM	0	0	0	0	15	61	0	0	16	0	14	0	0	45	12	0	163
Total	0	0	0	0	51	224	0	0	30	0	63	0	2	193	48	0	611
02:00 PM	0	0	0	1	9	69	0	0	12	0	10	0	0	57	5	0	163
02:15 PM	0	0	0	0	17	54	0	0	10	0	10	0	0	52	14	0	157
02:30 PM	0	0	0	0	25	60	1	0	10	0	9	0	1	59	18	0	183
02:45 PM	0	0	1	0	14	47	1	0	8	0	10	0	1	36	10	0	128
Total	0	0	1	1	65	230	2	0	40	0	39	0	2	204	47	0	631
03:00 PM	0	0	0	0	27	59	0	0	6	0	14	0	0	61	15	0	182
03:15 PM	0	0	0	0	15	60	0	0	11	0	18	0	0	60	12	0	176
03:30 PM	0	0	0	0	26	62	0	0	12	0	31	0	0	73	11	0	215
03:45 PM	0	0	0	0	16	61	1	0	10	0	20	0	0	64	9	0	181
Total	0	0	0	0	84	242	1	0	39	0	83	0	0	258	47	0	754
04:00 PM	0	0	0	0	14	65	0	0	8	0	18	0	0	69	14	0	188
04:15 PM	0	0	0	0	15	71	0	0	15	0	21	0	0	71	16	0	209
04:30 PM	0	0	0	0	14	43	0	0	22	0	17	0	1	61	17	0	175
04:45 PM	0	0	0	0	9	35	1	0	9	0	10	0	0	53	14	0	131
Total	0	0	0	0	52	214	1	0	54	0	66	0	1	254	61	0	703
05:00 PM	0	0	0	0	15	79	0	0	12	0	14	0	0	81	14	0	215
05:15 PM	0	0	0	0	21	77	0	0	9	0	14	0	0	74	7	0	202
05:30 PM	0	0	0	0	12	77	0	0	13	0	12	0	0	68	13	0	195
05:45 PM	0	0	0	0	6	71	0	0	12	0	17	0	1	70	21	0	198
Total	0	0	0	0	54	304	0	0	46	0	57	0	1	293	55	0	810
Grand Total	0	0	1	3	439	1791	5	0	382	2	466	0	6	1671	438	1	5205
Apprch %	0	0	25	75	19.6	80.1	0.2	0	44.9	0.2	54.8	0	0.3	79	20.7	0	
Total %	0	0	0	0.1	8.4	34.4	0.1	0	7.3	0	9	0	0.1	32.1	8.4	0	

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	SPGHILLRD					MILLERTNPK					SPGHILLRD					MILLERTNPK					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	16	40	0	0	56	20	0	11	0	31	0	32	37	0	69	156
07:30 AM	0	0	0	0	0	**25**	**52**	0	0	**77**	**40**	**1**	10	0	**51**	0	33	**49**	0	**82**	**210**
07:45 AM	0	0	0	0	0	17	52	0	0	69	25	1	**25**	0	51	0	**35**	15	**1**	51	171
08:00 AM	0	0	0	0	0	4	39	0	0	43	17	0	5	0	22	0	29	5	0	34	99
Total Volume	0	0	0	0	0	62	183	0	0	245	102	2	51	0	155	0	129	106	1	236	636
% App. Total	0	0	0	0		25.3	74.7	0	0		65.8	1.3	32.9	0		0	54.7	44.9	0.4		
PHF	.000	.000	.000	.000	.000	.620	.880	.000	.000	.795	.638	.500	.510	.000	.760	.000	.921	.541	.250	.720	.757
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	15	**79**										**81**			**95**	**215**
05:15 PM	0	0	0	0	0	**21**	77	0	0	**98**	9	0	14	0	23	0	74	7	0	81	202
05:30 PM	0	0	0	0	0	12	77	0	0	89	**13**	0	12	0	25	0	68	13	0	81	195
05:45 PM	0	0	0	0	0	6	71	0	0	77	12	0	**17**	0	**29**	**1**	70	**21**	0	92	198
Total Volume	0	0	0	0	0	54	304	0	0	358	46	0	57	0	103	1	293	55	0	349	810
% App. Total	0	0	0	0		15.1	84.9	0	0		44.7	0	55.3	0		0.3	84	15.8	0		
PHF	.000	.000	.000	.000	.000	.643	.962	.000	.000	.913	.885	.000	.838	.000	.888	.250	.904	.655	.000	.918	.942

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File Name : No 14 Millertown Pk with South Mall Rd
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Groups Printed- Unshifted

	SMALLRD				MILLET TOWN TI PK				SMALLRD				MILLET TOWN TI PK				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:15 AM	19	22	3	0	98	37	0	0	0	0	0	0	0	17	15	0	211
07:30 AM	24	28	6	1	109	48	1	0	0	0	0	0	0	27	14	0	258
07:45 AM	23	33	6	0	123	51	0	0	0	0	0	0	0	15	18	0	269
Total	66	83	15	1	330	136	1	0	0	0	0	0	0	59	47	0	738
08:00 AM	26	31	16	0	103	71	7	0	0	0	0	0	1	25	22	0	302
08:15 AM	39	37	5	0	112	62	0	0	0	0	0	0	0	42	27	1	325
08:30 AM	37	41	1	0	76	57	0	0	0	0	0	0	0	28	16	0	256
08:45 AM	34	34	5	0	71	42	0	0	0	0	0	0	0	30	20	0	236
Total	136	143	27	0	362	232	7	0	0	0	0	0	1	125	85	1	1119
09:00 AM	40	34	4	0	58	60	0	0	0	0	0	0	0	52	9	0	257
09:15 AM	46	24	5	0	59	74	0	0	0	2	0	0	0	35	16	0	261
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	86	58	9	0	117	134	0	0	0	2	0	0	0	87	25	0	518
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	41	32	14	1	75	94	1	0	0	0	0	0	1	68	16	0	343
Total	41	32	14	1	75	94	1	0	0	0	0	0	1	68	16	0	343
12:00 PM	68	29	12	0	76	88	2	0	0	0	0	0	0	80	28	0	383
12:15 PM	85	37	16	0	67	77	0	0	0	0	0	0	0	80	18	0	380
12:30 PM	67	35	13	0	94	92	2	0	0	0	0	0	0	99	25	0	427
12:45 PM	61	42	26	0	67	95	0	0	0	0	0	0	1	104	24	0	420
Total	281	143	67	0	304	352	4	0	0	0	0	0	1	363	95	0	1610
01:00 PM	65	32	23	0	88	100	2	0	0	0	0	0	0	84	25	0	419
01:15 PM	90	43	14	0	79	90	0	0	0	0	0	0	0	72	25	0	413
01:30 PM	67	39	9	0	100	94	1	0	0	0	0	0	0	75	21	0	406
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	222	114	46	0	267	284	3	0	0	0	0	0	0	231	71	0	1238
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	78	48	16	1	96	94	3	0	0	0	0	0	0	73	23	0	432
02:30 PM	89	48	13	0	90	106	0	0	0	0	0	0	0	82	24	0	452
02:45 PM	67	48	18	0	83	100	0	0	0	0	0	0	0	98	23	0	437
Total	234	144	47	1	269	300	3	0	0	0	0	0	0	253	70	0	1321
03:00 PM	88	61	24	0	88	110	0	0	0	0	0	0	0	99	22	0	492
03:15 PM	61	30	15	0	84	80	0	0	0	0	0	0	0	108	21	0	399
03:30 PM	95	51	13	0	103	97	5	0	0	0	0	0	0	110	22	0	496
03:45 PM	85	42	8	0	78	86	0	0	0	0	0	0	0	115	15	0	429
Total	329	184	60	0	353	373	5	0	0	0	0	0	0	432	80	0	1816
04:00 PM	76	54	25	0	80	115	0	0	0	0	0	0	0	108	22	0	480
04:15 PM	64	52	29	0	78	84	0	0	0	0	0	0	0	117	31	0	455
04:30 PM	61	47	20	0	64	100	0	0	0	0	0	0	0	106	27	0	425
04:45 PM	69	58	38	0	104	115	0	0	0	0	0	0	0	122	31	0	537
Total	270	211	112	0	326	414	0	0	0	0	0	0	0	453	111	0	1897

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Groups Printed- Unshifted

	SMALLRD				MILLET TOWN TI PK				SMALLRD				MILLET TOWN TI PK				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
05:00 PM	63	55	35	0	97	108	0	0	0	0	0	0	0	121	29	0	508
05:15 PM	62	43	22	0	92	94	0	0	0	0	0	0	0	123	32	0	468
05:30 PM	78	49	11	0	109	125	0	0	0	0	0	0	0	139	26	0	537
05:45 PM	75	45	22	0	94	104	0	0	0	0	0	0	0	102	22	0	464
Total	278	192	90	0	392	431	0	0	0	0	0	0	0	485	109	0	1977
06:00 PM	68	41	36	0	105	89	1	0	0	0	0	0	0	116	20	0	476
Grand Total	2011	1345	523	3	2900	2839	25	0	0	2	0	0	3	2672	729	1	13053
Apprch %	51.8	34.6	13.5	0.1	50.3	49.3	0.4	0	0	100	0	0	0.1	78.5	21.4	0	
Total %	15.4	10.3	4	0	22.2	21.7	0.2	0	0	0	0	0	0	20.5	5.6	0	

	SMALLRD					MILLET TOWN TI PK					SMALLRD					MILLET TOWN TI PK					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	19	22	3	0	44	98	37	0	0	135	0	0	0	0	0	0	17	15	0	32	211
07:30 AM	24	28	6	1	59	109	48	1	0	158	0	0	0	0	0	0	27	14	0	41	258
07:45 AM	23	33	6	0	62	123	51	0	0	174	0	0	0	0	0	0	15	18	0	33	269
08:00 AM	26	31	16	0	73	103	71	7	0	181	0	0	0	0	0	1	25	22	0	48	302
Total Volume	92	114	31	1	238	433	207	8	0	648	0	0	0	0	0	1	84	69	0	154	1040
% App. Total	38.7	47.9	13	0.4		66.8	31.9	1.2	0		0	0	0	0		0.6	54.5	44.8	0		
PHF	.885	.864	.484	.250	.815	.880	.729	.286	.000	.895	.000	.000	.000	.000	.000	.250	.778	.784	.000	.802	.861
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	63	55	35		153																
05:15 PM	62	43	22	0	127	92	94	0	0	186	0	0	0	0	0	0	123	32	0	155	468
05:30 PM	78	49	11	0	138	109	125	0	0	234	0	0	0	0	0	0	139	26	0	165	537
05:45 PM	75	45	22	0	142	94	104	0	0	198	0	0	0	0	0	0	102	22	0	124	464
Total Volume	278	192	90	0	560	392	431	0	0	823	0	0	0	0	0	0	485	109	0	594	1977
% App. Total	49.6	34.3	16.1	0		47.6	52.4	0	0		0	0	0	0		0	81.6	18.4	0		
PHF	.891	.873	.643	.000	.915	.899	.862	.000	.000	.879	.000	.000	.000	.000	.000	.000	.872	.852	.000	.900	.920

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File Name : No 15 - I640 WB Off Rmp with Millertown Pk
Site Code : 00000001
Start Date : 3/31/2008
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Groups Printed- Unshifted

	Millertown Pk				I-640 WB Off Ramp				Millertown Pk								
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	110	33	0	4	22	41	0	2	32	0	0	0	0	0	0	244
07:15 AM	0	133	56	3	10	23	39	0	1	23	0	0	0	0	0	0	288
07:30 AM	0	150	73	0	17	24	61	0	3	49	0	0	0	0	0	0	377
07:45 AM	0	125	65	0	15	48	43	0	6	42	0	0	0	0	0	0	344
Total	0	518	227	3	46	117	184	0	12	146	0	0	0	0	0	0	1253
08:00 AM	0	116	85	1	21	37	72	0	2	71	0	0	0	0	0	0	405
08:15 AM	0	135	71	0	18	28	63	0	6	46	0	0	0	0	0	0	367
08:30 AM	0	125	52	0	25	29	63	0	6	39	0	0	0	0	0	0	339
08:45 AM	0	124	54	0	7	34	51	0	9	75	0	0	0	0	0	0	354
Total	0	500	262	1	71	128	249	0	23	231	0	0	0	0	0	0	1465
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	114	45	0	24	47	70	0	28	85	0	0	0	0	0	0	413
11:15 AM	0	92	43	0	21	62	69	0	18	102	0	0	0	0	0	0	407
11:30 AM	0	131	42	0	23	51	76	0	22	108	0	0	0	0	0	0	453
11:45 AM	0	114	68	1	15	72	83	0	27	108	0	0	0	0	0	0	488
Total	0	451	198	1	83	232	298	0	95	403	0	0	0	0	0	0	1761
12:00 PM	0	105	48	0	13	75	92	0	19	101	0	0	0	0	0	0	453
12:15 PM	0	132	62	0	25	66	97	0	23	145	0	0	0	0	0	0	550
12:30 PM	0	128	46	0	26	63	76	0	26	122	0	0	0	0	0	0	487
12:45 PM	0	126	52	0	7	60	88	0	31	108	0	0	0	0	0	0	472
Total	0	491	208	0	71	264	353	0	99	476	0	0	0	0	0	0	1962
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	92	67	0	35	97	44	0	18	100	0	0	0	0	0	0	453
02:15 PM	0	130	51	0	20	77	116	0	25	110	0	0	0	0	13	0	542
02:30 PM	1	157	55	0	15	54	77	0	32	138	0	0	0	0	0	0	529
02:45 PM	1	104	51	0	17	64	89	0	21	143	0	0	0	0	0	0	490
Total	2	483	224	0	87	292	326	0	96	491	0	0	0	0	13	0	2014
03:00 PM	0	131	53	0	16	67	88	0	19	142	0	0	0	0	0	0	516
03:15 PM	0	145	54	0	24	67	122	0	27	134	2	0	0	0	0	0	575
03:30 PM	0	113	66	3	28	57	139	0	25	158	1	0	0	0	0	0	590
03:45 PM	0	138	45	0	28	84	191	0	25	184	0	0	0	0	0	0	695
Total	0	527	218	3	96	275	540	0	96	618	3	0	0	0	0	0	2376
04:00 PM	0	128	43	0	22	83	149	0	21	175	0	0	0	0	0	0	621
04:15 PM	1	143	64	0	40	84	160	0	23	147	0	0	0	0	0	0	662
04:30 PM	3	137	70	0	12	89	159	0	16	179	1	0	0	0	0	0	666
04:45 PM	1	141	70	0	16	94	175	0	25	203	5	0	0	0	0	0	730
Total	5	549	247	0	90	350	643	0	85	704	6	0	0	0	0	0	2679

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File Name : No 15 - I640 WB Off Rmp with Millertown Pk
Site Code : 00000001
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Groups Printed- Unshifted

	Millertown Pk				I-640 WB Off Ramp				Millertown Pk								
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
05:00 PM	9	135	46	0	30	90	154	0	15	216	0	0	0	0	0	0	695
05:15 PM	0	128	49	0	18	118	218	0	13	201	6	0	0	0	0	0	751
05:30 PM	0	154	68	1	40	125	95	0	22	247	4	0	0	0	0	0	756
05:45 PM	0	137	57	0	38	124	176	0	35	203	0	0	0	0	0	0	770
Total	9	554	220	1	126	457	643	0	85	867	10	0	0	0	0	0	2972
Grand Total	16	4073	1804	9	670	2115	3236	0	591	3936	19	0	0	0	13	0	16482
Apprch %	0.3	69	30.6	0.2	11.1	35.1	53.7	0	13	86.6	0.4	0	0	0	100	0	
Total %	0.1	24.7	10.9	0.1	4.1	12.8	19.6	0	3.6	23.9	0.1	0	0	0	0.1	0	

	Millertown Pk					I-640 WB Off Ramp					Millertown Pk										
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	133	56	3	192	10	23	39	0	72	1	23	0	0	24	0	0	0	0	0	288
07:30 AM	0	150	73	0	223	17	24	61	0	102	3	49	0	0	52	0	0	0	0	0	377
07:45 AM	0	125	65	0	190	15	48	43	0	106	6	42	0	0	48	0	0	0	0	0	344
08:00 AM	0	116	85	1	202	21	37	72	0	130	2	71	0	0	73	0	0	0	0	0	405
Total Volume	0	524	279	4	807	63	132	215	0	410	12	185	0	0	197	0	0	0	0	0	1414
% App. Total	0	64.9	34.6	0.5		15.4	32.2	52.4	0		6.1	93.9	0	0		0	0	0	0		
PHF	.000	.873	.821	.333	.905	.750	.688	.747	.000	.788	.500	.651	.000	.000	.675	.000	.000	.000	.000	.000	.873
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	9																				
05:15 PM	0	128	49	0	177	18	118	218	0	354	13	201	6	0	220	0	0	0	0	0	751
05:30 PM	0	154	68	1	223	40	125	95	0	260	22	247	4	0	273	0	0	0	0	0	756
05:45 PM	0	137	57	0	194	38	124	176	0	338	35	203	0	0	238	0	0	0	0	0	770
Total Volume	9	554	220	1	784	126	457	643	0	1226	85	867	10	0	962	0	0	0	0	0	2972
% App. Total	1.1	70.7	28.1	0.1		10.3	37.3	52.4	0		8.8	90.1	1	0		0	0	0	0		
PHF	.250	.899	.809	.250	.879	.788	.914	.737	.000	.866	.607	.878	.417	.000	.881	.000	.000	.000	.000	.000	.965

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File Name : No 16 Millertown Pk with Knox Ctr and Kenzil way
Site Code : 00000000
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Groups Printed- Unshifted

	Millertown Pk				Kinzel Way				Millertown Pk				Knox Ctr Ent-Exit				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	6	174	5	0	25	3	6	0	6	51	14	0	4	5	5	0	304
07:15 AM	18	191	9	0	28	2	8	0	5	61	14	0	2	0	6	0	344
07:30 AM	16	222	14	0	31	2	9	0	1	61	22	0	6	3	10	0	397
07:45 AM	21	192	18	0	40	4	9	0	19	80	31	0	5	4	5	0	428
Total	61	779	46	0	124	11	32	0	31	253	81	0	17	12	26	0	1473
08:00 AM	13	173	11	0	30	7	8	0	10	61	18	0	3	3	6	0	343
08:15 AM	11	127	10	0	30	3	7	0	6	66	18	0	2	5	1	0	286
08:30 AM	18	103	12	0	34	5	18	0	13	54	19	0	4	4	0	0	284
08:45 AM	16	110	12	0	35	5	7	0	15	59	20	0	10	5	4	0	298
Total	58	513	45	0	129	20	40	0	44	240	75	0	19	17	11	0	1211
11:00 AM	9	81	32	0	38	12	14	0	40	93	45	0	28	18	24	0	434
11:15 AM	15	71	25	0	44	13	19	0	23	94	63	0	20	14	24	0	425
11:30 AM	18	87	27	0	41	12	23	0	35	83	63	0	24	27	24	0	464
11:45 AM	17	78	30	0	63	15	21	0	36	75	51	0	28	18	28	0	460
Total	59	317	114	0	186	52	77	0	134	345	222	0	100	77	100	0	1783
12:00 PM	19	104	21	0	57	12	23	0	26	86	53	0	24	20	27	0	472
12:15 PM	10	81	27	0	41	15	20	1	28	105	63	0	36	17	37	0	481
12:30 PM	14	98	12	0	57	24	20	0	30	99	52	0	23	29	26	0	484
12:45 PM	15	93	27	0	71	15	29	0	35	79	50	0	36	23	39	0	512
Total	58	376	87	0	226	66	92	1	119	369	218	0	119	89	129	0	1949
02:00 PM	10	95	16	0	42	14	26	0	27	107	56	0	20	23	27	0	463
02:15 PM	15	89	20	0	72	20	14	1	24	111	60	0	24	21	32	0	503
02:30 PM	14	93	13	0	69	14	27	0	24	117	57	0	28	18	37	0	511
02:45 PM	11	93	20	0	79	13	23	0	28	104	75	2	30	25	21	0	524
Total	50	370	69	0	262	61	90	1	103	439	248	2	102	87	117	0	2001
03:00 PM	18	84	19	0	60	15	33	0	31	113	61	0	32	18	40	1	525
03:15 PM	14	74	17	0	63	13	19	0	34	123	68	0	30	18	41	0	514
03:30 PM	23	82	29	0	62	15	30	0	25	134	74	0	30	9	25	0	538
03:45 PM	12	84	36	0	67	14	36	0	36	152	78	0	25	18	32	0	590
Total	67	324	101	0	252	57	118	0	126	522	281	0	117	63	138	1	2167
04:00 PM	12	78	34	0	74	12	30	0	45	136	55	0	42	12	41	1	572
04:15 PM	14	101	27	0	58	21	28	0	31	152	70	0	36	24	38	0	600
04:30 PM	14	86	20	0	64	13	42	0	39	160	74	0	27	27	43	0	609
04:45 PM	15	82	46	0	59	12	35	0	35	177	75	0	33	22	48	0	639
Total	55	347	127	0	255	58	135	0	150	625	274	0	138	85	170	1	2420
05:00 PM	16	95	24	1	57	16	46	0	31	156	73	0	34	31	42	0	622
05:15 PM	14	88	27	0	75	18	27	0	31	164	84	1	40	27	33	0	629
05:30 PM	23	87	36	0	50	18	30	0	18	157	46	0	43	22	37	0	567
05:45 PM	9	88	36	0	47	12	38	0	19	167	58	0	39	25	48	0	586
Total	62	358	123	1	229	64	141	0	99	644	261	1	156	105	160	0	2404
Grand Total	470	3384	712	1	1663	389	725	2	806	3437	1660	3	768	535	851	2	15408
Apprch %	10.3	74.1	15.6	0	59.8	14	26.1	0.1	13.6	58.2	28.1	0.1	35.6	24.8	39.5	0.1	
Total %	3.1	22	4.6	0	10.8	2.5	4.7	0	5.2	22.3	10.8	0	5	3.5	5.5	0	

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File Name : No 16 Millertown Pk with Knox Ctr and Kenzil way
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	Millertown Pk					Kinzel Way					Millertown Pk					Knox Ctr Ent-Exit					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	18	191	9	0	218	28	2	8	0	38	5	61	14	0	80	2	0	6	0	8	344
07:30 AM	16	222	14	0	252	31	2	9	0	42	1	61	22	0	84	6	3	10	0	19	397
07:45 AM	21	192	18	0	231	40	4	9	0	53	19	80	31	0	130	5	4	5	0	14	428
08:00 AM	13	173	11	0	197	30	7	8	0	45	10	61	18	0	89	3	3	6	0	12	343
Total Volume	68	778	52	0	898	129	15	34	0	178	35	263	85	0	383	16	10	27	0	53	1512
% App. Total	7.6	86.6	5.8	0		72.5	8.4	19.1	0		9.1	68.7	22.2	0		30.2	18.9	50.9	0		
PHF	.810	.876	.722	.000	.891	.806	.536	.944	.000	.840	.461	.822	.685	.000	.737	.667	.625	.675	.000	.697	.883
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	16	95		1				46			31						31				
05:15 PM	14	88	27	0	129	75	18	27	0	120	31	164	84	1	280	40	27	33	0	100	629
05:30 PM	23	87	36	0	146	50	18	30	0	98	18	157	46	0	221	43	22	37	0	102	567
05:45 PM	9	88	36	0	133	47	12	38	0	97	19	167	58	0	244	39	25	48	0	112	586
Total Volume	62	358	123	1	544	229	64	141	0	434	99	644	261	1	1005	156	105	160	0	421	2404
% App. Total	11.4	65.8	22.6	0.2		52.8	14.7	32.5	0		9.9	64.1	26	0.1		37.1	24.9	38	0		
PHF	.674	.942	.854	.250	.932	.763	.889	.766	.000	.904	.798	.984	.777	.250	.897	.907	.847	.833	.000	.940	.955

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File Name : No 17 Millertown Pk with Loves Crk Rd
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Groups Printed- Unshifted

	LOVE CREEK				MJLLER TOWN P				LOVE CREEK				MJLLER TOWN P				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	3	0	21	151	0	0	21	1	11	0	0	40	12	0	260
07:15 AM	0	0	8	0	34	177	0	0	24	0	6	0	2	50	11	0	312
07:30 AM	1	4	7	0	40	196	0	0	28	0	19	0	0	45	11	0	351
07:45 AM	0	0	7	0	40	241	0	0	26	2	12	0	0	65	10	0	403
Total	1	4	25	0	135	765	0	0	99	3	48	0	2	200	44	0	1326
08:00 AM	0	1	5	0	40	170	0	0	16	3	22	0	1	75	16	0	349
08:15 AM	1	0	5	0	23	120	0	0	32	0	19	0	2	72	11	0	285
08:30 AM	0	0	6	0	14	116	0	0	26	2	17	0	4	48	12	0	245
08:45 AM	2	3	9	0	26	112	0	0	22	2	7	0	5	74	10	0	272
Total	3	4	25	0	103	518	0	0	96	7	65	0	12	269	49	0	1151
11:00 AM	0	4	5	0	14	89	0	0	27	5	11	0	4	73	15	0	247
11:15 AM	1	6	16	0	14	85	0	0	23	5	19	0	3	69	16	0	257
11:30 AM	1	3	11	0	12	77	0	0	31	1	5	0	4	94	23	0	262
11:45 AM	1	2	7	0	12	101	0	0	35	3	19	0	3	96	21	0	300
Total	3	15	39	0	52	352	0	0	116	14	54	0	14	332	75	0	1066
12:00 PM	2	4	11	0	14	93	1	0	35	4	11	0	8	109	16	0	308
12:15 PM	2	5	10	0	17	100	0	0	48	2	19	0	4	91	29	0	327
12:30 PM	0	4	15	0	7	78	0	0	29	5	15	0	5	94	29	0	281
12:45 PM	5	2	10	0	17	82	4	0	28	6	16	0	9	100	29	0	308
Total	9	15	46	0	55	353	5	0	140	17	61	0	26	394	103	0	1224
02:00 PM	2	5	11	0	19	86	1	0	34	3	12	0	4	103	30	0	310
02:15 PM	5	4	6	0	19	66	1	0	28	7	22	0	7	117	28	0	310
02:30 PM	3	4	10	0	21	83	1	0	18	2	16	0	2	111	30	0	301
02:45 PM	2	5	13	0	15	87	1	0	32	5	15	0	6	110	24	0	315
Total	12	18	40	0	74	322	4	0	112	17	65	0	19	441	112	0	1236
03:00 PM	5	9	11	0	35	84	1	0	25	3	19	0	2	129	25	0	348
03:15 PM	3	2	17	0	19	85	0	0	39	6	16	0	6	133	16	0	342
03:30 PM	6	9	11	0	22	82	1	0	29	9	24	0	11	136	17	0	357
03:45 PM	4	4	8	0	18	78	0	0	31	4	35	0	8	166	22	0	378
Total	18	24	47	0	94	329	2	0	124	22	94	0	27	564	80	0	1425
04:00 PM	10	6	7	0	17	110	0	0	32	2	30	0	9	150	33	0	406
04:15 PM	9	6	11	0	21	95	1	0	28	13	24	0	5	180	30	0	423
04:30 PM	3	5	11	0	21	81	1	0	35	6	31	0	7	182	27	0	410
04:45 PM	9	6	15	0	25	108	0	0	32	13	33	0	7	192	20	0	460
Total	31	23	44	0	84	394	2	0	127	34	118	0	28	704	110	0	1699
05:00 PM	6	8	9	0	14	91	0	0	26	8	34	0	9	213	19	0	437
05:15 PM	7	7	16	0	18	105	0	0	34	5	25	0	9	230	23	0	479
05:30 PM	8	7	12	0	13	91	0	0	27	6	22	0	13	200	17	0	416
05:45 PM	9	12	11	0	19	100	1	0	33	6	21	0	8	197	19	0	436
Total	30	34	48	0	64	387	1	0	120	25	102	0	39	840	78	0	1768
Grand Total	107	137	314	0	661	3420	14	0	934	139	607	0	167	3744	651	0	10895
Apprch %	19.2	24.6	56.3	0	16.1	83.5	0.3	0	55.6	8.3	36.1	0	3.7	82.1	14.3	0	
Total %	1	1.3	2.9	0	6.1	31.4	0.1	0	8.6	1.3	5.6	0	1.5	34.4	6	0	

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	LOVE CREEK					MJLLER TOWN P					LOVE CREEK					MJLLER TOWN P					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	8	0	8	34	177	0	0	211	24	0	6	0	30	2	50	11	0	63	312
07:30 AM	1	4	7	0	12	40	196	0	0	236	28	0	19	0	47	0	45	11	0	56	351
07:45 AM	0	0	7	0	7	40	241	0	0	281	26	2	12	0	40	0	65	10	0	75	403
08:00 AM	0	1	5	0	6	40	170	0	0	210	16	3	22	0	41	1	75	16	0	92	349
Total Volume	1	5	27	0	33	154	784	0	0	938	94	5	59	0	158	3	235	48	0	286	1415
% App. Total	3	15.2	81.8	0		16.4	83.6	0	0		59.5	3.2	37.3	0		1	82.2	16.8	0		
PHF	.250	.313	.844	.000	.688	.963	.813	.000	.000	.835	.839	.417	.670	.000	.840	.375	.783	.750	.000	.777	.878
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	6	8	9	0	23	14	91	0	0	105	26	8	34		68						
05:15 PM	7	7	16	0	30	18	105	0	0	123	34	5	25	0	64	9	230	23	0	262	479
05:30 PM	8	7	12	0	27	13	91	0	0	104	27	6	22	0	55	13	200	17	0	230	416
05:45 PM	9	12	11	0	32	19	100	1	0	120	33	6	21	0	60	8	197	19	0	224	436
Total Volume	30	34	48	0	112	64	387	1	0	452	120	25	102	0	247	39	840	78	0	957	1768
% App. Total	26.8	30.4	42.9	0		14.2	85.6	0.2	0		48.6	10.1	41.3	0		4.1	87.8	8.2	0		
PHF	.833	.708	.750	.000	.875	.842	.921	.250	.000	.919	.882	.781	.750	.000	.908	.750	.913	.848	.000	.913	.923

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Groups Printed- Unshifted

	MILL ROAD				MILLER TOWN P				MILL ROAD				MILLER TOWN P				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	4	0	123	0	0	76	6	0	0	0	0	0	31	16	0	0	256
07:15 AM	5	0	133	0	0	102	6	0	0	0	0	0	45	17	0	0	308
07:30 AM	6	0	130	0	0	131	15	0	0	0	0	0	51	15	0	0	348
07:45 AM	10	0	159	0	0	129	15	0	0	0	0	0	41	21	0	0	375
Total	25	0	545	0	0	438	42	0	0	0	0	0	168	69	0	0	1287
08:00 AM	5	0	146	0	0	90	6	0	0	0	0	0	42	35	0	0	324
08:15 AM	2	0	131	0	0	65	6	0	0	0	0	0	84	27	0	0	315
08:30 AM	2	0	108	0	0	53	7	0	0	0	0	0	43	29	0	0	242
08:45 AM	3	0	103	0	0	68	5	0	0	0	0	0	43	31	0	0	253
Total	12	0	488	0	0	276	24	0	0	0	0	0	212	122	0	0	1134
11:00 AM	1	0	58	0	0	41	2	0	0	0	0	0	42	30	0	0	174
11:15 AM	8	0	78	0	0	35	6	0	0	0	0	0	64	39	0	0	230
11:30 AM	9	0	75	0	0	42	5	0	0	0	0	0	60	36	0	0	227
11:45 AM	4	0	65	0	0	50	1	0	0	0	0	0	48	28	0	0	196
Total	22	0	276	0	0	168	14	0	0	0	0	0	214	133	0	0	827
12:00 PM	5	0	76	0	0	43	4	0	0	0	0	0	65	41	0	0	234
12:15 PM	6	0	64	0	0	35	3	0	0	0	0	0	59	46	0	0	213
12:30 PM	4	0	88	0	0	42	8	0	0	0	0	0	81	53	0	0	276
12:45 PM	4	0	76	0	0	36	8	0	0	0	0	0	78	40	0	0	242
Total	19	0	304	0	0	156	23	0	0	0	0	0	283	180	0	0	965
02:00 PM	7	0	75	0	0	47	7	0	0	0	0	0	107	37	0	0	280
02:15 PM	7	0	50	0	0	43	4	0	0	0	0	0	99	61	0	0	264
02:30 PM	8	0	76	0	0	46	5	0	0	0	0	0	83	54	0	0	272
02:45 PM	7	0	83	0	0	36	10	0	0	0	0	0	105	61	0	0	302
Total	29	0	284	0	0	172	26	0	0	0	0	0	394	213	0	0	1118
03:00 PM	10	0	60	0	0	44	2	0	0	0	0	0	104	58	0	0	278
03:15 PM	5	0	81	0	0	41	5	0	0	0	0	0	91	77	0	0	300
03:30 PM	3	0	81	0	0	42	4	0	0	0	0	0	144	71	0	0	345
03:45 PM	3	0	60	0	0	39	9	0	0	0	0	0	151	80	0	0	342
Total	21	0	282	0	0	166	20	0	0	0	0	0	490	286	0	0	1265
04:00 PM	13	0	70	0	0	41	12	0	0	0	0	0	136	82	0	0	354
04:15 PM	6	0	95	0	0	47	7	0	0	0	0	0	129	77	0	0	361
04:30 PM	6	0	72	0	0	45	3	0	0	0	0	0	117	72	0	0	315
04:45 PM	10	0	92	0	0	50	13	0	0	0	0	0	143	90	0	0	398
Total	35	0	329	0	0	183	35	0	0	0	0	0	525	321	0	0	1428
05:00 PM	3	0	62	0	0	55	11	0	0	0	0	0	157	99	0	0	387
05:15 PM	4	0	63	0	0	77	5	0	0	0	0	0	143	94	0	0	386
05:30 PM	14	0	75	0	0	61	9	0	0	0	0	0	161	96	1	0	417
05:45 PM	10	0	65	0	0	60	14	0	0	0	0	0	135	85	0	0	369
Total	31	0	265	0	0	253	39	0	0	0	0	0	596	374	1	0	1559
Grand Total	194	0	2773	0	0	1812	223	0	0	0	0	0	2882	1698	1	0	9583
Apprch %	6.5	0	93.5	0	0	89	11	0	0	0	0	0	62.9	37.1	0	0	
Total %	2	0	28.9	0	0	18.9	2.3	0	0	0	0	0	30.1	17.7	0	0	

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	MILL ROAD					MILLER TOWN P					MILL ROAD					MILLER TOWN P					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	5	0	133	0	138	0	102	6	0	108	0	0	0	0	0	45	17	0	0	62	308
07:30 AM	6	0	130	0	136	0	**131**	**15**	0	**146**	0	0	0	0	0	**51**	15	0	0	66	348
07:45 AM	**10**	0	**159**	0	**169**	0	129	15	0	144	0	0	0	0	0	41	21	0	0	62	**375**
08:00 AM	5	0	146	0	151	0	90	6	0	96	0	0	0	0	0	42	**35**	0	0	**77**	324
Total Volume	26	0	568	0	594	0	452	42	0	494	0	0	0	0	0	179	88	0	0	267	1355
% App. Total	4.4	0	95.6	0		0	91.5	8.5	0		0	0	0	0		67	33	0	0		
PHF	.650	.000	.893	.000	.879	.000	.863	.700	.000	.846	.000	.000	.000	.000	.000	.877	.629	.000	.000	.867	.903
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	3	0	62	0	65	0	55	11	0	66	0	0	0	0	0	157	**99**				
05:15 PM	4	0	63	0	67	0	**77**	5	0	**82**	0	0	0	0	0	143	94	0	0	237	386
05:30 PM	**14**	0	**75**	0	**89**	0	61	9	0	70	0	0	0	0	0	**161**	96	**1**	0	**258**	**417**
05:45 PM	10	0	65	0	75	0	60	**14**	0	74	0	0	0	0	0	135	85	0	0	220	369
Total Volume	31	0	265	0	296	0	253	39	0	292	0	0	0	0	0	596	374	1	0	971	1559
% App. Total	10.5	0	89.5	0		0	86.6	13.4	0		0	0	0	0		61.4	38.5	0.1	0		
PHF	.554	.000	.883	.000	.831	.000	.821	.696	.000	.890	.000	.000	.000	.000	.000	.925	.944	.250	.000	.941	.935

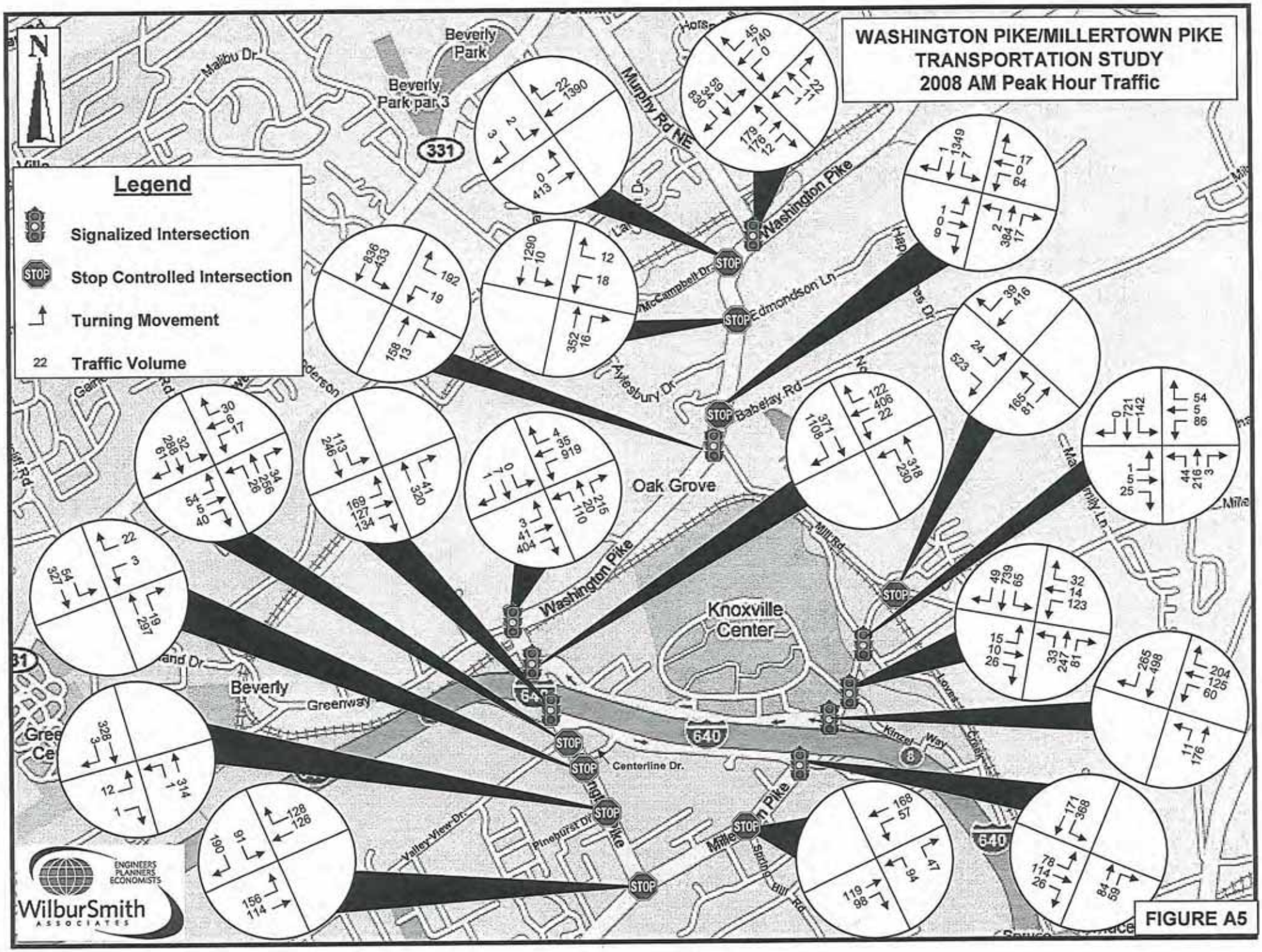

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2008 AM Peak Hour Traffic
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
N
Beverly Park
Beverly Park par 3
Malibu Dr
Murphy Rd NE
Washington Pike
McCampbell Dr
Edmondson Ln
Aylesbury Dr
Babelay Rd
Oak Grove
Knoxville Center
Mill Rd
Kinzel Way
Centerline Dr.
Greenway
Beverly
Valley View Dr
Pinehurst Dr
Millertown Pike
Spring Hill Rd
331
640
8
STOP
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

FIGURE A5

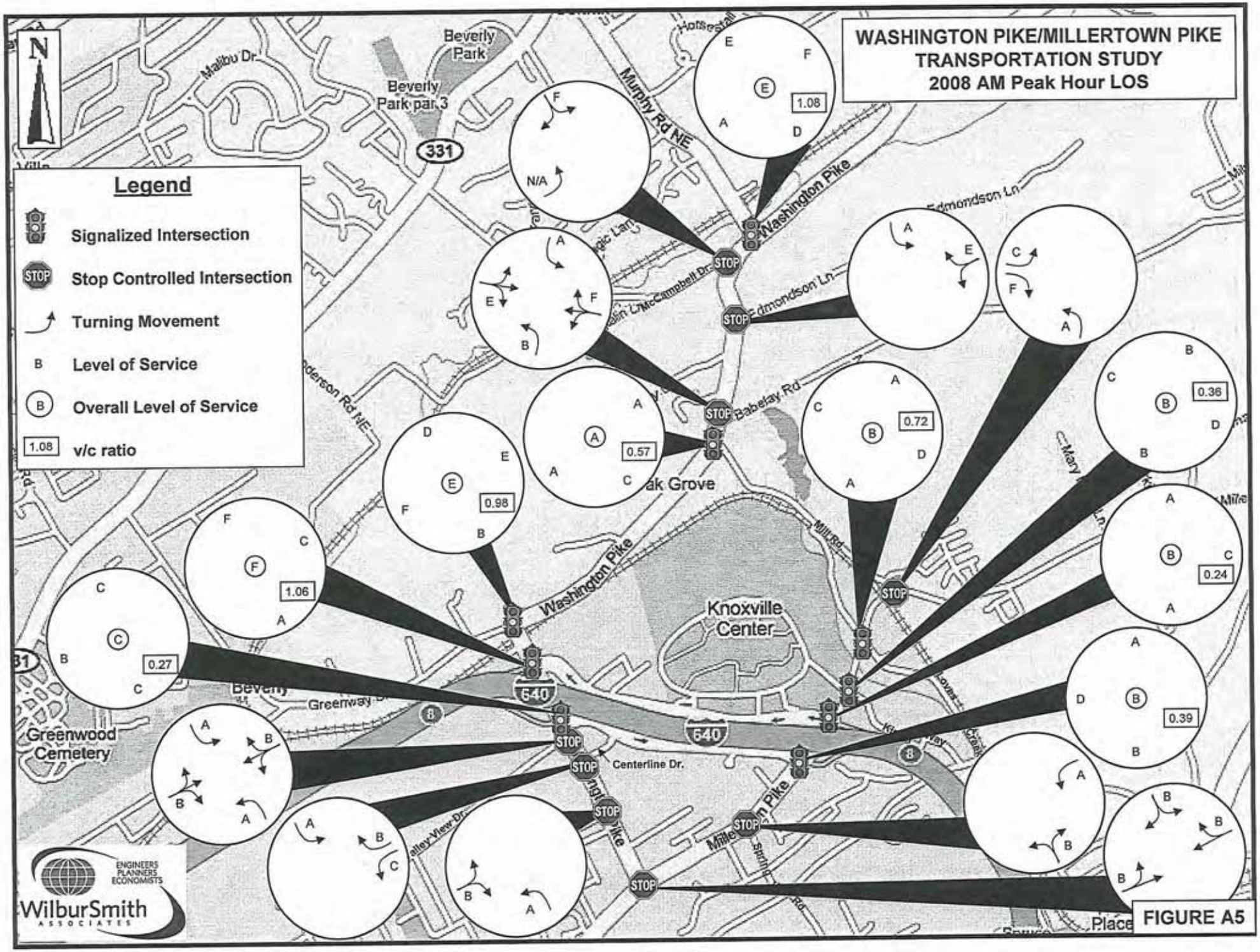

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2008 AM Peak Hour LOS
N
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
Level of Service
Overall Level of Service
v/c ratio
Beverly Park
Beverly Park par 3
Malibu Dr
Murphy Rd NE
Washington Pike
Edmondson Ln
Babelay Rd
Mill Rd
Knoxville Center
Greenway
Greenwood Cemetery
Centerline Dr.
Millertown Pike
331
640
8
STOP
1.08
N/A
0.57
0.72
0.36
0.98
1.06
0.24
0.27
0.39
ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

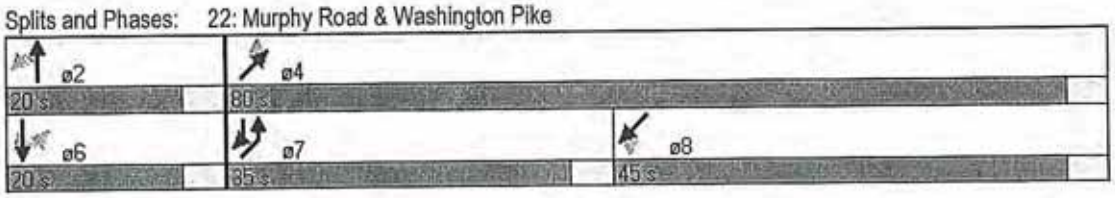
FIGURE A5

Lane Group	NBL	NBT	SBL	SBT	SBR	NEL	NET	SWT
Lane Configurations								
Volume (vph)	1	11	59	34	830	179	176	740
Turn Type	Perm		Perm		pm+ov	pm+pt		
Protected Phases		2		6	7	7	4	8
Permitted Phases	2		6		6	4		
Detector Phase	2	2	6	6	7	7	4	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	35.0	35.0	80.0	45.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	35.0%	35.0%	80.0%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lead		Lag
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 22: Murphy Road & Washington Pike



Lane Group	NBT	SBT	SBR	NEL	NET	SWT
Lane Group Flow (vph)	57	101	902	213	224	872
v/c Ratio	0.25	0.57	1.05	0.30	0.15	1.12
Control Delay	21.2	53.9	66.9	10.9	2.2	100.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	53.9	66.9	10.9	2.2	100.0
Queue Length 50th (ft)	12	62	~602	39	22	~645
Queue Length 95th (ft)	23	111	#842	94	36	#883
Internal Link Dist (ft)	209	5075			203	483
Turn Bay Length (ft)						
Base Capacity (vph)	301	240	862	717	1502	778
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.42	1.05	0.30	0.15	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	1	11	22	59	34	830	179	176	12	0	740	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	3.0	3.0	3.0			3.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Frt		0.91			1.00	0.85	1.00	0.99			0.99	
Flt Protected		1.00			0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1697			1806	1583	1770	1845			1848	
Flt Permitted		0.99			0.81	1.00	0.09	1.00			1.00	
Satd. Flow (perm)		1685			1504	1583	166	1845			1848	
Peak-hour factor, PHF	0.60	0.60	0.60	0.92	0.92	0.92	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	2	18	37	64	37	902	213	210	14	0	822	50
RTOR Reduction (vph)	0	33	0	0	0	41	0	2	0	0	2	0
Lane Group Flow (vph)	0	24	0	0	101	861	213	222	0	0	870	0
Turn Type	Perm			Perm		pm+ov	pm+pt			Perm		
Protected Phases		2			6	7	7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)		11.7			11.7	47.0	80.3	80.3			41.0	
Effective Green, g (s)		11.7			11.7	49.0	81.3	81.3			42.0	
Actuated g/C Ratio		0.12			0.12	0.49	0.81	0.81			0.42	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		197			176	823	717	1500			776	
v/s Ratio Prot						c0.38	0.11	0.12			c0.47	
v/s Ratio Perm		0.01			0.07	0.16	0.13					
v/c Ratio		0.12			0.57	1.05	0.30	0.15			1.12	
Uniform Delay, d1		39.6			41.8	25.5	13.6	2.0			29.0	
Progression Factor		1.00			1.00	1.00	1.13	0.91			1.00	
Incremental Delay, d2		1.3			12.9	44.0	0.2	0.0			70.8	
Delay (s)		40.8			54.7	69.5	15.6	1.9			99.8	
Level of Service		D			D	E	B	A			F	
Approach Delay (s)		40.8			68.0			8.6			99.8	
Approach LOS		D			E			A			F	

Intersection Summary			
HCM Average Control Delay	68.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	106.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	0	413	1390	22	2	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	459	1544	24	2	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			283			
pX, platoon unblocked	0.59				0.59	0.59
vC, conflicting volume	1569				2016	1557
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1617				2378	1597
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				90	96
cM capacity (veh/h)	236				22	77

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	0	459	1569	6
Volume Left	0	0	0	2
Volume Right	0	0	24	3
cSH	1700	1700	1700	39
Volume to Capacity	0.00	0.27	0.92	0.14
Queue Length 95th (ft)	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	112.6
Lane LOS				F
Approach Delay (s)	0.0		0.0	112.6
Approach LOS				F

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	18	12	352	16	10	1290
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	13	391	18	11	1433
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1856	400			409	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1856	400			409	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	98			99	
cM capacity (veh/h)	80	650			1150	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	33	409	1444
Volume Left	20	0	11
Volume Right	13	18	0
cSH	124	1700	1150
Volume to Capacity	0.27	0.24	0.01
Queue Length 95th (ft)	25	0	1
Control Delay (s)	44.6	0.0	0.6
Lane LOS	E		A
Approach Delay (s)	44.6	0.0	0.6
Approach LOS	E		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	9	64	0	17	2	384	17	7	1349	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	10	71	0	19	2	427	19	8	1499	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								687				
pX, platoon unblocked												
vC, conflicting volume	1965	1965	1499	1965	1956	436	1500			446		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1965	1965	1499	1965	1956	436	1500			446		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	93	0	100	97	100			99		
cM capacity (veh/h)	45	62	150	44	63	620	447			1115		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	11	90	2	446	8	1500
Volume Left	1	71	2	0	8	0
Volume Right	10	19	0	19	0	1
cSH	122	54	447	1700	1115	1700
Volume to Capacity	0.09	1.66	0.00	0.26	0.01	0.88
Queue Length 95th (ft)	7	211	0	0	1	0
Control Delay (s)	37.5	486.5	13.1	0.0	8.3	0.0
Lane LOS	E	F	B		A	
Approach Delay (s)	37.5	486.5	0.1		0.0	
Approach LOS	E	F				

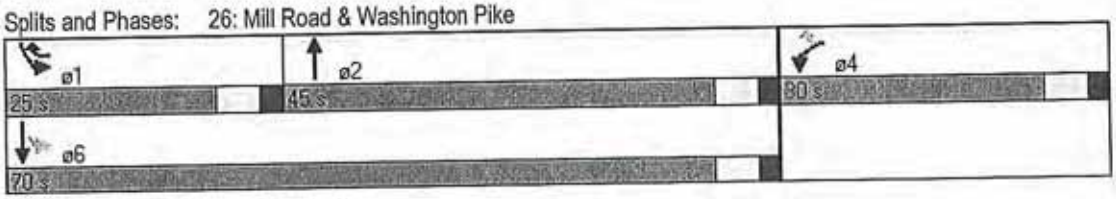
Intersection Summary			
Average Delay	21.5		
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	19	192	158	433	836
Turn Type		pm+ov		pm+pt	
Protected Phases	4	1	2	1	6
Permitted Phases		4		6	
Detector Phase	4	1	2	1	6
Switch Phase					
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	30.0	25.0	45.0	25.0	70.0
Total Split (s)	30.0	25.0	45.0	25.0	70.0
Total Split (%)	30.0%	25.0%	45.0%	25.0%	70.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	None	C-Min

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 25 (25%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 26: Mill Road & Washington Pike



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	23	229	206	481	929
v/c Ratio	0.17	0.45	0.16	0.45	0.54
Control Delay	45.1	6.2	7.8	2.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	6.2	7.8	2.2	3.1
Queue Length 50th (ft)	14	0	34	0	0
Queue Length 95th (ft)	36	39	90	m74	m209
Internal Link Dist (ft)	913		316		607
Turn Bay Length (ft)					
Base Capacity (vph)	443	577	1276	1108	1720
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.05	0.40	0.16	0.43	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	19	192	158	13	433	836
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1843		1770	1863
Flt Permitted	0.95	1.00	1.00		0.58	1.00
Satd. Flow (perm)	1770	1583	1843		1088	1863
Peak-hour factor, PHF	0.84	0.84	0.83	0.83	0.90	0.90
Adj. Flow (vph)	23	229	190	16	481	929
RTOR Reduction (vph)	0	184	2	0	0	0
Lane Group Flow (vph)	23	45	204	0	481	929
Turn Type		pm+ov			pm+pt	
Protected Phases	4	1	2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	3.3	17.6	64.4		84.7	84.7
Effective Green, g (s)	4.3	19.6	65.4		85.7	85.7
Actuated g/C Ratio	0.04	0.20	0.65		0.86	0.86
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	76	389	1205		1037	1597
v/s Ratio Prot	c0.01	0.02	0.11		0.07	c0.50
v/s Ratio Perm		0.01			0.33	
v/c Ratio	0.30	0.12	0.17		0.46	0.58
Uniform Delay, d1	46.4	33.1	6.7		1.6	2.0
Progression Factor	1.00	1.00	1.00		1.24	1.29
Incremental Delay, d2	2.2	0.1	0.3		0.1	0.4
Delay (s)	48.6	33.2	7.0		2.1	3.1
Level of Service	D	C	A		A	A
Approach Delay (s)	34.6		7.0			2.7
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	7.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

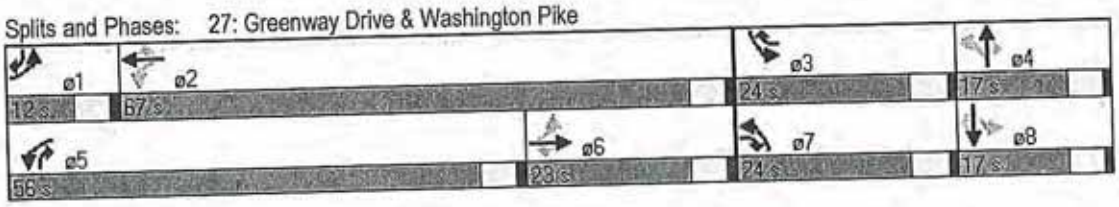
Timings
27: Greenway Drive & Washington Pike

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations											
Volume (vph)	3	41	404	919	35	4	110	20	215	7	1
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov		pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	8	1
Permitted Phases	6		6	2		2	4		4		8
Detector Phase	1	6	7	5	2	3	7	4	5	8	1
Switch Phase											
Minimum Initial (s)	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0
Minimum Split (s)	12.0	21.0	15.0	45.0	21.0	15.0	15.0	15.0	45.0	21.0	12.0
Total Split (s)	12.0	23.0	24.0	56.0	67.0	24.0	24.0	17.0	56.0	17.0	12.0
Total Split (%)	10.0%	19.2%	20.0%	46.7%	55.8%	20.0%	20.0%	14.2%	46.7%	14.2%	10.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?											
Recall Mode	None	C-Min	None	None	C-Min	None	None	None	None	None	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow, Master Intersection
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 27: Greenway Drive & Washington Pike



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	4	56	553	1081	41	5	128	23	250	12	2
v/c Ratio	0.02	0.33	0.98	1.02	0.03	0.00	0.27	0.05	0.19	0.05	0.01
Control Delay	21.0	55.4	70.8	52.4	9.8	4.8	33.8	33.3	2.8	52.7	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	55.4	70.8	52.4	9.8	4.8	33.8	33.3	2.8	52.7	30.0
Queue Length 50th (ft)	2	41	419	636	9	0	81	14	23	4	0
Queue Length 95th (ft)	5	65	425	#995	30	5	117	35	74	9	4
Internal Link Dist (ft)		662			903			649		594	
Turn Bay Length (ft)	100		250	350		300	250				100
Base Capacity (vph)	257	311	567	1065	1199	1323	478	504	1331	413	181
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.18	0.98	1.02	0.03	0.00	0.27	0.05	0.19	0.03	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	41	404	919	35	4	110	20	215	0	7	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583		3539	1583
Flt Permitted	0.73	1.00	1.00	0.46	1.00	1.00	0.49	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1360	1863	1583	855	1863	1583	909	1863	1583		3539	1583
Peak-hour factor, PHF	0.73	0.73	0.73	0.85	0.85	0.85	0.86	0.86	0.86	0.56	0.56	0.56
Adj. Flow (vph)	4	56	553	1081	41	5	128	23	250	0	12	2
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	0	2
Lane Group Flow (vph)	4	56	553	1081	41	3	128	23	250	0	12	0
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	6.2	5.0	33.0	73.4	67.2	68.3	36.6	30.5	93.9		3.6	4.8
Effective Green, g (s)	10.2	7.0	35.0	75.4	69.2	70.3	38.6	32.5	97.9		5.6	8.8
Actuated g/C Ratio	0.08	0.06	0.29	0.63	0.58	0.59	0.32	0.27	0.82		0.05	0.07
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	127	109	514	1036	1074	980	508	505	1331		165	156
v/s Ratio Prot	0.00	0.03	c0.26	c0.57	0.02	0.00	0.06	0.01	0.10		0.00	0.00
v/s Ratio Perm	0.00		0.09	c0.09		0.00	c0.02		0.06			0.00
v/c Ratio	0.03	0.51	1.08	1.04	0.04	0.00	0.25	0.05	0.19		0.07	0.00
Uniform Delay, d1	50.4	54.8	42.5	21.8	11.0	10.3	29.8	32.3	2.4		54.7	51.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	16.2	61.6	40.0	0.1	0.0	0.3	0.0	0.1		0.2	0.0
Delay (s)	50.5	71.1	104.1	61.7	11.1	10.3	30.1	32.3	2.5		54.9	51.5
Level of Service	D	E	F	E	B	B	C	C	A		D	D
Approach Delay (s)		100.8			59.7			13.0			54.4	
Approach LOS		F			E			B			D	

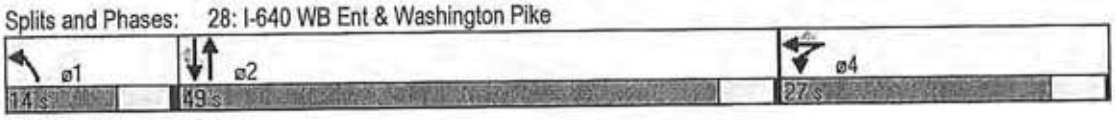
Intersection Summary			
HCM Average Control Delay	62.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	406	122	230	318	371	1108
Turn Type		Perm	pm+pt			Perm
Protected Phases	4		1	2	2	
Permitted Phases		4	2			2
Detector Phase	4	4	1	2	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	8.0	9.0	9.0	9.0
Total Split (s)	27.0	27.0	14.0	49.0	49.0	49.0
Total Split (%)	30.0%	30.0%	15.6%	54.4%	54.4%	54.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 65 (72%), Referenced to phase 2:NBSB and 6:, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated

Splits and Phases: 28: I-640 WB Ent & Washington Pike



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	481	137	240	332	442	1319
v/c Ratio	0.62	0.30	0.34	0.17	0.22	1.34
Control Delay	35.0	6.8	5.7	2.7	11.1	182.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	6.8	5.7	2.7	11.1	182.2
Queue Length 50th (ft)	129	0	19	7	64	~948
Queue Length 95th (ft)	168	42	67	11	91	#1103
Internal Link Dist (ft)	172			918	649	
Turn Bay Length (ft)			75			100
Base Capacity (vph)	941	523	712	1976	1976	981
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.26	0.34	0.17	0.22	1.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	22	406	122	230	318	0	0	371	1108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3530	1583	1770	3539			3539	1583
Flt Permitted					1.00	1.00	0.47	1.00			1.00	1.00
Satd. Flow (perm)					3530	1583	870	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.90	0.90	0.90	0.84	0.84	0.84
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	94%	94%	94%	100%	100%	100%
Adj. Flow (vph)	0	0	0	25	456	137	240	332	0	0	442	1319
RTOR Reduction (vph)	0	0	0	0	0	107	0	0	0	0	0	97
Lane Group Flow (vph)	0	0	0	0	481	30	240	332	0	0	442	1222
Turn Type				Split		Perm	pm+pt					Perm
Protected Phases				4	4		1	2			2	
Permitted Phases						4	2					2
Actuated Green, G (s)					17.8	17.8	57.2	48.2			48.2	48.2
Effective Green, g (s)					19.8	19.8	61.2	50.2			50.2	50.2
Actuated g/C Ratio					0.22	0.22	0.68	0.56			0.56	0.56
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					777	348	702	1974			1974	883
v/s Ratio Prot					c0.14		c0.04	0.09			0.12	
v/s Ratio Perm						0.02	0.19					c0.77
v/c Ratio					0.62	0.09	0.34	0.17			0.22	1.38
Uniform Delay, d1					31.7	27.9	5.4	9.7			10.1	19.9
Progression Factor					1.00	1.00	0.89	0.23			1.00	1.00
Incremental Delay, d2					1.5	0.1	0.3	0.2			0.3	179.9
Delay (s)					33.2	28.0	5.1	2.5			10.3	199.8
Level of Service					C	C	A	A			B	F
Approach Delay (s)		0.0			32.0			3.6			152.2	
Approach LOS		A			C			A			F	

Intersection Summary			
HCM Average Control Delay	98.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

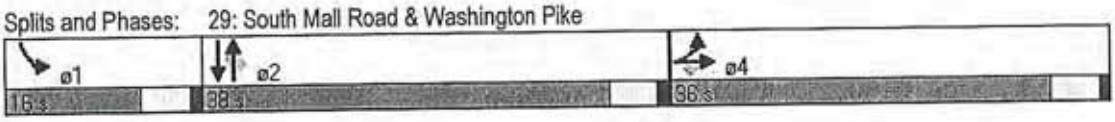
c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	169	127	134	320	41	113	246
Turn Type	Split		Perm		Perm	pm+pt	
Protected Phases	4	4		2		1	2
Permitted Phases			4		2	2	
Detector Phase	4	4	4	2	2	1	2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	9.0	21.0
Total Split (s)	36.0	36.0	36.0	38.0	38.0	16.0	38.0
Total Split (%)	40.0%	40.0%	40.0%	42.2%	42.2%	17.8%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-1.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	4.0	3.0	3.0	3.0	3.0
Lead/Lag				Lag	Lag	Lead	Lag
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	Min	Min	None	Min

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 65 (72%), Referenced to phase 4:EBTL, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 29: South Mall Road & Washington Pike



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	105	217	146	451	58	147	319
v/c Ratio	0.12	0.12	0.16	0.57	0.14	0.40	0.40
Control Delay	12.2	11.5	3.0	33.3	7.9	21.6	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	11.5	3.0	33.3	7.9	21.6	33.9
Queue Length 50th (ft)	30	31	0	121	0	68	97
Queue Length 95th (ft)	70	59	32	115	16	100	121
Internal Link Dist (ft)		260		170			918
Turn Bay Length (ft)	300		300		200	250	
Base Capacity (vph)	874	1808	911	1376	651	383	1376
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.12	0.16	0.33	0.09	0.38	0.23

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	127	134	0	0	0	0	320	41	113	246	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	0.91	0.91	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1610	3330	1583					3539	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.31	1.00	
Satd. Flow (perm)	1610	3330	1583					3539	1583	571	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.71	0.71	0.71	0.77	0.77	0.77
Adj. Flow (vph)	184	138	146	0	0	0	0	451	58	147	319	0
RTOR Reduction (vph)	0	0	68	0	0	0	0	0	45	0	0	0
Lane Group Flow (vph)	105	217	78	0	0	0	0	451	13	147	319	0
Turn Type	Split		Perm						Perm	pm+pt		
Protected Phases	4	4						2		1	2	
Permitted Phases			4						2	2		
Actuated Green, G (s)	46.9	46.9	46.9					18.2	18.2	28.1	18.2	
Effective Green, g (s)	48.9	48.9	47.9					20.2	20.2	32.1	20.2	
Actuated g/C Ratio	0.54	0.54	0.53					0.22	0.22	0.36	0.22	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	875	1809	843					794	355	362	794	
v/s Ratio Prot	c0.07	0.07						c0.13		c0.05	0.09	
v/s Ratio Perm			0.05						0.01	0.09		
v/c Ratio	0.12	0.12	0.09					0.57	0.04	0.41	0.40	
Uniform Delay, d1	10.0	10.0	10.4					31.0	27.3	20.7	29.7	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.07	1.12	
Incremental Delay, d2	0.3	0.1	0.2					0.9	0.0	0.7	0.3	
Delay (s)	10.3	10.2	10.6					32.0	27.3	23.0	33.7	
Level of Service	B	B	B					C	C	C	C	
Approach Delay (s)		10.3			0.0			31.4			30.3	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	5	40	17	6	30	26	256	34	32	288	61
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	60	6	44	19	7	33	29	284	38	36	320	68
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											250	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	662	805	194	639	820	161	388			322		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	502	655	2	478	671	161	209			322		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	98	96	95	98	96	98			97		
cM capacity (veh/h)	385	341	1012	400	334	855	1272			1234		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	110	59	171	180	196	228
Volume Left	60	19	29	0	36	0
Volume Right	44	33	0	38	0	68
cSH	509	555	1272	1700	1234	1700
Volume to Capacity	0.22	0.11	0.02	0.11	0.03	0.13
Queue Length 95th (ft)	20	9	2	0	2	0
Control Delay (s)	14.0	12.3	1.5	0.0	1.7	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	14.0	12.3	0.7		0.8	
Approach LOS	B	B				

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	297	19	54	327	3	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	330	21	60	363	3	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				578		
pX, platoon unblocked					0.93	
vC, conflicting volume			351		824	341
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			351		774	341
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		99	97
cM capacity (veh/h)			1208		325	702

Direction, Lane #	NB 1	SB 1	SB 2	SW 1	SW 2
Volume Total	351	60	363	3	24
Volume Left	0	60	0	3	0
Volume Right	21	0	0	0	24
cSH	1700	1208	1700	325	702
Volume to Capacity	0.21	0.05	0.21	0.01	0.03
Queue Length 95th (ft)	0	4	0	1	3
Control Delay (s)	0.0	8.1	0.0	16.2	10.3
Lane LOS		A		C	B
Approach Delay (s)	0.0	1.2		11.0	
Approach LOS				B	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	12	1	1	314	328	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	1	1	349	364	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	717	366	368			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	717	366	368			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	396	679	1191			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	14	350	368
Volume Left	13	1	0
Volume Right	1	0	3
cSH	409	1191	1700
Volume to Capacity	0.04	0.00	0.22
Queue Length 95th (ft)	3	0	0
Control Delay (s)	14.1	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	14.1	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	156	114	126	128	91	190
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	173	127	140	142	101	211

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	300	282	312
Volume Left (vph)	173	0	101
Volume Right (vph)	0	142	211
Hadj (s)	0.15	-0.27	-0.31
Departure Headway (s)	5.3	4.9	5.1
Degree Utilization, x	0.44	0.39	0.44
Capacity (veh/h)	644	688	659
Control Delay (s)	12.4	11.0	12.0
Approach Delay (s)	12.4	11.0	12.0
Approach LOS	B	B	B

Intersection Summary			
Delay	11.8		
HCM Level of Service	B		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	119	98	57	168	94	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	132	109	63	187	104	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			241		500	187
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			241		500	187
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		79	94
cM capacity (veh/h)			1325		505	855

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	241	250	157
Volume Left	0	63	104
Volume Right	109	0	52
cSH	1700	1325	585
Volume to Capacity	0.14	0.05	0.27
Queue Length 95th (ft)	0	4	27
Control Delay (s)	0.0	2.3	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	2.3	13.4
Approach LOS			B

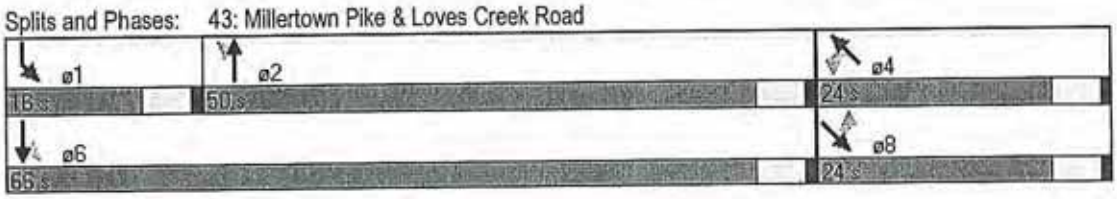
Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	NBL	NBT	SBL	SBT	SEL	SET	NWL	NWT
Lane Configurations								
Volume (vph)	44	216	142	721	1	5	86	5
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	9.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	50.0	50.0	16.0	66.0	24.0	24.0	24.0	24.0
Total Split (%)	55.6%	55.6%	17.8%	73.3%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	C-Min	None	None	Min	Min

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 43: Millertown Pike & Loves Creek Road



Lane Group	NBT	SBL	SBT	SET	NWT
Lane Group Flow (vph)	313	206	1045	37	185
v/c Ratio	0.36	0.25	0.75	0.11	0.63
Control Delay	6.7	4.5	11.8	13.4	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	4.5	11.8	13.4	37.0
Queue Length 50th (ft)	29	28	283	3	81
Queue Length 95th (ft)	63	41	285	24	117
Internal Link Dist (ft)	835		552	525	539
Turn Bay Length (ft)					
Base Capacity (vph)	859	850	1397	408	367
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.24	0.75	0.09	0.50

Intersection Summary

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	44	216	3	142	721	0	1	5	25	86	5	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0			3.0			3.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		1.00		1.00	1.00			0.89			0.95	
Flt Protected		0.99		0.95	1.00			1.00			0.97	
Satd. Flow (prot)		1844		1770	1863			1657			1718	
Flt Permitted		0.77		0.53	1.00			0.99			0.83	
Satd. Flow (perm)		1433		982	1863			1648			1472	
Peak-hour factor, PHF	0.84	0.84	0.84	0.69	0.69	0.69	0.84	0.84	0.84	0.78	0.78	0.78
Adj. Flow (vph)	52	257	4	206	1045	0	1	6	30	110	6	69
RTOR Reduction (vph)	0	0	0	0	0	0	0	25	0	0	25	0
Lane Group Flow (vph)	0	313	0	206	1045	0	0	13	0	0	160	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		51.9		65.5	65.5			14.5			14.5	
Effective Green, g (s)		53.9		67.5	67.5			16.5			16.5	
Actuated g/C Ratio		0.60		0.75	0.75			0.18			0.18	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		858		829	1397			302			270	
v/s Ratio Prot				0.03	c0.56							
v/s Ratio Perm		0.22		0.16				0.01			c0.11	
v/c Ratio		0.36		0.25	0.75			0.04			0.59	
Uniform Delay, d1		9.3		3.7	6.4			30.2			33.7	
Progression Factor		0.50		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.2		0.2	3.7			0.1			3.4	
Delay (s)		5.8		3.9	10.1			30.3			37.1	
Level of Service		A		A	B			C			D	
Approach Delay (s)		5.8			9.1			30.3			37.1	
Approach LOS		A			A			C			D	

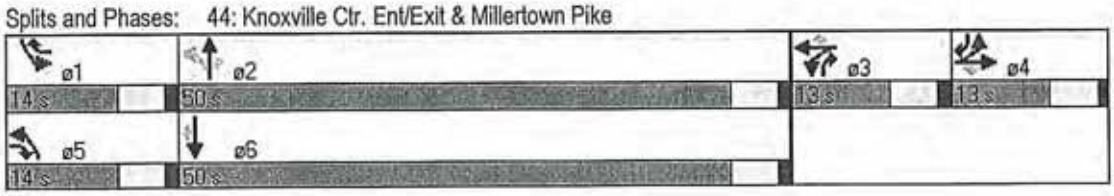
Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	10	26	123	14	32	33	247	81	65	739	49
Turn Type		pm+ov	Split		pm+ov	pm+pt		pm+ov	Prot		pm+ov
Protected Phases	4	5	3	3	1	5	2	3	1	6	4
Permitted Phases		4			3	2		2			6
Detector Phase	4	5	3	3	1	5	2	3	1	6	4
Switch Phase											
Minimum Initial (s)	4.0	4.0	3.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	8.0	8.0	9.0	9.0	8.0	8.0	9.0	9.0	9.0
Total Split (s)	13.0	14.0	13.0	13.0	14.0	14.0	50.0	13.0	14.0	50.0	13.0
Total Split (%)	14.4%	15.6%	14.4%	14.4%	15.6%	15.6%	55.6%	14.4%	15.6%	55.6%	14.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 82 (91%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 44: Knoxville Ctr. Ent/Exit & Millertown Pike



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	37	82	81	38	45	334	109	73	830	55
v/c Ratio	0.19	0.11	0.46	0.45	0.10	0.09	0.30	0.09	0.21	0.38	0.05
Control Delay	39.5	9.8	46.4	45.9	6.7	6.4	15.1	4.2	36.7	10.2	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	9.8	46.4	45.9	6.7	6.4	15.1	4.2	36.7	10.2	0.9
Queue Length 50th (ft)	19	0	46	46	0	7	121	0	21	102	0
Queue Length 95th (ft)	36	14	87	87	16	m22	175	13	m29	167	m3
Internal Link Dist (ft)	752			313			473			835	
Turn Bay Length (ft)			300		300			200	200		200
Base Capacity (vph)	201	395	187	189	402	528	1126	1212	420	2179	1131
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.09	0.44	0.43	0.09	0.09	0.30	0.09	0.17	0.38	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	10	26	123	14	32	33	247	81	65	739	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1808	1583	1681	1702	1583	1770	1863	1583	3433	3539	1583
Flt Permitted		0.97	1.00	0.95	0.96	1.00	0.29	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1808	1583	1681	1702	1583	538	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.70	0.70	0.70	0.84	0.84	0.84	0.74	0.74	0.74	0.89	0.89	0.89
Adj. Flow (vph)	21	14	37	146	17	38	45	334	109	73	830	55
RTOR Reduction (vph)	0	0	31	0	0	30	0	0	34	0	0	18
Lane Group Flow (vph)	0	35	6	82	81	8	45	334	75	73	830	37
Turn Type	Split		pm+ov	Split		pm+ov	pm+pt		pm+ov	Prot		pm+ov
Protected Phases	4	4	5	3	3	1	5	2	3	1	6	4
Permitted Phases			4			3	2		2			6
Actuated Green, G (s)		5.9	11.1	7.6	7.6	13.8	55.5	50.3	57.9	6.2	51.3	57.2
Effective Green, g (s)		7.9	15.1	9.6	9.6	17.8	59.5	52.3	61.9	8.2	53.3	61.2
Actuated g/C Ratio		0.09	0.17	0.11	0.11	0.20	0.66	0.58	0.69	0.09	0.59	0.68
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		159	318	179	182	313	454	1083	1142	313	2096	1076
v/s Ratio Prot		c0.02	0.00	c0.05	0.05	0.00	0.01	0.18	0.01	c0.02	c0.23	0.00
v/s Ratio Perm			0.00			0.00	0.06		0.04			0.02
v/c Ratio		0.22	0.02	0.46	0.45	0.02	0.10	0.31	0.07	0.23	0.40	0.03
Uniform Delay, d1		38.2	31.3	37.8	37.7	29.1	5.7	9.6	4.6	38.0	9.8	4.7
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.23	1.33	3.55	0.98	0.94	1.03
Incremental Delay, d2		0.7	0.0	1.9	1.7	0.0	0.1	0.7	0.0	0.3	0.4	0.0
Delay (s)		38.9	31.3	39.6	39.4	29.1	7.1	13.5	16.3	37.4	9.6	4.9
Level of Service		D	C	D	D	C	A	B	B	D	A	A
Approach Delay (s)		35.0			37.6			13.5			11.5	
Approach LOS		C			D			B			B	

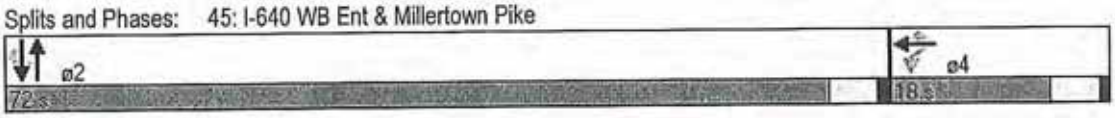
Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	125	204	11	176	498	265
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	2	
Permitted Phases		4	2		2	2
Detector Phase	4	4	2	2	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	21.0	21.0	21.0	21.0
Total Split (s)	18.0	18.0	72.0	72.0	72.0	72.0
Total Split (%)	20.0%	20.0%	80.0%	80.0%	80.0%	80.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 19 (21%), Referenced to phase 2:NBSB, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 45: I-640 WB Ent & Millertown Pike



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	234	258	16	259	553	294
v/c Ratio	0.45	0.56	0.02	0.09	0.20	0.23
Control Delay	37.2	9.6	4.2	3.2	3.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	9.6	4.2	3.2	3.5	1.2
Queue Length 50th (ft)	64	0	1	8	40	9
Queue Length 95th (ft)	83	38	10	37	61	21
Internal Link Dist (ft)	601			683	473	
Turn Bay Length (ft)		600	300			
Base Capacity (vph)	599	486	647	2791	2791	1311
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.53	0.02	0.09	0.20	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	125	204	11	176	0	0	498	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3483	1583	1770	3539			3539	1583
Flt Permitted					0.98	1.00	0.44	1.00			1.00	1.00
Satd. Flow (perm)					3483	1583	820	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.79	0.79	0.79	0.68	0.68	0.68	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	76	158	258	16	259	0	0	553	294
RTOR Reduction (vph)	0	0	0	0	0	219	0	0	0	0	0	64
Lane Group Flow (vph)	0	0	0	0	234	39	16	259	0	0	553	230
Turn Type				Perm		Perm	Perm					Perm
Protected Phases					4			2			2	
Permitted Phases				4		4	2				2	2
Actuated Green, G (s)					11.5	11.5	68.5	68.5			68.5	68.5
Effective Green, g (s)					13.5	13.5	70.5	70.5			70.5	70.5
Actuated g/C Ratio					0.15	0.15	0.78	0.78			0.78	0.78
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					522	237	642	2772			2772	1240
v/s Ratio Prot								0.07			c0.16	
v/s Ratio Perm					0.07	0.02	0.02					0.15
v/c Ratio					0.45	0.16	0.02	0.09			0.20	0.19
Uniform Delay, d1					34.9	33.3	2.2	2.3			2.5	2.5
Progression Factor					1.00	1.00	1.51	1.24			1.22	1.97
Incremental Delay, d2					0.6	0.3	0.1	0.1			0.2	0.3
Delay (s)					35.5	33.7	3.3	2.9			3.2	5.2
Level of Service					D	C	A	A			A	A
Approach Delay (s)		0.0			34.5			2.9			3.9	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NET	NER	SWL	SWT
Lane Configurations							
Volume (vph)	78	114	26	84	59	368	171
Turn Type	Perm		Perm		Perm	pm+pt	
Protected Phases		4		2		1	2
Permitted Phases	4		4		2	2	
Detector Phase	4	4	4	2	2	1	2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	9.0	21.0
Total Split (s)	24.0	24.0	24.0	50.0	50.0	16.0	50.0
Total Split (%)	26.7%	26.7%	26.7%	55.6%	55.6%	17.8%	55.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag				Lag	Lag	Lead	Lag
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 20 (22%), Referenced to phase 2:NESW, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 46: South Mall Road & Millertown Pike

ø1	ø2	ø4
16 s	50 s	24 s

Lane Group	EBL	EBT	EBR	NET	NER	SWL	SWT
Lane Group Flow (vph)	95	139	32	105	74	409	190
v/c Ratio	0.35	0.48	0.12	0.06	0.10	0.38	0.12
Control Delay	36.4	39.6	12.0	17.3	6.0	4.9	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	39.6	12.0	17.3	6.0	4.9	19.5
Queue Length 50th (ft)	49	73	0	16	0	31	40
Queue Length 95th (ft)	81	111	20	37	23	71	66
Internal Link Dist (ft)		347		1273			683
Turn Bay Length (ft)			300		300	300	
Base Capacity (vph)	413	435	394	1937	900	1089	1937
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.32	0.08	0.05	0.08	0.38	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	78	114	26	0	0	0	0	84	59	368	171	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.69	1.00	
Satd. Flow (perm)	1770	1863	1583					3539	1583	1277	3539	
Peak-hour factor, PHF	0.82	0.82	0.82	0.90	0.90	0.90	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	95	139	32	0	0	0	0	105	74	409	190	0
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	40	0	0	0
Lane Group Flow (vph)	95	139	5	0	0	0	0	105	34	409	190	0
Turn Type	Perm		Perm						Perm	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4						2	2		
Actuated Green, G (s)	12.0	12.0	12.0					39.9	39.9	63.0	39.9	
Effective Green, g (s)	14.0	14.0	14.0					41.9	41.9	67.0	41.9	
Actuated g/C Ratio	0.16	0.16	0.16					0.47	0.47	0.74	0.47	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	275	290	246					1648	737	1088	1648	
v/s Ratio Prot		c0.07						0.03		c0.10	0.05	
v/s Ratio Perm	0.05		0.00						0.02	c0.17		
v/c Ratio	0.35	0.48	0.02					0.06	0.05	0.38	0.12	
Uniform Delay, d1	33.9	34.7	32.2					13.2	13.1	3.8	13.6	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.14	1.15	
Incremental Delay, d2	0.8	1.3	0.0					0.1	0.1	0.2	0.1	
Delay (s)	34.7	35.9	32.2					13.3	13.3	4.6	15.7	
Level of Service	C	D	C					B	B	A	B	
Approach Delay (s)		35.0			0.0			13.3			8.1	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	165	81	416	39	24	523
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	183	90	462	43	27	581
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		924				
pX, platoon unblocked						
vC, conflicting volume	506				941	484
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	506				941	484
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				89	0
cM capacity (veh/h)	1059				242	583

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	183	90	506	27	581
Volume Left	183	0	0	27	0
Volume Right	0	0	43	0	581
cSH	1059	1700	1700	242	583
Volume to Capacity	0.17	0.05	0.30	0.11	1.00
Queue Length 95th (ft)	16	0	0	9	366
Control Delay (s)	9.1	0.0	0.0	21.7	63.1
Lane LOS	A			C	F
Approach Delay (s)	6.1		0.0	61.3	
Approach LOS				F	

Intersection Summary			
Average Delay	28.1		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

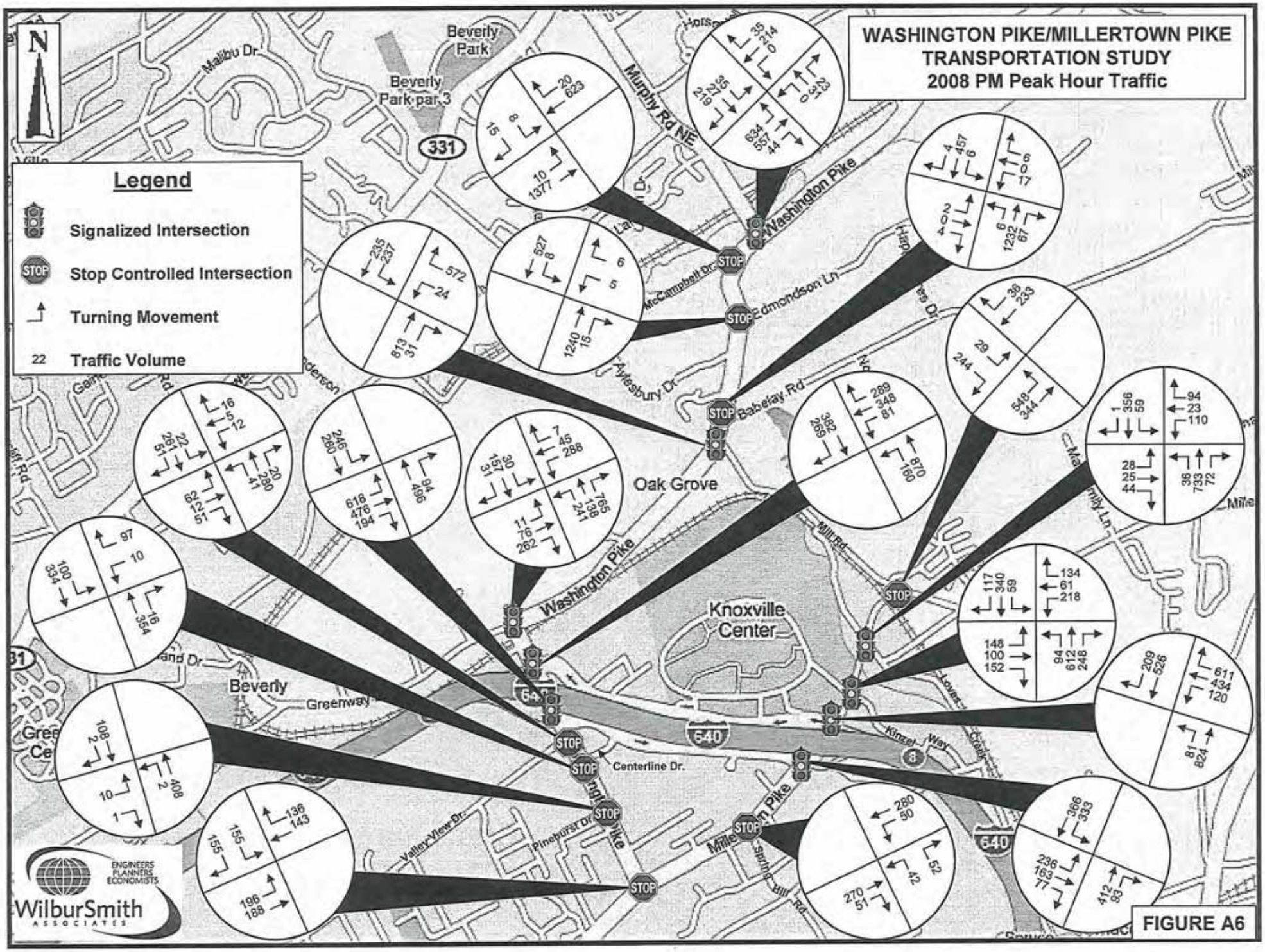

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2008 PM Peak Hour Traffic
N
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
Beverly Park
Beverly Park par 3
Malibu Dr
Murphy Rd NE
Washington Pike
McCampbell Dr
Edmondson Ln
Aylesbury Dr
Babelay Rd
Oak Grove
Knoxville Center
Mill Rd
Beverly
Greenway
Centerline Dr.
Valley View Dr.
Pinehurst Dr
Millertown Pike
Spring Hill Rd
Kinzel Way
331
640
STOP
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

FIGURE A6

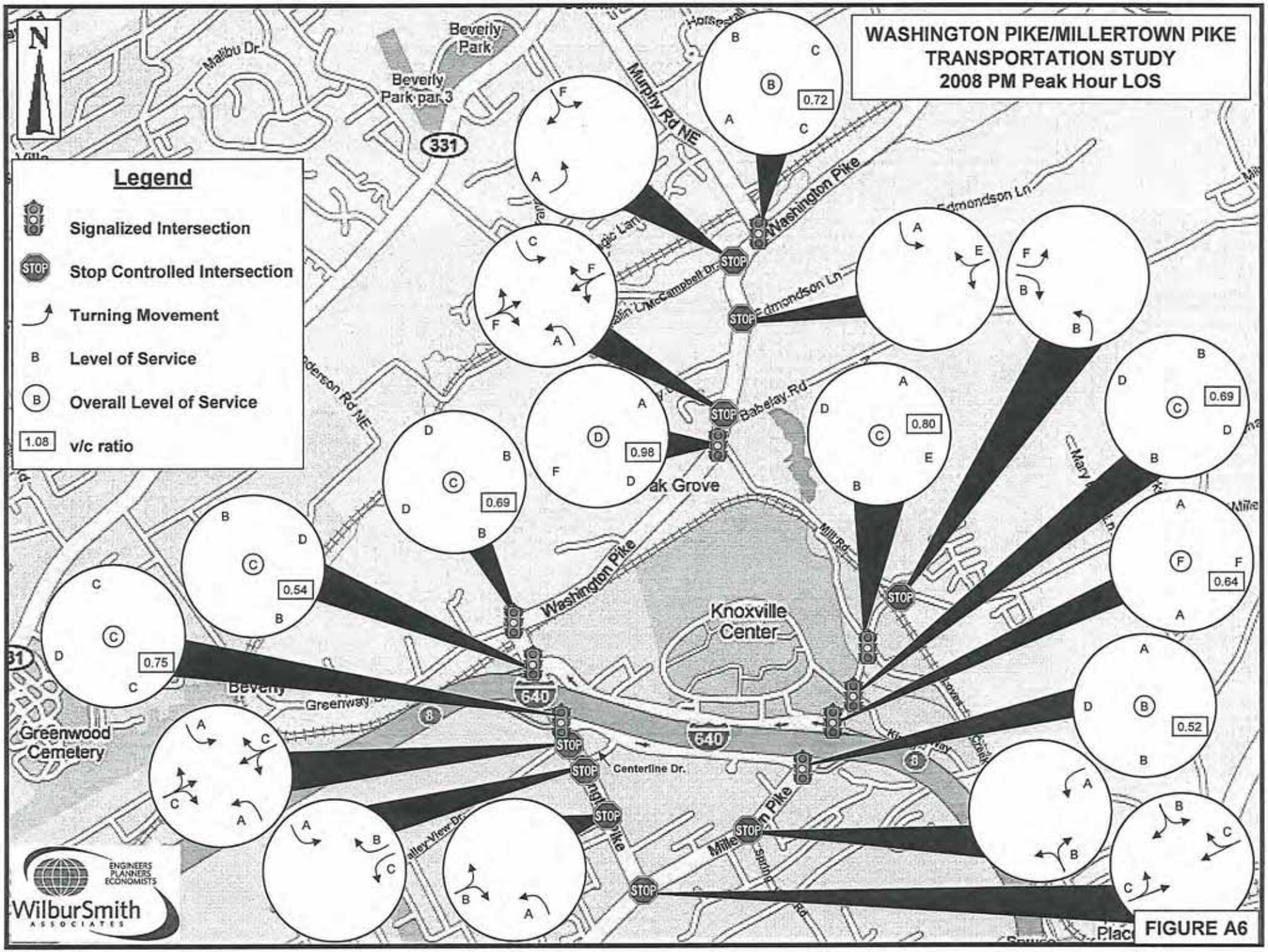

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2008 PM Peak Hour LOS
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
Level of Service
Overall Level of Service
v/c ratio
N
Beverly Park
Beverly Park par 3
Malibu Dr
Murphy Rd NE
Washington Pike
Edmondson Ln
McCampbell Dr
Babelay Rd
Mill Rd
Knoxville Center
Greenwood Cemetery
Greenway Dr
Centerline Dr.
640
331
0.72
0.98
0.80
0.69
0.69
0.54
0.75
0.64
0.52
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

FIGURE A6

Lane Group	NBT	SBL	SBT	SBR	NEL	NET	SWT
Lane Configurations							
Volume (vph)	31	35	27	219	634	557	214
Turn Type		Perm		pm+ov	pm+pt		
Protected Phases	2		6	7	7	4	8
Permitted Phases		6		6	4		
Detector Phase	2	6	6	7	7	4	8
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	25.0	25.0	45.0	20.0
Total Split (%)	30.8%	30.8%	30.8%	38.5%	38.5%	69.2%	30.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	3.0	4.0	3.0	3.0	3.0	3.0
Lead/Lag				Lead	Lead		Lag
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 22: Murphy Road & Washington Pike

ø2	ø4	
20 s	45 s	
ø6	ø7	ø8
20 s	25 s	20 s

Lane Group	NBT	SBT	SBR	NEL	NET	SWT
Lane Group Flow (vph)	90	82	288	746	707	312
v/c Ratio	0.28	0.34	0.25	0.81	0.52	0.71
Control Delay	18.0	28.4	1.2	19.0	5.6	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	28.4	1.2	19.0	5.6	31.5
Queue Length 50th (ft)	19	30	0	160	78	106
Queue Length 95th (ft)	29	53	11	#362	152	155
Internal Link Dist (ft)	209	5075			156	483
Turn Bay Length (ft)						
Base Capacity (vph)	461	365	1160	922	1347	487
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.22	0.25	0.81	0.52	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	31	23	35	27	219	634	557	44	0	214	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	3.0	3.0	3.0			3.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Frt		0.94			1.00	0.85	1.00	0.99			0.98	
Flt Protected		1.00			0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1757			1812	1583	1770	1842			1827	
Flt Permitted		1.00			0.80	1.00	0.24	1.00			1.00	
Satd. Flow (perm)		1757			1483	1583	453	1842			1827	
Peak-hour factor, PHF	0.60	0.60	0.60	0.76	0.76	0.76	0.85	0.85	0.85	0.80	0.80	0.80
Adj. Flow (vph)	0	52	38	46	36	288	746	655	52	0	268	44
RTOR Reduction (vph)	0	32	0	0	0	107	0	3	0	0	9	0
Lane Group Flow (vph)	0	58	0	0	82	181	746	704	0	0	303	0
Turn Type	Perm			Perm		pm+ov	pm+pt			Perm		
Protected Phases		2			6	7	7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)		10.6			10.6	38.8	46.4	46.4			14.2	
Effective Green, g (s)		10.6			10.6	40.8	47.4	47.4			15.2	
Actuated g/C Ratio		0.16			0.16	0.63	0.73	0.73			0.23	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		287			242	1067	922	1343			427	
v/s Ratio Prot		0.03				0.08	c0.36	0.38			0.17	
v/s Ratio Perm					c0.06	0.04	c0.23					
v/c Ratio		0.20			0.34	0.17	0.81	0.52			0.71	
Uniform Delay, d1		23.5			24.1	5.0	9.6	3.9			22.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2		1.6			3.8	0.1	5.3	0.4			5.3	
Delay (s)		25.1			27.9	5.1	14.9	4.2			28.2	
Level of Service		C			C	A	B	A			C	
Approach Delay (s)		25.1			10.2			9.7			28.2	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR	SBR2	SEL	SER	NEL2	NEL
Lane Configurations						
Volume (veh/h)	623	20	8	15	10	1377
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	692	22	9	17	11	1530
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (ft)	236					
pX, platoon unblocked			0.86	0.86	0.86	
vC, conflicting volume			2256	703	714	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2380	572	585	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			72	96	99	
cM capacity (veh/h)			32	446	850	

Direction, Lane #	SB 1	SE 1	NE 1	NE 2
Volume Total	714	26	11	1530
Volume Left	0	9	11	0
Volume Right	22	17	0	0
cSH	1700	81	850	1700
Volume to Capacity	0.42	0.31	0.01	0.90
Queue Length 95th (ft)	0	29	1	0
Control Delay (s)	0.0	68.4	9.3	0.0
Lane LOS		F	A	
Approach Delay (s)	0.0	68.4	0.1	
Approach LOS		F		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

EDMONDSON LANE

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	6	1240	15	8	527
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	7	1378	17	9	586
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1989	1386			1394	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1989	1386			1394	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			98	
cM capacity (veh/h)	66	175			490	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	1394	594
Volume Left	6	0	9
Volume Right	7	17	0
cSH	100	1700	490
Volume to Capacity	0.12	0.82	0.02
Queue Length 95th (ft)	10	0	1
Control Delay (s)	46.1	0.0	0.5
Lane LOS	E		A
Approach Delay (s)	46.1	0.0	0.5
Approach LOS	E		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	0	4	17	0	6	6	1232	67	6	457	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	0	4	19	0	7	7	1369	74	7	508	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								687				
pX, platoon unblocked	0.58	0.58		0.58	0.58	0.58				0.58		
vC, conflicting volume	1912	1980	510	1945	1945	1406	512			1443		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2214	2331	510	2270	2270	1337	512			1402		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	99	0	100	94	99			98		
cM capacity (veh/h)	17	21	563	16	23	108	1053			281		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	7	26	7	1443	7	512
Volume Left	2	19	7	0	7	0
Volume Right	4	7	0	74	0	4
cSH	47	21	1053	1700	281	1700
Volume to Capacity	0.14	1.24	0.01	0.85	0.02	0.30
Queue Length 95th (ft)	11	86	0	0	2	0
Control Delay (s)	93.6	551.6	8.4	0.0	18.1	0.0
Lane LOS	F	F	A		C	
Approach Delay (s)	93.6	551.6	0.0		0.2	
Approach LOS	F	F				

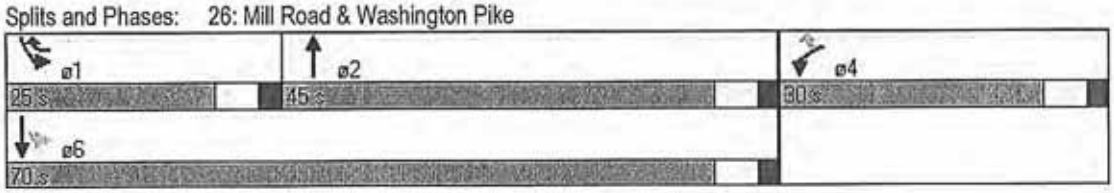
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	24	572	813	237	235
Turn Type		pm+ov		pm+pt	
Protected Phases	4	1	2	1	6
Permitted Phases		4		6	
Detector Phase	4	1	2	1	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	10.0	22.0	10.0	22.0
Total Split (s)	30.0	25.0	45.0	25.0	70.0
Total Split (%)	30.0%	25.0%	45.0%	25.0%	70.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	None	C-Min

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 25 (25%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 26: Mill Road & Washington Pike



Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	29	689	879	282	280
v/c Ratio	0.20	0.94	1.04	0.40	0.17
Control Delay	45.5	44.7	70.0	13.6	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	44.7	70.0	13.6	1.9
Queue Length 50th (ft)	18	356	~643	78	28
Queue Length 95th (ft)	41	435	#920	135	46
Internal Link Dist (ft)	913		316		607
Turn Bay Length (ft)					
Base Capacity (vph)	443	736	849	712	1650
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.94	1.04	0.40	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	24	572	813	31	237	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1854		1770	1863
Flt Permitted	0.95	1.00	1.00		0.08	1.00
Satd. Flow (perm)	1770	1583	1854		154	1863
Peak-hour factor, PHF	0.83	0.83	0.96	0.96	0.84	0.84
Adj. Flow (vph)	29	689	847	32	282	280
RTOR Reduction (vph)	0	37	1	0	0	0
Lane Group Flow (vph)	29	652	878	0	282	280
Turn Type		pm+ov			pm+pt	
Protected Phases	4	1	2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	4.9	39.7	42.3		83.1	83.1
Effective Green, g (s)	5.9	41.7	43.3		84.1	84.1
Actuated g/C Ratio	0.06	0.42	0.43		0.84	0.84
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	104	739	803		708	1567
v/s Ratio Prot	0.02	c0.32	c0.47		0.14	0.15
v/s Ratio Perm		0.10			0.19	
v/c Ratio	0.28	0.88	1.09		0.40	0.18
Uniform Delay, d1	45.0	26.9	28.4		17.2	1.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	12.0	60.3		0.4	0.2
Delay (s)	46.5	38.9	88.6		17.6	1.7
Level of Service	D	D	F		B	A
Approach Delay (s)	39.2		88.6			9.7
Approach LOS	D		F			A

Intersection Summary			
HCM Average Control Delay	51.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	76	262	288	45	7	241	138	765	30	157	31
Turn Type	pm+pt		pm+ov	pm+pt		Free	pm+pt		pm+ov	pm+pt		Free
Protected Phases	1	6	7	5	2		7	4	5	3	8	
Permitted Phases	6		6	2		Free	4		4	8		Free
Detector Phase	1	6	7	5	2		7	4	5	3	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0		21.0	21.0	21.0	21.0	21.0	
Total Split (s)	22.0	28.0	33.0	22.0	28.0	0.0	33.0	27.0	22.0	33.0	27.0	0.0
Total Split (%)	20.0%	25.5%	30.0%	20.0%	25.5%	0.0%	30.0%	24.5%	20.0%	30.0%	24.5%	0.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0	-1.0	-2.0	-2.0	-1.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	C-Min	None	None	C-Min		None	None	None	None	None	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 27: Greenway Drive & Washington Pike

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	84	288	343	54	8	268	153	850	34	176	35
v/c Ratio	0.04	0.40	0.54	0.37	0.05	0.01	0.54	0.29	0.70	0.12	0.43	0.02
Control Delay	18.5	50.2	32.0	14.1	14.4	0.0	30.4	32.4	13.1	23.4	48.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	50.2	32.0	14.1	14.4	0.0	30.4	32.4	13.1	23.4	48.0	0.0
Queue Length 50th (ft)	3	56	165	112	15	0	145	91	310	16	61	0
Queue Length 95th (ft)	14	102	211	193	45	0	187	134	584	32	93	0
Internal Link Dist (ft)		662			903			649			594	
Turn Bay Length (ft)	100		250	350		300	250			150		100
Base Capacity (vph)	457	423	639	918	1065	1583	552	527	1208	577	772	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.20	0.45	0.37	0.05	0.01	0.49	0.29	0.70	0.06	0.23	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	76	262	288	45	7	241	138	765	30	157	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.72	1.00	1.00	0.45	1.00	1.00	0.45	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	1345	1863	1583	832	1863	1583	847	1863	1583	1229	3539	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.84	0.84	0.84	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	12	84	288	343	54	8	268	153	850	34	176	35
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	12	84	288	343	54	8	268	153	850	34	176	35
Turn Type	pm+pt		pm+ov	pm+pt		Free	pm+pt		pm+ov	pm+pt		Free
Protected Phases	1	6	7	5	2		7	4	5	3	8	
Permitted Phases	6		6	2		Free	4		4	8		Free
Actuated Green, G (s)	9.7	8.4	29.4	61.2	54.9	110.0	38.8	29.1	76.9	17.5	12.8	110.0
Effective Green, g (s)	13.7	10.4	31.4	63.2	56.9	110.0	40.8	31.1	80.9	21.5	14.8	110.0
Actuated g/C Ratio	0.12	0.09	0.29	0.57	0.52	1.00	0.37	0.28	0.74	0.20	0.13	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	180	176	509	903	964	1583	507	527	1207	273	476	1583
v/s Ratio Prot	0.00	0.05	c0.11	0.17	0.03		0.11	0.08	c0.32	0.01	0.05	
v/s Ratio Perm	0.01		0.07	0.05		0.01	0.09		0.22	0.02		0.02
v/c Ratio	0.07	0.48	0.57	0.38	0.06	0.01	0.53	0.29	0.70	0.12	0.37	0.02
Uniform Delay, d1	42.5	47.2	33.5	12.5	13.2	0.0	25.8	30.8	8.0	36.3	43.4	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	9.0	1.4	0.3	0.1	0.0	1.0	0.3	1.9	0.2	0.5	0.0
Delay (s)	42.7	56.2	34.9	12.8	13.3	0.0	26.8	31.1	9.9	36.5	43.8	0.0
Level of Service	D	E	C	B	B	A	C	C	A	D	D	A
Approach Delay (s)		39.8			12.6			16.0			36.6	
Approach LOS		D			B			B			D	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

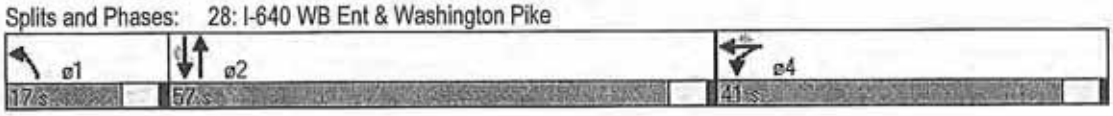
c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	348	289	160	870	382	269
Turn Type		Perm	pm+pt			Perm
Protected Phases	4		1	2	2	
Permitted Phases		4	2			2
Detector Phase	4	4	1	2	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	41.0	41.0	17.0	57.0	57.0	57.0
Total Split (%)	35.7%	35.7%	14.8%	49.6%	49.6%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 115
Offset: 14 (12%), Referenced to phase 2:NBSB, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 28: I-640 WB Ent & Washington Pike



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	464	318	174	946	424	299
v/c Ratio	0.50	0.75	0.26	0.48	0.22	0.34
Control Delay	36.7	49.7	8.6	18.0	14.6	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	49.7	8.6	18.0	14.6	17.2
Queue Length 50th (ft)	152	215	42	215	80	117
Queue Length 95th (ft)	186	295	83	323	131	213
Internal Link Dist (ft)	172			918	649	
Turn Bay Length (ft)			75			100
Base Capacity (vph)	1159	523	697	1964	1964	879
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.61	0.25	0.48	0.22	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	81	348	289	160	870	0	0	382	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3508	1583	1770	3539			3539	1583
Flt Permitted					0.99	1.00	0.47	1.00			1.00	1.00
Satd. Flow (perm)					3508	1583	877	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.99	0.91	0.91	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	82	382	318	174	946	0	0	424	299
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	464	318	174	946	0	0	424	299
Turn Type				Split		Perm	pm+pt					Perm
Protected Phases				4	4		1	2			2	
Permitted Phases						4	2					2
Actuated Green, G (s)					28.7	28.7	71.3	61.8			61.8	61.8
Effective Green, g (s)					30.7	30.7	75.3	63.8			63.8	63.8
Actuated g/C Ratio					0.27	0.27	0.65	0.55			0.55	0.55
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					936	423	664	1963			1963	878
v/s Ratio Prot					0.13		c0.03	c0.27			0.12	
v/s Ratio Perm						c0.20	0.15					0.19
v/c Ratio					0.50	0.75	0.26	0.48			0.22	0.34
Uniform Delay, d1					35.6	38.7	7.7	15.6			12.9	14.1
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.4	7.4	0.2	0.8			0.3	1.1
Delay (s)					36.0	46.0	7.9	16.4			13.2	15.1
Level of Service					D	D	A	B			B	B
Approach Delay (s)		0.0			40.1			15.1			14.0	
Approach LOS		A			D			B			B	

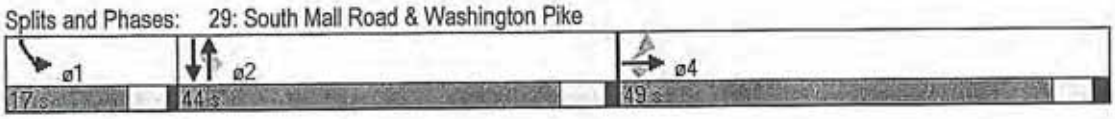
Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	618	476	194	496	94	246	260
Turn Type	Perm		Perm		Perm	pm+pt	
Protected Phases		4		2		1	2
Permitted Phases	4		4		2	2	
Detector Phase	4	4	4	2	2	1	2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	15.0	21.0
Total Split (s)	49.0	49.0	49.0	44.0	44.0	17.0	44.0
Total Split (%)	44.5%	44.5%	44.5%	40.0%	40.0%	15.5%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	4.0	4.5
All-Red Time (s)	2.0	2.0	2.0	1.5	1.5	1.0	1.5
Lost Time Adjust (s)	-2.0	-2.0	-1.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	4.0	3.0	4.0
Lead/Lag				Lag	Lag	Lead	Lag
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	None	C-Max

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 57 (52%), Referenced to phase 2:NBSB, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 29: South Mall Road & Washington Pike



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	657	506	206	605	115	270	286
v/c Ratio	0.93	0.36	0.33	0.46	0.19	0.61	0.22
Control Delay	51.9	23.7	24.9	27.6	24.9	20.8	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	23.7	24.9	27.6	24.9	20.8	24.3
Queue Length 50th (ft)	428	127	99	171	55	102	72
Queue Length 95th (ft)	#657	170	159	198	89	156	105
Internal Link Dist (ft)		260		170			918
Turn Bay Length (ft)	300		300		200	250	
Base Capacity (vph)	724	1448	633	1329	595	450	1329
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.35	0.33	0.46	0.19	0.60	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	618	476	194	0	0	0	0	496	94	246	260	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0					4.0	4.0	3.0	4.0	
Lane Util. Factor	1.00	0.95	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.31	1.00	
Satd. Flow (perm)	1770	3539	1583					3539	1583	583	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.82	0.82	0.82	0.91	0.91	0.91
Adj. Flow (vph)	657	506	206	0	0	0	0	605	115	270	286	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	657	506	206	0	0	0	0	605	115	270	286	0
Turn Type	Perm		Perm						Perm	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4						2	2		
Actuated Green, G (s)	42.1	42.1	42.1					39.3	39.3	50.9	39.3	
Effective Green, g (s)	44.1	44.1	43.1					41.3	41.3	54.9	41.3	
Actuated g/C Ratio	0.40	0.40	0.39					0.38	0.38	0.50	0.38	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	5.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	710	1419	620					1329	594	438	1329	
v/s Ratio Prot		0.14						0.17		c0.08	0.08	
v/s Ratio Perm	c0.37		0.13						0.07	c0.23		
v/c Ratio	0.93	0.36	0.33					0.46	0.19	0.62	0.22	
Uniform Delay, d1	31.4	23.0	23.4					25.9	23.1	17.1	23.3	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.9	0.2	0.3					1.1	0.7	2.6	0.4	
Delay (s)	49.3	23.2	23.7					27.0	23.9	19.7	23.7	
Level of Service	D	C	C					C	C	B	C	
Approach Delay (s)		35.8			0.0			26.5			21.7	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	62	12	51	12	5	16	41	280	20	22	261	51
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	69	13	57	13	6	18	46	311	22	24	290	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											250	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	606	763	290	816	809	167	347			333		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	549	716	212	771	764	167	272			333		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	96	92	94	98	98	96			98		
cM capacity (veh/h)	363	314	745	233	294	848	1210			1223		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	139	37	201	178	314	57
Volume Left	69	13	46	0	24	0
Volume Right	57	18	0	22	0	57
cSH	451	377	1210	1700	1223	1700
Volume to Capacity	0.31	0.10	0.04	0.10	0.02	0.03
Queue Length 95th (ft)	32	8	3	0	2	0
Control Delay (s)	16.5	15.6	2.1	0.0	0.8	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	16.5	15.6	1.1		0.7	
Approach LOS	C	C				

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	97	354	16	100	334
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	108	393	18	111	371
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						697
pX, platoon unblocked	1.00					
vC, conflicting volume	996	402			411	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	995	402			411	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	83			90	
cM capacity (veh/h)	245	648			1148	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	11	108	411	111	371
Volume Left	11	0	0	111	0
Volume Right	0	108	18	0	0
cSH	245	648	1700	1148	1700
Volume to Capacity	0.05	0.17	0.24	0.10	0.22
Queue Length 95th (ft)	4	15	0	8	0
Control Delay (s)	20.4	11.7	0.0	8.5	0.0
Lane LOS	C	B		A	
Approach Delay (s)	12.5		0.0	2.0	
Approach LOS	B				

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	1	2	408	108	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	1	2	453	120	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	579	121	122			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	579	121	122			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	477	930	1465			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	456	122
Volume Left	11	2	0
Volume Right	1	0	2
cSH	499	1465	1700
Volume to Capacity	0.02	0.00	0.07
Queue Length 95th (ft)	2	0	0
Control Delay (s)	12.4	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	12.4	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	196	188	143	136	155	155
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	218	209	159	151	172	172

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	427	310	344
Volume Left (vph)	218	0	172
Volume Right (vph)	0	151	172
Hadj (s)	0.14	-0.26	-0.17
Departure Headway (s)	5.6	5.4	5.7
Degree Utilization, x	0.66	0.46	0.54
Capacity (veh/h)	623	629	590
Control Delay (s)	18.9	13.0	15.3
Approach Delay (s)	18.9	13.0	15.3
Approach LOS	C	B	C

Intersection Summary			
Delay	16.0		
HCM Level of Service	C		
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	270	51	50	280	42	52
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	300	57	56	311	47	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			357		751	328
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			357		751	328
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		87	92
cM capacity (veh/h)			1202		361	713

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	357	367	104
Volume Left	0	56	47
Volume Right	57	0	58
cSH	1700	1202	497
Volume to Capacity	0.21	0.05	0.21
Queue Length 95th (ft)	0	4	20
Control Delay (s)	0.0	1.6	14.2
Lane LOS		A	B
Approach Delay (s)	0.0	1.6	14.2
Approach LOS			B

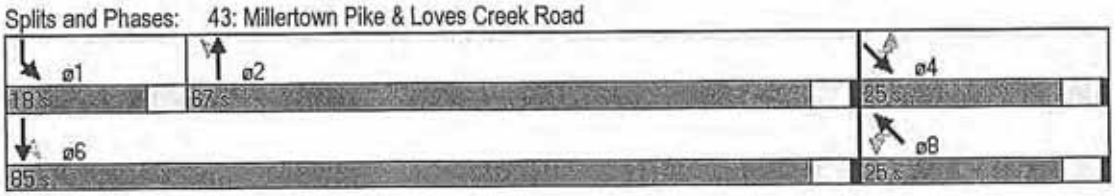
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	NBL	NBT	SBL	SBT	SEL	SET	NWL	NWT
Lane Configurations								
Volume (vph)	36	733	59	356	28	25	110	23
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		2	1	6		4		8
Permitted Phases	2		6		4		8	
Detector Phase	2	2	1	6	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	67.0	67.0	18.0	85.0	25.0	25.0	25.0	25.0
Total Split (%)	60.9%	60.9%	16.4%	77.3%	22.7%	22.7%	22.7%	22.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	C-Min	Min	Min	None	None

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 85 (77%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 43: Millertown Pike & Loves Creek Road



Lane Group	NBT	SBL	SBT	SET	NWT
Lane Group Flow (vph)	967	66	397	114	252
v/c Ratio	0.81	0.14	0.28	0.36	0.92
Control Delay	11.3	4.1	5.1	30.1	77.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	4.1	5.1	30.1	77.4
Queue Length 50th (ft)	227	10	77	48	157
Queue Length 95th (ft)	268	20	112	95	#312
Internal Link Dist (ft)	835		552	525	539
Turn Bay Length (ft)					
Base Capacity (vph)	1200	557	1395	321	277
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.81	0.12	0.28	0.36	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	36	733	72	59	356	1	28	25	44	110	23	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		2.0	3.0			3.0			3.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		1.00	1.00			0.94			0.94	
Flt Protected		1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)		1837		1770	1862			1723			1717	
Flt Permitted		0.97		0.26	1.00			0.84			0.72	
Satd. Flow (perm)		1787		488	1862			1470			1272	
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	41	843	83	66	396	1	33	29	52	122	26	104
RTOR Reduction (vph)	0	2	0	0	0	0	0	27	0	0	23	0
Lane Group Flow (vph)	0	965	0	66	397	0	0	87	0	0	229	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		71.0		80.4	80.4			19.6			19.6	
Effective Green, g (s)		73.0		82.4	82.4			21.6			21.6	
Actuated g/C Ratio		0.66		0.75	0.75			0.20			0.20	
Clearance Time (s)		5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1186		452	1395			289			250	
v/s Ratio Prot				0.01	c0.21							
v/s Ratio Perm		c0.54		0.10				0.06			c0.18	
v/c Ratio		0.81		0.15	0.28			0.30			0.91	
Uniform Delay, d1		13.5		5.5	4.4			37.7			43.3	
Progression Factor		0.46		1.00	1.00			1.00			1.00	
Incremental Delay, d2		4.3		0.1	0.5			0.6			34.7	
Delay (s)		10.5		5.7	4.9			38.3			78.0	
Level of Service		B		A	A			D			E	
Approach Delay (s)		10.5			5.0			38.3			78.0	
Approach LOS		B			A			D			E	

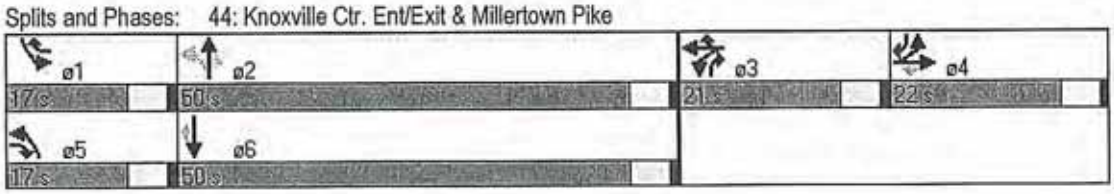
Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	100	152	218	61	134	94	612	248	59	340	117
Turn Type		pm+ov	Split		pt+ov	pm+pt		pm+ov	Prot		pm+ov
Protected Phases	4	5	3	3	3 1	5	2	3	1	6	4
Permitted Phases		4				2		2			6
Detector Phase	4	5	3	3	3 1	5	2	3	1	6	4
Switch Phase											
Minimum Initial (s)	4.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	4.0	4.0
Minimum Split (s)	9.0	8.0	8.0	8.0		8.0	8.0	8.0	8.0	9.0	9.0
Total Split (s)	22.0	17.0	21.0	21.0	38.0	17.0	50.0	21.0	17.0	50.0	22.0
Total Split (%)	20.0%	15.5%	19.1%	19.1%	34.5%	15.5%	45.5%	19.1%	15.5%	45.5%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	None	None	None	None		None	C-Max	None	None	C-Max	None

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 65 (59%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 44: Knoxville Ctr. Ent/Exit & Millertown Pike



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	169	152	158	149	104	680	276	66	378	130
v/c Ratio	0.86	0.36	0.62	0.63	0.39	0.18	0.77	0.27	0.21	0.23	0.13
Control Delay	69.5	32.6	55.0	55.4	22.9	9.3	26.1	8.1	50.3	14.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0
Total Delay	69.5	32.6	55.0	55.4	22.9	9.3	28.5	8.1	50.3	14.7	4.5
Queue Length 50th (ft)	192	94	105	109	58	26	373	72	21	74	17
Queue Length 95th (ft)	#341	151	176	182	96	m40	m462	m77	m37	m102	m30
Internal Link Dist (ft)	752			313			473			835	
Turn Bay Length (ft)			300		300			200	200		200
Base Capacity (vph)	322	526	275	281	461	644	885	1054	437	1675	1032
Starvation Cap Reductn	0	0	0	0	0	0	104	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.32	0.55	0.56	0.32	0.16	0.87	0.26	0.15	0.23	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	100	152	218	61	134	94	612	248	59	340	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1809	1583	1681	1721	1583	1770	1863	1583	3433	3539	1583
Flt Permitted		0.97	1.00	0.95	0.97	1.00	0.48	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1809	1583	1681	1721	1583	900	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	164	111	169	242	68	149	104	680	276	66	378	130
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	275	169	152	158	149	104	680	276	66	378	130
Turn Type	Split		pm+ov	Split		pt+ov	pm+pt		pm+ov	Prot		pm+ov
Protected Phases	4	4	5	3	3	3 1	5	2	3	1	6	4
Permitted Phases			4				2		2			6
Actuated Green, G (s)		17.5	25.8	14.1	14.1	22.2	58.6	50.3	64.4	8.1	50.1	67.6
Effective Green, g (s)		19.5	29.8	16.1	16.1	26.2	62.6	52.3	68.4	10.1	52.1	71.6
Actuated g/C Ratio		0.18	0.27	0.15	0.15	0.24	0.57	0.48	0.62	0.09	0.47	0.65
Clearance Time (s)		5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		321	472	246	252	377	594	886	1028	315	1676	1030
v/s Ratio Prot		c0.15	c0.03	0.09	c0.09	0.09	0.02	c0.37	0.04	0.02	0.11	0.02
v/s Ratio Perm			0.07				0.08		0.14			0.06
v/c Ratio		0.86	0.36	0.62	0.63	0.40	0.18	0.77	0.27	0.21	0.23	0.13
Uniform Delay, d1		43.9	32.4	44.1	44.1	35.2	10.9	23.8	9.4	46.3	17.1	7.3
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.88	0.88	0.90	1.07	0.80	1.02
Incremental Delay, d2		19.6	0.5	4.6	4.8	0.7	0.1	3.4	0.1	0.3	0.3	0.1
Delay (s)		63.4	32.8	48.6	48.9	35.9	9.7	24.5	8.6	49.6	14.0	7.5
Level of Service		E	C	D	D	D	A	C	A	D	B	A
Approach Delay (s)		51.8			44.6			18.9			16.6	
Approach LOS		D			D			B			B	

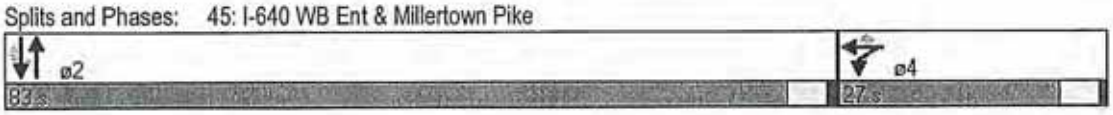
Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	434	611	81	824	526	209
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	2	
Permitted Phases		4	2		2	2
Detector Phase	4	4	2	2	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	21.0	21.0	21.0	21.0
Total Split (s)	27.0	27.0	83.0	83.0	83.0	83.0
Total Split (%)	24.5%	24.5%	75.5%	75.5%	75.5%	75.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 102 (93%), Referenced to phase 2:NBSB, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 45: I-640 WB Ent & Millertown Pike



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	668	736	86	877	566	225
v/c Ratio	0.87	1.41	0.15	0.34	0.22	0.19
Control Delay	55.4	220.3	3.1	3.5	4.3	3.6
Queue Delay	0.0	34.4	0.0	0.0	0.0	0.0
Total Delay	55.4	254.7	3.1	3.5	4.3	3.6
Queue Length 50th (ft)	241	~571	4	22	45	26
Queue Length 95th (ft)	282	#701	m19	70	56	41
Internal Link Dist (ft)	601			683	473	
Turn Bay Length (ft)		600	300			
Base Capacity (vph)	764	522	573	2574	2574	1163
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	27	0	137	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	1.49	0.15	0.36	0.22	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	120	434	611	81	824	0	0	526	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3501	1583	1770	3539			3539	1583
Flt Permitted					0.99	1.00	0.42	1.00			1.00	1.00
Satd. Flow (perm)					3501	1583	788	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.83	0.83	0.83	0.94	0.94	0.94	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	145	523	736	86	877	0	0	566	225
RTOR Reduction (vph)	0	0	0	0	0	177	0	0	0	0	0	12
Lane Group Flow (vph)	0	0	0	0	668	559	86	877	0	0	566	213
Turn Type				Split		Perm	Perm					Perm
Protected Phases				4	4			2			2	
Permitted Phases						4	2				2	2
Actuated Green, G (s)					22.0	22.0	78.0	78.0			78.0	78.0
Effective Green, g (s)					24.0	24.0	80.0	80.0			80.0	80.0
Actuated g/C Ratio					0.22	0.22	0.73	0.73			0.73	0.73
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					764	345	573	2574			2574	1151
v/s Ratio Prot					0.19			c0.25			0.16	
v/s Ratio Perm						c0.35	0.11					0.13
v/c Ratio					0.87	1.62	0.15	0.34			0.22	0.19
Uniform Delay, d1					41.5	43.0	4.6	5.4			4.9	4.7
Progression Factor					1.00	1.00	0.53	0.57			0.83	0.86
Incremental Delay, d2					10.9	292.5	0.5	0.4			0.2	0.3
Delay (s)					52.4	335.5	3.0	3.4			4.2	4.4
Level of Service					D	F	A	A			A	A
Approach Delay (s)		0.0			200.8			3.4			4.3	
Approach LOS		A			F			A			A	

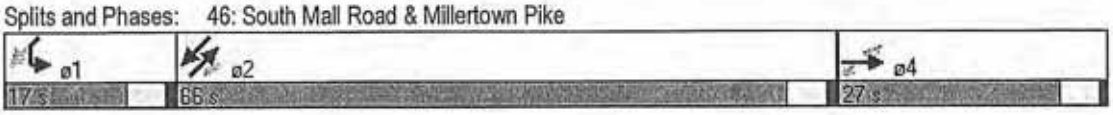
Intersection Summary			
HCM Average Control Delay	91.4	HCM Level of Service	F
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NET	NER	SWL	SWT
Lane Configurations							
Volume (vph)	236	163	77	412	93	333	366
Turn Type	Perm		Perm		Perm	pm+pt	
Protected Phases		4		2		1	2
Permitted Phases	4		4		2	2	1
Detector Phase	4	4	4	2	2	1	2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	9.0	21.0
Total Split (s)	27.0	27.0	27.0	66.0	66.0	17.0	66.0
Total Split (%)	24.5%	24.5%	24.5%	60.0%	60.0%	15.5%	60.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag				Lag	Lag	Lead	Lag
Lead-Lag Optimize?							
Recall Mode	Min	Min	Min	C-Min	C-Min	None	C-Min

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 105 (95%), Referenced to phase 2:NESW, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 46: South Mall Road & Millertown Pike



Lane Group	EBL	EBT	EBR	NET	NER	SWL	SWT
Lane Group Flow (vph)	271	187	89	434	98	378	416
v/c Ratio	0.69	0.46	0.26	0.27	0.14	0.47	0.16
Control Delay	48.5	39.7	35.5	21.7	22.2	7.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	39.7	35.5	21.7	22.2	7.6	2.6
Queue Length 50th (ft)	178	116	52	96	39	42	18
Queue Length 95th (ft)	235	161	86	173	94	m88	m26
Internal Link Dist (ft)		347		1273			683
Turn Bay Length (ft)			300		300	300	
Base Capacity (vph)	423	445	378	2049	917	805	3002
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.42	0.24	0.21	0.11	0.47	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	236	163	77	0	0	0	0	412	93	333	366	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.44	1.00	
Satd. Flow (perm)	1770	1863	1583					3539	1583	825	3539	
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	271	187	89	0	0	0	0	434	98	378	416	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	271	187	89	0	0	0	0	434	98	378	416	0
Turn Type	Perm		Perm						Perm	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4						2	2	1	
Actuated Green, G (s)	22.2	22.2	22.2					48.2	48.2	72.8	72.8	
Effective Green, g (s)	24.2	24.2	24.2					50.2	50.2	76.8	76.8	
Actuated g/C Ratio	0.22	0.22	0.22					0.46	0.46	0.70	0.70	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	389	410	348					1615	722	805	2567	
v/s Ratio Prot		0.10						0.12		c0.11	0.07	
v/s Ratio Perm	c0.15		0.06						0.06	c0.21	0.04	
v/c Ratio	0.70	0.46	0.26					0.27	0.14	0.47	0.16	
Uniform Delay, d1	39.5	37.2	35.5					18.5	17.3	6.6	5.6	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.91	0.46	
Incremental Delay, d2	5.4	0.8	0.4					0.4	0.4	0.4	0.0	
Delay (s)	44.9	38.0	35.8					18.9	17.7	6.4	2.6	
Level of Service	D	D	D					B	B	A	A	
Approach Delay (s)		41.1			0.0			18.7			4.4	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	548	344	233	36	29	244
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	609	382	259	40	32	271
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		924				
pX, platoon unblocked						
vC, conflicting volume	299				1879	279
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	299				1879	279
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	52				21	64
cM capacity (veh/h)	1262				41	760

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	609	382	299	32	271
Volume Left	609	0	0	32	0
Volume Right	0	0	40	0	271
cSH	1262	1700	1700	41	760
Volume to Capacity	0.48	0.22	0.18	0.79	0.36
Queue Length 95th (ft)	68	0	0	75	41
Control Delay (s)	10.5	0.0	0.0	231.5	12.3
Lane LOS	B			F	B
Approach Delay (s)	6.4		0.0	35.6	
Approach LOS				E	

Intersection Summary			
Average Delay	10.8		
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

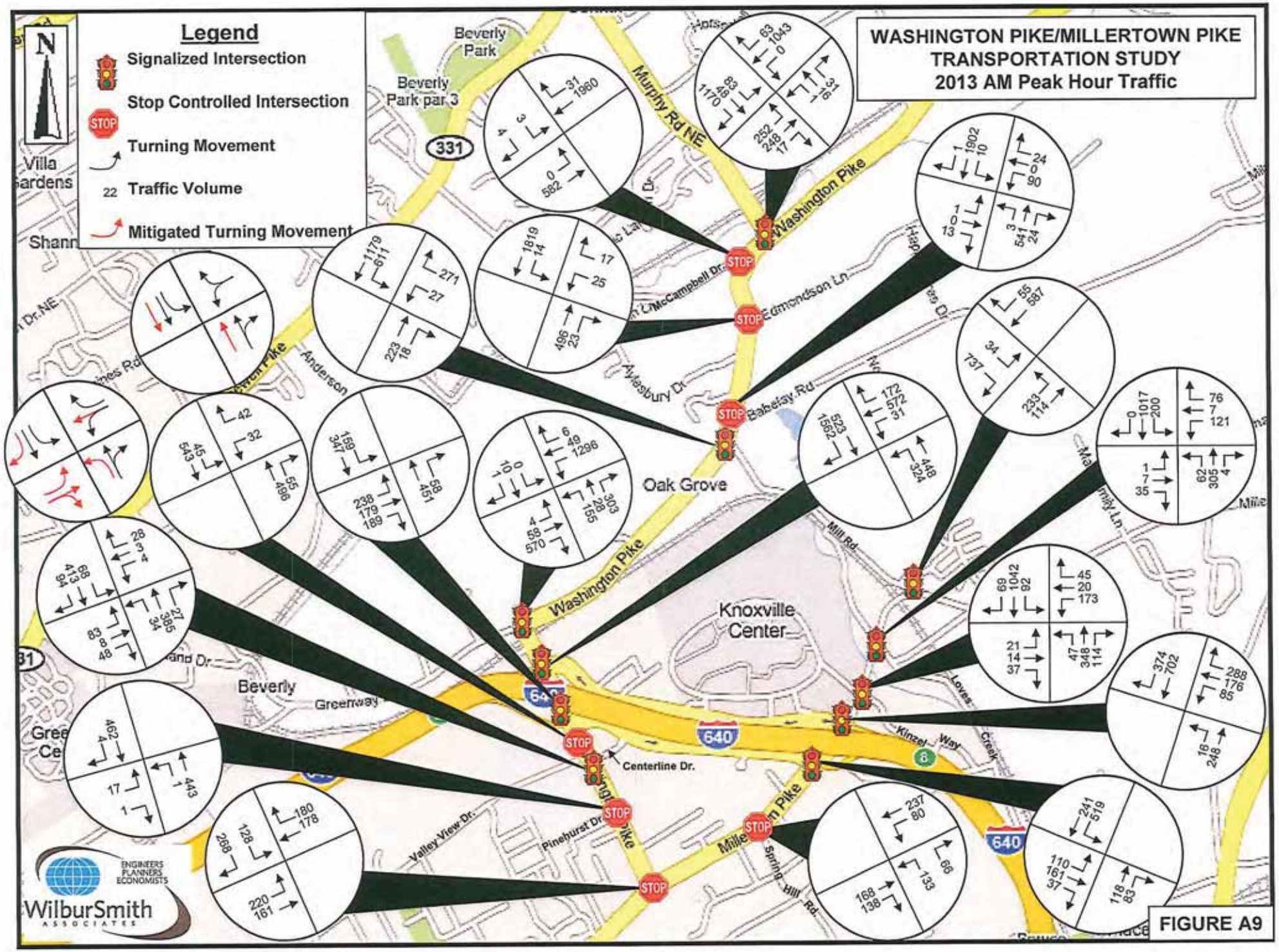

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2013 AM Peak Hour Traffic
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
Mitigated Turning Movement
N
Beverly Park
Beverly Park par 3
331
Murphy Rd NE
Washington Pike
McCampbell Dr.
Edmondson Ln
Aylesbury Dr
Bakeley Rd
Anderson
Oak Grove
Mill Rd
Knoxville Center
Beverly
Greenway
Centerline Dr.
Valley View Dr.
Pinehurst Dr
Spring Hill Rd
Kinzel Way
Loves Creek
640
Villa Gardens
Shann
ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

FIGURE A9

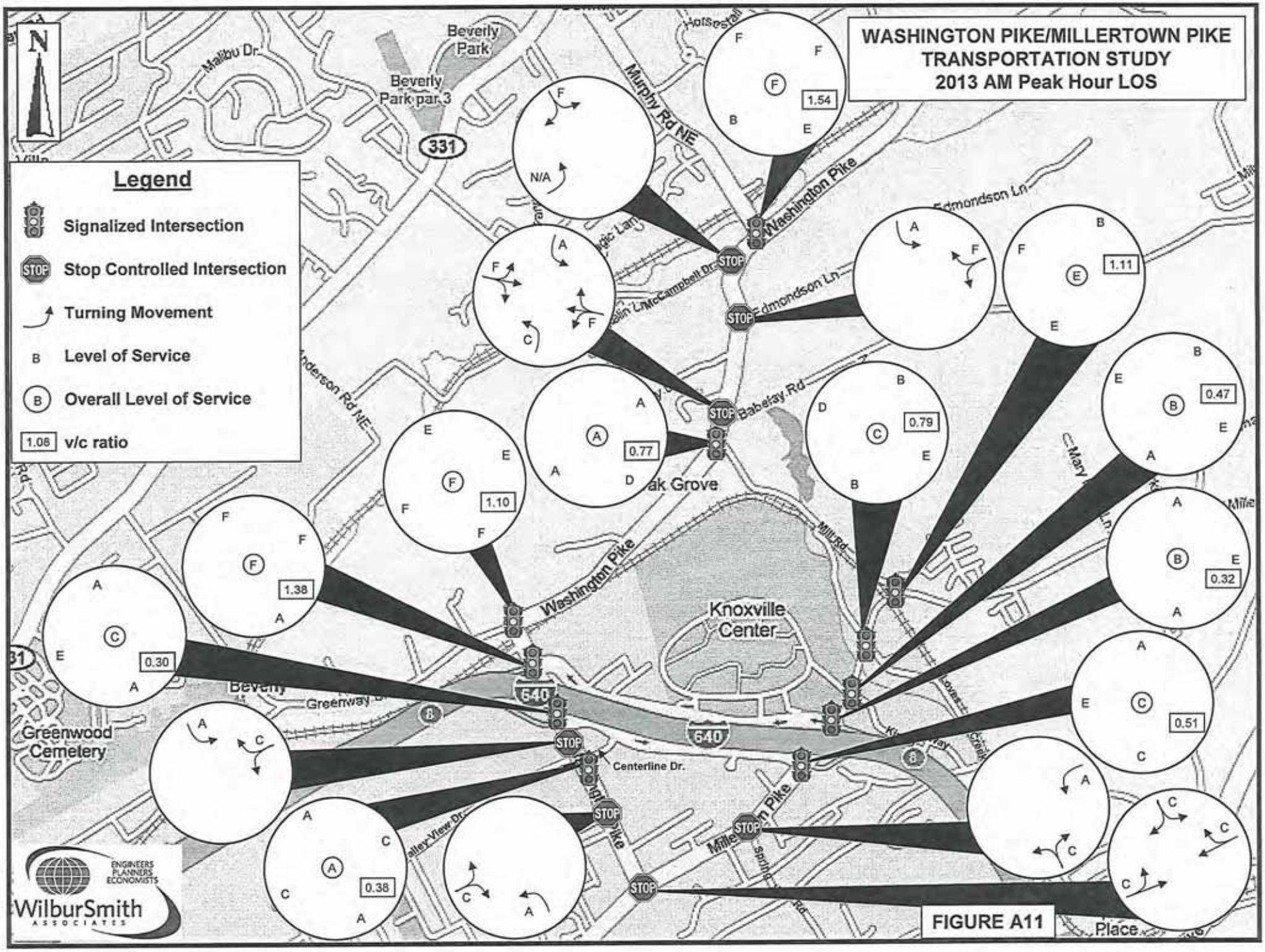

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2013 AM Peak Hour LOS
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
Level of Service
Overall Level of Service
1.08 v/c ratio
N
Beverly Park
Beverly Park par 3
Malibu Dr
331
Murphy Rd NE
Washington Pike
Edmondson Ln
Babelay Rd
Mill Rd
Knoxville Center
640
Greenwood Cemetery
Greenway
Centerline Dr.
Millertown Pike
Place
1.54
N/A
1.11
0.47
0.79
0.77
1.10
1.38
0.30
0.32
0.51
0.38
ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

FIGURE A11

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	1	16	31	83	48	1170	252	248	17	0	1043	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	3.0	3.0	3.0			3.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Frt		0.91			1.00	0.85	1.00	0.99			0.99	
Flt Protected		1.00			0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1700			1805	1583	1770	1845			1848	
Flt Permitted		1.00			0.74	1.00	0.06	1.00			1.00	
Satd. Flow (perm)		1695			1387	1583	110	1845			1848	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	18	34	92	53	1300	280	276	19	0	1159	70
RTOR Reduction (vph)	0	30	0	0	0	17	0	2	0	0	2	0
Lane Group Flow (vph)	0	23	0	0	145	1283	280	293	0	0	1227	0
Turn Type	Perm			Perm		pm+ov	pm+pt			Perm		
Protected Phases		2			6	7	7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)		16.0			16.0	69.0	121.0	121.0			64.0	
Effective Green, g (s)		16.0			16.0	71.0	122.0	122.0			65.0	
Actuated g/C Ratio		0.11			0.11	0.49	0.84	0.84			0.45	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		187			153	808	711	1552			828	
v/s Ratio Prot						c0.59	0.15	0.16			c0.66	
v/s Ratio Perm		0.01			0.10	0.22	0.19					
v/c Ratio		0.12			0.95	1.59	0.39	0.19			1.48	
Uniform Delay, d1		58.2			64.1	37.0	26.7	2.2			40.0	
Progression Factor		1.00			1.00	1.00	0.96	0.82			1.00	
Incremental Delay, d2		0.3			56.6	270.5	0.4	0.3			223.5	
Delay (s)		58.5			120.7	307.5	25.9	2.1			263.5	
Level of Service		E			F	F	C	A			F	
Approach Delay (s)		58.5			288.8			13.7			263.5	
Approach LOS		E			F			B			F	

Intersection Summary			
HCM Average Control Delay	227.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	144.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	4	0	582	1960	31
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	4	0	647	2178	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					245	
pX, platoon unblocked	0.55	0.55	0.55			
vC, conflicting volume	2842	2195	2212			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3920	2753	2784			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	69	100			
cM capacity (veh/h)	2	14	78			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	8	0	647	2212
Volume Left	3	0	0	0
Volume Right	4	0	0	34
cSH	4	1700	1700	1700
Volume to Capacity	1.94	0.00	0.38	1.30
Queue Length 95th (ft)	49	0	0	0
Control Delay (s)	2025.7	0.0	0.0	0.0
Lane LOS	F			
Approach Delay (s)	2025.7	0.0		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	115.0%	ICU Level of Service	H
Analysis Period (min)	15		

EDMONDSON LANE

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	17	496	23	14	1819
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	19	551	26	16	2021
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2616	564			577	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2616	564			577	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	96			98	
cM capacity (veh/h)	26	525			997	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	47	577	2037
Volume Left	28	0	16
Volume Right	19	26	0
cSH	43	1700	997
Volume to Capacity	1.09	0.34	0.02
Queue Length 95th (ft)	111	0	1
Control Delay (s)	314.8	0.0	0.1
Lane LOS	F		A
Approach Delay (s)	314.8	0.0	0.1
Approach LOS	F		

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	116.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	13	90	0	24	3	541	24	10	1902	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	14	100	0	27	3	601	27	11	2113	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)								687				
pX, platoon unblocked	0.96	0.96		0.96	0.96	0.96				0.96		
vC, conflicting volume	2771	2771	2114	2771	2758	614	2114			628		
vC1, stage 1 conf vol	2136	2136		621	621							
vC2, stage 2 conf vol	634	634		2150	2137							
vCu, unblocked vol	2829	2829	2114	2830	2816	573	2114			587		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	77	0	100	95	99			99		
cM capacity (veh/h)	62	84	64	44	81	496	258			944		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	127	3	628	11	2114
Volume Left	1	100	3	0	11	0
Volume Right	14	27	0	27	0	1
cSH	64	54	258	1700	944	1700
Volume to Capacity	0.24	2.33	0.01	0.37	0.01	1.24
Queue Length 95th (ft)	21	319	1	0	1	0
Control Delay (s)	78.8	771.5	19.1	0.0	8.9	0.0
Lane LOS	F	F	C		A	
Approach Delay (s)	78.8	771.5	0.1		0.0	
Approach LOS	F	F				

Intersection Summary			
Average Delay	34.2		
Intersection Capacity Utilization	119.9%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	30	301	268	679	1310
v/c Ratio	0.28	0.47	0.22	0.64	0.77
Control Delay	70.4	6.3	8.9	2.0	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	6.3	8.9	2.0	4.4
Queue Length 50th (ft)	28	0	106	80	333
Queue Length 95th (ft)	63	67	80	m74	m201
Internal Link Dist (ft)	913		316		607
Turn Bay Length (ft)				400	
Base Capacity (vph)	305	771	1226	1140	1707
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.10	0.39	0.22	0.60	0.77

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	27	271	223	18	611	1179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1844		1770	1863
Flt Permitted	0.95	1.00	1.00		0.54	1.00
Satd. Flow (perm)	1770	1583	1844		1007	1863
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	301	248	20	679	1310
RTOR Reduction (vph)	0	226	1	0	0	0
Lane Group Flow (vph)	30	75	267	0	679	1310
Turn Type		pm+ov			pm+pt	
Protected Phases	4	1	2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	5.5	34.1	92.9		127.5	127.5
Effective Green, g (s)	6.5	36.1	93.9		128.5	128.5
Actuated g/C Ratio	0.04	0.25	0.65		0.89	0.89
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	79	449	1194		1048	1651
v/s Ratio Prot	c0.02	0.03	0.14		0.13	c0.70
v/s Ratio Perm		0.01			0.44	
v/c Ratio	0.38	0.17	0.22		0.65	0.79
Uniform Delay, d1	67.3	42.7	10.5		2.2	3.2
Progression Factor	1.00	1.00	0.81		0.97	0.95
Incremental Delay, d2	3.0	0.2	0.3		0.1	0.4
Delay (s)	70.3	42.8	8.9		2.3	3.4
Level of Service	E	D	A		A	A
Approach Delay (s)	45.3		8.9			3.0
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	4	64	633	1440	54	7	172	31	337	11	1
v/c Ratio	0.01	0.15	1.09	1.07	0.03	0.01	0.97	0.15	0.70	0.06	0.01
Control Delay	22.5	45.1	94.1	61.5	4.1	3.5	118.2	54.0	21.2	65.3	49.0
Queue Delay	0.0	0.0	11.8	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	45.1	105.9	72.8	4.1	3.5	118.2	54.0	21.2	65.3	49.0
Queue Length 50th (ft)	2	48	~459	~1141	5	0	~196	29	80	5	0
Queue Length 95th (ft)	9	91	#701	#1606	m22	m2	#270	m47	107	16	6
Internal Link Dist (ft)		662			903			649		594	
Turn Bay Length (ft)	100		250	350		300	250				100
Base Capacity (vph)	830	440	579	1340	1545	1303	177	213	480	293	132
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	15	33	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.15	1.12	1.10	0.03	0.01	0.97	0.15	0.70	0.04	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	58	570	1296	49	6	155	28	303	0	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583		3539	1583
Flt Permitted	0.72	1.00	1.00	0.63	1.00	1.00	0.53	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1345	1863	1583	1169	1863	1583	980	1863	1583		3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	64	633	1440	54	7	172	31	337	0	11	1
RTOR Reduction (vph)	0	0	222	0	0	2	0	0	291	0	0	1
Lane Group Flow (vph)	4	64	411	1440	54	5	172	31	46	0	11	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	30.3	29.2	29.2	117.4	111.3	111.3	17.6	17.6	17.6		2.6	2.6
Effective Green, g (s)	34.3	31.2	30.2	119.4	113.3	112.3	19.6	19.6	19.6		4.6	4.6
Actuated g/C Ratio	0.24	0.22	0.21	0.82	0.78	0.77	0.14	0.14	0.14		0.03	0.03
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	327	401	330	1316	1456	1226	198	252	214		112	50
v/s Ratio Prot	0.00	0.03		c0.64	0.03		c0.07	0.02			0.00	
v/s Ratio Perm	0.00		c0.26	0.26		0.00	c0.05		0.03			0.00
v/c Ratio	0.01	0.16	1.25	1.09	0.04	0.00	0.87	0.12	0.21		0.10	0.00
Uniform Delay, d1	42.4	46.2	57.4	12.5	3.6	3.7	60.4	55.1	55.8		68.2	68.0
Progression Factor	1.00	1.00	1.00	1.44	1.18	1.29	0.95	0.95	2.41		1.00	1.00
Incremental Delay, d2	0.0	0.9	133.8	51.9	0.0	0.0	30.1	0.2	0.5		0.4	0.0
Delay (s)	42.4	47.1	191.2	69.9	4.2	4.8	87.6	52.7	135.2		68.6	68.0
Level of Service	D	D	F	E	A	A	F	D	F		E	E
Approach Delay (s)		177.2			67.3			115.3			68.5	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM Average Control Delay	104.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	120.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	670	191	360	498	581	1736
v/c Ratio	1.38	0.52	0.55	0.18	0.21	1.42
Control Delay	226.6	16.3	8.3	3.2	1.7	206.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.7
Total Delay	226.6	16.3	8.3	3.2	1.7	210.5
Queue Length 50th (ft)	~440	17	40	38	36	~2191
Queue Length 95th (ft)	#567	95	69	49	m14	m#1986
Internal Link Dist (ft)	172			918	649	
Turn Bay Length (ft)			75			100
Base Capacity (vph)	487	366	657	2709	2709	1223
Starvation Cap Reductn	0	0	0	0	0	7
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.52	0.55	0.18	0.21	1.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	31	572	172	324	448	0	0	523	1562
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3530	1583	1770	3539			3539	1583
Flt Permitted					1.00	1.00	0.42	1.00			1.00	1.00
Satd. Flow (perm)					3530	1583	778	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	34	636	191	360	498	0	0	581	1736
RTOR Reduction (vph)	0	0	0	0	0	147	0	0	0	0	0	11
Lane Group Flow (vph)	0	0	0	0	670	44	360	498	0	0	581	1725
Turn Type				Split		Perm	pm+pt					Perm
Protected Phases				4	4		1	2			2	
Permitted Phases						4	2					2
Actuated Green, G (s)					18.0	18.0	112.0	109.0			109.0	109.0
Effective Green, g (s)					20.0	20.0	116.0	111.0			111.0	111.0
Actuated g/C Ratio					0.14	0.14	0.80	0.77			0.77	0.77
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					487	218	657	2709			2709	1212
v/s Ratio Prot					c0.19		c0.02	0.14			0.16	
v/s Ratio Perm						0.03	0.42					c1.09
v/c Ratio					1.38	0.20	0.55	0.18			0.21	1.42
Uniform Delay, d1					62.5	55.4	4.4	4.6			4.8	17.0
Progression Factor					1.00	1.00	1.40	0.66			0.34	0.51
Incremental Delay, d2					181.7	0.5	0.9	0.1			0.1	192.0
Delay (s)					244.2	55.9	7.0	3.2			1.7	200.6
Level of Service					F	E	A	A			A	F
Approach Delay (s)		0.0			202.4			4.8			150.8	
Approach LOS		A			F			A			F	

Intersection Summary			
HCM Average Control Delay	130.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	141.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	150	313	210	501	64	177	386
v/c Ratio	0.60	0.61	0.51	0.21	0.06	0.24	0.16
Control Delay	66.8	61.8	10.8	10.4	2.8	2.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	61.8	10.8	10.4	2.8	2.2	6.0
Queue Length 50th (ft)	147	154	0	88	0	10	54
Queue Length 95th (ft)	217	196	70	148	21	m41	m94
Internal Link Dist (ft)		260		170			918
Turn Bay Length (ft)	300		300			250	
Base Capacity (vph)	544	1125	665	2379	1085	853	2379
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.28	0.32	0.21	0.06	0.21	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	238	179	189	0	0	0	0	451	58	159	347	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	0.91	0.91	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1610	3330	1583					3539	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.44	1.00	
Satd. Flow (perm)	1610	3330	1583					3539	1583	826	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	264	199	210	0	0	0	0	501	64	177	386	0
RTOR Reduction (vph)	0	0	179	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	150	313	31	0	0	0	0	501	43	177	386	0
Turn Type	Split		Perm						Perm	pm+pt		
Protected Phases	4	4						2		1	2	
Permitted Phases			4						2	2		
Actuated Green, G (s)	20.4	20.4	20.4					95.4	95.4	109.6	95.4	
Effective Green, g (s)	22.4	22.4	21.4					97.4	97.4	113.6	97.4	
Actuated g/C Ratio	0.15	0.15	0.15					0.67	0.67	0.78	0.67	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	249	514	234					2377	1063	753	2377	
v/s Ratio Prot	0.09	c0.09						0.14		c0.03	0.11	
v/s Ratio Perm			0.02						0.03	c0.16		
v/c Ratio	0.60	0.61	0.13					0.21	0.04	0.24	0.16	
Uniform Delay, d1	57.1	57.2	53.7					9.1	8.0	3.9	8.8	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.40	0.60	
Incremental Delay, d2	4.1	2.0	0.3					0.2	0.1	0.2	0.1	
Delay (s)	61.2	59.3	54.0					9.3	8.1	1.7	5.4	
Level of Service	E	E	D					A	A	A	A	
Approach Delay (s)		58.1			0.0			9.2			4.2	
Approach LOS		E			A			A			A	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	141.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	32	42	496	55	45	543
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	36	47	551	61	50	603
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			328			250
pX, platoon unblocked	0.96					
vC, conflicting volume	983	306			612	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	908	306			612	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	93			95	
cM capacity (veh/h)	251	690			963	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	82	367	245	251	402
Volume Left	36	0	0	50	0
Volume Right	47	0	61	0	0
cSH	393	1700	1700	963	1700
Volume to Capacity	0.21	0.22	0.14	0.05	0.24
Queue Length 95th (ft)	19	0	0	4	0
Control Delay (s)	16.6	0.0	0.0	2.2	0.0
Lane LOS	C			A	
Approach Delay (s)	16.6	0.0		0.8	
Approach LOS	C				

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	NBL	NBT	SBL	SBT	SBR	NEL	NET	SWT	SWR
Lane Group Flow (vph)	38	458	76	459	104	92	62	7	31
v/c Ratio	0.06	0.36	0.13	0.35	0.09	0.37	0.23	0.04	0.16
Control Delay	7.1	7.5	7.4	7.6	2.4	26.8	10.8	24.2	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	7.5	7.4	7.6	2.4	26.8	10.8	24.2	12.3
Queue Length 50th (ft)	3	44	6	44	0	31	3	2	0
Queue Length 95th (ft)	21	176	36	177	20	64	29	12	21
Internal Link Dist (ft)		931		68			572	634	
Turn Bay Length (ft)									
Base Capacity (vph)	586	1289	588	1300	1136	472	472	483	445
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.36	0.13	0.35	0.09	0.19	0.13	0.01	0.07

Intersection Summary

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	34	385	27	68	413	94	83	8	48	4	3	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.87			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	1844		1770	1863	1583	1770	1624			1811	1583
Flt Permitted	0.45	1.00		0.45	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (perm)	840	1844		842	1863	1583	1770	1624			1811	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	428	30	76	459	104	92	9	53	4	3	31
RTOR Reduction (vph)	0	2	0	0	0	38	0	46	0	0	0	30
Lane Group Flow (vph)	38	456	0	76	459	66	92	16	0	0	7	1
Turn Type	Perm			Perm		Perm	Split			Split		Perm
Protected Phases		2			6		4	4		8	8	
Permitted Phases	2			6		6						8
Actuated Green, G (s)	37.8	37.8		37.8	37.8	37.8	7.4	7.4			2.8	2.8
Effective Green, g (s)	37.8	37.8		37.8	37.8	37.8	7.4	7.4			2.8	2.8
Actuated g/C Ratio	0.63	0.63		0.63	0.63	0.63	0.12	0.12			0.05	0.05
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	529	1162		530	1174	997	218	200			85	74
v/s Ratio Prot		c0.25			0.25		c0.05	0.01			c0.00	
v/s Ratio Perm	0.05			0.09		0.04						0.00
v/c Ratio	0.07	0.39		0.14	0.39	0.07	0.42	0.08			0.08	0.02
Uniform Delay, d1	4.3	5.5		4.5	5.4	4.3	24.3	23.3			27.4	27.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	1.0		0.6	1.0	0.1	1.3	0.2			0.4	0.1
Delay (s)	4.6	6.5		5.1	6.4	4.4	25.6	23.4			27.8	27.4
Level of Service	A	A		A	A	A	C	C			C	C
Approach Delay (s)		6.3			5.9			24.8			27.5	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	17	1	1	443	462	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	1	1	492	513	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1011	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	1010	516	518			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	998	491	493			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	263	564	1044			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	20	493	518
Volume Left	19	1	0
Volume Right	1	0	4
cSH	271	1044	1700
Volume to Capacity	0.07	0.00	0.30
Queue Length 95th (ft)	6	0	0
Control Delay (s)	19.3	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	19.3	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	220	161	178	180	128	268
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	244	179	198	200	142	298

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	423	398	440
Volume Left (vph)	244	0	142
Volume Right (vph)	0	200	298
Hadj (s)	0.15	-0.27	-0.31
Departure Headway (s)	6.2	5.9	5.9
Degree Utilization, x	0.73	0.65	0.72
Capacity (veh/h)	553	580	582
Control Delay (s)	24.2	19.1	22.9
Approach Delay (s)	24.2	19.1	22.9
Approach LOS	C	C	C

Intersection Summary			
Delay	22.1		
HCM Level of Service	C		
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	168	138	80	237	133	66
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	187	153	89	263	148	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			340		704	263
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			340		704	263
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		60	91
cM capacity (veh/h)			1219		374	775

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	340	352	221
Volume Left	0	89	148
Volume Right	153	0	73
cSH	1700	1219	451
Volume to Capacity	0.20	0.07	0.49
Queue Length 95th (ft)	0	6	66
Control Delay (s)	0.0	2.6	20.4
Lane LOS		A	C
Approach Delay (s)	0.0	2.6	20.4
Approach LOS			C

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	NBT	SBL	SBT	SET	NWT
Lane Group Flow (vph)	412	222	1130	48	226
v/c Ratio	0.59	0.30	0.79	0.14	0.83
Control Delay	12.5	5.8	15.7	18.0	75.4
Queue Delay	0.0	0.0	3.1	0.0	0.0
Total Delay	12.5	5.8	18.8	18.0	75.4
Queue Length 50th (ft)	81	52	585	7	188
Queue Length 95th (ft)	197	81	849	44	#298
Internal Link Dist (ft)	835		552	525	539
Turn Bay Length (ft)					
Base Capacity (vph)	698	751	1437	384	309
Starvation Cap Reductn	0	0	207	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.30	0.92	0.13	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	62	305	4	200	1017	0	1	7	35	121	7	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0			3.0			3.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		1.00		1.00	1.00			0.89			0.95	
Flt Protected		0.99		0.95	1.00			1.00			0.97	
Satd. Flow (prot)		1845		1770	1863			1657			1718	
Flt Permitted		0.54		0.49	1.00			1.00			0.78	
Satd. Flow (perm)		1005		912	1863			1651			1375	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	69	339	4	222	1130	0	1	8	39	134	8	84
RTOR Reduction (vph)	0	0	0	0	0	0	0	32	0	0	15	0
Lane Group Flow (vph)	0	412	0	222	1130	0	0	16	0	0	211	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		98.8		109.8	109.8			25.2			25.2	
Effective Green, g (s)		100.8		111.8	111.8			27.2			27.2	
Actuated g/C Ratio		0.70		0.77	0.77			0.19			0.19	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		699		751	1436			310			258	
v/s Ratio Prot				0.02	c0.61							
v/s Ratio Perm		0.41		0.21				0.01			c0.15	
v/c Ratio		0.59		0.30	0.79			0.05			0.82	
Uniform Delay, d1		11.4		5.0	9.7			48.3			56.5	
Progression Factor		0.71		1.00	1.00			1.00			1.00	
Incremental Delay, d2		3.5		0.2	4.4			0.1			17.7	
Delay (s)		11.6		5.2	14.1			48.4			74.2	
Level of Service		B		A	B			D			E	
Approach Delay (s)		11.6			12.6			48.4			74.2	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	41	106	108	50	52	387	127	102	1158	77
v/c Ratio	0.30	0.15	0.55	0.56	0.14	0.15	0.32	0.10	0.38	0.48	0.06
Control Delay	68.6	15.4	71.0	71.1	8.7	5.2	11.6	1.8	77.6	7.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	68.6	15.4	71.0	71.1	8.7	5.2	12.0	1.8	77.6	7.8	0.3
Queue Length 50th (ft)	36	0	101	103	0	14	165	0	51	159	1
Queue Length 95th (ft)	74	35	163	166	28	15	216	32	m62	268	m1
Internal Link Dist (ft)	752			313			473			835	
Turn Bay Length (ft)			300		300			200	200		200
Base Capacity (vph)	154	277	290	293	355	349	1214	1357	294	2430	1236
Starvation Cap Reductn	0	0	0	0	0	0	434	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.15	0.37	0.37	0.14	0.15	0.50	0.09	0.35	0.48	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	14	37	173	20	45	47	348	114	92	1042	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1809	1583	1681	1702	1583	1770	1863	1583	3433	3539	1583
Flt Permitted		0.97	1.00	0.95	0.96	1.00	0.20	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1809	1583	1681	1702	1583	375	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	16	41	192	22	50	52	387	127	102	1158	77
RTOR Reduction (vph)	0	0	36	0	0	40	0	0	30	0	0	19
Lane Group Flow (vph)	0	39	5	106	108	10	52	387	97	102	1158	58
Turn Type	Split		pm+ov	Split		pm+ov	pm+pt		pm+ov	Prot		pm+ov
Protected Phases	4	4	5	3	3	1	5	2	3	1	6	4
Permitted Phases			4			3	2		2			6
Actuated Green, G (s)		8.6	14.0	14.5	14.5	24.0	97.8	92.4	106.9	9.5	96.5	105.1
Effective Green, g (s)		10.6	18.0	16.5	16.5	28.0	101.8	94.4	110.9	11.5	98.5	109.1
Actuated g/C Ratio		0.07	0.12	0.11	0.11	0.19	0.70	0.65	0.76	0.08	0.68	0.75
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		132	229	191	194	306	334	1213	1243	272	2404	1191
v/s Ratio Prot		c0.02	0.00	0.06	c0.06	0.00	0.01	0.21	0.01	c0.03	c0.33	0.00
v/s Ratio Perm			0.00			0.00	0.10		0.05			0.03
v/c Ratio		0.30	0.02	0.55	0.56	0.03	0.16	0.32	0.08	0.38	0.48	0.05
Uniform Delay, d1		63.7	55.8	60.8	60.8	47.5	7.7	11.1	4.3	63.3	11.1	4.6
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.73	0.88	2.33	1.19	0.62	0.37
Incremental Delay, d2		1.3	0.0	3.5	3.4	0.0	0.2	0.7	0.0	0.6	0.5	0.0
Delay (s)		64.9	55.8	64.2	64.2	47.5	5.8	10.4	10.0	75.9	7.3	1.7
Level of Service		E	E	E	E	D	A	B	A	E	A	A
Approach Delay (s)		60.2			61.1			9.9			12.2	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	290	320	18	276	780	416
v/c Ratio	0.59	0.64	0.03	0.10	0.27	0.30
Control Delay	63.1	11.7	0.6	0.4	3.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.3
Total Delay	63.1	11.7	0.6	0.4	3.6	1.2
Queue Length 50th (ft)	136	0	0	3	61	0
Queue Length 95th (ft)	180	89	1	5	120	24
Internal Link Dist (ft)	601			683	473	
Turn Bay Length (ft)		600	300			
Base Capacity (vph)	1417	834	521	2897	2897	1371
Starvation Cap Reductn	0	0	0	0	1219	445
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.38	0.03	0.10	0.46	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	S		
Lane Configurations												
Volume (vph)	0	0	0	85	176	288	16	248	0	0	702	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3483	1583	1770	3539			3539	1583
Flt Permitted					0.98	1.00	0.34	1.00			1.00	1.00
Satd. Flow (perm)					3483	1583	637	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	94	196	320	18	276	0	0	780	416
RTOR Reduction (vph)	0	0	0	0	0	275	0	0	0	0	0	75
Lane Group Flow (vph)	0	0	0	0	290	45	18	276	0	0	780	341
Turn Type				Perm		Perm	Perm					Perm
Protected Phases					4			2			2	
Permitted Phases				4		4	2				2	2
Actuated Green, G (s)					18.3	18.3	116.7	116.7			116.7	116.7
Effective Green, g (s)					20.3	20.3	118.7	118.7			118.7	118.7
Actuated g/C Ratio					0.14	0.14	0.82	0.82			0.82	0.82
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					488	222	521	2897			2897	1296
v/s Ratio Prot								0.08			c0.22	
v/s Ratio Perm					0.08	0.03	0.03					0.22
v/c Ratio					0.59	0.20	0.03	0.10			0.27	0.26
Uniform Delay, d1					58.5	55.2	2.5	2.6			3.1	3.0
Progression Factor					1.00	1.00	0.13	0.13			0.94	1.29
Incremental Delay, d2					1.9	0.5	0.1	0.1			0.2	0.4
Delay (s)					60.4	55.6	0.4	0.4			3.1	4.4
Level of Service					E	E	A	A			A	A
Approach Delay (s)		0.0			57.9			0.4			3.5	
Approach LOS		A			E			A			A	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NET	NER	SWL	SWT
Lane Group Flow (vph)	122	179	41	131	92	577	268
v/c Ratio	0.47	0.66	0.15	0.10	0.14	0.48	0.20
Control Delay	61.8	69.5	15.2	34.3	8.3	2.8	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	61.8	69.5	15.2	34.3	8.3	2.9	28.0
Queue Length 50th (ft)	107	162	0	42	0	3	87
Queue Length 95th (ft)	167	234	34	82	47	86	130
Internal Link Dist (ft)		347		1273			683
Turn Bay Length (ft)			300		300	300	
Base Capacity (vph)	403	424	392	1331	653	1271	1331
Starvation Cap Reductn	0	0	0	0	0	80	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.42	0.10	0.10	0.14	0.48	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	110	161	37	0	0	0	0	118	83	519	241	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.66	1.00	
Satd. Flow (perm)	1770	1863	1583					3539	1583	1232	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	179	41	0	0	0	0	131	92	577	268	0
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	57	0	0	0
Lane Group Flow (vph)	122	179	6	0	0	0	0	131	35	577	268	0
Turn Type	Perm		Perm						Perm	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4						2	2		
Actuated Green, G (s)	19.2	19.2	19.2					52.5	52.5	110.8	52.5	
Effective Green, g (s)	21.2	21.2	21.2					54.5	54.5	114.8	54.5	
Actuated g/C Ratio	0.15	0.15	0.15					0.38	0.38	0.79	0.38	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	259	272	231					1330	595	1199	1330	
v/s Ratio Prot		c0.10						0.04		c0.20	0.08	
v/s Ratio Perm	0.07		0.00						0.02	c0.18		
v/c Ratio	0.47	0.66	0.03					0.10	0.06	0.48	0.20	
Uniform Delay, d1	56.8	58.5	53.1					29.3	28.9	4.7	30.6	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.34	0.80	
Incremental Delay, d2	1.4	5.7	0.0					0.1	0.2	0.3	0.3	
Delay (s)	58.1	64.1	53.1					29.5	29.1	1.9	24.8	
Level of Service	E	E	D					C	C	A	C	
Approach Delay (s)		60.7			0.0			29.3			9.2	
Approach LOS		E			A			C			A	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	259	127	713	38	819
v/c Ratio	1.10	0.12	0.67	0.06	1.10
Control Delay	114.9	11.2	20.2	22.6	87.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	114.9	11.2	20.2	22.6	87.4
Queue Length 50th (ft)	~209	39	328	17	~540
Queue Length 95th (ft)	#371	67	464	40	#781
Internal Link Dist (ft)		212	1004	276	
Turn Bay Length (ft)					
Base Capacity (vph)	235	1067	1057	660	746
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.10	0.12	0.67	0.06	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	233	114	587	55	34	737
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1841		1770	1583
Flt Permitted	0.22	1.00	1.00		0.95	1.00
Satd. Flow (perm)	410	1863	1841		1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	259	127	652	61	38	819
RTOR Reduction (vph)	0	0	3	0	0	156
Lane Group Flow (vph)	259	127	710	0	38	663
Turn Type	Perm					Perm
Protected Phases		4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	62.0	62.0	62.0		40.0	40.0
Effective Green, g (s)	63.0	63.0	63.0		41.0	41.0
Actuated g/C Ratio	0.57	0.57	0.57		0.37	0.37
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	235	1067	1054		660	590
v/s Ratio Prot		0.07	0.39		0.02	
v/s Ratio Perm	c0.63					c0.42
v/c Ratio	1.10	0.12	0.67		0.06	1.12
Uniform Delay, d1	23.5	10.8	16.3		22.1	34.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	88.8	0.1	1.7		0.2	76.3
Delay (s)	112.3	10.8	18.1		22.3	110.8
Level of Service	F	B	B		C	F
Approach Delay (s)		78.9	18.1		106.8	
Approach LOS		E	B		F	

Intersection Summary			
HCM Average Control Delay	69.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NBT	SBT	SBR	NEL	NET	SWT
Lane Group Flow (vph)	53	145	1300	280	295	1229
v/c Ratio	0.24	0.95	1.58	0.39	0.19	1.48
Control Delay	30.1	123.2	293.4	21.9	2.0	254.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	123.2	293.4	21.9	2.0	254.1
Queue Length 50th (ft)	16	138	~1736	128	35	~1604
Queue Length 95th (ft)	61	#281	#2007	219	45	#1872
Internal Link Dist (ft)	209	5075			165	483
Turn Bay Length (ft)						
Base Capacity (vph)	217	153	824	711	1553	830
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.95	1.58	0.39	0.19	1.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

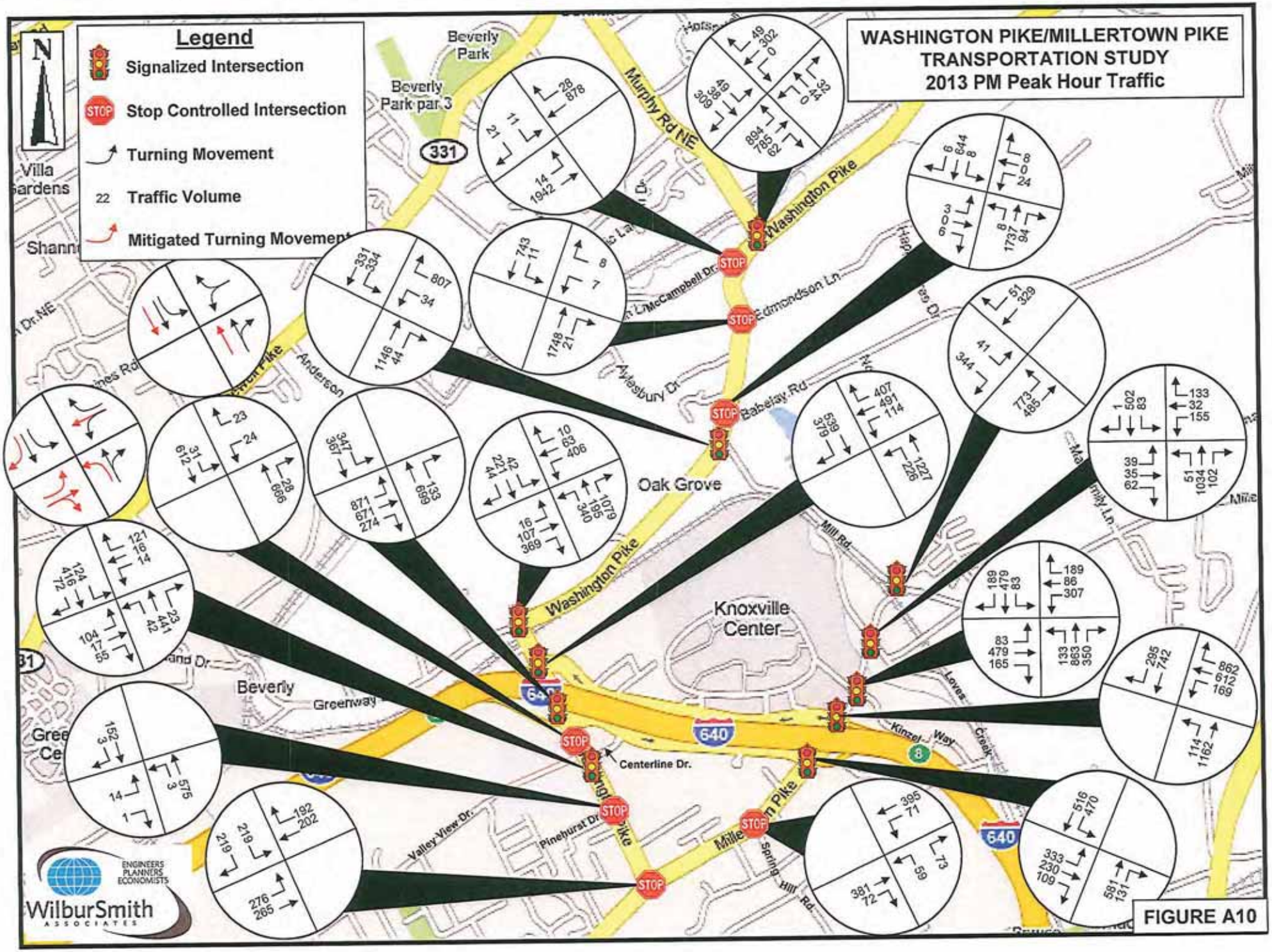

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2013 PM Peak Hour Traffic
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
Mitigated Turning Movement
N
Beverly Park
Beverly Park par 3
331
Murphy Rd NE
Washington Pike
McCampbell Dr.
Edmondson Ln.
Aylesbury Dr.
Babelay Rd.
Anderson
Oak Grove
Mill Rd.
Knoxville Center
Beverly
Greenway
640
Kinzel Way
Centerline Dr.
Valley View Dr.
Pinehurst Dr.
Mile
Spring Hill Rd.
Villa Gardens
Shann
Gree Ce
ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

FIGURE A10

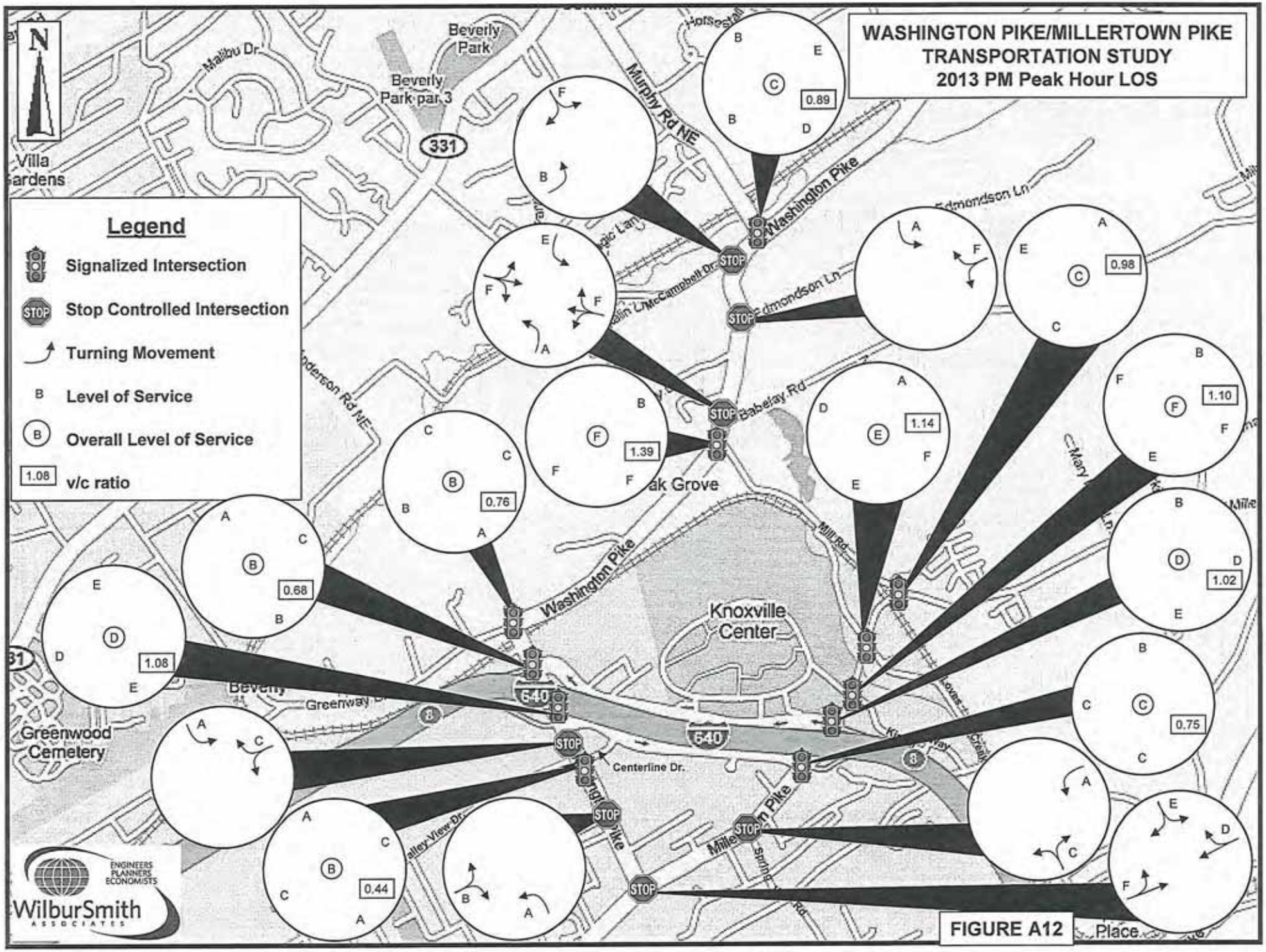

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2013 PM Peak Hour LOS
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
Level of Service
Overall Level of Service
v/c ratio
Beverly Park
Beverly Park par 3
Malibu Dr
Murphy Rd NE
Washington Pike
Edmondson Ln
Babelay Rd
Mill Rd
Knoxville Center
Greenwood Cemetery
Greenway
Centerline Dr.
Millertown Pike
640
331
0.89
0.98
1.39
1.14
1.10
0.76
0.68
1.02
1.08
0.75
0.44
ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

FIGURE A12

Lane Group	NBT	SBT	SBR	NEL	NET	SWT
Lane Group Flow (vph)	85	96	343	993	941	390
v/c Ratio	0.37	0.60	0.29	0.94	0.62	0.91
Control Delay	33.5	59.6	3.6	35.1	6.2	66.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	59.6	3.6	35.1	6.2	66.4
Queue Length 50th (ft)	35	62	38	511	171	250
Queue Length 95th (ft)	81	115	68	#917	353	#461
Internal Link Dist (ft)	209	5075			156	483
Turn Bay Length (ft)						
Base Capacity (vph)	328	239	1168	1059	1508	427
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.40	0.29	0.94	0.62	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	44	32	49	38	309	894	785	62	0	302	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	3.0	3.0	3.0			3.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Frt		0.94			1.00	0.85	1.00	0.99			0.98	
Flt Protected		1.00			0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1756			1812	1583	1770	1842			1828	
Flt Permitted		1.00			0.74	1.00	0.15	1.00			1.00	
Satd. Flow (perm)		1756			1382	1583	276	1842			1828	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	49	36	54	42	343	993	872	69	0	336	54
RTOR Reduction (vph)	0	26	0	0	0	46	0	2	0	0	5	0
Lane Group Flow (vph)	0	59	0	0	96	297	993	939	0	0	385	0
Turn Type	Perm			Perm		pm+ov	pm+pt			Perm		
Protected Phases		2			6	7	7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)		12.0			12.0	69.1	84.1	84.1			23.0	
Effective Green, g (s)		12.0			12.0	71.1	85.1	85.1			24.0	
Actuated g/C Ratio		0.12			0.12	0.68	0.82	0.82			0.23	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		202			159	1127	1059	1506			421	
v/s Ratio Prot		0.03				0.15	c0.52	0.51			0.21	
v/s Ratio Perm					c0.07	0.04	c0.24					
v/c Ratio		0.29			0.60	0.26	0.94	0.62			0.91	
Uniform Delay, d1		42.2			43.8	6.4	17.7	3.5			39.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2		0.8			6.3	0.1	14.8	0.8			23.9	
Delay (s)		43.0			50.1	6.5	32.6	4.3			63.0	
Level of Service		D			D	A	C	A			E	
Approach Delay (s)		43.0			16.0			18.8			63.0	
Approach LOS		D			B			B			E	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	104.1	Sum of lost time (s)	7.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR	SBR2	SEL	SER	NEL2	NEL
Lane Configurations						
Volume (veh/h)	878 ✓	28 ✓	11 ✓	21 ✓	14	✓ 1942 ✓
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	976	31	12	23	16	2158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					None
Median storage veh)						
Upstream signal (ft)	236					
pX, platoon unblocked			0.80	0.80	0.80	
vC, conflicting volume			3180	991	1007	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			3600	864	883	
tC, single (s)			6.4	6.2	4.1	
tC, 2 stage (s)						
tF (s)			3.5	3.3	2.2	
p0 queue free %			0	92	97	
cM capacity (veh/h)			5	283	613	

Direction, Lane #	SB 1	SE 1	NE 1	NE 2
Volume Total	1007	36	16	2158
Volume Left	0	12	16	0
Volume Right	31	23	0	0
cSH	1700	13	613	1700
Volume to Capacity	0.59	2.68	0.03	1.27
Queue Length 95th (ft)	0	132	2	0
Control Delay (s)	0.0	1338.1	11.0	0.0
Lane LOS		F ✓	B ✓	
Approach Delay (s)	0.0	1338.1	0.1	
Approach LOS		F		

Intersection Summary			
Average Delay	14.8		
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		

EDMONDSON LANE

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	8	1748	21	11	743
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	9	1942	23	12	826
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2804	1954			1966	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2804	1954			1966	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	60	89			96	
cM capacity (veh/h)	19	80			295	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	17	1966	838
Volume Left	8	0	12
Volume Right	9	23	0
cSH	32	1700	295
Volume to Capacity	0.51	1.16	0.04
Queue Length 95th (ft)	42	0	3
Control Delay (s)	200.1	0.0	1.7
Lane LOS	F		A
Approach Delay (s)	200.1	0.0	1.7
Approach LOS	F		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	0	6	24	0	8	8	1737	94	8	644	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	0	7	27	0	9	9	1930	104	9	716	7
Pedestrians								3				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								687				
pX, platoon unblocked	0.51	0.51		0.51	0.51	0.51				0.51		
vC, conflicting volume	2693	2789	722	2743	2740	1982	722			2034		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3829	4016	722	3926	3920	2441	722			2543		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	98	0	100	57	99			90		
cM capacity (veh/h)	1	1	426	1	1	21	880			90		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	10	36	9	2034	9	722
Volume Left	3	27	9	0	9	0
Volume Right	7	9	0	104	0	7
cSH	2	1	880	1700	90	1700
Volume to Capacity	6.21	34.38	0.01	1.20	0.10	0.42
Queue Length 95th (ft)	Err	Err	1	0	8	0
Control Delay (s)	Err	Err	9.1	0.0	49.5	0.0
Lane LOS	F	F	A		E	
Approach Delay (s)	Err	Err	0.0		0.6	
Approach LOS	F	F				

Intersection Summary			
Average Delay	161.7		
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	38	897	1322	371	368
v/c Ratio	0.27	1.40	1.37	0.60	0.22
Control Delay	51.4	215.5	205.5	28.5	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	215.5	205.5	28.5	2.0
Queue Length 50th (ft)	26	~836	~1242	176	41
Queue Length 95th (ft)	58	#1082	#1522	#297	73
Internal Link Dist (ft)	913		316		607
Turn Bay Length (ft)					
Base Capacity (vph)	274	643	962	617	1659
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	1.40	1.37	0.60	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	34	807	1146	44	334	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1853		1770	1863
Flt Permitted	0.95	1.00	1.00		0.07	1.00
Satd. Flow (perm)	1770	1583	1853		125	1863
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	897	1273	49	371	368
RTOR Reduction (vph)	0	25	2	0	0	0
Lane Group Flow (vph)	38	872	1320	0	371	368
Turn Type		pm+ov			pm+pt	
Protected Phases	4	1	2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	5.4	38.4	53.6		92.6	92.6
Effective Green, g (s)	6.4	40.4	54.6		93.6	93.6
Actuated g/C Ratio	0.06	0.37	0.50		0.85	0.85
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	103	653	920		615	1585
v/s Ratio Prot	0.02	c0.41	c0.71		0.19	0.20
v/s Ratio Perm		0.14			0.33	
v/c Ratio	0.37	1.33	1.44		0.60	0.23
Uniform Delay, d1	49.9	34.8	27.7		26.7	1.5
Progression Factor	1.00	1.00	1.47		1.00	1.00
Incremental Delay, d2	2.2	161.0	200.3		1.7	0.3
Delay (s)	52.1	195.8	240.9		28.3	1.9
Level of Service	D	F	F		C	A
Approach Delay (s)	190.0		240.9			15.2
Approach LOS	F		F			B

Intersection Summary			
HCM Average Control Delay	169.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	121.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	18	119	410	451	70	11	378	217	1199	47	246	49
v/c Ratio	0.06	0.50	0.26	0.72	0.10	0.01	0.60	0.28	0.76	0.10	0.24	0.03
Control Delay	19.4	51.3	0.4	30.7	20.3	0.0	14.6	17.6	14.5	17.4	33.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	51.3	0.4	30.7	20.3	0.0	14.6	17.6	14.5	17.4	33.7	0.0
Queue Length 50th (ft)	7	79	0	209	26	0	165	118	496	17	72	0
Queue Length 95th (ft)	19	134	0	312	59	0	278	m201	518	39	118	0
Internal Link Dist (ft)		662			903			649			594	
Turn Bay Length (ft)	100		250	350		300	250			150		100
Base Capacity (vph)	460	305	1583	639	734	1583	661	779	1583	618	1008	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.39	0.26	0.71	0.10	0.01	0.57	0.28	0.76	0.08	0.24	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	107	369	406	63	10	340	195	1079	42	221	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.71	1.00	1.00	0.46	1.00	1.00	0.48	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	1325	1863	1583	853	1863	1583	891	1863	1583	1160	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	119	410	451	70	11	378	217	1199	47	246	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	18	119	410	451	70	11	378	217	1199	47	246	49
Turn Type	pm+pt		Free	pm+pt		Free	pm+pt		Free	pm+pt		Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		Free	2		Free	4		Free	8		Free
Actuated Green, G (s)	17.8	15.1	110.0	49.0	41.3	110.0	51.0	40.0	110.0	32.4	26.4	110.0
Effective Green, g (s)	21.8	17.1	110.0	51.0	43.3	110.0	53.0	42.0	110.0	36.4	28.4	110.0
Actuated g/C Ratio	0.20	0.16	1.00	0.46	0.39	1.00	0.48	0.38	1.00	0.33	0.26	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	290	1583	653	733	1583	602	711	1583	428	914	1583
v/s Ratio Prot	0.00	0.06		0.19	0.04		0.12	0.12		0.01	0.07	
v/s Ratio Perm	0.01		0.26	0.13		0.01	0.18		c0.76	0.03		0.03
v/c Ratio	0.06	0.41	0.26	0.69	0.10	0.01	0.63	0.31	0.76	0.11	0.27	0.03
Uniform Delay, d1	35.7	41.9	0.0	21.5	21.0	0.0	19.1	23.8	0.0	25.3	32.5	0.0
Progression Factor	1.00	1.00	1.00	1.04	0.93	1.00	0.61	0.70	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.9	0.4	3.1	0.1	0.0	1.7	0.9	2.8	0.1	0.7	0.0
Delay (s)	35.8	42.8	0.4	25.5	19.5	0.0	13.3	17.7	2.8	25.4	33.3	0.0
Level of Service	D	D	A	C	B	A	B	B	A	C	C	A
Approach Delay (s)		10.8			24.2			6.8			27.4	
Approach LOS		B			C			A			C	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	673	452	251	1363	599	421
v/c Ratio	0.77	0.29	0.43	0.68	0.30	0.27
Control Delay	44.7	0.5	1.9	12.5	11.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	0.5	1.9	12.5	11.9	0.4
Queue Length 50th (ft)	228	0	23	342	116	0
Queue Length 95th (ft)	292	0	m26	m334	150	0
Internal Link Dist (ft)	172			918	649	
Turn Bay Length (ft)			75			100
Base Capacity (vph)	956	1583	591	1991	1991	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.29	0.42	0.68	0.30	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	114	491	407	226	1227	0	0	539	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	2.0	3.0	3.0			3.0	2.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3506	1583	1770	3539			3539	1583
Flt Permitted					0.99	1.00	0.38	1.00			1.00	1.00
Satd. Flow (perm)					3506	1583	700	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	127	546	452	251	1363	0	0	599	421
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	673	452	251	1363	0	0	599	421
Turn Type				Split		Free	pm+pt					Free
Protected Phases				4	4		1	2			2	
Permitted Phases						Free	2					Free
Actuated Green, G (s)					25.4	110.0	69.6	59.9			59.9	110.0
Effective Green, g (s)					27.4	110.0	73.6	61.9			61.9	110.0
Actuated g/C Ratio					0.25	1.00	0.67	0.56			0.56	1.00
Clearance Time (s)					5.0		5.0	5.0			5.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					873	1583	582	1991			1991	1583
v/s Ratio Prot					c0.19		c0.05	c0.39			0.17	
v/s Ratio Perm						0.29	0.24					0.27
v/c Ratio					0.77	0.29	0.43	0.68			0.30	0.27
Uniform Delay, d1					38.4	0.0	7.4	17.1			12.7	0.0
Progression Factor					1.00	1.00	0.26	0.68			0.87	1.00
Incremental Delay, d2					4.3	0.5	0.0	0.2			0.4	0.4
Delay (s)					42.6	0.5	2.0	11.8			11.4	0.4
Level of Service					D	A	A	B			B	A
Approach Delay (s)		0.0			25.7			10.3			6.8	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	968	746	304	777	148	386	408
v/c Ratio	1.06	0.41	0.32	0.97	0.09	1.12	0.51
Control Delay	72.8	17.0	2.6	67.2	0.1	111.6	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.8	17.0	2.6	67.2	0.1	111.6	40.6
Queue Length 50th (ft)	~750	162	0	287	0	~266	151
Queue Length 95th (ft)	#996	208	42	#413	0	#462	203
Internal Link Dist (ft)		260		170			918
Turn Bay Length (ft)	300		300		200	250	
Base Capacity (vph)	917	1834	955	804	1583	344	804
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.41	0.32	0.97	0.09	1.12	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	871	671	274	0	0	0	0	699	133	347	367	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0					4.0	2.0	3.0	4.0	
Lane Util. Factor	1.00	0.95	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.16	1.00	
Satd. Flow (perm)	1770	3539	1583					3539	1583	298	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	968	746	304	0	0	0	0	777	148	386	408	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	968	746	155	0	0	0	0	777	148	386	408	0
Turn Type	Perm		Perm						Free	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4						Free	2		
Actuated Green, G (s)	55.0	55.0	55.0					23.0	110.0	38.0	23.0	
Effective Green, g (s)	57.0	57.0	56.0					25.0	110.0	42.0	25.0	
Actuated g/C Ratio	0.52	0.52	0.51					0.23	1.00	0.38	0.23	
Clearance Time (s)	6.0	6.0	6.0					6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)	917	1834	806					804	1583	341	804	
v/s Ratio Prot		0.21						0.22		c0.17	0.12	
v/s Ratio Perm	c0.55		0.10						0.09	c0.26		
v/c Ratio	1.06	0.41	0.19					0.97	0.09	1.13	0.51	
Uniform Delay, d1	26.5	16.2	14.7					42.1	0.0	30.9	37.1	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.87	1.03	
Incremental Delay, d2	45.5	0.1	0.1					24.5	0.1	88.5	2.2	
Delay (s)	72.0	16.3	14.8					66.6	0.1	115.3	40.3	
Level of Service	E	B	B					E	A	F	D	
Approach Delay (s)		42.8			0.0			56.0			76.8	
Approach LOS		D			A			E			E	

Intersection Summary			
HCM Average Control Delay	53.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	24	232	666	28	31	612
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	258	740	31	34	680
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			328			250
pX, platoon unblocked	0.90					
vC, conflicting volume	1164	386			771	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	967	386			771	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	58			96	
cM capacity (veh/h)	218	613			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	284	493	278	261	453
Volume Left	27	0	0	34	0
Volume Right	258	0	31	0	0
cSH	524	1700	1700	839	1700
Volume to Capacity	0.54	0.29	0.16	0.04	0.27
Queue Length 95th (ft)	80	0	0	3	0
Control Delay (s)	19.7	0.0	0.0	1.6	0.0
Lane LOS	C			A	
Approach Delay (s)	19.7	0.0		0.6	
Approach LOS	C				

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	NBL	NBT	SBL	SBT	SBR	NEL	NET	SWT	SWR
Lane Group Flow (vph)	47	516	138	462	80	116	80	34	134
v/c Ratio	0.09	0.43	0.28	0.38	0.08	0.47	0.28	0.18	0.47
Control Delay	8.8	10.3	11.0	9.8	2.7	33.0	13.1	30.0	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	10.3	11.0	9.8	2.7	33.0	13.1	30.0	11.8
Queue Length 50th (ft)	8	111	27	96	0	47	7	14	0
Queue Length 95th (ft)	28	237	78	206	19	88	40	37	44
Internal Link Dist (ft)		931		68			332	634	
Turn Bay Length (ft)									
Base Capacity (vph)	531	1207	486	1215	1060	405	424	416	465
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.43	0.28	0.38	0.08	0.29	0.19	0.08	0.29

Intersection Summary

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	42	441	23	124	416	72	104	17	55	14	16	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	1849		1770	1863	1583	1770	1650			1820	1583
Flt Permitted	0.44	1.00		0.40	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (perm)	815	1849		744	1863	1583	1770	1650			1820	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	490	26	138	462	80	116	19	61	16	18	134
RTOR Reduction (vph)	0	2	0	0	0	31	0	54	0	0	0	122
Lane Group Flow (vph)	47	514	0	138	462	49	116	26	0	0	34	12
Turn Type	Perm			Perm		Perm	Split			Split		Perm
Protected Phases		2			6		4	4		8	8	
Permitted Phases	2			6		6						8
Actuated Green, G (s)	43.3	43.3		43.3	43.3	43.3	8.6	8.6			6.1	6.1
Effective Green, g (s)	43.3	43.3		43.3	43.3	43.3	8.6	8.6			6.1	6.1
Actuated g/C Ratio	0.62	0.62		0.62	0.62	0.62	0.12	0.12			0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	504	1144		460	1152	979	217	203			159	138
v/s Ratio Prot		c0.28			0.25		c0.07	0.02			c0.02	
v/s Ratio Perm	0.06			0.19		0.03						0.01
v/c Ratio	0.09	0.45		0.30	0.40	0.05	0.53	0.13			0.21	0.08
Uniform Delay, d1	5.4	7.1		6.3	6.8	5.3	28.8	27.4			29.7	29.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.4	1.3		1.7	1.0	0.1	2.5	0.3			0.7	0.3
Delay (s)	5.8	8.3		7.9	7.8	5.4	31.3	27.7			30.4	29.6
Level of Service	A	A		A	A	A	C	C			C	C
Approach Delay (s)		8.1			7.5			29.8			29.8	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	14	1	3	575	152	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	1	3	639	169	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1011	
pX, platoon unblocked						
vC, conflicting volume	816	171	172			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	816	171	172			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	346	873	1405			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	642	172
Volume Left	16	3	0
Volume Right	1	0	3
cSH	360	1405	1700
Volume to Capacity	0.05	0.00	0.10
Queue Length 95th (ft)	4	0	0
Control Delay (s)	15.5	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	15.5	0.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	276	265	202	192	219	219
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	307	294	224	213	243	243

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	601	438	487
Volume Left (vph)	307	0	243
Volume Right (vph)	0	213	243
Hadj (s)	0.14	-0.26	-0.17
Departure Headway (s)	6.7	6.5	6.6
Degree Utilization, x	1.13	0.79	0.89
Capacity (veh/h)	537	542	533
Control Delay (s)	103.3	29.6	41.5
Approach Delay (s)	103.3	29.6	41.5
Approach LOS	F	D	E

Intersection Summary			
Delay	62.4		
HCM Level of Service	F		
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	381	72	71	395	59	73
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	423	80	79	439	66	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			503		1060	463
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			503		1060	463
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		71	86
cM capacity (veh/h)			1061		230	599

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	503	518	147
Volume Left	0	79	66
Volume Right	80	0	81
cSH	1700	1061	348
Volume to Capacity	0.30	0.07	0.42
Queue Length 95th (ft)	0	6	50
Control Delay (s)	0.0	2.1	22.6
Lane LOS		A	C
Approach Delay (s)	0.0	2.1	22.6
Approach LOS			C

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	NBT	SBL	SBT	SET	NWT
Lane Group Flow (vph)	1319	92	559	151	355
v/c Ratio	1.13	0.29	0.41	0.45	1.25
Control Delay	74.5	6.7	6.9	33.1	171.0
Queue Delay	2.9	0.0	0.0	0.0	0.0
Total Delay	77.4	6.7	6.9	33.1	171.0
Queue Length 50th (ft)	~1135	16	133	71	~297
Queue Length 95th (ft)	m#1005	30	188	135	#483
Internal Link Dist (ft)	835		552	525	539
Turn Bay Length (ft)					
Base Capacity (vph)	1168	319	1355	339	285
Starvation Cap Reductn	7	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.14	0.29	0.41	0.45	1.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	51	1034	102	83	502	1	39	35	62	155	32	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0			3.0			3.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		1.00	1.00			0.94			0.94	
Flt Protected		1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)		1837		1770	1862			1723			1717	
Flt Permitted		0.96		0.18	1.00			0.82			0.68	
Satd. Flow (perm)		1760		330	1862			1430			1200	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	57	1149	113	92	558	1	43	39	69	172	36	147
RTOR Reduction (vph)	0	3	0	0	0	0	0	27	0	0	23	0
Lane Group Flow (vph)	0	1316	0	92	559	0	0	124	0	0	332	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		69.8		78.0	78.0			22.0			22.0	
Effective Green, g (s)		71.8		80.0	80.0			24.0			24.0	
Actuated g/C Ratio		0.65		0.73	0.73			0.22			0.22	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1149		308	1354			312			262	
v/s Ratio Prot				0.01	c0.30							
v/s Ratio Perm		c0.75		0.20				0.09			c0.28	
v/c Ratio		1.15		0.30	0.41			0.40			1.27	
Uniform Delay, d1		19.1		8.3	5.8			36.8			43.0	
Progression Factor		0.35		1.00	1.00			1.00			1.00	
Incremental Delay, d2		68.7		0.5	0.9			3.7			146.2	
Delay (s)		75.3		8.9	6.8			40.5			189.2	
Level of Service		E		A	A			D			F	
Approach Delay (s)		75.3			7.1			40.5			189.2	
Approach LOS		E			A			D			F	

Intersection Summary			
HCM Average Control Delay	71.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	124.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	624	183	215	222	210	148	959	389	92	532	210
v/c Ratio	1.20	0.26	1.28	1.29	0.51	0.34	1.11	0.40	0.59	0.34	0.18
Control Delay	142.4	5.2	204.4	207.6	7.7	20.0	89.7	13.4	71.6	16.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	136.9	0.0	0.0	0.0	0.0
Total Delay	142.4	5.2	204.4	207.6	7.7	20.0	226.6	13.4	71.6	16.2	0.6
Queue Length 50th (ft)	~535	5	~203	~210	0	0	~797	125	34	106	2
Queue Length 95th (ft)	#755	50	#363	#372	38	m0	m#796	m128	m55	m126	m5
Internal Link Dist (ft)	752			313			473			835	
Turn Bay Length (ft)			300		300			200	200		200
Base Capacity (vph)	521	710	168	172	410	434	864	971	156	1544	1196
Starvation Cap Reductn	0	0	0	0	0	0	189	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.26	1.28	1.29	0.51	0.34	1.42	0.40	0.59	0.34	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	479	165	307	86	189	133	863	350	83	479	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1849	1583	1681	1721	1583	1770	1863	1583	3433	3539	1583
Flt Permitted		0.99	1.00	0.95	0.97	1.00	0.35	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1849	1583	1681	1721	1583	657	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	92	532	183	341	96	210	148	959	389	92	532	210
RTOR Reduction (vph)	0	0	110	0	0	179	0	0	38	0	0	59
Lane Group Flow (vph)	0	624	73	215	222	31	148	959	351	92	532	151
Turn Type	Split		pm+ov	Split		pt+ov	pm+pt		pm+ov	Prot		pm+ov
Protected Phases	4	4	5	3	3	3 1	5	2	3	1	6	4
Permitted Phases			4				2		2			6
Actuated Green, G (s)		29.0	35.0	9.0	9.0	12.0	55.0	49.0	58.0	3.0	46.0	75.0
Effective Green, g (s)		31.0	39.0	11.0	11.0	16.0	59.0	51.0	62.0	5.0	48.0	79.0
Actuated g/C Ratio		0.28	0.35	0.10	0.10	0.15	0.54	0.46	0.56	0.05	0.44	0.72
Clearance Time (s)		5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		521	604	168	172	230	433	864	935	156	1544	1137
v/s Ratio Prot		c0.34	0.01	0.13	c0.13	0.02	c0.02	c0.51	0.04	c0.03	0.15	0.04
v/s Ratio Perm			0.04				0.16		0.18			0.06
v/c Ratio		1.20	0.12	1.28	1.29	0.13	0.34	1.11	0.38	0.59	0.34	0.13
Uniform Delay, d1		39.5	23.9	49.5	49.5	41.0	13.6	29.5	13.3	51.5	20.6	4.8
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.51	1.39	1.44	1.13	0.76	0.90
Incremental Delay, d2		106.5	0.1	163.6	167.2	0.3	0.0	51.3	0.0	4.7	0.5	0.0
Delay (s)		146.0	24.0	213.1	216.7	41.2	20.6	92.2	19.2	63.1	16.0	4.4
Level of Service		F	C	F	F	D	C	F	B	E	B	A
Approach Delay (s)		118.3			158.5			66.2			18.3	
Approach LOS		F			F			E			B	

Intersection Summary			
HCM Average Control Delay	82.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	868	958	127	1291	824	328
v/c Ratio	0.44	1.07	0.94	0.96	0.61	0.44
Control Delay	14.8	74.9	105.9	58.1	17.1	6.6
Queue Delay	0.0	261.3	0.0	2.9	0.0	0.0
Total Delay	14.8	336.2	105.9	60.9	17.1	6.6
Queue Length 50th (ft)	177	~749	95	507	192	55
Queue Length 95th (ft)	224	#998	m#208	#630	m208	m74
Internal Link Dist (ft)	601			683	473	
Turn Bay Length (ft)		600	300			
Base Capacity (vph)	1973	897	135	1351	1351	744
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	320	0	31	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.66	0.94	0.98	0.61	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	169	612	862	114	1162	0	0	742	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3501	1583	1770	3539			3539	1583
Flt Permitted					0.99	1.00	0.19	1.00			1.00	1.00
Satd. Flow (perm)					3501	1583	354	3539			3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	188	680	958	127	1291	0	0	824	328
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	0	0	0	140
Lane Group Flow (vph)	0	0	0	0	868	954	127	1291	0	0	824	188
Turn Type				Split		Perm	Perm					Perm
Protected Phases				4	4			2			2	
Permitted Phases						4	2				2	2
Actuated Green, G (s)					60.0	60.0	40.0	40.0			40.0	40.0
Effective Green, g (s)					62.0	62.0	42.0	42.0			42.0	42.0
Actuated g/C Ratio					0.56	0.56	0.38	0.38			0.38	0.38
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1973	892	135	1351			1351	604
v/s Ratio Prot					0.25			c0.36			0.23	
v/s Ratio Perm						c0.60	0.36					0.12
v/c Ratio					0.44	1.07	0.94	0.96			0.61	0.31
Uniform Delay, d1					13.9	24.0	32.8	33.1			27.4	23.9
Progression Factor					1.00	1.00	1.35	1.30			0.56	0.64
Incremental Delay, d2					0.2	50.4	60.1	15.1			1.7	1.1
Delay (s)					14.1	74.4	104.4	58.0			16.9	16.3
Level of Service					B	E	F	E			B	B
Approach Delay (s)		0.0			45.7			62.2			16.7	
Approach LOS		A			D			E			B	

Intersection Summary			
HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NET	NER	SWL	SWT
Lane Group Flow (vph)	370	256	121	646	146	522	573
v/c Ratio	0.78	0.51	0.08	0.54	0.09	0.73	0.24
Control Delay	49.0	37.3	0.1	33.6	0.1	25.6	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	37.3	0.1	33.6	0.1	25.6	3.6
Queue Length 50th (ft)	238	151	0	198	0	130	29
Queue Length 95th (ft)	335	222	0	285	0	174	41
Internal Link Dist (ft)		347		1273			683
Turn Bay Length (ft)			300		300	300	
Base Capacity (vph)	547	576	1583	1200	1583	776	2399
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.44	0.08	0.54	0.09	0.67	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	333	230	109	0	0	0	0	581	131	470	516	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	2.0					3.0	2.0	3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00					0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.25	1.00	
Satd. Flow (perm)	1770	1863	1583					3539	1583	474	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	370	256	121	0	0	0	0	646	146	522	573	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	370	256	121	0	0	0	0	646	146	522	573	0
Turn Type	Perm		Free						Free	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		Free						Free	2	1	
Actuated Green, G (s)	27.4	27.4	110.0					35.3	110.0	67.6	67.6	
Effective Green, g (s)	29.4	29.4	110.0					37.3	110.0	71.6	71.6	
Actuated g/C Ratio	0.27	0.27	1.00					0.34	1.00	0.65	0.65	
Clearance Time (s)	5.0	5.0						5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	473	498	1583					1200	1583	713	2400	
v/s Ratio Prot		0.14						0.18		c0.23	0.08	
v/s Ratio Perm	c0.21		0.08						0.09	c0.25	0.08	
v/c Ratio	0.78	0.51	0.08					0.54	0.09	0.73	0.24	
Uniform Delay, d1	37.3	34.2	0.0					29.4	0.0	13.9	7.9	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.41	0.46	
Incremental Delay, d2	8.2	0.9	0.1					1.7	0.1	3.3	0.0	
Delay (s)	45.6	35.1	0.1					31.1	0.1	23.0	3.7	
Level of Service	D	D	A					C	A	C	A	
Approach Delay (s)		34.6			0.0			25.4			12.9	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	859	539	423	46	382
v/c Ratio	1.04	0.33	0.26	0.32	0.80
Control Delay	53.5	2.3	1.9	70.2	18.9
Queue Delay	0.9	0.0	0.0	0.0	0.0
Total Delay	54.4	2.3	1.9	70.2	18.9
Queue Length 50th (ft)	~892	54	37	44	0
Queue Length 95th (ft)	#1192	119	83	85	109
Internal Link Dist (ft)		212	1004	276	
Turn Bay Length (ft)					
Base Capacity (vph)	827	1637	1610	201	518
Starvation Cap Reductn	2	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.04	0.33	0.26	0.23	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	773	485	329	51	41	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1829		1770	1583
Flt Permitted	0.51	1.00	1.00		0.95	1.00
Satd. Flow (perm)	941	1863	1829		1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	859	539	366	57	46	382
RTOR Reduction (vph)	0	0	3	0	0	351
Lane Group Flow (vph)	859	539	420	0	46	31
Turn Type	Perm					Perm
Protected Phases		4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	130.8	130.8	130.8		11.2	11.2
Effective Green, g (s)	131.8	131.8	131.8		12.2	12.2
Actuated g/C Ratio	0.88	0.88	0.88		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	827	1637	1607		144	129
v/s Ratio Prot		0.29	0.23		c0.03	
v/s Ratio Perm	c0.91					0.02
v/c Ratio	1.04	0.33	0.26		0.32	0.24
Uniform Delay, d1	9.1	1.6	1.4		65.0	64.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	41.8	0.1	0.1		5.8	4.4
Delay (s)	50.9	1.7	1.5		70.7	68.9
Level of Service	D	A	A		E	E
Approach Delay (s)		31.9	1.5		69.1	
Approach LOS		C	A		E	

Intersection Summary			
HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

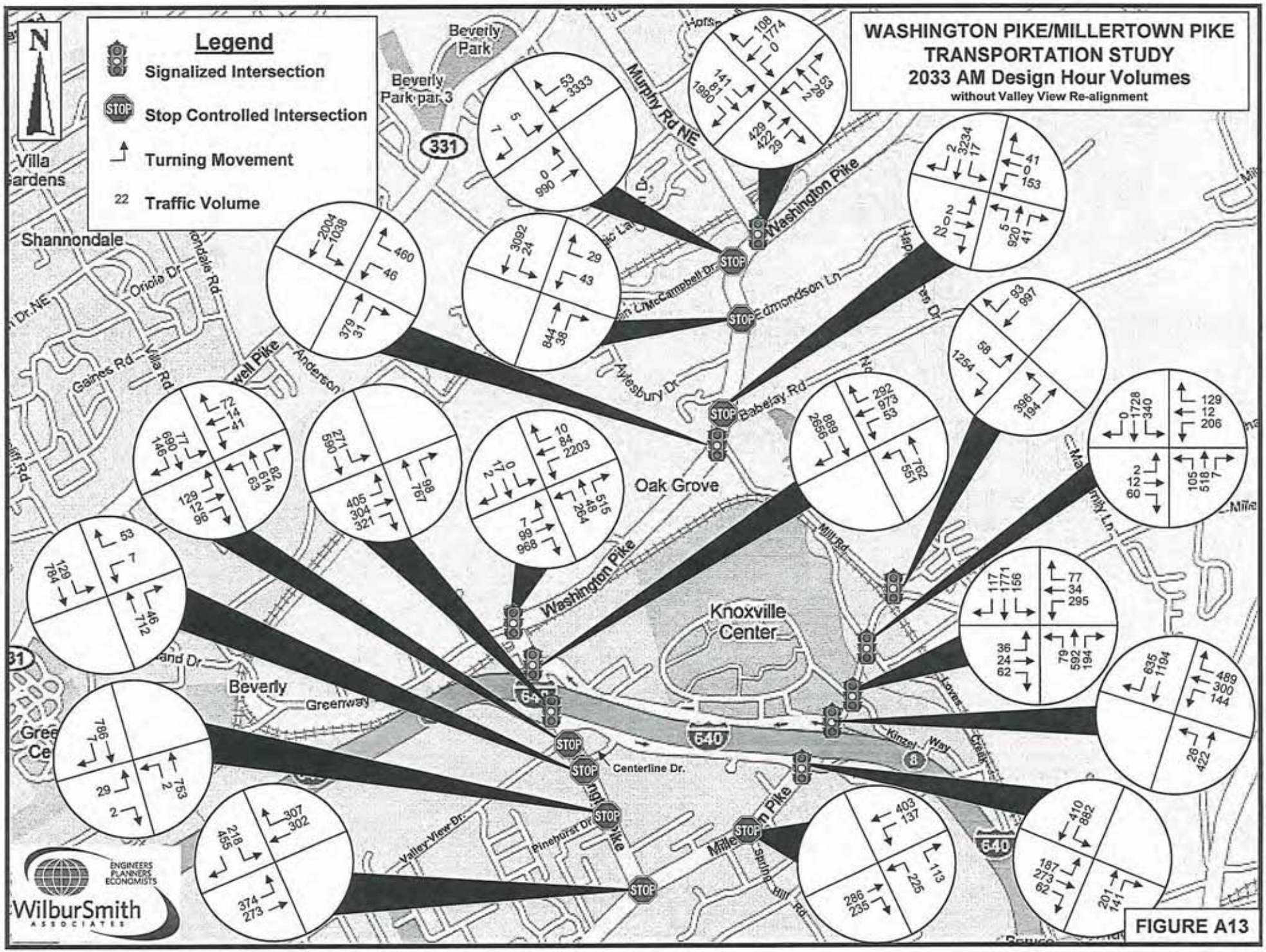
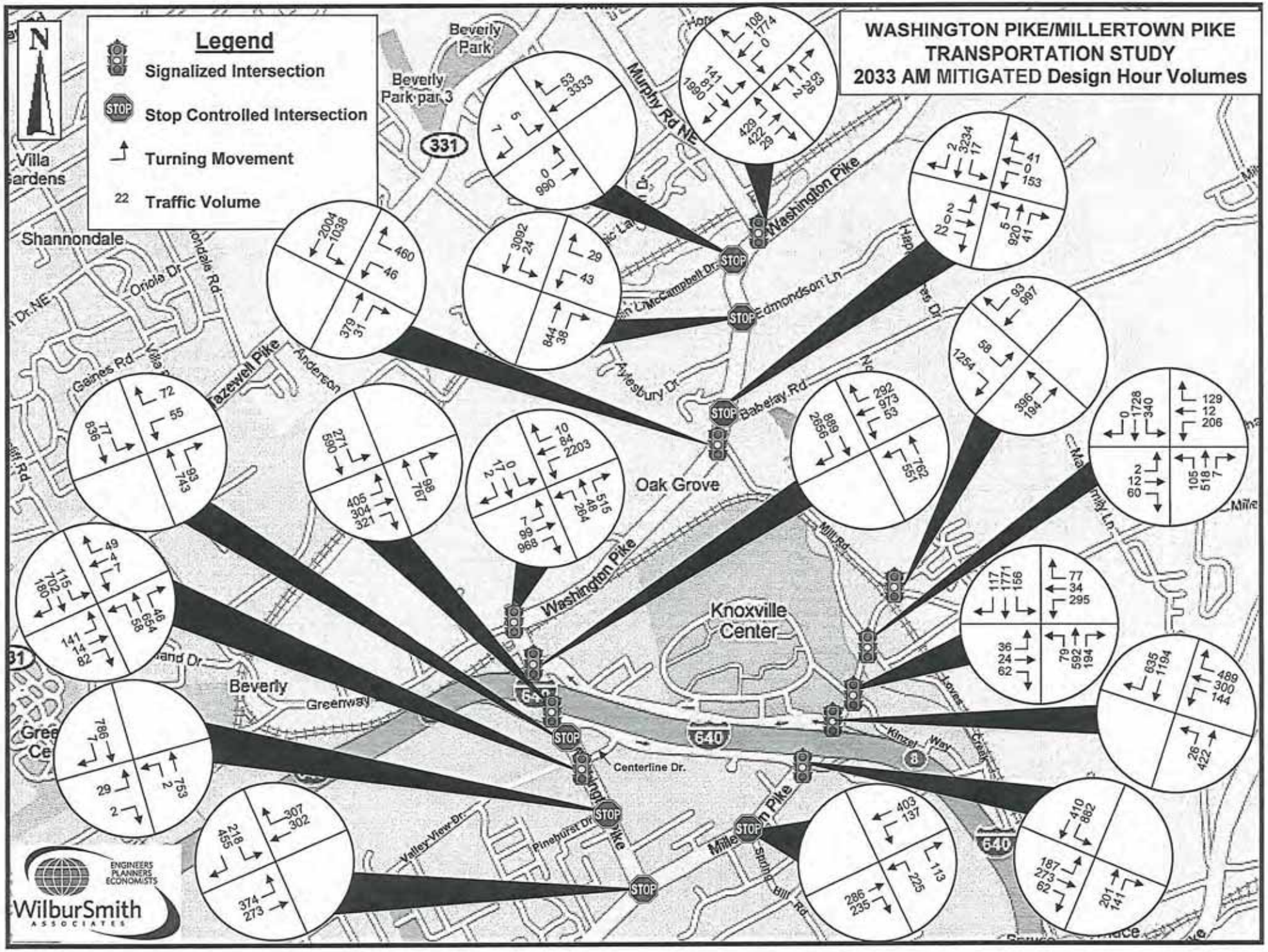

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 AM Design Hour Volumes
without Valley View Re-alignment
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
N
Beverly Park
Beverly Park par 3
Villa Gardens
Shannondale
Oriole Dr
Gaines Rd
Villa Rd
Anderson
Murphy Rd NE
Washington Pike
McCampbell Dr
Edmondson Ln
Aylesbury Dr
Babelay Rd
Oak Grove
Mill Rd
Knoxville Center
Beverly
Greenway
Centerline Dr.
Valley View Dr.
Pinehurst Dr
Millertown Pike
Spring Hill Rd
Kinzel Way
331
640
8
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

FIGURE A13


WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 AM MITIGATED Design Hour Volumes
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
N
Beverly Park
Beverly Park par 3
Villa Gardens
Shannondale
Oriola Dr
Gaines Rd
Tazewell Pike
Anderson
Murphy Rd NE
Washington Pike
McCampbell Dr
Edmondson Ln
Aylesbury Dr
Babelay Rd
Oak Grove
Mill Rd
Knoxville Center
Beverly
Greenway
Centerline Dr.
Valley View Dr
Pineburst Dr
Millertown Pike
Spring Hill Rd
Kinzel Way
640
331
3
STOP
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

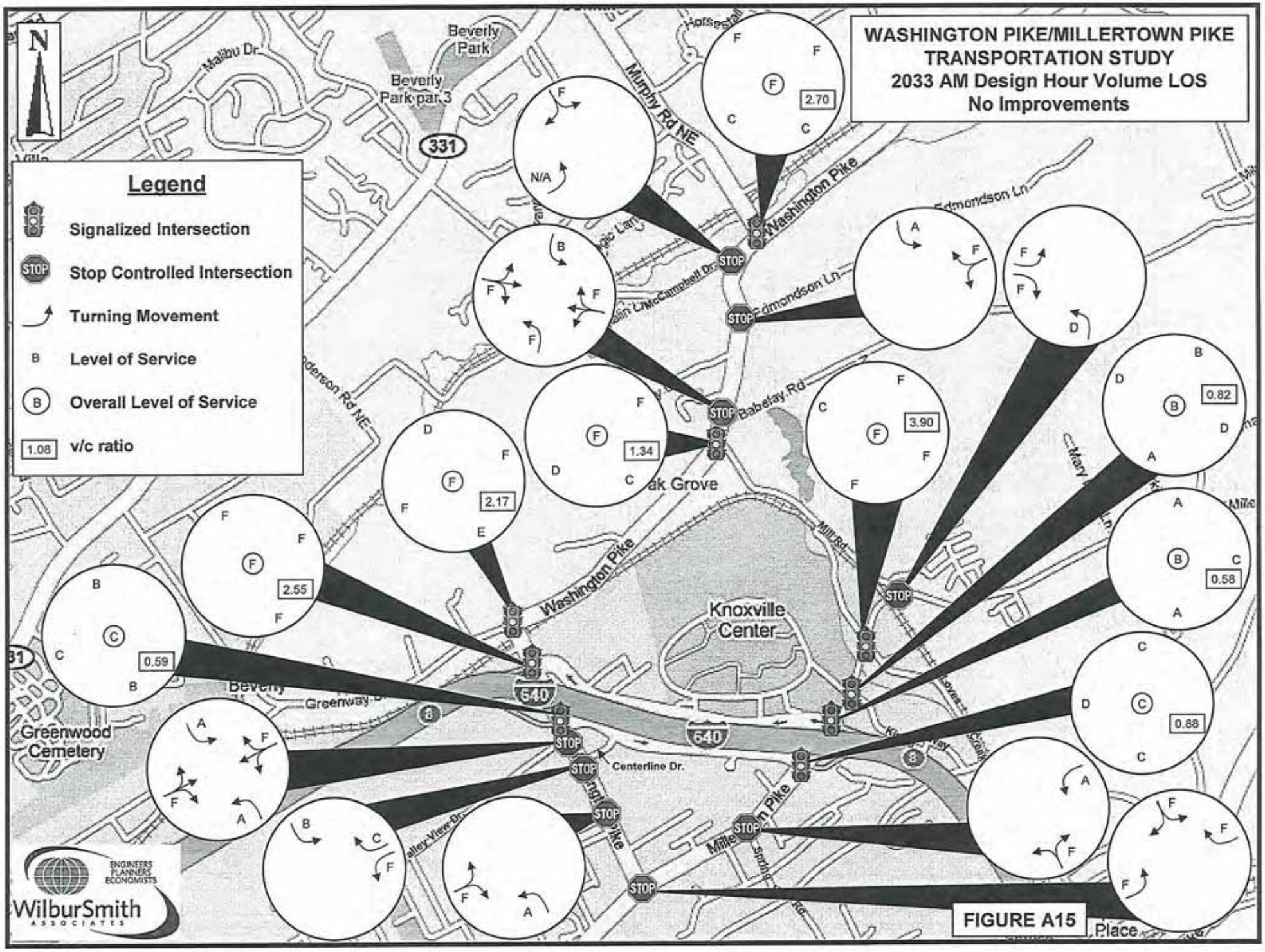

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 AM Design Hour Volume LOS
No Improvements
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
Level of Service
Overall Level of Service
v/c ratio
N
Beverly Park
Beverly Park par 3
Malibu Dr
Murphy Rd NE
Washington Pike
Edmondson Ln
McCampbell Dr
Babelay Rd
Oak Grove
Mill Rd
Knoxville Center
Greenwood Cemetery
Greenway
Centerline Dr.
Millertown Pike
Place
331
540
2.70
N/A
1.34
3.90
0.82
2.17
2.55
0.58
0.59
0.88
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

FIGURE A15

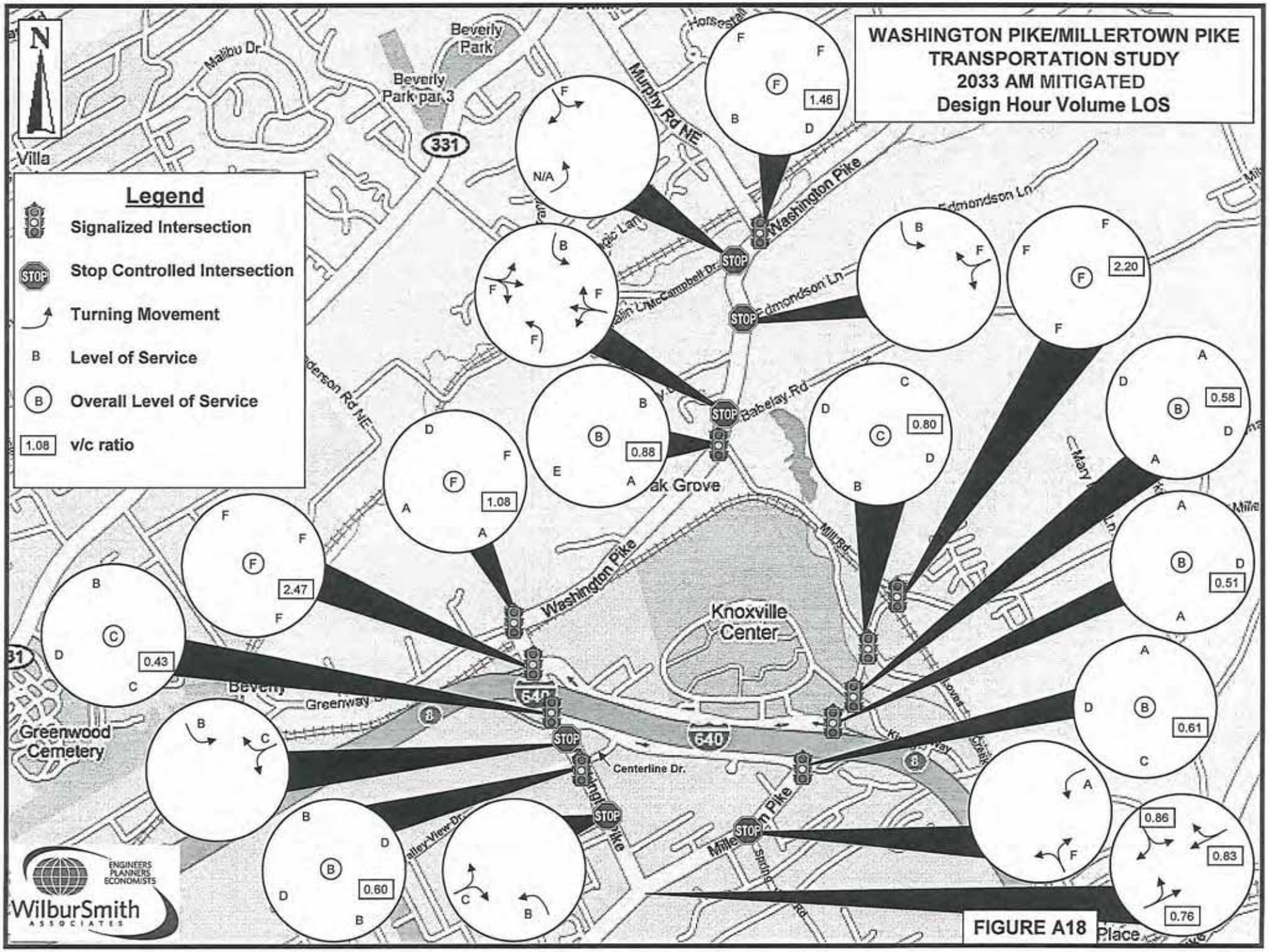

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 AM MITIGATED
Design Hour Volume LOS
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
Level of Service
Overall Level of Service
v/c ratio
N
Beverly Park
Beverly Park par. 3
Malibu Dr
Murphy Rd NE
Washington Pike
Edmondson Ln
McCampbell Dr
Babelay Rd
Mill Rd
Knoxville Center
Greenwood Cemetery
Greenway
Centerline Dr.
Millertown Pike
331
640
STOP
N/A
1.46
2.20
0.88
0.80
0.58
1.08
2.47
0.51
0.43
0.61
0.60
0.86
0.83
0.76
ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

FIGURE A18

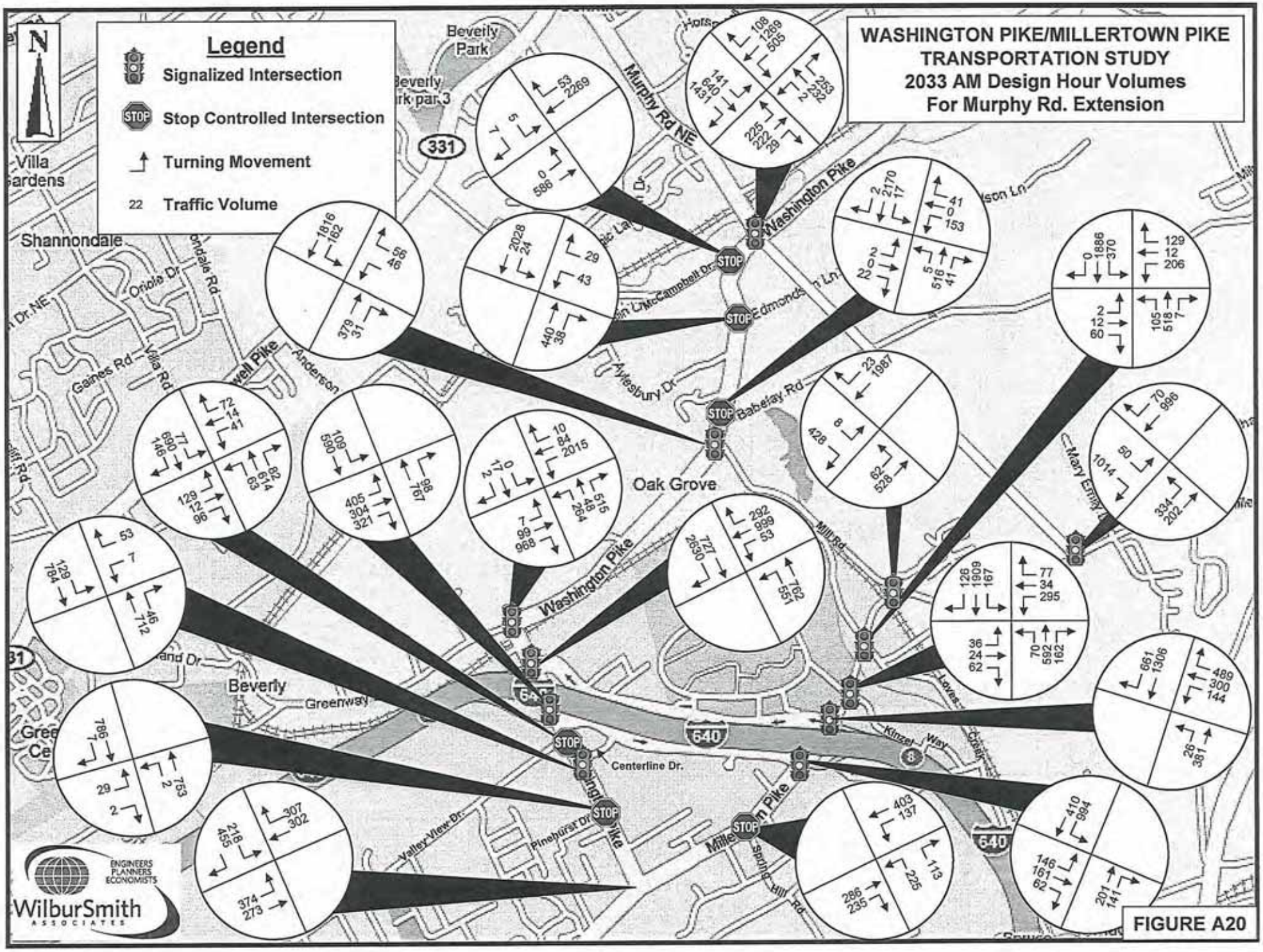

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 AM Design Hour Volumes
For Murphy Rd. Extension
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
N
Beverly Park
Villa Gardens
Shannondale
Oriole Dr
Gaines Rd
Anderson
Murphy Rd NE
Washington Pike
McCampbell Dr
Edmonds
Aylesbury Dr
Babelay Rd
Oak Grove
Mill Rd
Mary Emily
Beverly
Greenway
Centerline Dr.
Kinzel Way
Valley View Dr
Pinehurst Dr
Millertown Pike
Spring Hill Rd
640
331
8
STOP
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

FIGURE A20

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	2	26	53	141	81	1990	429	422	29	0	1774	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	3.0	3.0	3.0			3.0	
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95			0.95	
Frt		0.91			1.00	0.85	1.00	0.99			0.99	
Flt Protected		1.00			0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1696			1805	2787	1770	3505			3509	
Flt Permitted		0.99			0.69	1.00	0.08	1.00			1.00	
Satd. Flow (perm)		1688			1282	2787	141	3505			3509	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	29	59	157	90	2211	477	469	32	0	1971	120
RTOR Reduction (vph)	0	49	0	0	0	1	0	4	0	0	4	0
Lane Group Flow (vph)	0	41	0	0	247	2210	477	497	0	0	2088	0
Turn Type	Perm			Perm		pm+ov	pm+pt			Perm		
Protected Phases		2			6	7	7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)		21.0			21.0	59.0	91.0	91.0			49.0	
Effective Green, g (s)		21.0			21.0	61.0	92.0	92.0			50.0	
Actuated g/C Ratio		0.18			0.18	0.51	0.77	0.77			0.42	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		295			224	1486	638	2687			1462	
v/s Ratio Prot						c0.48	0.24	0.14			c0.59	
v/s Ratio Perm		0.02			0.19	0.31	0.33					
v/c Ratio		0.14			1.10	1.49	0.75	0.18			1.43	
Uniform Delay, d1		41.9			49.5	29.5	30.0	3.8			35.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2		0.2			90.3	222.9	4.8	0.0			196.6	
Delay (s)		42.1			139.8	252.4	34.8	3.8			231.6	
Level of Service		D			F	F	C	A			F	
Approach Delay (s)		42.1			241.1			18.9			231.6	
Approach LOS		D			F			B			F	

Intersection Summary			
HCM Average Control Delay	195.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	136.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR	SBR2	SEL	SER	NEL2	NEL
Lane Configurations						
Volume (veh/h)	3332	53	5	7	0	990
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3702	59	6	8	0	1100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					Raised
Median storage veh)						1
Upstream signal (ft)	407					
pX, platoon unblocked			0.59	0.59	0.59	
vC, conflicting volume			4282	1881	3761	
vC1, stage 1 conf vol			3732			
vC2, stage 2 conf vol			550			
vCu, unblocked vol			5170	1105	4288	
tC, single (s)			6.8	6.9	4.1	
tC, 2 stage (s)			5.8			
tF (s)			3.5	3.3	2.2	
p0 queue free %			0	94	100	
cM capacity (veh/h)			2	121	20	

Direction, Lane #	SB 1	SB 2	SE 1	NE 1	NE 2	NE 3
Volume Total	2468	1293	13	0	550	550
Volume Left	0	0	6	0	0	0
Volume Right	0	59	8	0	0	0
cSH	1700	1700	6	1700	1700	1700
Volume to Capacity	1.45	0.76	2.39	0.00	0.32	0.32
Queue Length 95th (ft)	0	0	69	0	0	0
Control Delay (s)	0.0	0.0	1854.1	0.0	0.0	0.0
Lane LOS			F			
Approach Delay (s)	0.0		1854.1	0.0		
Approach LOS			F			

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
Analysis Period (min)	15		

EDMONDSON LANE

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	43	29	844	38	24	3092
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	48	32	938	42	27	3436
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2730	490			980	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2730	490			980	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	94			96	
cM capacity (veh/h)	16	524			700	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	80	625	355	27	1718	1718
Volume Left	48	0	0	27	0	0
Volume Right	32	0	42	0	0	0
cSH	26	1700	1700	700	1700	1700
Volume to Capacity	3.09	0.37	0.21	0.04	1.01	1.01
Queue Length 95th (ft)	Err	0	0	3	0	0
Control Delay (s)	Err	0.0	0.0	10.3	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	Err	0.0		0.1		
Approach LOS	F					

Intersection Summary			
Average Delay	176.9		
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	0	22	153	0	41	5	920	41	17	3234	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	0	24	170	0	46	6	1022	46	19	3593	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								687				
pX, platoon unblocked	0.90	0.90		0.90	0.90	0.90				0.90		
vC, conflicting volume	4200	4711	1798	2915	4689	534	3596			1068		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	4339	4910	1798	2905	4885	248	3596			844		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	65	0	100	93	91			97		
cM capacity (veh/h)	0	1	69	4	1	674	65			706		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	27	216	6	681	386	19	2396	1200
Volume Left	2	170	6	0	0	19	0	0
Volume Right	24	46	0	0	46	0	0	2
cSH	4	5	65	1700	1700	706	1700	1700
Volume to Capacity	6.19	45.60	0.09	0.40	0.23	0.03	1.41	0.71
Queue Length 95th (ft)	Err	Err	7	0	0	2	0	0
Control Delay (s)	Err	Err	65.9	0.0	0.0	10.2	0.0	0.0
Lane LOS	F	F	F			B		
Approach Delay (s)	Err	Err	0.3			0.1		
Approach LOS	F	F						

Intersection Summary			
Average Delay	491.4		
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	SBL	SBT
Protected Phases	4	1	2	1	6
Permitted Phases		4		6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	10.0	22.0	10.0	22.0
Total Split (s)	22.0	75.0	23.0	75.0	98.0
Total Split (%)	18.3%	62.5%	19.2%	62.5%	81.7%
Maximum Green (s)	16.0	69.0	17.0	69.0	92.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lead/Lag		Lead	Lag	Lead	
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max
Walk Time (s)	5.0		5.0		5.0
Flash Dont Walk (s)	11.0		11.0		11.0
Pedestrian Calls (#/hr)	0		0		0
90th %ile Green (s)	12.1	72.9	17.0	72.9	95.9
90th %ile Term Code	Gap	Max	Coord	Max	Coord
70th %ile Green (s)	10.2	74.8	17.0	74.8	97.8
70th %ile Term Code	Gap	Max	Coord	Max	Coord
50th %ile Green (s)	8.8	76.2	17.0	76.2	99.2
50th %ile Term Code	Gap	Max	Coord	Max	Coord
30th %ile Green (s)	7.4	77.6	17.0	77.6	100.6
30th %ile Term Code	Gap	Max	Coord	Max	Coord
10th %ile Green (s)	0.0	87.0	21.0	87.0	114.0
10th %ile Term Code	Skip	Gap	Coord	Gap	Coord

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 25 (21%), Referenced to phase 6:SBTL, Start of Green
Control Type: Actuated-Coordinated

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	46	460	379	31	1038	2004
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.88	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	2787	3500		1770	3539
Flt Permitted	0.95	1.00	1.00		0.18	1.00
Satd. Flow (perm)	1770	2787	3500		330	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	511	421	34	1153	2227
RTOR Reduction (vph)	0	12	5	0	0	0
Lane Group Flow (vph)	51	499	450	0	1153	2227
Turn Type		pm+ov			pm+pt	
Protected Phases	4	1	2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	7.7	85.4	16.6		100.3	100.3
Effective Green, g (s)	8.7	87.4	17.6		101.3	101.3
Actuated g/C Ratio	0.07	0.73	0.15		0.84	0.84
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	128	2146	513		1223	2988
v/s Ratio Prot	c0.03	0.15	0.13		c0.62	0.63
v/s Ratio Perm		0.03			c0.18	
v/c Ratio	0.40	0.23	0.88		0.94	0.75
Uniform Delay, d1	53.2	5.3	50.1		15.4	3.9
Progression Factor	1.00	1.00	1.14		1.00	1.00
Incremental Delay, d2	2.0	0.1	15.3		14.1	1.7
Delay (s)	55.2	5.4	72.4		29.5	5.7
Level of Service	E	A	E		C	A
Approach Delay (s)	9.9		72.4			13.8
Approach LOS	A		E			B

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	ø3
Protected Phases	1	6		5	2		7	4	4	8		3
Permitted Phases	6		Free	2		Free	4		5		Free	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0		4.0
Minimum Split (s)	21.0	21.0		21.0	21.0		21.0	21.0	21.0	21.0		21.0
Total Split (s)	21.0	21.0	0.0	57.0	57.0	0.0	21.0	21.0	21.0	21.0	0.0	21.0
Total Split (%)	17.5%	17.5%	0.0%	47.5%	47.5%	0.0%	17.5%	17.5%	17.5%	17.5%	0.0%	18%
Maximum Green (s)	16.0	16.0		52.0	52.0		16.0	16.0	16.0	16.0		16.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0		1.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lag		Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Recall Mode	None	Min		None	Min		None	C-Max	C-Max	C-Max		None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
90th %ile Green (s)	6.3	11.5		52.0	57.2		20.5	41.5	41.5	16.0		0.0
90th %ile Term Code	Gap	Gap		Max	Hold		Max	Coord	Coord	Coord		Skip
70th %ile Green (s)	0.0	10.1		52.0	67.1		21.9	42.9	42.9	16.0		0.0
70th %ile Term Code	Skip	Gap		Max	Hold		Max	Coord	Coord	Coord		Skip
50th %ile Green (s)	0.0	9.1		52.0	66.1		20.1	43.9	43.9	18.8		0.0
50th %ile Term Code	Skip	Gap		Max	Hold		Gap	Coord	Coord	Coord		Skip
30th %ile Green (s)	0.0	8.1		52.0	65.1		17.1	44.9	44.9	22.8		0.0
30th %ile Term Code	Skip	Gap		Max	Hold		Gap	Coord	Coord	Coord		Skip
10th %ile Green (s)	0.0	6.6		52.0	63.6		13.2	46.4	46.4	28.2		0.0
10th %ile Term Code	Skip	Gap		Max	Hold		Gap	Coord	Coord	Coord		Skip

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	98	968	2203	84	10	264	48	515	0	17	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	2.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	0.88		0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	1583	1770	1863	2787		3539	1583
Flt Permitted	0.70	1.00	1.00	0.55	1.00	1.00	0.64	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1298	3539	1583	1998	1863	1583	1191	1863	2787		3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	109	1076	2448	93	11	293	53	572	0	19	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	115	0	0	0
Lane Group Flow (vph)	8	109	1076	2448	93	11	293	53	457	0	19	2
Turn Type	pm+pt		Free	pm+pt		Free	pm+pt		custom	pm+pt		Free
Protected Phases	1	6		5	2		7	4	4	3	8	
Permitted Phases	6		Free	2		Free	4		5	8		Free
Actuated Green, G (s)	14.4	13.1	120.0	70.1	63.8	120.0	39.9	39.9	91.9		16.3	120.0
Effective Green, g (s)	18.4	15.1	120.0	72.1	65.8	120.0	41.9	41.9	95.9		18.3	120.0
Actuated g/C Ratio	0.15	0.13	1.00	0.60	0.55	1.00	0.35	0.35	0.80		0.15	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	212	445	1583	1846	1022	1583	515	650	2297		540	1583
v/s Ratio Prot	0.00	0.03		c0.60	0.05		0.10	0.03	0.07		0.01	
v/s Ratio Perm	0.00		c0.68	c0.20		0.01	0.10		0.09			0.00
v/c Ratio	0.04	0.24	0.68	1.33	0.09	0.01	0.57	0.08	0.20		0.04	0.00
Uniform Delay, d1	43.3	47.3	0.0	21.1	12.9	0.0	30.5	26.2	2.9		43.3	0.0
Progression Factor	1.00	1.00	1.00	0.86	0.78	1.00	0.81	0.85	0.00		1.00	1.00
Incremental Delay, d2	0.1	0.3	2.4	149.7	0.0	0.0	1.4	0.2	0.0		0.1	0.0
Delay (s)	43.4	47.6	2.4	167.8	10.1	0.0	26.2	22.4	0.0		43.4	0.0
Level of Service	D	D	A	F	B	A	C	C	A		D	A
Approach Delay (s)		6.8			161.3			9.7			39.3	
Approach LOS		A			F			A			D	

Intersection Summary			
HCM Average Control Delay	91.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Protected Phases	4		1	2	2	
Permitted Phases		4	2			2
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	11.0	79.0	79.0	79.0
Total Split (%)	25.0%	25.0%	9.2%	65.8%	65.8%	65.8%
Maximum Green (s)	25.0	25.0	6.0	74.0	74.0	74.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
90th %ile Green (s)	25.0	25.0	6.0	74.0	74.0	74.0
90th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
70th %ile Green (s)	25.0	25.0	6.0	74.0	74.0	74.0
70th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
50th %ile Green (s)	25.0	25.0	6.0	74.0	74.0	74.0
50th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
30th %ile Green (s)	25.0	25.0	6.0	74.0	74.0	74.0
30th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
10th %ile Green (s)	25.0	25.0	6.0	74.0	74.0	74.0
10th %ile Term Code	Max	Max	Max	Coord	Coord	Coord

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 90 (75%), Referenced to phase 2:NBSB, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	53	973	292	551	762	0	0	889	2656
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	0.88	1.00	0.91			0.91	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3530	2787	1770	5085			5085	1583
Flt Permitted					1.00	1.00	0.25	1.00			1.00	1.00
Satd. Flow (perm)					3530	2787	462	5085			5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	59	1081	324	612	847	0	0	988	2951
RTOR Reduction (vph)	0	0	0	0	0	178	0	0	0	0	0	3
Lane Group Flow (vph)	0	0	0	0	1140	146	612	847	0	0	988	2948
Turn Type				Split		Perm	pm+pt					Perm
Protected Phases				4	4		1	2			2	
Permitted Phases						4	2					2
Actuated Green, G (s)					25.0	25.0	80.0	74.0			74.0	74.0
Effective Green, g (s)					27.0	27.0	84.0	76.0			76.0	76.0
Actuated g/C Ratio					0.22	0.22	0.70	0.63			0.63	0.63
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					794	627	411	3221			3221	1003
v/s Ratio Prot					c0.32		c0.10	0.17			0.19	
v/s Ratio Perm						0.05	0.94					c1.86
v/c Ratio					1.44	0.23	1.49	0.26			0.31	2.94
Uniform Delay, d1					46.5	38.0	12.8	9.7			10.0	22.0
Progression Factor					1.00	1.00	3.78	1.02			0.33	0.40
Incremental Delay, d2					203.3	0.2	232.0	0.2			0.0	873.1
Delay (s)					249.8	38.2	280.5	10.1			3.3	881.9
Level of Service					F	D	F	B			A	F
Approach Delay (s)		0.0			203.0			123.5			661.5	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM Average Control Delay	449.3	HCM Level of Service	F
HCM Volume to Capacity ratio	2.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	223.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Protected Phases		4		2		1	2
Permitted Phases	4		4		2	2	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	45.0	45.0	45.0	50.0	50.0	25.0	50.0
Total Split (%)	37.5%	37.5%	37.5%	41.7%	41.7%	20.8%	41.7%
Maximum Green (s)	39.0	39.0	39.0	44.0	44.0	19.0	44.0
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lead/Lag				Lag	Lag	Lead	Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max	C-Max	Max	C-Max
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
90th %ile Green (s)	32.0	32.0	32.0	44.0	44.0	26.0	44.0
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	MaxR	Coord
70th %ile Green (s)	26.7	26.7	26.7	44.0	44.0	31.3	44.0
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	MaxR	Coord
50th %ile Green (s)	23.8	23.8	23.8	44.0	44.0	34.2	44.0
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	MaxR	Coord
30th %ile Green (s)	20.8	20.8	20.8	44.0	44.0	37.2	44.0
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	MaxR	Coord
10th %ile Green (s)	16.8	16.8	16.8	44.0	44.0	41.2	44.0
10th %ile Term Code	Gap	Gap	Gap	Coord	Coord	MaxR	Coord

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 94 (78%), Referenced to phase 2:NBSB, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	405	304	321	0	0	0	0	767	98	271	590	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95	1.00					0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.24	1.00	
Satd. Flow (perm)	3433	3539	1583					5085	1583	866	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	450	338	357	0	0	0	0	852	109	301	656	0
RTOR Reduction (vph)	0	0	283	0	0	0	0	0	67	0	0	0
Lane Group Flow (vph)	450	338	74	0	0	0	0	852	42	301	656	0
Turn Type	Perm		Perm						Perm	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4						2	2		
Actuated Green, G (s)	24.0	24.0	24.0					44.0	44.0	78.0	44.0	
Effective Green, g (s)	26.0	26.0	25.0					46.0	46.0	82.0	46.0	
Actuated g/C Ratio	0.22	0.22	0.21					0.38	0.38	0.68	0.38	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	744	767	330					1949	607	1362	1357	
v/s Ratio Prot		0.10						0.17		c0.07	c0.19	
v/s Ratio Perm	c0.13		0.05						0.03	0.08		
v/c Ratio	0.60	0.44	0.23					0.44	0.07	0.22	0.48	
Uniform Delay, d1	42.4	40.7	39.5					27.4	23.4	7.3	28.0	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.82	0.60	
Incremental Delay, d2	1.4	0.4	0.3					0.7	0.2	0.4	1.2	
Delay (s)	43.8	41.1	39.8					28.1	23.7	6.4	18.1	
Level of Service	D	D	D					C	C	A	B	
Approach Delay (s)		41.7			0.0			27.6			14.4	
Approach LOS		D			A			C			B	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	225.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	55	72	743	93	77	836
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	61	80	826	103	86	929
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			454			250
pX, platoon unblocked	0.86					
vC, conflicting volume	1513	464			929	
vC1, stage 1 conf vol	877					
vC2, stage 2 conf vol	636					
vCu, unblocked vol	1281	464			929	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	85			88	
cM capacity (veh/h)	320	545			732	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	141	550	379	86	464	464
Volume Left	61	0	0	86	0	0
Volume Right	80	0	103	0	0	0
cSH	417	1700	1700	732	1700	1700
Volume to Capacity	0.34	0.32	0.22	0.12	0.27	0.27
Queue Length 95th (ft)	37	0	0	10	0	0
Control Delay (s)	18.0	0.0	0.0	10.6	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	18.0	0.0		0.9		
Approach LOS	C					

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Protected Phases	4	4	8			2		6	
Permitted Phases				8	2		6		6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	50.0	50.0	50.0	50.0	50.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	55.6%	55.6%	55.6%	55.6%	55.6%
Maximum Green (s)	16.0	16.0	16.0	16.0	46.0	46.0	46.0	46.0	46.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0
90th %ile Green (s)	16.0	16.0	8.9	8.9	53.1	53.1	53.1	53.1	53.1
90th %ile Term Code	Max	Max	Gap	Gap	Coord	Coord	Coord	Coord	Coord
70th %ile Green (s)	15.3	15.3	6.8	6.8	55.9	55.9	55.9	55.9	55.9
70th %ile Term Code	Gap	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord
50th %ile Green (s)	13.2	13.2	6.0	6.0	58.8	58.8	58.8	58.8	58.8
50th %ile Term Code	Gap	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord
30th %ile Green (s)	11.1	11.1	5.5	5.5	61.4	61.4	61.4	61.4	61.4
30th %ile Term Code	Gap	Gap	Gap	Gap	Coord	Coord	Coord	Coord	Coord
10th %ile Green (s)	8.2	8.2	0.0	0.0	73.8	73.8	73.8	73.8	73.8
10th %ile Term Code	Gap	Gap	Skip	Skip	Coord	Coord	Coord	Coord	Coord

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	14	82	7	4	49	58	654	46	115	702	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1625			1803	1583	1770	1844		1770	1863	1583
Flt Permitted	0.95	1.00			0.97	1.00	0.25	1.00		0.25	1.00	1.00
Satd. Flow (perm)	1770	1625			1803	1583	469	1844		472	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	157	16	91	8	4	54	64	727	51	128	780	178
RTOR Reduction (vph)	0	78	0	0	0	51	0	2	0	0	0	60
Lane Group Flow (vph)	157	29	0	0	12	3	64	776	0	128	780	118
Turn Type	Split			Split		Perm	Perm			Perm		Perm
Protected Phases	4	4		8	8			2			6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	12.8	12.8			5.4	5.4	59.8	59.8		59.8	59.8	59.8
Effective Green, g (s)	12.8	12.8			5.4	5.4	59.8	59.8		59.8	59.8	59.8
Actuated g/C Ratio	0.14	0.14			0.06	0.06	0.66	0.66		0.66	0.66	0.66
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	252	231			108	95	312	1225		314	1238	1052
v/s Ratio Prot	c0.09	0.02			c0.01			c0.42			0.42	
v/s Ratio Perm						0.00	0.14			0.27		0.07
v/c Ratio	0.62	0.13			0.11	0.03	0.21	0.63		0.41	0.63	0.11
Uniform Delay, d1	36.3	33.7			40.0	39.8	5.9	8.7		6.9	8.7	5.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.7	0.2			0.5	0.1	1.5	2.5		3.9	2.4	0.2
Delay (s)	41.1	34.0			40.5	40.0	7.3	11.3		10.8	11.2	5.7
Level of Service	D	C			D	D	A	B		B	B	A
Approach Delay (s)		38.2			40.1			11.0			10.2	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	29	2	2	753	786	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	32	2	2	837	873	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					885	
pX, platoon unblocked	0.71	0.71	0.71			
vC, conflicting volume	1718	877	881			
vC1, stage 1 conf vol	877					
vC2, stage 2 conf vol	841					
vCu, unblocked vol	1810	617	622			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	99	100			
cM capacity (veh/h)	279	346	676			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	34	2	837	881
Volume Left	32	2	0	0
Volume Right	2	0	0	8
cSH	283	676	1700	1700
Volume to Capacity	0.12	0.00	0.49	0.52
Queue Length 95th (ft)	10	0	0	0
Control Delay (s)	19.5	10.3	0.0	0.0
Lane LOS	C	B		
Approach Delay (s)	19.5	0.0		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Right Turn Channelized						
Volume (veh/h)	374	273	302	307	218	455
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	416	303	336	341	242	506
Approach Volume (veh/h)		719	677		748	
Crossing Volume (veh/h)		242	416		336	
High Capacity (veh/h)		1145	998		1064	
High v/c (veh/h)		0.63	0.68		0.70	
Low Capacity (veh/h)		944	812		871	
Low v/c (veh/h)		0.76	0.83		0.86	

Intersection Summary			
Maximum v/c High	0.70		
Maximum v/c Low	0.86		
Intersection Capacity Utilization	119.8%	ICU Level of Service	H

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	285	235	137	403	225	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	317	261	152	448	250	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			578		1199	447
vC1, stage 1 conf vol					447	
vC2, stage 2 conf vol					752	
vCu, unblocked vol			578		1199	447
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			85		30	79
cM capacity (veh/h)			996		357	611

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	578	152	448	376
Volume Left	0	152	0	250
Volume Right	261	0	0	126
cSH	1700	996	1700	415
Volume to Capacity	0.34	0.15	0.26	0.91
Queue Length 95th (ft)	0	13	0	242
Control Delay (s)	0.0	9.3	0.0	55.6
Lane LOS		A		F
Approach Delay (s)	0.0	2.4		55.6
Approach LOS				F

Intersection Summary			
Average Delay	14.4		
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	NBL	NBT	NBR	SBL	SBT	SET	SER	NWL	NWT
Protected Phases	5	2		1	6	3		4	4
Permitted Phases	2		2	6			3		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	20.0	20.0	9.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	56.0	56.0	24.0	71.0	20.0	20.0	20.0	20.0
Total Split (%)	7.5%	46.7%	46.7%	20.0%	59.2%	16.7%	16.7%	16.7%	16.7%
Maximum Green (s)	4.0	51.0	51.0	19.0	66.0	15.0	15.0	15.0	15.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Walk Time (s)									
Flash Dont Walk (s)									
Pedestrian Calls (#/hr)									
90th %ile Green (s)	4.0	51.0	51.0	19.0	66.0	9.9	9.9	20.1	20.1
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Gap	Gap	Max	Max
70th %ile Green (s)	4.0	51.0	51.0	19.0	66.0	7.3	7.3	22.7	22.7
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Gap	Gap	Max	Max
50th %ile Green (s)	4.7	53.8	53.8	16.9	66.0	6.4	6.4	22.9	22.9
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Gap	Gap	Gap	Gap
30th %ile Green (s)	7.8	59.6	59.6	14.2	66.0	5.7	5.7	20.5	20.5
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Gap	Gap	Gap	Gap
10th %ile Green (s)	7.0	79.3	79.3	9.3	81.6	0.0	0.0	16.4	16.4
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Skip	Skip	Gap	Gap

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 44 (37%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Control Type: Actuated-Coordinated

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	105	518	7	340	1728	0	2	12	60	206	12	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0			3.0	4.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539			1850	1583	1770	1607	
Flt Permitted	0.07	1.00	1.00	0.35	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	124	3539	1583	654	3539			1850	1583	1770	1607	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	576	8	378	1920	0	2	13	67	229	13	143
RTOR Reduction (vph)	0	0	4	0	0	0	0	0	63	0	116	0
Lane Group Flow (vph)	117	576	4	378	1920	0	0	15	4	229	40	0
Turn Type	pm+pt		Perm	pm+pt			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2		2	6					3			
Actuated Green, G (s)	63.4	57.9	57.9	78.6	68.1			5.9	5.9	20.5	20.5	
Effective Green, g (s)	67.4	59.9	59.9	80.6	70.1			7.9	6.9	22.5	22.5	
Actuated g/C Ratio	0.56	0.50	0.50	0.67	0.58			0.07	0.06	0.19	0.19	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	173	1767	790	604	2067			122	91	332	301	
v/s Ratio Prot	c0.04	0.16		0.09	c0.54			c0.01		c0.13	0.02	
v/s Ratio Perm	0.34		0.00	0.33					0.00			
v/c Ratio	0.68	0.33	0.01	0.63	0.93			0.12	0.04	0.69	0.13	
Uniform Delay, d1	24.9	18.0	15.1	9.4	22.7			52.8	53.4	45.5	40.6	
Progression Factor	1.46	0.66	0.59	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.9	0.5	0.0	2.0	8.9			0.5	0.2	5.9	0.2	
Delay (s)	46.1	12.4	9.0	11.4	31.6			53.2	53.6	51.4	40.8	
Level of Service	D	B	A	B	C			D	D	D	D	
Approach Delay (s)		18.0			28.3			53.6			47.1	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Minimum Initial (s)	6.0	10.0	6.0	6.0	10.0	6.0	6.0	15.0	6.0	6.0	15.0	6.0
Minimum Split (s)	11.0	20.0	11.0	11.0	20.0	11.0	11.0	20.0	11.0	11.0	20.0	11.0
Total Split (s)	11.0	20.0	13.0	15.0	24.0	14.0	13.0	71.0	15.0	14.0	72.0	11.0
Total Split (%)	9.2%	16.7%	10.8%	12.5%	20.0%	11.7%	10.8%	59.2%	12.5%	11.7%	60.0%	9.2%
Maximum Green (s)	6.0	15.0	8.0	10.0	19.0	9.0	8.0	66.0	10.0	9.0	67.0	6.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
90th %ile Green (s)	6.3	10.0	10.2	10.3	14.0	10.3	10.2	69.4	10.3	10.3	69.5	6.3
90th %ile Term Code	Max	Min	Gap	Max	Hold	Gap	Gap	Coord	Max	Gap	Coord	Max
70th %ile Green (s)	7.4	10.0	8.0	15.4	18.0	9.6	8.0	65.0	15.4	9.6	66.6	7.4
70th %ile Term Code	Gap	Min	Gap	Gap	Hold	Gap	Gap	Coord	Gap	Gap	Coord	Gap
50th %ile Green (s)	6.5	10.0	6.4	13.7	17.2	8.4	6.4	67.9	13.7	8.4	69.9	6.5
50th %ile Term Code	Gap	Min	Gap	Gap	Hold	Gap	Gap	Coord	Gap	Gap	Coord	Gap
30th %ile Green (s)	14.3	0.0	6.4	14.3	0.0	6.3	6.4	84.4	14.3	6.3	84.3	14.3
30th %ile Term Code	Hold	Skip	Gap	Gap	Skip	Gap	Gap	Coord	Gap	Gap	Coord	Hold
10th %ile Green (s)	11.6	0.0	6.0	11.6	0.0	6.0	6.0	87.4	11.6	6.0	87.4	11.6
10th %ile Term Code	Hold	Skip	Min	Gap	Skip	Min	Min	Coord	Gap	Min	Coord	Hold

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	24	62	295	34	77	79	592	194	156	1771	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	5085	1583	1770	5085	1583
Flt Permitted	0.73	1.00	1.00	0.54	1.00	1.00	0.06	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)	1364	1863	1583	1944	1863	1583	119	5085	1583	682	5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	40	27	69	328	38	86	88	658	216	173	1968	130
RTOR Reduction (vph)	0	0	16	0	0	70	0	0	54	0	0	36
Lane Group Flow (vph)	40	27	53	328	38	16	88	658	162	173	1968	94
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	15.2	6.0	13.4	23.0	9.9	18.0	80.2	72.8	85.9	81.6	73.5	82.7
Effective Green, g (s)	19.2	8.0	17.4	26.1	11.9	22.0	84.2	74.8	89.9	85.6	75.5	86.7
Actuated g/C Ratio	0.16	0.07	0.14	0.22	0.10	0.18	0.70	0.62	0.75	0.71	0.63	0.72
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Grp Cap (vph)	256	124	269	610	185	330	213	3170	1226	578	3199	1183
v/s Ratio Prot	0.01	0.01	0.02	c0.07	0.02	0.00	c0.03	0.13	0.02	c0.03	c0.39	0.01
v/s Ratio Perm	0.01		0.02	c0.05		0.01	0.26		0.09	0.19		0.05
v/c Ratio	0.16	0.22	0.20	0.54	0.21	0.05	0.41	0.21	0.13	0.30	0.62	0.08
Uniform Delay, d1	43.3	53.0	45.1	40.7	49.7	40.4	11.1	9.8	4.2	5.6	13.5	4.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.86	0.71	1.23	0.45	0.43	0.05
Incremental Delay, d2	0.1	0.9	0.1	0.5	0.6	0.0	0.5	0.1	0.0	0.1	0.4	0.0
Delay (s)	43.4	53.9	45.3	41.1	50.3	40.4	21.0	7.1	5.2	2.6	6.3	0.3
Level of Service	D	D	D	D	D	D	C	A	A	A	A	A
Approach Delay (s)		46.4			41.8			7.9			5.6	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Protected Phases	4	14	1	2	2	
Permitted Phases		14	2		2	2
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		8.0	21.0	21.0	21.0
Total Split (s)	24.0	41.0	17.0	79.0	79.0	79.0
Total Split (%)	20.0%	34.2%	14.2%	65.8%	65.8%	65.8%
Maximum Green (s)	19.0		13.0	74.0	74.0	74.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		0.0	1.0	1.0	1.0
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0
Recall Mode	None		None	C-Max	C-Max	C-Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
90th %ile Green (s)	19.0		7.5	79.5	79.5	79.5
90th %ile Term Code	Max		Gap	Coord	Coord	Coord
70th %ile Green (s)	19.0		7.1	79.9	79.9	79.9
70th %ile Term Code	Max		Gap	Coord	Coord	Coord
50th %ile Green (s)	19.0		5.9	81.1	81.1	81.1
50th %ile Term Code	Max		Gap	Coord	Coord	Coord
30th %ile Green (s)	17.3		5.6	83.1	83.1	83.1
30th %ile Term Code	Gap		Gap	Coord	Coord	Coord
10th %ile Green (s)	14.3		5.5	86.2	86.2	86.2
10th %ile Term Code	Gap		Gap	Coord	Coord	Coord

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 81 (68%), Referenced to phase 2:NBSB, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	144	300	489	26	422	0	0	1194	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	2.0	2.0	3.0			3.0	3.0
Lane Util. Factor					0.91	0.88	1.00	0.91			0.91	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					5004	2787	1770	5085			5085	1583
Flt Permitted					0.98	1.00	0.17	1.00			1.00	1.00
Satd. Flow (perm)					5004	2787	318	5085			5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	160	333	543	29	469	0	0	1327	706
RTOR Reduction (vph)	0	0	0	0	0	416	0	0	0	0	0	130
Lane Group Flow (vph)	0	0	0	0	493	127	29	469	0	0	1327	576
Turn Type				Split		custom	pm+pt					Perm
Protected Phases				4	4	1 4	1	2			2	
Permitted Phases						1 4	2				2	2
Actuated Green, G (s)					17.7	29.0	88.3	82.0			82.0	82.0
Effective Green, g (s)					19.7	28.0	92.3	84.0			84.0	84.0
Actuated g/C Ratio					0.16	0.23	0.77	0.70			0.70	0.70
Clearance Time (s)					5.0		4.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					821	650	345	3560			3560	1108
v/s Ratio Prot					c0.10	c0.05	0.01	0.09			0.26	
v/s Ratio Perm							0.06					c0.36
v/c Ratio					0.60	0.19	0.08	0.13			0.37	0.52
Uniform Delay, d1					46.5	36.9	3.7	5.9			7.3	8.5
Progression Factor					1.00	1.00	1.42	1.16			0.64	0.58
Incremental Delay, d2					1.2	0.1	0.1	0.1			0.2	1.4
Delay (s)					47.7	37.1	5.4	7.0			4.9	6.3
Level of Service					D	D	A	A			A	A
Approach Delay (s)		0.0			42.2			6.9			5.4	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NET	SWL	SWT
Protected Phases		4		2	1	2
Permitted Phases	4		4		2	1
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	9.0	21.0
Total Split (s)	44.0	44.0	44.0	27.0	49.0	27.0
Total Split (%)	36.7%	36.7%	36.7%	22.5%	40.8%	22.5%
Maximum Green (s)	39.0	39.0	39.0	22.0	44.0	22.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag				Lag	Lead	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	C-Min	None	C-Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
90th %ile Green (s)	37.1	37.1	37.1	24.1	43.8	24.1
90th %ile Term Code	Gap	Gap	Gap	Coord	Gap	Coord
70th %ile Green (s)	31.8	31.8	31.8	32.1	41.1	32.1
70th %ile Term Code	Gap	Gap	Gap	Coord	Gap	Coord
50th %ile Green (s)	27.6	27.6	27.6	40.6	36.8	40.6
50th %ile Term Code	Gap	Gap	Gap	Coord	Gap	Coord
30th %ile Green (s)	24.0	24.0	24.0	47.0	34.0	47.0
30th %ile Term Code	Gap	Gap	Gap	Coord	Gap	Coord
10th %ile Green (s)	18.9	18.9	18.9	55.9	30.2	55.9
10th %ile Term Code	Gap	Gap	Gap	Coord	Gap	Coord

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 106 (88%), Referenced to phase 2:NESW, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	187	273	62	0	0	0	0	201	141	882	410	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Lane Util. Factor	0.95	0.95	1.00					0.91		0.97	0.95	
Frt	1.00	1.00	0.85					0.94		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1681	1764	1583					4770		3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00		0.47	1.00	
Satd. Flow (perm)	1681	1764	1583					4770		1714	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	208	303	69	0	0	0	0	223	157	980	456	0
RTOR Reduction (vph)	0	0	52	0	0	0	0	87	0	0	0	0
Lane Group Flow (vph)	187	324	17	0	0	0	0	293	0	980	456	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4							2	1	
Actuated Green, G (s)	27.9	27.9	27.9					39.9		77.1	77.1	
Effective Green, g (s)	29.9	29.9	29.9					41.9		81.1	81.1	
Actuated g/C Ratio	0.25	0.25	0.25					0.35		0.68	0.68	
Clearance Time (s)	5.0	5.0	5.0					5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)	419	440	394					1666		1720	2480	
v/s Ratio Prot								0.06		c0.19	0.06	
v/s Ratio Perm	0.11	0.18	0.01							c0.20	0.06	
v/c Ratio	0.45	0.74	0.04					0.18		0.57	0.18	
Uniform Delay, d1	38.1	41.4	34.2					27.1		8.9	7.2	
Progression Factor	1.00	1.00	1.00					1.00		0.49	0.51	
Incremental Delay, d2	0.8	6.3	0.0					0.2		0.4	0.0	
Delay (s)	38.8	47.7	34.2					27.3		4.8	3.7	
Level of Service	D	D	C					C		A	A	
Approach Delay (s)		43.3			0.0			27.3			4.4	
Approach LOS		D			A			C			A	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

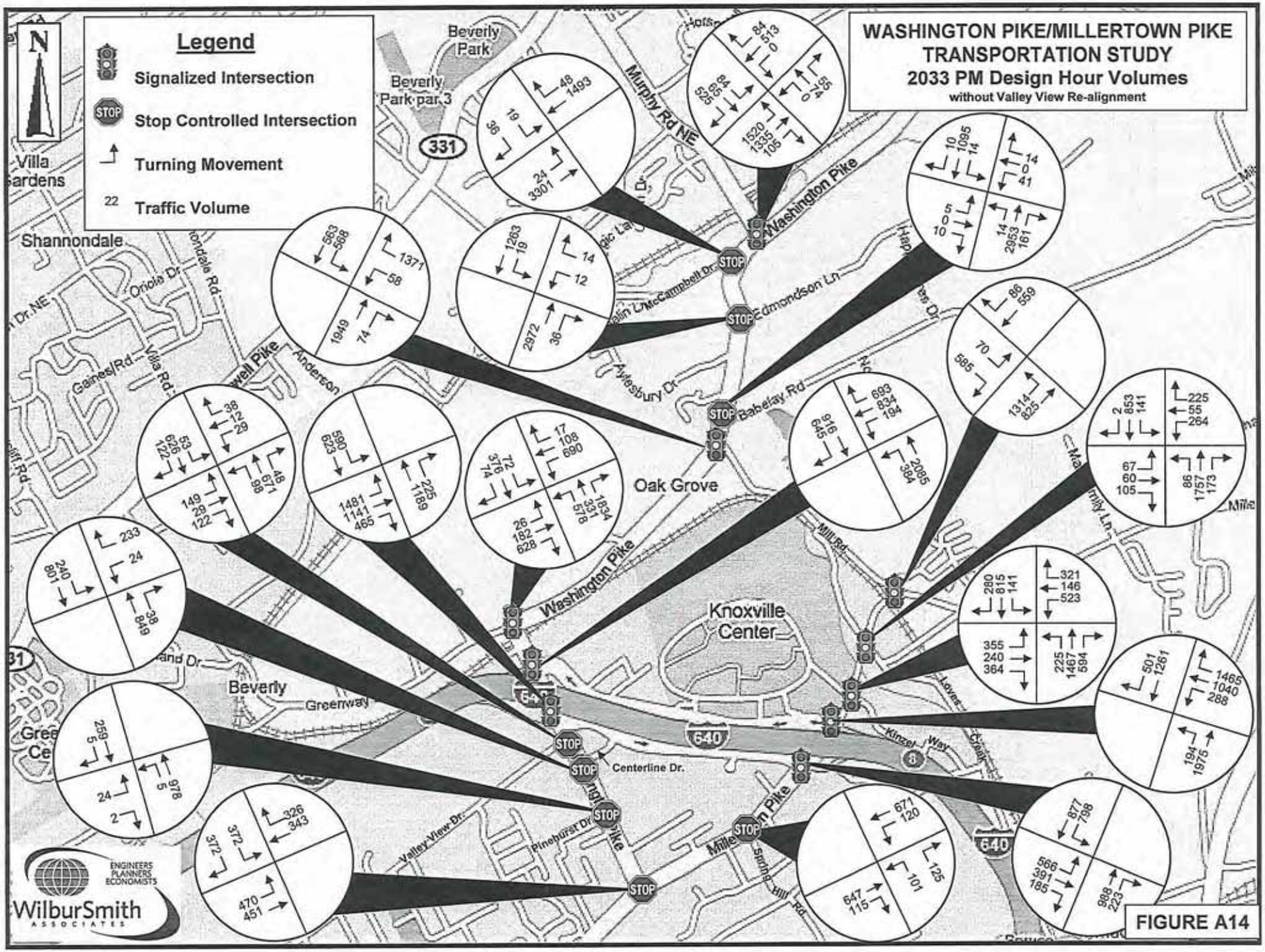
Lane Group	EBL	EBT	WBT	SBL	SBR
Protected Phases		4	8	6	
Permitted Phases	4				6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	16.0	16.0	16.0	16.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Min	C-Min
Walk Time (s)	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0
90th %ile Green (s)	16.0	16.0	16.0	16.0	16.0
90th %ile Term Code	Max	Max	Max	Coord	Coord
70th %ile Green (s)	16.0	16.0	16.0	16.0	16.0
70th %ile Term Code	Max	Max	Max	Coord	Coord
50th %ile Green (s)	16.0	16.0	16.0	16.0	16.0
50th %ile Term Code	Max	Max	Max	Coord	Coord
30th %ile Green (s)	16.0	16.0	16.0	16.0	16.0
30th %ile Term Code	Max	Max	Max	Coord	Coord
10th %ile Green (s)	16.0	16.0	16.0	16.0	16.0
10th %ile Term Code	Max	Max	Max	Coord	Coord

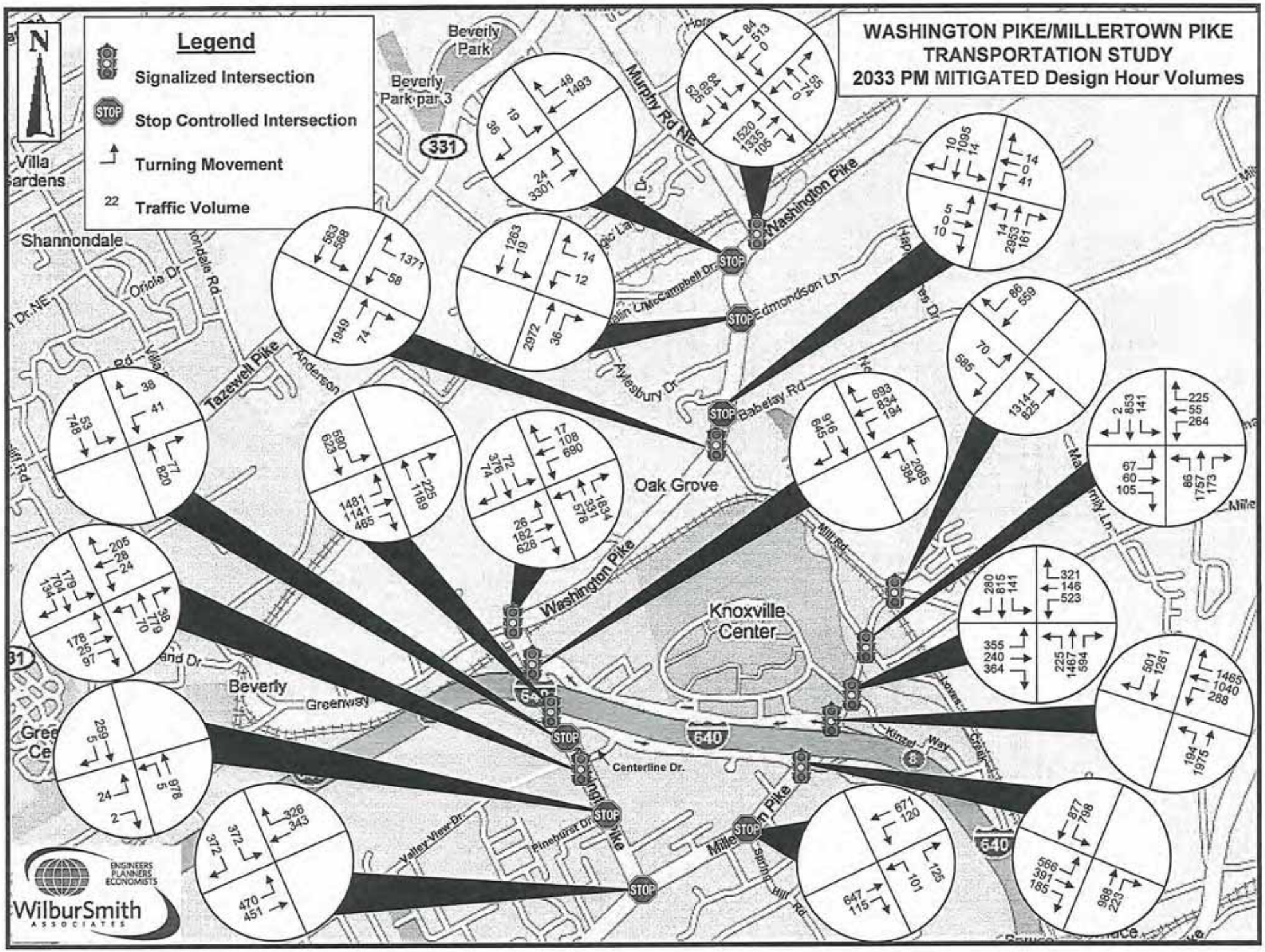
Intersection Summary

Cycle Length: 40
Actuated Cycle Length: 40
Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green
Control Type: Actuated-Coordinated

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	396	194	997	93	58	1254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1841		1770	1583
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	438	1863	1841		1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	440	216	1108	103	64	1393
RTOR Reduction (vph)	0	0	9	0	0	18
Lane Group Flow (vph)	440	216	1202	0	64	1375
Turn Type	Perm					Perm
Protected Phases		4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	16.0	16.0	16.0		16.0	16.0
Effective Green, g (s)	17.0	17.0	17.0		17.0	17.0
Actuated g/C Ratio	0.42	0.42	0.42		0.42	0.42
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	186	792	782		752	673
v/s Ratio Prot		0.12	0.65		0.04	
v/s Ratio Perm	c1.00					c0.87
v/c Ratio	2.37	0.27	1.54		0.09	2.04
Uniform Delay, d1	11.5	7.5	11.5		6.9	11.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	630.8	0.2	248.3		0.2	474.3
Delay (s)	642.3	7.7	259.8		7.1	485.8
Level of Service	F	A	F		A	F
Approach Delay (s)		433.4	259.8		464.8	
Approach LOS		F	F		F	

Intersection Summary			
HCM Average Control Delay	383.9	HCM Level of Service	F
HCM Volume to Capacity ratio	2.20 ✓		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	142.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			


WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 PM Design Hour Volumes
without Valley View Re-alignment
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
N
Beverly Park
Beverly Park par 3
331
Villa Gardens
Shannondale
Oriole Dr
Gaines Rd
Villa Rd
Anderson
Murphy Rd NE
Washington Pike
Edmondson Ln
McCampbell Dr
Aylesbury Dr
Babelay Rd
Oak Grove
Mill Rd
Knoxville Center
Beverly
Greenway
640
Kinzel Way
Centerline Dr.
Valley View Dr.
Pineburst Dr
Millertown Pike
Spring Hill Rd
Loves Creek
ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES
FIGURE A14


WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 PM MITIGATED Design Hour Volumes
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
22 Traffic Volume
N
Beverly Park
Beverly Park par 3
Villa Gardens
Shannondale
Oriole Dr
Tazewell Pike
Anderson
Murphy Rd NE
Washington Pike
McCampbell Dr
Edmondson Ln
Aylesbury Dr
Babelay Rd
Oak Grove
Mill Rd
Knoxville Center
Beverly
Greenway
Centerline Dr.
Valley View Dr.
Pinehurst Dr
Millertown Pike
Spring Hill Rd
Kinzel Way
Lovers Crk
540
331
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

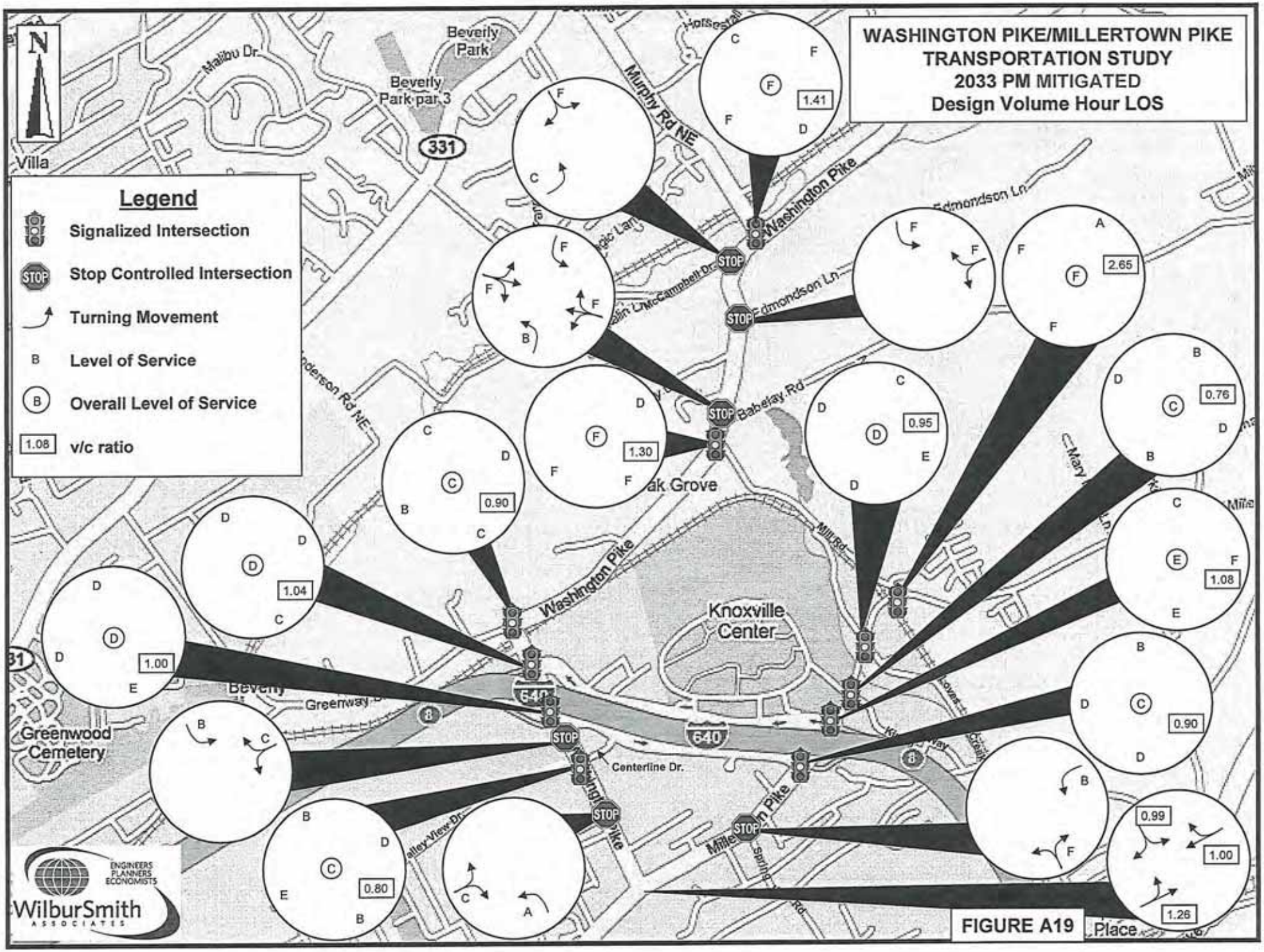

WASHINGTON PIKE/MILLERTOWN PIKE
TRANSPORTATION STUDY
2033 PM MITIGATED
Design Volume Hour LOS
Legend
Signalized Intersection
Stop Controlled Intersection
Turning Movement
Level of Service
Overall Level of Service
v/c ratio
N
Beverly Park
Beverly Park par 3
Malibu Dr
Murphy Rd NE
Washington Pike
Edmondson Ln
McCampbell Dr
Babelay Rd
Mill Rd
Knoxville Center
Greenwood Cemetery
Greenway
Centerline Dr.
Miller Springs Rd
640
331
1.41
2.65
0.76
0.95
1.30
0.90
1.04
1.08
1.00
0.90
0.99
1.00
1.26
0.80
WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS

FIGURE A19

Lane Group	NBT	SBL	SBT	SBR	NEL	NET	SWT
Lane Configurations							
Volume (vph)	74	84	65	525	1520	1335	513
Turn Type		Perm		pm+ov	pm+pt		
Protected Phases	2		6	7	7	4	8
Permitted Phases		6		6	4		
Detector Phase	2	6	6	7	7	4	8
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	65.0	65.0	85.0	20.0
Total Split (%)	19.0%	19.0%	19.0%	61.9%	61.9%	81.0%	19.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	3.0	4.0	3.0	3.0	3.0	3.0
Lead/Lag				Lead	Lead		Lag
Lead-Lag Optimize?							
Recall Mode	Min	Min	Min	None	None	None	None

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 105
Natural Cycle: 140
Control Type: Actuated-Uncoordinated

Splits and Phases: 22: Murphy Road & Washington Pike

ø2	ø4	
20 s	85 s	
ø6	ø7	ø8
20 s	65 s	20 s

Lane Group	NBT	SBT	SBR	NEL	NET	SWT
Lane Group Flow (vph)	143	165	583	1689	1600	663
v/c Ratio	0.49	1.01	0.27	1.51	0.58	1.16
Control Delay	38.3	119.7	3.4	256.8	5.6	127.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	119.7	3.4	256.8	5.6	127.6
Queue Length 50th (ft)	70	~114	47	~1551	179	~274
Queue Length 95th (ft)	133	#250	65	#1820	223	#392
Internal Link Dist (ft)	209	5075			327	483
Turn Bay Length (ft)						
Base Capacity (vph)	293	163	2180	1116	2739	574
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	1.01	0.27	1.51	0.58	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	NBT	SBL	SBT	SBR	NEL	NET	SWT
Protected Phases	2		6	7	7	4	8
Permitted Phases		6		6	4		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	22.0	68.0	68.0	88.0	20.0
Total Split (%)	20.0%	20.0%	20.0%	61.8%	61.8%	80.0%	18.2%
Maximum Green (s)	18.0	18.0	18.0	64.0	64.0	84.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead/Lag				Lead	Lead		Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	None	None	None	None
Walk Time (s)	5.0	5.0	5.0			5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0	0			0	0
90th %ile Green (s)	18.0	18.0	18.0	64.0	64.0	84.0	16.0
90th %ile Term Code	Max	Max	Max	Max	Max	Hold	Max
70th %ile Green (s)	18.0	18.0	18.0	64.0	64.0	84.0	16.0
70th %ile Term Code	Hold	Max	Max	Max	Max	Hold	Max
50th %ile Green (s)	18.0	18.0	18.0	64.0	64.0	84.0	16.0
50th %ile Term Code	Hold	Max	Max	Max	Max	Hold	Max
30th %ile Green (s)	18.0	18.0	18.0	64.0	64.0	84.0	16.0
30th %ile Term Code	Hold	Max	Max	Max	Max	Hold	Max
10th %ile Green (s)	17.1	17.1	17.1	64.0	64.0	84.0	16.0
10th %ile Term Code	Hold	Gap	Gap	Max	Max	Hold	Max

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 109.8
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 110
70th %ile Actuated Cycle: 110
50th %ile Actuated Cycle: 110
30th %ile Actuated Cycle: 110
10th %ile Actuated Cycle: 109.1

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	74	55	84	65	525	1520	1335	105	0	513	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	3.0	3.0	3.0			3.0	
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95			0.95	
Frt		0.94			1.00	0.85	1.00	0.99			0.98	
Flt Protected		1.00			0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1755			1812	2787	1770	3500			3465	
Flt Permitted		1.00			0.58	1.00	0.20	1.00			1.00	
Satd. Flow (perm)		1755			1084	2787	373	3500			3465	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	82	61	93	72	583	1689	1483	117	0	570	93
RTOR Reduction (vph)	0	24	0	0	0	3	0	5	0	0	12	0
Lane Group Flow (vph)	0	119	0	0	165	580	1689	1595	0	0	651	0
Turn Type	Perm			Perm		pm+ov	pm+pt			Perm		
Protected Phases		2			6	7	7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)		17.8			17.8	81.8	84.0	84.0			16.0	
Effective Green, g (s)		17.8			17.8	83.8	85.0	85.0			17.0	
Actuated g/C Ratio		0.16			0.16	0.76	0.77	0.77			0.15	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)		285			176	2203	1116	2709			536	
v/s Ratio Prot		0.07				0.16	c0.90	0.46			0.19	
v/s Ratio Perm					c0.15	0.05	c0.28					
v/c Ratio		0.42			0.94	0.26	1.51	0.59			1.21	
Uniform Delay, d1		41.3			45.5	3.9	18.8	5.1			46.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2		1.0			49.4	0.1	235.7	0.3			112.9	
Delay (s)		42.3			94.9	3.9	254.5	5.5			159.3	
Level of Service		D			F	A	F	A			F	
Approach Delay (s)		42.3			24.0			133.4			159.3	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	117.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	7.0
Intersection Capacity Utilization	129.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR	SBR2	SEL	SER	NEL2	NEL
Lane Configurations						
Volume (veh/h)	1493	48	19	36	24	3301
Sign Control	Free		Stop			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1659	53	21	40	27	3668
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					Raised
Median storage veh)						1
Upstream signal (ft)	407					
pX, platoon unblocked			0.85	0.85	0.85	
vC, conflicting volume			3573	856	1712	
vC1, stage 1 conf vol			1686			
vC2, stage 2 conf vol			1887			
vCu, unblocked vol			3671	490	1492	
tC, single (s)			6.8	6.9	4.1	
tC, 2 stage (s)			5.8			
tF (s)			3.5	3.3	2.2	
p0 queue free %			62	91	93	
cM capacity (veh/h)			56	448	381	

Direction, Lane #	SB 1	SB 2	SE 1	NE 1	NE 2	NE 3
Volume Total	1106	606	61	27	1834	1834
Volume Left	0	0	21	27	0	0
Volume Right	0	53	40	0	0	0
cSH	1700	1700	130	381	1700	1700
Volume to Capacity	0.65	0.36	0.47	0.07	1.08	1.08
Queue Length 95th (ft)	0	0	53	6	0	0
Control Delay (s)	0.0	0.0	54.9	15.2	0.0	0.0
Lane LOS			F	C		
Approach Delay (s)	0.0		54.9	0.1		
Approach LOS			F			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

EDMONDSON LANE

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	14	2972	36	19	1263
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	16	3302	40	21	1403
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	4066	1671			3342	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4066	1671			3342	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	82			74	
cM capacity (veh/h)	1	85			82	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	29	2201	1141	21	702	702
Volume Left	13	0	0	21	0	0
Volume Right	16	0	40	0	0	0
cSH	3	1700	1700	82	1700	1700
Volume to Capacity	10.00	1.29	0.67	0.26	0.41	0.41
Queue Length 95th (ft)	Err	0	0	23	0	0
Control Delay (s)	Err	0.0	0.0	63.5	0.0	0.0
Lane LOS	F			F		
Approach Delay (s)	Err	0.0		0.9		
Approach LOS	F					

Intersection Summary			
Average Delay	60.5		
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	10	41	0	14	14	2953	161	14	1095	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	11	46	0	16	16	3281	179	16	1217	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								687				
pX, platoon unblocked	0.54	0.54		0.54	0.54	0.54				0.54		
vC, conflicting volume	2941	4744	614	4052	4661	1730	1228			3460		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2891	6211	614	4937	6057	662	1228			3847		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	97	0	100	93	97			44		
cM capacity (veh/h)	2	0	435	0	0	220	563			28		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	17	61	16	2187	1273	16	811	417
Volume Left	6	46	16	0	0	16	0	0
Volume Right	11	16	0	0	179	0	0	11
cSH	6	0	563	1700	1700	28	1700	1700
Volume to Capacity	2.83	985.50	0.03	1.29	0.75	0.56	0.48	0.25
Queue Length 95th (ft)	82	Err	2	0	0	44	0	0
Control Delay (s)	2004.9	Err	11.6	0.0	0.0	243.6	0.0	0.0
Lane LOS	F	F	B			F		
Approach Delay (s)	2004.9	Err	0.1			3.0		
Approach LOS	F	F						

Intersection Summary			
Average Delay	135.2		
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	SBL	SBT
Protected Phases	4	1	2	1	6
Permitted Phases		4		6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	10.0	22.0	10.0	22.0
Total Split (s)	22.0	30.0	58.0	30.0	88.0
Total Split (%)	20.0%	27.3%	52.7%	27.3%	80.0%
Maximum Green (s)	16.0	24.0	52.0	24.0	82.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lead/Lag		Lead	Lag	Lead	
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max
Walk Time (s)	5.0		5.0		5.0
Flash Dont Walk (s)	11.0		11.0		11.0
Pedestrian Calls (#/hr)	0		0		0
90th %ile Green (s)	12.9	27.1	52.0	27.1	85.1
90th %ile Term Code	Gap	Max	Coord	Max	Coord
70th %ile Green (s)	10.8	29.2	52.0	29.2	87.2
70th %ile Term Code	Gap	Max	Coord	Max	Coord
50th %ile Green (s)	9.3	30.7	52.0	30.7	88.7
50th %ile Term Code	Gap	Max	Coord	Max	Coord
30th %ile Green (s)	7.9	32.1	52.0	32.1	90.1
30th %ile Term Code	Gap	Max	Coord	Max	Coord
10th %ile Green (s)	0.0	46.0	52.0	46.0	104.0
10th %ile Term Code	Skip	Max	Coord	Max	Coord

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 6:SBTL, Start of Green
Control Type: Actuated-Coordinated

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	58	1371	1949	74	568	563
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.88	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	2787	3520		1770	3539
Flt Permitted	0.95	1.00	1.00		0.07	1.00
Satd. Flow (perm)	1770	2787	3520		131	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	64	1523	2166	82	631	626
RTOR Reduction (vph)	0	2	3	0	0	0
Lane Group Flow (vph)	64	1521	2245	0	631	626
Turn Type		pm+ov			pm+pt	
Protected Phases	4	1	2		1	6
Permitted Phases		4			6	
Actuated Green, G (s)	8.2	41.2	50.8		89.8	89.8
Effective Green, g (s)	9.2	43.2	51.8		90.8	90.8
Actuated g/C Ratio	0.08	0.39	0.47		0.83	0.83
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	148	1221	1658		615	2921
v/s Ratio Prot	0.04	c0.39	c0.64		0.32	0.18
v/s Ratio Perm		0.16			0.53	
v/c Ratio	0.43	1.25	1.35		1.03	0.21
Uniform Delay, d1	47.9	33.4	29.1		33.8	2.0
Progression Factor	1.03	0.56	0.84		1.00	1.00
Incremental Delay, d2	0.9	113.9	161.6		43.1	0.2
Delay (s)	50.5	132.8	186.0		76.9	2.2
Level of Service	D	F	F		E	A
Approach Delay (s)	129.5		186.0			39.7
Approach LOS	F		F			D

Intersection Summary			
HCM Average Control Delay	132.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2		7	4	4	3	8	
Permitted Phases	6		Free	2		Free	4		5	8		Free
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		21.0	21.0	21.0	21.0	21.0	
Total Split (s)	21.0	21.0	0.0	21.0	21.0	0.0	39.0	47.0	47.0	21.0	29.0	0.0
Total Split (%)	19.1%	19.1%	0.0%	19.1%	19.1%	0.0%	35.5%	42.7%	42.7%	19.1%	26.4%	0.0%
Maximum Green (s)	16.0	16.0		16.0	16.0		34.0	42.0	42.0	16.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	Min		None	Min		None	C-Max	C-Max	None	C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
90th %ile Green (s)	8.3	14.7		16.0	22.4		35.3	49.9	49.9	9.4	24.0	
90th %ile Term Code	Gap	Gap		Max	Hold		Max	Coord	Coord	Gap	Coord	
70th %ile Green (s)	7.4	12.9		16.0	21.5		37.1	53.0	53.0	8.1	24.0	
70th %ile Term Code	Gap	Gap		Max	Hold		Max	Coord	Coord	Gap	Coord	
50th %ile Green (s)	6.7	11.6		16.0	20.9		35.0	55.0	55.0	7.4	27.4	
50th %ile Term Code	Gap	Gap		Max	Hold		Gap	Coord	Coord	Gap	Coord	
30th %ile Green (s)	0.0	10.3		16.0	31.3		26.7	57.0	57.0	6.7	37.0	
30th %ile Term Code	Skip	Gap		Max	Hold		Gap	Coord	Coord	Gap	Coord	
10th %ile Green (s)	0.0	8.4		16.0	29.4		20.9	70.6	70.6	0.0	44.7	
10th %ile Term Code	Skip	Gap		Max	Hold		Gap	Coord	Coord	Skip	Coord	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	182	628	690	108	17	578	331	1834	72	376	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	1583	1770	1863	2787	1770	3539	1583
Flt Permitted	0.68	1.00	1.00	0.43	1.00	1.00	0.35	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	1266	3539	1583	1539	1863	1583	645	1863	2787	1010	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	202	698	767	120	19	642	368	2038	80	418	82
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	285	0	0	0
Lane Group Flow (vph)	29	202	698	767	120	19	642	368	1753	80	418	82
Turn Type	pm+pt		Free	pm+pt		Free	pm+pt		custom	pm+pt		Free
Protected Phases	1	6		5	2		7	4	4	3	8	
Permitted Phases	6		Free	2		Free	4		5	8		Free
Actuated Green, G (s)	18.1	13.6	110.0	34.6	25.1	110.0	65.4	54.1	70.1	35.7	29.4	110.0
Effective Green, g (s)	22.1	15.6	110.0	36.6	27.1	110.0	67.4	56.1	74.1	39.7	31.4	110.0
Actuated g/C Ratio	0.20	0.14	1.00	0.33	0.25	1.00	0.61	0.51	0.67	0.36	0.29	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	284	502	1583	822	459	1583	733	950	1953	422	1010	1583
v/s Ratio Prot	0.01	0.06		c0.15	0.06		c0.26	0.20	c0.46	0.01	0.12	
v/s Ratio Perm	0.01		0.44	c0.16		0.01	0.27		0.17	0.05		0.05
v/c Ratio	0.10	0.40	0.44	0.93	0.26	0.01	0.88	0.39	0.90	0.19	0.41	0.05
Uniform Delay, d1	35.7	43.0	0.0	32.8	33.4	0.0	14.6	16.5	14.8	23.5	31.8	0.0
Progression Factor	1.00	1.00	1.00	0.94	0.92	1.00	2.35	1.16	1.83	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.5	0.9	17.2	0.3	0.0	5.2	0.5	2.6	0.2	1.3	0.1
Delay (s)	35.9	43.5	0.9	48.0	30.9	0.0	39.6	19.5	29.6	23.7	33.1	0.1
Level of Service	D	D	A	D	C	A	D	B	C	C	C	A
Approach Delay (s)		11.2			44.7			30.5			27.1	
Approach LOS		B			D			C			C	

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Protected Phases	4		1	2	2	
Permitted Phases		4	2			2
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	39.0	39.0	17.0	54.0	54.0	54.0
Total Split (%)	35.5%	35.5%	15.5%	49.1%	49.1%	49.1%
Maximum Green (s)	34.0	34.0	12.0	49.0	49.0	49.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
90th %ile Green (s)	34.0	34.0	12.0	49.0	49.0	49.0
90th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
70th %ile Green (s)	34.0	34.0	12.0	49.0	49.0	49.0
70th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
50th %ile Green (s)	34.0	34.0	12.0	49.0	49.0	49.0
50th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
30th %ile Green (s)	34.0	34.0	12.0	49.0	49.0	49.0
30th %ile Term Code	Max	Max	Max	Coord	Coord	Coord
10th %ile Green (s)	34.0	34.0	12.0	49.0	49.0	49.0
10th %ile Term Code	Max	Max	Max	Coord	Coord	Coord

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 4 (4%), Referenced to phase 2:NBSB, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	194	834	693	384	2085	0	0	916	645
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor					0.95	0.88	1.00	0.91			0.91	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3506	2787	1770	5085			5085	1583
Flt Permitted					0.99	1.00	0.20	1.00			1.00	1.00
Satd. Flow (perm)					3506	2787	379	5085			5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	216	927	770	427	2317	0	0	1018	717
RTOR Reduction (vph)	0	0	0	0	0	255	0	0	0	0	0	21
Lane Group Flow (vph)	0	0	0	0	1143	515	427	2317	0	0	1018	696
Turn Type				Split		Perm	pm+pt					Perm
Protected Phases				4	4		1	2			2	
Permitted Phases						4	2					2
Actuated Green, G (s)					34.0	34.0	61.0	49.0			49.0	49.0
Effective Green, g (s)					36.0	36.0	65.0	51.0			51.0	51.0
Actuated g/C Ratio					0.33	0.33	0.59	0.46			0.46	0.46
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1147	912	401	2358			2358	734
v/s Ratio Prot					c0.33		c0.14	0.46			0.20	
v/s Ratio Perm						0.18	c0.49					0.44
v/c Ratio					1.00	0.56	1.06	0.98			0.43	0.95
Uniform Delay, d1					36.9	30.5	16.7	29.1			19.8	28.2
Progression Factor					1.00	1.00	0.79	0.70			1.25	1.16
Incremental Delay, d2					25.5	0.8	34.7	2.8			0.4	18.8
Delay (s)					62.5	31.3	47.9	23.3			25.1	51.5
Level of Service					E	C	D	C			C	D
Approach Delay (s)		0.0			49.9			27.1			36.0	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM Average Control Delay	36.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Protected Phases		4		2		1	2
Permitted Phases	4		4		2	2	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	56.0	56.0	56.0	33.0	33.0	21.0	33.0
Total Split (%)	50.9%	50.9%	50.9%	30.0%	30.0%	19.1%	30.0%
Maximum Green (s)	50.0	50.0	50.0	27.0	27.0	15.0	27.0
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lead/Lag				Lag	Lag	Lead	Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max	C-Max	Max	C-Max
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
90th %ile Green (s)	50.0	50.0	50.0	27.0	27.0	15.0	27.0
90th %ile Term Code	Max	Max	Max	Coord	Coord	MaxR	Coord
70th %ile Green (s)	50.0	50.0	50.0	27.0	27.0	15.0	27.0
70th %ile Term Code	Max	Max	Max	Coord	Coord	MaxR	Coord
50th %ile Green (s)	50.0	50.0	50.0	27.0	27.0	15.0	27.0
50th %ile Term Code	Max	Max	Max	Coord	Coord	MaxR	Coord
30th %ile Green (s)	50.0	50.0	50.0	27.0	27.0	15.0	27.0
30th %ile Term Code	Max	Max	Max	Coord	Coord	MaxR	Coord
10th %ile Green (s)	50.0	50.0	50.0	27.0	27.0	15.0	27.0
10th %ile Term Code	Max	Max	Max	Coord	Coord	MaxR	Coord

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 36 (33%), Referenced to phase 2:NBSB, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1481	1141	465	0	0	0	0	1189	225	590	623	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95	1.00					0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3539	1583					5085	1583	3433	3539	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.14	1.00	
Satd. Flow (perm)	3433	3539	1583					5085	1583	498	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1646	1268	517	0	0	0	0	1321	250	656	692	0
RTOR Reduction (vph)	0	0	220	0	0	0	0	0	18	0	0	0
Lane Group Flow (vph)	1646	1268	297	0	0	0	0	1321	232	656	692	0
Turn Type	Perm		Perm						Perm	pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4						2	2		
Actuated Green, G (s)	50.0	50.0	50.0					27.0	27.0	42.0	27.0	
Effective Green, g (s)	52.0	52.0	51.0					29.0	29.0	46.0	29.0	
Actuated g/C Ratio	0.47	0.47	0.46					0.26	0.26	0.42	0.26	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1623	1673	734					1341	417	662	933	
v/s Ratio Prot		0.36						0.26		c0.15	0.20	
v/s Ratio Perm	c0.48		0.19						0.15	c0.26		
v/c Ratio	1.01	0.76	0.40					0.99	0.56	0.99	0.74	
Uniform Delay, d1	29.0	23.8	19.5					40.3	34.9	31.5	37.1	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.65	0.87	
Incremental Delay, d2	25.9	2.0	0.4					21.3	5.3	30.8	4.7	
Delay (s)	54.9	25.8	19.8					61.6	40.2	51.3	36.9	
Level of Service	D	C	B					E	D	D	D	
Approach Delay (s)		38.9			0.0			58.2			43.9	
Approach LOS		D			A			E			D	

Intersection Summary			
HCM Average Control Delay	44.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	41	38	820	77	53	748
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	46	42	911	86	59	831
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						250
pX, platoon unblocked	0.85					
vC, conflicting volume	1487	498			997	
vC1, stage 1 conf vol	954					
vC2, stage 2 conf vol	533					
vCu, unblocked vol	1214	498			997	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	92			91	
cM capacity (veh/h)	311	518			690	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	88	607	389	59	416	416
Volume Left	46	0	0	59	0	0
Volume Right	42	0	86	0	0	0
cSH	385	1700	1700	690	1700	1700
Volume to Capacity	0.23	0.36	0.23	0.09	0.24	0.24
Queue Length 95th (ft)	22	0	0	7	0	0
Control Delay (s)	17.1	0.0	0.0	10.7	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	17.1	0.0		0.7		
Approach LOS	C					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	178	25	97	24	28	205	70	779	38	179	704	134
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	198	28	108	27	31	228	78	866	42	199	782	149
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											704	
pX, platoon unblocked	0.83	0.83	0.83	0.83	0.83		0.83					
vC, conflicting volume	2444	2243	782	2344	2371	887	931			908		
vC1, stage 1 conf vol	1180	1180		1042	1042							
vC2, stage 2 conf vol	1264	1063		1302	1329							
vCu, unblocked vol	2636	2394	637	2515	2548	887	816			908		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	55	73	0	49	34	88			73		
cM capacity (veh/h)	2	61	397	6	61	343	675			750		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	198	136	58	228	78	908	199	782	149
Volume Left	198	0	27	0	78	0	199	0	0
Volume Right	0	108	0	228	0	42	0	0	149
cSH	2	187	11	343	675	1700	750	1700	1700
Volume to Capacity	100.86	0.72	5.29	0.66	0.12	0.53	0.27	0.46	0.09
Queue Length 95th (ft)	Err	115	Err	113	10	0	27	0	0
Control Delay (s)	Err	62.6	Err	33.9	11.0	0.0	11.5	0.0	0.0
Lane LOS	F	F	F	D	B		B		
Approach Delay (s)	5958.2		2050.2		0.9		2.0		
Approach LOS	F		F						

Intersection Summary			
Average Delay	941.6		
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	24	2	5	978	259	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	2	6	1087	288	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1388	291	293			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1388	291	293			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	100	100			
cM capacity (veh/h)	157	749	1268			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	1092	293
Volume Left	27	6	0
Volume Right	2	0	6
cSH	167	1268	1700
Volume to Capacity	0.17	0.00	0.17
Queue Length 95th (ft)	15	0	0
Control Delay (s)	31.1	0.1	0.0
Lane LOS	D	A	
Approach Delay (s)	31.1	0.1	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Right Turn Channelized						
Volume (veh/h)	470	451	343	326	372	372
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	522	501	381	362	413	413
Approach Volume (veh/h)		1023	743		827	
Crossing Volume (veh/h)		413	522		381	
High Capacity (veh/h)		1000	917		1026	
High v/c (veh/h)		1.02	0.81		0.81	
Low Capacity (veh/h)		814	740		837	
Low v/c (veh/h)		1.26	1.00		0.99	

Intersection Summary			
Maximum v/c High	1.02		
Maximum v/c Low	1.26		
Intersection Capacity Utilization	141.1%	ICU Level of Service	H

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	647	122	120	671	101	125
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	719	136	133	746	112	139
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			854		1799	787
vC1, stage 1 conf vol					787	
vC2, stage 2 conf vol					1012	
vCu, unblocked vol			854		1799	787
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		55	65
cM capacity (veh/h)			785		247	392

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	854	133	746	251
Volume Left	0	133	0	112
Volume Right	136	0	0	139
cSH	1700	785	1700	310
Volume to Capacity	0.50	0.17	0.44	0.81
Queue Length 95th (ft)	0	15	0	167
Control Delay (s)	0.0	10.5	0.0	51.5
Lane LOS		B		F
Approach Delay (s)	0.0	1.6		51.5
Approach LOS				F

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	NBL	NBT	NBR	SBL	SBT	SET	SER	NWL	NWT
Protected Phases	5	2		1	6	3		4	4
Permitted Phases	2		2	6			3		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	20.0	20.0	9.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	61.0	61.0	9.0	61.0	20.0	20.0	20.0	20.0
Total Split (%)	8.2%	55.5%	55.5%	8.2%	55.5%	18.2%	18.2%	18.2%	18.2%
Maximum Green (s)	4.0	56.0	56.0	4.0	56.0	15.0	15.0	15.0	15.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Walk Time (s)									
Flash Dont Walk (s)									
Pedestrian Calls (#/hr)									
90th %ile Green (s)	4.0	56.0	56.0	4.0	56.0	15.0	15.0	15.0	15.0
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Max	Max	Max	Max
70th %ile Green (s)	4.0	56.0	56.0	4.0	56.0	15.0	15.0	15.0	15.0
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Max	Max	Max	Max
50th %ile Green (s)	4.0	56.0	56.0	4.0	56.0	13.8	13.8	16.2	16.2
50th %ile Term Code	Max	Coord	Coord	Max	Coord	Gap	Gap	Max	Max
30th %ile Green (s)	4.0	56.0	56.0	4.0	56.0	11.7	11.7	18.3	18.3
30th %ile Term Code	Max	Coord	Coord	Max	Coord	Gap	Gap	Max	Max
10th %ile Green (s)	4.0	56.0	56.0	4.0	56.0	8.6	8.6	21.4	21.4
10th %ile Term Code	Max	Coord	Coord	Max	Coord	Gap	Gap	Max	Max

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 62 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Control Type: Actuated-Coordinated

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	86	1757	173	141	853	2	67	60	105	264	55	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0			3.0	4.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3538			1815	1583	1770	1638	
Flt Permitted	0.21	1.00	1.00	0.07	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (perm)	397	3539	1583	128	3538			1815	1583	1770	1638	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	96	1952	192	157	948	2	74	67	117	293	61	250
RTOR Reduction (vph)	0	0	67	0	0	0	0	0	102	0	131	0
Lane Group Flow (vph)	96	1952	125	157	950	0	0	141	15	293	180	0
Turn Type	pm+pt		Perm	pm+pt			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	2		2	6					3			
Actuated Green, G (s)	60.0	56.0	56.0	60.0	56.0			12.8	12.8	17.2	17.2	
Effective Green, g (s)	64.0	58.0	58.0	64.0	58.0			14.8	13.8	19.2	19.2	
Actuated g/C Ratio	0.58	0.53	0.53	0.58	0.53			0.13	0.13	0.17	0.17	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	306	1866	835	164	1865			244	199	309	286	
v/s Ratio Prot	0.02	c0.55		c0.05	0.27			c0.08		c0.17	0.11	
v/s Ratio Perm	0.17		0.08	0.50					0.01			
v/c Ratio	0.31	1.05	0.15	0.96	0.51			0.58	0.07	0.95	0.63	
Uniform Delay, d1	11.8	26.0	13.3	29.9	16.8			44.7	42.5	44.9	42.1	
Progression Factor	0.79	0.64	0.45	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	30.4	0.2	57.0	1.0			3.3	0.2	37.2	4.3	
Delay (s)	9.6	47.0	6.3	86.9	17.8			48.0	42.6	82.1	46.4	
Level of Service	A	D	A	F	B			D	D	F	D	
Approach Delay (s)		41.9			27.6			45.5			63.7	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Minimum Initial (s)	6.0	10.0	6.0	6.0	10.0	6.0	6.0	15.0	6.0	6.0	15.0	6.0
Minimum Split (s)	11.0	20.0	11.0	11.0	20.0	11.0	11.0	20.0	11.0	11.0	20.0	11.0
Total Split (s)	26.0	24.0	26.0	23.0	21.0	16.0	26.0	47.0	23.0	16.0	37.0	26.0
Total Split (%)	23.6%	21.8%	23.6%	20.9%	19.1%	14.5%	23.6%	42.7%	20.9%	14.5%	33.6%	23.6%
Maximum Green (s)	21.0	19.0	21.0	18.0	16.0	11.0	21.0	42.0	18.0	11.0	32.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
90th %ile Green (s)	21.0	19.0	20.7	18.0	16.0	11.0	20.7	42.0	18.0	11.0	32.3	21.0
90th %ile Term Code	Max	Max	Gap	Max	Max	Max	Gap	Coord	Max	Max	Coord	Max
70th %ile Green (s)	21.0	19.0	15.2	18.0	16.0	11.0	15.2	42.0	18.0	11.0	37.8	21.0
70th %ile Term Code	Max	Max	Gap	Max	Max	Max	Gap	Coord	Max	Max	Coord	Max
50th %ile Green (s)	21.0	19.0	12.7	18.0	16.0	9.8	12.7	43.2	18.0	9.8	40.3	21.0
50th %ile Term Code	Max	Max	Gap	Max	Hold	Gap	Gap	Coord	Max	Gap	Coord	Max
30th %ile Green (s)	20.9	18.4	10.7	16.9	14.4	7.9	10.7	46.8	16.9	7.9	44.0	20.9
30th %ile Term Code	Gap	Gap	Gap	Gap	Hold	Gap	Gap	Coord	Gap	Gap	Coord	Gap
10th %ile Green (s)	17.1	14.4	7.9	15.1	12.4	6.1	7.9	54.4	15.1	6.1	52.6	17.1
10th %ile Term Code	Gap	Gap	Gap	Gap	Hold	Gap	Gap	Coord	Gap	Gap	Coord	Gap

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 20 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	355	240	364	523	146	321	225	1467	594	141	815	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	5085	1583	1770	5085	1583
Flt Permitted	0.35	1.00	1.00	0.26	1.00	1.00	0.20	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	658	1863	1583	926	1863	1583	381	5085	1583	172	5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	394	267	404	581	162	357	250	1630	660	157	906	311
RTOR Reduction (vph)	0	0	17	0	0	44	0	0	84	0	0	126
Lane Group Flow (vph)	394	267	387	581	162	313	250	1630	576	157	906	185
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	38.2	18.0	31.4	32.2	15.0	24.2	59.0	45.6	62.8	50.6	41.4	61.6
Effective Green, g (s)	42.2	20.0	35.4	36.2	17.0	28.2	61.8	47.6	66.8	54.6	43.4	65.6
Actuated g/C Ratio	0.38	0.18	0.32	0.33	0.15	0.26	0.56	0.43	0.61	0.50	0.39	0.60
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Grp Cap (vph)	477	339	553	742	288	449	409	2200	1004	248	2006	987
v/s Ratio Prot	c0.17	0.14	c0.10	0.14	0.09	0.07	0.09	c0.32	0.10	0.06	0.18	0.04
v/s Ratio Perm	c0.15		0.15	0.12		0.13	0.26		0.26	0.25		0.08
v/c Ratio	0.83	0.79	0.70	0.78	0.56	0.70	0.61	0.74	0.57	0.63	0.45	0.19
Uniform Delay, d1	27.4	43.0	32.7	30.4	43.1	37.0	14.1	26.1	13.0	19.7	24.5	10.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.20	0.88	0.59	1.40	0.63	0.57
Incremental Delay, d2	10.7	11.5	3.1	5.0	2.5	3.8	0.2	0.2	0.0	3.2	0.6	0.0
Delay (s)	38.1	54.4	35.8	35.4	45.6	40.8	17.2	23.2	7.7	30.7	16.1	5.8
Level of Service	D	D	D	D	D	D	B	C	A	C	B	A
Approach Delay (s)		41.3			38.6			18.6			15.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Protected Phases	4	14	1	2	2	
Permitted Phases		14	2		2	2
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		8.0	21.0	21.0	21.0
Total Split (s)	33.0	62.0	29.0	48.0	48.0	48.0
Total Split (%)	30.0%	56.4%	26.4%	43.6%	43.6%	43.6%
Maximum Green (s)	28.0		25.0	43.0	43.0	43.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		0.0	1.0	1.0	1.0
Lead/Lag			Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0
Recall Mode	None		None	C-Max	C-Max	C-Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
90th %ile Green (s)	28.0		25.0	43.0	43.0	43.0
90th %ile Term Code	Max		Max	Coord	Coord	Coord
70th %ile Green (s)	28.0		25.0	43.0	43.0	43.0
70th %ile Term Code	Max		Max	Coord	Coord	Coord
50th %ile Green (s)	28.0		25.0	43.0	43.0	43.0
50th %ile Term Code	Max		Max	Coord	Coord	Coord
30th %ile Green (s)	28.0		25.0	43.0	43.0	43.0
30th %ile Term Code	Max		Max	Coord	Coord	Coord
10th %ile Green (s)	28.0		25.0	43.0	43.0	43.0
10th %ile Term Code	Max		Max	Coord	Coord	Coord

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 51 (46%), Referenced to phase 2:NBSB, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	288	1040	1465	194	1975	0	0	1261	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.0	2.0	2.0	3.0			3.0	3.0
Lane Util. Factor					0.91	0.88	1.00	0.91			0.91	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					5031	2787	1770	5085			5085	1583
Flt Permitted					0.99	1.00	0.09	1.00			1.00	1.00
Satd. Flow (perm)					5031	2787	166	5085			5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	320	1156	1628	216	2194	0	0	1401	557
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	115
Lane Group Flow (vph)	0	0	0	0	1476	1628	216	2194	0	0	1401	442
Turn Type				Split		custom	pm+pt					Perm
Protected Phases				4	4	1 4	1	2			2	
Permitted Phases						1 4	2				2	2
Actuated Green, G (s)					28.0	58.0	68.0	43.0			43.0	43.0
Effective Green, g (s)					30.0	57.0	72.0	45.0			45.0	45.0
Actuated g/C Ratio					0.27	0.52	0.65	0.41			0.41	0.41
Clearance Time (s)					5.0		4.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1372	1444	502	2080			2080	648
v/s Ratio Prot					0.29	c0.58	0.11	c0.43			0.28	
v/s Ratio Perm							0.18					0.28
v/c Ratio					1.08	1.13	0.43	1.05			0.67	0.68
Uniform Delay, d1					40.0	26.5	17.4	32.5			26.5	26.6
Progression Factor					1.00	1.00	0.68	0.85			0.98	0.95
Incremental Delay, d2					47.5	66.7	0.5	34.3			1.5	4.8
Delay (s)					87.5	93.2	12.3	62.0			27.4	30.0
Level of Service					F	F	B	E			C	C
Approach Delay (s)		0.0			90.5			57.5			28.1	
Approach LOS		A			F			E			C	

Intersection Summary			
HCM Average Control Delay	63.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	NET	SWL	SWT
Protected Phases		4		2	1	2
Permitted Phases	4		4		2	1
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	9.0	21.0
Total Split (s)	43.0	43.0	43.0	37.0	30.0	37.0
Total Split (%)	39.1%	39.1%	39.1%	33.6%	27.3%	33.6%
Maximum Green (s)	38.0	38.0	38.0	32.0	25.0	32.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag				Lag	Lead	Lag
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	C-Min	None	C-Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
90th %ile Green (s)	38.0	38.0	38.0	32.0	25.0	32.0
90th %ile Term Code	Max	Max	Max	Coord	Max	Coord
70th %ile Green (s)	38.0	38.0	38.0	32.0	25.0	32.0
70th %ile Term Code	Max	Max	Max	Coord	Max	Coord
50th %ile Green (s)	38.0	38.0	38.0	32.0	25.0	32.0
50th %ile Term Code	Max	Max	Max	Coord	Max	Coord
30th %ile Green (s)	37.8	37.8	37.8	32.0	25.2	32.0
30th %ile Term Code	Gap	Gap	Gap	Coord	Max	Coord
10th %ile Green (s)	30.6	30.6	30.6	40.1	24.3	40.1
10th %ile Term Code	Gap	Gap	Gap	Coord	Gap	Coord

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 101 (92%), Referenced to phase 2:NESW, Start of Yellow
Control Type: Actuated-Coordinated

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	566	391	185	0	0	0	0	988	223	798	877	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Lane Util. Factor	0.95	0.95	1.00					0.91		0.97	0.95	
Frt	1.00	1.00	0.85					0.97		1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1681	1752	1583					4945		3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00		0.11	1.00	
Satd. Flow (perm)	1681	1752	1583					4945		406	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	629	434	206	0	0	0	0	1098	248	887	974	0
RTOR Reduction (vph)	0	0	77	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	522	541	129	0	0	0	0	1314	0	887	974	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	2	
Permitted Phases	4		4							2	1	
Actuated Green, G (s)	36.5	36.5	36.5					33.6		58.5	58.5	
Effective Green, g (s)	38.5	38.5	38.5					35.6		62.5	62.5	
Actuated g/C Ratio	0.35	0.35	0.35					0.32		0.57	0.57	
Clearance Time (s)	5.0	5.0	5.0					5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)	588	613	554					1600		971	2107	
v/s Ratio Prot								0.27		c0.22	0.15	
v/s Ratio Perm	c0.31	0.31	0.08							c0.30	0.13	
v/c Ratio	0.89	0.88	0.23					0.82		0.91	0.46	
Uniform Delay, d1	33.7	33.6	25.3					34.3		30.6	13.9	
Progression Factor	1.00	1.00	1.00					1.00		0.53	0.58	
Incremental Delay, d2	15.1	14.1	0.2					4.9		9.6	0.1	
Delay (s)	48.8	47.7	25.5					39.1		25.8	8.2	
Level of Service	D	D	C					D		C	A	
Approach Delay (s)		44.5			0.0			39.1			16.6	
Approach LOS		D			A			D			B	

Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1314	825	559	86	70	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1829		1770	1583
Flt Permitted	0.33	1.00	1.00		0.95	1.00
Satd. Flow (perm)	624	1863	1829		1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1460	917	621	96	78	650
RTOR Reduction (vph)	0	0	4	0	0	331
Lane Group Flow (vph)	1460	917	713	0	78	319
Turn Type	Perm					Perm
Protected Phases		4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	118.0	118.0	118.0		24.0	24.0
Effective Green, g (s)	119.0	119.0	119.0		25.0	25.0
Actuated g/C Ratio	0.79	0.79	0.79		0.17	0.17
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	495	1478	1451		295	264
v/s Ratio Prot		0.49	0.39		0.04	
v/s Ratio Perm	c2.34					c0.20
v/c Ratio	2.95	0.62	0.49		0.26	1.21
Uniform Delay, d1	15.5	6.3	5.3		54.5	62.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	882.7	0.8	0.3		2.2	124.0
Delay (s)	898.2	7.1	5.5		56.7	186.5
Level of Service	F	A	A		E	F
Approach Delay (s)		554.5	5.5		172.6	
Approach LOS		F	A		F	

Intersection Summary			
HCM Average Control Delay	378.7	HCM Level of Service	F
HCM Volume to Capacity ratio	2.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	121.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

DEMOGRAPHICS

East City Sector

Existing Park Recommendations

Chestnut Square Park (formerly Union Square Park)—vacate the right-of-way of Curie Place and assimilate that land into the park. New sidewalks should be provided along with passive recreation opportunities such as picnic tables and benches.

Holston River Park—expand the park to the west along Riverside Drive, add access points to Boyd's Island and partner with UT for programs and uses that could be made available to the public on the island.

Skyline Park—repair the surface of the basketball courts and repair or replace the goals and benches.

Chilhowee Park—create daily use activities at this park, reopen the portion of the park south of Magnolia Avenue as a neighborhood park with active and passive recreation opportunities during non-event times with improved pedestrian access from surrounding neighborhoods.

Proposed Park Recommendations

Boyd's Island—acquire an easement from the State of Tennessee to access the island from Holston River Park.

East Burlington Park—obtain land for a new park location between Holston Drive and Skyline Drive, east of Dickson Street to serve the neighborhood.

Holston Hills Neighborhood Park—provide a neighborhood serving park, while this area is served by a private golf course which provides golf, swimming and tennis to members there is a lack of public, neighborhood serving facilities.

Prosser Road Park—provide a neighborhood park on City owned parcel, consider a partnership with the Kiwanis club located across the street at 2330 and 2400 Prosser Road. If a partnership is established a community park could be created to serve multiple neighborhoods including: Plantation Hills, Woodland Terrace, Gillenwater, and others.

Greenway Recommendations

Holston River Greenway—connect to the existing James White Greenway and have a connection to the proposed Williams Creek Greenway. The path of the greenway would follow the river and would connect to the Holston Cutoff Greenway through Holston River Park onto Boyd's Bridge connecting to John Sevier Highway and Asheville Highway (in East County) with a connector to Chilhowee Middle School.

Chilhowee Connector—provide bike and pedestrian facilities with any road improvements to Holston Hills Drive and Chilhowee Drive.

Loves Creek Greenway—develop this portion of the greenway running from the Holston River northwest to Asheville Highway and I-40.

Williams Creek Greenway—follow the creek from the river through the Wee Golf Course and into the neighborhood ending at Austin East Magnet High School.

Knoxville Center District

Principles of new urbanism should be used to develop vacant parcels adjacent to Washington and Millertown Pikes, and to redevelop parcels where the existing low density residential land use is no longer appropriate. This neighborhood should contain public transit facilities, with the needs of daily life easily accessible by a 5-10 minute walk. Commerce can be integrated with residential uses, using the improved Washington and Millertown Pikes roadway to contain intensive uses within the triangle. For example, apartments can be allowed over stores. Buildings should successfully define public space, including streets, parks and squares. An architectural design code for the district should be developed in order to establish massing, fenestration (windows/entrances), materials, and roof pitch.

This is the type neighborhood that many of the residents envision living in, but with additional retail traffic, they worry that the transportation system will not function well. At the request of the City of Knoxville, the engineering firm Wilbur-Smith and Associates proposed a series of improvements for the Knoxville Center Mall area. Providing adequate road capacity for vehicles coming into the shopping center from outlying areas in the county was important in this study. Additional studies on circulation should be conducted at a micro-level, to improve the traffic flow between shopping centers and to increase pedestrian connectivity.

There are several issues related to new development around the Alice Bell-Spring Hill community. Questions include the potential to provide a connection between Centerline Drive and Spring Hill Road, the appropriateness of North and South Mall Road still being one way roads, and the best location for crosswalks and other pedestrian connections.

This intersection of Washington and Millertown Pike, currently a three-way stop, will soon consist of more lanes and a signal light. With several residential developments in the neighborhood, the movement of vehicles should not take precedence over the movement of pedestrians.

In a compact urban neighborhood, condominiums provide high enough density to support public transit facilities and neighborhood-serving retail establishments within walking distance, reducing the number of vehicle trips per day.

In general, these principles produce settings resembling American towns before World War II, including sidewalks, street trees and "main street" style shops. Human scale is the standard for buildings, with cars not taking precedence over human needs, including aesthetic needs. Civic buildings such as churches and libraries serve as landmarks. The street is the pre-eminent form of public space; building facades along the edge of the sidewalk enclose the street like walls of an outdoor room. Because streets differ in importance, scale, and quality, appropriate distinctions are expressed by physical design.

PROFILE OF GENERAL DEMOGRAPHIC CHARACTERISTICS: 2000

Geographic Area: East City

Total population	**25,478**
SEX AND AGE	
Male	11,699
Female	13,779
Under 5 years	1,454
5 to 9 years	1,556
10 to 14 years	1,609
15 to 19 years	1,452
20 to 24 years	1,434
25 to 34 years	3,371
35 to 44 years	3,820
45 to 54 years	3,617
55 to 59 years	1,302
60 to 64 years	1,121
65 to 74 years	2,286
75 to 84 years	1,778
85 years and over	678
Median age (years, estimated)	40.3
18 years and over	19,961
21 years and over	19,119
62 years and over	5,399
65 years and over	4,742
5 to 10 years	1,891
11 to 13 years	949
14 to 18 years	1,546
RACE	
One race	25,136
White	15,242
Black or African American	9,573
American Indian and Alaska Native	43
Asian	128
Native Hawaiian/Other Pac. Islander	2
Some other race	148
Two or more races	342
HISPANIC OR LATINO	
Hispanic or Latino (of any race)	261
Not Hispanic or Latino	25,217

GROUP QUARTERS	
Total population in group quarters	**277**
Institutionalized	200
Correctional Institutions	0
Nursing homes	200
Noninstitutionalized	77
College (incl. college quarters off campus)	0
Military quarters	0
Other (Institutionalized and Noninstitutionalized)	77
HOUSEHOLD BY TYPE	
Total households	**11,282**
Family households (families)	6,759
With own children under 18 years	2,711
Married-couple family	4,320
With own children under 18 years	1,464
Female householder, no husband present	1,990
With own children under 18 years	1,061
Male householder, no wife present	449
With own children under 18 years	186
Nonfamily households	4,523
Householder living alone	3,920
Householder 65 years and over, living alone	1,687
Unmarried-partner households	529
Households with individuals under 18 years	3,176
Households with individuals 65 years and over	3,542
Average household size	2.23
Average family size (estimated)	2.90
HOUSING OCCUPANCY	
Total housing units	**12,636**
Occupied housing units	11,282
Vacant housing units	1,354
For seasonal, recreational, occasional use	22
Vacancy rate (percent)	10.7
HOUSING TENURE	
Occupied housing units	**11,282**
Owner-occupied housing units	7,354
Renter-occupied housing units	3,928
Avg. (est.) household size of owner-occupied units	2.29
Avg. (est.) household size of renter-occupied units	2.32

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, August 2001.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 1.

PROFILE OF SELECTED SOCIAL CHARACTERISTICS: 2000

Geographic Area: East City

SCHOOL ENROLLMENT	
Population 3 years and over enrolled in school	**5,680**
Nursery school, preschool	355
Kindergarten	234
Elementary school (grades 1-8)	2,693
High school (grades 9-12)	1,375
College or graduate school	1,023

EDUCATIONAL ATTAINMENT	
Population 25 years and over	**18,039**
Less than 9th grade	1,374
9th to 12th grade, no diploma	3,024
High school graduate (includes GED)	5,861
Some college, no degree	3,715
Associate degree	793
Bachelor's degree	2,056
Graduate or professional degree	1,216
Percent high school graduate or higher	75.6
Percent bachelor's degree or higher	18.1

MARITAL STATUS	
Population 15 years and over	**20,906**
Never married	5,574
Now married (not separated)	9,479
Separated	607
Widowed	2,355
Female	1,968
Divorced	2,891
Female	1,951

DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALIZED POPULATION	
Population 5 to 20 years	**5,012**
With a disability	538
Population 21 to 64 years	**14,388**
With a disability	3,433
Percent employed	45.3
No disability	10,955
Percent employed	75.5
Population 65 years and over	**4,529**
With a disability	2,319

RESIDENCE IN 1995	
Population 5 years and over	**24,149**
Same house in 1995	14,114
Different house in the U.S. in 1995	9,795
Same county	7,396
Different county	2,399
Same state	1,095
Different state	1,304
Elsewhere in 1995	240

NATIVITY AND PLACE OF BIRTH	
Total population	**25,528**
Native	25,135
Born in United States	25,046
State of residence	19,219
Different state	5,827
Born outside United States	89
Foreign born	393
Entered 1990 to March 2000	194
Naturalized citizen	140
Not a citizen	253

REGION OF BIRTH OF FOREIGN BORN	
Total (excluding born at sea)	**393**
Europe	86
Asia	110
Africa	0
Oceania	10
Latin America	168
Northern America	19

LANGUAGE SPOKEN AT HOME	
Population 5 years and over	**24,149**
English only	23,390
Language other than English	759
Spanish	350
Other Indo-European languages	262
Asian and Pacific Island languages	104
Other	43

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF SELECTED ECONOMIC CHARACTERISTICS: 2000

Geographic Area: East City

EMPLOYMENT STATUS	
Population 16 years and over	**20,578**
In labor force	11,782
Civilian labor force	11,782
Employed	11,044
Unemployed	738
Percent of civilian labor force	6.3
Armed Forces	0
Not in labor force	8,796
Females 16 years and over	**11,546**
In labor force	5,965
Civilian labor force	5,965
Employed	5,595

COMMUTING TO WORK	
Workers 16 years and over	**10,864**
Car, truck, or van (drove alone)	8,945
Car, truck, or van (carpooled)	1,428
Public transportation (including taxicab)	106
Walked	64
Other means	66
Worked at home	255
Mean travel time to work (minutes)	21.8

Employed civilian population 16 years and over	**11,044**
OCCUPATION	
Management, professional, related	3,154
Service	2,057
Sales and office	3,061
Farming, fishing, forestry	8
Construction, extraction, maintenance	919
Production, transportation, material	1,845
INDUSTRY	
Agriculture, forestry, fishing, mining	19
Construction	570
Manufacturing	1,228
Wholesale trade	460
Retail trade	1,420
Transportation, warehousing, utilities	568
Information	306
Finance, insurance, real estate	553
Professional, scientific, management	1,085
Educational, health, social services	2,737
Arts, entertainment, accommodation	988
Other services	550
Public administration	560
CLASS OF WORKER	
Private wage and salary	8,105
Government	2,148
Self-employed	760
Unpaid family workers	31

INCOME IN 1999	
Households	**11,263**
Less than $10,000	1,765
$10,000 to $14,999	1,129
$15,000 to $24,999	2,174
$25,000 to $34,999	1,806
$35,000 to $49,999	1,867
$50,000 to $74,999	1,476
$75,000 to $99,999	619
$100,000 to $149,999	283
$150,000 to $199,999	95
$200,000 or more	49
Mean household income (dollars)	36,486
With earnings	8,165
With Social Security income	3,901
Mean Social Security income (dollars)	10,321
With Supplemental Security Income (SSI)	830
Mean SSI (dollars)	5,703
With public assistance income	515
Mean public assistance income (dollars)	1,829
With retirement income	2,334
Mean retirement income (dollars)	13,259
Families	**6,791**
Less than $10,000	669
$10,000 to $14,999	506
$15,000 to $24,999	1,146
$25,000 to $34,999	1,103
$35,000 to $49,999	1,308
$50,000 to $74,999	1,150
$75,000 to $99,999	531
$100,000 to $149,999	267
$150,000 to $199,999	68
$200,000 or more	43
Mean family income (dollars)	43,472
Per capita income (dollars)	16,364
Mean earnings (dollars)	
Male	28,025
Female	20,259
POVERTY STATUS IN 1999	
Families	**1,037**
With related children under 18 years	781
With related children under 5 years	321
Families with female householder, no husband present	**709**
With related children under 18 years	580
With related children under 5 years	246
Individuals	**4,788**
18 years and over	3,073
65 years and over	618

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF SELECTED HOUSING CHARACTERISTICS: 2000

Geographic Area: East City

Total housing units	**12,664**
UNITS IN STRUCTURE	
1-unit, detached	9,399
1-unit, attached	376
2 units	605
3 or 4 units	415
5 to 9 units	541
10 to 19 units	373
20 or more units	883
Mobile home	66
Boat, RV, van, etc.	6
YEAR STRUCTURE BUILT	
1999 to March 2000	74
1995 to 1998	453
1990 to 1994	243
1980 to 1989	814
1970 to 1979	1,190
1960 to 1969	2,130
1940 to 1959	5,938
1939 or earlier	1,822
ROOMS	
1 room	108
2 rooms	376
3 rooms	1,015
4 rooms	2,387
5 rooms	3,311
6 rooms	2,339
7 rooms	1,621
8 rooms	800
9 or more rooms	707
Mean (rooms)	5.4
Occupied housing units	**11,307**
YEAR HOUSEHOLDER MOVED INTO UNIT	
1999 to March 2000	1,796
1995 to 1998	3,042
1990 to 1994	1,650
1980 to 1989	1,501
1970 to 1979	1,303
1969 or earlier	2,015
VEHICLES AVAILABLE	
None	1,209
1	4,787
2	3,787
3 or more	1,524
Vehicles per household	1.6
SELECTED CHARACTERISTICS	
Lacking complete plumbing facilities	21
Lacking complete kitchen facilities	16
No telephone service	290

Occupied housing units	**11,307**
HOUSE HEATING FUEL	
Utility gas	4,603
Bottled, tank, or LP gas	130
Electricity	6,302
Fuel oil, kerosene, etc.	197
Coal or coke	16
Wood	44
Solar energy	0
Other fuel	15
No fuel used	0
OCCUPANTS PER ROOM	
1.00 or less	11,091
1.01 to 1.50	162
1.51 or more	54
Specified owner-occupied units	**7,058**
VALUE	
Less than $50,000	1,547
$50,000 to $99,999	4,193
$100,000 to $149,999	959
$150,000 to $199,999	273
$200,000 to $299,999	80
$300,000 to $499,999	6
$500,000 to $999,999	0
$1,000,000 or more	0
Mean (dollars)	77,114
MORTGAGE STATUS AND SELECTED MONTHLY OWNER COSTS	
With a mortgage	4,267
Less than $300	96
$300 to $499	482
$500 to $699	1,279
$700 to $999	1,377
$1,000 to $1,499	805
$1,500 to $1,999	184
$2,000 or more	44
Not mortgaged	2,791
Specified renter-occupied units	**3,895**
GROSS RENT	
Less than $200	486
$200 to $299	255
$300 to $499	1,410
$500 to $749	1,222
$750 to $999	193
$1,000 to $1,499	5
$1,500 or more	0
No cash rent	324
Mean (dollars)	410

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF GENERAL DEMOGRAPHIC CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

Total population	**2,028**
SEX AND AGE	
Male	941
Female	1,087
Under 5 years	135
5 to 9 years	116
10 to 14 years	117
15 to 19 years	125
20 to 24 years	165
25 to 34 years	335
35 to 44 years	299
45 to 54 years	258
55 to 59 years	104
60 to 64 years	87
65 to 74 years	120
75 to 84 years	112
85 years and over	55
Median age (years)	35.7
18 years and over	1,590
21 years and over	1,506
62 years and over	339
65 years and over	287
5 to 10 years	139
11 to 13 years	65
14 to 18 years	121
RACE	
One race	2,005
White	1,705
Black or African American	264
American Indian and Alaska Native	8
Asian	15
Native Hawaiian/Other Pac. Islander	1
Some other race	12
Two or more races	23
HISPANIC OR LATINO	
Hispanic or Latino (of any race)	21
Not Hispanic or Latino	2,007

GROUP QUARTERS	
Total population in group quarters	**39**
Institutionalized	39
Correctional institutions	0
Nursing homes	39
Noninstitutionalized	0
College (incl. college quarters off campus)	0
Military quarters	0
Other (Institutionalized and Noninstitutionalized)	0
HOUSEHOLD BY TYPE	
Total households	**895**
Family households (families)	537
With own children under 18 years	237
Married-couple family	373
With own children under 18 years	150
Female householder, no husband present	136
With own children under 18 years	69
Male householder, no wife present	28
With own children under 18 years	18
Nonfamily households	358
Householder living alone	293
Householder 65 years and over, living alone	88
Unmarried-partner households	48
Households with individuals under 18 years	262
Households with individuals 65 years and over	200
Average household size	2.22
Average family size	2.83
HOUSING OCCUPANCY	
Total housing units	**1,009**
Occupied housing units	895
Vacant housing units	114
For seasonal, recreational, occasional use	1
Vacancy rate (percent)	11.3
HOUSING TENURE	
Occupied housing units	**895**
Owner-occupied housing units	447
Renter-occupied housing units	448
Average household size of owner-occupied units	2.44
Average household size of renter-occupied units	2.01

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, August 2001.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 1.

PROFILE OF SELECTED SOCIAL CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

SCHOOL ENROLLMENT	
Population 3 years and over enrolled in school	**502**
Nursery school, preschool	8
Kindergarten	49
Elementary school (grades 1-8)	223
High school (grades 9-12)	111
College or graduate school	111

EDUCATIONAL ATTAINMENT	
Population 25 years and over	**1,419**
Less than 9th grade	112
9th to 12th grade, no diploma	218
High school graduate (includes GED)	459
Some college, no degree	281
Associate degree	76
Bachelor's degree	214
Graduate or professional degree	59
Percent high school graduate or higher	76.7
Percent bachelor's degree or higher	19.2

MARITAL STATUS	
Population 15 years and over	**1,662**
Never married	412
Now married (not separated)	777
Separated	53
Widowed	165
Female	127
Divorced	255
Female	203

DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALIZED POPULATION	
Population 5 to 20 years	**431**
With a disability	48
Population 21 to 64 years	**1,272**
With a disability	337
Percent employed	63.2
No disability	935
Percent employed	81.1
Population 65 years and over	**201**
With a disability	111

RESIDENCE IN 1995	
Population 5 years and over	**1,949**
Same house in 1995	839
Different house in the U.S. in 1995	1,063
Same county	534
Different county	529
Same state	160
Different state	369
Elsewhere in 1995	47

NATIVITY AND PLACE OF BIRTH	
Total population	**2,070**
Native	1,984
Born in United States	1,971
State of residence	1,361
Different state	610
Born outside United States	13
Foreign born	86
Entered 1990 to March 2000	43
Naturalized citizen	42
Not a citizen	44

REGION OF BIRTH OF FOREIGN BORN	
Total (excluding born at sea)	**86**
Europe	25
Asia	29
Africa	20
Oceania	0
Latin America	12
Northern America	0

LANGUAGE SPOKEN AT HOME	
Population 5 years and over	**1,949**
English only	1,858
Language other than English	91
Spanish	16
Other Indo-European languages	47
Asian and Pacific Island languages	9
Other	19

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF SELECTED ECONOMIC CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

EMPLOYMENT STATUS	
Population 16 years and over	**1,636**
In labor force	1,078
Civilian labor force	1,078
Employed	1,045
Unemployed	33
Percent of civilian labor force	3.1
Armed Forces	0
Not in labor force	558
Females 16 years and over	**958**
In labor force	539
Civilian labor force	539
Employed	511
COMMUTING TO WORK	
Workers 16 years and over	**1,026**
Car, truck, or van (drove alone)	788
Car, truck, or van (carpooled)	191
Public transportation (including taxicab)	6
Walked	8
Other means	16
Worked at home	17
Mean travel time to work (minutes)	22.2
Employed civilian population 16 years and over	**1,045**
OCCUPATION	
Management, professional, related	298
Service	248
Sales and office	299
Farming, fishing, forestry	0
Construction, extraction, maintenance	71
Production, transportation, material	129
INDUSTRY	
Agriculture, forestry, fishing, mining	0
Construction	55
Manufacturing	111
Wholesale trade	22
Retail trade	174
Transportation, warehousing, utilities	47
Information	12
Finance, insurance, real estate	50
Professional, scientific, management	129
Educational, health, social services	186
Arts, entertainment, accommodation	124
Other services	87
Public administration	48
CLASS OF WORKER	
Private wage and salary	762
Government	153
Self-employed	125
Unpaid family workers	5

INCOME IN 1999	
Households	**887**
Less than $10,000	111
$10,000 to $14,999	89
$15,000 to $24,999	184
$25,000 to $34,999	179
$35,000 to $49,999	144
$50,000 to $74,999	105
$75,000 to $99,999	49
$100,000 to $149,999	26
$150,000 to $199,999	0
$200,000 or more	0
Median household income (dollars)	28,201
With earnings	719
With Social Security income	191
Mean Social Security income (dollars)	8,549
With Supplemental Security Income (SSI)	51
Mean SSI (dollars)	4,276
With public assistance income	58
Mean public assistance income (dollars)	2,059
With retirement income	137
Mean retirement income (dollars)	13,003
Families	**538**
Less than $10,000	49
$10,000 to $14,999	53
$15,000 to $24,999	59
$25,000 to $34,999	123
$35,000 to $49,999	92
$50,000 to $74,999	94
$75,000 to $99,999	42
$100,000 to $149,999	26
$150,000 to $199,999	0
$200,000 or more	0
Median family income (dollars)	32,455
Per capita income (dollars)	15,025
Median earnings (dollars)	
Male	22,589
Female	11,867
POVERTY STATUS IN 1999	
Families	**61**
With related children under 18 years	39
With related children under 5 years	7
Families with female householder, no husband present	**53**
With related children under 18 years	39
With related children under 5 years	7
Individuals	**215**
18 years and over	149
65 years and over	19

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF SELECTED HOUSING CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

Total housing units	**1,015**
UNITS IN STRUCTURE	
1-unit, detached	659
1-unit, attached	10
2 units	11
3 or 4 units	6
5 to 9 units	93
10 to 19 units	111
20 or more units	120
Mobile home	5
Boat, RV, van, etc.	0
YEAR STRUCTURE BUILT	
1999 to March 2000	18
1995 to 1998	59
1990 to 1994	122
1980 to 1989	215
1970 to 1979	97
1960 to 1969	44
1940 to 1959	312
1939 or earlier	148
Median, owner-occupied (year)	1956
Median, renter-occupied (year)	1981
ROOMS	
1 room	6
2 rooms	67
3 rooms	111
4 rooms	206
5 rooms	240
6 rooms	144
7 rooms	93
8 rooms	62
9 or more rooms	86
Median (rooms)	5.0
Occupied housing units	**899**
YEAR HOUSEHOLDER MOVED INTO UNIT	
1999 to March 2000	302
1995 to 1998	182
1990 to 1994	85
1980 to 1989	151
1970 to 1979	79
1969 or earlier	100
VEHICLES AVAILABLE	
None	73
1	376
2	291
3 or more	159
Vehicles per household	1.7
SELECTED CHARACTERISTICS	
Lacking complete plumbing facilities	0
Lacking complete kitchen facilities	0
No telephone service	18

Occupied housing units	**899**
HOUSE HEATING FUEL	
Utility gas	340
Bottled, tank, or LP gas	25
Electricity	500
Fuel oil, kerosene, etc.	29
Coal or coke	0
Wood	5
Solar energy	0
Other fuel	0
No fuel used	0
OCCUPANTS PER ROOM	
1.00 or less	894
1.01 to 1.50	5
1.51 or more	0
Specified owner-occupied units	**429**
VALUE	
Less than $50,000	68
$50,000 to $99,999	209
$100,000 to $149,999	81
$150,000 to $199,999	54
$200,000 to $299,999	17
$300,000 to $499,999	0
$500,000 to $999,999	0
$1,000,000 or more	0
Median (dollars)	85,100
MORTGAGE STATUS AND SELECTED MONTHLY OWNER COSTS	
With a mortgage	274
Less than $300	0
$300 to $499	5
$500 to $699	92
$700 to $999	90
$1,000 to $1,499	71
$1,500 to $1,999	6
$2,000 or more	10
Not mortgaged	155
Specified renter-occupied units	**458**
GROSS RENT	
Less than $200	39
$200 to $299	19
$300 to $499	148
$500 to $749	198
$750 to $999	21
$1,000 to $1,499	14
$1,500 or more	0
No cash rent	19
Median (dollars)	519

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF GENERAL DEMOGRAPHIC CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

Total population	**2,028**
SEX AND AGE	
Male	941
Female	1,087
Under 5 years	135
5 to 9 years	116
10 to 14 years	117
15 to 19 years	125
20 to 24 years	165
25 to 34 years	335
35 to 44 years	299
45 to 54 years	258
55 to 59 years	104
60 to 64 years	87
65 to 74 years	120
75 to 84 years	112
85 years and over	55
Median age (years)	35.7
18 years and over	1,590
21 years and over	1,506
62 years and over	339
65 years and over	287
5 to 10 years	139
11 to 13 years	65
14 to 18 years	121
RACE	
One race	2,005
White	1,705
Black or African American	264
American Indian and Alaska Native	8
Asian	15
Native Hawaiian/Other Pac. Islander	1
Some other race	12
Two or more races	23
HISPANIC OR LATINO	
Hispanic or Latino (of any race)	21
Not Hispanic or Latino	2,007

GROUP QUARTERS	
Total population in group quarters	**39**
Institutionalized	39
Correctional institutions	0
Nursing homes	39
Noninstitutionalized	0
College (incl. college quarters off campus)	0
Military quarters	0
Other (Institutionalized and Noninstitutionalized)	0
HOUSEHOLD BY TYPE	
Total households	**895**
Family households (families)	537
With own children under 18 years	237
Married-couple family	373
With own children under 18 years	150
Female householder, no husband present	136
With own children under 18 years	69
Male householder, no wife present	28
With own children under 18 years	18
Nonfamily households	358
Householder living alone	293
Householder 65 years and over, living alone	88
Unmarried-partner households	48
Households with individuals under 18 years	262
Households with individuals 65 years and over	200
Average household size	2.22
Average family size	2.83
HOUSING OCCUPANCY	
Total housing units	**1,009**
Occupied housing units	895
Vacant housing units	114
For seasonal, recreational, occasional use	1
Vacancy rate (percent)	11.3
HOUSING TENURE	
Occupied housing units	**895**
Owner-occupied housing units	447
Renter-occupied housing units	448
Average household size of owner-occupied units	2.44
Average household size of renter-occupied units	2.01

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, August 2001.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 1.

PROFILE OF SELECTED SOCIAL CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

SCHOOL ENROLLMENT	
Population 3 years and over enrolled in school	**502**
Nursery school, preschool	8
Kindergarten	49
Elementary school (grades 1-8)	223
High school (grades 9-12)	111
College or graduate school	111

EDUCATIONAL ATTAINMENT	
Population 25 years and over	**1,419**
Less than 9th grade	112
9th to 12th grade, no diploma	218
High school graduate (includes GED)	459
Some college, no degree	281
Associate degree	76
Bachelor's degree	214
Graduate or professional degree	59
Percent high school graduate or higher	76.7
Percent bachelor's degree or higher	19.2

MARITAL STATUS	
Population 15 years and over	**1,662**
Never married	412
Now married (not separated)	777
Separated	53
Widowed	165
Female	127
Divorced	255
Female	203

DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALIZED POPULATION	
Population 5 to 20 years	**431**
With a disability	48
Population 21 to 64 years	**1,272**
With a disability	337
Percent employed	63.2
No disability	935
Percent employed	81.1
Population 65 years and over	**201**
With a disability	111

RESIDENCE IN 1995	
Population 5 years and over	**1,949**
Same house in 1995	839
Different house in the U.S. in 1995	1,063
Same county	534
Different county	529
Same state	160
Different state	369
Elsewhere in 1995	47

NATIVITY AND PLACE OF BIRTH	
Total population	**2,070**
Native	1,984
Born in United States	1,971
State of residence	1,361
Different state	610
Born outside United States	13
Foreign born	86
Entered 1990 to March 2000	43
Naturalized citizen	42
Not a citizen	44

REGION OF BIRTH OF FOREIGN BORN	
Total (excluding born at sea)	**86**
Europe	25
Asia	29
Africa	20
Oceania	0
Latin America	12
Northern America	0

LANGUAGE SPOKEN AT HOME	
Population 5 years and over	**1,949**
English only	1,858
Language other than English	91
Spanish	16
Other Indo-European languages	47
Asian and Pacific Island languages	9
Other	19

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF SELECTED ECONOMIC CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

EMPLOYMENT STATUS	
Population 16 years and over	**1,636**
In labor force	1,078
Civilian labor force	1,078
Employed	1,045
Unemployed	33
Percent of civilian labor force	3.1
Armed Forces	0
Not in labor force	558
Females 16 years and over	**958**
In labor force	539
Civilian labor force	539
Employed	511
COMMUTING TO WORK	
Workers 16 years and over	**1,026**
Car, truck, or van (drove alone)	788
Car, truck, or van (carpooled)	191
Public transportation (including taxicab)	6
Walked	8
Other means	16
Worked at home	17
Mean travel time to work (minutes)	22.2
Employed civilian population 16 years and over	**1,045**
OCCUPATION	
Management, professional, related	298
Service	248
Sales and office	299
Farming, fishing, forestry	0
Construction, extraction, maintenance	71
Production, transportation, material	129
INDUSTRY	
Agriculture, forestry, fishing, mining	0
Construction	55
Manufacturing	111
Wholesale trade	22
Retail trade	174
Transportation, warehousing, utilities	47
Information	12
Finance, insurance, real estate	50
Professional, scientific, management	129
Educational, health, social services	186
Arts, entertainment, accommodation	124
Other services	87
Public administration	48
CLASS OF WORKER	
Private wage and salary	762
Government	153
Self-employed	125
Unpaid family workers	5

INCOME IN 1999	
Households	**887**
Less than $10,000	111
$10,000 to $14,999	89
$15,000 to $24,999	184
$25,000 to $34,999	179
$35,000 to $49,999	144
$50,000 to $74,999	105
$75,000 to $99,999	49
$100,000 to $149,999	26
$150,000 to $199,999	0
$200,000 or more	0
Median household income (dollars)	28,201
With earnings	719
With Social Security income	191
Mean Social Security income (dollars)	8,549
With Supplemental Security Income (SSI)	51
Mean SSI (dollars)	4,276
With public assistance income	58
Mean public assistance income (dollars)	2,059
With retirement income	137
Mean retirement income (dollars)	13,003
Families	**538**
Less than $10,000	49
$10,000 to $14,999	53
$15,000 to $24,999	59
$25,000 to $34,999	123
$35,000 to $49,999	92
$50,000 to $74,999	94
$75,000 to $99,999	42
$100,000 to $149,999	26
$150,000 to $199,999	0
$200,000 or more	0
Median family income (dollars)	32,455
Per capita income (dollars)	15,025
Median earnings (dollars)	
Male	22,589
Female	11,867
POVERTY STATUS IN 1999	
Families	**61**
With related children under 18 years	39
With related children under 5 years	7
Families with female householder, no husband present	**53**
With related children under 18 years	39
With related children under 5 years	7
Individuals	**215**
18 years and over	149
65 years and over	19

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

PROFILE OF SELECTED HOUSING CHARACTERISTICS: 2000

Geographic Area: Census Tract 43

Total housing units	**1,015**
UNITS IN STRUCTURE	
1-unit, detached	659
1-unit, attached	10
2 units	11
3 or 4 units	6
5 to 9 units	93
10 to 19 units	111
20 or more units	120
Mobile home	5
Boat, RV, van, etc.	0
YEAR STRUCTURE BUILT	
1999 to March 2000	18
1995 to 1998	59
1990 to 1994	122
1980 to 1989	215
1970 to 1979	97
1960 to 1969	44
1940 to 1959	312
1939 or earlier	148
Median, owner-occupied (year)	1956
Median, renter-occupied (year)	1981
ROOMS	
1 room	6
2 rooms	67
3 rooms	111
4 rooms	206
5 rooms	240
6 rooms	144
7 rooms	93
8 rooms	62
9 or more rooms	86
Median (rooms)	5.0
Occupied housing units	**899**
YEAR HOUSEHOLDER MOVED INTO UNIT	
1999 to March 2000	302
1995 to 1998	182
1990 to 1994	85
1980 to 1989	151
1970 to 1979	79
1969 or earlier	100
VEHICLES AVAILABLE	
None	73
1	376
2	291
3 or more	159
Vehicles per household	1.7
SELECTED CHARACTERISTICS	
Lacking complete plumbing facilities	0
Lacking complete kitchen facilities	0
No telephone service	18

Occupied housing units	**899**
HOUSE HEATING FUEL	
Utility gas	340
Bottled, tank, or LP gas	25
Electricity	500
Fuel oil, kerosene, etc.	29
Coal or coke	0
Wood	5
Solar energy	0
Other fuel	0
No fuel used	0
OCCUPANTS PER ROOM	
1.00 or less	894
1.01 to 1.50	5
1.51 or more	0
Specified owner-occupied units	**429**
VALUE	
Less than $50,000	68
$50,000 to $99,999	209
$100,000 to $149,999	81
$150,000 to $199,999	54
$200,000 to $299,999	17
$300,000 to $499,999	0
$500,000 to $999,999	0
$1,000,000 or more	0
Median (dollars)	85,100
MORTGAGE STATUS AND SELECTED MONTHLY OWNER COSTS	
With a mortgage	274
Less than $300	0
$300 to $499	5
$500 to $699	92
$700 to $999	90
$1,000 to $1,499	71
$1,500 to $1,999	6
$2,000 or more	10
Not mortgaged	155
Specified renter-occupied units	**458**
GROSS RENT	
Less than $200	39
$200 to $299	19
$300 to $499	148
$500 to $749	198
$750 to $999	21
$1,000 to $1,499	14
$1,500 or more	0
No cash rent	19
Median (dollars)	519

Compiled by the Knoxville/Knox County Metropolitan Planning Commission, September 2002.

Source: U.S. Census Bureau, 2000 Census of Population and Housing: Summary File 3.

KNOXVILLE, TN METROPOLITAN STATISTICAL AREA (MSA) POPULATION, 2000-200

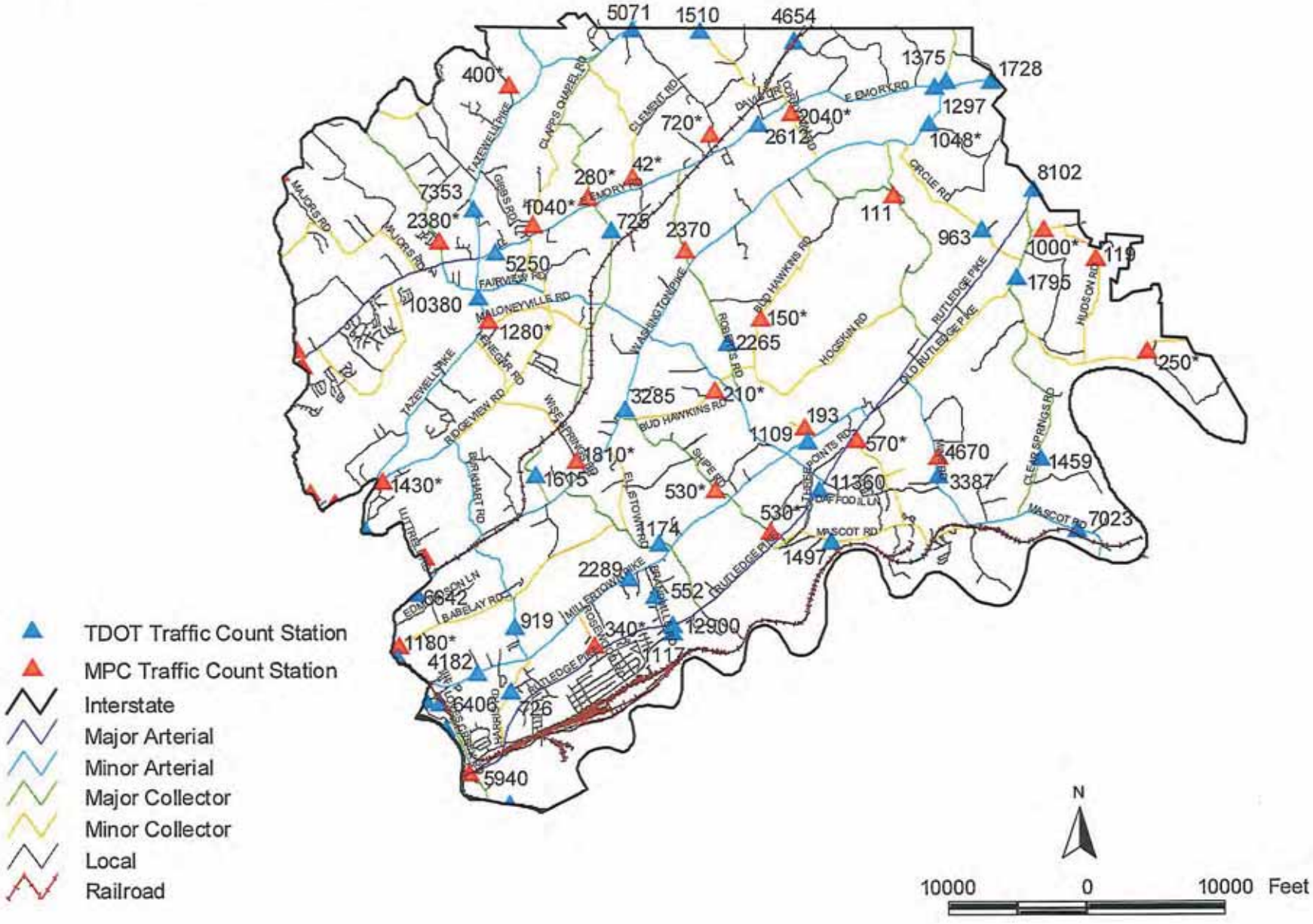
County	2007	2006	2005	2004	2003	2002	2001	2000	Estimates Base 2000	Census 2000
Anderson County	73,471	72,873	71,801	71,381	71,407	71,377	71,336	71,241	71,330	71,330
Blount County	119,855	117,934	115,261	113,120	111,139	109,552	107,953	106,225	105,823	105,823
Knox County	423,874	416,352	409,116	403,080	398,760	392,858	387,775	383,046	382,032	382,032
Loudon County	45,448	44,362	43,242	42,155	41,418	40,755	39,970	39,215	39,087	39,086
Union County	18,877	18,761	18,660	18,589	18,592	18,410	18,285	17,858	17,808	17,808
Knoxville MSA	**681,525**	**670,282**	**658,080**	**648,325**	**641,316**	**632,952**	**625,319**	**617,585**	**616,080**	**616,079**

Note:
Metropolitan Statistical Area definition as of December, 2005. Totals for all years are based on the 2005 definition.

Source:
U.S. Census Bureau, *Population Estimates Program*. March 20, 2008.

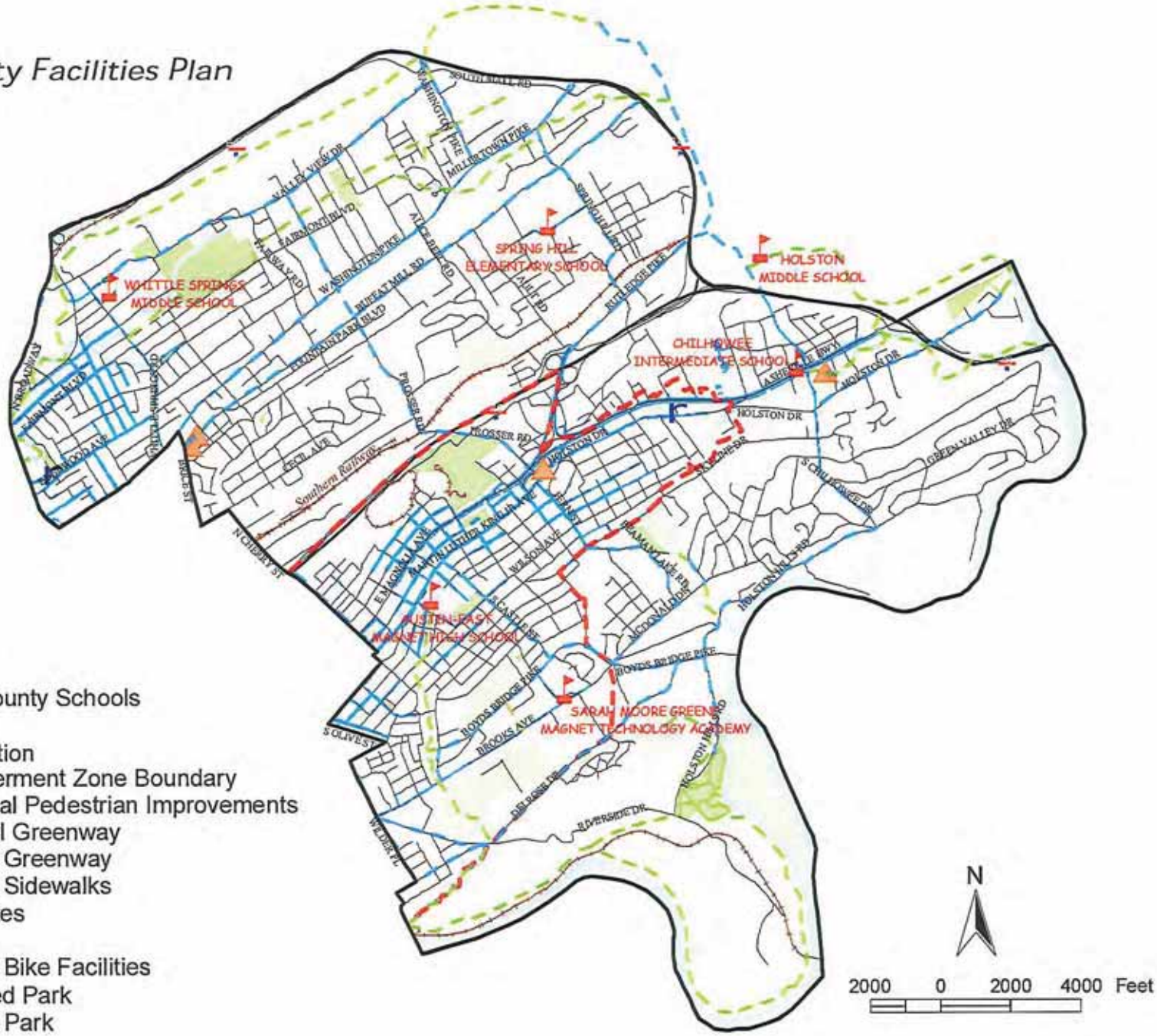
Prepared by the Knoxville/Knox County Metropolitan Planning Commission, March 20, 2008.

Map 8: Transportation System



Northeast County Sector Plan, 2003

Map 8
Community Facilities Plan



Legend

- Knox County Schools
- Library
- Fire Station
- Empowerment Zone Boundary
- Additional Pedestrian Improvements
- Potential Greenway
- Existing Greenway
- Existing Sidewalks
- Interstates
- Roads
- Existing Bike Facilities
- Proposed Park
- Existing Park

Population and Growth Trends

View East City Population Density Map

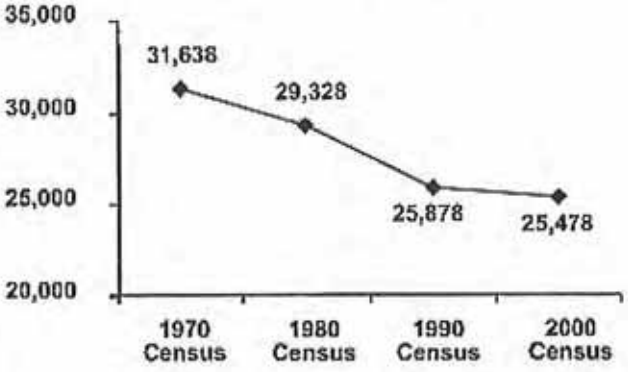
- According to 2000 Census figures, population for the East City Sector declined by 400 persons, or 1.5%, almost reversing a trend of population decline.
- Population increased significantly in tracts 30 and 31.
- Population dropped significantly in tracts 19 and 32.
- In contrast, population in the sector decreased by 3,450 persons, or 11.8%, between 1980 and 1990.
- Only East City and Central City sectors experienced a decline in population between 1990 and 2000.
- East City's population is dense enough to support public transit in certain spots, as shown in Map 2.

New apartments and condominiums in tracts 30 and 31 are adding the density needed to support healthy neighborhood-serving businesses, and creating demand for transportation alternatives such as pedestrian facilities and public transit.

Census Tracts in the East City Sector

Census tracts 16, 18, 19, 20, 31, 30, 31, 32, and 33 are in the East City Sector and are shown in gray.

Figure 1:
East City Sector Population Change, 1970-2000



Block Group 2
Census Tract 93

1-640 [illegible]

Special Development Opportunity Areas

View Map 11: Development Concepts

Murphy Road: An Attractive Gateway into Northeast Knox County

Neighborhood commercial services at Washington Pike should connect by sidewalk to existing and future residential areas.

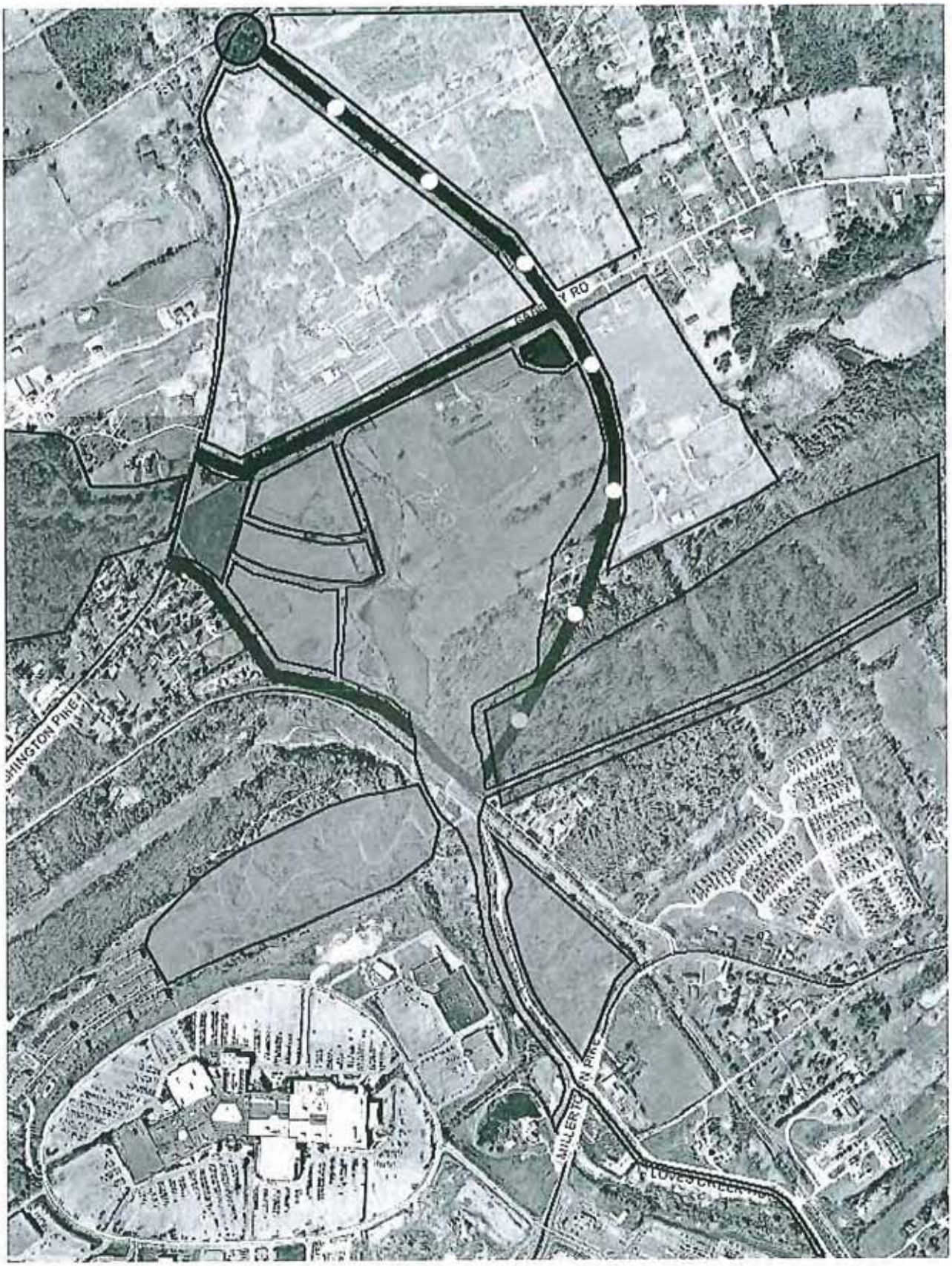
Road improvements include extension of Murphy Road to Mill Road, near Millertown Pike. This is proposed as a four-lane, divided highway with a raised median, sidewalks and signalized intersections to be located at Babelay Drive and Edmondson Lane. Aesthetic issues should be carefully considered, including landscaping along with the road improvements.

Portions of this low-lying area are flood prone and best suited for recreational uses.

A low to medium density land use transition area will need to develop between the high intensity areas surrounding Knoxville Center Mall and existing large lot, single family homes near the extended portion of Murphy Road. Preserving the floodplain protection area around Loves Creek headwaters will limit future flooding in the area. These low-lying areas should be acquired by the county and used for recreational purposes. Acquiring easements for greenway connections and future community amenities should be done in coordination with right-of-way purchases for the road improvements.

The development opportunity illustrated in Figure 5 shows the general location of Murphy Road as it is proposed to be extended through the Babelay farm.

The parkland (in blue) is surrounded by a mix of housing types, with walking trail connections to the village center and to future greenways that are proposed along Loves Creek to the south, McAnnally Ridge to the east and Sharps Ridge to the west. As the area grows, additional public facilities, such as a fire department, may be needed, and could be located in the Village Center or a centrally located intersection such as Babelay Drive and the extended Murphy Road.



Legend

- Village commons, parkland and greenway trails
- Village center with mix of office, commercial, and civic uses
- Low density residential
- Medium density residential

Existing Land Use

View Existing Land Use Map
View Existing Land Use Table

In terms of acreage, most of the sector is single family residential. Because of land constraints and a lack of vacant land, there are few opportunities for large-scale land development and therefore few changes in land use. Emphasis is on achieving compatible infill housing and redeveloping commercial areas to meet the needs of a diverse population.

Laurel Place on Valley View Drive is within easy walking distance to many commercial establishments and other community amenities, but adequate pedestrian facilities are not available.

Residential Trends
1990-2000 The breakdown of new residential units in the past ten years includes 408 single family units, 53 multi-family, and 234 condominiums. The total number of net residential properties since 1990 is 702. Major developments include Laurel Place on Valley View Drive and Buffat Trace on Buffat Mill Road.

Commercial Trends
Since its construction in 1984, Knoxville Center (formerly East Towne Mall) has increased traffic and stimulated development in a significant portion of the sector. This mall and several surrounding commercial properties including Sam's Club, Kohl's, and Walmart, are not located within the sector but have a great deal of influence on the livability of adjacent East City neighborhoods. East Towne Crossing (Home Depot) and Isaiah's Landing (Lowe's, currently under construction) are within the East City Sector, in very close proximity to well-established residential areas.

The old Kmart building on Asheville Highway is in need of re-adaptation/renovation for a new type of use.

If market conditions favor further expansion of commercial establishments, this growth must occur in a way that is pedestrian friendly and does not disturb existing neighborhoods. Within the sector, existing commercially zoned property is available for redevelopment as an alternative

to creating new commercial areas. The highest shopping center vacancy rates in Knoxville/Knox County are found in East City, with rates approaching 20 percent. In many cases, vacant buildings will contribute to blight in the sector if they remain empty, with litter and illegal activities more likely to occur at these locations. If it is not possible to renovate the property to create a more "modern" shopping experience, re-adaptation of obsolete shopping center space for uses other than retail may be necessary.

Office Trends

Due in large part to a dominant, stable medical sector, the Central, East, and South City Sectors form a sub-market (excluding the downtown area) that outperforms all other sub-markets, with a 1.71 percent vacancy rate. Sixty-six total buildings are in the sub-market, which consists of some of Knoxville's older building stock. Out of 2,517,432 gross sq. ft., only 36,846 is estimated to be vacant. Vacancy in the county as a whole is 7.8 percent, with office space in some sub-markets over 10 percent vacant. Trends show that office space is migrating westward, with the highest percentage of new office space in the Pellissippi sub-market.

Better access is needed to insure viability of Forks of the River Industrial Park as an employment center for East City residents. Large trucks disrupt neighborhood traffic on Boyd's Bridge Pike, Holston Hills Rd. and S. Chilhowee Dr. by using this bridge across Holston River as a short cut to and from the park.

As a planning sector, East City Sector contains 96,808 gross sq. ft. of office space in nine buildings, with no vacant square footage reported. It has the lowest vacancy rate by sector. Among city sectors, the East City Sector has the least amount of gross office space to rent. Existing office space is concentrated along Magnolia Avenue.

Industrial Trends

Knoxville/Knox County has a total of 706 industrial buildings, with a vacancy rate of 5.4 percent, compared to the eight percent national average. Four small sub-markets, or clusters, dominate the local industrial supply. East Knoxville and Forks of the River are two of the dominant clusters, and have several large buildings. Together these two clusters have 165 buildings, representing 31 percent of the total industrial space in Knoxville/Knox County. The largest collection of warehouse footage in Knoxville/Knox County is found in the East Knoxville cluster. Portions of East City and Central City Sectors combine to form the East Knoxville cluster, which is located along the I-40 corridor, adjacent to the rail line just north of the interstate.

Local demand has been growing for suburban locations, with some tenants vacating older properties within the city. The estimated vacancy rate within the East Knoxville cluster is currently 10.9 percent, second only to the Central Avenue cluster, with a vacancy rate of 15.5 percent.

As a planning sector, the East City Sector has a 21.2 percent vacancy rate. To capitalize on Knox County's overall shortage in industrial space, and to provide good jobs for area residents, efforts to revitalize industrial properties are underway as part of Knoxville's Empowerment Zone initiatives. Most of the vacant space in the East Knoxville cluster is over 20 years old.

Forks of the River Industrial Park, directly adjacent to East City Sector, is newer than the East Knoxville cluster but also has some aging buildings. Continued viability of the Forks of the River

Industrial Park is very important to the residents of East City sector. This industrial park has water and rail access, and is in close proximity to the Empowerment Zone. The park will provide jobs for residents of the sector and increase the stability of the entire community if properly maintained.

Some neighborhood streets, such as N. Chilhowee Drive and Holston Hills Road, experience cut through traffic—including large trucks—because of this industrial park's proximity. Roadway improvements to Governor John Sevier Highway, which is outside of the East City Sector, would increase the viability of the industrial park while reducing the instances of traffic cutting through residential neighborhoods.

Table 3:
Existing Land Use Total—By Acre

Rural Residential	610.5	596.8	5.9
Single Family Residential	3,432.9	3,471.7	34.6
Multifamily Residential	183.0	207.8	2.1
Commercial	246.8	326.8	3.3
Office	126.0	79.7	0.8
Industrial (Manufacturing)	100.6	206.5	2.1
Wholesale	*n/a	103.2	1.0
Transportation/Communications/Utilities	77.4	79.4	0.8
Public/Quasi Public Land	1,049.7	891.1	8.9
Agriculture, Forestry and Vacant Land	2,062.8	1,723.9	17.2
Public Parks	**n/a	432.4	4.3
Private Recreation	273.7	175.6	1.7
Under Construction/Other Uses/Unknown	163.2	10.6	0.1
Water	257.0	257.0	2.5
Right of Way/Open Space	1,460.4	1,481.9	14.7
Total	10,044.0	10,044.0	100

Previous Section

East City Sector Plan Home

Next Section

KNOXVILLE AREA STATISTICS

*The Knoxville Metropolitan Statistical Area (MSA) refers to Anderson, Blount, Knox, Loudon, and Union counties.

CIVIC

Churches 460

Golf Courses
Public - MSA* 33
Public - Knox County 13
Country Clubs 5

Government
City of Knoxville:
Mayor; 9 Council members (4-year terms)
Knox County:
County Mayor; Board of 19 Commissioners (4-year terms)

Historic Districts 25

Hospital Systems (Knox County)
General Use 8
Children's Hospital 1
Beds, approximate number 2,589

Libraries
Knox County Public Library
Size of Collection 1,011,163
Branches 19

Newspapers - circulation
The Knoxville News-Sentinel
Daily 117,339
Sunday 148,107
Weeklies, Biweeklies, and Monthlies
Total Number 12

Park Area (approximate public acreage)
Knox County 5,881

Radio and Television
Radio Stations 20
Television Stations 9

Theaters
Movie Screens 102
Performance Theaters 11
Dinner Theaters 1

DEMOGRAPHICS

Building Permits - 2007 (city/county)
Total Number 4,296
Total Value $911,858,039

Dwelling Units (city/county)
2000 Census 171,439
2007 estimate 196,836

Education
College Graduates
(percent of population) 31
College/University Enrollment 2007-08
University of Tennessee 26,000
Pellissippi State Technical Community College 7,600
Schools
Public 86
Private/Parochial 46
Business/Vocational 20

Housing - 2007 Median Sales Price
Knox County $156,400
U.S. $217,800
Apartment Rent $564

Population - (2000 Census)
City of Knoxville 173,890
(2006) 182,337
Knox County (including city) 382,032
(2007) 423,874
MSA* 616,079
(2007) 681,525
Knox County Median Age 38

ECONOMY

Businesses - 2007
Knox County 10,929
MSA* 15,657

Cost of Living
(U.S. Average = 100) 86.0

Earnings - 2007 MSA*
Average All Industries
Per Hour $17.45
Per Week $698
Average Annual Pay $36,296

Employment - 2007 MSA*
Annual Average 342,630
Labor Force 356,830
Unemployment 4.0%

Hotel/Motel Rooms - 2007
Number 8,234
Average Room Rate $80
Occupancy Rate 56.6%

Industrial Properties - 2007
Number of Buildings 605
Total Square Feet (in millions) 32.1
Vacancy Rate 11.1%

Manufacturing Establishments- 2007
Knox County 493
MSA* 812

Office Properties - 2007
Buildings 556
Total sq. ft. (in millions) 20.8
Vacancy Rate 12.6%
Average Rent (sq ft) $14.78

Retail Establishments - 2007
Knox County 1,689
MSA* 2,422

Retail Sales (thousands) - 2006
Knox County $8,910,315
Sales Per Capita $21,021

Service Establishments - 2007
Knox County 5,098
MSA* 7,135

Shopping Centers - 2006
Number 169
Total sq. ft. (in millions) 15.6
Vacancy Rate 6.5%

Wholesale Establishments - 2007
Knox County 922
MSA* 1,251

TRANSPORTATION

Airlines 8
Allegiant Air, American Eagle, Continental Express, Delta, Delta Connection, Northwest AirLink, United Express, USAirways Express
Daily flights 144

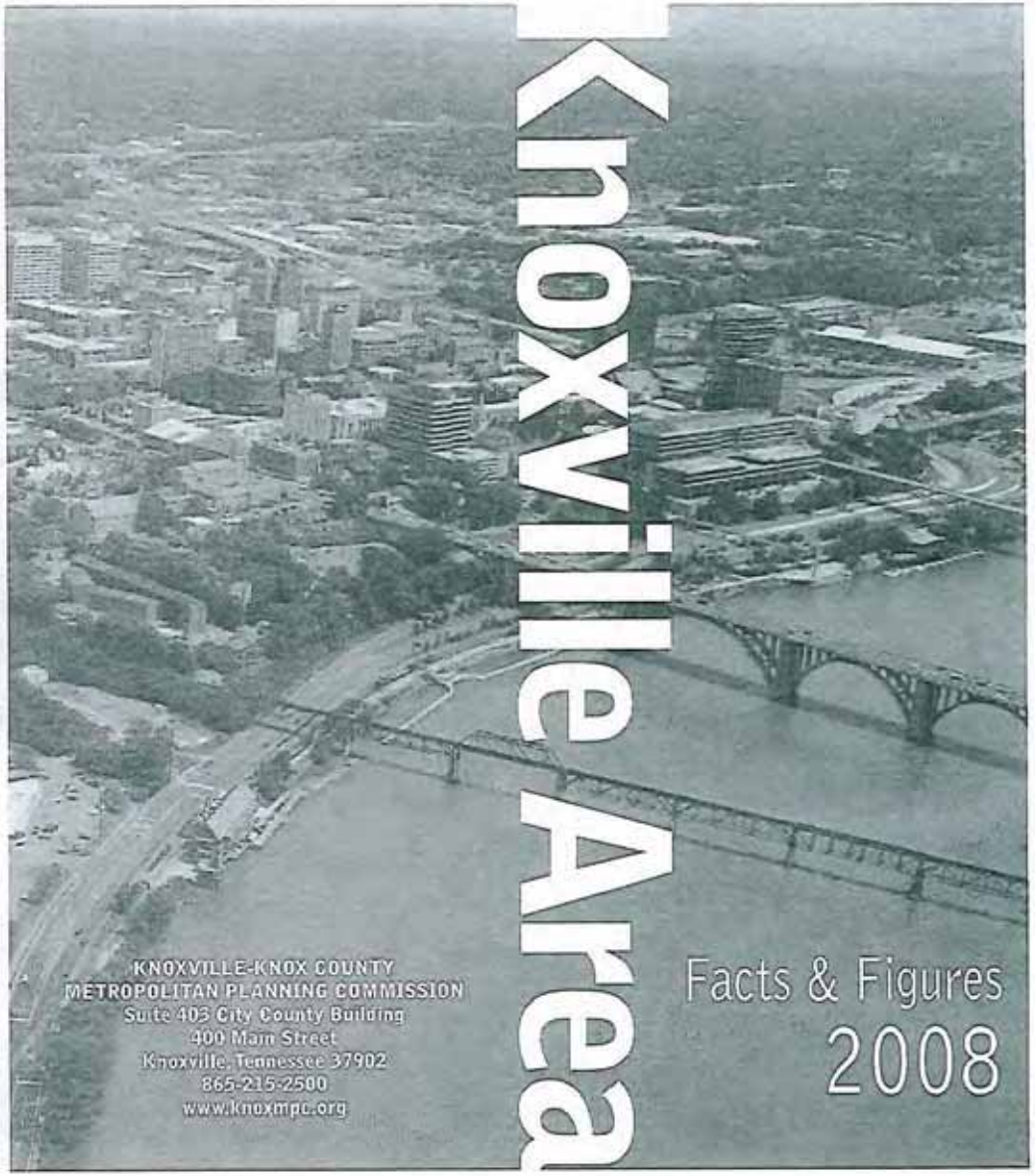
Air Services
Cargo services 5
Freight (tons) 2007 50,940

Air Passengers 1,821,581

Bus Terminals
Greyhound/Trailways 1

Railroad Lines
CSX/Seaboard, Norfolk Southern 2
Miles of Lines 170

Water Transportation - 2007
Port of Knoxville (tons) 591,210
Barges Per Year 276



LOCATION AND CLIMATE

Founded in 1791 where the French Broad and Holston Rivers meet to form the Tennessee River, Knoxville is the largest city in East Tennessee, ranking third statewide with a metropolitan population of 689,695. It is located in a broad valley between the Cumberland Mountains to the northwest and the Great Smoky Mountains to the southeast. These two ranges afford an attractive natural setting and provide a moderate, four-season climate, with average monthly temperatures ranging from 38 degrees in January to 78 degrees in July. The City of Knoxville comprises 103.7 square miles of the 526-square mile total for Knox County. Downtown Knoxville is 936 feet above sea level.

LIVABILITY

Knoxville continually receives high honors for quality of life. As published in the 2007 Best Cities for Relocating Families, Knoxville is the best medium sized metropolitan area in the nation. Rankings are based on cost of living, housing cost, crime rate, education, climate, arts/culture, and diversity. Salary.com placed Knoxville third among all markets in the U.S. when it comes to good wages and low cost of living. According to the 2007 American Chamber of Commerce Researchers Association (ACCRA) Cost of Living (COL) Index, which measures the relative price levels for consumer goods and services in metropolitan and nonmetropolitan areas whose chambers agree to participate, Knoxville was the eighth least expensive urban area in the country with a COL Index of 86.0. With the average of all participating cities equaling 100.0, this further solidifies Knoxville among the leading markets for low cost of living.

EDUCATION

Knox County operates 86 public schools, including 48 (primary, elementary or intermediate), 14 middle, and 13 high schools, two vocational schools, and several special/adult education centers. Included in the total are five magnet schools offering enhanced arts and science curriculum. Total enrollment in 2007 was 52,915. The system employs 3,401 teachers, with an average classroom ratio of one teacher for every 15 students. In addition to public education, there are 46 private and parochial schools offering elementary and secondary instruction in Knox County.

Post-secondary education is available at 10 public and private four-year institutions in Knox County and the surrounding area. In 2008, The University of Tennessee, Knoxville, with an average enrollment of 26,000 students, was placed in the top 30 percent of national public universities ranking 45th among 164 public institutions by U.S. News and World Report. Four community colleges offer two-year, associate degree programs, and several vocational and technical institutions also serve the area.

ARTS AND CULTURE

The Knoxville Symphony, the Knoxville Opera Company, and the Tennessee Children's Dance Ensemble are among the many exceptional arts organizations in the city. Choral groups, dance companies, and 11 performance theatres, including the renovated Tennessee and Bijou Theaters, also promote the arts. Live entertainment includes touring Broadway productions, ice shows, concerts, and circuses. The Knoxville Museum of Art and the Emporium Center for Arts and Culture feature changing exhibits throughout the year, while the area's libraries, historic sites, and museums, such as the Museum of Appalachia and the Beck Cultural Center, celebrate Knoxville's heritage.

RECREATION AND TOURISM

Knox County has over 5,881 acres of park and recreation space, including 27 recreation centers, six senior citizen centers, the newly opened Knoxville Skatepark, 13 golf courses open to the public, and more than 60 miles of greenway and walking trails. Knoxville's Zoological Gardens and Ijams Nature Center attract visitors both young and old. Nearby is the Great Smoky Mountains National Park, the country's most visited, with over nine million guests in 2007. Visitors enjoy the natural beauty and leisure activities that can be found there and at the numerous other state parks, lakes, and resorts which dot the area.

For sports fans, Knoxville has much to offer. Nationally-ranked University of Tennessee varsity teams draw thousands of enthusiasts to football, basketball, and many other NCAA events each year. The Tennessee Smokies provide AA minor league baseball in neighboring Sevier County, while the Knoxville Ice Bears bring minor league hockey to local fans. The city is also home to the Women's Basketball Hall of Fame.

Special seasonal events include the Dogwood Arts Festival and Rossini Festival in the spring, Sundown in the City concerts during summer months, Boomsday in the fall, and December's celebration Christmas in the City. Knoxville supports an active tourism and convention trade with a 500,000-square foot convention center located downtown at World's Fair Park. Other local facilities are a large civic coliseum/auditorium, two exhibition halls, and a 25,000-seat arena. Nestled downtown, Knoxville's listener supported radio station WDVX hosts a live radio broadcast weekdays called "The Blue Plate Special" where nationally known artists (Bela Fleck, Del McCoury, and Ricky Skaggs among them) and local greats perform for free. The radio station has been featured in The Boston Globe and Southern Living Magazine to national television on PBS and ABC World News Tonight with Peter Jennings.

CIVIC ORGANIZATIONS

The Knoxville Area Chamber Partnership has over 2,100 members who participate in economic development, general commerce, and community affairs. About 150 civic groups and 270 neighborhood associations are active in the city and county. United Way and Community Shares support many youth, family, and social service programs, and organizations such as the Community Action Committee and Child and Family Tennessee also offer local assistance. More than 460 churches, serving many faiths and denominations, meet the religious needs of the community.

COMMERCE AND INDUSTRY

Knoxville placed tenth and remained among one of the best cities in the country to do business according to the 2008 Forbes magazine rankings of the top 10 metros for business and careers. This recognition as one of the top metros is characteristic of a diverse market. Commerce and industry vary from the media success of Scripps Television Networks (HGTV, DIY, Food Network, GAC, and Fine Living), to Sysco Corporation's (largest food service marketer and distributor in North America) regional warehouse and distribution center. In addition, many other local companies are recognized as national and global leaders, including Clayton Homes, Brunswick Corporation, Goody's Family Clothing, Bush Brothers, Pilot Corporation, and Ruby Tuesday.

Knox County has 11 business parks and a Technology Corridor to meet a wide range of corporate facility needs. In 2007, over 780 new jobs were created in Knox County and over $80 million in new business investment. Across the metro area, new investment totaled $447 million and netted 2,555 jobs.

Four regional malls and 169 shopping centers and factory outlets comprise the retail landscape of the Knoxville area. Overall retail sales in Knox County increased 8.6 percent from 2005 to 2006 with over $8.9 billion, while the Knoxville MSA increased 7.4 percent and grossed over $12.0 billion.

INCOME

In 2006, Knox County's per capita personal income was seventh highest in the state at $33,963, a 3.5 percent increase from 2005. State and national increases were 3.9 percent, or $32,172, and 6.5 percent, or $36,714, respectively, during the same period. The annual growth rate of per capita income in Knox County over the past 10 years averaged 3.8 percent. Earnings of persons employed in Knox County increased 5.7 percent between 2005 and 2006.

LABOR FORCE AND EMPLOYMENT

The 2007 civilian labor force (full and part-time, non-farm wage and salary employees, and self-employed persons) in the Knoxville MSA was 356,830, with an average unemployment rate of 4.3 percent. Knox County reported a total labor force of 225,760 and 3.7 percent unemployment. Local rates were lower than the statewide average of 5.0 percent and the national level of 4.8 percent.

A diversified economy is credited for the stability of local employment and wages. Employment by industry (excluding self-employed) for the Knoxville MSA in 2007:

INDUSTRY	NUMBER	PERCENTAGE
Government	53,600	15.8
Retail Trade	46,800	13.8
Educational, Health Services	41,500	12.2
Professional, Business Services	39,700	11.7
Manufacturing	38,700	11.4
Durable goods	*28,800*	*8.5*
Nondurable goods	*9,900*	*2.9*
Leisure and Hospitality	35,400	10.4
Natural Resources, Mining, Construction	18,900	5.6
Financial Activities	17,500	5.1
Wholesale Trade	16,100	4.7
Other Services	14,200	4.2
Transportation, Utilities	11,500	3.4
Information	6,000	1.8
TOTAL	339,900	

Source: Tennessee Department of Labor and Workforce Development

TAXES

Under Tennessee Constitutional law, residential property is assessed at 25% of appraised value, and commercial/industrial property is assessed at 40%. The current property tax rate for Knox County residents is $2.69 per $100 assessed value. The assessment in the City of Knoxville is $5.50 per $100. City residents pay both property taxes.

The state sales tax is 6% on food and food ingredients and 7% on all other tangible personal property. The local rate, applicable countywide, is 2.25%, bringing the total sales tax in Knox County to 8.25-9.25%. About 72% of the local portion goes to the Knox County School system, the remainder dedicated to the general funds of the city and county.

There is no personal income tax in Tennessee, but the state does levy a tax of 6% on stock dividends and bond interest over $1,250 for single-filers. Called the Hall Income Tax, it applies to both individuals and partnerships.

All businesses in Knox County must have an operating license. Establishments within the City of Knoxville must have both a city and county license. Business taxes are calculated on gross receipts and are assessed within one of four classes. Assessments range from 1/40 of 1% to 3/16 of 1%, depending on type of business. Many professional services and manufacturers are exempt from local business taxes but are responsible for the state's Professional Privilege Tax or Franchise and Excise Taxes. More information can be obtained from the business tax offices of the city at 865-215-2083 and the county at 865-215-2392. State tax information is available from the Department of Revenue, 615-253-0600.

TRANSPORTATION

An extensive transportation network connects Knoxville to the U.S. marketplace. Forty percent of the nation's population is within 600 miles of Knoxville via I-40, I-75, and I-81 which meet in the metro area. The city is directly linked to the Great Lakes by the Interconnected Inland Water System and to the Gulf of Mexico by the Tennessee-Tombigbee Waterway. Barge shipping is facilitated by three local river terminals. Also serving the area are 125 truck lines, two railroads, and eight airlines. Knoxville Area Transit (KAT) provides around 28 public bus routes, operating 80 vehicles and carrying around 3.2 million passengers a year in the city. In 2004, KAT garnered the prestigious American Public Transportation Association's Outstanding Achievement Award and is scheduled to break ground in 2008 on its new downtown Knoxville Station Transit Center. It will have state-of-the-art customer amenities and serve as the major transportation hub for metropolitan Knoxville.

COMMUNICATIONS

Knoxville businesses and residents have access to leading-edge communications technology. Downtown and other local sites are served by BellSouth's high capacity fiber optic network. Comcast, Knology, and Charter offer digital cable and high speed Internet access. Knoxville is 52nd in the country on Intel's list of cities with greatest wireless accessibility, offering 72 Wi-Fi locations. The advanced communications network has attracted the telemarketing divisions of 29 large corporations to Knoxville.

UTILITIES

In 2008, Knoxville was selected as one of 12 Solar American Cities designated by the U.S. Department of Energy, receiving $200,000 to help make solar technology cost-competitive with conventional electricity sources. The Knoxville Utilities Board (KUB) provides natural gas, water, and wastewater services and distributes electric power generated by the Tennessee Valley Authority throughout much of Knox County. Beyond KUB's service area, residents receive electricity from two local power companies, and water is supplied by six utility districts, five of which also provide wastewater treatment service.

Table 8: Transportation Improvements

Project Description	Time Frame
1. Washington Pike	
A. Greenway Drive to Murphy Road - four-lane, divided highway with sidewalks and raised median. Signalized intersections at Mill Road, Babelay Drive and Murphy Road.	5 years
B. Murphy Road to Luttrell Road - widen with shoulder improvements.	5 years
C. Luttrell Road to Roberts Road – turn lanes at intersections and widened shoulders to include space for bikers.	15 years
2. Murphy Road Extension	
A. Four-lane, divided highway with sidewalks and raised median from Washington Pike to realigned Mill Road. Signalized intersections at Washington Pike, Babelay Drive and Edmondson Lane, bridge over Norfolk Southern Railroad.	5 years
3. Millertown Pike	
A. From I-640 to (relocated) Loves Creek Road – six lane with sidewalks and median.	5 years
B. Loves Creek Road (relocated) to Mill Road - four lane divided highway with sidewalks and median.	5 years
4. Loves Creek Road	
A. Relocated to the east near Millertown Pike, closer to Norfolk Southern Railroad.	5 years
B. Loves Creek Road near Rutledge Pike, investigate environmentally sensitive alternatives for reducing traffic problems at the underpass.	5 years
5. Tazewell Pike and E. Emory Road Intersection (Harbison's Crossroads) Signalize intersection, include crosswalks for pedestrian access.	5 years
6. E. Emory Road	
A. Widen with sidewalks through Gibbs area, to Clapps Chapel Road, including pedestrian refuge islands at the intersection of Tazewell Pike and E. Emory Road.	15 years
B. Continued widening between Clapps Chapel Road to Corryton and Grainger County line.	15 years
7. Tazewell Pike	
A. Raised crosswalks for traffic calming at Fairview Road.	5 years
B. Widen from Murphy Road to Gibbs Road, four-lane with sidewalks and median.	15 years
C. Continued widening from Gibbs Road to Union County line, four-lane with sidewalks and median.	15 years
8. Carter Road/Brown Gap Road—improve with curb and gutter, add sidewalks.	5 years
9. Regional Beltway from 1-75 North to I-40 East—feasibility study.	5 years
10. Corryton Road—improvements to narrow shoulders and sharp curves.	5 years
11. Davis Road—widen intersections to improve response time of emergency vehicles.	5 years

Special Development Opportunity Areas

View Map 11: Development Concepts

Farmers Market: A Genuine Civic Amenity*

Enhancing the Farmers Market property provides a good opportunity for the neighborhoods of Ritta, John Sevier and Alice Bell to share a library facility and other community needs by adding senior citizen services, recreation fields and greenway trail connections.

Community serving retail establishments should also be considered. The businesses should be pedestrian friendly and be accessible by the sidewalks planned along Washington Pike as part of the road improvement project. Creation of a small 'lifestyle center' in this area may be a good alternative, incorporating Farmers Market activities and additional specialty shopping.

The International Council of Shopping Centers defines a lifestyle center as an open-air mall with at least 50,000 square feet of specialty shops, one or more department stores and one or more sit-down restaurants. It has "nooks, crannies, shade, fountains and benches — a place to hang out while window shopping." Sometimes lifestyle centers look like 'community commons' or Main Street, and incorporate components of government. Future development at the site should not disturb the slope protection area.

**A Farmers Market study for Knox County was completed by MPC on July 25, 2003. Please see Appendix A for the Executive Summary.*

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Future Land Use Plan

View Future Land Use Plan Map

The development plan includes proposals for land use and transportation improvements. The plan will serve as a guide for growth, and for making zoning and subdivision decisions for the East City Sector in the next 15 years.

In general, land use patterns are well established and growth can take place through infill and reinvestment, avoiding changes in land use. The following areas are in transition, and many need increased investment. They include predominantly non-residential components, but the community is supportive of the addition of quality, well-designed housing. Opportunities for vibrant, mixed-use communities are numerous.

Additional low and medium density residential development, such as Georgetown, should be established around the perimeter of the commercial core. Apartments and/or offices above first floor retail and flexible live/work units should also be included in appropriate locations.

Areas that are experiencing change

- Knoxville Center Neighborhood, including Washington Pike and Millertown Pike
- I-40 Industrial Corridor, N. Cherry Street to Rutledge Pike
- Empowerment Zone, including 5-Points, Magnolia Avenue and Chilhowee Park/Knoxville Zoo
- Broadway Commercial Corridor
- Asheville Highway/I-40 – Exit 394
- Burlington Business District
- Forks-of-the-River Industrial Park, adjacent to East City Sector

We propose a change in the future land use designation for three of these areas:

1. Empowerment Zone, including 5-Points, Magnolia Avenue and Chilhowee Park/Knoxville Zoo
2. Asheville Highway
3. Knoxville Center Neighborhood

Summary of changes:

1. Empowerment Zone, including 5-Points, Magnolia Avenue and Chilhowee

Park/Knoxville Zoo—Some privately owned commercial and single family residential property is slated for acquisition as part of the Long-Range Master Plan for Chilhowee Park, during Phase 2-5. For remaining parcels, mixed-use development, including vertical mixed-use, is recommended with emphasis on the character of development, to ensure compatibility with existing neighborhoods.

2. Asheville Highway—Additional office space should be allowed fronting Asheville Highway. These parcels should be designed and landscaped in a way that compliments adjacent residential properties.

3. Knoxville Town Center Neighborhood—The loss of low-density residential land is expected when the Washington—Millertown Pike roadway improvements are realized. The community's vision for this area is outlined in the special development opportunity portion of this plan. Changes in land use are outlined in the Land Use Plan Map.

(A) Recommended Development: Mixed-Use Development should be pedestrian friendly mixed use, including vertical mixed use, with a detailed development plan depicting lower intensity transition to south and west. Commercial, office and residential could be vertical. Development of property within the triangle, as well as contiguous properties, should be planned for as part of this concept.

(B) Conventional Development If property develops in a fashion similar to the Isaiah's Landing site, with a joint rezoning request, high intensity commercial development should occur "within" the triangle area: north side of Millertown Pike, east side of Washington Pike. Office/MDR will serve as buffer, providing a lower intensity transition to the south and west. The Memorial Wesleyan Church would serve as a stopping point for office development, west of the church should be residential.

(C) Least Preferred Development If redevelopment/rezoning occurs parcel by parcel with no overall developer (piecemeal), property with road frontage to Millertown and Washington Pike should be used for Office/MDR. This concept should only be followed if the property owners within the triangle do not reach an agreement with developers to consolidate the parcels.

View maps for options A, B, and C above.

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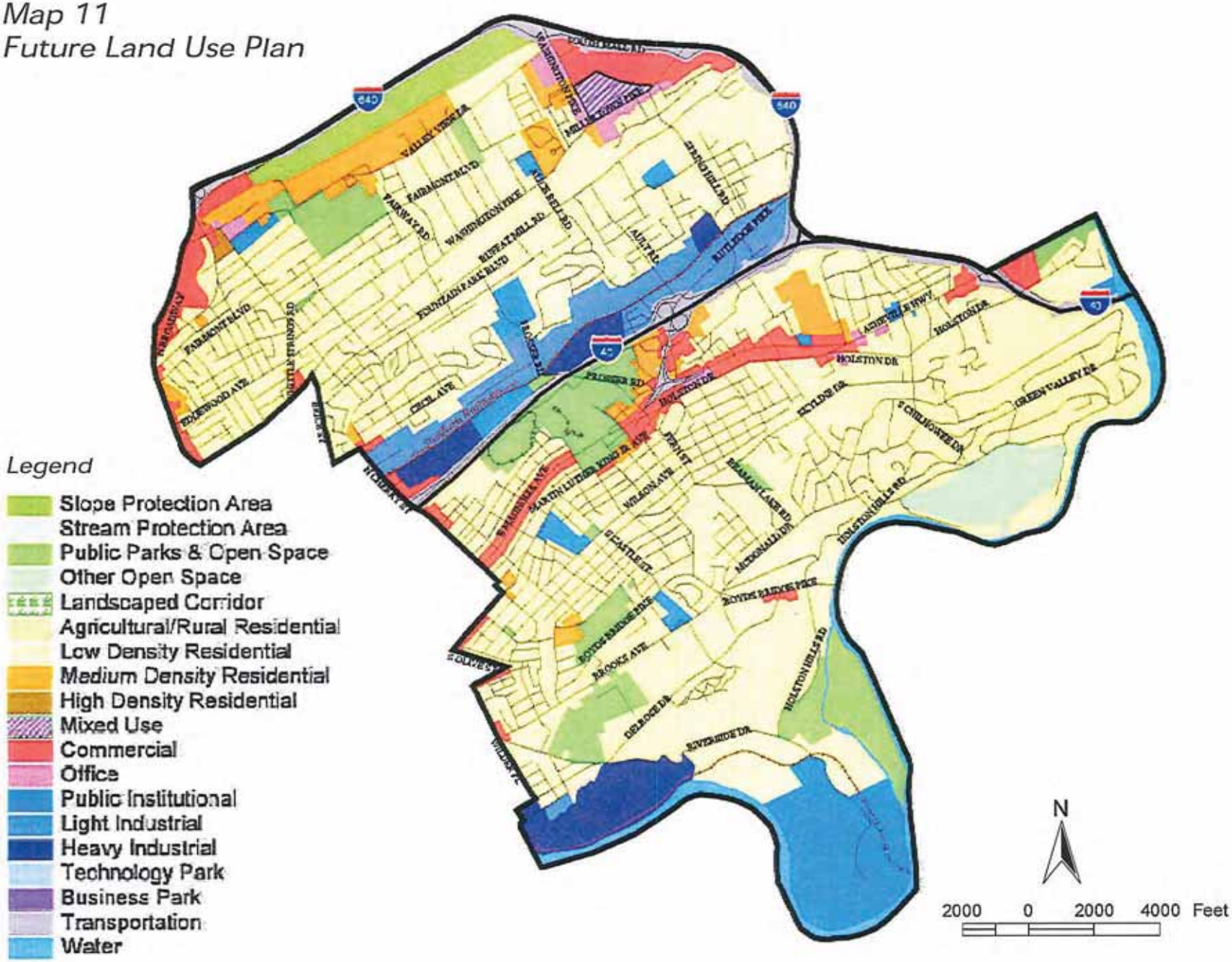
Map 11
Future Land Use Plan



3. Knoxville Town Center Neighborhood—The loss of low-density residential land is expected when the Washington—Millertown Pike roadway improvements are realized. The community's vision for this area is outlined in the special development opportunity portion of this plan. Changes in land use are outlined in the Land Use Plan Map.

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If redevelopment/rezoning occurs parcel by parcel with no overall developer (piecemeal), property with road frontage to Millertown and Washington Pike should be used for Office/MDR. This concept should only be followed if the property owners within the triangle do not reach an agreement with developers to consolidate the parcels.

(C) Least Preferred Development

Legend for Maps A, B, and C

- Low Density Residential
- Medium Density Residential
- Mixed Use
- Commercial
- Office
- Public Institutional
- Transportation

residents want in this area. However, newer zones such as the TND-1 and TC-1 give developers considerable flexibility in exchange for pedestrian amenities and high-quality design.

Holston River Park Neighborhood/Marble Hill

This is one of the places that gives the East City Sector distinctive character, and it has some historical significance due to the wealth brought to the community through mining. While several residents of the East City Sector would like to see the entire ridge preserved as it is, this site offers an opportunity to balance conservation and development objectives, creating a better community in the process.

At the end of this demolition landfill's operating life, the site can be reused as public recreational space.

If adequate sewer capacity is obtained, this area should develop according to environmental assets, capabilities and limitations of the site. Land and slope conservation should be the central organizing principle of the development. The site serves as one building block within a community-wide system of open space, eventually leading to an interconnected network of protected land. The developer should design buildings and streets around public open space, providing pedestrian connections to the Holston River Park and Greenway. Connections should also be planned to open space on the opposite side of the ridge, where the landfill is located, because this site can be used for parks and recreation in the future.

Knoxville Center District

Principles of new urbanism should be used to develop vacant parcels adjacent to Washington and Millertown Pikes, and to redevelop parcels where the existing low density residential land use is no longer appropriate. This neighborhood should contain public transit facilities, with the needs of daily life easily accessible by a 5-10 minute walk. Commerce can be integrated with residential uses, using the improved Washington and Millertown Pikes roadway to contain intensive uses within the triangle. For example, apartments can be allowed over stores. Buildings should successfully define public space, including streets, parks and squares. An architectural design code for the district should be developed in order to establish massing, fenestration (windows/entrances), materials, and roof pitch.

This intersection of Washington and Millertown Pike, currently a three-way stop, will soon consist of more lanes and a signal light. With several residential developments in the neighborhood, the movement of vehicles should not take precedence over the movement of pedestrians.

This is the type neighborhood that many of the residents envision living in, but with additional retail traffic, they worry that the transportation

system will not function well. At the request of the City of Knoxville, the engineering firm Wilbur-Smith and Associates proposed a series of improvements for the Knoxville Center Mall area. Providing adequate road capacity for vehicles coming into the shopping center from outlying areas in the county was important in this study. Additional studies on circulation should be conducted at a micro-level, to improve the traffic flow between shopping centers and to increase pedestrian connectivity.

There are several issues related to new development around the Alice Bell-Spring Hill community. Questions include the potential to provide a connection between Centerline Drive and Spring Hill Road, the appropriateness of North and South Mall Road still being one way roads, and the best location for crosswalks and other pedestrian connections.

In a compact urban neighborhood, condominiums provide high enough density to support public transit facilities and neighborhood-serving retail establishments within walking distance, reducing the number of vehicle trips per day.

In general, these principles produce settings resembling American towns before World War II, including sidewalks, street trees and "main street" style shops. Human scale is the standard for buildings, with cars not taking precedence over human needs, including aesthetic needs. Civic buildings such as churches and libraries serve as landmarks. The street is the pre-eminent form of public space; building facades along the edge of the sidewalk enclose the street like walls of an outdoor room. Because streets differ in importance, scale, and quality, appropriate distinctions are expressed by physical design.

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community groups participated, including residential property owners, business owners, farmers and developers. Meetings were held in Gibbs, Corryton, Ritta and Skaggston.

The difficult questions and issues discussed sometimes produced contradictory statements. A great need exists for better infrastructure in many parts of northeast Knox County, but with that investment comes additional subdivisions, more traffic and business expansion. For decades, the land use plan for this sector has called for rural, agricultural uses with land reserved for future growth. Some feel that the time for growth has arrived, while others are reluctant to see change take place.

The agricultural heritage of the region is still strong in many parts of northeast Knox County.

While development pressures increase, lack of adequate infrastructure in appropriate locations continues to be a major barrier to quality development. Coordination of roadway improvements with sanitary sewer extensions is necessary before any significant changes in land use are realized. This coordination should take place as soon as possible. The current pattern of agricultural parcels being developed at one unit per acre has several long-term negative impacts. Sprawling development adds to traffic congestion, uses land inefficiently, pollutes the air, and endangers ground water sources. It also fosters an auto-based lifestyle that is harmful to the health of both adults and children.

Local residents review a historic map.

Better-planned communities with houses, schools, shops, and workplaces within walking distance are needed and many residents are looking to the traditional neighborhood development patterns as a solution. They do not want the sector to become an anchorless, car-bound suburb. The classic rural village settlement provides another good example for the future, with development clustered around preserved open space.

The conventional suburban development model is at odds with the rural landscape of northeast Knox County, and should not become the predominant building pattern. The conventional suburban approach results in the entire parcel being covered with house lots and subdivision streets. As one parcel after another is eventually developed, the formerly open landscape evolves into a network of wall-to-wall subdivisions.

Some homeowners have relocated to northeast Knox County in order to escape west Knoxville. While this trend of people leaving the suburbs "wanting to live with nature right in their own back door" creates a new set of problems related to exurban growth, the message is clear. New development should respect the sector's landscape and heritage, not destroy the very qualities that make it a desirable place to live.

Walkable neighborhoods provide a safe way to reach parks and schools.

Critical Issues

- Lack of public facilities including parks, libraries, and community centers
- Need for new elementary and middle schools
- Timing of road and other community improvements
- Increasing pressure to develop
- Lack of control over utility decisions
- Quality of future growth
- Preserving beauty and history of northeast Knox County
- Future of Knox County Detention Facility
- Future of General Shale property

Major Resources

- Proximity to I-40 and I-640
- Three Ridges Golf Course
- Active community groups
- Holston River
- Scenic vistas
- Rural heritage
- Significant historic sites
- Farmers Market
- Relatively large parcels of developable land
- Rutledge Pike as a development corridor

Development Constraints

- Steep slopes: House Mountain, Copper Ridge, Beaver Ridge, McAnnally Ridge and

Significant Changes Since Last Update

- Increased pressure for agricultural areas to be rezoned
- Adoption of Growth Policy Plan
- Improvements to Rutledge Pike

Community Goals

- Make decisions that limit sprawl and encourage quality development
- Identify locations for additional housing options, including condos, apartments and assisted living facilities
- Determine appropriate locations for commercial areas
- Encourage continued agricultural production by conserving prime farmland
- Preserve open space with future development
- Protect and seek recognition for numerous historic sites within the sector
- Implement planned improvements to roads, schools and parks
- Plan schools for future growth
- Insure adequate drainage measures
- Protect watershed areas and groundwater resources, including springs and wells
- Provide adequate biking and pedestrian facilities
- Create safe neighborhood access, especially to schools
- Better utilize the Farmers Market as a community resource

Black Oak Ridge

- Flood prone areas: Beaver Creek, Flat Creek, Murphy Creek and Holston River floodway
- Several sinkholes
- Public transportation rights-of-way: rail and interstate

Recent improvements provide additional highway capacity on Rutledge Pike.

Millertown Meadows, a new subdivision near Knoxville Center Mall.

Eastbridge Industrial Park in Mascot provides jobs for many local residents.

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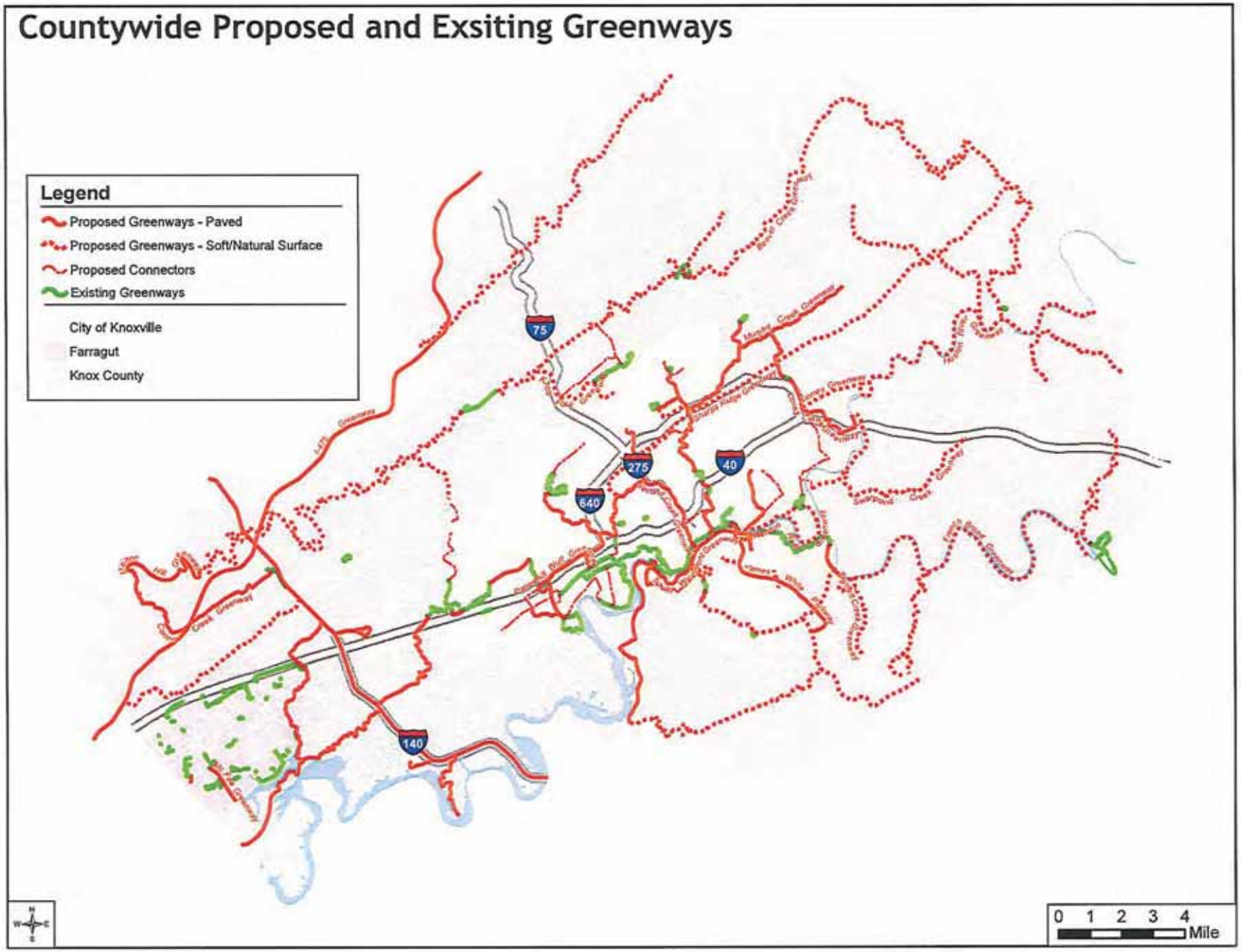
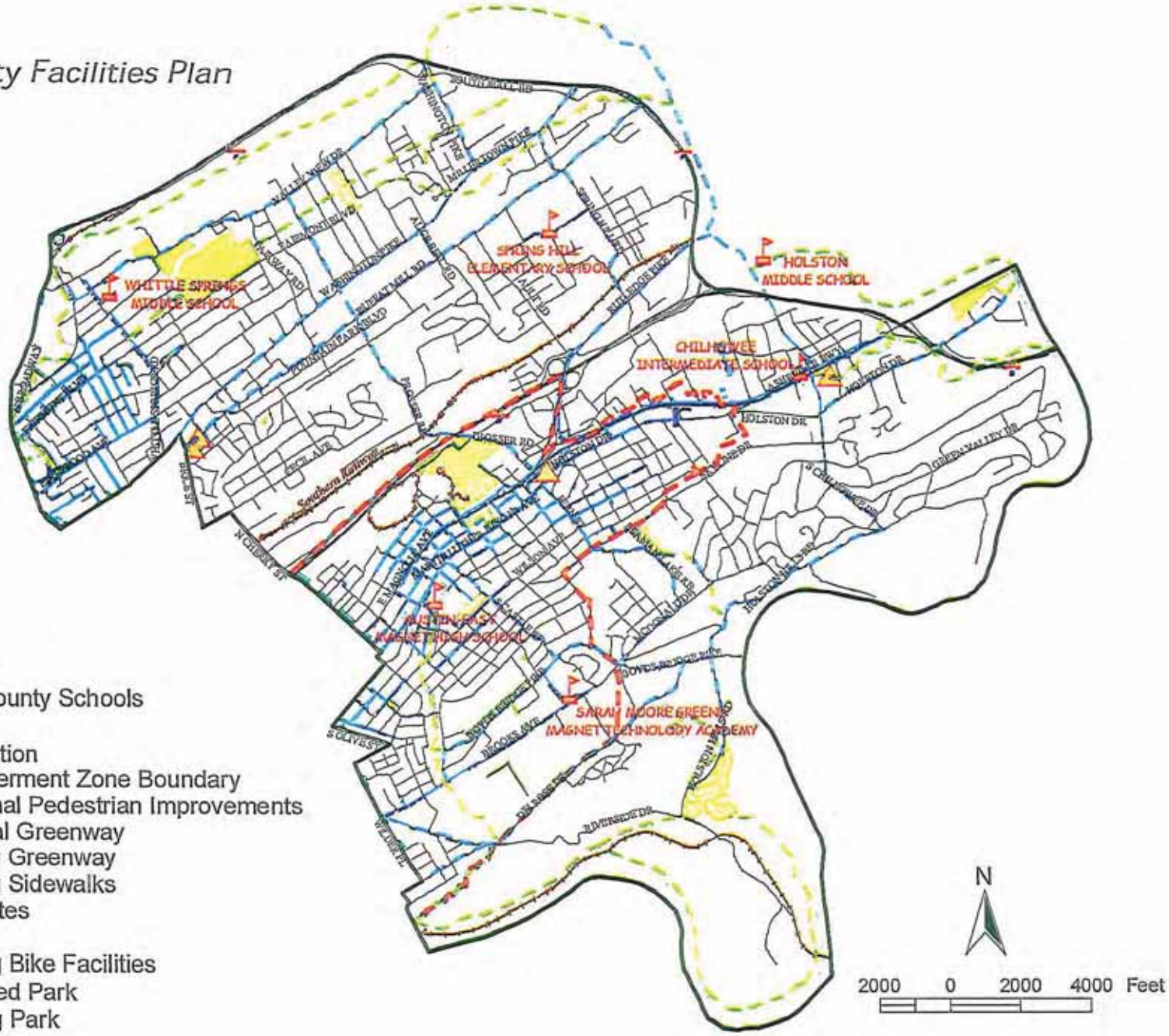
Countywide Proposed and Exsiting Greenways



Map 8
Community Facilities Plan



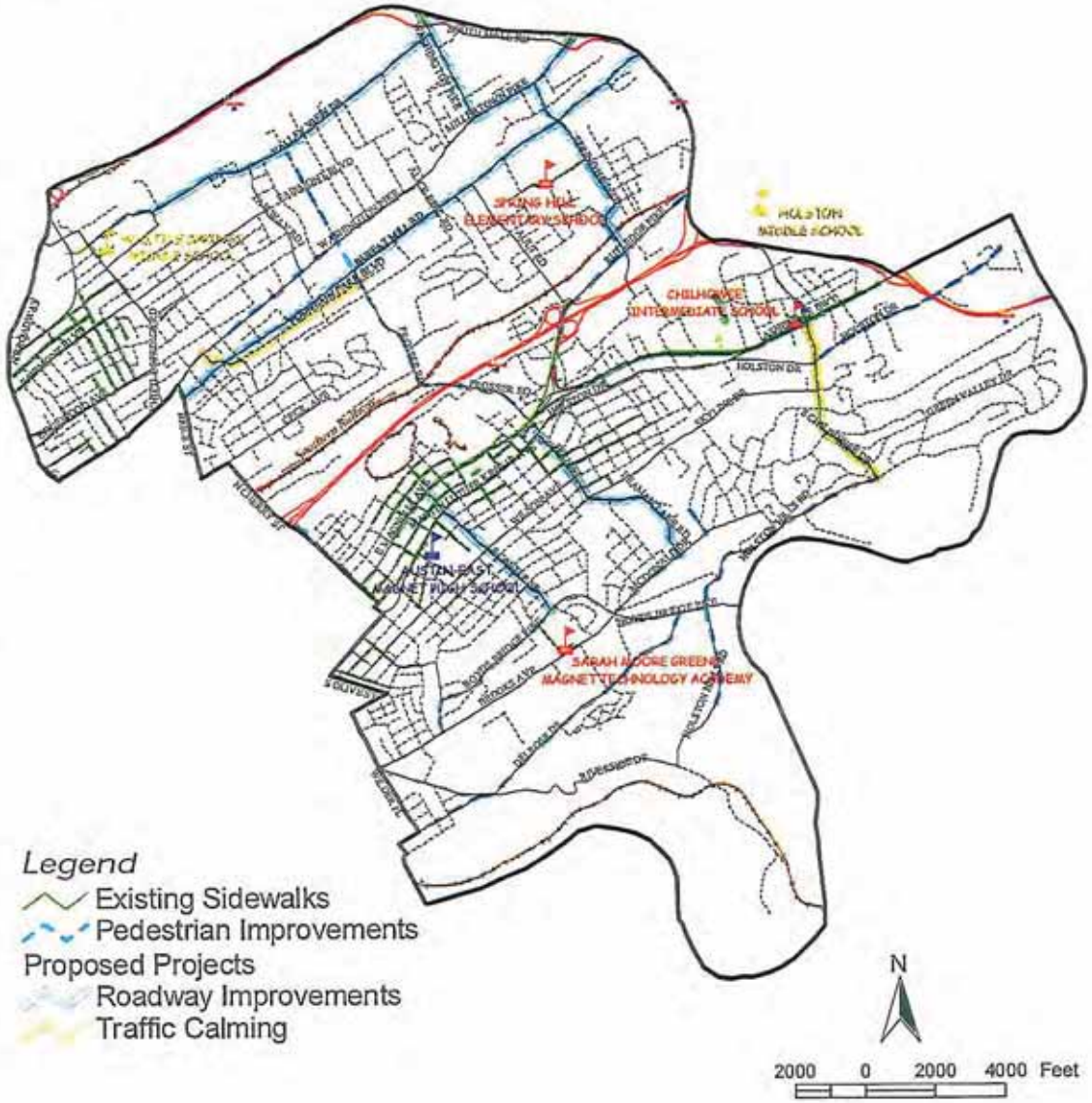
Legend

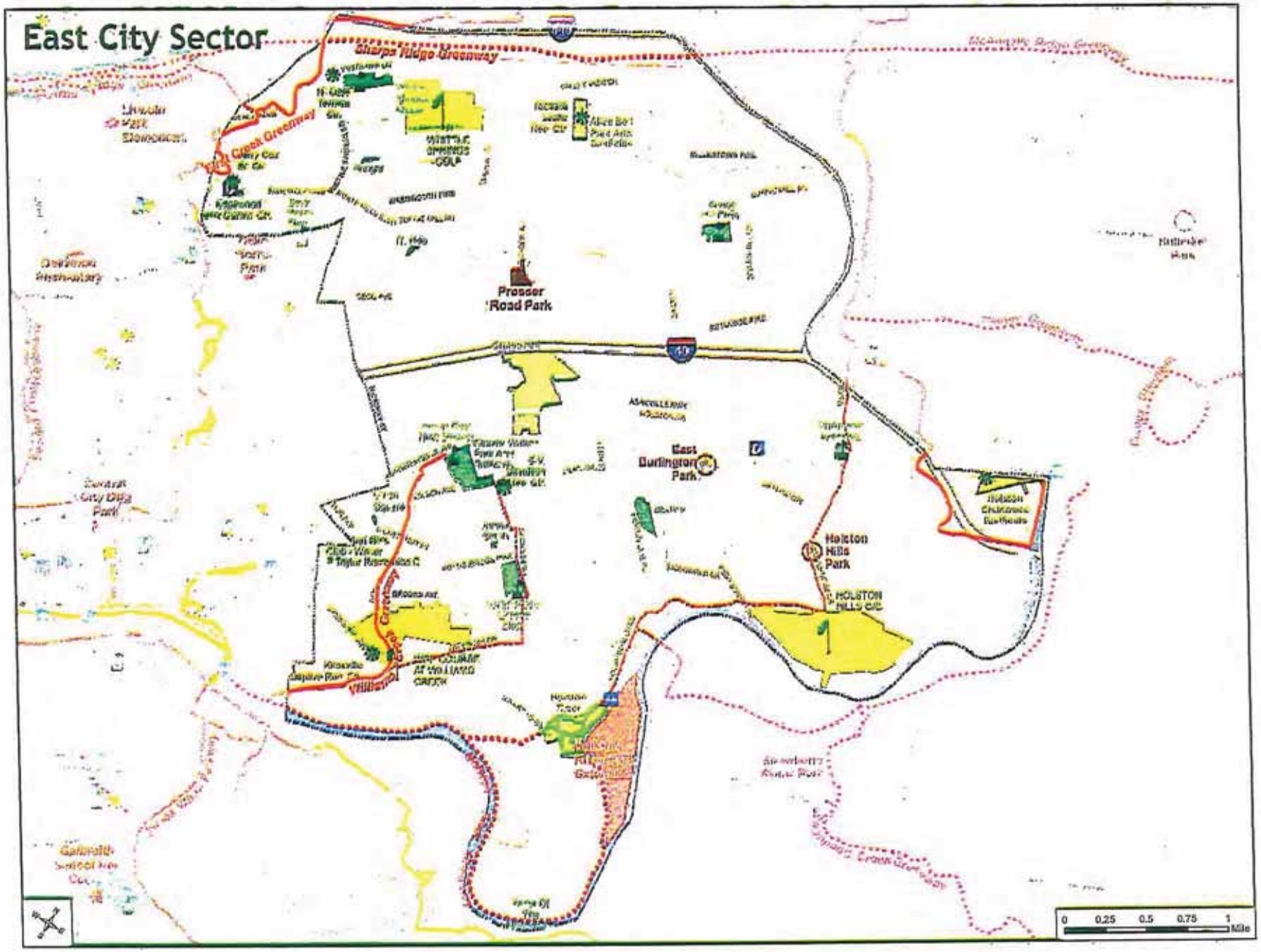
- Knox County Schools
- Library
- Fire Station
- Empowerment Zone Boundary
- Additional Pedestrian Improvements
- Potential Greenway
- Existing Greenway
- Existing Sidewalks
- Interstates
- Roads
- Existing Bike Facilities
- Proposed Park
- Existing Park

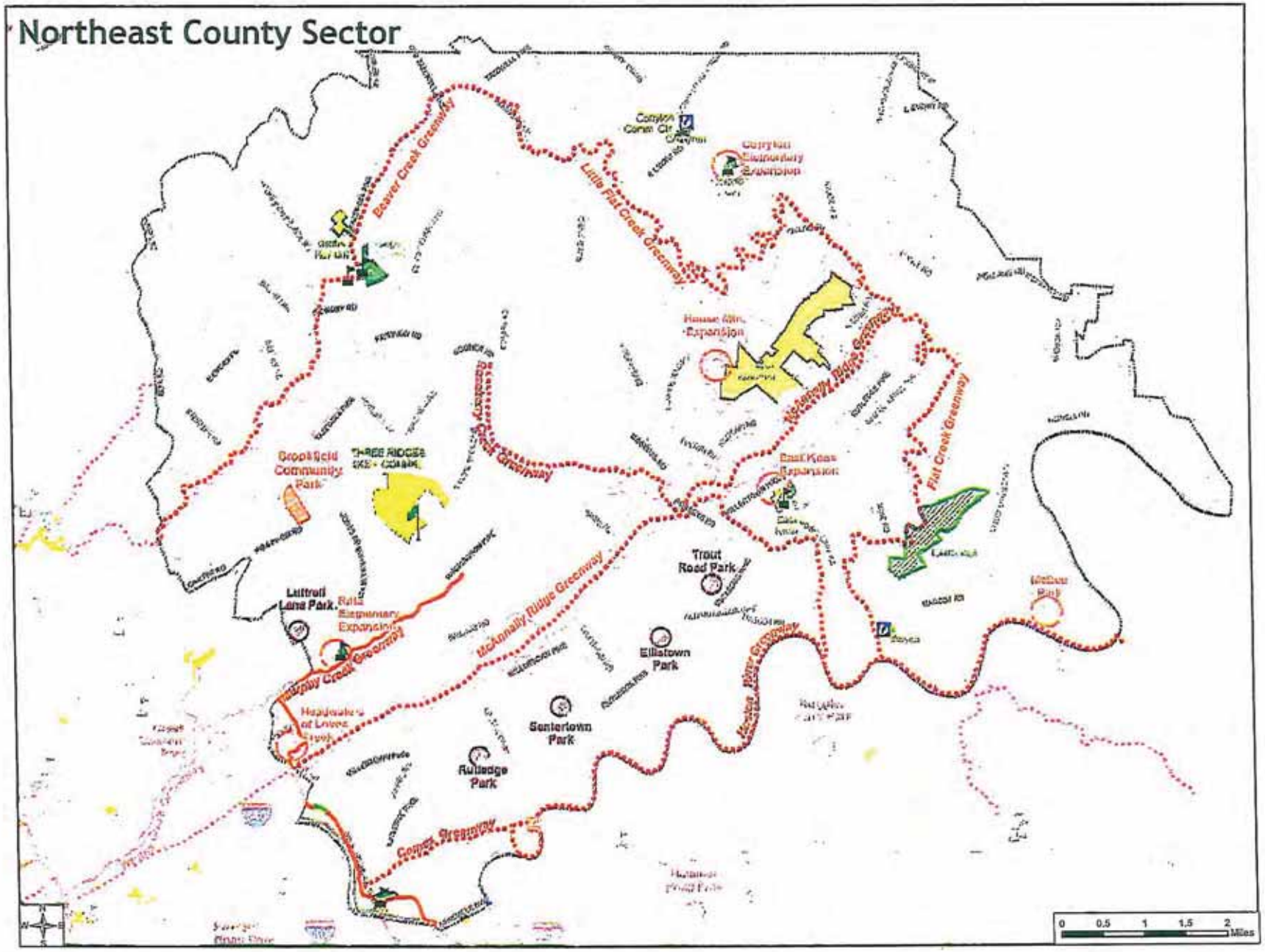
Table 8: Transportation Improvements

Project Description	Time Frame
A. Valley View Drive–improve road, widen in certain areas, add sidewalk	15 yrs.
B. Washington Pike–improve to a 4 lane boulevard with median and street trees, add sidewalk	5 yrs.
C. Millertown Pike–improve to a 4 lane boulevard with median and street trees, add sidewalk	5 yrs.
D. S. Chilhowee Drive–add traffic calming solutions where needed to reduce speed	5 yrs.
E. Spring Hill Road–improve road, upgrade lanes, if possible make less steep, add curb and sidewalk	15 yrs.
F. Buffat Mill Road – study stop sign locations, add traffic calming where needed, add sidewalks	5 yrs.
G. Castle Street/Pickering Street–improve road, upgrade lanes, add curb and sidewalk	5 yrs.
H. Fern Street/Beaman Lake Rd.–improve road, upgrade lanes, add curb and sidewalks	15 yrs.
I. Fountain Park Blvd.—Traffic calming to reduce traffic cutting through from Buffat Mill to Cecil/N. Cherry	5 yrs.

Map 9
Transportation Improvements




East City Sector
Sharps Ridge Greenway
Prosser Road Park
East Burlington Park
Holston Hills Park
0 0.25 0.5 0.75 1 Mile


Northeast County Sector
Beaver Creek Greenway
Little Flat Creek Greenway
Flat Creek Greenway
Hickory Ridge Greenway
Grooms Greenway
Gibbs Greenway
Corryton Elementary Expansion
House Mtn. Expansion
East Knox Expansion
Groothfield Community Park
THREE RIDGES ICE - CREAM
Trout Road Park
Luttrell Lane Park
Ellistown Park
Senterlown Park
Fulbridge Park
0 0.5 1 1.5 2 Miles

CRASH DATA

ROUTE FEATURE DESCRIPTION LISTING

KNOX County - 01289

COUNTY: KNOX **COUNTY NO.** 47

ROUTE: 01289 **SPECIAL CASE:** None **CTY SEQ:** 1

LOG MILE	ITEM CODE	ROUTE FEATURE	DESC CODE
0.000	3	I-640 RT. & LT. CENTER OF UNDERPASS / BEGIN WASHINGTON PK	360
0.000	9	BEGIN 30 MPH	932
0.000	9	ILLUMINATION	930
0.010	2	UNDERPASS [47I08400022]: I-640 WB LNS.	222
0.100	9	TRAFFIC SIGNAL	905
0.100	5	G301 MALL RD. N. RT.	520
0.100	7	RAMP TO I-640 WEST BOUND LNS LT.	703
0.120	7	RAMP FROM G301 MALL RD N RT.	734
0.120	7	RAMP TO I-640 RAMP LT.	703
0.160	5	G309 ERMA LN. LT.	530
0.180	2	OVERHEAD [47012890001]: SOUTHERN RWY.	261
0.190	1	LEAVE KNOXVILLE CITY LIMITS	135
0.230	7	RAMP TO 1289 WASHINGSTON PIKE RT. & RAMP FROM A021 GREENWAY DR LT.	721
0.240	9	TRAFFIC SIGNAL	905
0.240	0	90 DEG RT. TURN	921
0.240	5	A021 GREENWAY DR LT.	530
0.260	7	RAMP FROM 1289 WASHINGTON PIKE RT.	724
0.670	5	Z999 NEW HARVEST LN LT.	530
1.100	5	D488 MILL RD RT.	520
1.110	9	OAK GROVE AME ZION CHURCH & CEM LT.	914
1.140	5	D477 BABELAY RD RT.	520
1.220	9	Z999 STEEPLE SHADOW WAY LT.	999
1.250	9	REST IN CHRIST BAPTIST CHURCH LT.	912
1.360	5	Z999 AYLESBURY DR LT.	530
1.410	9	END ILLUMINATION	931
1.460	5	D476 EDMONDSON LN RT.	520

ROUTE FEATURE DESCRIPTION LISTING

KNOX County - 01289

COUNTY: KNOX COUNTY NO. 47

ROUTE: 01289 SPECIAL CASE: None CTY SEQ: 1

LOG MILE	ITEM CODE	ROUTE FEATURE	DESC CODE
1.700	5	D473 MCCAMPBELL DR LT.	530
1.750	9	TRAFFIC SIGNAL	905
1.750	5	D464 MURPHY RD LT.	530
1.810	9	BEGIN 45 MPH	932
1.920	9	MURPHY CEM RT. 250'	913
2.090	2	BRIDGE [47S24120003]: MURPHY CR	221
2.330	5	D461 LUTTRELL RD LT.	530
2.600	9	BEGIN 20 MPH SCHOOL ZONE	933
2.770	9	RITTA ELEM SCHOOL RT.	915
2.960	9	END 20 MPH SCHOOL ZONE	934
2.960	5	D460 OLD WASHINGTON PK LT.	530
3.050	5	D479 HARRIS RD RT.	520
3.790	5	D457 JONES RD LT.	530
3.810	5	D460 OLD WASHINGTON PK LT.	530
3.860	9	UNION CEM RT.	913
4.030	9	UNION BAPTIST CHURCH LT.	912
4.200	4	2405 LINK RD RT.	420
4.240	4	2405 MALONEYVILLE RD LT.	430
4.250	9	CULVERT: BRANCH	980
4.280	1	LEAVE KNOXVILLE URBAN BOUNDARY	145
4.520	5	D437 BUD MCMILLAN RD RT.	520
4.630	5	D439 SHELL RD LT.	530
4.770	5	Z999 WASHINGTON VALLEY LN LT.	530
4.830	5	Z999 GOLDEN POND WAY RT.	520
4.900	5	D435 WISE SPGS RD LT.	530
5.010	5	Z999 ANGAKOT RD RT.	520

Crash Summary Report

Date: 06/04/2008

County: KNOX | Route: 01289 | Spcl Cse: 0-NONE | Cnty Seq: 1

Begin LogMile: 0 | End LogMile: 2 | Begin Date: 01/01/2004 | End Date: 12/31/2006

Statistics

Fatal Crashes:	1
Total Killed:	1
Incap Injury Crashes:	5
Total Incap Injuries:	7
Other Injury Crashes:	42
Total Other Injuries:	56
Prop Damage Crashes:	140
Total Crashes:	188

Weather Conditions

No Adverse Conditions:	159	Sleet and Fog:	0
Rain:	26	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	1	Other:	1
Foggy:	0	Unknown:	0
Rain and Fog:	0	Blowing Sand, Soil, Dirt, or Snow:	0

Crashes Involving

Pedestrians:	0
Hazardous Cargo:	1
Construction Zones:	2
Fixed Objects:	21
Heavy Trucks:	4
Bicycles:	0

Manner of Collision

Rear End:	88
Head On:	8
Rear-to-Rear:	0
Angle:	63
Sideswipe Same Dir:	6
Sideswipe Opp. Dir:	0
Unknown:	2

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	0
Dry:	0
Other:	0
Unknown:	0

Crash Location

Along Roadway:	23
At Intersection:	164
Railroad Crossing:	0
Bridge:	0
Underpass:	1
Ramp:	1
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	0
Other Animal:	0
Motor Vehicle in Transport:	163
Motor Vehicle in Transport in Other Rdway:	1
Parked Motor Vehicle:	0
Other Type Non-Motorist:	0
Fixed Object:	21
Other Object (not fixed):	0
Non Collision:	2

Lighting Conditions

Dawn:	3
Daylight:	149
Dusk:	3
Dark/Lighted:	23
Dark/Not Lighted:	10
Not Indicated:	0

Crash Summary Report

Date: 06/04/2008

County: KNOX	Route: 01289	Spcl Cse: 0-NONE	Cnty Seq: 1
Begin LogMile: 0	End LogMile: 2	Begin Date: 01/01/2004	End Date: 12/31/2006

Fixed Ojects

Boulder:	0
Building:	0
Impact Attenuator:	0
Bridge Pelr/Abutment:	0
Bridge Parapet End:	0
Bridge Rail:	0
Guardrail Face:	0
Guardrail End:	1
Median Barrier:	1
Highway Traffic Sign Post:	1
Overhead Sign Support:	0
Luminaire/Light Support:	0
Traffic Signal Support:	0
Utility Pole:	2
Other Post, Pole, Supports:	1
Culvert:	0
Curb	1
Ditch:	5
Embankment:	2
Fence:	0
Wall:	1
Mail Box:	2
Shrubbery:	0
Tree:	2
Fire Hydrant:	1
Other Fixed Object:	1

Crash Summary Report

Date: 06/04/2008

County: KNOX | Route: 03779 | Spcl Cse: 0-NONE | Cnty Seq: 1

gin LogMile: 0 | End LogMile: 1 | Begin Date: 01/01/2004 | End Date: 12/31/2006

Statistics

Fatal Crashes:	0
Total Killed:	0
Incap Injury Crashes:	1
Total Incap Injuries:	1
Other Injury Crashes:	7
Total Other Injuries:	11
Prop Damage Crashes:	16
Total Crashes:	24

Weather Conditions

No Adverse Conditions:	23	Sleet and Fog:	0
Rain:	1	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	0	Other:	0
Foggy:	0	Unknown:	0
Rain and Fog:	0	Blowing Sand, Soil, Dirt, or Snow:	0

Crashes Involving

Pedestrians:	0
Hazardous Cargo:	1
Construction Zones:	0
Fixed Objects:	1
Heavy Trucks:	1
Bicycles:	0

Manner of Collision

Rear End:	11
Head On:	0
Rear-to-Rear:	0
Angle:	9
Sideswipe Same Dir:	3
Sideswipe Opp. Dir:	0
Unknown:	0

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	0
Dry:	0
Other:	0
Unknown:	0

Crash Location

Along Roadway:	2
At Intersection:	21
Railroad Crossing:	0
Bridge:	0
Underpass:	0
Ramp:	1
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	0
Other Animal:	0
Motor Vehicle In Transport:	23
Motor Vehicle In Transport In Other Rdway:	0
Parked Motor Vehicle:	0
Other Type Non-Motorist:	0
Fixed Object:	1
Other Object (not fixed):	0
Non Collision:	0

Lighting Conditions

Dawn:	0
Daylight:	20
Dusk:	0
Dark/Lighted:	4
Dark/Not Lighted:	0
Not Indicated:	0

Crash Summary Report

Date: 08/04/2008

County: KNOX | Route: 03779 | Spcl Cse: 0-NONE | Cnty Seq: 1

egin LogMile: 0 | End LogMile: 1 | Begin Date: 01/01/2004 | End Date: 12/31/2006

Fixed Ojects

Boulder:	0
Building:	0
Impact Attenuator:	0
Bridge Pier/Abutment:	0
Bridge Parapet End:	0
Bridge Rail:	0
Guardrail Face:	0
Guardrail End:	0
Median Barrier:	0
Highway Traffic Sign Post:	0
Overhead Sign Support:	0
Luminaire/Light Support:	0
Traffic Signal Support:	0
Utility Pole:	1
Other Post, Pole, Supports:	0
Culvert:	0
Curb	0
Ditch:	0
Embankment:	0
Fence:	0
Wall:	0
Mail Box:	0
Shrubbery:	0
Tree:	0
Fire Hydrant:	0
Other Fixed Object:	0

ROUTE FEATURE DESCRIPTION LISTING

KNOX County - 03779

COUNTY: KNOX COUNTY NO. 47

ROUTE: 03779 SPECIAL CASE: None CTY SEQ: 1

LOG MILE	ITEM CODE	ROUTE FEATURE	DESC CODE
0.000	3	I-640 RT. & LT. CENTER OF UNDERPASS / BEGIN WASHINGTON PK.	300
0.000	9	BEGIN 30 MPH & ILLUM.	932
0.010	2	UNDERPASS [47I00400921]: I-640 EB LNS.	222
0.100	9	TRAFFIC SIGNAL	905
0.100	7	RAMP FROM I-640 RT.	705
0.100	5	G303 MALL RD. S. LT.	530
0.150	5	A099 VALLEY VIEW DR. RT.	530
0.230	5	G307 CENTERLINE DR. LT.	530
0.390	5	C420 PINEHURST DR. RT.	530
0.400	5	C422 PINEHURST DR. RT.	530
0.460	5	WASHINGTON CT. RT.	530
0.520	5	C427 GREEN MEADOW LN. LT.	530
0.550	9	3-WAY STOP	903
0.650	4	3773 WASHINGTON PK. RT. & MILLERTOWN PK. LT.	410

[illegible]	[illegible]	[illegible]	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather Cond	Light Conditions	Case Number
0.000	01/03/2004	820	Non-Incap Inj/Inc	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	7998091
0.100	04/09/2004	1212	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse Cond.	Daylight	7974034
0.100	01/23/2005	1500	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	Rain	Dark Lighted	8405349
0.100	03/05/2005	1811	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8501872
0.100	09/15/2005	1728	Non-Incap Inj/Inc	0	1	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8534143
0.100	05/11/2006	1108	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8519000
0.100	12/12/2006	1518	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8533010
0.100	04/30/2008	1403	Ap Damage Inc	0	0	Ramp	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse Cond.	Daylight	9233828
0.100	12/01/2008	1030	Incap Inj/Inc	0	2	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Dark Lighted	9434204
0.100	03/03/2005	1725	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8130553
0.100	12/09/2008	1629	Non-Incap Inj/Inc	0	1	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse Cond.	Daylight	9385318
0.100	04/09/2004	1402	Non-Incap Inj/Inc	0	1	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	7933266
0.100	03/10/2004	708	Non-Incap Inj/Inc	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8041818
0.100	05/23/2004	1618	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8101048
0.100	05/12/2004	1628	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8101018
0.100	05/05/2005	709	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8334018
0.100	10/04/2005	1500	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8134112
0.100	03/10/2006	1505	Non-Incap Inj/Inc	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8233214
0.100	06/21/2006	1006	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8233222
0.100	09/30/2006	843	Non-Incap Inj/Inc	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Dark Lighted	8721028
0.210	03/10/2004	710	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8521048
0.230	03/27/2006	733	Ap Damage Inc	0	0	At an Intersection	2	Vehicle in Transport	Rear End	No Adverse Cond.	Daylight	8136784
1.000	12/10/2004	1843	Ap Damage Inc	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8348278
1.020	11/01/2004	2025	Ap Damage Inc	0	0	Along Roadway	1	Utility Pole	No Collision w/ Vehicle	No Adverse Cond.	Dark Lighted	8144028

11
92

22 AT INTERSECTION
2 ON THE ROAD

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	1.140	02/21/2004	1848	Non-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.140	07/24/2004	1850	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.140	05/07/2004	2253	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.140	12/07/2004	1323	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.140	09/12/2005	1833	Prop Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.140	03/24/2005	2028	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.140	03/17/2006	1730	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.150	04/09/2005	1851	Non-Incap Injur	0	1	Along Roadway	1	Other Post, Pole, Supports	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.170	05/30/2004	658	Incap Injury	0	1	Along Roadway	1	Mail Box	Head-On	No Adverse
KNOX	01289	0-NONE	1	1.170	08/12/2005	1402	Prop Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.220	07/03/2004	1138	Prop Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.260	12/03/2004	1001	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.300	02/03/2004	1700	Prop Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.350	02/28/2005	1238	Prop Damage (ov	0	0	Along Roadway	1	Fire Hydrant	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	1.460	01/23/2006	1513	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.460	02/05/2004	1230	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.460	09/13/2004	750	Prop Damage (ov	0	0	At an Intersection	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.460	12/19/2005	1229	Prop Damage (ov	0	0	At an Intersection	1	Curb	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.460	05/15/2006	2100	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	1.460	08/03/2006	137	Prop Damage (ov	0	0	At an Intersection	1	Utility Pole	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.460	12/12/2005	1642	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.460	08/29/2005	2133	Prop Damage (ov	0	0	At an Intersection	1	Other Fixed Object	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	1.460	05/29/2006	1719	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.460	07/19/2006	1659	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.460	10/03/2006	918	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.650	12/10/2005	235	Prop Damage (ov	0	0	Along Roadway	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.700	06/03/2004	644	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	03/21/2003	1125	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	03/23/2005	1549	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.750	01/18/2005	1008	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	07/01/2004	1234	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Di	No Adverse
KNOX	01289	0-NONE	1	1.750	09/06/2004	1030	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	11/18/2005	2107	Prop Damage (ov	0	0	At an Intersection	1	Tree	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.750	05/23/2006	740	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	06/27/2006	1725	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	12/03/2005	1131	Non-Incap Injur	0	1	At an Intersection	1	Ditch	No Collision w/ Vehicle	Rain

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	0.240	03/15/2006	1717	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/26/2005	1510	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	04/28/2005	804	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	04/06/2005	1550	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	01/31/2005	1608	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	09/19/2005	2108	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Head-On	
KNOX	01289	0-NONE	1	0.240	11/06/2006	1820	ıp Damage (ov	0	0	At an Intersection	1	Median Barrier	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.250	06/10/2005	1620	ıp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.280	07/01/2005	1000	ıp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.580	05/23/2004	1419	ıp Damage (ov	0	0	Along Roadway	3	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.670	05/31/2005	1648	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.670	04/20/2004	315	ıp Damage (ov	0	0	At an Intersection	1	Wall	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.670	12/11/2005	2208	Non-Incap Injur	0	2	At an Intersection	1	Embankment	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.670	10/19/2006	903	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.730	07/27/2004	730	Non-Incap Injur	0	2	Along Roadway	2	Other Non-Collision	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	0.770	07/15/2005	1014	ıp Damage (ov	0	0	Along Roadway	1	Utility Pole	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.800	07/11/2006	1727	Non-Incap Injur	0	1	Along Roadway	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.850	02/01/2004		ıp Damage (ov	0	0	Along Roadway	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.850	07/27/2004	1458	Non-Incap Injur	0	1	Along Roadway	2	de in Transport in other Roa	Angle	Rain
KNOX	01289	0-NONE	1	0.870	03/20/2005	215	ıp Damage (ov	0	0	Along Roadway	1	Unknown Harmful Event	Unknown	No Adverse
KNOX	01289	0-NONE	1	0.970	12/19/2004	1805	ıp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	Snow
KNOX	01289	0-NONE	1	1.000	12/19/2005	1539	ıp Damage (ov	0	0	Along Roadway	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	11/16/2004	1744	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.100	08/18/2004	1039	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.100	01/04/2005	2352	ıp Damage (ov	0	0	At an Intersection	1	Embankment	No Collision w/ Vehicle	0
KNOX	01289	0-NONE	1	1.100	05/06/2005	1208	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	09/22/2004	1312	Fatal	1	0	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	1.100	09/07/2006	1418	Non-Incap Injur	0	2	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.100	03/08/2004	1442	ıp Damage (ov	0	0	At an Intersection	1	Guardrail End	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	1.100	02/06/2004	1646	Incap Injury	0	3	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	05/13/2004	2020	0	0	1	At an Intersection	4	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.100	06/10/2005	1003	ıp Damage (ov	0	0	At an Intersection	1	Unknown Harmful Event	Unknown	Rain
KNOX	01289	0-NONE	1	1.100	09/07/2005	1845	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	12/07/2005	1450	Non-Incap Injur	0	1	At an Intersection	2	Other Non-Collision	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.100	10/17/2006	1405	Non-Incap Injur	0	1	At an Intersection	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.140	04/20/2004	922	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather I
KNOX	01289	0-NONE	1	0.240	03/07/2005	1545	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.240	01/14/2004	744	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	01/23/2004	734	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	03/10/2005	756	op Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	10/05/2004	1850	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	02/10/2005	1856	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	10/29/2004	1829	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	10/07/2004	543	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	02/05/2004	754	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	05/05/2004	738	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	01/07/2005	1626	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/05/2004	1552	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	07/10/2004	1458	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	02/11/2005	1118	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	09/13/2004	1035	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	07/29/2004	841	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	07/01/2004	1838	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	0.240	08/10/2004	1737	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	07/25/2005	859	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	06/09/2005	1305	Non-Incap Injur	0	3	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	11/05/2006	1124	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	01/11/2006	2113	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	11/07/2005	1454	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	12/13/2004	1536	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	12/16/2004	1535	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/02/2005	832	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/07/2004	1546	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	11/12/2004	720	Incap Injury	0	1	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	0.240	03/03/2005	1605	op Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	03/30/2005	1656	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	03/25/2005	1020	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	06/09/2006	1249	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	02/01/2006	1258	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	07/05/2006	1755	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	12/01/2006	1642	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Di	Other (Expl
KNOX	01289	0-NONE	1	0.240	01/01/2006	911	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse

County	Route	Sp Cas	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	0.100	11/24/2005	1319	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/16/2006	1138	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/24/2005	650	ion-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/19/2005	1522	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	03/16/2005	1656	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/13/2004	850	ion-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	06/06/2006	748	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	0.100	06/26/2006	1132	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	03/03/2006	2123	Incap Injury	0	3	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.100	10/13/2006	649	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	05/18/2006	1703	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	08/23/2006	1712	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	08/28/2006	1725	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/25/2006	1323	ıp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	02/17/2006	1853	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	02/10/2006	1147	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	05/05/2006	1733	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	09/13/2006	830	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	06/03/2006	1740	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/03/2006	1028	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	12/10/2005	1530	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	05/26/2006	1846	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	0.100	05/03/2005	1235	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	08/30/2005	1713	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/11/2006	747	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	08/05/2006	1744	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	0.100	07/06/2006	1225	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	07/27/2006	1206	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/12/2006	1401	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End,	No Adverse
KNOX	01289	0-NONE	1	0.100	07/05/2006	1402	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	09/16/2006	1648	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/15/2006	1142	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/05/2006	1638	ion-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	12/22/2006	1242	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.120	05/15/2006	1556	ıp Damage (ov	0	0	Ramp	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	0.160	07/12/2006	1434	ıp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather I
KNOX	01289	0-NONE	1	0.010	12/16/2006	1655	ıp Damage (ov	0	0	Underpass	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.070	12/22/2005	1605	ıp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	01/20/2004	717	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	05/16/2004	103	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	03/17/2005	1935	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	04/30/2004	1402	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	05/18/2004	1058	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	05/03/2004	1520	Non-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/05/2006	1134	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/23/2004	1219	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	05/01/2005	1307	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Di	No Adverse
KNOX	01289	0-NONE	1	0.100	02/16/2005	2040	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	03/13/2005	1325	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	03/17/2005	1740	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	08/24/2005	1735	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	07/15/2005	643	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	05/17/2006	2103	ıp Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	07/09/2004	1135	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	02/07/2004	2100	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/03/2006	1557	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	02/19/2006	1227	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	09/08/2005	1653	Incap Injury	0	3	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	12/20/2005	1329	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	05/09/2005	1308	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	08/10/2005	818	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	09/29/2005	1719	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/15/2005	1945	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/05/2005	1427	Non-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	10/08/2005	1222	ıp Damage (ov	0	0	At an Intersection	1	Highway Traffic Sign Post	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.100	04/24/2006	1728	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/25/2006	1339	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/03/2006	1314	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/18/2006	1344	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/26/2006	1651	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/02/2006	1111	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/06/2006	1514	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	1.750	11/08/2005	1713	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.750	06/09/2006	1215	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	08/19/2006	1830	ıon-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	10/03/2006	1007	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	11/15/2006	1830	ıon-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.750	07/22/2008	2029	ıp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	1.750	10/21/2008	1913	ıon-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.830	11/06/2006	1612	ıon-Incap Injur	0	1	Along Roadway	1	Tree	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	2.000	05/01/2005	0	ıp Damage (ov	0	0	Along Roadway	1	Mail Box	No Collision w/ Vehicle	No Adverse

167 AT INTERSECTION
21 ALONG THE ROAD

Crash Summary Report

Date: 06/04/2008

County: KNOX | Route: 03779 | Spcl Cse: 0-NONE | Cnty Seq: 1

Begin LogMile: 0 | End LogMile: 1 | Begin Date: 01/01/2004 | End Date: 12/31/2006

Fixed Ojects

Boulder:	0
Building:	0
Impact Attenuator:	0
Bridge Peir/Abutment:	0
Bridge Parapet End:	0
Bridge Rail:	0
Guardrail Face:	0
Guardrail End:	0
Median Barrier:	0
Highway Traffic Sign Post:	0
Overhead Sign Support:	0
Luminaire/Light Support:	0
Traffic Signal Support:	0
Utility Pole:	1
Other Post, Pole, Supports:	0
Culvert:	0
Curb	0
Ditch:	0
Embankment:	0
Fence:	0
Wall:	0
Mail Box:	0
Shrubbery:	0
Tree:	0
Fire Hydrant:	0
Other Fixed Object:	0

ROUTE FEATURE DESCRIPTION LISTING

KNOX County - 03779

COUNTY: KNOX **COUNTY NO.** 47

ROUTE: 03779 **SPECIAL CASE:** None **CTY SEQ:** 1

LOG MILE	ITEM CODE	ROUTE FEATURE	DESC CODE
0.000	3	I-640 RT. & LT. CENTER OF UNDERPASS / BEGIN WASHINGTON PK.	360
0.000	9	BEGIN 30 MPH & ILLUM.	932
0.010	2	UNDERPASS [47I06400021]: I-640 EB LNS.	222
0.100	9	TRAFFIC SIGNAL	905
0.100	7	RAMP FROM I-640 RT.	705
0.100	5	G302 MALL RD. S. LT.	530
0.150	5	A099 VALLEY VIEW DR. RT.	520
0.230	5	G307 CENTERLINE DR. LT.	530
0.390	5	C420 PINEHURST DR. RT.	520
0.400	5	C422 PINEHURST DR. RT.	520
0.460	5	WASHINGTON CT. RT.	520
0.520	5	C427 GREEN MEADOW LN. LT.	530
0.650	9	3-WAY STOP	903
0.650	4	3773 WASHINGTON PK. RT. & MILLERTOWN PK. LT.	410

[illegible]	[illegible]	[illegible] Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather Cond	Light Conditions	Case Number
0.100	01/22/2004	820	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	7966391
0.100	04/20/2004	1212	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse Cond.	Daylight	7974584
0.100	01/23/2006	1800	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain	Dark-Lighted	8495349
0.100	05/08/2005	1911	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	8651672
0.100	09/18/2005	1738	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	8681443
0.100	05/17/2005	1105	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	9149000
0.100	12/12/2006	1618	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	9228870
0.100	04/30/2006	1403	Disp Damage (ov	0	0	Ramp	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse Cond.	Daylight	9275939
0.100	12/01/2005	1839	Incap Injury	0	3	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse Cond.	Dark-Lighted	9531004
0.100	06/03/2005	1729	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	9730500
0.100	12/29/2005	1620	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse Cond.	Daylight	9858275
0.150	04/08/2004	1402	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	7962788
0.150	03/10/2004	758	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8544615
0.150	05/27/2005	1516	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	8551049
0.150	08/21/2004	1628	Disp Damage (un	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8551658
0.150	08/05/2005	750	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8634013
0.150	10/04/2005	1850	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	9136112
0.150	05/16/2006	1659	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	9228214
0.150	09/27/2006	1030	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	9228552
0.150	08/23/2006	843	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Dark-Lighted	9279926
0.230	07/21/2004	710	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8531340
0.230	03/27/2006	755	Disp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse Cond.	Daylight	9136704
0.300	12/01/2004	1643	Disp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse Cond.	Daylight	8548779
0.630	11/07/2004	2025	Disp Damage (ov	0	0	Along Roadway	1	Utility Pole	No Collision w/ Vehicle	No Adverse Cond.	Dark-Lighted	9146656

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9L

22 AT INTERSECTION
2 ON THE ROAD

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	1.140	02/21/2004	1845	Non-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.140	07/24/2004	1850	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.140	05/07/2004	2253	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.140	12/07/2004	1323	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.140	09/12/2005	1833	Prop Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.140	03/24/2005	2028	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.140	03/17/2006	1730	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.160	04/09/2005	1851	Non-Incap Injur	0	1	Along Roadway	1	Other Post, Pole, Supports	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.170	05/30/2004	558	Incap Injury	0	1	Along Roadway	1	Mail Box	Head-On	No Adverse
KNOX	01289	0-NONE	1	1.170	08/12/2005	1402	Prop Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.220	07/03/2004	1138	Prop Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.260	12/03/2004	1001	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.300	02/03/2004	1700	Prop Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.350	02/28/2005	1238	Prop Damage (ov	0	0	Along Roadway	1	Fire Hydrant	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	1.460	01/23/2006	1513	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.460	02/20/2004	1230	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.460	09/13/2004	750	Prop Damage (ov	0	0	At an Intersection	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.460	12/19/2005	1239	Prop Damage (ov	0	0	At an Intersection	1	Curb	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.460	05/15/2006	2100	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	1.460	09/03/2006	137	Prop Damage (ov	0	0	At an Intersection	1	Utility Pole	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.460	12/12/2005	1642	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.460	08/29/2005	2133	Prop Damage (ov	0	0	At an Intersection	1	Other Fixed Object	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	1.460	05/25/2006	1718	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.460	07/19/2006	1859	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.460	10/03/2006	918	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.650	12/10/2005	235	Prop Damage (ov	0	0	Along Roadway	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.700	06/03/2004	644	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	03/21/2005	1125	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	03/22/2005	1549	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.750	01/18/2005	1008	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	07/31/2004	1234	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	1.750	09/08/2004	1036	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	11/18/2005	2107	Prop Damage (ov	0	0	At an Intersection	1	Tree	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.750	05/23/2006	740	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	06/27/2006	1725	Prop Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	12/03/2005	1131	Non-Incap Injur	0	1	At an Intersection	1	Ditch	No Collision w/ Vehicle	Rain

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	0.240	03/15/2006	1717	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/26/2005	1510	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	04/28/2005	804	‹on-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	04/08/2005	1550	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	01/31/2005	1608	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	09/19/2006	2158	‹on-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Head-On	
KNOX	01289	0-NONE	1	0.240	11/06/2006	1826	›p Damage (ov	0	0	At an Intersection	1	Median Barrier	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.250	08/10/2005	1626	›p Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.280	07/01/2005	1000	›p Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.580	06/23/2004	1419	›p Damage (ov	0	0	Along Roadway	3	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.670	05/31/2005	1648	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.670	04/20/2004	315	›p Damage (ov	0	0	At an Intersection	1	Wall	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.670	12/11/2005	2208	‹on-Incap Injur	0	2	At an Intersection	1	Embankment	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.670	10/19/2005	905	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.730	07/27/2004	730	‹on-Incap Injur	0	2	Along Roadway	2	Other Non-Collision	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	0.770	07/18/2006	1014	›p Damage (ov	0	0	Along Roadway	1	Utility Pole	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.800	07/11/2006	1727	‹on-Incap Injur	0	1	Along Roadway	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.850	02/01/2004		›p Damage (ov	0	0	Along Roadway	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.850	07/27/2004	1456	‹on-Incap Injur	0	1	Along Roadway	2	›le in Transport in other Roa	Angle	Rain
KNOX	01289	0-NONE	1	0.870	03/20/2005	215	›p Damage (ov	0	0	Along Roadway	1	Unknown Harmful Event	Unknown	No Adverse
KNOX	01289	0-NONE	1	0.970	12/19/2004	1805	›p Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	Snow
KNOX	01289	0-NONE	1	1.000	12/19/2005	1538	›p Damage (ov	0	0	Along Roadway	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	11/16/2004	1744	‹on-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.100	08/18/2004	1039	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.100	01/04/2005	2352	›p Damage (ov	0	0	At an Intersection	1	Embankment	No Collision w/ Vehicle	0
KNOX	01289	0-NONE	1	1.100	05/06/2005	1208	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	06/22/2004	1312	Fatal	1	0	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	1.100	08/07/2006	1416	‹on-Incap Injur	0	2	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.100	09/08/2004	1442	›p Damage (ov	0	0	At an Intersection	1	Guardrail End	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	1.100	02/28/2004	1646	Incap Injury	0	3	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	05/13/2004	2020	0	0	1	At an Intersection	4	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.100	06/10/2005	1903	›p Damage (ov	0	0	At an Intersection	1	Unknown Harmful Event	Unknown	Rain
KNOX	01289	0-NONE	1	1.100	09/07/2005	1645	‹on-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.100	12/07/2005	1450	‹on-Incap Injur	0	1	At an Intersection	2	Other Non-Collision	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.100	10/17/2006	1405	‹on-Incap Injur	0	1	At an Intersection	1	Ditch	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	1.140	04/20/2004	922	›p Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather I
KNOX	01289	0-NONE	1	0.240	03/07/2005	1545	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.240	01/14/2004	744	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	01/23/2004	734	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	03/10/2005	756	op Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	10/25/2004	1950	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	02/10/2005	1856	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	10/29/2004	1829	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	10/07/2004	543	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	02/05/2004	754	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	05/05/2004	738	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	01/07/2005	1628	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/05/2004	1552	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	07/10/2004	1458	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	02/11/2005	1118	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	09/13/2004	1035	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	07/29/2004	841	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	07/01/2004	1838	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	0.240	09/10/2004	1737	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	07/25/2005	859	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	06/09/2005	1305	Non-Incap Injur	0	3	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	11/25/2006	1124	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	01/11/2006	2113	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	11/07/2005	1454	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	12/13/2004	1536	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	12/16/2004	1535	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/22/2005	632	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	11/07/2004	1546	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	11/12/2004	720	Incap Injury	0	1	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	0.240	03/03/2005	1605	op Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	03/30/2005	1556	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	03/25/2005	1020	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	08/09/2006	1249	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.240	02/01/2006	1258	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.240	07/05/2006	1755	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.240	12/01/2006	1642	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	Other (Narr
KNOX	01289	0-NONE	1	0.240	01/31/2006	911	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	0.100	11/24/2006	1319	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/16/2006	1138	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/24/2005	650	ion-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/19/2005	1522	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	02/16/2005	1856	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/13/2004	850	ion-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	06/26/2006	748	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	Rain
KNOX	01289	0-NONE	1	0.100	06/26/2006	1132	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	03/03/2006	2123	Incap Injury	0	3	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	0.100	10/13/2006	649	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	05/18/2006	1703	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	08/22/2006	1712	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	08/28/2006	1725	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/26/2006	1323	ɔp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	02/17/2006	1853	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	02/10/2006	1147	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	05/05/2006	1733	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	08/13/2006	830	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	09/09/2005	1740	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/20/2005	1028	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	12/10/2005	1530	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	06/26/2006	1848	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	0.100	08/08/2005	1235	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	08/30/2005	1713	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/11/2006	747	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	09/05/2006	1744	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	0.100	07/06/2006	1225	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	07/27/2006	1206	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/12/2006	1401	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	07/05/2006	1402	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	09/16/2006	1848	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/18/2006	1142	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/28/2006	1638	ion-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	12/22/2006	1242	ɔp Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.120	05/15/2006	1556	ɔp Damage (ov	0	0	Ramp	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	0.160	07/12/2006	1434	ɔp Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Angle	No Adverse

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather I
KNOX	01289	0-NONE	1	0.010	12/16/2006	1055	op Damage (ov	0	0	Underpass	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.070	12/22/2006	1605	op Damage (ov	0	0	Along Roadway	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	01/20/2004	717	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	05/16/2004	103	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	03/17/2005	1925	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	04/30/2004	1402	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	06/16/2004	1058	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	0.100	09/03/2004	1520	Non-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/05/2006	1134	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/23/2004	1219	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	08/01/2005	1307	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Sideswipe, Same Dir	No Adverse
KNOX	01289	0-NONE	1	0.100	02/16/2005	2040	Non-Incap Injur	0	2	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	03/13/2005	1325	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	03/17/2005	1740	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	08/24/2005	1735	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	07/15/2005	643	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	05/17/2006	2103	op Damage (ov	0	0	At an Intersection	3	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	07/09/2004	1135	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	02/07/2004	2150	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/03/2006	1557	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	02/19/2006	1227	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	09/08/2005	1853	Incap Injury	0	3	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	12/20/2005	1329	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	05/30/2005	1308	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	08/10/2005	818	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	09/29/2005	1719	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/15/2005	1945	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/30/2005	1427	Non-Incap Injur	0	1	At an Intersection	3	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	10/08/2005	1222	op Damage (ov	0	0	At an Intersection	1	Highway Traffic Sign Post	No Collision w/ Vehicle	No Adverse
KNOX	01289	0-NONE	1	0.100	04/24/2006	1728	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/28/2006	1339	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/03/2006	1314	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	12/18/2006	1344	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	10/26/2006	1651	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	0.100	11/02/2006	1111	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	0.100	11/08/2006	1514	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse

County	Route	Sp Cse	Co Seq	Log Mile	Date of Crash	Time of Crash	Type of Crash	Total Killed	Total Inj	Location	Total Veh	First Harmful Event	Manner of First Collision	Weather
KNOX	01289	0-NONE	1	1.750	11/28/2005	1713	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.750	06/08/2006	1215	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	08/19/2006	1830	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.750	10/03/2005	1007	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Rear-End	No Adverse
KNOX	01289	0-NONE	1	1.750	11/15/2006	1830	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Rear-End	Rain
KNOX	01289	0-NONE	1	1.750	07/22/2006	2029	op Damage (ov	0	0	At an Intersection	2	Vehicle in Transport	Head-On	No Adverse
KNOX	01289	0-NONE	1	1.750	10/21/2006	1913	Non-Incap Injur	0	1	At an Intersection	2	Vehicle in Transport	Angle	No Adverse
KNOX	01289	0-NONE	1	1.830	11/30/2006	1612	Non-Incap Injur	0	1	Along Roadway	1	Tree	No Collision w/ Vehicle	Rain
KNOX	01289	0-NONE	1	2.000	05/01/2005	0	op Damage (ov	0	0	Along Roadway	1	Mail Box	No Collision w/ Vehicle	No Adverse

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21 ALONG THE ROAD