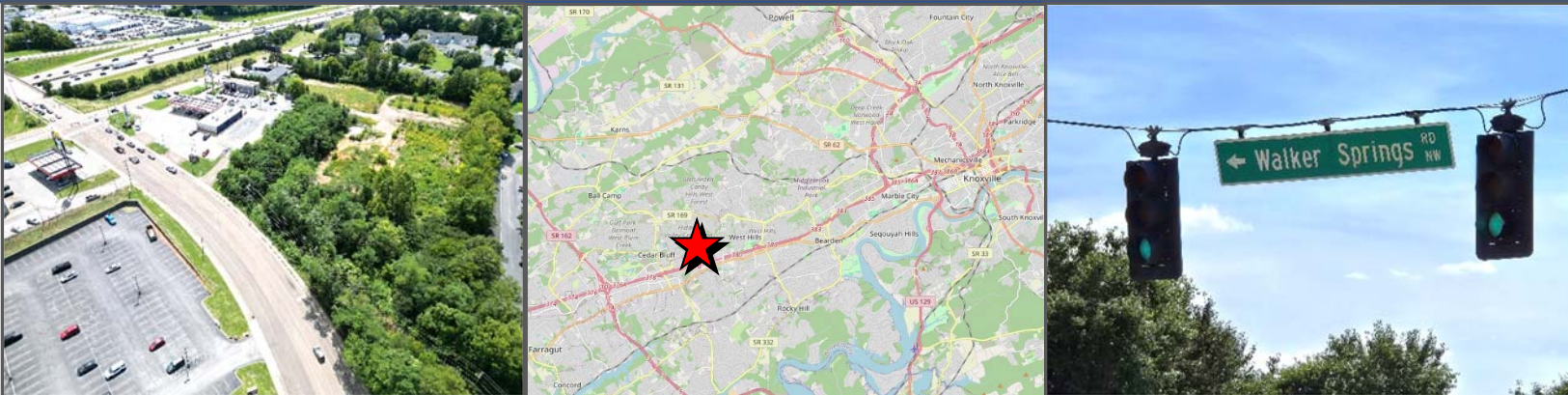


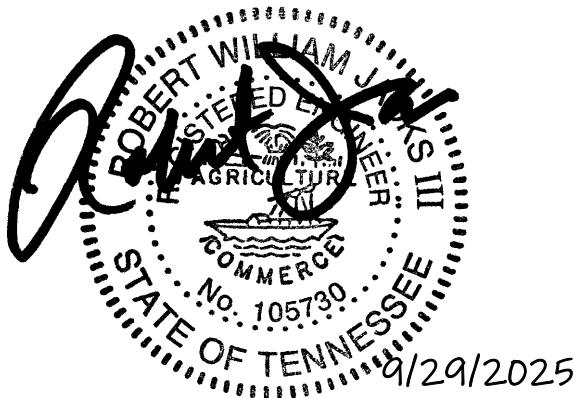


Transportation Impact Study Thompson Landing Apartments Knox County, Tennessee



September 2025

Prepared for:
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3523 Maloney Road
Knoxville, TN 37920



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EXECUTIVE SUMMARY

Preface:

Thompson Landing of Knoxville, LP, proposes a residential development near the intersection of Walker Springs Road and Walbrook Drive in West Knox County, TN. This proposed development is named “Thompson Landing Apartments”. The development will comprise 96 multi-family apartments on approximately 5.2 acres. It is anticipated to be fully built out and occupied by 2027. It proposes an entrance to the east at Walker Springs Road, 570 feet north of the signalized intersection with Walbrook Drive, directly across from an entrance to a National Fitness center, and another to the south at Walbrook Drive, 360 feet west of the signalized intersection.

The primary purpose of this study is to determine and evaluate the potential impacts of the development on the adjacent transportation system. The study includes a review of the primary access roads, the entrance intersections, and the adjacent signalized intersection of Walker Springs Road at Walbrook Drive. This report is a Level 1 study established by Knoxville/Knox County Planning. Recommendations and mitigation measures are offered if transportation operations are projected to be below recognized engineering standards.

Study Results:

The significant findings of this study include the following:

- The Thompson Landing Apartments, with up to 96 multi-family housing units, is estimated to generate 920 vehicle trips at full build-out and occupancy on an average weekday. Of these daily trips, 51 are estimated to occur during the AM peak hour and 74 during the PM peak hour in 2027.
- The entrance intersections at Walker Springs Road and Walbrook Drive are calculated to have minimal vehicle delays and queues during the projected AM and PM peak hours, operating under two-way stop-controlled conditions.
- The right-turn volumes entering the proposed development from Walker Springs Road and Walbrook Drive in 2027 are not projected to meet the threshold warrants for separate turn lanes. Left-turn movements into the development from Walker Springs Road will be adequately served by an existing center two-way left-turn lane (TWLTL).
- Unrelated to the proposed project, the existing signalized intersection of Walker Springs Road at Walbrook Drive was observed with a couple of deficiencies. The first noted deficiency is excessive vehicle queues for the southbound shared

thru/right-turn lane on Walker Springs Road, which is caused by very large right-turn volumes during peak periods. Secondly, and more importantly, the proper use of the westbound approach lanes of Walbrook Drive at the signalized intersection was frequently observed being misused.

Recommendations:

The following summary recommendations are presented based on the study's analyses to minimize the impacts of the proposed development on the adjacent transportation system, while aiming to achieve an acceptable traffic flow and improved safety. More details regarding all the recommendations are discussed at the end of the report. The recommendations marked with an asterisk indicate an existing transportation need and are not associated with the proposed development's projected impacts.

Walker Springs Road at East Proposed Entrance & National Fitness Entrance:

- A single exit lane for the development's residents, allowing both left and right turn movements from the East Proposed Entrance onto Walker Springs Road, will be sufficient, according to calculations based on projected 2027 volumes.
- Future landscaping, existing vegetation, or proposed signage must not impact the intersection sight distances looking from the East Proposed Entrance to the north and south on Walker Springs Road.
- * • The vegetation currently along the west side of Walker Springs Road is overtaking the sidewalk and needs to be removed and better maintained by Knox County.
- A white crosswalk is recommended to be applied across the East Proposed Entrance approach, where the existing sidewalk on the west side of Walker Springs Road will cross. The crosswalk should have a white transverse marking as shown in TDOT Standard Drawing T-M-4.
- It is recommended that a Stop Sign (R1-1) be posted and a 24" white stop bar be applied to the East Proposed Entrance approach at Walker Springs Road. The stop bar should be applied a minimum of 4 feet away from the edge of the recommended crosswalk at Walker Springs Road and placed at the desired stopping point that maximizes the sight distance to the north and south.
- The existing center two-way left-turn lane (TWLTL) pavement striping on Walker Springs Road at the East Proposed Entrance is recommended to be modified. This modification should include providing a designated left-turn area in the center lane on Walker Springs Road for northbound left-turning vehicles into the Thompson Landing Apartments. In the center of Walker Springs Road at the

entrance, 50 feet of vehicle storage for left turns should be delineated by the application of a solid white line, followed by an opening of 50 feet in the TWLTL pavement marking for the transition between the new dedicated left-turn area and the existing TWLTL striping to the south. The inner edge of the center of Walker Springs Road in the southbound direction should be modified to include a double yellow centerline within this total 100-foot distance to eliminate the current TWLTL designation. A white left-turn arrow should be applied to the pavement for this new designated northbound turn lane. Additionally, the existing center pavement markings on Walker Springs Road, within the East Proposed Entrance approach and the National Fitness entrance, should be removed. The pavement markings for southbound left turns into National Fitness should mirror those recommended for northbound left turns into the Thompson Landing Apartments.

Walbrook Drive at South Proposed Entrance:

- A single exit lane for the development's residents, allowing right-turn-only movements from the South Proposed Entrance onto Walbrook Drive, will be sufficient, according to calculations based on projected 2027 volumes.
- Future landscaping, existing vegetation, or proposed signage must not impact the intersection sight distance looking from the South Proposed Entrance to the east on Walbrook Drive.
- It is recommended that a Stop Sign (R1-1) be posted and a 24" white stop bar be applied to the South Proposed Entrance approach at Walbrook Drive. The stop bar should be applied a minimum of 4 feet away from the shoulder edge of Walbrook Drive and placed at the desired stopping point that maximizes the sight distance to the east.
- Since Walbrook Drive is one-way in the westbound direction only, it is recommended that a No Left Turn Sign (R3-2) be posted below the recommended Stop Sign (R1-1).

Walker Springs Road at Walbrook Drive:

- * • Due to current traffic conditions and expected general growth in the surrounding area, Knox County and the City of Knoxville should consider, at some point, modifying the two lanes on the southbound approach of Walker Springs Road at Walbrook Drive to provide more capacity for right-turn movements, and thereby also reducing the potential for excessive vehicle queues that could interfere with the turning movements at the East Proposed Entrance to the Thompson Landing

Apartments. This potential modification would involve changing the inside lane on the southbound approach of Walker Springs Road, currently a thru lane only, to a shared thru/right-turn lane, and converting the outside lane from its current shared thru/right-turn lane configuration to a right-turn-only lane.

- * • To assist motorists in determining and using the appropriate lane and reduce potential crashes from improper use, it is highly recommended that Knox County and the City of Knoxville supplement the existing advance signage and pavement markings by installing overhead lane use control signs for the westbound approach of Walbrook Drive at the traffic signal. These overhead signs should include a shared left/thru sign, a thru only sign, and a right-turn-only sign.

Thompson Landing Apartments Internal Drives/Parking Lot Aisleways:

- 10-mph Speed Limit Signs (R2-1) are recommended to be posted near the beginning of the development entrance driveways off Walker Springs Road and Walbrook Drive.
- Stop Signs (R1-1) with 24" white stop bars and other traffic signage are recommended to be installed at the internal locations, as shown in the report.
- Sight distance at the new internal intersections must not be impacted by new signage, parked cars, or future landscaping. The civil site designer should ensure internal sight distances are met, especially at the sharp internal aisleway turns.
- All drainage grates and covers for the residential development must be pedestrian and bicycle-safe.
- The proposed internal sidewalk system should be connected to the existing external sidewalk system located on the west side of Walker Springs Road. Sidewalks should have appropriate ADA-compliant ramps at intersection corners, and the internal sidewalks are recommended to be a minimum of 5 feet in width to meet Knox County regulations.
- With a Knoxville Area Transit (KAT) route nearby, installing a new bus stop closer to the proposed development would provide more convenient transit access for residents in the Thompson Landing Apartments and reduce the number of vehicle trips. If a bus stop is desired closer to the development, a request by the developer should be submitted to KAT officials to determine its feasibility.
- All road and intersection elements should be designed in accordance with the American Association of State Highway and Transportation Officials (AASHTO) specifications, as well as those of Knox County and the City of Knoxville, to ensure proper transportation operations.

DESCRIPTION OF EXISTING CONDITIONS

▪ STUDY AREA:

The location of the proposed Thompson Landing Apartments is shown on a map in Figure 1. This proposed development will be located northwest of the signalized intersection of Walker Springs Road at Walbrook Drive in West Knox County, TN. The development property is located within Knox County, just outside the city limits of Knoxville, TN. However, the adjacent traffic signal of Walker Springs Road at Walbrook Drive, which is included in this study, is within the City of Knoxville. The development proposes one entrance to Walker Springs Road on its eastern end, directly across from an existing National Fitness center entrance, and one entrance to Walbrook Drive to the south, where the development property has a narrow strip of road frontage adjacent to a Taco Bell and a tire repair shop.

The proposed development property is situated in a suburban area of West Knox County, TN, and is located in a transitional zone between residential and commercial properties. The development property is bound on the south side by an Exxon gas station, a Subway restaurant, a Taco Bell, and a tire repair shop. To the north and northwest, the property is bound by The Hudson on the Greenway, a large apartment complex.

In addition to these existing developments, the proposed residential apartments will be located near large pockets of businesses and commercial developments, just north and fronting along Walbrook Drive, which parallels Interstate 40/75. These other developments in the surrounding area include a Walmart Supercenter and a Sam's Club, as well as other businesses that include a National Fitness center, a self-storage center, a Casey's gas station with an attached McDonald's restaurant, and a used car sales lot. In addition to this proposed residential development, The Rowan, a 320-unit multi-family development, is under construction and nearing completion, and will be located slightly further to the north on the east side of Walker Springs Road.

The development property was previously occupied by Walker Springs Studio Apartments, which were partially demolished over the past decade. This previous development had singular external road access to the south at Walbrook Drive via a narrow strip of property and lacked access to Walker Springs Road to the east. The proposed development site is currently undeveloped, featuring vegetation and remnants of the previous studio apartments, including leveled areas and traces of asphalt and concrete.

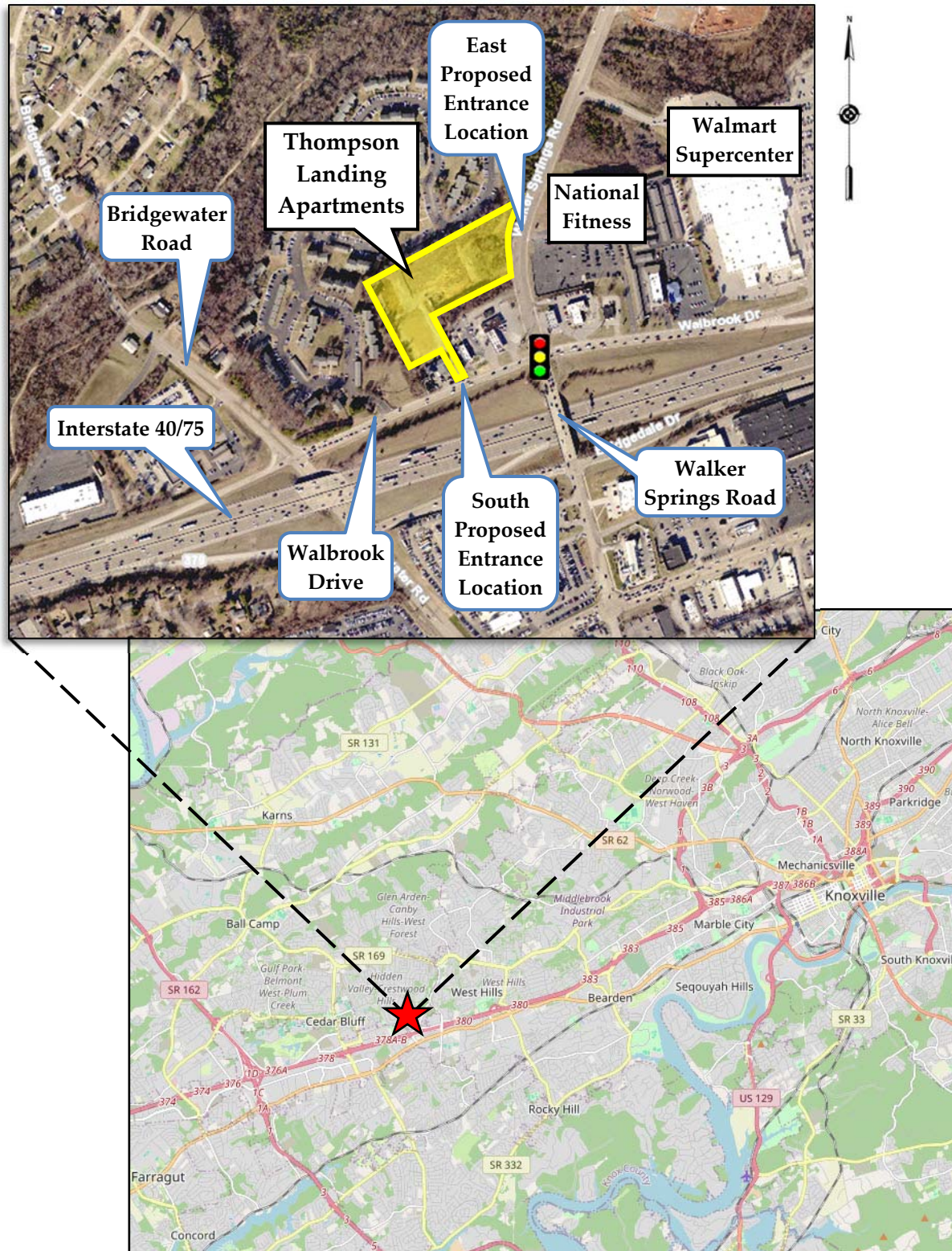


Figure 1
Location Map

▪ **EXISTING ROADWAYS:**

Table 1 lists the characteristics of the existing primary roadways near the development property and included in the study:

TABLE 1
STUDY CORRIDOR CHARACTERISTICS

NAME	CLASSIFICATION ¹	SPEED LIMIT	LANES	ROAD WIDTH ²	TRANSIT ³	PEDESTRIAN FACILITIES	BICYCLE FACILITIES
Walker Springs Road	Minor Arterial / Minor Collector	40 mph	4 undivided with TWLTL	62 feet	KAT Route 16 (no stops)	Sidewalk on both sides	No bike lanes
Walbrook Drive	Major Collector	40 mph	2 - 3 lanes (one way only)	38 - 50 feet	KAT Route 16	No sidewalks	No bike lanes

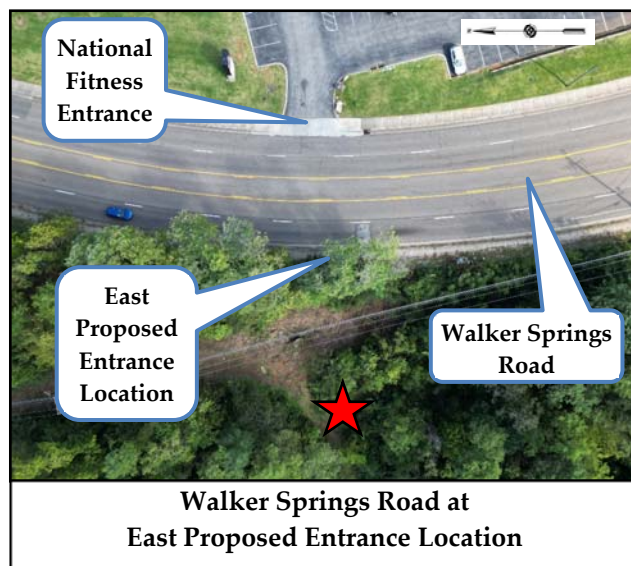
¹ 2018 Major Road Plan by Knoxville/Knox County Planning

² Measured from face of curbs and edges of pavement near project site

³ According to Knoxville Area Transit System Map

Walker Springs Road traverses adjacent to the development in a north-south direction and traverses in several other directions over its entire length. Walker Springs Road near the Interstate was relocated and modified nearly 30 years ago. It originally looped around the Walmart Supercenter and Sam's Club to the east. When the Interstate interchange (Exit 379) and surrounding roads were reconstructed, Walker Springs Road was divided into two distinct sections, but it retained its name over both. Walker Springs Road begins at Fox Lonas Road to the northwest in the Crestwood Hills Subdivision and ends at N Gallaher View Road at a t-intersection and is classified as a Minor Collector. Five hundred feet to the south of this unsignalized t-intersection, Walker Springs Road resumes at N Gallaher View Road at a signalized t-intersection, marking the beginning of its classification as a Minor Arterial. Walker Springs Road then continues to the south across Interstate 40/75 and ends at Kingston Pike.

Walker Springs Road is a 4-lane, undivided roadway with a center two-way left-turn lane (TWLTL) adjacent to the proposed development site. The TWLTL has a width of



12 feet with 11.5-foot-wide dual-thru lanes in both directions. Both sides of Walker Springs Road near the development site are flanked by curb and gutter. Near the project site, Walker Springs Road does not provide access to any other developments on its western side between N Gallaher View Road to the north and Walbrook Drive to the south, except for the Exxon/Subway and Taco Bell development directly to the south. On its eastern side, it provides access to the rear of the Walmart Supercenter, a National Fitness center, and the Casey's gas station that includes a McDonald's. The eastern side of Walker Springs Road, located further north, will also provide an entrance to the nearly fully constructed The Rowan residential development. The East Proposed Entrance at Walker Springs Road will be located directly across from the existing National Fitness entrance.

Walker Springs Road has a posted speed limit of 40 mph and has a large horizontal curve along its length where the East Proposed Entrance for the Thompson Landing Apartments will be located. Bike lanes and roadway illumination are not provided along Walker Springs Road. Six-foot-wide concrete sidewalks are provided on each side between Walbrook Drive and N Gallaher View Road. The sidewalks continue on Walker Springs Road only on the east side south of the Interstate.

Knoxville Area Transit (KAT) provides bus service in the area; however, it does not currently have a bus stop on Walker Springs Road near the development site.

At its intersection with Walbrook Drive, the intersection is signalized, but it only serves three approaches, as Walbrook Drive is one-way in the westbound direction. Painted white crosswalks, 10 feet in width, are provided across Walker Springs Road's north approach and Walbrook Drive's east approach only. The traffic signal heads are hung on span wires supported by wood posts, and the traffic signal does not provide any pedestrian buttons or indicators to assist pedestrians crossing the crosswalks. The



The traffic signal is within the City and operated and maintained by the City of Knoxville.

Walbrook Drive is classified as a Major Collector and traverses in an east-to-west one-way direction. For most of its length, it provides two lanes for westbound travel and functions as a frontage road off Interstate 40/75.

To the east, Walbrook Drive begins at N Gallaher View Road at a 4-way signalized intersection, with the westbound approach comprising the Exit 379 ramp off the Interstate. It ends to the west at its intersection with Bridgewater Road and an entrance ramp to the Interstate, with a total length of 0.6 miles.

Walbrook Drive was constructed nearly 30 years ago during the widening and reconfiguration of the Interstate system and adjacent roads in the area. In addition to the exit ramp to N Gallaher View Road, an exit slip ramp off the Interstate is provided on Walbrook Drive between N Gallaher View Road and Walker Springs Road. The intersection of Walbrook Drive and the slip ramp is Y-shaped and controlled by a traffic signal. In addition to the Interstate exit ramps, Walbrook Drive provides access to entrances for the Walmart Supercenter, Sam's Club, and the previously mentioned commercial businesses that front the Interstate on its northern side, which includes the Exxon/Subway and Taco Bell, adjacent to the proposed Thompson Landing Apartments. An entrance to the Thompson Landing Apartments will be provided to the south at Walbrook Drive, at the location of the previous studio apartment's driveway, between Taco Bell and the tire repair shop.

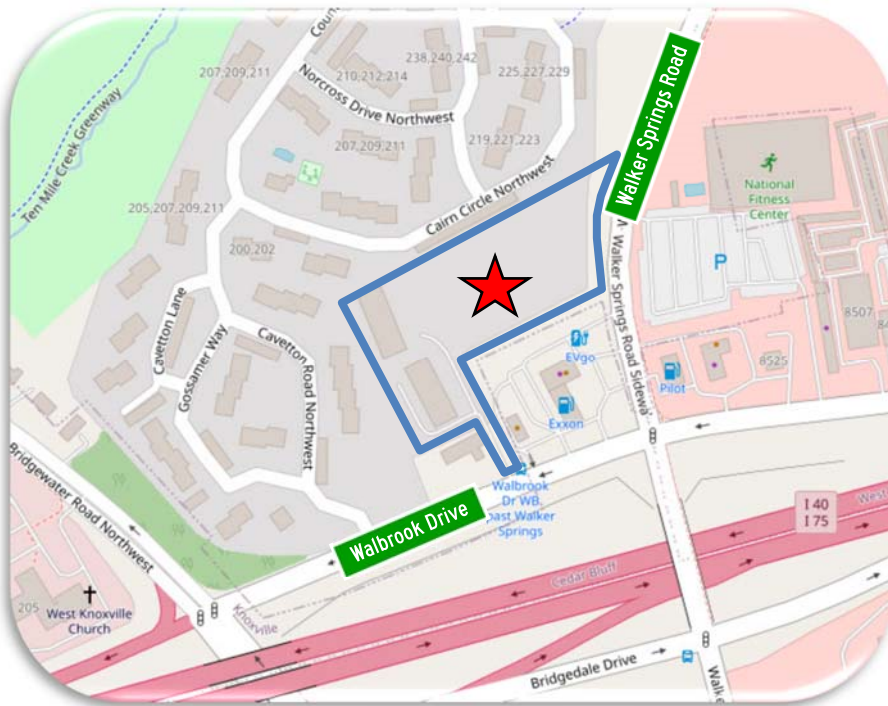
The signalized intersection of Walker Springs Road at Walbrook Drive is provided with roadway illumination from high-mast lighting installed between Walbrook Drive and the Interstate.

Walbrook Drive has a variable roadway width, ranging from 38 to 50 feet. Its northern edge is lined by concrete curb and gutter, and the surfaces outside the southern edge consist of grass and concrete ditches. Walbrook Drive also includes a 9-foot paved shoulder on its northern side.

KAT has a bus stop on Walbrook Drive located between N Gallaher View Road and Walker Springs Road, adjacent to and in front of the Walmart Supercenter and Sam's Club.

Figure 2 shows the traffic count locations for the study as well as the current traffic signage along Walker Springs Road and Walbrook Drive in the vicinity of the development site and the adjacent signalized intersection. The signage only includes warning and regulatory signage and does not show directional road signage. The pages following Figure 2 provide a further overview of the site study area, accompanied by photographs.

PHOTO EXHIBITS



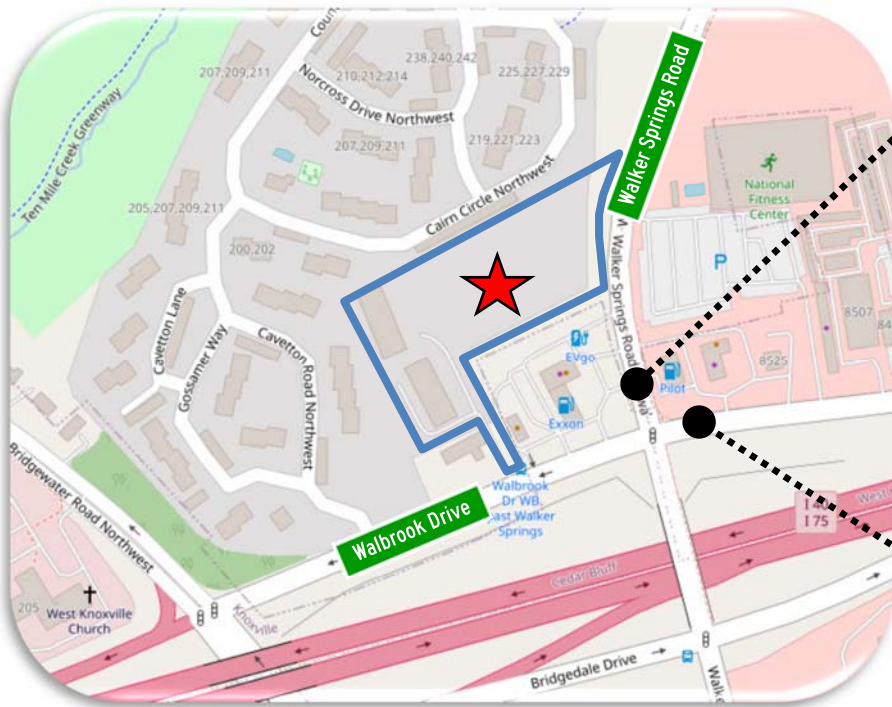
Proposed Development Site



**Aerial View of Proposed Development Site
(Looking East)**



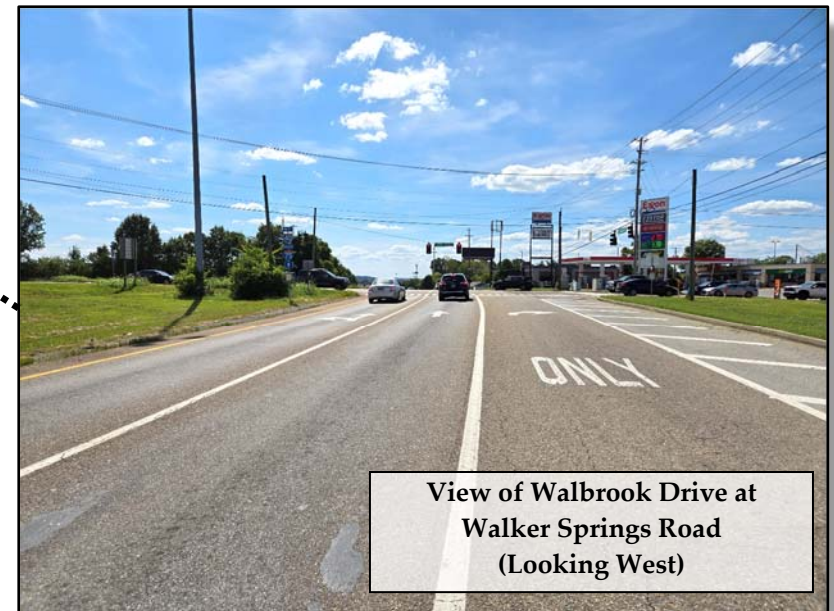
**Aerial View of Proposed Development Site
(Looking Southwest)**



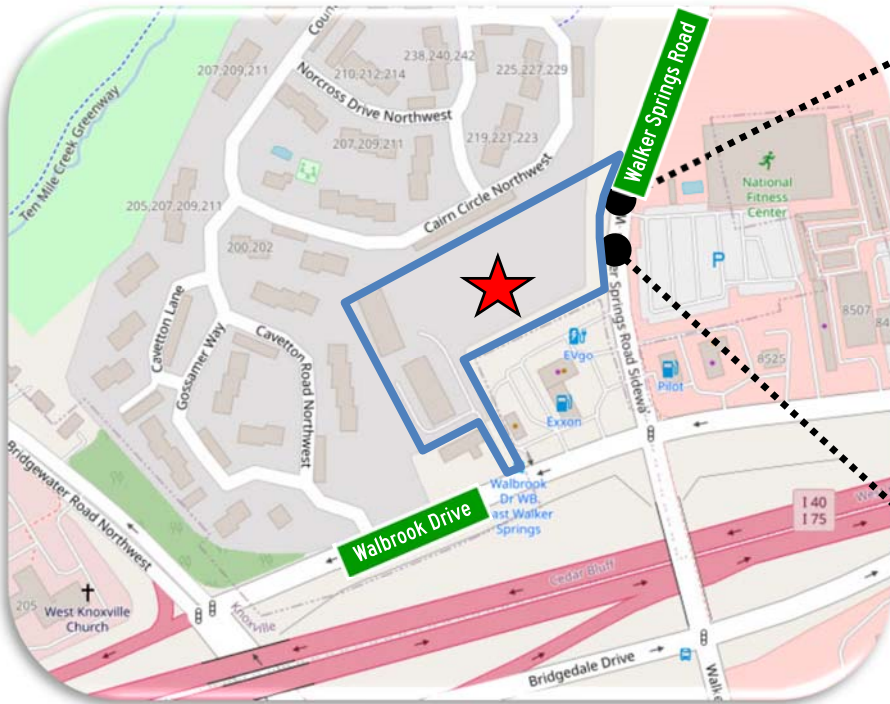
Walker Springs Road at Walbrook Drive



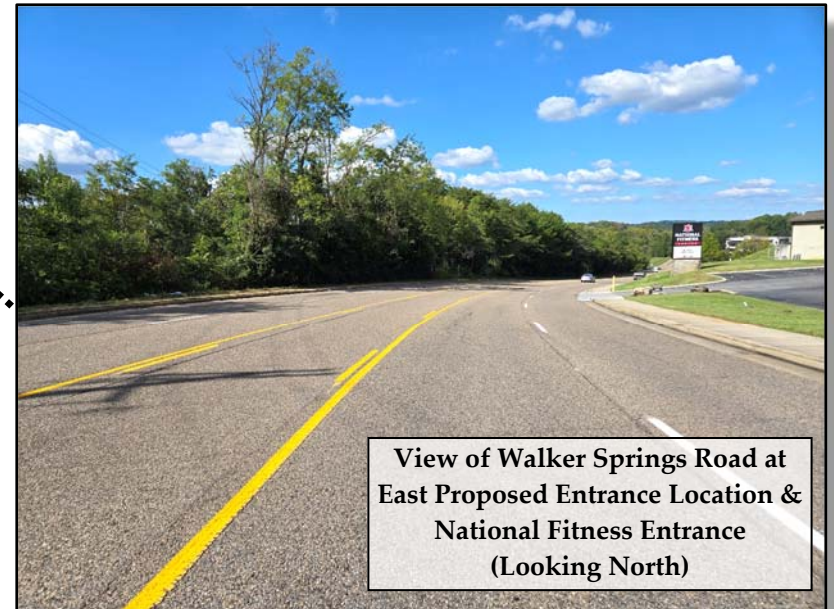
**View of Walker Springs Road at
Walbrook Drive
(Looking South)**



**View of Walbrook Drive at
Walker Springs Road
(Looking West)**



**Walker Springs Road at East Proposed Entrance Location
& National Fitness Entrance**





Walbrook Drive at South Proposed Entrance Location



**View of Property at
South Proposed Entrance Location
from Walbrook Drive
(Looking North)**

▪ **EXISTING TRANSPORTATION VOLUMES PER MODE:**

A couple of annual vehicular traffic count locations are located in the vicinity, but not particularly close to the development site. TDOT conducts these counts, and the count location data is the following and can be viewed with further details in Appendix A:

○ Existing vehicular roadway traffic:

TDOT reported the following Average Annual Daily Traffic (AADT):

- Walker Springs Road, located south of Walbrook Drive and the development site, and on the opposite side of the Interstate, with 11,161 vehicles per day in 2024. Between 2014 and 2024, this count station has reported a negative average annual growth rate of -0.1%.
- Walbrook Drive, located east of Walker Springs Road and the project site, at 5,056 vehicles per day in 2024. Between 2018 and 2024, this count station has reported a negative average annual growth rate of -1.6%.

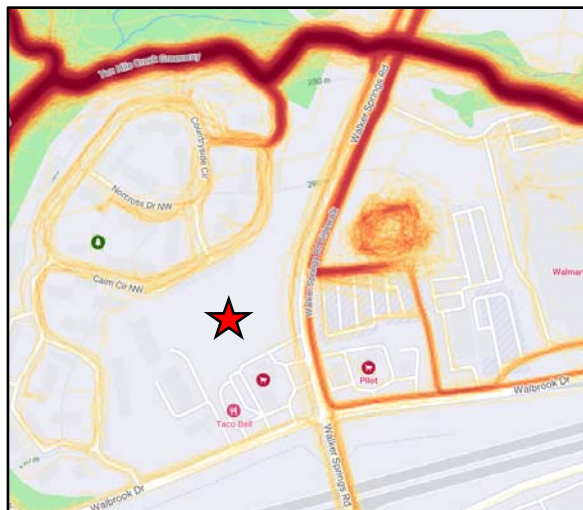
○ Existing bicycle and pedestrian volumes:

The average daily pedestrian and bicycle traffic along Walker Springs Road and Walbrook Drive is unknown. However, without sidewalks on Walbrook Drive, the significant distance between development on Walker Springs Road north of the development site, combined with the availability and accessibility of a nearby greenway system, suggests that these roadways are assumed to have minimal pedestrian and bicyclist activity. During the 6-hour traffic count for this project at the intersection of Walker Springs Road and Walbrook Drive, four bicyclists and 18 pedestrians were observed crossing the intersection.

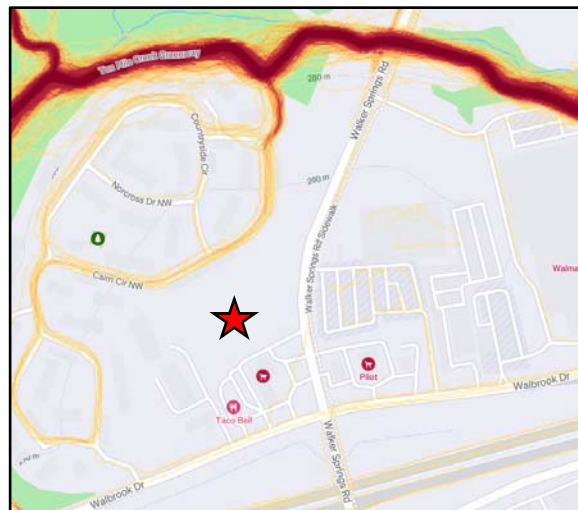
An online website, [strava.com](https://www.strava.com), provides “heat” maps detailing routes taken by pedestrians, joggers, and bicyclists. The provided heat maps display data from the last two years, are updated monthly, and are compiled from individuals who have allowed their smart devices to track and record their routes (millions of users). The activities in the maps are represented on the roads by color intensities, with darker colors indicating higher activity.

The Strava heat maps show minimal to nonexistent bicyclist traffic on Walker Springs Road and Walbrook Drive near the development site, but a considerable amount along the Ten Mile Creek Greenway just to the north. Large amounts of pedestrian activity

are also shown on the Ten Mile Creek Greenway to the north, and a fair amount on the eastern side of Walker Springs Road and the north side of Walbrook Drive, despite the lack of sidewalks on Walbrook Drive.



Strava Heat Map for Pedestrian and Joggers

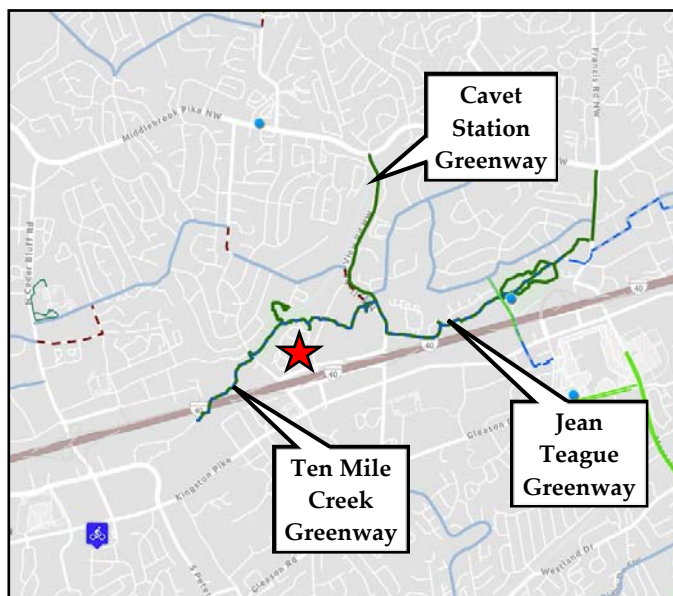


Strava Heat Map for Bicyclists

▪ **PEDESTRIAN AND BICYCLE FACILITIES:**

Bicycle lanes are not available within the immediate area, but greenways generously surround the development site. The City of Knoxville has designated a few roads further to the north as “Comfortable Routes” for bicycle travel. A “Comfortable Route” is defined as a route based on low to medium traffic speeds and volumes, along with other criteria. These routes are designated and highlighted in the adjacent image with blue lines.

These greenways in the near area include the Ten Mile Creek Greenway, Jean Teague Greenway, and Cavet Station Greenway. The closest greenway to the proposed development site is the Ten Mile Creek Greenway, located approximately 1,000 feet north of the site.



Bicycle Lanes and Greenways in Study Area

The Ten Mile Creek Greenway is 1.6 miles long and begins at the southwest end, near a closed AMC movie theater and a Lowe's Home Improvement Center off N Peters Road. From the southwest, the Ten Mile Creek Greenway crosses under Interstate 40/75 and then provides access to Ten Mile Creek Park and Walker Springs Park. To the northeast, the greenway then intersects and connects with the Jean Teague Greenway. This greenway connection is provided via an underpass tunnel adjacent to Ten Mile Creek, located under N Gallaher View Road, and just south of The Rowan apartment complex, which is currently under construction. The paved pathway to this tunnel at N Gallaher View Road will be the closest official connection point to the Ten Mile Creek Greenway for the Thompson Landing Apartment residents. A similar underpass tunnel is provided closer by for the Ten Mile Creek Greenway at Walker Springs Road, but direct, official access to the greenway is not provided where it crosses under Walker Springs Road. However, an unofficial connection has been established by users using a dirt path behind a section of guardrail on the western side of Walker Springs Road.

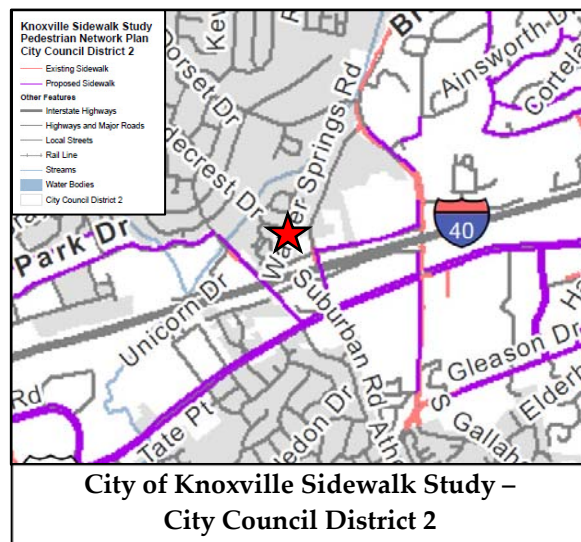


**Dirt Path to Ten Mile Creek Greenway Tunnel
under Walker Springs Road**

The sidewalk system along Walker Springs Road and N Gallaher View Road allows pedestrians and joggers to travel north up to Middlebrook Pike. The sidewalk system on Middlebrook Pike allows travel west to Cedar Bluff Road and northwest to Hardin Valley Road near Ball Camp Pike. To the east on Middlebrook Pike, sidewalks allow pedestrians to travel just short of Weisgarber Road. The adjacent existing sidewalks on Walker Springs Road also allow pedestrians to travel south to Kingston Pike.

The City of Knoxville produced a report in June 2020 titled Sidewalk Study. In this study, the report identified the existing sidewalk system in the City of Knoxville, areas of need for sidewalks, and a framework for future sidewalk infrastructure. This study provided maps broken down by City Council Districts, showing both the existing and proposed recommended sidewalks. The proposed development site is situated just outside City Council District 2. A map of this area, as depicted in this Knoxville study, is included in the following image. The lines in red indicate the locations of existing sidewalks, and the purple lines illustrate the proposed sidewalks. The map in the image designates areas outside the City with gray shading. Walker Springs Road, adjacent to the development, is in the County and is not included or shown as

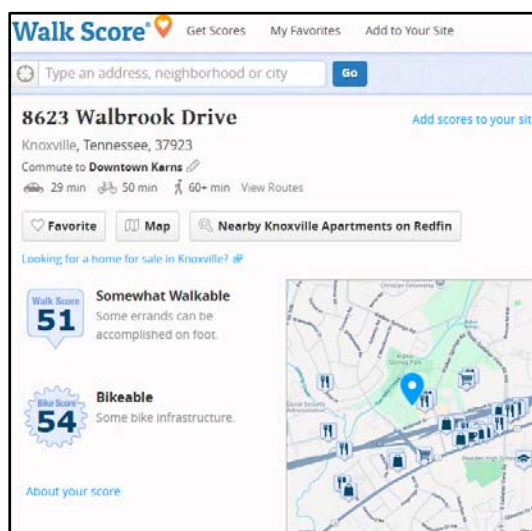
having an existing sidewalk. Walbrook Drive between Walker Springs Road and N Gallaher View Road is within the City and is marked with a purple line indicating a proposed sidewalk. In the study, however, this proposed recommended sidewalk is listed relatively low in their rankings. The study reported an estimated cost of \$1.7 million for 2,069 feet of new sidewalk on Walbrook Drive.



Currently, it is unknown when the proposed sidewalk on Walbrook Drive will be constructed. According to the City, however, if the proposed sales tax increase, which citizens are voting on in November 2025, passes, it will accelerate the design and construction of sidewalk projects on the study list. The City of Knoxville study does not indicate a need for a sidewalk along the western portion of Walbrook Drive, west of Walker Springs Road, where the proposed development will tie into via the South Proposed Entrance.

▪ WALK SCORE:

A private company offers a website at walkscore.com that grades and gives scores to locations within the United States based on “walkability”, “bikeability”, and transit availability based on a patented system. According to the website, the numerical values assigned to the Walk Score and Bike Score are based on the distance to the closest amenity in various relevant categories (such as businesses, schools, and parks) and are graded from 0 to 100.



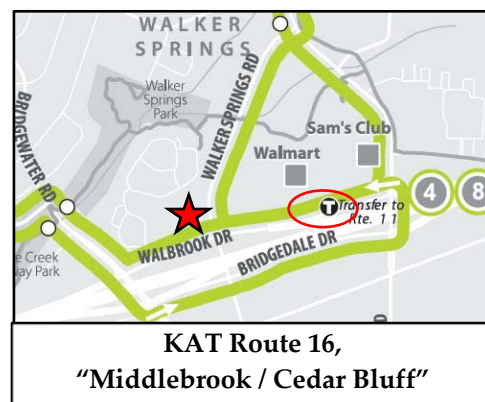
The project site location is graded with a relatively high Walk Score of 51 at the development property address (8623 Walbrook Drive). This Walk Score indicates that some errands can be accomplished on foot at the development property location. The Walk Score is graded fairly higher than average in the area due to the provision of sidewalks and nearby amenities. The site is assigned a Bike Score of 54, indicating some bike infrastructure is available.

Overall, this study assumed no reductions in vehicle trips due to pedestrian or bicyclist activity by future residents of the Thompson Landing Apartments development, despite the availability of sidewalks and nearby amenities that may likely encourage some residents to travel without using an automobile.

▪ **TRANSIT SERVICES:**

The City of Knoxville offers a network of public transit options through Knoxville Area Transit (KAT). Although bus service is not directly available, it will be somewhat accessible near the development site.

The closest public transit bus stop to the development site is only 0.4 miles to the east on Route 16, “Middlebrook / Cedar Bluff”. This bus station is situated on Walbrook Drive, directly in front of the Walmart Supercenter and Sam’s Club. This route has established bus service every 60 minutes at this bus stop, and on its route, it passes the development site during its travel on Walker Springs Road and Walbrook Drive. This route operates on weekdays and weekends; the route map is also included



in Appendix B. Other transit services in the area include the East Tennessee Human Resource Agency (ETHRA) and the Community Action Committee (CAC), which provide transportation services upon request.

Although the distance to the nearest public bus stop is within walking distance, sidewalks are not provided on Walbrook Drive from the proposed development site. Therefore, assuming conservatively, residents in the proposed apartment development are not expected to have any reduced vehicle trips due to public transit usage, and vehicle trip reductions are not included in the analysis.

▪ **CRASH DATA:**

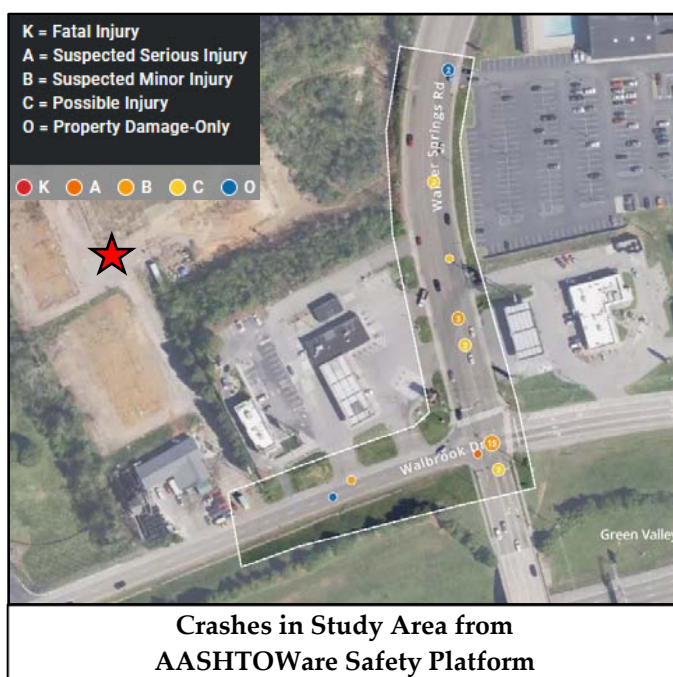
For this project, access to the AASHTOWare Safety online platform was provided. This AASHTO (American Association of State Highway and Transportation Officials) platform is a component of several offerings that include compiling crash data for local state DOTs to use in safety analyses. TDOT provides vehicle crash data to this system and is an extension of its existing E-

TRIMS (Enhanced Tennessee Roadway Information Management System) database. The crash data in the E-TRIMS system is from the statewide TITAN (Tennessee Integrated Traffic Analysis Network) database. The TITAN database includes all reportable vehicle crash data from Tennessee law enforcement agencies.

In the vicinity of the proposed entrances for the development and the signalized intersection of Walker Springs Road at Walbrook Drive, 30 crashes occurred during the past 3 years between September 11th, 2022, and September 11th, 2025. Of the 30 crashes, one involved alcohol, two included pedestrians, two included a bus/truck, and the rest involved passenger vehicles.

Of the 30 crashes, 21 were property-damage-only (PDO) without injuries or fatalities, five involved possible injuries, three had suspected minor injuries, and one of the crashes involving a pedestrian resulted in a suspected serious injury.

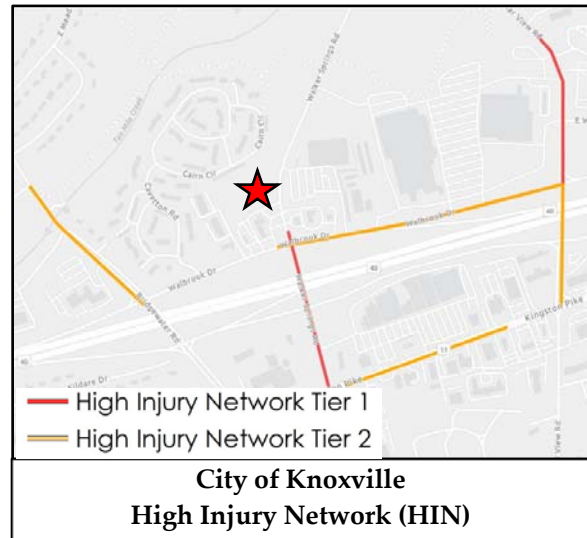
The crash types included 13 angle crashes, 7 rear-end crashes, 7 sideswipe crashes in the same direction, and 3 crashes that involved collisions with objects other than vehicles. The three crashes with objects other than other vehicles included two pedestrians, and the other involved a driver impaired by alcohol, striking a curb.



One of the pedestrians was struck in the center of the intersection, and this suspected serious injury crash occurred on April 14th, 2023. The other pedestrian incident resulted in a minor injury and occurred at the shared entrance for the Exxon/Subway and Taco Bell on Walbrook Drive. Further online news searches were unsuccessful in determining the sequence of events or the outcomes for the pedestrians who were struck.

The City of Knoxville's Vision Zero Action Plan includes the identification of a High Injury Network (HIN). According to the City, "This HIN identifies specific roads that bear a disproportionate amount of serious crashes. The HIN represents a small percentage of the overall roadway network in the City, but this small percentage account for a large portion of the life-

altering crashes. Roads on the HIN that ranked particularly high for severe crashes are shown as a Tier 1 priority.” Both Walbrook Drive and Walker Springs Road (within the City of Knoxville), near the development site, are identified in this network in Tier 1 and 2, as shown in the adjacent image. The City uses the HIN network to identify improvement strategies and safety countermeasures.



Overall, the crash data along Walker Springs

Road and Walbrook Drive does not readily indicate potential issues with additional vehicles generated to and from the planned residential apartments at the proposed entrances, with most crashes occurring at the traffic signal. However, by default, the additional trips generated by the development will slightly increase exposure and the potential for vehicle conflicts.

PROJECT DESCRIPTION

▪ LOCATION AND SITE PLAN:

The proposed plan layout, featuring 96 apartments, is designed by Will Robinson & Associates and is illustrated in Figure 3. As shown in the figure, two driveways will be constructed for the development: one on the eastern edge at Walker Springs Road and another on the southern edge at Walbrook Drive. The driveway entrances and internal aisleways will have a width of 26 feet. The East Proposed Entrance on Walker Springs Road will be 570 feet to the north of the signalized intersection of Walker Springs Road at Walbrook Drive (centerline to centerline), directly across from the existing National Fitness entrance. The East Proposed Entrance will also be approximately 245 feet north of the Exxon/Subway/Taco Bell rear entrance located on the same side of Walker Springs Road. The South Proposed Entrance will be 360 feet to the west of the signalized intersection and 60 feet to the west of the exit-only driveway at Taco Bell. The South Proposed Entrance will be located on Walbrook Drive, where the previous Walker Springs Studio Apartments had sole external road access.

The plan shown in Figure 3 depicts seven “3/4 split” buildings containing 96 apartment units. Six of the buildings will have 14 units each, while the seventh building will contain 12 units, including a common building area for residents. In addition to the main buildings, a small maintenance building is proposed along with a pavilion, dog park, playground, and a gazebo. A trash dumpster location will be provided for the residents on the northwest corner of the property. Retaining walls will also be constructed throughout the development to provide the necessary grade changes between the buildings and adjacent properties.

A total of 195 parking spaces are shown in the site plan. These will be provided along several internal parking lot aisleways and will include the appropriate number of ADA-accessible parking spaces. Concrete sidewalks are proposed internally for this development.

The completion schedule for this new residential development depends on economic factors and construction timelines. This project is also contingent on permitting, design, and other regulatory approvals. Overall, the local real estate market for new housing remains quite competitive due to population growth and other factors, and the developer is facing an expedited timeline for this particular project. This study assumed that the total construction build-out of the Thompson Landing Apartments and full occupancy would occur by 2027.



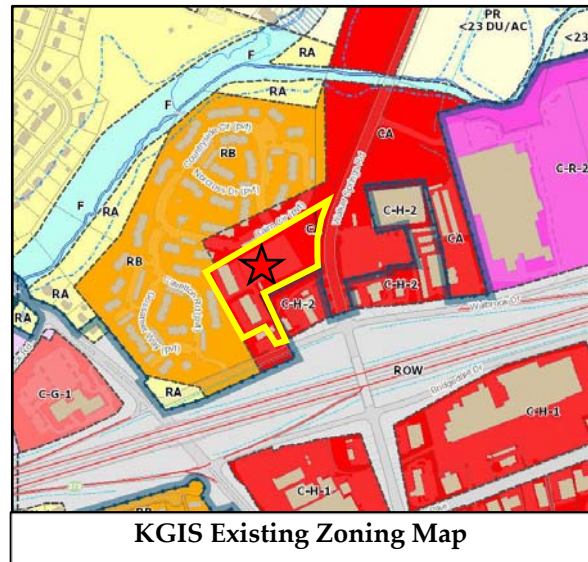
WILL ROBINSON
& ASSOCIATES

Figure 3
Proposed Plan Layout
Thompson Landing Apartments

Not to Scale –
Annotated by Ajax
Engineering for
Display Purposes

■ **PROPOSED USES AND ZONING REQUIREMENTS:**

The development will be located on the existing parcel that contained the previous Walker Springs Studio Apartments. Additionally, a triangle-shaped piece of property will be acquired from the adjacent property to the northeast, providing an extension of road frontage along the western side of Walker Springs Road. The existing parcel and the additional purchased triangle-shaped property comprising the Thompson Landing Apartments development property are located in Knox County, TN, just outside the City of Knoxville's limits. They are both zoned as General



Business (CA). This zoning is not being proposed to be changed for this development. Uses permitted in the General Business (CA) zone include houses, duplexes, churches, and numerous other uses. The most recently published online KGIS zoning map is provided in Appendix C and shown here. The existing adjacent surrounding zoning and land uses are the following:

- All the adjacent properties to the west, north, and east are in Knox County, TN. The city limits of Knoxville are located directly to the south, along Walbrook Drive, and include the commercial businesses on the north side of Walbrook Drive.
- The properties to the west and north are zoned as General Residential (RB) and consist entirely of The Hudson on the Greenway apartment complex. This apartment development has singular access to Walbrook Drive to the south, which only allows travel towards the west due to the one-way direction on Walbrook Drive.
- The development is bound by Walker Springs Road to the east. Across Walker Springs Road, the property is zoned as General Residential (RB) in Knox County and is occupied by a National Fitness center with a large parking lot. The fitness center has external road access via two entrances – one to the south at Walbrook Drive, east of the signalized intersection with Walker Springs Road, and the other to the west at Walker Springs Road. The National Fitness center entrance on Walker Springs Road will be located directly across from the East Proposed Entrance for the Thompson Landing Apartments.
- To the south, the development property is bound by parcels in both the City and County, in addition to Walbrook Drive. The proposed development property extends to the south along Walbrook Drive via a small strip, and the South Proposed Entrance

will be constructed on this land. Adjacent to this small strip on the west side, a tire repair shop is located on a parcel in Knox County, and it is also zoned as General Residential (RB). To the south-southeast, two parcels are in the City of Knoxville and are zoned in the Highway Commercial District (C-H-2). These two parcels are occupied by Exxon, Subway, and the Taco Bell restaurant. These businesses have direct access to Walbrook Drive via individual driveways, and all have access to three entrances at Walker Springs Road via an internal parking lot connection between the two businesses.

▪ **ON-SITE CIRCULATION:**

The driveway and parking lot aiseways for the apartments will be designed and constructed to Knox County, TN specifications. The internal drives and aiseways will be asphalt-paved and include concrete curbs. The lane widths will be 13 feet each, resulting in a total 26-foot pavement driveway and parking lot aisle width. Concrete sidewalks are being proposed internally along the parking lot aiseways and around the apartment unit buildings. The driveway entrances and aiseways will be private and will be maintained by the development in the future.

▪ **SERVICE AND DELIVERY VEHICLE ACCESS AND CIRCULATION:**

In addition to residential passenger vehicles, the internal roadways will provide service, delivery, maintenance, and access for fire protection/rescue vehicles. These vehicle types will not impact roadway operations except when they occasionally enter and exit the development.

A trash collection area is designed for the apartment residents in the development complex. A concrete pad will be provided in front of the trash collection area to provide heavy-duty pavement that resists damage from trash collection trucks.

The new private aiseways and proposed entrances will be designed and constructed to Knox County specifications and are expected to be adequate for fire protection and rescue vehicles, trash collection trucks, and single-unit delivery trucks. The development's internal drives will accommodate larger vehicle types and residents' standard passenger vehicles, and be sufficiently sized to allow vehicles to turn around within the development and enter or exit at either entrance.

ANALYSIS OF EXISTING AND PROJECTED CONDITIONS

▪ EXISTING TRAFFIC CONDITIONS:

This study conducted a 6-hour traffic count at the signalized intersection of Walker Springs Road at Walbrook Drive on Thursday, August 28th, 2025. Slightly further to the north, northbound and southbound volumes on Walker Springs Road at the East Proposed Entrance location were also counted during the signalized intersection's identified peak AM and PM hours (2 hours). Due to a change in the initial location of the East Proposed Entrance, a follow-up peak-hour-only traffic count was also conducted on Tuesday, September 30th, 2025, at the National Fitness entrance to tabulate its entering and exiting turning movements.

Manual traffic counts were conducted to identify and tabulate the morning and afternoon peak period volumes, as well as the travel directions, at and near the proposed development site. The signalized intersection had an observed morning peak hour from 7:45 to 8:45 am and an afternoon peak hour from 4:45 to 5:45 pm. The manual tabulated traffic counts at the intersection and at the East Proposed Entrance location can be reviewed in Figure 4 and Appendix D. The differences in volumes on Walker Springs Road at the count locations are due to numerous vehicles entering and exiting at the Exxon/Subway and Casey's/McDonald's entrances. The volumes shown on Walbrook Drive at the South Proposed Entrance location were derived from the traffic volumes exiting the signalized intersection towards the west. Some observations of the adjacent Walker Springs Road and Walbrook Drive corridors include the following:

- During the morning count, ten pedestrians and one bicyclist were observed crossing at the signalized intersection. During the afternoon count, eight pedestrians and three bicyclists were observed crossing at the signalized intersection. A few other pedestrians were also observed crossing Walker Springs Road just north of the signalized intersection between Casey's/McDonald's and Exxon/Subway.
- At the East Proposed Entrance location, on the western side of Walker Springs Road, two pedestrians and one bicyclist were observed on the sidewalk. However, overall, the majority of north-south non-motorized traffic on Walker Springs Road was observed on the east side sidewalk (as documented in the Strava data).
- The majority of observed vehicles during the traffic count were passenger cars. However, school buses, dump trucks, KAT buses, and several semi-tractor-trailer trucks were observed on Walker Springs Road and Walbrook Drive.

- The outside southbound shared thru/right lane on Walker Springs Road operates almost as a de facto right-turn lane due to the high volumes of right turns towards the west onto Walbrook Drive. Due to the high volumes of right turns and the fact that a single thru vehicle in this shared lane can block numerous right turns during right-on-red opportunities, very long vehicle queues were observed in this lane. Occasionally, a few vehicles used the Exxon/Subway property as a shortcut to avoid the long queues. This outside lane experiences the longest queues of southbound vehicles. During the morning peak hour, the vehicle queues in this lane reached a length of over 400 feet on several occasions. The afternoon peak was not as severe, with only a few occurrences of this vehicle queue extending this distance.
- A few vehicles were observed traveling southbound on Walker Springs Road in the center TWLTL for considerable distances to turn left into the Casey's/McDonald's. The majority of these were vehicles exiting the National Fitness center and not making the effort to enter the thru southbound lanes on Walker Springs Road before entering the center turn lane. Motorists exiting the National Fitness were also occasionally observed using the center TWLTL as a temporary refuge to complete their turns towards the south.
- Incredibly and inexplicably, one motorist was observed driving eastbound the wrong way on Walbrook Drive through the signalized intersection along the road's southern edge. This illegal movement occurred at 7:38 am, and it is unknown where and how this dangerous maneuver started and ended.
- The proper use of the westbound approach lanes of Walbrook Drive at the signalized intersection was regularly observed to be misused. The westbound approach of Walbrook Drive has three lanes at the traffic signal – a shared left/thru lane, a thru lane only, and a right-turn-only lane.



During the traffic counts, the exclusive westbound right-turn-only lane on Walbrook Drive at the signal, in the afternoon, was observed with motorists going thru the intersection, particularly at the beginning of the traffic signal's green indication, instead

of turning right as assigned. Due to the traffic camera location, it is unclear whether this was a result of impatience to jump to the front and avoid the westbound vehicle queues, or as a means to utilize the generous 9-foot-wide outside shoulder on the north side of Walbrook Drive to enter the Exxon/Subway, or Taco Bell.

More dangerously, the westbound thru lane on Walbrook Drive at the signal was often used to turn left (southbound) onto Walker Springs Road, even though it is a thru lane only. This illegal maneuver was observed 18 times during the traffic counts, with a couple of near-miss crashes involving other vehicles properly going thru instead of turning left in the shared left/thru lane. The southern downstream

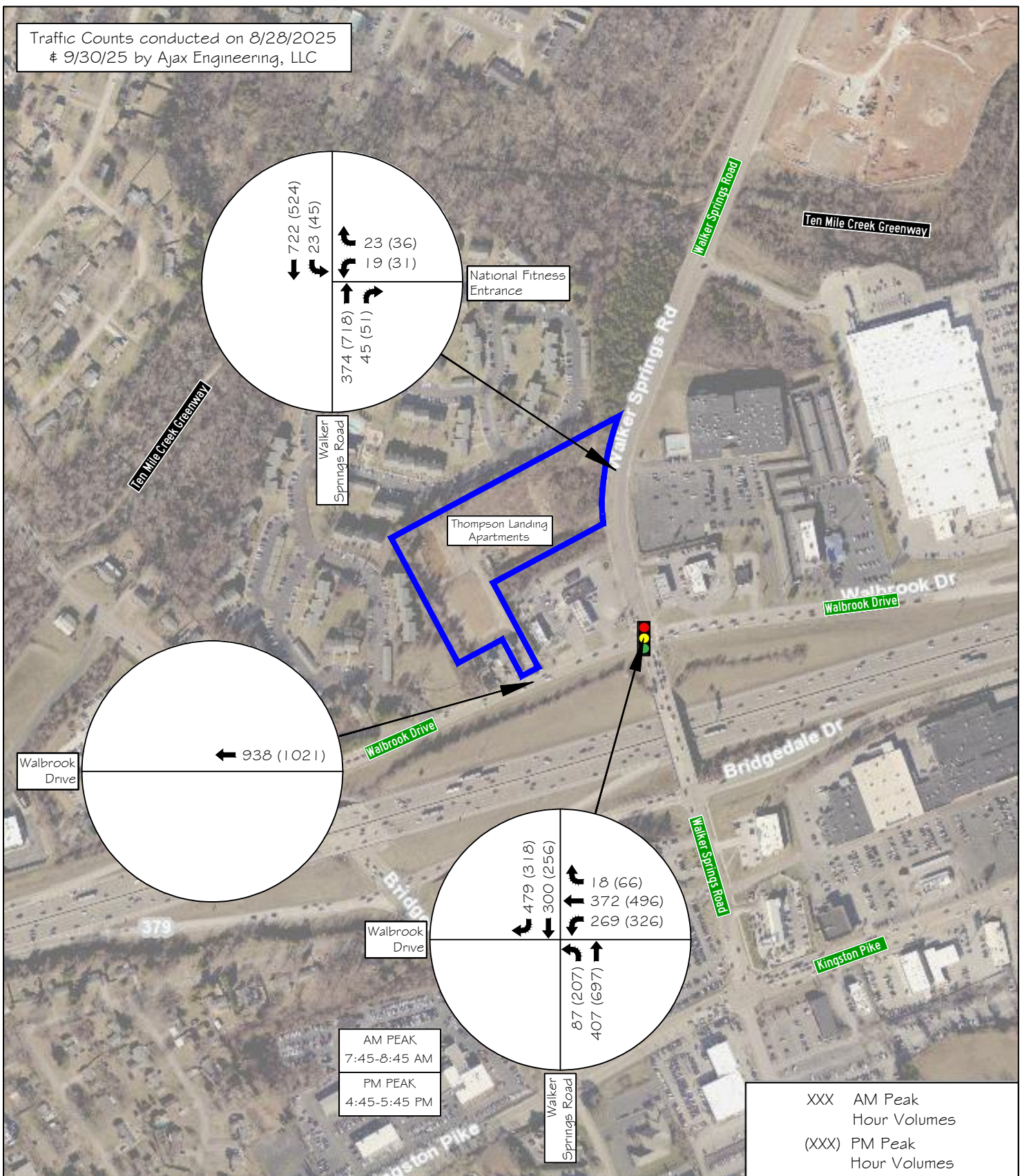


section of Walker Springs Road from the traffic signal has two receiving lanes, which may explain and possibly contribute to mistaken assumptions by motorists. Otherwise, these maneuvers could be an intentional lane violation to avoid the sometimes lengthy left-turn queues in the shared left/thru lane.

Furthermore, four of the seven side-swap crashes in the same direction that have occurred over the past three years, which were previously documented and discussed, were geo-located approximately where these illegal turns were observed; however, this association with possible improper lane use is not officially confirmable without reviewing the individual traffic crash reports.

- During the follow-up peak-hour-only traffic count conducted at the National Fitness entrance, all northbound right-turning vehicles entering from Walker Springs Road were observed turning extremely slowly, causing brief backups behind them. These slow turns are due to a relatively steep downhill grade on Walker Springs Road, a nonexistent provided turning radius, and the narrow width of the entrance. In addition, larger boulders have been placed near this entrance radius to dissuade vehicles from encroaching outside the pavement when turning.

Traffic Counts conducted on 8/28/2025
 & 9/30/25 by Ajax Engineering, LLC



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NOT TO SCALE



FIGURE 4

Thompson Landing Apartments

2025 Peak Hour Traffic Volumes -
 EXISTING TRAFFIC CONDITIONS

Capacity analyses were conducted to determine the Level of Service (LOS) for the existing 2025 intersection traffic volumes, as shown in Figure 4, at the signalized intersection of Walker Springs Road and Walbrook Drive and at the unsignalized t-intersection of Walker Springs Road at the National Fitness entrance. The capacity analyses were calculated following the Highway Capacity Manual (HCM) methods and utilizing Synchro (Version 12) traffic software.

Methodology:

LOS is a qualitative measurement developed by the transportation profession to express how well an intersection or roadway performs based on a driver's perception. LOS designations include LOS A through LOS F. The designation of LOS A signifies a roadway or intersection operating at best, while LOS F signifies road operations at worst. This grading system provides a reliable, straightforward means to communicate road operations to the public. The HCM lists the level of service criteria for unsignalized intersections and signalized intersections.



LOS is defined by delay per vehicle (seconds), and roadway facilities are also characterized by the volume-to-capacity ratio (v/c). LOS designations, which are based on delay, are reported differently for unsignalized and signalized intersections. For example, a delay of 20 seconds at an unsignalized intersection would indicate LOS C, representing the additional delay a motorist would experience traveling through the intersection. Also, for example, a v/c ratio of 0.75 for an approach at an unsignalized intersection would indicate that it is operating at 75% of its available capacity. This difference is primarily due to the motorists' different expectations between the two road facilities. Generally, for most instances, the LOS D / LOS E boundary is considered the upper limit of acceptable delay during peak periods in urban and suburban areas.

For unsignalized intersections, LOS is measured in terms of delay (in seconds). This measure attempts to quantify delay, including travel time, driver discomfort, and fuel consumption. For unsignalized intersections, the analysis assumes that the mainline thru and right-turn traffic does not stop and is not affected by the traffic on the minor side

streets. Thus, the LOS for a two-way stop (or yield) controlled intersection is defined by the delay for each minor approach and the left-turn movements on the major street. Table 2 lists the level of service criteria for unsignalized intersections. The analysis results of unsignalized intersections using the HCM methodologies are conservative due to the more significant vehicle gap parameters used. More often, in normal road conditions, drivers are more willing to accept smaller gaps in traffic than what is modeled using the HCM methodology. The unsignalized intersection methodology also does not account for more significant gaps sometimes produced by nearby upstream and downstream signalized intersections. For unsignalized intersections, in most instances, the upper limit of acceptable delay during peak hours is the LOS D/E boundary at 35 seconds.

For signalized intersections, LOS is based on delay (in seconds) for various movements within the intersection and the overall operation of all the traffic entering the intersection. This delay measures driver discomfort, frustration, fuel consumption, and lost travel time and depends on traffic signal cycle lengths, lengths of green phases, and the quality of traffic progression. This control delay includes deceleration/acceleration delay, queue move-up time, and stopped delay time. For signalized intersections, in most instances, the upper limit of acceptable delay during peak hours is the LOS D/E boundary at 55 seconds. Table 3 lists the level of service criteria for signalized intersections.

TABLE 2
LEVEL OF SERVICE AND DELAY FOR UNSIGNALIZED INTERSECTIONS



LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (seconds/vehicle)
A	Little or no delay	0 - 10
B	Short Traffic Delays	>10 - 15
C	Average Traffic Delays	>15 - 25
D	Long Traffic Delays	>25 - 35
E	Very Long Traffic Delays	>35 - 50
F	Extreme Traffic Delays	>50

Source: Highway Capacity Manual, 7th Edition

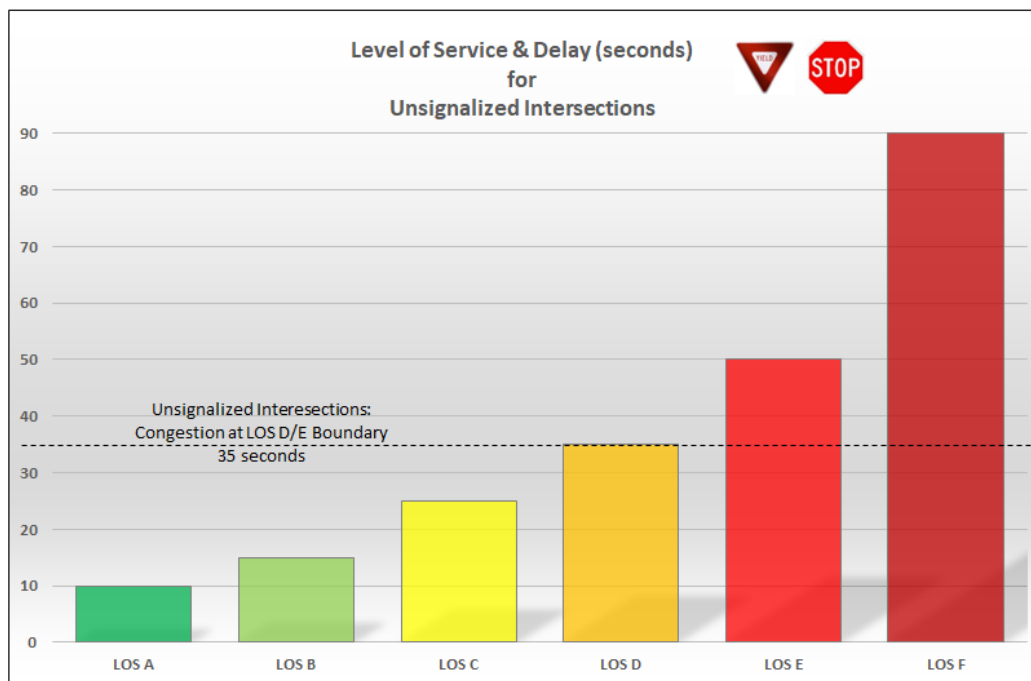
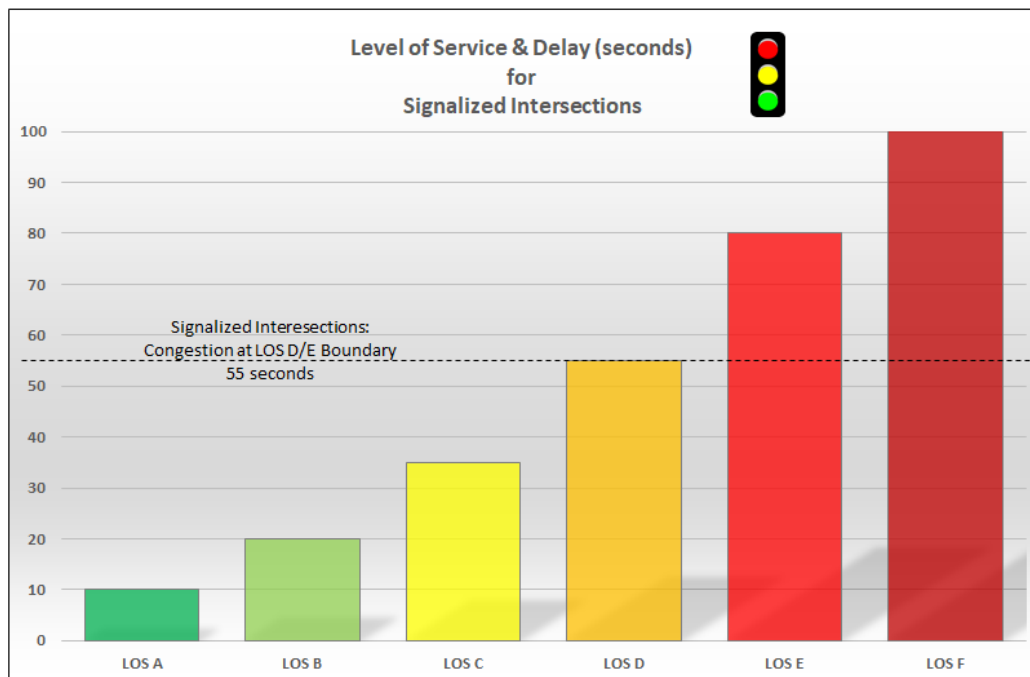


TABLE 3
LEVEL OF SERVICE AND DELAY FOR SIGNALIZED INTERSECTIONS



LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (seconds/vehicle)
A	Operation with very low control delay. Progression is extremely favorable and most vehicles do not stop at all.	≤ 10.0
B	Generally good level of progression. More vehicles stop than with LOS A, causing higher levels of average delay.	$> 10 - 20$
C	Higher delays with individual cycle failures may begin at this level. Many vehicles may still pass through without stopping.	$> 20 - 35$
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Many vehicles stop.	$> 35 - 55$
E	Considered the limit of acceptable delay. High delays indicated by poor progression, long cycle lengths, and high v/c ratios.	$> 55 - 80$
F	Unacceptable delay occurs. Progression is extremely poor with long cycle lengths and high v/c ratios.	> 80



Source: Highway Capacity Manual, 7th Edition



The intersection capacity results for the existing 2025 peak hour traffic are shown in Table 4. The intersections in the table are shown with a LOS (Level of Service) designation, delay (in seconds), and v/c ratio (volume-to-capacity ratio) for the AM and PM peak hours. Appendix E includes the worksheets for the existing 2025 peak hour capacity analyses.

As shown in Table 4, the intersections of Walker Springs Road at Walbrook Drive and at the National Fitness entrance are calculated to operate with very good to average LOS and low to moderate vehicle delays during the existing peak hour conditions.

TABLE 4
INTERSECTION CAPACITY ANALYSIS RESULTS -
2025 EXISTING TRAFFIC CONDITIONS

INTERSECTION	TRAFFIC CONTROL	APPROACH/ MOVEMENT	AM PEAK			PM PEAK		
			LOS ^a	DELAY ^b (seconds)	Max v/c ^c	LOS ^a	DELAY ^b (seconds)	Max v/c ^c
Walker Springs Road (SB & NB) at Walbrook Drive (WB)	 Signalized	Westbound	C	29.7		C	33.3	
		Northbound	A	8.7		B	17.4	
		Southbound	A	9.0		B	12.2	
		Summary	B	16.0	0.72	C	22.1	0.83
Walker Springs Road (SB & NB) at National Fitness Entrance (WB)	 Unsignalized	Westbound Left/Right	B	10.9	0.090	B	13.5	0.158
		Southbound Left	A	8.3	0.022	A	10.0	0.064

Note: All analyses were calculated in Synchro 12 software and reported with HCM 7th Edition methodology

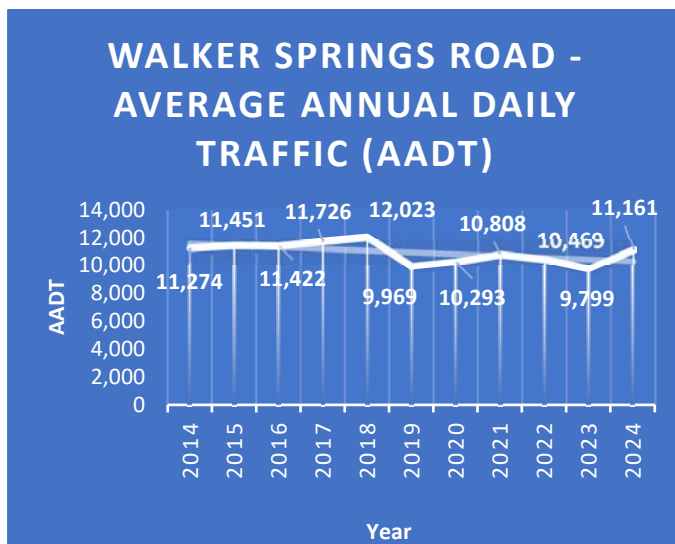
^a Level of Service , ^b Average Delay (sec/vehicle) , ^c Volume-to-Capacity Ratio

The signal timing used to analyze the signalized intersection was obtained from the City of Knoxville and is included in Appendix E. The traffic signal operates independently, without coordination with other surrounding traffic signals. The basic timings were used as given in the analysis.

▪ **PROJECTED TRAFFIC CONDITIONS WITHOUT THE PROJECT:**

Horizon year traffic conditions represent the projected traffic volumes in the study area without the proposed project being developed (no-build option). This proposed development's build-out and full occupancy are assumed to occur by 2027.

According to the nearby TDOT count stations, vehicular traffic has experienced slightly negative growth over the past few years. Specifically, the TDOT data shown in Appendix A indicate that Walker Springs Road, to the south of the development site, has experienced a negative annual growth rate of -0.1% over the past decade, from 2014 to 2024. Walbrook Drive, east of the development site, has experienced a negative growth rate of -1.6% from 2018 to 2024.



In addition to the normal growth in general traffic volume in the area, a new, substantial, but unrelated residential development is under construction and nearing completion. This development, The Rowan, is situated north of the proposed Thompson Landing Apartments development on the east side of Walker Springs Road and will feature two entrances, one leading to Walker Springs Road to the west and the other to N Gallaher View Road to the east. This development will include a total of 320 housing units, and a portion of its residents will travel through the studied intersections on Walker Springs Road and Walbrook Drive, which are included in this study. A Transportation Impact Study (TIS) was performed in 2022 by Ajax Engineering, LLC, for The Rowan development. The results of this study indicated that, at its full build-out, a total of 9 vehicles will enter and travel northbound on Walker Springs Road during the morning peak hour, and 31 vehicles during the afternoon peak hour. Likewise, the study projected that a total of 31 vehicles will exit by traveling southbound on Walker Springs Road during the AM peak hour, and 25 vehicles during the PM peak hour. This data from the other study is included in Appendix F.

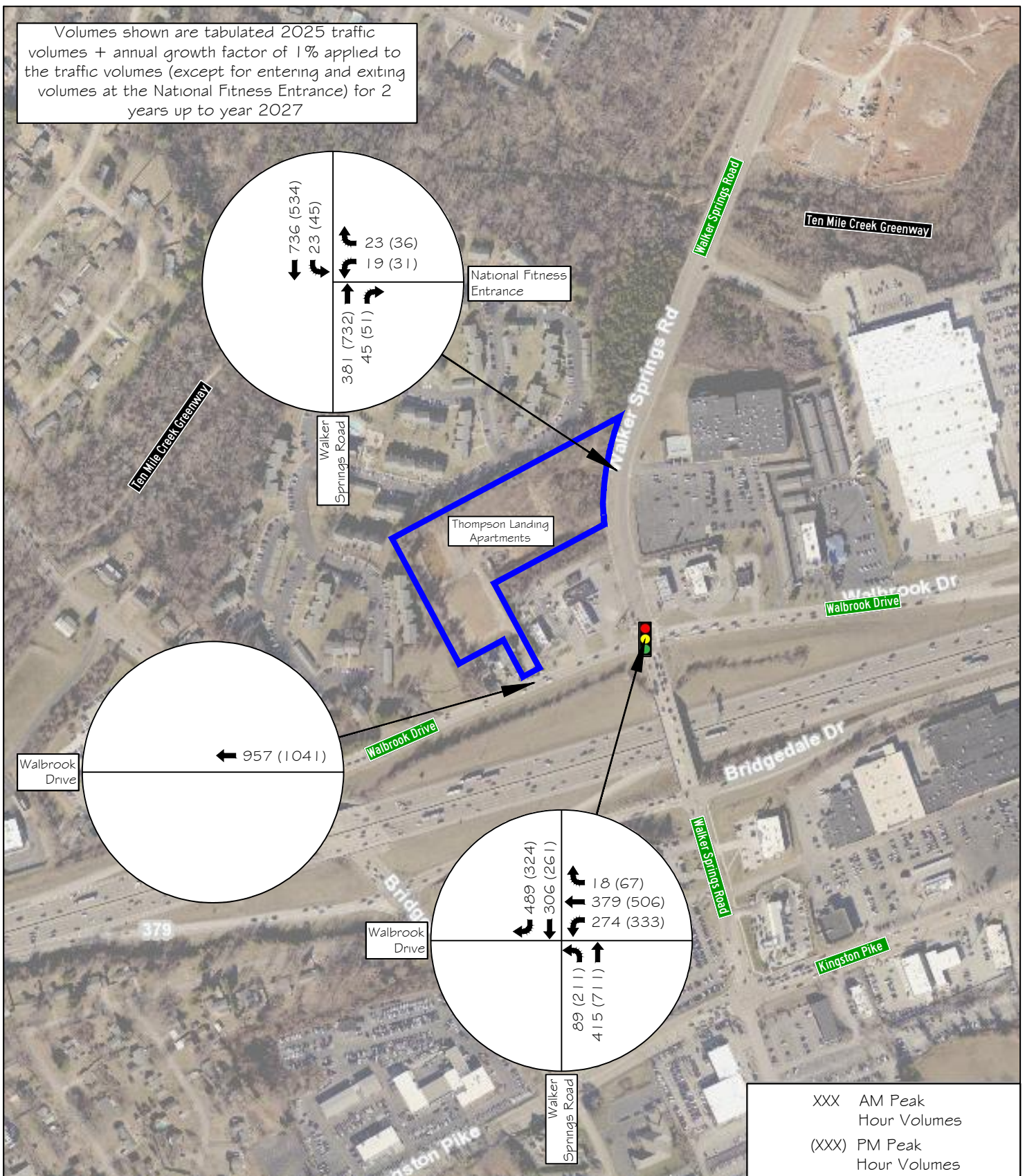
Besides this other, unrelated residential development, the analysis for the Thompson Landing Apartments used an annual growth rate of +1% to calculate non-related general future growth on

Walker Springs Road and Walbrook Drive up to 2027. The annual growth rate of 1% was applied to the existing 2025 volumes tabulated for this study to estimate future volumes in the horizon year of 2027, excluding the proposed development traffic from Thompson Landing Apartments or The Rowan, and is slightly higher than the actual documented growth over the past few years, which has been negative.

Figure 5 shows the projected horizon year traffic volumes on Walker Springs Road at Walbrook Drive and at the proposed entrance locations on Walker Springs Road and Walbrook Drive during the 2027 AM and PM peak hours without the proposed additional residential developments.

Although current construction traffic related to The Rowan's development was tabulated in the collected traffic counts and theoretically should be removed from the analysis data or subtracted from the collected volumes, these vehicles were not identified, and their volumes were retained in the data, resulting in a more conservative analysis.

Volumes shown are tabulated 2025 traffic volumes + annual growth factor of 1% applied to the traffic volumes (except for entering and exiting volumes at the National Fitness Entrance) for 2 years up to year 2027



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NOT TO SCALE



FIGURE 5



Thompson Landing Apartments

2027 Peak Hour Traffic Volumes -
PROJECTED TRAFFIC CONDITIONS
WITHOUT THE PROJECT

Capacity analyses were conducted to determine the projected LOS in 2027, without any of the new proposed development trips (or The Rowan trips), at the studied intersections. The results are presented in Table 5, and Appendix E includes the capacity analysis worksheets generated by the software.

The results in Table 5 indicate only slightly worse vehicle delays at the intersections in the 2027 projected conditions compared to the existing 2025 conditions. This result is due to the small increase in traffic volumes resulting from the assumed general background growth of 1% over a two-year period.

TABLE 5
INTERSECTION CAPACITY ANALYSIS RESULTS -
2027 PROJECTED TRAFFIC CONDITIONS WITHOUT THE PROJECT

INTERSECTION	TRAFFIC CONTROL	APPROACH/ MOVEMENT	AM PEAK			PM PEAK		
			LOS ^a	DELAY ^b (seconds)	Max v/c ^c	LOS ^a	DELAY ^b (seconds)	Max v/c ^c
Walker Springs Road (SB & NB) at Walbrook Drive (WB)	 Signalized	Westbound	C	29.8		C	34.0	
		Northbound	A	9.0		B	18.2	
		Southbound	A	9.5		B	12.6	
		Summary	B	16.3	0.73	C	22.8	0.85
Walker Springs Road (SB & NB) at National Fitness Entrance (WB)	 Unsignalized	Westbound Left/Right	B	11.0	0.091	B	13.6	0.160
		Southbound Left	A	8.3	0.022	A	10.0	0.065

Note: All analyses were calculated in Synchro 12 software and reported with HCM 7th Edition methodology

^a Level of Service, ^b Average Delay (sec/vehicle), ^c Volume-to-Capacity Ratio

▪ **TRIP GENERATION:**

A generated trip is a single or one-direction vehicle movement entering or exiting the study site. The estimated traffic generated by the 96 apartments in the Thompson Landing Apartments was based on the equations provided by Knoxville/Knox County Planning. These equations from Knoxville/Knox County Planning were developed based on an extensive local study in the surrounding area to estimate multi-family housing units, including duplexes, townhouses, and apartment trip generation. For Knox County, this is the preferred rate to use for multi-family residential units. This local rate is slightly higher than the trip rates for similar land uses in the widely used ITE Trip Generation Manual.

The data and calculations from the local trip generation study for the proposed land use are shown in Appendix G. A summary of this information is presented in Table 6:

TABLE 6
TRIP GENERATION FOR THOMPSON LANDING APARTMENTS
96 Apartments

ITE LAND USE CODE	LAND USE DESCRIPTION	# OF UNITS	GENERATED DAILY TRAFFIC	GENERATED TRAFFIC AM PEAK HOUR			GENERATED TRAFFIC PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
Local Trip Rate	Apartments	96	920	22%	78%		55%	45%	
				11	40	51	41	33	74
Total New Volume Site Trips			920	11	40	51	41	33	74

Data from Local Trip Rates

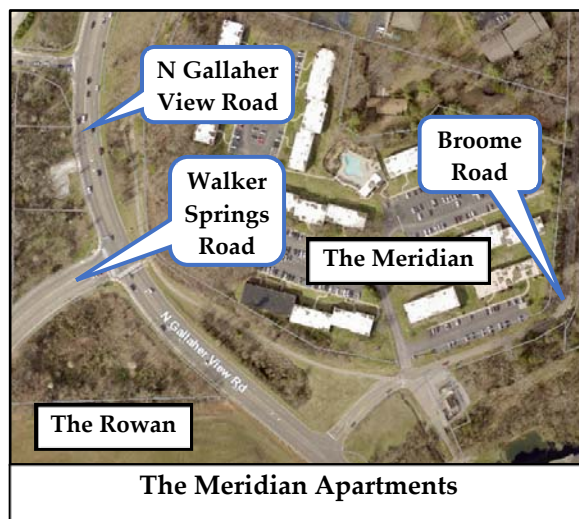
Trips calculated by using Fitted Curve Equations

For the proposed Thompson Landing Apartments development with a total of 96 apartment units, it is estimated that 11 vehicles will enter and 40 will exit, resulting in a total of 51 generated trips during the AM peak hour in 2027. Similarly, it is estimated that 41 vehicles will enter and 33 will exit, resulting in a total of 74 generated trips during the PM peak hour in 2027. The calculated trips generated for an average weekday are estimated to be 920 vehicles for the proposed development. No vehicle trip reductions were included in the calculations or analysis. All these estimated vehicle trips will enter and exit at either the East Proposed Entrance on Walker Springs Road or the South Proposed Entrance on Walbrook Drive.

▪ **TRIP DISTRIBUTION AND ASSIGNMENT:**

The projected trip distribution and assignment for the Thompson Landing Apartments development are based on several sources and engineering judgment. The first source is based on the existing traffic count volumes and the observed travel directions collected on Walker Springs Road and Walbrook Drive. Overall, the volumes on Walker Springs Road were observed with the majority traveling south during the morning AM peak hour and the opposite direction in the evening.

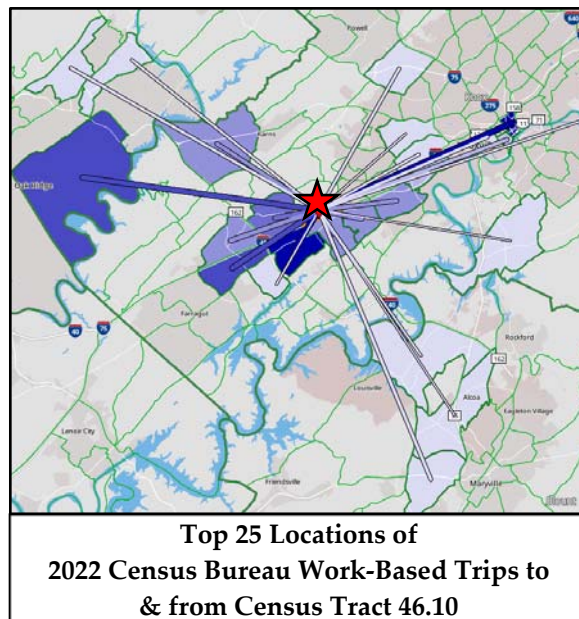
The previous TIS produced for The Rowan development conducted an auxiliary traffic count to document the travel directions for an existing, nearby apartment complex. This apartment complex, The Meridian, is located to the northeast off Broome Road near the intersection with N Gallaher View Road. This apartment complex has only one entrance and comprises 217 apartments. Overall, it was determined that the residents in the nearby The Meridian apartments traveled in roughly the following percentages in the AM and PM peak hours:



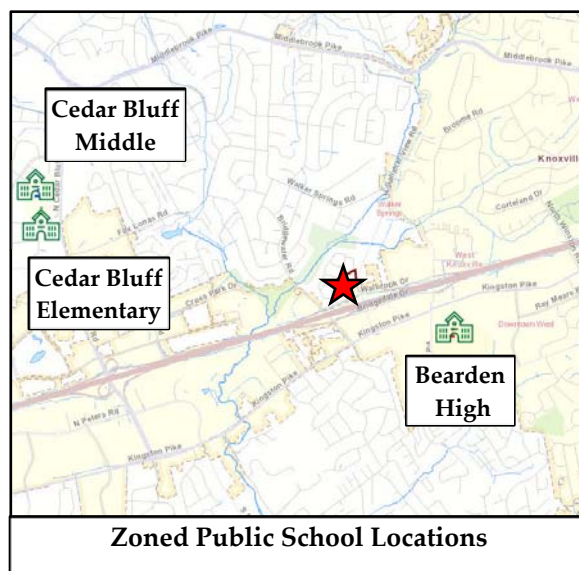
- To and from Broome Road, 10%
- To and from the southern side of N Gallaher View Road, 40%
- To and from Walker Springs Road, 25%
- To and from the northern side of N Gallaher View Road, 25%

The exact percentages of travel from this auxiliary count, as previously reported by The Rowan TIS, are shown in Appendix F. The travel to and from Broome Road was assumed to be an alternative route that The Meridian residents use to access Middlebrook Pike and Kingston Pike (including West Town Mall) to the east through West Hills Subdivision. This data suggests that the vast majority of apartment residents in the area traveled to and from the south on Walker Springs Road and N Gallaher View Road, with nearby access to Interstate 40/75 and Kingston Pike.

Another source for determining the projected trip distribution is based on work-related trips in the local area. Work-based trips will be a significant impetus for trips generated by the development, and these trips are more likely to travel to and from the east, west, and south. This assertion is based on data from the United States Bureau website for Census Tract 46.10, where the proposed development property is located. Based on 2022 (latest available) census data and as presented in Appendix H, most work-based trips in the surrounding area correspond to the surrounding areas of West Knoxville, Oak Ridge, downtown Knoxville, and the University of Tennessee. Some of the work-based trips also correspond to the Forks of the River Industrial Park and the Alcoa and Maryville, TN, areas. This data suggests a fairly strong preference among future apartment residents for traveling to and from the south on Walker Springs Road and Walbrook Drive for work-related purposes.



In addition to employment centers, some generated traffic will travel to and from public and private schools. Schools will be another incentive for taking external trips. The development property is currently zoned for Cedar Bluff Elementary and Middle School and Bearden High School. These zoned public schools for the development property are located relatively near the development site. The Cedar Bluff schools are both approximately 2.7 miles from the proposed development site by roadway. The shortest route to these schools will be via



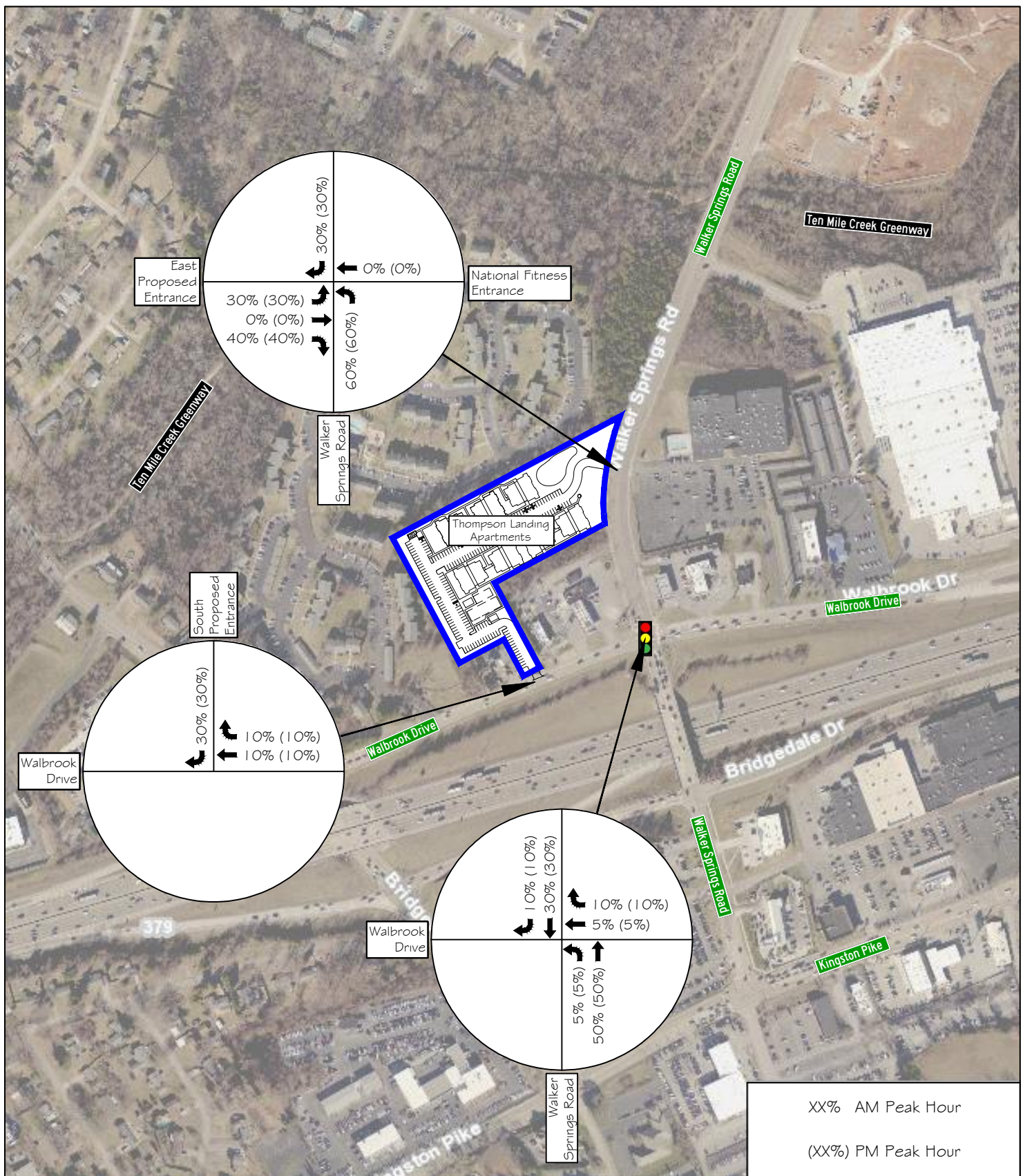
Walbrook Drive, then to Cross Park Drive, and finally to N Cedar Bluff Road, with a nearly identical route on the return. Bearden High School is located just 1 mile away, and the shortest route to this school is via southbound Walker Springs Road, then to Kingston Pike, and finally to S Gallaher View Road. The route back home from Bearden High School could be the reverse or via N Gallaher View Road to Walbrook Drive for travel westward back to the apartments.

The Knox County Schools Transportation Department has developed Parental Responsibility Zones (PRZs) to determine whether students are eligible for transportation services to and from school. The PRZ is defined as being 1.5 miles for grades 6–12 and 1.0 miles for grades K–5, from where the students' parcel is accessed to the point where the buses unload at the school. The proposed apartments will be located outside the PRZ for all Cedar Bluff public schools, but within the PRZ for Bearden High School. All elementary and middle school-age children attending the Cedar Bluff schools in the development will be able to utilize the school bus service if desired. However, high school-age students will be required to provide their own transportation to and from school.

Based on all these factors, Figure 6 shows the projected distribution of traffic entering and exiting the residential development at the proposed entrances and at the adjacent signalized intersection of Walker Springs Road at Walbrook Drive. The percentages shown in the figure pertain only to the trips generated by the proposed apartments, calculated from the local trip rates. Ultimately, the projected trip distribution was heavily based on the observed residential traffic that was recorded at the nearby The Meridian apartments, as documented in the previous TIS for The Rowan development. At the signalized intersection, the travel split assumptions were based on the observed splits.

Figure 7a shows the traffic assignment of the computed trips generated by the Thompson Landing Apartments with 96 apartment units based on the assumed distribution of trips shown in Figure 6.

Figure 7b shows the trips that were calculated for the non-related, but nearby residential development, The Rowan, as discussed and documented in a TIS by Ajax Engineering, LLC. This other residential development is assumed to be fully built and occupied prior to 2027, most likely before the end of 2025.



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 Knoxville, TN 37932
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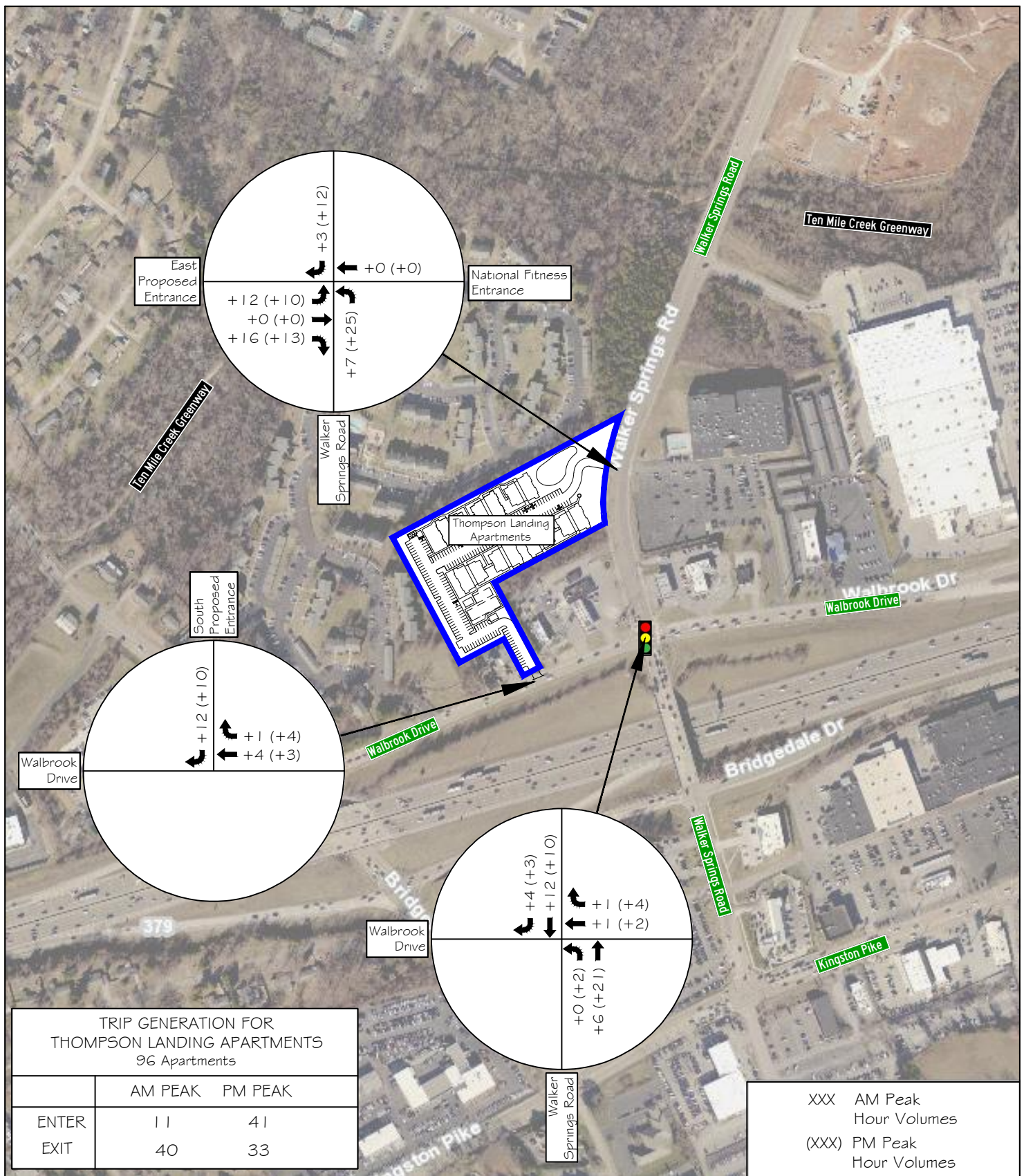
NOT TO SCALE



FIGURE 6

Thompson Landing Apartments

Directional Distribution of Generated Traffic during AM and PM Peak Hours



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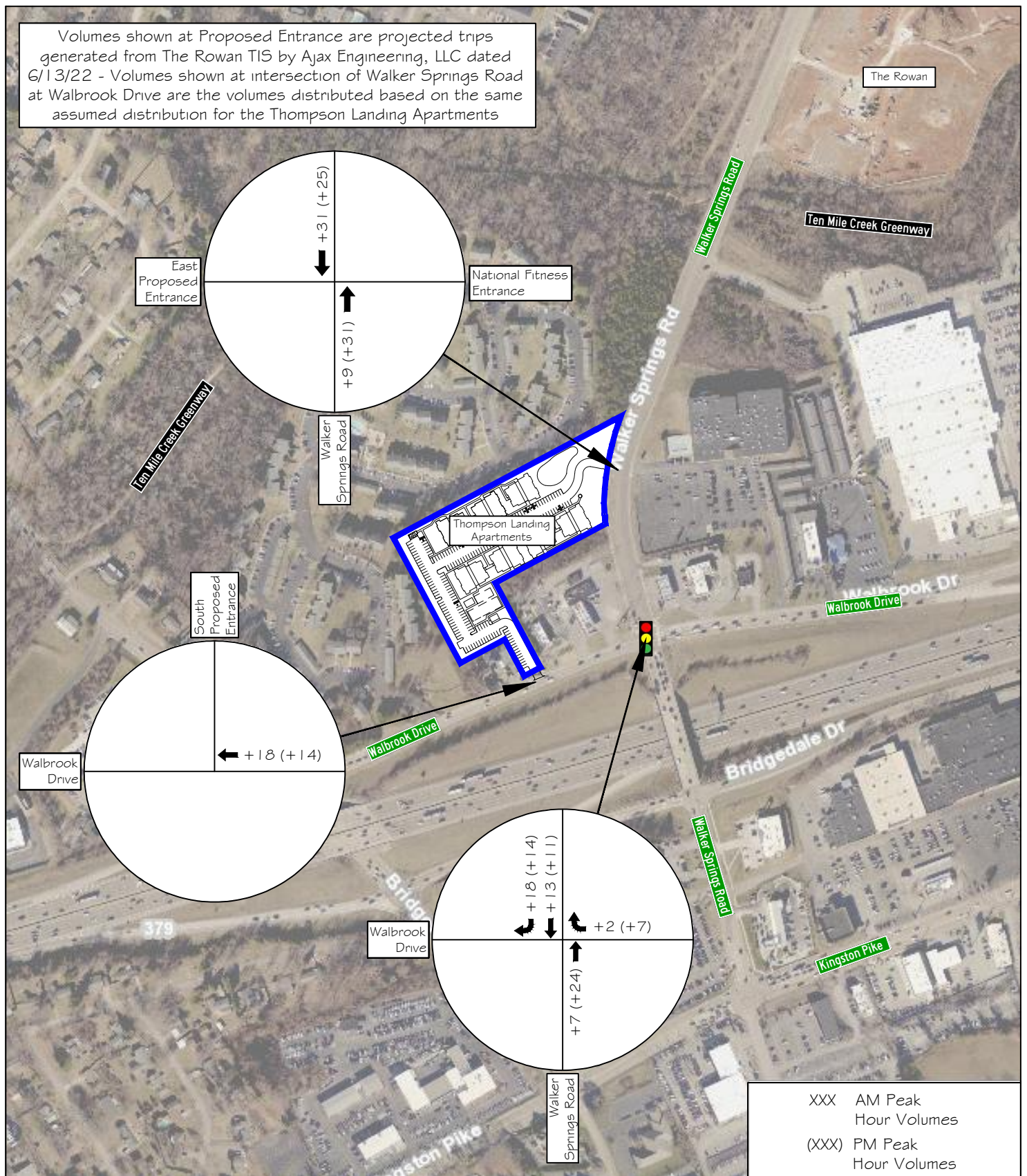


FIGURE 7a

Thompson Landing Apartments

Traffic Assignment of Generated Trips
 during AM and PM Peak Hours

Volumes shown at Proposed Entrance are projected trips generated from The Rowan TIS by Ajax Engineering, LLC dated 6/13/22 - Volumes shown at intersection of Walker Springs Road at Walbrook Drive are the volumes distributed based on the same assumed distribution for the Thompson Landing Apartments



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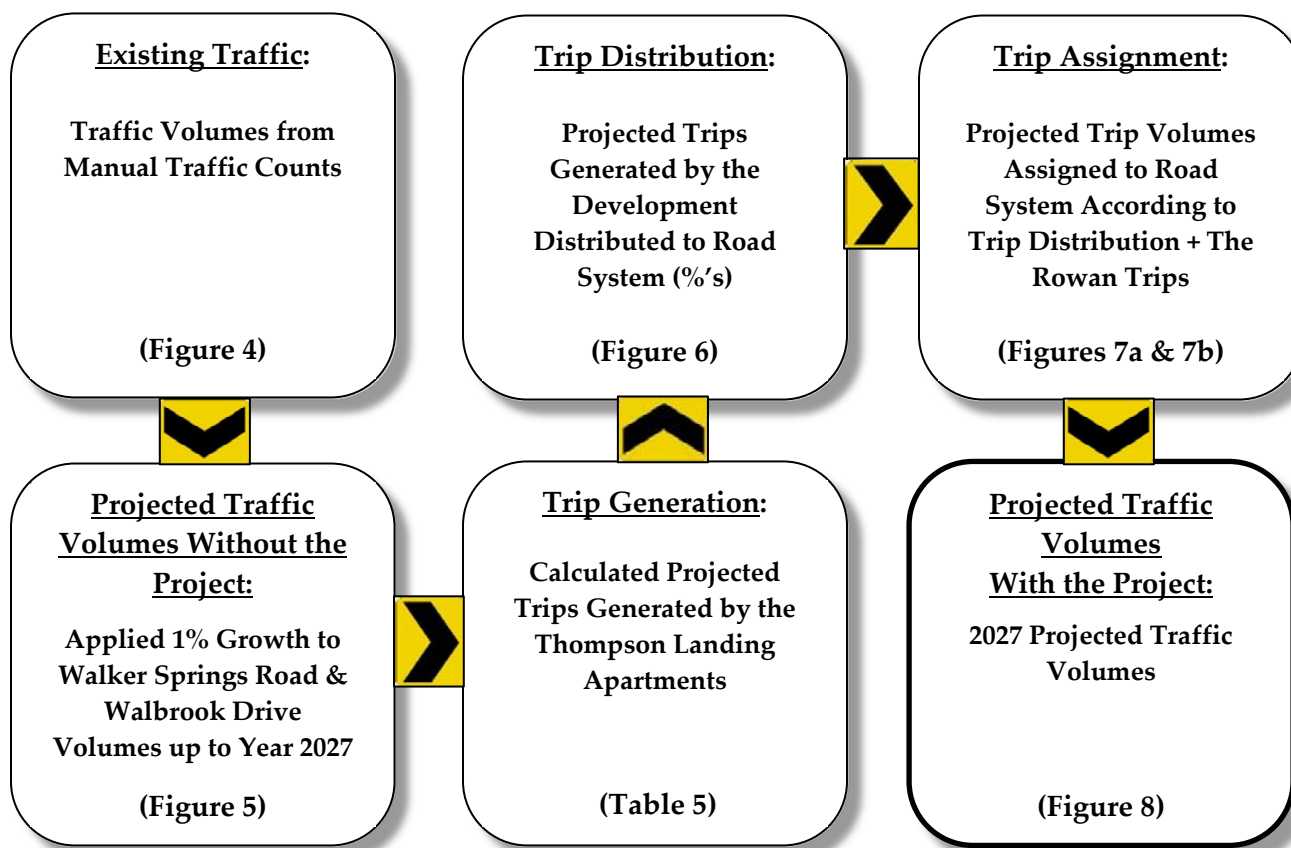
FIGURE 7b

Thompson Landing Apartments

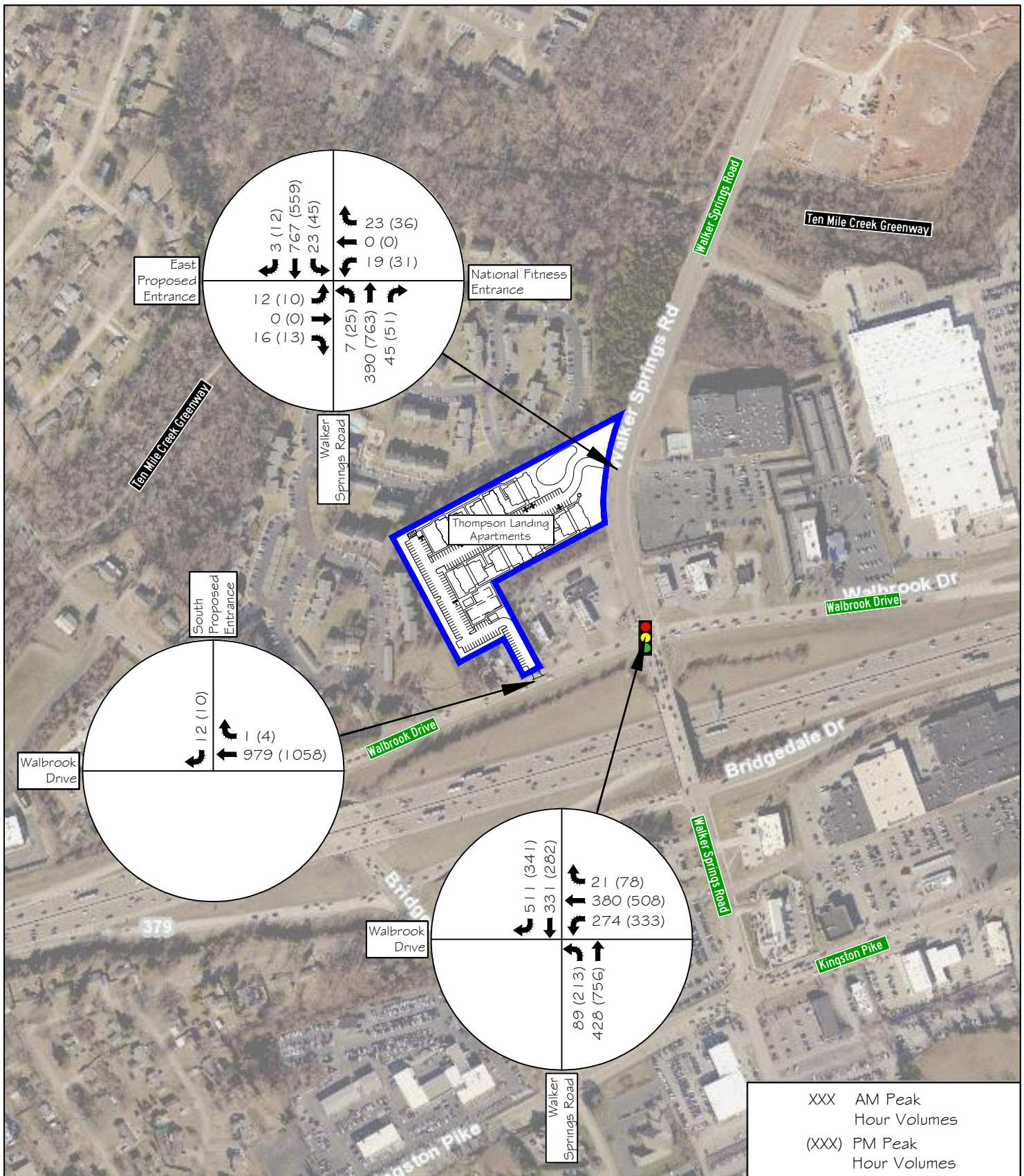
Traffic Assignment of Generated Trips
during AM and PM Peak Hours from
The Rowan

▪ **PROJECTED TRAFFIC CONDITIONS WITH THE PROJECT:**

Several additive steps were taken to estimate the total projected traffic volumes at the intersection of Walker Springs Road and Walbrook Drive, as well as at the proposed entrances, when the Thompson Landing Apartments (and The Rowan) are constructed and fully occupied in 2027. The steps are illustrated below for clarity and review:



The calculated peak hour traffic generated by the Thompson Landing Apartments development was added to the 2027 horizon year traffic by following the predicted trip distributions and assignments, and included the trips generated by The Rowan development. This procedure was completed to obtain the total projected traffic volumes at the intersection of Walker Springs Road at Walbrook Drive and at the proposed entrances in 2027. Figure 8 shows the projected volumes at these intersections in 2027.



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FIGURE 8

Thompson Landing Apartments

2027 Peak Hour Traffic Volumes -
PROJECTED TRAFFIC CONDITIONS
WITH THE PROJECT

The intersection capacity results from the projected 2027 peak hour traffic with the new apartment development (and The Rowan) are shown in Table 7. The results in the table show that the studied intersections are projected to operate with average to good LOS and low to average vehicle delays in the 2027 AM and PM peak hours. Appendix E includes the capacity analysis worksheets from the software. Based on these results, it is determined that the turning movements from the existing National Fitness entrance will be only moderately affected by the addition of the Thompson Landing Apartments entrance on Walker Springs Road.

TABLE 7
INTERSECTION CAPACITY ANALYSIS RESULTS -
2027 PROJECTED TRAFFIC CONDITIONS WITH THE PROJECT

INTERSECTION	TRAFFIC CONTROL	APPROACH/ MOVEMENT	AM PEAK			PM PEAK		
			LOS ^a	DELAY ^b (seconds)	Max v/c ^c	LOS ^a	DELAY ^b (seconds)	Max v/c ^c
Walker Springs Road (SB & NB) at Walbrook Drive (WB)	 Signalized	Westbound	C	30.8		D	35.6	
		Northbound	A	9.1		B	19.6	
		Southbound	B	10.3		B	13.0	
		Summary	B	16.8	0.73	C	23.8	0.86
Walker Springs Road (SB & NB) at National Fitness Entrance (WB) & East Proposed Entrance (EB)	 Unsignalized	Northbound Left	A	9.5	0.010	A	8.8	0.029
		Eastbound Left/Thru/Right	C	19.0	0.108	C	18.4	0.087
		Westbound Left/Thru/Right	B	13.5	0.124	C	22.6	0.281
		Southbound Left	A	8.3	0.023	B	10.2	0.067
Walbrook Drive (WB) at South Proposed Entrance (SB)	 Unsignalized	Southbound Right	B	12.4	0.027	B	12.8	0.024

Note: All analyses were calculated in Synchro 12 software and reported with HCM 7th Edition methodology

^a Level of Service, ^b Average Delay (sec/vehicle), ^c Volume-to-Capacity Ratio

▪ **POTENTIAL TRANSPORTATION SAFETY ISSUES:**

The study area was investigated for potential existing and future safety issues when the development is constructed. These transportation features are discussed in the following pages.

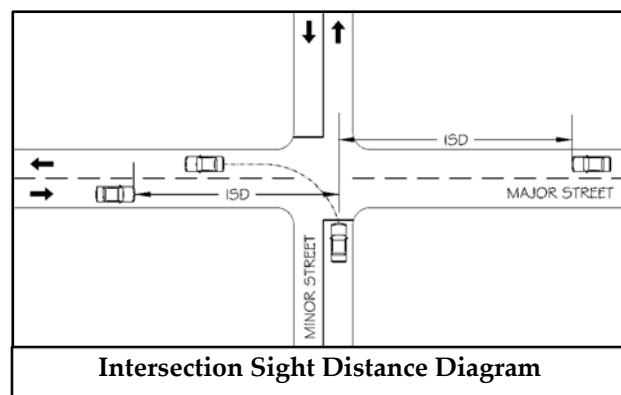
○ **EVALUATION OF SIGHT DISTANCE**

For intersections, sight distance evaluations are categorized into two types: Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD).

Methodology:

SSD is the distance required for a motorist on a major street to perceive, react, and the vehicle to come to a complete stop before colliding with an object on the road. For evaluating intersections, this object would be another vehicle entering the intersection from a minor street. SSD can be considered the minimum visibility distance standard for evaluating the safety of an intersection.

ISD is the required visibility distance standard for evaluating the safety of an intersection. ISD is based on the time required to perceive, react, and complete the desired traffic maneuver once a motorist on a minor street decides to perform a traffic maneuver. Three traffic maneuvers are available for vehicles stopped on a minor street



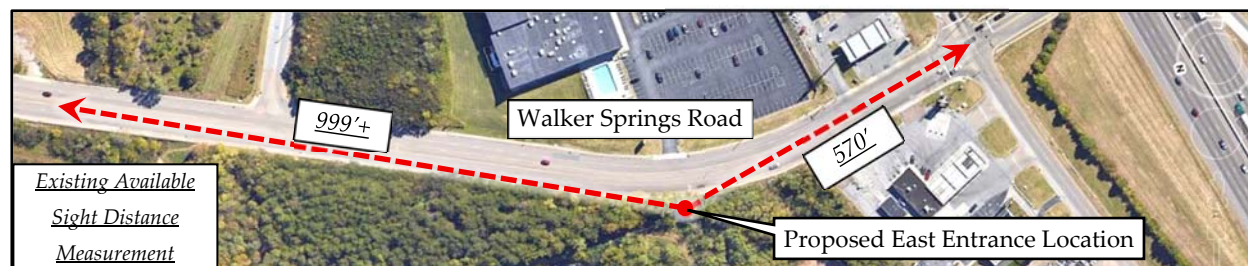
at a 4-way intersection: (1) a left-turn, (2) a right-turn, or (3) a crossing maneuver across the major street. For turns from the minor street, the ISD is needed to allow a stopped motorist to turn onto a major street without being overtaken by an approaching vehicle. The most critical ISD is for left turns from the minor street. The ISD for this maneuver includes the time to turn left and clear half of the intersection without conflicting with oncoming traffic from the left and accelerating to the road's operating speed without causing the approaching vehicles from the right to reduce their speed substantially.

Walker Springs Road and Walbrook Drive have a posted speed limit of 40 mph. Based on Knox County's policy of requiring 10 feet of sight distance per 1 mph of speed, the required intersection

sight distance is 400 feet. This distance is required for a motorist to exit safely to the left or right from the East Proposed Entrance onto Walker Springs Road or turn right from the South Proposed Entrance onto Walbrook Drive.

As a safety check, visual observations of the sight distances from the proposed entrance locations at Walker Springs Road and Walbrook Drive were undertaken. Using a Nikon Laser Rangefinder at the exit point at the East Proposed Entrance location, the available sight distance was visually estimated to be 999+ feet (the rangefinder's limit) to the north and a minimum of 570 feet to the south on Walker Springs Road. The centerline-to-centerline distance between the East Proposed Entrance and Walbrook Drive at the intersection with Walker Springs Road is approximately 570 feet. Sight distance to the south beyond the signalized intersection is available when not occupied by heavy southbound vehicle queues on Walker Springs Road. The available sight distance to the east for exiting right-turns-only from the South Proposed Entrance was estimated to be 425 feet. Based on visual observation, the available sight distances from the proposed entrance locations will be adequate for vehicles exiting the development.

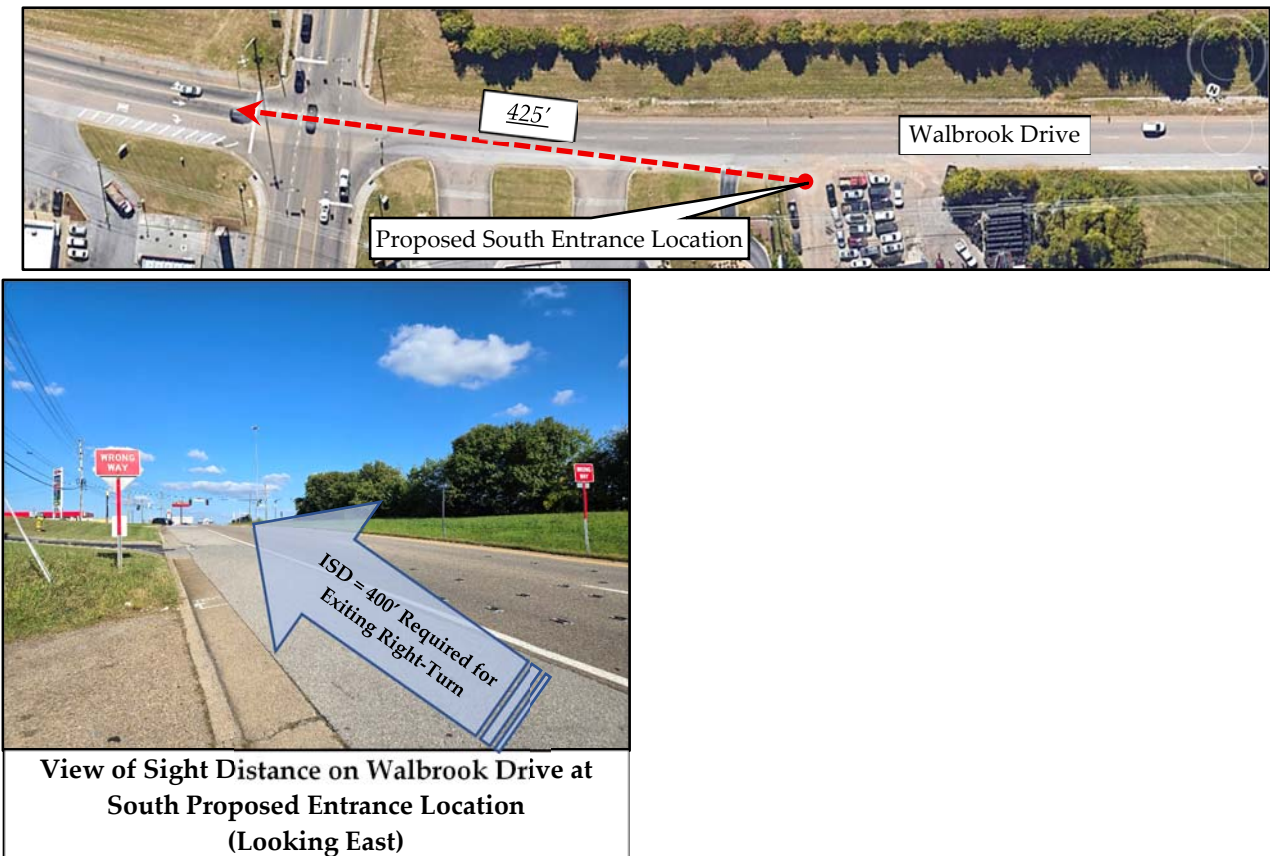
Images of the existing sight distances from the proposed entrance locations are labeled in the following with the required ISD and rangefinder-measured sight distances.



View of Sight Distance on Walker Springs Road at East Proposed Entrance Location (Looking North)



View of Sight Distance on Walker Springs Road at East Proposed Entrance Location (Looking South)



○ EVALUATION OF TURN LANE THRESHOLDS

The need for a separate southbound right-turn entering lane on Walker Springs Road at the East Proposed Entrance or a separate westbound right-turn entering lane on Walbrook Drive at the South Proposed Entrance was evaluated in the projected 2027 conditions. An evaluation for a separate northbound left-turn entering lane on Walker Springs Road at the East Proposed Entrance was not conducted, as a center TWLTL is already provided and will allow for the storage and separation of northbound left-turning movements into the Thompson Landing Apartments.

The criteria used for this turn lane evaluation were based on Knox County's "Access Control and Driveway Design Policy". This design policy relates vehicle volume thresholds based on prevailing speeds for two-lane and four-lane roadways. The locations of these proposed entrance intersections are within a 40 mph speed zone; therefore, the intersections were evaluated based on the posted speed limit of 40 mph. The worksheets for these evaluations are provided in Appendix I.

Based on the projected 2027 traffic volumes at the proposed entrance intersections, separate right-turn entering lanes on Walker Springs Road or Walbrook Drive will not be warranted.




○ **PROJECTED VEHICLE QUEUES**

An additional software program calculated the projected vehicle queues at the proposed entrance intersections and at the signalized intersection of Walker Springs Road at Walbrook Drive during the 2027 AM and PM peak hours. The previously mentioned Synchro traffic software includes SimTraffic. The Synchro portion of the software performs macroscopic calculations for intersections, while SimTraffic handles micro-simulation and animation of vehicular traffic. SimTraffic software was utilized to estimate the projected vehicle queues at the intersections.

The 95th percentile vehicle queue is the recognized measurement in the transportation engineering profession, serving as the design standard for considering vehicle queue lengths. A 95th percentile vehicle queue length means 95% certainty that the vehicle queue will not extend beyond that point. The calculated vehicle queue results were based on averaging the outcomes obtained during ten one-hour traffic simulations in the software.

The 95th percentile vehicle queue lengths at the proposed entrance intersections and at the signalized intersection of Walker Springs Road at Walbrook Drive are shown in Table 8 for the 2027 projected peak hour conditions. The vehicle queue worksheet results from the SimTraffic software are in Appendix J.

TABLE 8
VEHICLE QUEUE SUMMARY -
2027 PROJECTED PEAK HOUR TRAFFIC CONDITIONS WITH THE PROJECT

INTERSECTION	TRAFFIC CONTROL	APPROACH/ MOVEMENT	95 th PERCENTILE VEHICLE QUEUE LENGTH (ft)	
			AM PEAK HOUR	PM PEAK HOUR
Walker Springs Road (SB & NB) at Walbrook Drive (WB)	 Signalized	Westbound Left/Thru	334	439
		Westbound Thru	278	363
		Westbound Right	33	49
		Northbound Left/Thru	179	348
		Northbound Thru	110	286
		Southbound Thru	157	130
		Southbound Thru/Right	242	165
Walker Springs Road (SB & NB) at National Fitness Entrance (WB) & East Proposed Entrance (EB)	 Unsignalized	Eastbound Left/Thru/Right	46	44
		Westbound Left/Thru/Right	53	65
		Northbound Left	18	33
		Southbound Left	24	43
Walbrook Drive (WB) at South Proposed Entrance (SB)	 Unsignalized	Southbound Right	37	30

Note: 95th percentile vehicle queues were calculated in SimTraffic 12 software

Table 8 shows minimal vehicle queue lengths at the proposed entrance intersection approaches in the 2027 AM and PM peak hours. The longest exiting vehicle queues associated with the Thompson Landing Apartments are for the eastbound approach at the East Proposed Entrance, with a queue of 46 feet in the AM peak hour and 44 feet in the PM peak hour. Based on these results, the longest vehicle queue exiting at the East Proposed Entrance at this intersection will be two passenger vehicles, assuming each vehicle is 25 feet in length.

The longest entering vehicle queues associated with the Thompson Landing Apartments are the northbound left turns in the center TWLTL on Walker Springs Road. These 95th percentile vehicle queues are calculated to be 18 feet and 33 feet in the AM and PM peak hours, approximately one to just over one passenger car. The southbound 95th percentile vehicle queue lengths for National Fitness entering left turns in the center TWLTL on Walker Springs Road are calculated to be 24 feet and 43 feet in the AM and PM peak hours, approximately one to nearly two passenger cars.

The longest exiting vehicle queues at the South Proposed Entrance are calculated to be 37 feet in the AM peak hour and 30 feet in the PM peak hour, just over one passenger car in length.

The National Fitness exiting volumes are calculated to have a 95th percentile vehicle queue of 53 feet in the AM peak hour and 65 feet in the PM peak hour, approximately 2 to 3 passenger cars.

At the signalized intersection, as observed during the traffic counts, the southbound shared thru/right lane is calculated to have vehicle queues approaching the East Proposed Entrance location on Walker Springs Road during the AM peak hour. While the calculated queues from the software for this lane are not as long as observed, with queues seen beyond the East Proposed Entrance location on Walker Springs Road, it is surmised that this discrepancy is attributable to inefficiencies in traffic flow progression due to the numerous turning movements to and from the commercial business entrances at the Exxon/Subway and Casey's/ McDonald's that are not reflected in the software.

CONCLUSIONS & RECOMMENDATIONS

The following is an overview of recommendations to minimize the transportation impacts of the Thompson Landing Apartments on the adjacent transportation system while attempting to achieve an acceptable traffic flow and safety level.



Walker Springs Road at East Proposed Entrance & National Fitness Entrance: This intersection is projected to operate with minimal vehicle delays and short queues for all movements. A single exit lane for the apartment's residents, allowing both left and right turn movements, will be sufficient according to the calculations based on the projected 2027 volumes.

- 1a) Future landscaping, existing vegetation, or proposed signage must not impact the intersection sight distances looking from the East Proposed Entrance to the north and south on Walker Springs Road. The vegetation currently along the west side of Walker Springs Road is overtaking the sidewalk and needs to be removed and better maintained by Knox County.



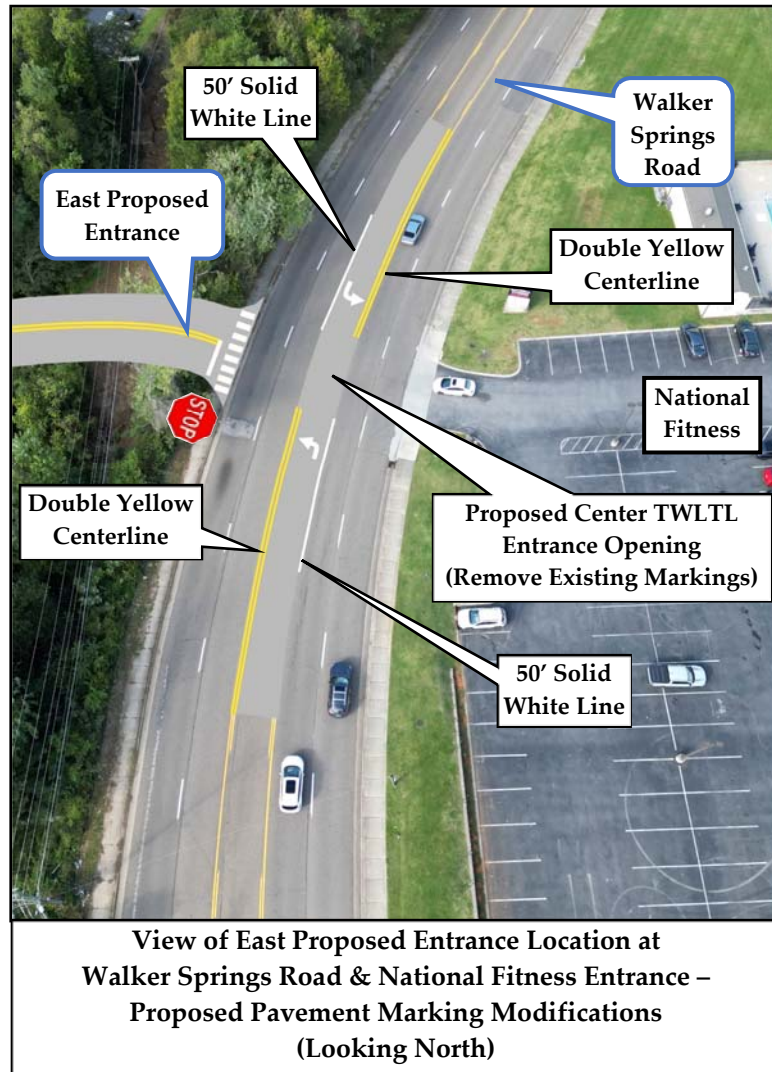
**Walker Springs Road near
East Proposed Entrance Location
(Looking North)**

- 1b) A white crosswalk is recommended to be applied across the East Proposed Entrance approach, where the existing sidewalk on the west side of Walker Springs Road will cross. The crosswalk should have a white transverse marking as shown in TDOT Standard Drawing T-M-4.
- 1c) Based on the posted speed limit of 40 mph on Walker Springs Road at the East Proposed Entrance location, the required intersection sight distance is 400 feet for exiting left and right-turning vehicles. The existing sight distances from the East Proposed Entrance location were estimated visually to be adequate in both directions.

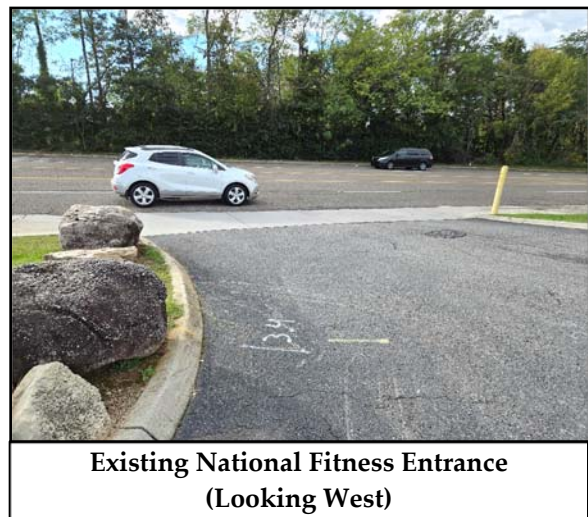
- 1d) It is recommended that a Stop Sign (R1-1) be posted and a 24" white stop bar be applied to the East Proposed Entrance approach at Walker Springs Road. The stop bar should be applied a minimum of 4 feet away from the edge of the recommended crosswalk at Walker Springs Road and placed at the desired stopping point that maximizes the sight distance to the north and south.
- 1e) The existing center two-way left-turn lane (TWLTL) pavement striping on Walker Springs Road at the East Proposed Entrance and National Fitness entrance is recommended to be modified. This modification should include providing a designated left-turn area in the center lane on Walker Springs Road for northbound left-turning vehicles into the Thompson Landing Apartments. In the center of Walker Springs Road at the entrance, 50 feet of vehicle storage for left turns should be delineated by the application of a solid white line, followed by an opening of 50 feet in the TWLTL pavement marking for the transition between the new dedicated left-turn area and the existing TWLTL striping to the south. The inner edge of the center of Walker Springs Road in the southbound direction should be modified to include a double yellow centerline within this total 100-foot distance to eliminate the current TWLTL designation. A white left-turn arrow should be applied to the pavement for this new designated northbound turn lane. Additionally, the existing center pavement markings on Walker Springs Road, within the East Proposed Entrance approach and the National Fitness entrance, should be removed. The pavement markings for southbound left turns into National Fitness should mirror those recommended for northbound left turns into the Thompson Landing Apartments. Refer to the image on the following page.

Typically, this recommendation would not be offered for private driveway entrances. However, with the observation that some southbound motorists are using the TWLTL as a thru lane between the National Fitness and Casey's/McDonald's, and to provide delineation and awareness of the East Proposed Entrance and the National Fitness entrance locations on Walker Springs Road, this recommendation is offered.

Overall, the new turning movements that will occur to and from Walker Springs Road at the East Proposed Entrance are not expected to interfere or have vehicle queues that would affect the existing adjacent driveway entrances to the National Fitness center, Casey's/McDonald's, Exxon/Subway, or Taco Bell.



- 1f) Due to the poor, sub-standard turning radius, narrow entrance, placement of boulders, and the grade of Walker Springs Road, it would be highly advised that the National Fitness entrance be improved since it significantly slows down vehicles turning into National Fitness and the northbound thru movements on the outside lane of Walker Springs Road. However, since this entrance is on private property, it is not included in the main recommendations provided at the beginning of the report.





Walbrook Drive at South Proposed Entrance: This intersection is projected to operate with minimal vehicle delays and short queues for all movements. A single exit lane for the development's residents, allowing right-turn-only movements from the South Proposed Entrance onto Walbrook Drive, will be sufficient, according to calculations based on projected 2027 volumes.

- 2a) Future landscaping, existing vegetation, or proposed signage must not impact the intersection sight distance looking from the South Proposed Entrance to the east on Walbrook Drive.
- 2b) Based on the posted speed limit of 40 mph on Walbrook Drive at the South Proposed Entrance location, the required intersection sight distance is 400 feet for exiting right-turning vehicles. The existing sight distance from the South Proposed Entrance location was estimated visually to be adequate to the east.
- 2c) It is recommended that a Stop Sign (R1-1) be posted and a 24" white stop bar be applied to the South Proposed Entrance approach at Walbrook Drive. The stop bar should be applied a minimum of 4 feet away from the shoulder of Walbrook Drive and placed at the desired stopping point that maximizes the sight distance to the east.
- 2d) Since Walbrook Drive is one-way in the westbound direction only, it is recommended that a No Left Turn Sign (R3-2) be posted below the recommended Stop Sign (R1-1). An existing One-Way Arrow Sign (R6-1r) is already posted directly across from the South Entrance on Walbrook Drive, and it should be verified that the sign remains present once the entrance exit approach is open to motorists.



Walker Springs Road at Walbrook Drive: This intersection is projected to operate adequately with respect to vehicle delays and LOS. However, during peak periods, excessive vehicle queues were observed in the current conditions for the southbound shared thru/right turn lane on Walker Springs Road, and are expected to continue even in future conditions if no changes are made, regardless of the proposed development. The occurrence of long vehicle queues was not constant during peak hours, as they fluctuated and were likely exacerbated by the turning movements into and out of the adjacent commercial developments of Exxon, Subway, Casey's, and McDonald's. Additionally, the westbound approach of Walbrook Drive at the traffic signal was observed to be suffering from improper lane use, which could lead to and contribute to vehicle crashes.

- 3a) The southbound shared thru/right turn lane on Walker Springs Road is currently experiencing volumes of close to 500 vehicles per hour in the AM peak hour and slightly over 300 in the PM peak hour. These high turning volumes are attributable to motorists from the north turning onto Walbrook Drive towards the Interstate 40/75 westbound entrance ramp at Bridgewater Road.

Traditionally, when a lane experiences greater than 300 turning vehicles, consideration is given to providing an additional turning lane. In this situation, providing an additional lane outside the existing one would be an expensive endeavor due to the presence of a large utility pole and the traffic signal controller cabinet located just outside the edge of Walker Springs Road.

Due to current traffic conditions and expected general future growth in the surrounding area, Knox County and the City of Knoxville should consider, at some point, modifying the two lanes on the southbound approach of Walker Springs Road at Walbrook Drive to provide more capacity for right-turn movements, and thereby also reducing the potential for excessive vehicle queues that could interfere with the turning movements at the East Proposed Entrance to the Thompson Landing Apartments. This potential modification would involve changing the inside lane on the southbound approach of Walker Springs Road, currently a thru lane only, to a shared thru/right-turn lane, and converting the outside lane from its current shared thru/right-turn lane configuration to a right-turn-only lane. Currently, a single thru vehicle in this shared thru/right-turn lane can block numerous vehicles during right-on-red opportunities.

This reconfiguration would require additional modifications, including signage, signal heads, and signal timing changes; however, these modifications would be significantly less expensive than adding a lane, which would necessitate relocating the large utility pole and the traffic signal controller cabinet. This modification, involving changes to lane use controls and configurations, would reduce the capacity of the thru movement. However, the southbound approach's main movement consists of right turns, which greatly outnumber the thru volumes. Furthermore, this modification would likely eliminate or reduce cut-through traffic occurring on the Exxon/Subway property.

- 3b) Due to repeated observed misuse of the lanes on the westbound approach of Walbrook Drive at the traffic signal and the dangerous conditions, the City of Knoxville should install lane use control signs on a span wire facing the westbound approach. This approach currently features pavement markings on the pavement, indicating lane use in two locations prior to the traffic signal, along with an advance lane use control sign. However, this sign is located far upstream from the traffic signal (525 feet) on the right-hand side, and the pavement markings are not always readily apparent.

All of the other approaches have overhead lane use control signs at the traffic signal, signifying to motorists which lane to use for each movement. The lane use control signs for these approaches are placed on the span wire that suspends the traffic signal heads for the opposite approach. Since Walbrook Drive is one-way towards the west, traffic signal heads were not needed for the



**Lane Use Control Signs on Walker Springs Road
Northbound Approach at Walbrook Drive**

eastbound direction, and thus, did not provide a convenient wire to hang lane use control signs for the westbound approach. Ideally, lane use control signs for the westbound approach on Walbrook Drive would be installed above the lanes on the near side on a new span wire near the stop bar, as currently provided for the other approaches.

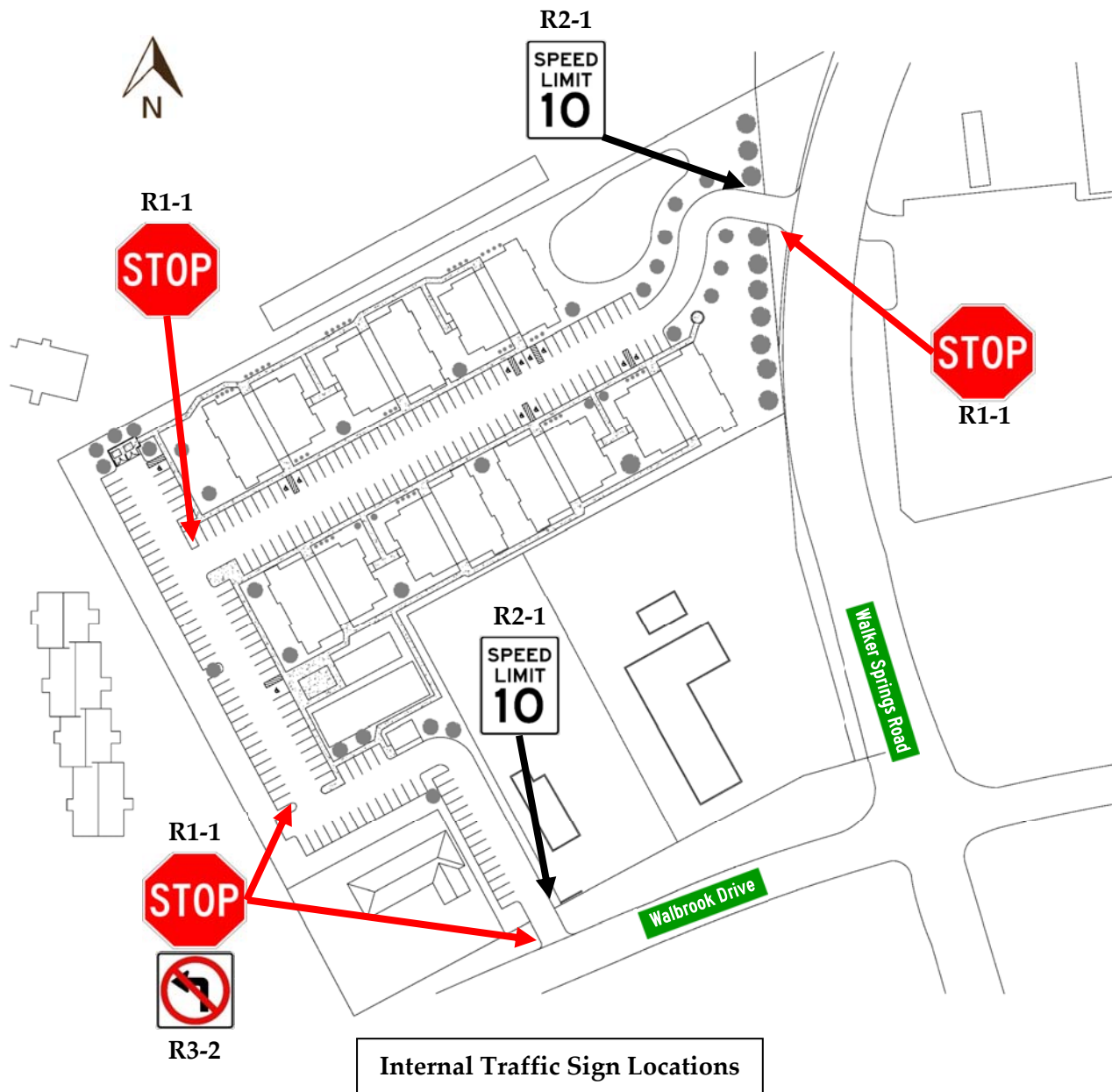
To assist motorists in determining and using the appropriate lane and reduce potential crashes from improper use, it is highly recommended that Knox County and the City of Knoxville supplement the existing advance signage and pavement markings by installing overhead lane use control signs for the westbound approach of Walbrook Drive at the traffic signal. These overhead signs should include a shared left/thru sign (R3-6l), a thru only sign (R3-5a), and a right-turn-only sign (R3-5r).





Thompson Landing Apartments Internal Drives/Parking Lot Aisleways: The current layout plan shows two entrance driveways with a couple of long parking lot aisleways constructed for the development, as shown in Figure 3.

- 4a) 10-mph Speed Limit Signs (R2-1) are recommended to be posted near the beginning of the development entrance driveways off Walker Springs Road and Walbrook Drive. Since the entrance driveway will not be a public road, a posted speed limit of less than 25-mph is acceptable.
- 4b) Stop Signs (R1-1) with 24" white stop bars and other traffic signage are recommended to be installed at the internal locations, as shown in the image below.



- 4c) Sight distance at the new internal intersections must not be impacted by new signage, parked cars, or future landscaping. With a proposed speed limit of 10 mph in the development, the required sight distances are 100 feet. The civil site designer should ensure internal sight distances are met, especially at the sharp internal aisleway turns.
- 4d) All drainage grates and covers for the residential development must be pedestrian and bicycle-safe.
- 4e) Internal sidewalks are proposed throughout the development. The proposed internal sidewalk system should be connected to the existing external sidewalk system located on the west side of Walker Springs Road. Sidewalks should have appropriate ADA-compliant ramps at intersection corners, and the internal sidewalks are recommended to be a minimum of 5 feet in width to meet Knox County regulations.
- 4f) Transit availability is near the development site. The closest bus stop is approximately 0.4 miles to the east on Walbrook Drive in front of the Walmart Supercenter. A new bus stop could be feasible on the east side of the development along Walker Springs Road or Walbrook Drive on the south side of the development, where the KAT route 16, "Middlebrook/Cedar Bluff", currently exists and traverses.

With a KAT route nearby, installing a new bus stop closer to the proposed development would provide more convenient transit access for residents in the Thompson Landing Apartments and reduce the number of vehicle trips. If a bus stop is desired closer to the development, a request by the developer should be submitted to KAT officials to determine its feasibility.

- 4g) While the possibility exists for the apartment complex's internal drive to be used as a cut-thru route between Walker Springs Road and Walbrook Drive due to long vehicle queues on the southbound approach at the traffic signal, the overall length and the circuitous nature of this drive through the new development are not expected to facilitate or attract this activity.
- 4h) All road and intersection elements should be designed in accordance with the American Association of State Highway and Transportation Officials (AASHTO), Knox County, and City of Knoxville specifications and guidelines to ensure proper transportation operations.

APPENDIX A

HISTORICAL TRAFFIC COUNT DATA

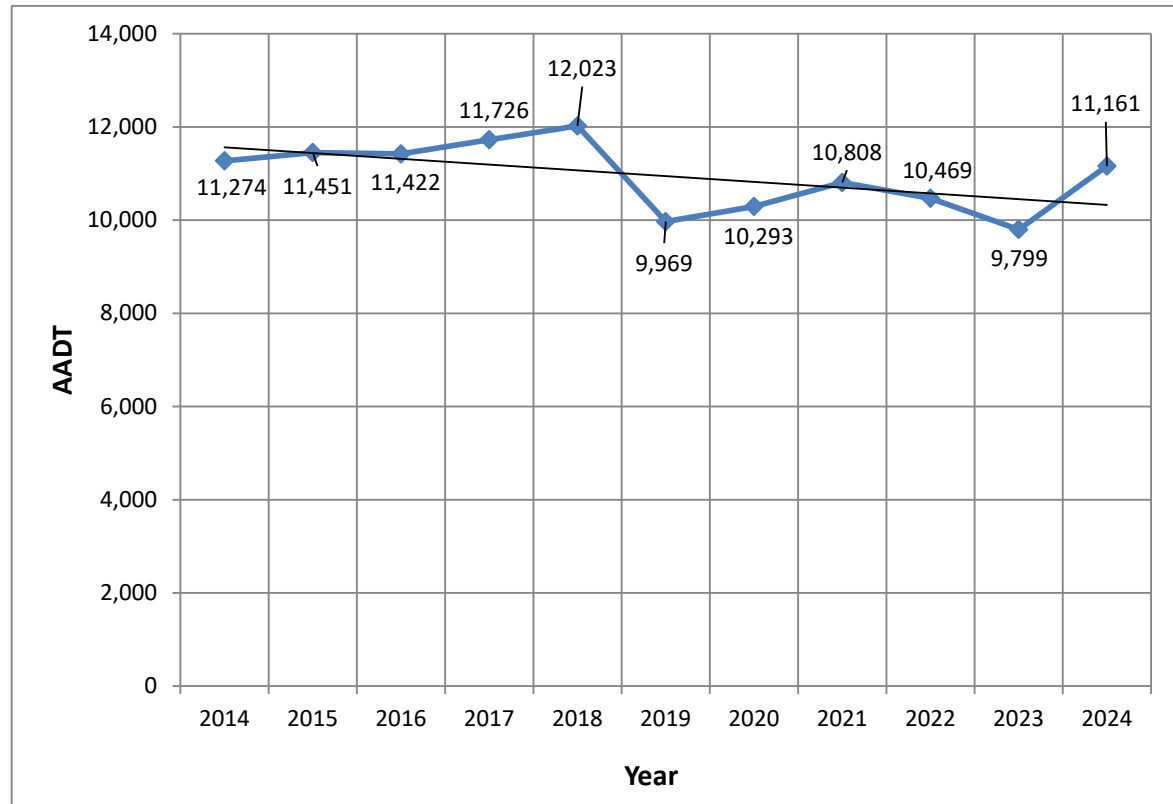
Historical Traffic Counts

Organization: TDOT

Station ID #: 47000428

Location: Walker Springs Road, between Kingston Pike and I-40/75

YEAR	AADT	
2014	11,274	Trendline ↓
2015	11,451	
2016	11,422	
2017	11,726	
2018	12,023	
2019	9,969	
2020	10,293	
2021	10,808	
2022	10,469	
2023	9,799	
2024	11,161	



2014 - 2024 Growth Rate = -1.0%

Average Annual Growth Rate = -0.1%

TN

TDOT

Department of Transportation

Traffic Count (TCDS)

Home

Locate

Locate All

Email This

Auto-Locate:

List View

All DIRs

Record

7904

of 16430

Goto Record

go

Location ID	47000428	MPO ID	
Type	SPOT	HPMS ID	
On NHS		On HPMS	
LRS ID	47L377801P00000	LRS Loc PL	0.065
SF Group	Lower FC (2025)	Route Type	
AF Group	Region 1 Urban Major Collector (2025)	Route	
GF Group	Knox (2025)	Active	Yes
Class Dist Grp	Region 1 Urban Major Collector (2025)	Category	CC
Seas Class Grp			
WIM Group			
QC Group	Default		
Fncf1 Class	Major Collector	Milepost	
Located On	03778		
Loc On Alias	WALKER SPRINGS RD. NW.		
	WALKER SPRINGS RD-KNOXVILLE		

More Detail

STATION DATA

Directions: 2-WAY NB SB

AADT	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2024	11,161	1,222	11	54	10,962 (98%)	199 (2%)	
	2023	9,799	888	9	65	9,583 (98%)	216 (2%)	
	2022	10,469	1,034	10	65	10,219 (98%)	250 (2%)	
	2021	10,808 ³		10	65	10,483 (97%)	325 (3%)	Grown from 2020
	2020	10,293	1,049	10	65	9,912 (96%)	381 (4%)	

Google

Location

Location ID: 47000428

Located On: 03778 WALKER SPRINGS RD- KNOXVILLE

Direction: 2-WAY

AADT: 11161 (2024)

NB Count: 5119 (2024)

SB Count: 6042 (2024)

View Detail in a New Search

Go to Record in Current Search

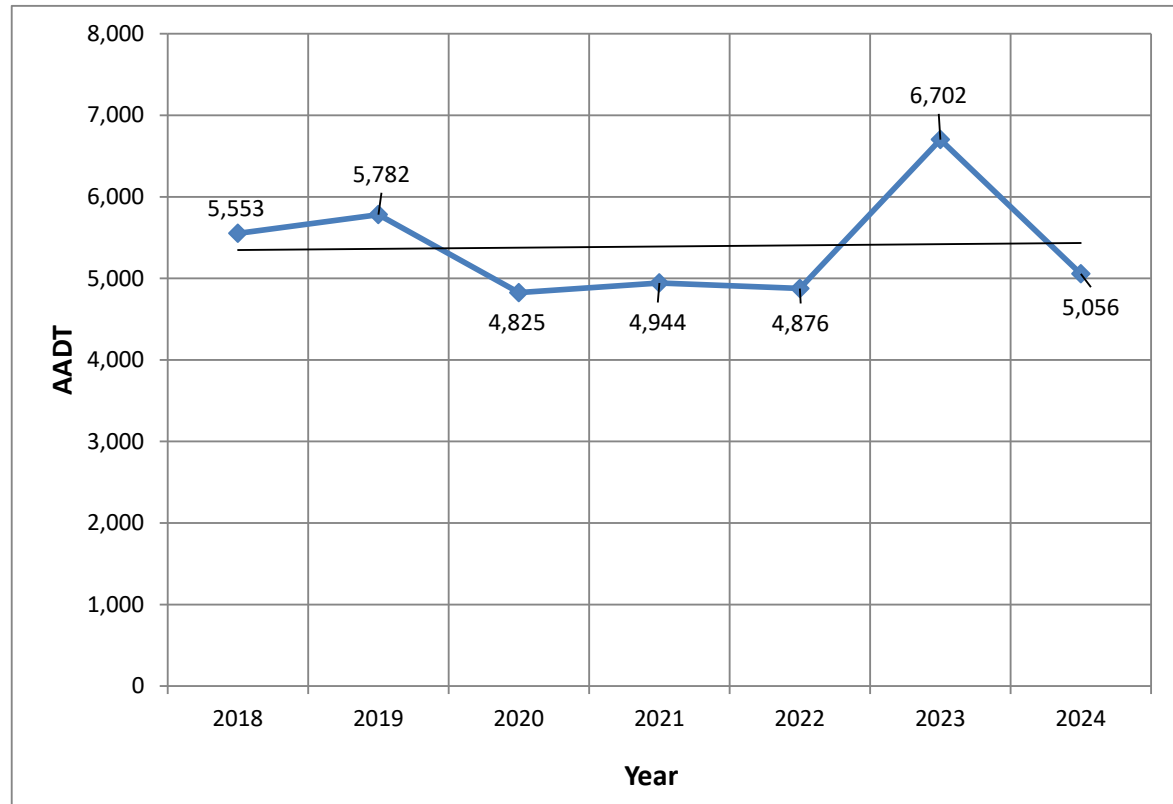
Historical Traffic Counts

Organization: TDOT

Station ID #: 47000537

Location: Walbrook Drive, west of N Gallaher View Road

YEAR	AADT	
2014	-	
2015	-	
2016	11,554	
2017	11,670	
2018	5,553	Trendline
2019	5,782	
2020	4,825	
2021	4,944	
2022	4,876	
2023	6,702	
2024	5,056	



2018 - 2024 Growth Rate = -9.0%

Average Annual Growth Rate = -1.6%

APPENDIX B

KNOXVILLE AREA TRANSIT (KAT) MAP AND INFORMATION

Route 16: Middlebrook/Cedar Bluff

How to Read this Schedule

SUNDAY										
Going away from downtown					Going toward downtown					
Knoxville Station Bay C	State Office Building	Middlebrook Pk WB and Lake Brook Blvd	Walmart	Parkwest Medical Center	Windsor Square on Market Place Blvd	Parkwest Medical Center	Walmart	Middlebrook Pk EB and Dowell Springs	State Office Bldg.	Knoxville Station Bay C
1	2	3	4	5	6	7	8	9	10	11
			Transfer to Rt. 11				Transfer to Rt. 11			
					8:40 AM	8:48 AM	9:15 AM	9:25 AM	9:35 AM	10:05 AM
8:15 AM	8:30 AM	8:48 AM	9:15 AM	9:30 AM	9:40 AM	9:48 AM	10:15 AM	10:25 AM	10:35 AM	11:05 AM
9:15 AM	9:30 AM	9:48 AM	10:15 AM	10:30 AM	10:40 AM	10:48 AM	11:15 AM	11:25 AM	11:35 AM	12:05 PM
10:15 AM	10:30 AM	10:48 AM	11:15 AM	11:30 AM	11:40 AM	11:48 AM	12:15 PM	12:25 PM	12:35 PM	1:05 PM
11:15 AM	11:30 AM	11:48 AM	12:15 PM	12:30 PM	12:40 PM	12:48 PM	1:15 PM	1:25 PM	1:35 PM	2:05 PM
12:15 PM	12:30 PM	12:48 PM	1:15 PM	1:30 PM	1:40 PM	1:48 PM	2:15 PM	2:25 PM	2:35 PM	3:05 PM
1:15 PM	1:30 PM	1:48 PM	2:15 PM	2:30 PM	2:40 PM	2:48 PM	3:15 PM	3:25 PM	3:35 PM	4:05 PM
2:15 PM	2:30 PM	2:48 PM	3:15 PM	3:30 PM	3:40 PM	3:48 PM	4:15 PM	4:25 PM	4:35 PM	5:05 PM
3:15 PM	3:30 PM	3:48 PM	4:15 PM	4:30 PM	4:40 PM	4:48 PM	5:15 PM	5:25 PM	5:35 PM	6:05 PM
4:15 PM	4:30 PM	4:48 PM	5:15 PM	5:30 PM	5:40 PM	5:48 PM	6:15 PM	6:25 PM	6:35 PM	7:05 PM
5:15 PM	5:30 PM	5:48 PM	6:15 PM	6:30 PM	6:40 PM	6:48 PM	7:15 PM	7:25 PM	7:35 PM	8:05 PM
6:15 PM	6:30 PM	6:48 PM	7:15 PM	7:30 PM	7:40 PM	7:48 PM	8:15 PM	8:25 PM	8:35 PM	9:05 PM
7:15 PM	7:30 PM	7:48 PM	8:15 PM	8:30 PM	8:40 PM	8:48 PM				
8:15 PM	8:30 PM	8:48 PM								

To determine when the bus serves a location, match the numbers on the timetable to the numbers on the map (these locations are called "timepoints").



To determine when the bus serves a stop in between timepoints, look at when it is due at the timepoint before your stop and the timepoint after your stop, and you can estimate when it will arrive. Always be at your stop 5 minutes early!

T These symbols indicate transfer points or Superstops, which are specific stops where you can transfer to a different route. Routes serving a transfer point or Superstop are indicated at the top of the times schedule, just above the name of the stop.

Cómo leer este horario
Conecte el número dentro del círculo en el mapa con la columna del horario con el mismo número para ver cuándo el bus para en ese lugar (esos lugares se llaman "timepoints").

Para determinar cuándo un bus atiende una parada entre timepoints, mire a qué hora debería llegar al timepoint antes de su parada y el timepoint después de su parada, y podrá estimar la hora de llegada. (Siempre llegue a su parada con 5 minutos de antelación)

T Estos símbolos indican puntos de transbordo Superstops que son paradas específicas donde puedes transbordar a una ruta diferente. Las rutas que atienden un punto de transbordo o Superstop están indicadas en la parte superior del horario, justo encima del nombre de la parada.

ACCESSIBILITY
All KAT buses are lift-equipped. Paratransit service is also available to those who qualify. For more information, visit katbus.com or call 865-637-3000.

Bike racks are available on all KAT buses.
Bikes ride free.

Wi-Fi
All buses have FREE Wi-Fi.

katbus.com • Customer Service: 865-637-3000



Rider Tools and Tips

Fare Information

Fare Type	Regular Fare	Discounted Fare
1-Ride pass	\$1.00	\$0.50
1-Day pass	\$2.00	\$1.00
20-Ride pass	\$15.00	\$7.50
30-Day Pass	\$30.00	\$15.00

Discounted fare for seniors 65+, Medicare cardholders, and persons with disabilities. KAT ID or Medicare card required.

Children 4 and under ride free.

Knox County School Students also ride free with the Youth Freedom Pass.

To learn more about our fares, the Youth Freedom Pass, and how to buy tickets, visit katbus.com.

Riding Tips

- Plan your trip using this map, the free Transit app, or our homepage trip planner on katbus.com.
- Always arrive at your bus stop 5 minutes early.
- When you see your bus coming, wave to the operator so they know you want to board.
- Have your fare ready when the bus arrives.
- When nearing your destination, pull the cord next to the windows to alert the operator that you want to get off at the next stop.
- View our Passenger Ride Guide at katbus.com.

KAT Holidays

KAT Services do not operate on the following holidays: New Year's Day, Independence Day, Thanksgiving & Christmas.

KAT buses run on a Sunday schedule on the following holidays: Martin Luther King, Jr. Day, Memorial Day, Juneteenth, Labor Day, day after Thanksgiving, day before Christmas.

KAT's administrative offices are closed on all of the holidays listed above.

Go paperless!

PLAN your trip, PAY your fare, and SCAN your ticket, all in our FREE official app:



Scan QR code to download Transit



Herramientas y consejos para los pasajeros

Información sobre tarifas

Tipo de tarifa	Tarifa regular	Tarifa con descuento
Pase de 1 viaje	\$1.00	\$0.50
Pase de 1 día	\$2.00	\$1.00
Pase de 20 viajes	\$15.00	\$7.50
Pase de 30 días	\$30.00	\$15.00

Tarifa descontada para mayores de 65 años, personas con tarjeta de Medicare y personas con discapacidades. Se necesita el ID de KAT o tarjeta de Medicare.

Los niños menores de 4 años viajan gratis.

Los estudiantes de las escuelas públicas del Condado de Knox también viajan gratis con el pase Youth Freedom Pass.

Visite katbus.com para averiguar más sobre nuestras tarifas, el pase para jóvenes y para comprar boletos.

Consejos para viajar

- Planifique su trayecto con este mapa, la aplicación gratuita Transit o el planificador en katbus.com.
- Siempre llegue a la parada del autobús 5 minutos antes.
- Cuando vea que llega el autobús, haga una señal al operador para que sepa que quiere subir.
- Tenga su pago listo cuando llega el autobús.
- Cuando se acerque a su destino, jale del cordón cercano a la ventana para alertar al operador de que quiere bajarse en la siguiente parada.
- Repase nuestra Guía del Pasajero en katbus.com.

Los servicios de KAT no funcionan en los siguientes días feriados: Año Nuevo, Día de la Independencia, Acción de Gracias y Navidad.

Los autobuses de KAT siguen los horarios de los domingos en los siguientes feriados: día de Martin Luther King Jr., Día de los Caldos (Memorial Day), Juneteenth, Día del Trabajador, día después del Día de Acción de Gracias, día antes de Navidad.

Las oficinas de KAT estarán cerradas en todos esos días feriados.

¡Haga todo sin papel!

PLANIFIQUE su viaje, PAGUE la tarifa y ESCANEE su boleto, todo en Transit, nuestra aplicación oficial gratuita! La aplicación se configura en el mismo idioma de su teléfono. Escanee el código QR para descargar Transit.



Accesibilidad

Todos los autobuses de KAT van equipados con un elevador. También existe servicio de paratransito para quienes cualifiquen. Para más información, visite katbus.com o llame a KAT al 865-637-3000.



Información en español en el interior

Serves/ Servir:

- Bearden Middle School
- Big Oaks Apartments
- Cedar Bluff Branch Library
- Cedar Bluff Post Office
- Dowell Springs
- Knoxville Area Rescue Ministries
- Knoxville Station/ Downtown
- Kroger Marketplace
- Market Place Shopping Center
- Mechanicsville
- Park West Medical Center
- Social Security Administration
- State Office Building
- Walmart
- Weisgarber Post Office
- Windsor Square Shopping Center

KAT Reimagined

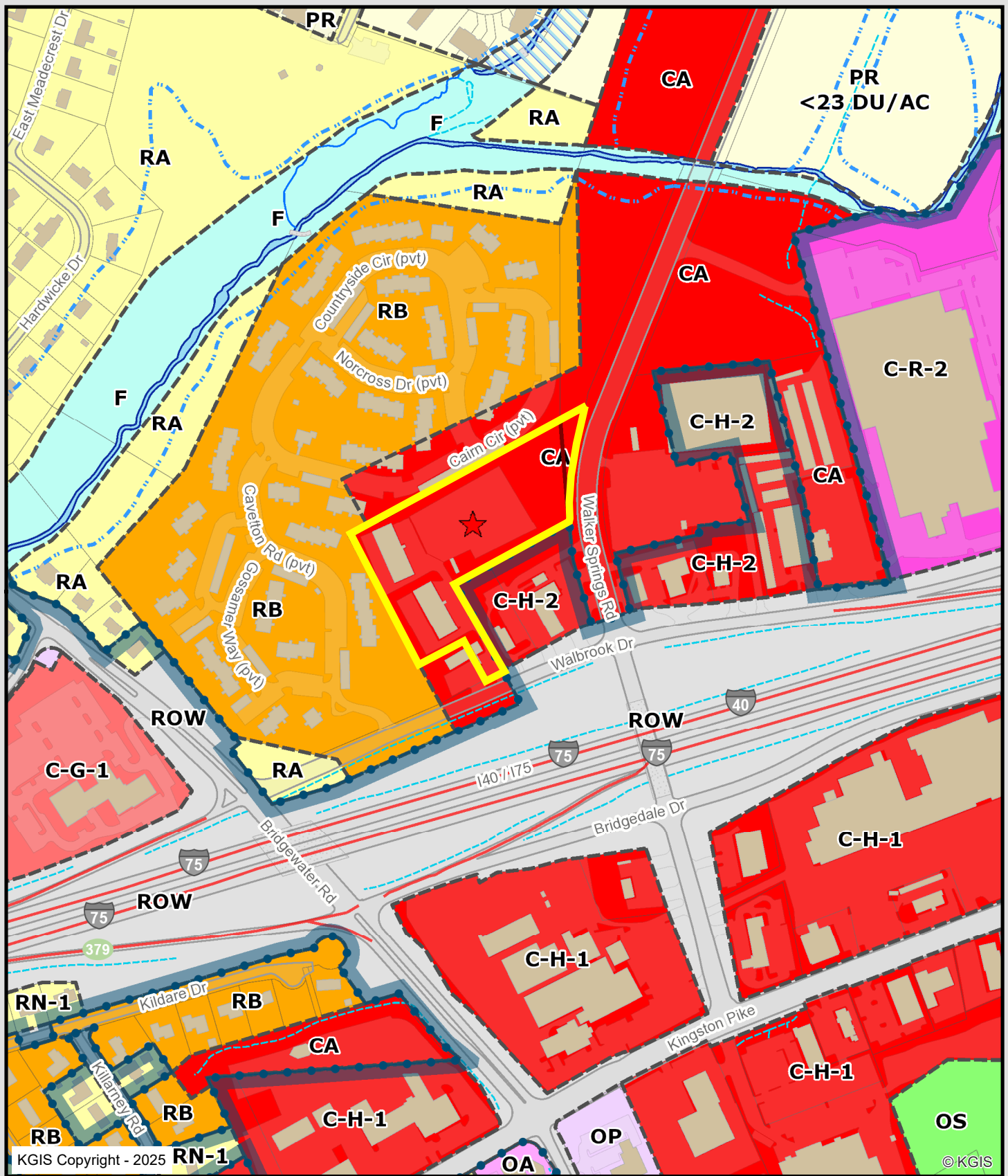
Effective Date:
August 26, 2024

Middlebrook/
Cedar Bluff
(Weekdays & Weekends)



APPENDIX C

ZONING MAP



Zoning Map

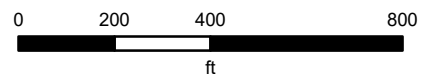
8.20.25

Knoxville - Knox County - KUB Geographic Information System

KGIS makes no representation or warranty as to the accuracy of his map and its information nor to its fitness for use. Any user of this map product accepts the same AS IS, WITH ALL FAULTS, and assumes all responsibility for the use thereof, and further covenants and agrees to hold KGIS harmless from any and all damage, loss, or liability arising from any use of this map product.



Printed: 8/20/2025 at 11:13:38 AM



APPENDIX D

MANUAL TRAFFIC COUNT DATA

TRAFFIC COUNT DATA

Major Street: Walker Springs Road (SB & NB)
 Minor Street: Walbrook Drive (WB)
 Traffic Control: Traffic Signal

8/28/2025 (Thursday)
 Mostly Sunny and Temperate
 Conducted by: Ajax Engineering

	Walker Springs Road			Walbrook Drive			Walker Springs Road			Walbrook Drive				
TIME BEGIN	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND			VEHICLE TOTAL	PEAK HOUR
	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT		
7:00 AM		42	110	37	54	7	16	54					320	
7:15 AM		46	118	62	75	3	12	94					410	
7:30 AM		73	162	57	70	5	14	82					463	7:45 AM - 8:45 AM
7:45 AM		83	127	63	102	4	18	99					496	
8:00 AM		80	123	58	99	4	27	91					482	
8:15 AM		68	114	76	68	5	22	112					465	
8:30 AM		69	115	72	103	5	20	105					489	
8:45 AM		74	99	80	70	8	25	97					453	
TOTAL		535	968	505	641	41	154	734					3578	
2:00 PM		53	72	64	109	15	44	118					475	
2:15 PM		47	68	50	101	10	43	120					439	
2:30 PM		45	72	60	107	17	43	120					464	
2:45 PM		50	63	59	104	12	51	127					466	
3:00 PM		52	87	69	108	12	33	143					504	
3:15 PM		52	67	65	109	11	48	152					504	
3:30 PM		55	64	65	123	13	50	143					513	
3:45 PM		67	72	67	133	12	42	166					559	
4:00 PM		56	84	63	125	18	40	167					553	
4:15 PM		64	74	81	125	27	44	176					591	
4:30 PM		62	81	72	118	10	44	168					555	4:45 PM - 5:45 PM
4:45 PM		58	74	89	111	16	50	159					557	
5:00 PM		70	80	72	106	10	46	164					548	
5:15 PM		64	87	85	131	25	64	191					647	
5:30 PM		64	77	80	148	15	47	183					614	
5:45 PM		58	54	67	111	18	43	160					511	
TOTAL		917	1176	1108	1869	241	732	2457					8500	

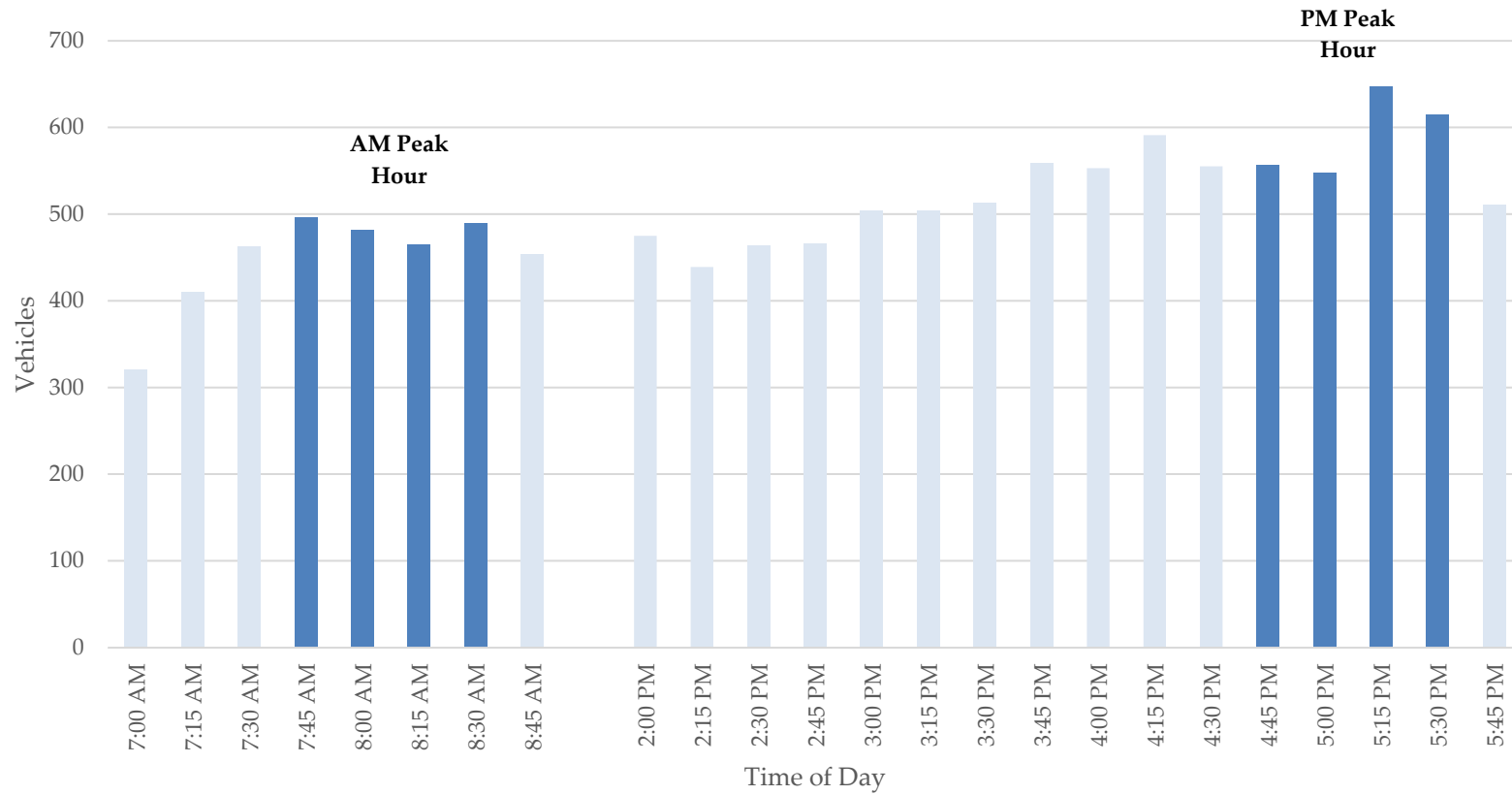
2025 AM Peak Hour 7:45 AM - 8:45 AM

TIME BEGIN	Walker Springs Road			Walbrook Drive			Walker Springs Road			Walbrook Drive		
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT
7:45 AM		83	127	63	102	4	18	99				
8:00 AM		80	123	58	99	4	27	91				
8:15 AM		68	114	76	68	5	22	112				
8:30 AM		69	115	72	103	5	20	105				
TOTAL		300	479	269	372	18	87	407				
TRUCK %		1.0%	1.3%	1.5%	3.8%	5.6%	2.3%	1.0%				
PHF _{mvmt}		0.90	0.94	0.88	0.90	0.90	0.81	0.91				
PHF _{app}		0.93			0.92			0.92				
PHF _{int}					0.97							

2025 PM Peak Hour 4:45 PM - 5:45 PM

TIME BEGIN	Walker Springs Road			Walbrook Drive			Walker Springs Road			Walbrook Drive		
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT
4:45 PM		58	74	89	111	16	50	159				
5:00 PM		70	80	72	106	10	46	164				
5:15 PM		64	87	85	131	25	64	191				
5:30 PM		64	77	80	148	15	47	183				
TOTAL		256	318	326	496	66	207	697				
TRUCK %		0.0%	0.9%	1.5%	0.8%	1.5%	1.4%	0.1%				
PHF _{mvmt}		0.91	0.91	0.92	0.84	0.66	0.81	0.91				
PHF _{app}		0.95			0.91			0.89				
PHF _{int}					0.91							

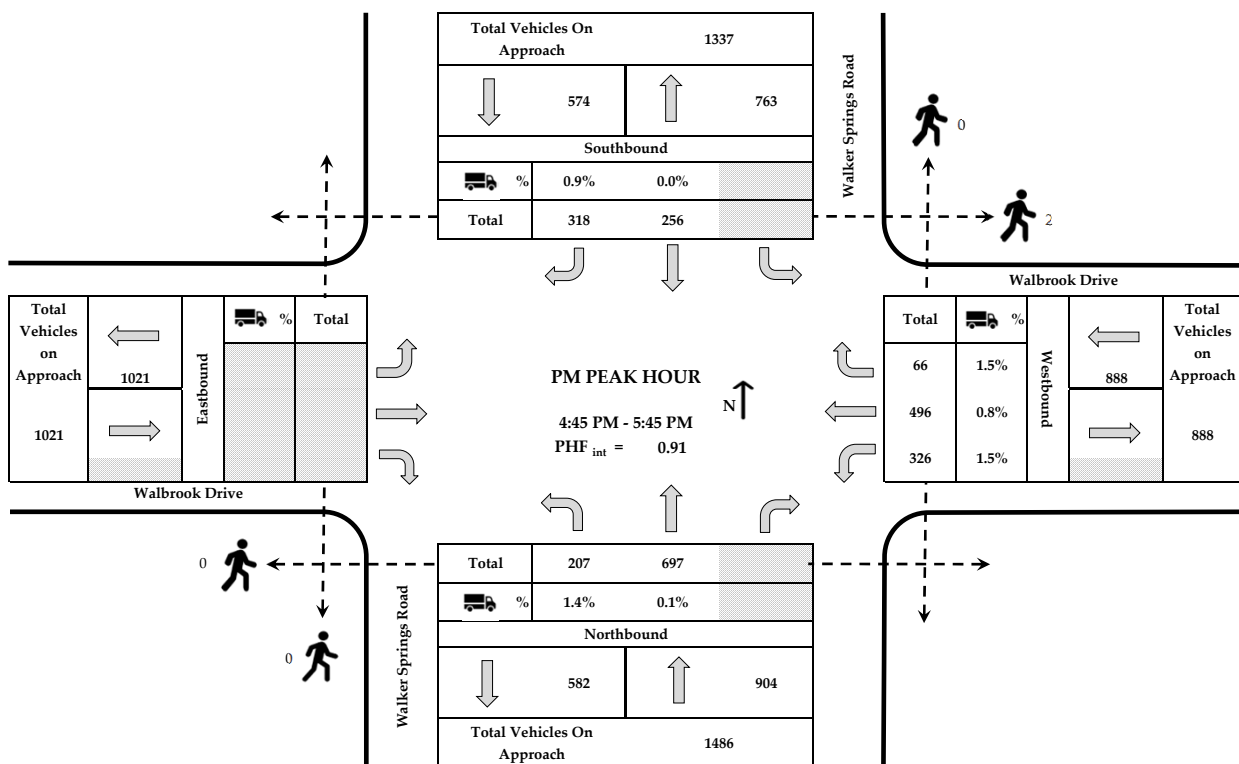
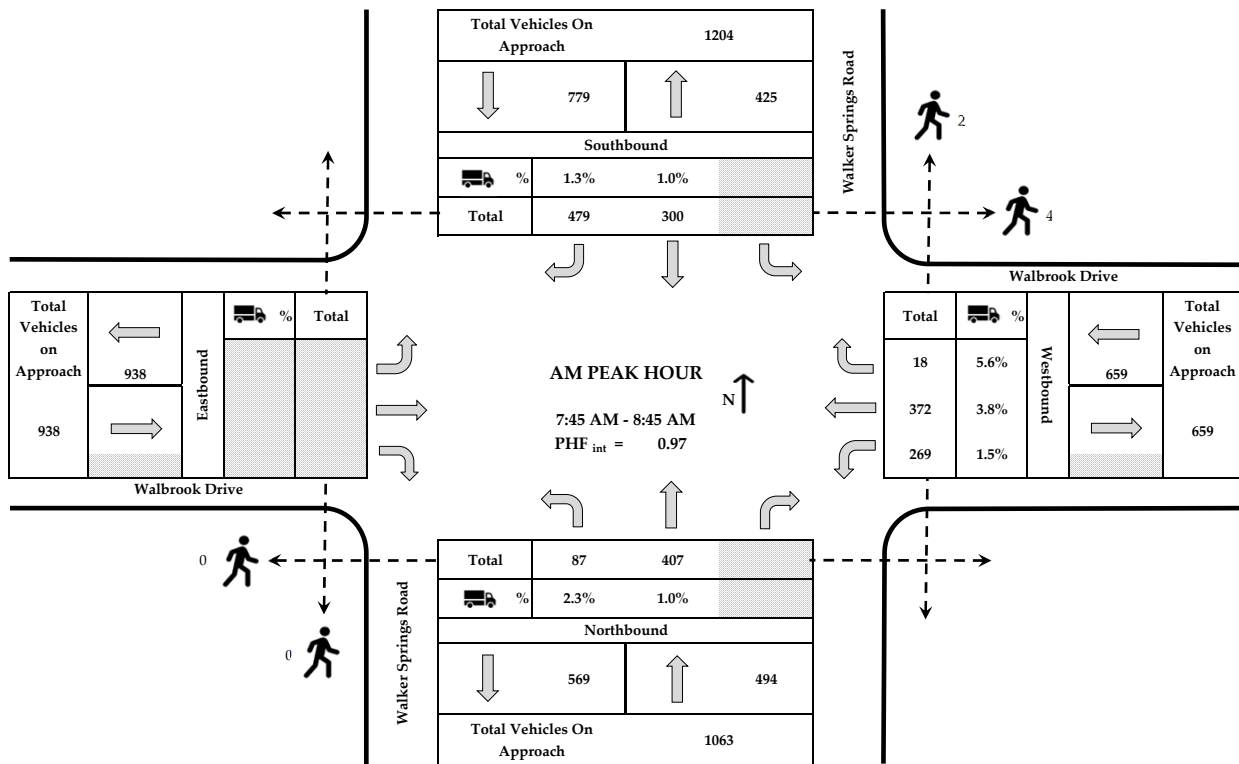
Walker Springs Road at Walbrook Drive
Intersection Traffic Count Totals
8/28/2025



PEAK HOUR DATA

Major Street: Walker Springs Road (SB & NB)
 Minor Street: Walbrook Drive (WB)
 Traffic Control: Traffic Signal

8/28/2025 (Thursday)
 Mostly Sunny and Temperate
 Conducted by: Ajax Engineering



TRAFFIC COUNT DATA

Major Street: Walker Springs Road (SB & NB)
Between Existing Entrances for Exxon and Casey's &
National Fitness Entrance

8/28/2025 (Thursday)
Mostly Sunny and Temperate
Conducted by: Ajax Engineering

	Walker Springs Road	Walker Springs Road		
TIME	SOUTHBOUND	NORTHBOUND	VEHICLE	PEAK
BEGIN	THRU	THRU	TOTAL	HOUR
7:00 AM				
7:15 AM				
7:30 AM				
7:45 AM	201	107	308	7:45 AM - 8:45 AM
8:00 AM	182	94	276	
8:15 AM	188	111	299	
8:30 AM	170	107	277	
8:45 AM				
TOTAL	741	419	1160	
2:00 PM				
2:15 PM				
2:30 PM				
2:45 PM				
3:00 PM				
3:15 PM				
3:30 PM				
3:45 PM				
4:00 PM				
4:15 PM				
4:30 PM				
4:45 PM	129	172	301	4:45 PM - 5:45 PM
5:00 PM	150	175	325	
5:15 PM	141	221	362	
5:30 PM	135	201	336	
5:45 PM				
TOTAL	555	769	1324	

2025 AM Peak Hour 7:45 AM - 8:45 AM

	Walker Springs Road	Walker Springs Road
TIME	SOUTHBOUND	NORTHBOUND
BEGIN	THRU	THRU
7:45 AM	201	107
8:00 AM	182	94
8:15 AM	188	111
8:30 AM	170	107
TOTAL	741	419
PHF	0.92	0.94
Truck %	0.1%	0.7%

2025 PM Peak Hour 4:45 PM - 5:45 PM

	Walker Springs Road	Walker Springs Road
TIME	SOUTHBOUND	NORTHBOUND
BEGIN	THRU	THRU
4:45 PM	129	172
5:00 PM	150	175
5:15 PM	141	221
5:30 PM	135	201
TOTAL	555	769
PHF	0.93	0.87
Truck %	0.5%	0.3%

TRAFFIC COUNT DATA

Major Street: Walker Springs Road (SB and NB)
 Minor Street: National Fitness Entrance (WB)
 Traffic Control: Stop Control on Minor Street

8/28/2025 (Thursday) &
 9/30/2025 (Tuesday)
 Mostly Sunny and Temperate
 Conducted by: Ajax Engineering

TIME BEGIN	Walker Springs Road		National Fitness Entrance		Walker Springs Road		VEHICLE TOTAL	PEAK HOUR
	SOUTHBOUND		WESTBOUND		NORTHBOUND			
	LT	THRU	LT	RT	THRU	RT		
7:00 AM								
7:15 AM								
7:30 AM								
7:45 AM	6	196	5	4	97	10	318	7:45 AM - 8:45 AM
8:00 AM	5	176	6	9	84	10	290	
8:15 AM	7	182	6	1	97	14	307	
8:30 AM	5	168	2	9	96	11	291	
8:45 AM								
TOTAL	23	722	19	23	374	45	1206	
2:00 PM								
2:15 PM								
2:30 PM								
2:45 PM								
3:00 PM								
3:15 PM								
3:30 PM								
3:45 PM								
4:00 PM								
4:15 PM								
4:30 PM								
4:45 PM	17	123	6	11	164	8	329	4:45 PM - 5:45 PM
5:00 PM	12	145	5	8	164	11	345	
5:15 PM	7	131	10	7	202	19	376	
5:30 PM	9	125	10	10	188	13	355	
5:45 PM								
TOTAL	45	524	31	36	718	51	1405	

2025 AM Peak Hour

7:45 AM - 8:45 AM

	Walker Springs Road		National Fitness Entrance		Walker Springs Road	
TIME	SOUTHBOUND		WESTBOUND		NORTHBOUND	
BEGIN	LT	THRU	LT	RT	THRU	RT
7:00 AM	6	196	5	4	97	10
7:15 AM	5	176	6	9	84	10
7:30 AM	7	182	6	1	97	14
7:45 AM	5	168	2	9	96	11
TOTAL	23	722	19	23	374	45
TRUCK %	0.0%	0.1%	0.0%	0.0%	0.7%	0.0%
PHF _{mvmt}	0.82	0.92	0.79	0.64	0.96	0.80
PHF _{app}	0.92		0.70		0.94	
PHF _{int}	0.95					

2025 PM Peak Hour

4:45 PM - 5:45 PM

	Walker Springs Road		National Fitness Entrance		Walker Springs Road	
TIME	SOUTHBOUND		WESTBOUND		NORTHBOUND	
BEGIN	LT	THRU	LT	RT	THRU	RT
4:30 PM	17	123	6	11	164	8
4:45 PM	12	145	5	8	164	11
5:00 PM	7	131	10	7	202	19
5:15 PM	9	125	10	10	188	13
TOTAL	45	524	31	36	718	51
TRUCK %	0.0%	0.5%	0.0%	0.0%	0.3%	0.0%
PHF _{mvmt}	0.66	0.90	0.78	0.82	0.89	0.67
PHF _{app}	0.91		0.84		0.87	
PHF _{int}	0.93					

Note: Thru Volumes on Walker Springs Road were collected on 8/28/25 & the Turning Volumes to and from the National Fitness Entrance were collected on 9/30/25


















APPENDIX E

CAPACITY ANALYSES – HCM WORKSHEETS (SYNCHRO 12) & TRAFFIC SIGNAL TIMING INFORMATION

EXISTING CONDITIONS

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

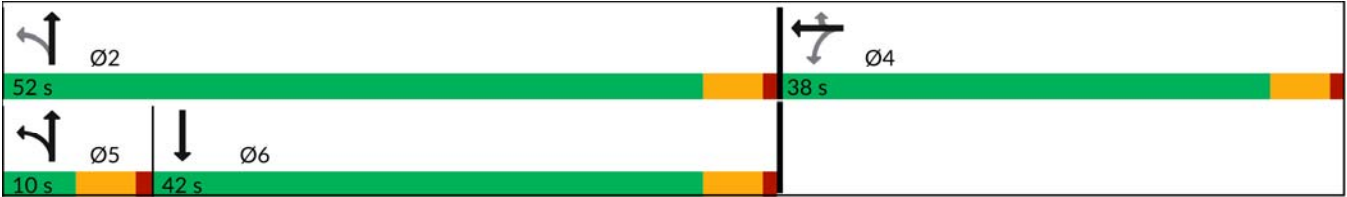
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	269	372	18	87	407	0	0	300	479
Future Volume (vph)	0	0	0	269	372	18	87	407	0	0	300	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-1%			4%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt						0.850					0.908	
Flt Protected					0.979			0.991				
Satd. Flow (prot)	0	0	0	0	3392	1508	0	3554	0	0	3212	0
Flt Permitted					0.979			0.687				
Satd. Flow (perm)	0	0	0	0	3392	1508	0	2463	0	0	3212	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85						349
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		585			512			493			517	
Travel Time (s)		10.0			8.7			8.4			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	2%	4%	6%	2%	1%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	277	384	19	90	420	0	0	309	494
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	661	19	0	510	0	0	803	0
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		5	2 5			6	
Permitted Phases				4		4	2 5					
Detector Phase				4	4	4	5	2 5			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0				10.0	
Minimum Split (s)				23.0	23.0	23.0	10.0				23.0	
Total Split (s)				38.0	38.0	38.0	10.0				42.0	
Total Split (%)				42.2%	42.2%	42.2%	11.1%				46.7%	
Maximum Green (s)				33.0	33.0	33.0	5.0				37.0	
Yellow Time (s)				4.0	4.0	4.0	4.0				4.0	
All-Red Time (s)				1.0	1.0	1.0	1.0				1.0	
Lost Time Adjust (s)					0.0	0.0					0.0	
Total Lost Time (s)					5.0	5.0					5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	
Recall Mode				None	None	None	None				Max	
Act Effct Green (s)					21.2	21.2		47.2			37.1	
Actuated g/C Ratio					0.27	0.27		0.60			0.47	
v/c Ratio					0.72	0.04		0.33			0.47	
Control Delay (s/veh)					30.6	0.2		8.7			9.0	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay (s/veh)					30.6	0.2		8.7			9.0	
LOS					C	A		A			A	
Approach Delay (s/veh)					29.7			8.7			9.0	
Approach LOS					C			A			A	

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	78.4
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay (s/veh):	16.0
Intersection LOS:	B
Intersection Capacity Utilization	68.1%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 4: Walker Springs Road & Walbrook Drive







Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	23.0
Total Split (s)	52.0
Total Split (%)	58%
Maximum Green (s)	47.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	


















HCM 7th TWSC

7: Walker Springs Road & National Fitness Entrance

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	23	374	45	23	722
Future Vol, veh/h	19	23	374	45	23	722
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-8	-	-7	-	-	7
Peak Hour Factor	70	70	94	94	92	92
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	27	33	398	48	25	785
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	864	223	0	0	446	0
Stage 1	422	-	-	-	-	-
Stage 2	442	-	-	-	-	-
Critical Hdwy	5.2	6.1	-	-	4.1	-
Critical Hdwy Stg 1	4.2	-	-	-	-	-
Critical Hdwy Stg 2	4.2	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	436	827	-	-	1125	-
Stage 1	767	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	427	827	-	-	1125	-
Mov Cap-2 Maneuver	538	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Approach	WB	NB		SB		
HCM Ctrl Dly, s/v	10.95	0		0.26		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		665	1125	
HCM Lane V/C Ratio	-	-		0.09	0.022	
HCM Ctrl Dly (s/v)	-	-		10.9	8.3	
HCM Lane LOS	-	-		B	A	
HCM 95th %tile Q(veh)	-	-		0.3	0.1	

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	326	496	66	207	697	0	0	256	318
Future Volume (vph)	0	0	0	326	496	66	207	697	0	0	256	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-1%			4%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt						0.850					0.917	
Flt Protected					0.981			0.989				
Satd. Flow (prot)	0	0	0	0	3458	1568	0	3580	0	0	3226	0
Flt Permitted					0.981			0.613				
Satd. Flow (perm)	0	0	0	0	3458	1568	0	2219	0	0	3226	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85						178
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		585			554			493			517	
Travel Time (s)		10.0			9.4			8.4			8.8	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	0	0	0	358	545	73	227	766	0	0	281	349
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	903	73	0	993	0	0	630	0
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		5	2 5			6	
Permitted Phases				4		4	2 5					
Detector Phase				4	4	4	5	2 5			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0				10.0	
Minimum Split (s)				23.0	23.0	23.0	10.0				23.0	
Total Split (s)				35.0	35.0	35.0	10.0				45.0	
Total Split (%)				38.9%	38.9%	38.9%	11.1%				50.0%	
Maximum Green (s)				30.0	30.0	30.0	5.0				40.0	
Yellow Time (s)				4.0	4.0	4.0	4.0				4.0	
All-Red Time (s)				1.0	1.0	1.0	1.0				1.0	
Lost Time Adjust (s)					0.0	0.0					0.0	
Total Lost Time (s)					5.0	5.0					5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	
Recall Mode				None	None	None	None				Max	
Act Effct Green (s)					27.4	27.4		50.1			40.1	
Actuated g/C Ratio					0.31	0.31		0.57			0.46	
v/c Ratio					0.83	0.13		0.74			0.40	
Control Delay (s/veh)					35.6	4.7		17.4			12.2	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay (s/veh)					35.6	4.7		17.4			12.2	
LOS					D	A		B			B	
Approach Delay (s/veh)					33.3			17.4			12.2	
Approach LOS					C			B			B	

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	87.5
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay (s/veh):	22.1
Intersection LOS:	C
Intersection Capacity Utilization	78.3%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 4: Walker Springs Road & Walbrook Drive



Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive





Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	23.0
Total Split (s)	55.0
Total Split (%)	61%
Maximum Green (s)	50.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	

HCM 7th TWSC

6: Walker Springs Road & National Fitness Entrance

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	31	36	718	51	45	524
Future Vol, veh/h	31	36	718	51	45	524
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-8	-	-7	-	-	7
Peak Hour Factor	84	84	87	87	91	91
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	37	43	825	59	49	576

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1241	442	0
Stage 1	855	-	-
Stage 2	387	-	-
Critical Hdwy	5.2	6.1	-
Critical Hdwy Stg 1	4.2	-	-
Critical Hdwy Stg 2	4.2	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	295	627	-
Stage 1	559	-	-
Stage 2	786	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	276	627	-
Mov Cap-2 Maneuver	412	-	-
Stage 1	559	-	-
Stage 2	736	-	-


















Approach	WB	NB	SB
HCM Ctrl Dly, s/v	13.46	0	0.79
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	505	774
HCM Lane V/C Ratio	-	-	0.158	0.064
HCM Ctrl Dly (s/v)	-	-	13.5	10
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2

PROJECTED CONDITIONS WITHOUT THE PROJECT

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	274	379	18	89	415	0	0	306	489
Future Volume (vph)	0	0	0	274	379	18	89	415	0	0	306	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-1%			4%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt						0.850					0.908	
Flt Protected					0.979			0.991				
Satd. Flow (prot)	0	0	0	0	3392	1508	0	3554	0	0	3212	0
Flt Permitted					0.979			0.677				
Satd. Flow (perm)	0	0	0	0	3392	1508	0	2428	0	0	3212	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85						341
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		585			512			493			517	
Travel Time (s)		10.0			8.7			8.4			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	2%	4%	6%	2%	1%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	282	391	19	92	428	0	0	315	504
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	673	19	0	520	0	0	819	0
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		5	2 5			6	
Permitted Phases				4		4	2 5					
Detector Phase				4	4	4	5	2 5			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0				10.0	
Minimum Split (s)				23.0	23.0	23.0	10.0				23.0	
Total Split (s)				38.0	38.0	38.0	10.0				42.0	
Total Split (%)				42.2%	42.2%	42.2%	11.1%				46.7%	
Maximum Green (s)				33.0	33.0	33.0	5.0				37.0	
Yellow Time (s)				4.0	4.0	4.0	4.0				4.0	
All-Red Time (s)				1.0	1.0	1.0	1.0				1.0	
Lost Time Adjust (s)					0.0	0.0					0.0	
Total Lost Time (s)					5.0	5.0					5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	
Recall Mode				None	None	None	None				Max	
Act Effct Green (s)					21.6	21.6		47.2			37.1	
Actuated g/C Ratio					0.27	0.27		0.60			0.47	
v/c Ratio					0.73	0.04		0.34			0.48	
Control Delay (s/veh)					30.6	0.2		9.0			9.5	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay (s/veh)					30.6	0.2		9.0			9.5	
LOS					C	A		A			A	
Approach Delay (s/veh)					29.8			9.0			9.5	
Approach LOS					C			A			A	

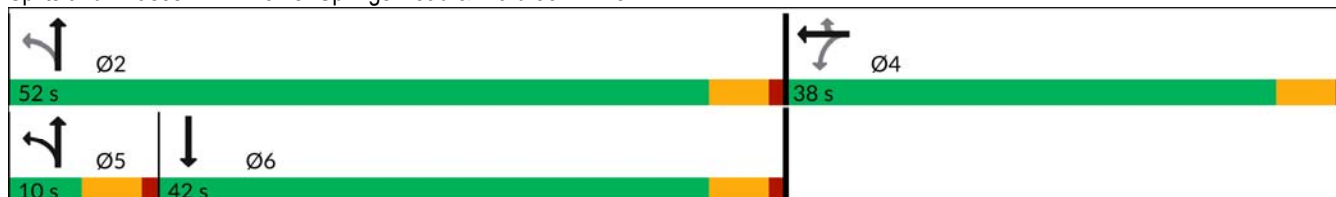
Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	78.8
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay (s/veh):	16.3
Intersection LOS:	B
Intersection Capacity Utilization	69.2%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 4: Walker Springs Road & Walbrook Drive



Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive





Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	23.0
Total Split (s)	52.0
Total Split (%)	58%
Maximum Green (s)	47.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	

HCM 7th TWSC

7: Walker Springs Road & National Fitness Entrance

Intersection

Int Delay, s/veh 0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	23	381	45	23	736
Future Vol, veh/h	19	23	381	45	23	736
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-8	-	-7	-	-	7
Peak Hour Factor	70	70	94	94	92	92
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	27	33	405	48	25	800


















Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	879	227	0
Stage 1	429	-	-
Stage 2	450	-	-
Critical Hdwy	5.2	6.1	-
Critical Hdwy Stg 1	4.2	-	-
Critical Hdwy Stg 2	4.2	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	430	823	-
Stage 1	762	-	-
Stage 2	751	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	420	823	-
Mov Cap-2 Maneuver	533	-	-
Stage 1	762	-	-
Stage 2	734	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	10.99	0	0.25
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	660	1118
HCM Lane V/C Ratio	-	-	0.091	0.022
HCM Ctrl Dly (s/v)	-	-	11	8.3
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	333	506	67	211	711	0	0	261	324
Future Volume (vph)	0	0	0	333	506	67	211	711	0	0	261	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-1%			4%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt						0.850					0.917	
Flt Protected					0.981			0.989				
Satd. Flow (prot)	0	0	0	0	3458	1568	0	3580	0	0	3226	0
Flt Permitted					0.981			0.608				
Satd. Flow (perm)	0	0	0	0	3458	1568	0	2201	0	0	3226	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85						172
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		585			554			493			517	
Travel Time (s)		10.0			9.4			8.4			8.8	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	0	0	0	366	556	74	232	781	0	0	287	356
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	922	74	0	1013	0	0	643	0
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		5	2 5			6	
Permitted Phases				4		4	2 5					
Detector Phase				4	4	4	5	2 5			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0				10.0	
Minimum Split (s)				23.0	23.0	23.0	10.0				23.0	
Total Split (s)				35.0	35.0	35.0	10.0				45.0	
Total Split (%)				38.9%	38.9%	38.9%	11.1%				50.0%	
Maximum Green (s)				30.0	30.0	30.0	5.0				40.0	
Yellow Time (s)				4.0	4.0	4.0	4.0				4.0	
All-Red Time (s)				1.0	1.0	1.0	1.0				1.0	
Lost Time Adjust (s)					0.0	0.0					0.0	
Total Lost Time (s)					5.0	5.0					5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	
Recall Mode				None	None	None	None				Max	
Act Effct Green (s)					27.7	27.7		50.1			40.1	
Actuated g/C Ratio					0.32	0.32		0.57			0.46	
v/c Ratio					0.85	0.13		0.76			0.41	
Control Delay (s/veh)					36.4	4.8		18.2			12.6	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay (s/veh)					36.4	4.8		18.2			12.6	
LOS					D	A		B			B	
Approach Delay (s/veh)					34.0			18.2			12.6	
Approach LOS					C			B			B	

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 87.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay (s/veh): 22.8

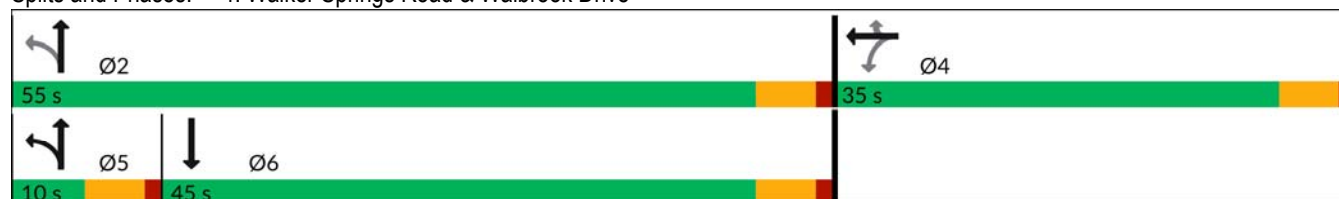
Intersection LOS: C

Intersection Capacity Utilization 79.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Walker Springs Road & Walbrook Drive



Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive





Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	23.0
Total Split (s)	55.0
Total Split (%)	61%
Maximum Green (s)	50.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	

HCM 7th TWSC

6: Walker Springs Road & National Fitness Entrance

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	31	36	732	51	45	534
Future Vol, veh/h	31	36	732	51	45	534
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-8	-	-7	-	-	7
Peak Hour Factor	84	84	87	87	91	91
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	37	43	841	59	49	587

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1263	450	0
Stage 1	871	-	-
Stage 2	392	-	-
Critical Hdwy	5.2	6.1	-
Critical Hdwy Stg 1	4.2	-	-
Critical Hdwy Stg 2	4.2	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	288	621	-
Stage 1	552	-	-
Stage 2	783	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	269	621	-
Mov Cap-2 Maneuver	406	-	-
Stage 1	552	-	-
Stage 2	732	-	-


















Approach	WB	NB	SB
HCM Ctrl Dly, s/v	13.58	0	0.78
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	499	763
HCM Lane V/C Ratio	-	-	0.16	0.065
HCM Ctrl Dly (s/v)	-	-	13.6	10
HCM Lane LOS	-	-	B	B
HCM 95th %tile Q(veh)	-	-	0.6	0.2

PROJECTED CONDITIONS WITH THE PROJECT

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	274	380	21	89	428	0	0	331	511
Future Volume (vph)	0	0	0	274	380	21	89	428	0	0	331	511
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-1%			4%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt						0.850					0.909	
Flt Protected					0.980			0.991				
Satd. Flow (prot)	0	0	0	0	3395	1508	0	3554	0	0	3216	0
Flt Permitted					0.980			0.665				
Satd. Flow (perm)	0	0	0	0	3395	1508	0	2385	0	0	3216	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						85						325
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		375			512			493			395	
Travel Time (s)		6.4			8.7			8.4			6.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	2%	4%	6%	2%	1%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	282	392	22	92	441	0	0	341	527
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	674	22	0	533	0	0	868	0
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		5	2 5			6	
Permitted Phases				4		4	2 5					
Detector Phase				4	4	4	5	2 5			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0				10.0	
Minimum Split (s)				23.0	23.0	23.0	10.0				23.0	
Total Split (s)				36.0	36.0	36.0	10.0				44.0	
Total Split (%)				40.0%	40.0%	40.0%	11.1%				48.9%	
Maximum Green (s)				31.0	31.0	31.0	5.0				39.0	
Yellow Time (s)				4.0	4.0	4.0	4.0				4.0	
All-Red Time (s)				1.0	1.0	1.0	1.0				1.0	
Lost Time Adjust (s)					0.0	0.0					0.0	
Total Lost Time (s)					5.0	5.0					5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	
Recall Mode				None	None	None	None				Max	
Act Effct Green (s)					22.1	22.1		49.2			39.2	
Actuated g/C Ratio					0.27	0.27		0.61			0.48	
v/c Ratio					0.73	0.05		0.35			0.51	
Control Delay (s/veh)					31.8	0.2		9.1			10.3	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay (s/veh)					31.8	0.2		9.1			10.3	
LOS					C	A		A			B	
Approach Delay (s/veh)					30.8			9.1			10.3	
Approach LOS					C			A			B	

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	81.3
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay (s/veh):	16.8
Intersection LOS:	B
Intersection Capacity Utilization	71.0%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 4: Walker Springs Road & Walbrook Drive













Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	23.0
Total Split (s)	54.0
Total Split (%)	60%
Maximum Green (s)	49.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	

Lanes, Volumes, Timings

7: Walker Springs Road & East Proposed Entrance

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	16	7	436	787	3
Future Volume (vph)	12	16	7	436	787	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	12	12	12	12
Grade (%)	7%			-7%	7%	
Storage Length (ft)	0	0	50			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt	0.923				0.999	
Flt Protected	0.979		0.950			
Satd. Flow (prot)	1712	0	1868	3699	3480	0
Flt Permitted	0.979		0.950			
Satd. Flow (perm)	1712	0	1868	3699	3480	0
Link Speed (mph)	10			40	40	
Link Distance (ft)	260			395	340	
Travel Time (s)	17.7			6.7	5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	13	17	8	474	855	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	8	474	858	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.9%			ICU Level of Service A		
Analysis Period (min)	15					

Lanes, Volumes, Timings

9: Walbrook Drive & South Proposed Entrance



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑			↑
Traffic Volume (vph)	0	0	979	1	0	12
Future Volume (vph)	0	0	979	1	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	13	13
Grade (%)		0%	-5%		-2%	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	0	3628	0	0	1715
Flt Permitted						
Satd. Flow (perm)	0	0	3628	0	0	1715
Link Speed (mph)		40	40		10	
Link Distance (ft)		291	375		264	
Travel Time (s)		5.0	6.4		18.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	0	0	1088	1	0	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1089	0	0	13
Sign Control		Stop	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 37.1% ICU Level of Service A

Analysis Period (min) 15

HCM 7th TWSC

7: Walker Springs Road & East Proposed Entrance/National Fitness Entrance

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	12	0	16	19	0	23	7	390	45	23	767	3
Future Vol, veh/h	12	0	16	19	0	23	7	390	45	23	767	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-8	-	-	-7	-	-	7	-
Peak Hour Factor	90	90	90	70	90	70	90	94	94	92	92	90
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	0	0
Mvmt Flow	13	0	18	27	0	33	8	415	48	25	834	3
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1108	1364	419	921	1341	231	837	0	0	463	0	0
Stage 1	885	885	-	454	454	-	-	-	-	-	-	-
Stage 2	223	478	-	467	887	-	-	-	-	-	-	-
Critical Hdwy	8.9	7.9	7.6	5.9	4.9	6.1	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	7.9	6.9	-	4.9	3.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.9	6.9	-	4.9	3.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	108	88	543	344	279	818	806	-	-	1109	-	-
Stage 1	220	259	-	686	701	-	-	-	-	-	-	-
Stage 2	701	464	-	678	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	101	85	543	322	270	818	806	-	-	1109	-	-
Mov Cap-2 Maneuver	178	181	-	322	270	-	-	-	-	-	-	-
Stage 1	215	253	-	679	694	-	-	-	-	-	-	-
Stage 2	667	459	-	641	529	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Ctrl Dly, s/v	18.95		13.52		0.16		0.24					
HCM LOS	C		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	806	-	-	289	482	1109	-	-				
HCM Lane V/C Ratio	0.01	-	-	0.108	0.124	0.023	-	-				
HCM Ctrl Dly (s/v)	9.5	-	-	19	13.5	8.3	-	-				
HCM Lane LOS	A	-	-	C	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.4	0.1	-	-				

HCM 7th TWSC

9: Walbrook Drive & South Proposed Entrance

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑			↑
Traffic Vol, veh/h	0	0	979	1	0	12
Future Vol, veh/h	0	0	979	1	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	-5	-	-2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	0	0	1088	1	0	13


















Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Ctrl Dly, s/v	0	12.35
HCM LOS		B

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	503
HCM Lane V/C Ratio	-	-	0.027
HCM Ctrl Dly (s/v)	-	-	12.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	333	508	78	213	756	0	0	282	341
Future Volume (vph)	0	0	0	333	508	78	213	756	0	0	282	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			2%			-1%			4%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Frt						0.850					0.918	
Flt Protected					0.981			0.989				
Satd. Flow (prot)	0	0	0	0	3458	1568	0	3580	0	0	3230	0
Flt Permitted					0.981			0.600				
Satd. Flow (perm)	0	0	0	0	3458	1568	0	2172	0	0	3230	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						86						164
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		363			554			493			392	
Travel Time (s)		6.2			9.4			8.4			6.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	0	0	0	366	558	86	234	831	0	0	310	375
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	924	86	0	1065	0	0	685	0
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		5	2 5			6	
Permitted Phases				4		4	2 5					
Detector Phase				4	4	4	5	2 5			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0				10.0	
Minimum Split (s)				23.0	23.0	23.0	10.0				23.0	
Total Split (s)				34.0	34.0	34.0	10.0				46.0	
Total Split (%)				37.8%	37.8%	37.8%	11.1%				51.1%	
Maximum Green (s)				29.0	29.0	29.0	5.0				41.0	
Yellow Time (s)				4.0	4.0	4.0	4.0				4.0	
All-Red Time (s)				1.0	1.0	1.0	1.0				1.0	
Lost Time Adjust (s)					0.0	0.0					0.0	
Total Lost Time (s)					5.0	5.0					5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0				3.0	
Recall Mode				None	None	None	None				Max	
Act Effct Green (s)					27.4	27.4		51.0			41.0	
Actuated g/C Ratio					0.31	0.31		0.58			0.46	
v/c Ratio					0.86	0.16		0.80			0.43	
Control Delay (s/veh)					38.4	6.0		19.6			13.0	
Queue Delay					0.0	0.0		0.0			0.0	
Total Delay (s/veh)					38.4	6.0		19.6			13.0	
LOS					D	A		B			B	
Approach Delay (s/veh)					35.6			19.6			13.0	
Approach LOS					D			B			B	

Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	88.4
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.86
Intersection Signal Delay (s/veh):	23.8
Intersection LOS:	C
Intersection Capacity Utilization	82.1%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 4: Walker Springs Road & Walbrook Drive



Lanes, Volumes, Timings

4: Walker Springs Road & Walbrook Drive

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	23.0
Total Split (s)	56.0
Total Split (%)	62%
Maximum Green (s)	51.0
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	

HCM 7th TWSC

6: Walker Springs Road & East Proposed Entrance/National Fitness Entrance

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↕↵		↵	↕↵	
Traffic Vol, veh/h	10	0	13	31	0	36	25	763	51	45	559	12
Future Vol, veh/h	10	0	13	31	0	36	25	763	51	45	559	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	7	-	-	-8	-	-	-7	-	-	7	-
Peak Hour Factor	90	90	90	84	90	84	90	87	87	91	91	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	1	0
Mvmt Flow	11	0	14	37	0	43	28	877	59	49	614	13
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1214	1711	314	1368	1688	468	628	0	0	936	0	0
Stage 1	720	720	-	962	962	-	-	-	-	-	-	-
Stage 2	494	991	-	406	727	-	-	-	-	-	-	-
Critical Hdwy	8.9	7.9	7.6	5.9	4.9	6.1	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	7.9	6.9	-	4.9	3.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.9	6.9	-	4.9	3.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	87	47	647	198	200	607	964	-	-	740	-	-
Stage 1	295	329	-	428	517	-	-	-	-	-	-	-
Stage 2	438	222	-	716	597	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	73	43	647	175	182	607	964	-	-	740	-	-
Mov Cap-2 Maneuver	173	116	-	175	182	-	-	-	-	-	-	-
Stage 1	275	307	-	415	502	-	-	-	-	-	-	-
Stage 2	395	216	-	654	557	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Ctrl Dly, s/v	18.36		22.59		0.26		0.75					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	964	-	-	295	284	740	-	-				
HCM Lane V/C Ratio	0.029	-	-	0.087	0.281	0.067	-	-				
HCM Ctrl Dly (s/v)	8.8	-	-	18.4	22.6	10.2	-	-				
HCM Lane LOS	A	-	-	C	C	B	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	1.1	0.2	-	-				

HCM 7th TWSC

9: Walbrook Drive & South Proposed Entrance

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑			↑
Traffic Vol, veh/h	0	0	1058	4	0	10
Future Vol, veh/h	0	0	1058	4	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	-5	-	-2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	0	0	1176	4	0	11

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

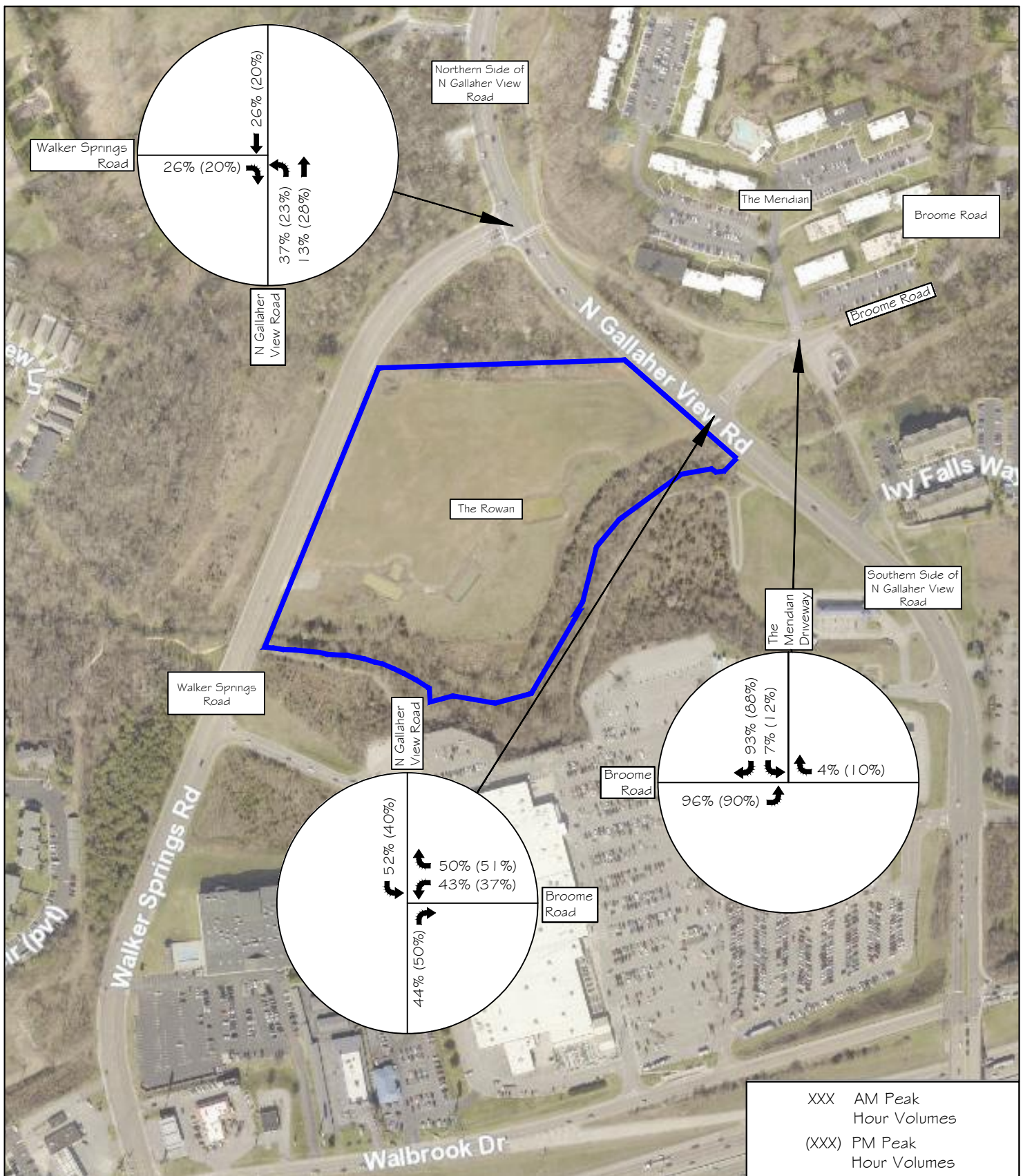
Approach	WB	SB
HCM Ctrl Dly, s/v	0	12.83
HCM LOS		B

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	471
HCM Lane V/C Ratio	-	-	0.024
HCM Ctrl Dly (s/v)	-	-	12.8
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Intersection Name : Walker Springs and Walbrook									
Basic Timing (seconds)		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
Min Green			10		10	5	10		
Gap / Extension			3.0		3.0	3.0	3.0		
Max 1			40		30	20	40		
Max 2									
Yellow Clearance			4.0		4.0	4.0	4.0		
Red Clearance			1.0		1.0	1.0	1.0		
Walk									
Pedestrian Clearance									
Max Recall			x				x		
Active (Enable) Phases			x		x	x	x		
Coordination Timing/(seconds)									
Split #	Coord. Phase	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
Split 1									
Split 2									
Split 3									
Split 4									
Split 5									
Split 6									
Pattern Table					Lead / Lag		Notes		
Pattern#	Cycle	Offset	Split	Seq. #	Phase #				
1									
2									
3									
4									
5									
6									
Day Plan Events									
Day Plan	HH:MM	Pattern			Day Plan	HH:MM	Pattern		
Week Day Plan									
Plan	Sun	Mon	Tue	Wed	Thu	Fri	Sat		
Notes :This intersection is not running a timing plan									

APPENDIX F

THE ROWAN TRIP GENERATION DATA



11812 Black Road
Knoxville, TN 37932
Phone: (865) 556-0042
Email: ajaxengineering@gmail.com

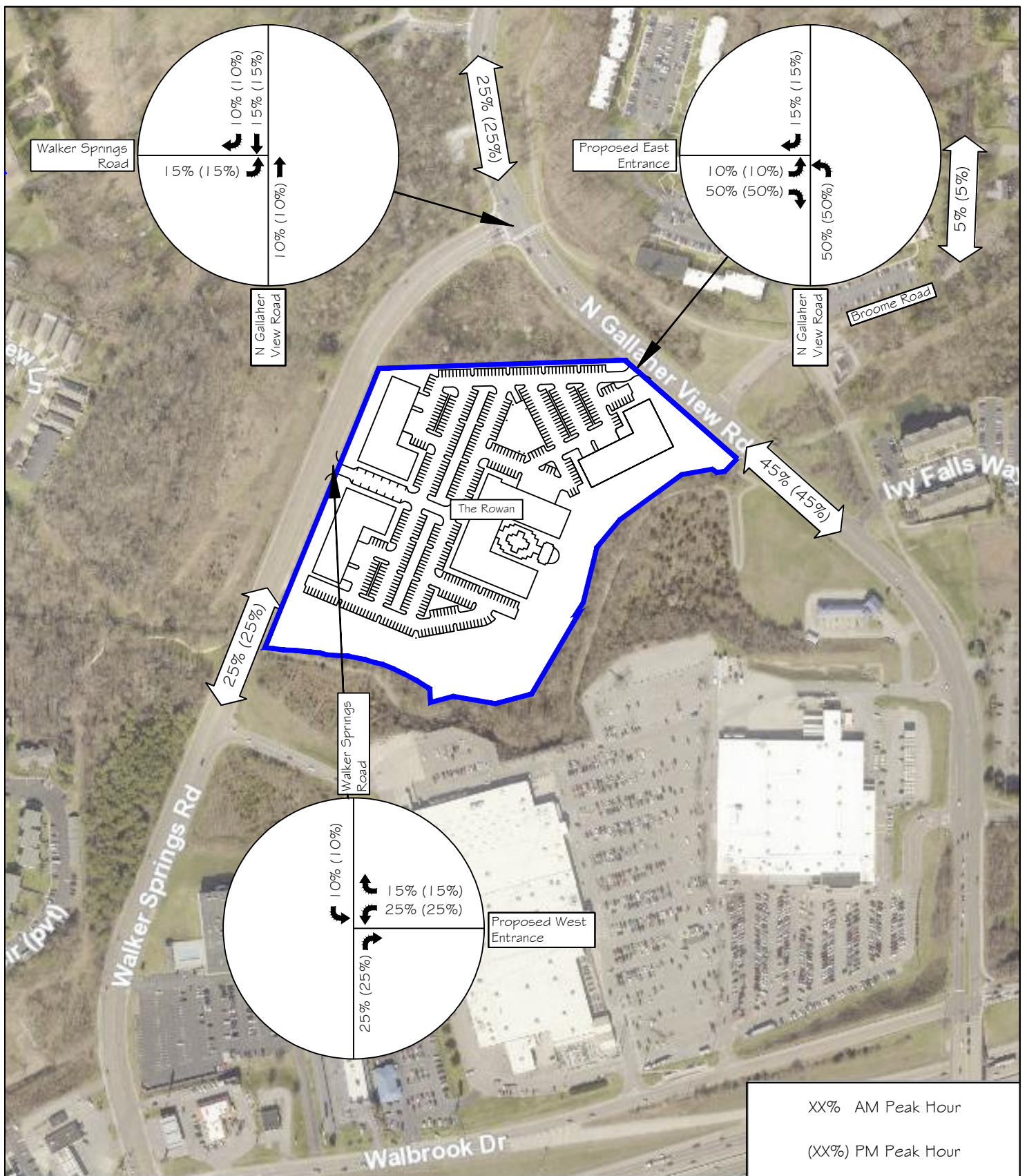
NOT TO SCALE



FIGURE 6b

The Rowan

Observed Distribution of Generated Traffic during AM and PM Peak Hour for The Meridian Apartments



11812 Black Road
Knoxville, TN 37932
Phone: (865) 556-0042
Email: ajaxengineering@gmail.com

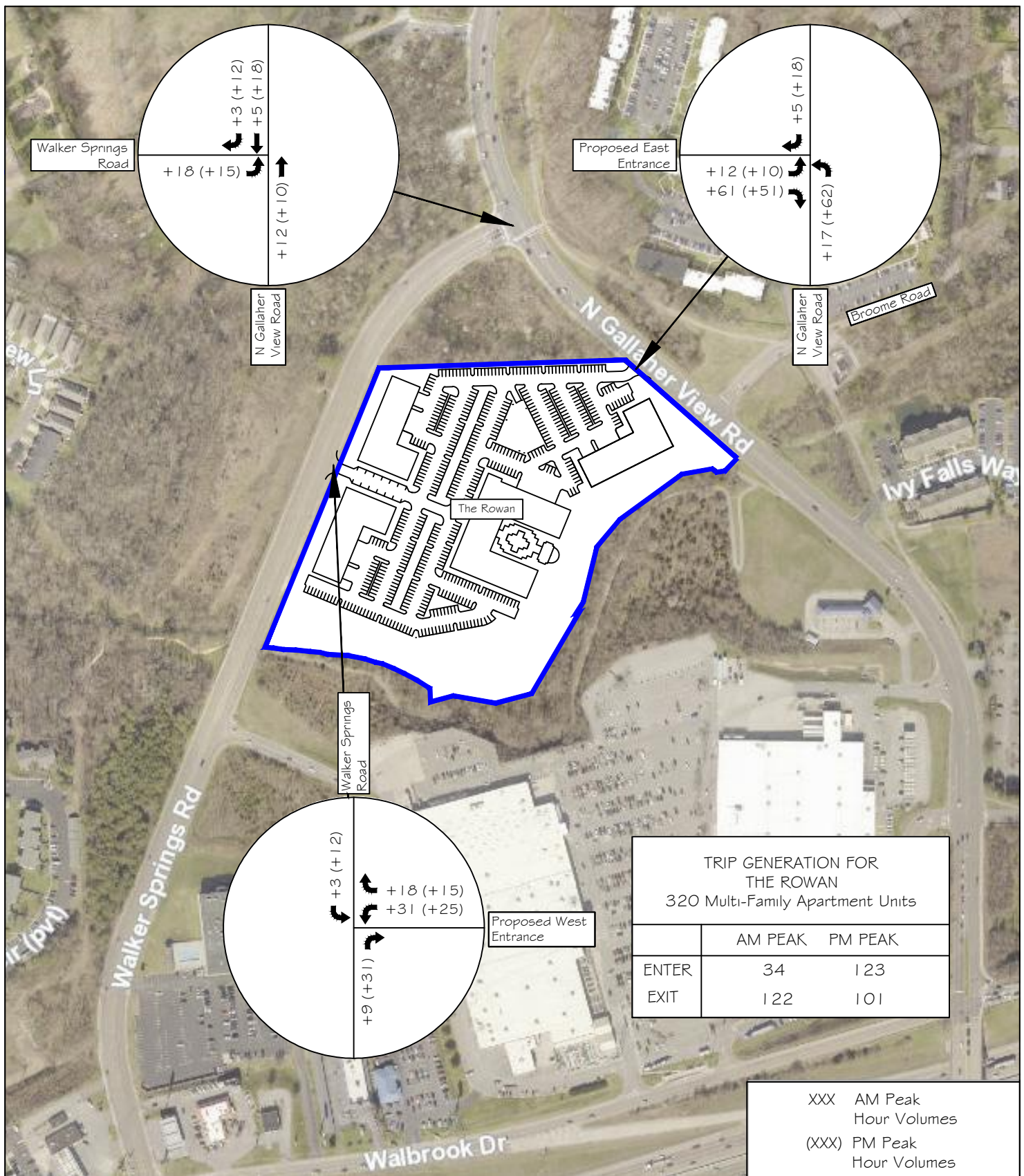
NOT TO SCALE



FIGURE 6c

The Rowan

Directional Distribution of Generated Traffic during AM and PM Peak Hour



11812 Black Road
Knoxville, TN 37932
Phone: (865) 556-0042
Email: ajaxengineering@gmail.com

NOT TO SCALE



FIGURE 7

The Rowan

Traffic Assignment of Generated Traffic
during AM and PM Peak Hour

APPENDIX G

LOCAL TRIP GENERATION DATA

Local Apartment Trip Generation Study

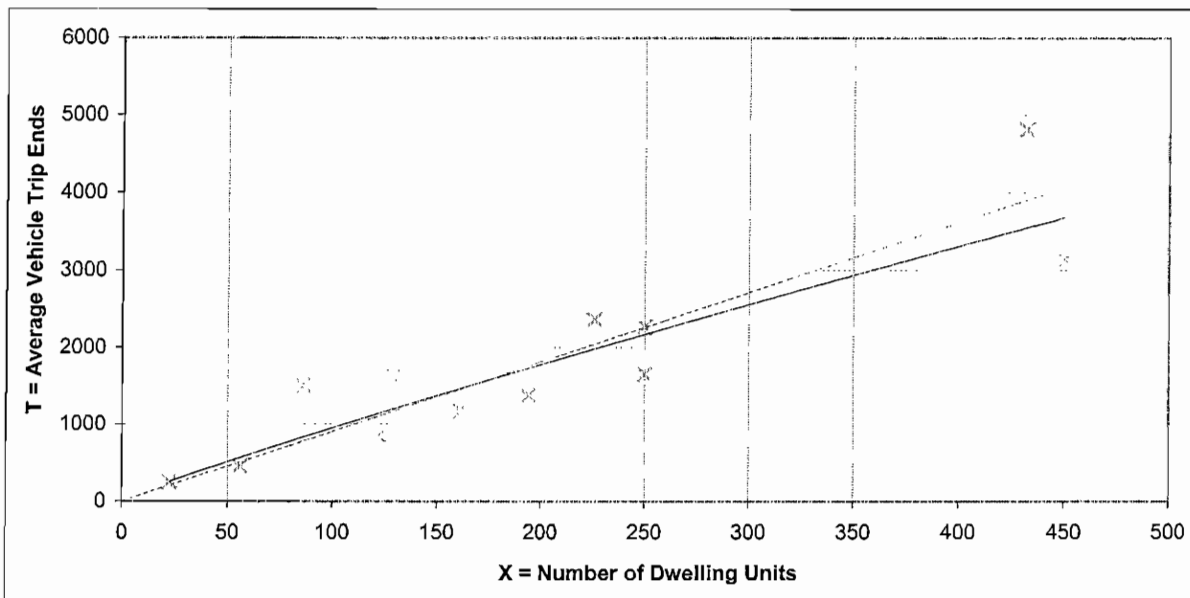
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Number of Studies: 13
Average Number of Dwelling Units: 193
Directional Distribution: 50% entering, 50% exiting

Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
9.03	6.59 - 17.41	2.47

Data Plot and Equation



X Actual Data Points

— Fitted Curve

— Average Rate

Fitted Curve Equation: $T = 15.193(X)^{0.899}$

$R^2 = 0.88$

Local Apartment Trip Generation Study

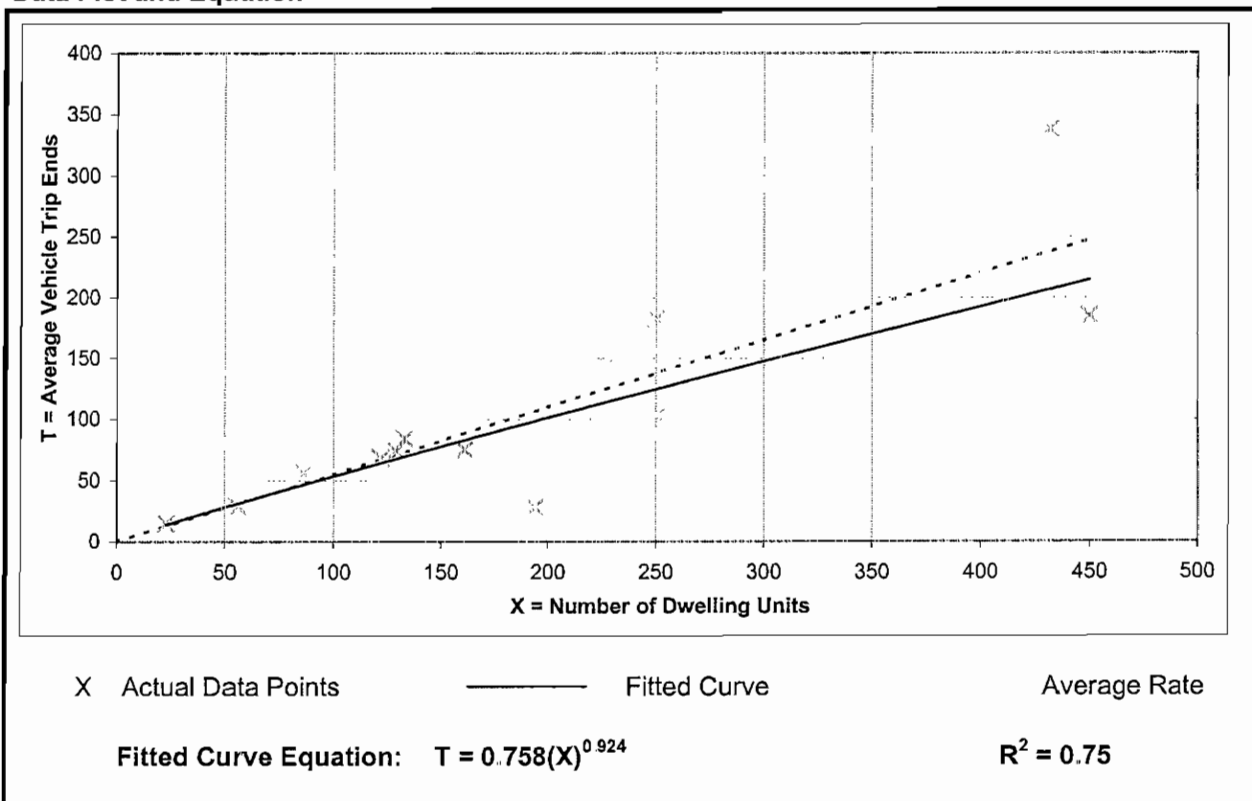
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 13
Average Number of Dwelling Units: 193
Directional Distribution: 22% entering, 78% exiting

Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
0.55	0.14 - 0.78	0.18

Data Plot and Equation



Local Apartment Trip Generation Study

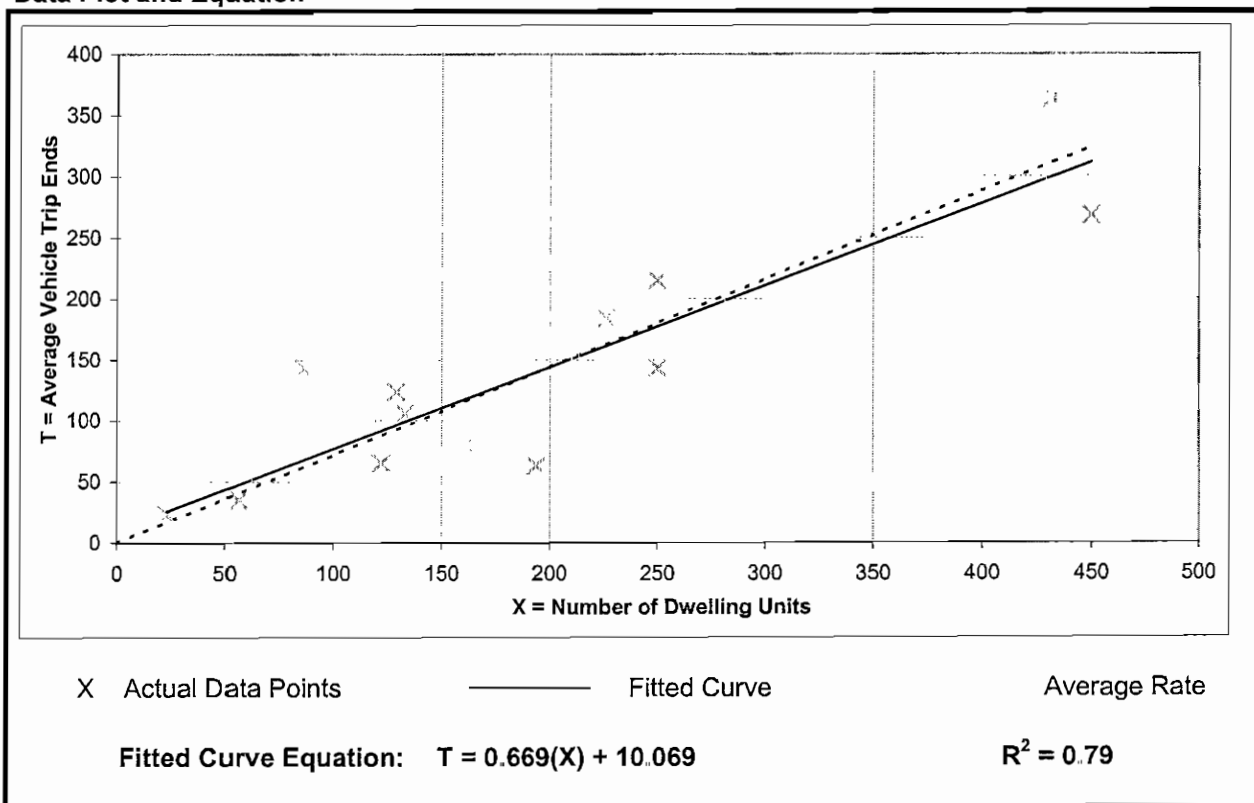
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 13
Average Number of Dwelling Units: 193
Directional Distribution: 55% entering, 45% exiting

Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
0.72	0.32 - 1.66	0.25

Data Plot and Equation



TRIP GENERATION FOR THOMPSON LANDING APARTMENTS

96 Apartments

ITE LAND USE CODE	LAND USE DESCRIPTION	# OF UNITS	GENERATED DAILY TRAFFIC	GENERATED TRAFFIC AM PEAK HOUR			GENERATED TRAFFIC PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
Local Trip Rate	Apartments	96	920	22%	78%		55%	45%	
				11	40	51	41	33	74
Total New Volume Site Trips			920	11	40	51	41	33	74

Data from Local Trip Rates

Trips calculated by using Fitted Curve Equations

TRIP GENERATION FOR THOMPSON LANDING APARTMENTS

96 Apartments

$$96 \text{ Units} = X$$

Weekday:

Fitted Curve Equation: $T = 15.193(X)^{0.899}$

$$T = 15 * 60.54$$

$$\underline{\underline{T = 920 \text{ trips}}}$$

Peak Hour of Adjacent Traffic between 7 and 9 am:

Fitted Curve Equation: $T = 0.758(X)^{0.924}$

$$T = 0.758 * 68$$

$$\underline{\underline{T = 51 \text{ trips}}}$$

Peak Hour of Adjacent Traffic between 4 and 6 pm:

Fitted Curve Equation: $T = 0.669(X)+10.069$

$$T = 0.669 * 96 + 10.07$$

$$\underline{\underline{T = 74 \text{ trips}}}$$

APPENDIX H

2022 CENSUS BUREAU DATA

Destination Analysis

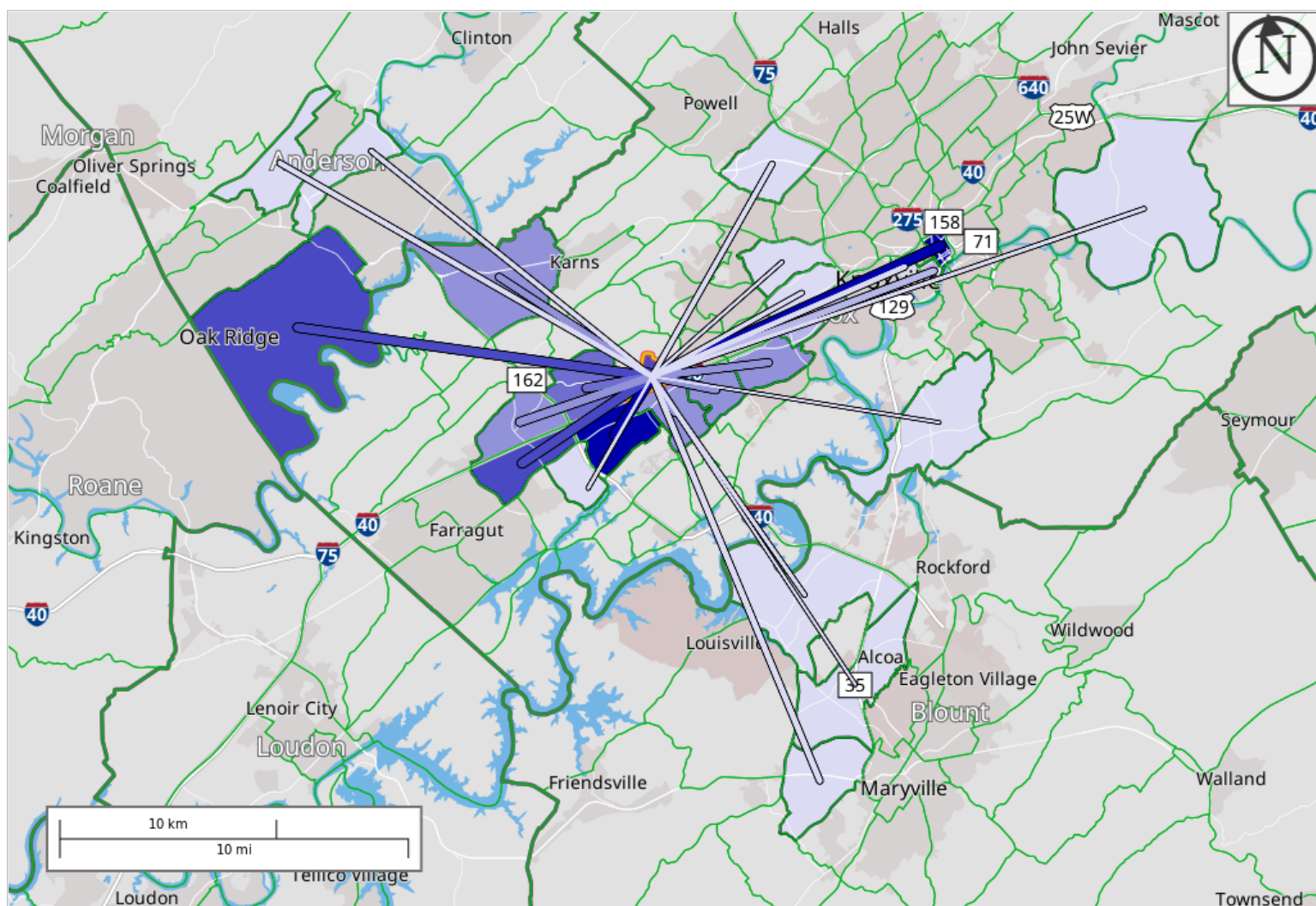
Workers: Living in 46.10 (Knox, TN)

Showing: Employment locations grouped by Census Tracts

Created by the U.S. Census Bureau's OnTheMap <https://onthemap.ces.census.gov> on 08/20/2025

Counts of All Jobs from Home Selection Area to Work Census Tracts in 2022

All Workers



Map Legend

Job Count

- 114 - 129
- 98 - 113
- 82 - 97
- 66 - 81
- 50 - 65
- 34 - 49
- 18 - 33

Selection Areas

- ◇ Home Area

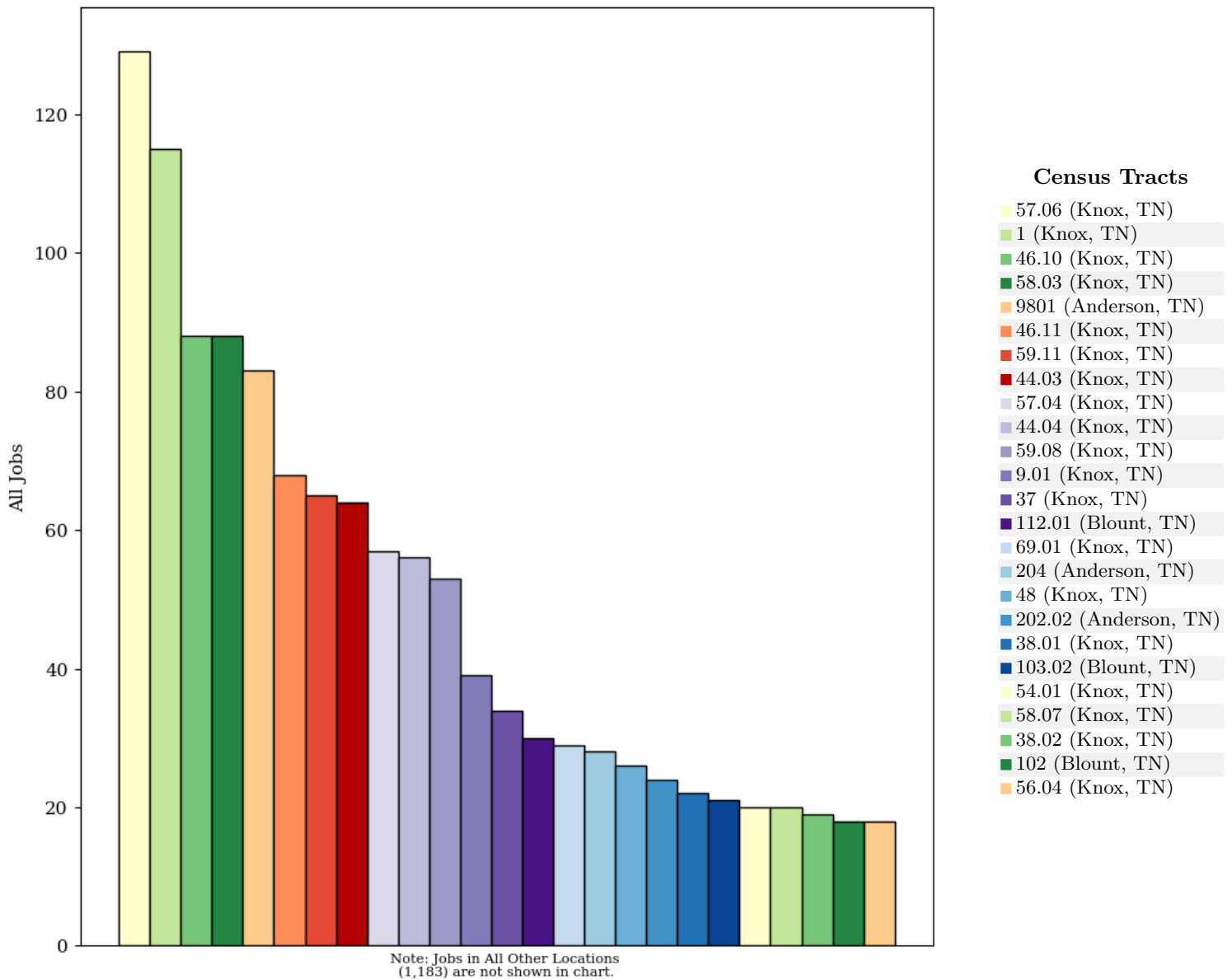
Job Count

- ◇ 114 - 129
- ◇ 98 - 113
- ◇ 82 - 97
- ◇ 66 - 81
- ◇ 50 - 65
- ◇ 34 - 49
- ◇ 18 - 33



All Jobs from Home Selection Area to Work Census Tracts in 2022

All Workers



All Jobs from Home Selection Area to Work Census Tracts in 2022

All Workers

Census Tracts as Work Destination Area	2022	
	Count	Share
All Census Tracts	2,397	100.0%
57.06 (Knox, TN)	129	5.4%
1 (Knox, TN)	115	4.8%
46.10 (Knox, TN)	88	3.7%
58.03 (Knox, TN)	88	3.7%
9801 (Anderson, TN)	83	3.5%
46.11 (Knox, TN)	68	2.8%
59.11 (Knox, TN)	65	2.7%
44.03 (Knox, TN)	64	2.7%
57.04 (Knox, TN)	57	2.4%
44.04 (Knox, TN)	56	2.3%

Census Tracts as Work Destination Area	2022	
	Count	Share
59.08 (Knox, TN)	53	2.2%
9.01 (Knox, TN)	39	1.6%
37 (Knox, TN)	34	1.4%
112.01 (Blount, TN)	30	1.3%
69.01 (Knox, TN)	29	1.2%
204 (Anderson, TN)	28	1.2%
48 (Knox, TN)	26	1.1%
202.02 (Anderson, TN)	24	1.0%
38.01 (Knox, TN)	22	0.9%
103.02 (Blount, TN)	21	0.9%
54.01 (Knox, TN)	20	0.8%
58.07 (Knox, TN)	20	0.8%
38.02 (Knox, TN)	19	0.8%
102 (Blount, TN)	18	0.8%
56.04 (Knox, TN)	18	0.8%
All Other Locations	1,183	49.4%

Additional Information

Analysis Settings

Analysis Type	Destination
Destination Type	Census Tracts
Selection area as	Home
Year(s)	2022
Job Type	All Jobs
Selection Area	46.10 (Knox, TN) from Census Tracts
Selected Census Blocks	61
Analysis Generation Date	08/20/2025 11:10 - OnTheMap 6.25.2
Code Revision	bd5bc0a714230c9c2b909d905c8753cb532970e8
LODES Data Vintage	20241022_1605

Data Sources

Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2022).

Notes

1. Race, Ethnicity, Educational Attainment, and Sex statistics are beta release results and are not available before 2009.
2. Educational Attainment is only produced for workers aged 30 and over.
3. Firm Age and Firm Size statistics are beta release results for All Private jobs and are not available before 2011.

APPENDIX I

KNOX COUNTY TURN LANE VOLUME THRESHOLD WORKSHEETS

TABLE 5B

**RIGHT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH**

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	<100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99						
100 - 149 150 - 199						
200 - 249 250 - 299					Yes	Yes
300 - 349 350 - 399			Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

$$(767 / 2) * 1.05 = 403$$

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
3 Fewer Than 25 25 - 49 50 - 99				Yes	Yes Yes	Yes Yes
100 - 149 150 - 199		Yes	Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes Yes	Yes Yes	Yes	Yes Yes	Yes Yes	Yes Yes
300 - 349 350 - 399	Yes Yes	Yes Yes	Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499	Yes Yes	Yes Yes	Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

Walker Springs Road at
East Proposed Entrance

2027 Projected AM
SB Right Turns = 3

Right Turn Lane NOT
Warranted

* Or through volume only if a left-turn lane exists.

TABLE 5B

**RIGHT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH**

$$(559 / 2) * 1.05 = 294$$

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	<100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
12 Fewer Than 25 25 - 49 50 - 99						
100 - 149 150 - 199						
200 - 249 250 - 299					Yes	Yes
300 - 349 350 - 399			Yes	Yes	Yes	Yes
400 - 449 450 - 499		Yes	Yes	Yes	Yes	Yes
500 - 549 550 - 599	Yes	Yes	Yes	Yes	Yes	Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

Walker Springs Road at
East Proposed Entrance

2027 Projected PM
SB Right Turns = 12

Right Turn Lane NOT
Warranted

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
Fewer Than 25 25 - 49 50 - 99				Yes	Yes	Yes
100 - 149 150 - 199		Yes	Yes	Yes	Yes	Yes
200 - 249 250 - 299	Yes	Yes	Yes	Yes	Yes	Yes
300 - 349 350 - 399	Yes	Yes	Yes	Yes	Yes	Yes
400 - 449 450 - 499	Yes	Yes	Yes	Yes	Yes	Yes
500 - 549 550 - 599	Yes	Yes	Yes	Yes	Yes	Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

* Or through volume only if a left-turn lane exists.

TABLE 5B

**RIGHT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH**

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	<100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99						
100 - 149 150 - 199						
200 - 249 250 - 299					Yes	Yes
300 - 349 350 - 399			Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

$$(979 / 2) * 1.05 = 514$$

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
1 Fewer Than 25 25 - 49 50 - 99				Yes	Yes Yes	Yes Yes
100 - 149 150 - 199		Yes	Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
300 - 349 350 - 399	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

Walbrook Drive at
South Proposed Entrance

2027 Projected AM
WB Right Turns = 1

Right Turn Lane NOT
Warranted

* Or through volume only if a left-turn lane exists.

TABLE 5B

**RIGHT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH**

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	<100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99						
100 - 149 150 - 199						
200 - 249 250 - 299					Yes	Yes Yes
300 - 349 350 - 399			Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

$$(1058 / 2) * 1.05 = 556$$

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
4 Fewer Than 25 25 - 49 50 - 99				Yes	Yes Yes	Yes Yes
100 - 149 150 - 199		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
300 - 349 350 - 399	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

Walbrook Drive at
South Proposed Entrance

2027 Projected PM
WB Right Turns = 4

Right Turn Lane NOT
Warranted

* Or through volume only if a left-turn lane exists.

APPENDIX J

VEHICLE QUEUE WORKSHEETS (SIMTRAFFIC 12)

Queuing and Blocking Report

Intersection: 4: Walker Springs Road & Walbrook Drive

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	365	302	48	214	153	194	296
Average Queue (ft)	234	148	10	109	42	90	127
95th Queue (ft)	334	278	33	179	110	157	242
Link Distance (ft)	464	464	464	472	472	490	490
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Walker Springs Road & East Proposed Entrance/National Fitness Entrance

Movement	EB	WB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	L	T	TR
Maximum Queue (ft)	52	63	28	35	6	5
Average Queue (ft)	19	26	3	6	0	0
95th Queue (ft)	46	53	18	24	5	3
Link Distance (ft)	213	197			311	311
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50	50		
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				0	0	

Intersection: 9: Walbrook Drive & South Proposed Entrance

Movement	SB
Directions Served	R
Maximum Queue (ft)	38
Average Queue (ft)	12
95th Queue (ft)	37
Link Distance (ft)	223
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

Intersection: 4: Walker Springs Road & Walbrook Drive

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	T	T	TR
Maximum Queue (ft)	494	399	61	402	329	156	212
Average Queue (ft)	308	223	23	227	151	75	86
95th Queue (ft)	439	363	49	348	286	130	165
Link Distance (ft)	506	506	506	472	472	484	484
Upstream Blk Time (%)	0	0		0	0		
Queuing Penalty (veh)	0	0		0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Walker Springs Road & East Proposed Entrance/National Fitness Entrance

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	45	76	41	6	53
Average Queue (ft)	17	34	10	0	16
95th Queue (ft)	44	65	33	5	43
Link Distance (ft)	192	210		484	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		50
Storage Blk Time (%)			0		0
Queuing Penalty (veh)			0		1

Intersection: 9: Walbrook Drive & South Proposed Entrance

Movement	SB
Directions Served	R
Maximum Queue (ft)	35
Average Queue (ft)	8
95th Queue (ft)	30
Link Distance (ft)	244
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1

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CIVIL ENGINEERING / TRAFFIC ENGINEERING