



# Traffic Impact Analysis

For:  
Austin Homes Development  
Knoxville, Tennessee

For Submittal To:  
Knoxville – Knox County Planning

Prepared for:  
Knoxville's Community Development Corporation (KCDC)

December 16, 2019

Prepared By:



**Civil & Environmental  
Consultants, Inc.**



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## 1.0 EXECUTIVE SUMMARY

This Traffic Impact Study has been performed for the proposed Austin Homes redevelopment located in Knoxville, Tennessee. The site is bounded on the north by East New Street, on the south by East Summit Hill Drive, on the east by Martin Luther King Jr. Avenue, and on the west by Willow Avenue.

The roadway network has been analyzed to determine the impact that the proposed redevelopment will have on the forecasted traffic operations of existing and future intersections.

Upon completion of the proposed redevelopment (including Phases 1A, 1B, 2, and C), the site is forecasted to generate a net increase of 3,590 daily trips, 202 AM peak hour trips, and 291 PM peak hour trips. Capacity analyses have been performed at seven (7) intersections for Existing Year 2019 and Background 2024, and at eight (8) intersections for the Future 2024 with redevelopment scenarios.

The following mitigation measures are recommended under the Future 2024 scenario with the proposed redevelopment:

### Sight Distance

It is recommended that adequate sight distance be provided at all proposed intersections and parking lot driveways. A visibility triangle shall be provided at all intersections consistent with AASHTO guidelines where there are no vertical obstructions (walls, fences, signs, structures, vegetation, etc.) to vision between 2.5 and 10 feet above the elevation of the center of the roadway. Based on the Site Plan in Appendix A, it appears that all proposed intersections provide at least a 60-degree angle of intersection. It is recommended that no objects be placed or constructed within the visibility triangle for any proposed or modified intersection. Any existing objects within visibility triangles should be removed during construction. As referenced in the Subdivision Regulations, AASHTO guidelines must be met. Measurements shall be taken 15-feet back from the edge of pavement. Sight triangles are provided to scale for all proposed access points to be modified on the Site Plan included in Appendix A.

### E. Summit Hill Dr. at S. Bell St.

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### E. Summit Hill Dr. at Lula Powell Dr.

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.
- Pedestrian enhancements for the existing crosswalk should be considered including an actuated pedestrian crossing signal such as a rectangular rapid flash beacon (RRFB). The existing pedestrian stairway heading north from E. Summit Hill Ave. should be retained and

ADA access be provided where shown throughout the development on the Site Plan in Appendix A.

### **E. Summit Hill Dr. at Martin Luther King Jr. Ave.**

- Based upon the capacity analysis, this intersection is expected to continue operating at acceptable overall levels of service. It is proposed with the development to remove the existing channelized southbound right-turn lane. The southbound right-turn movement would then become a shared lane with the outside southbound through lane. The removal of the channelized southbound right-turn is modeled in the capacity analysis provided under the Future 2024 condition with the proposed development. As shown in the capacity analysis, removal of the channelized southbound right-turn lane and utilizing the existing outside through lane as a shared southbound through/right-turn lane is expected to operate with acceptable levels of service and 95<sup>th</sup> percentile queue. Therefore, removal of the channelized right-turn lane as proposed is appropriate based on anticipated future conditions and provides better visibility for the turning movement without sacrificing level of service. The existing pavement and other infrastructure used to support the channelized right-turn lane will be removed as included on the site development plans submitted separately. Sidewalk extensions will be provided through to the existing sidewalk on the northern and western end of the existing median where the current channelized right-turn lane exists.

Should an exclusive right-turn lane ever be needed, there is sufficient space provided in the existing median requiring removal of an existing street light.

### **Martin Luther King Jr. Ave. at Harriet Tubman St.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **Harriet Tubman St. at Burge St.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **McCalla St. at S. Bell St.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **Georgia St. at Willow Ave.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **Harriet Tubman St. at Proposed Project Boulevard (Georgia Street Extension)**

- This proposed intersection is anticipated to operate at LOS A under all conditions. Recommendations for the proposed intersection include 12-foot approach/departure lanes with a 22-foot median on the boulevard section. Additionally, pedestrian access should be provided to tie-into the existing pedestrian facilities along Harriet Tubman St.

### **Proposed Project Boulevard (Georgia Street Extension)**

- As shown on the Site Plan in Appendix A, a boulevard section is being proposed as an extension of Georgia Street across First Creek, intersecting S. Bell St. and terminating at Harriet Tubman St. S. Bell St. is proposed to be removed south of the Georgia St. extension. This extension provides better east-west connectivity through the redevelopment area and additional access options should they be required with future development. The roadway section west of S. Bell St. is planned to provide one 12-foot lane in each direction and sidewalks on each side of the roadway. The roadway section east of S. Bell St. is planned to be a boulevard section with one 12-foot lane in each direction, a 22-foot median, on-street parking on each side, a multi-use path through the middle of the median, and pedestrian crosswalks at each internal driveway. Volumes through the area are expected to be evenly distributed and function at the same acceptable levels of service as surrounding external roadway connections. It is recommended to provide landscaping conducive to appropriate sight distance along the boulevard and at all internal roadway and driveway connections.

### **Proposed Burge Drive Modifications**

- Currently Burge Drive is a one-way driveway providing 10-20 feet of pavement including sections of on-street parking on the south side of the roadway. This roadway provides westbound connection from Harriet Tubman St. to S. Bell St. No sidewalks are provided along the roadway. As shown on the Site Plan in Appendix A, Burge Drive is proposed to be widened from S. Bell St. to Harriet Tubman St. and converted to allow traffic in each direction. The widening includes providing one 12-foot lane in each direction and on-street parking provided on both sides. In addition, sidewalk is proposed on both sides of the roadway.

### **General**

- It is recommended on each of the proposed roadways to provide sidewalks as illustrated on the Site Plan in **Appendix A**. Understanding that there are significant slopes on site that are not conducive to ADA compliance, areas where appropriate slopes are available should meet ADA guidelines. During the six hours of traffic counts completed on site, pedestrians and bicycles were also counted. While there were pedestrians observed at most intersections, there were no bicycles observed during the observation times. Therefore, bicycle lanes and shared bicycle lanes, in addition to the ones already provided, are not recommended at this time.

## **2.0 INTRODUCTION**

### **2.1 Purpose of Study**

The purpose of this Traffic Impact Study is to determine the impact of the proposed redevelopment on the roadway network and analyze the forecasted traffic operations of intersections. This study investigates the impacts of all proposed phases of the redevelopment to determine if the site and surrounding roadway facilities will be able to accommodate the increase in projected traffic under the existing roadway conditions. Trip generation associated with all proposed phases have been included to determine the overall impact of the redevelopment on the surrounding roadway network.

### **2.2 Methodology**

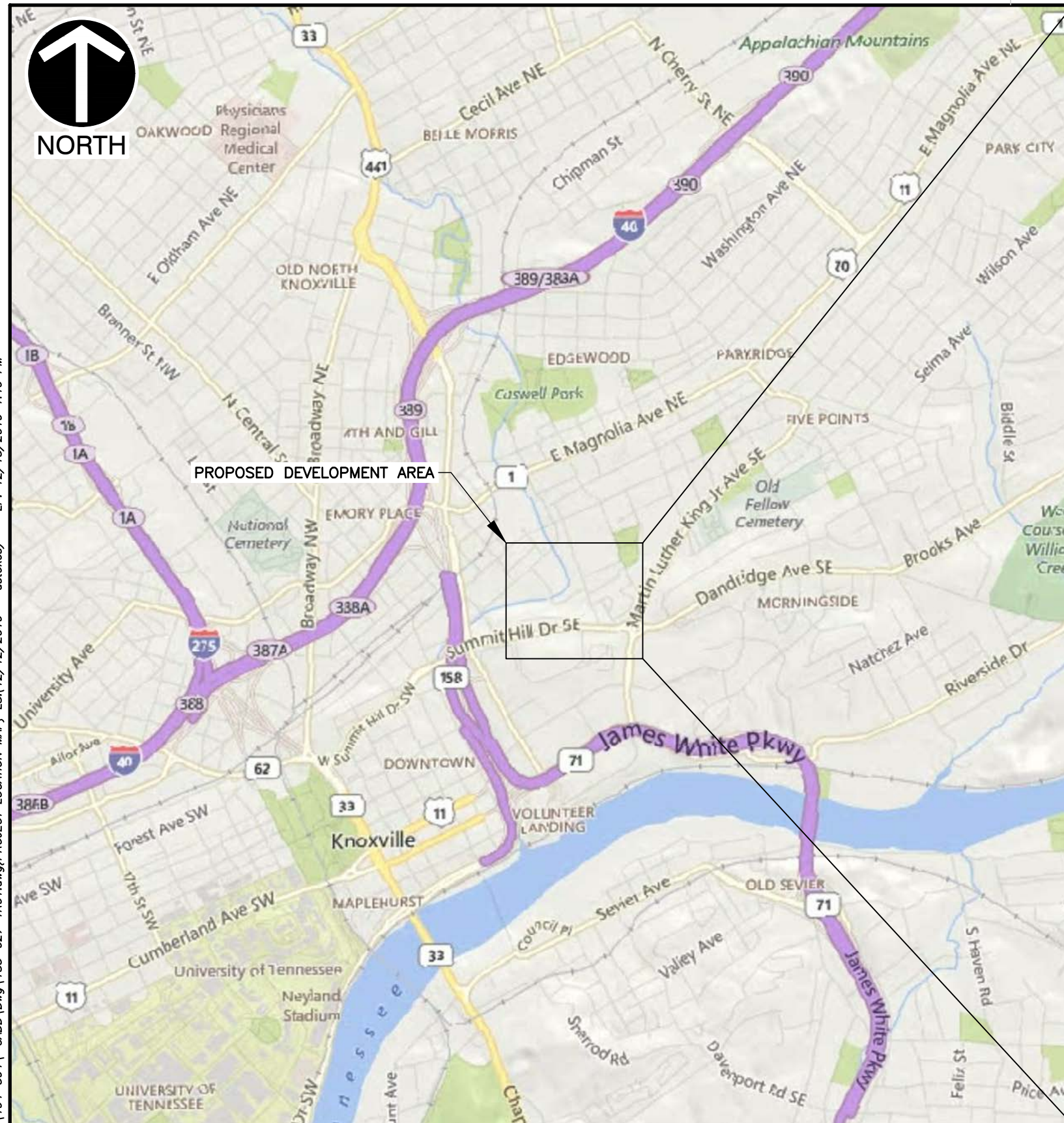
This Traffic Impact Study consists of data collection, determining the number of trips expected to be generated by the redevelopment and the directional distribution of these trips, analyses of the study intersections with the redevelopment, and the development of recommendations to mitigate the impacts of the redevelopment on the study area roadway network. Development densities and anticipated trip generation have been included to provide an overall evaluation of the redevelopment on the surrounding roadway network.

### **2.3 Proposed Redevelopment**

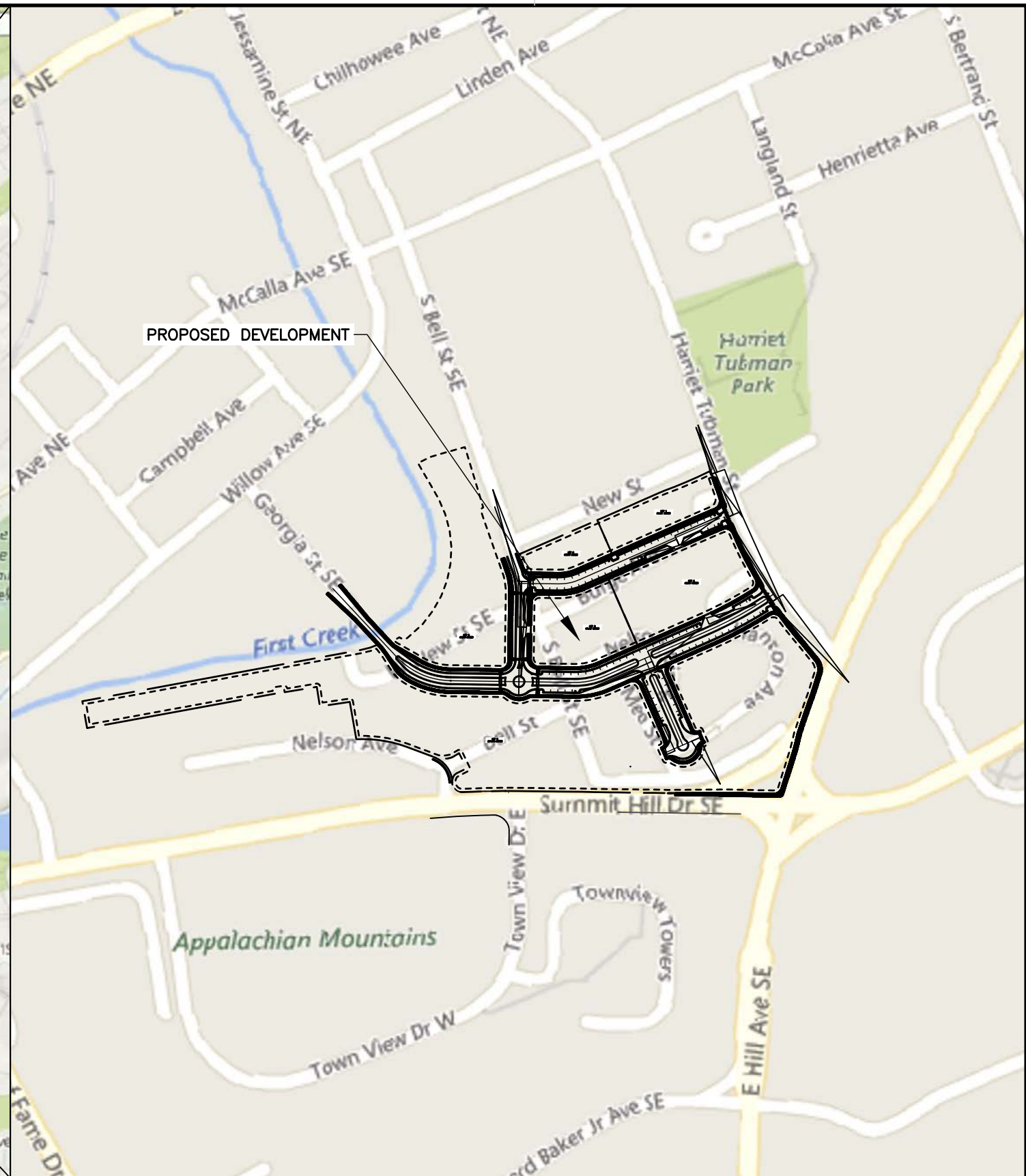
The redevelopment site is located west of Martin Luther King Jr. Ave., north of East Summit Hill Drive, and between Harriett Tubman Street and Willow Avenue. The redevelopment is anticipated to occur in four (4) total phases resulting in up to 420 residential dwelling units. For trip generation estimates, all dwelling units are conservatively assumed to be apartments using the local trip generation rates from Knoxville-Knox County Planning.

The Project Map and Project Aerials of the proposed redevelopment are illustrated in **Figure 1** and **Figure 2**, respectively. The locations of each phase of redevelopment is also illustrated in **Figure 2**.





PROPOSED DEVELOPMENT AREA



PROPOSED DEVELOPMENT

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PROJECT LOCATION MAP

DRAWN BY:	AAS	CHECKED BY:	RGM	APPROVED BY:	KLB	FIGURE NO.:	<b>001</b>
DATE:	NOVEMBER 2019	DWG SCALE:	NTS	PROJECT NO.:	194-594		





**LEGEND**

- ① STUDY INTERSECTION



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PROJECT AERIAL

DRAWN BY:	AAS	CHECKED BY:	RGM	APPROVED BY:	KLB	FIGURE NO.:	<b>002</b>
DATE:	NOVEMBER 2019	DWG SCALE:	NTS	PROJECT NO.:	194-594		



## 2.4 Site Access

Roadway improvements are planned to support the proposed redevelopment including:

- Internal network of access drives and upgrades to Burge Dr. and East New St. to support the different areas of the site as shown on the site plan, and
- Extension of Georgia Street to cross First Creek to the west providing a western connection to Willow Ave. and a boulevard section to the east providing access to Harriett Tubman St.
- Removal of S. Bell St. south of the proposed Georgia St. Extension.

Access into the development is proposed based on the following:

- From the north via South Bell St. & Harriet Tubman St. at McCalla Ave.
- From the south via E. Summit Hill Ave. at South Bell St. & Martin Luther King Jr. Ave. at Harriet Tubman St.
- From the west via Georgia St. (Bridge over First Creek) & Hall of Fame Dr.
- From the east via Harriet Tubman St. at Burge Dr. & Extended Georgia St.

E. New Street is proposed to be re-aligned to become one-way eastbound. Burge Drive is proposed to be converted from a one-way eastbound street to a two-way street with on-street parking on each side and sidewalks.

The proposed boulevard section of Georgia Street from S. Bell St. to Harriet Tubman St. is proposed to have one lane in each direction with on-street parking on each side and a 22-foot median. In addition, sidewalks are proposed on each side of the roadway throughout the entire proposed Georgia Street extension.

South Bell Street is proposed to be removed south of the proposed Georgia Street extension. This will remove the existing intersection of Nelson St. at S. Bell St. and will allow traffic on Nelson St. to connect directly to E. Summit Hill Ave as does today but without the need to stop at S. Bell St.

Pedestrian access will be provided where feasible accommodating ADA access where possible as shown on the site plan. Existing pedestrian access will be maintained and pedestrian sidewalk routes will be provided in locations shown on the site plan.

Planned vegetation clearing and necessary grading work is recommended at all site access points and internal intersections to provide adequate sight distance.

The site plan for the proposed redevelopment is provided in **Appendix A**.

## 2.5 Study Area

For purposes of this Traffic Impact Analysis, E. Summit Hill Ave., McCalla Ave., E. New St., Burge Dr. and Georgia St. are considered east-west oriented roadways. MLK Jr. Ave., Harriet Tubman St., S. Bell St., Lula Powell Dr., and Willow Ave. are considered north-south oriented roadways.

The study area intersections and existing traffic control are summarized in **Table 1** below.

<b>Table 1 – Study Intersections</b>	
<b>Intersection</b>	<b>Existing Traffic Control</b>
E. Summit Hill Ave. at S. Bell St.	Unsignalized T-Intersection
E. Summit Hill Ave. at Lula Powell Dr.	Unsignalized T-Intersection
E. Summit Hill Ave. at Martin Luther King Jr. Ave	Signalized
Martin Luther King Jr. Ave. at Harriet Tubman St.	Unsignalized T-Intersection
Harriet Tubman St. at Burge Dr. / E. New St.	Unsignalized T-Intersection
S. Bell St. at McCalla Ave.	Unsignalized
Georgia St. at Willow Ave.	Unsignalized

## 3.0 EXISTING CONDITIONS

### 3.1 Roadway Network

Roadway geometry, posted speed limits, and functional classifications for the roadways were obtained from the Knoxville-Knox County Major Road Plan. This information is summarized in **Table 2**.

<b>Table 2 – Roadway Information</b>			
<b>Roadway</b>	<b>Number of Lanes</b>	<b>Posted Speed Limit</b>	<b>Knoxville-Knox County Major Road Plan Functional Classification</b>
E. Summit Hill Ave.	4	35	Minor Arterial
Martin Luther King Jr. Ave.	3 (Bike Lane Each Side / Shared Bike Lane at E. Summit Hill Ave.)	35	Major Collector
Harriet Tubman St.	2 (Bike Lane Each Side)	30	Minor Collector

<b>Table 2 – Roadway Information</b>			
<b>Roadway</b>	<b>Number of Lanes</b>	<b>Posted Speed Limit</b>	<b>Knoxville-Knox County Major Road Plan Functional Classification</b>
McCalla Ave.	2 (Bike Lane Each Side)	Not Posted	Minor Collector
Lula Powell Dr.	4	Not Posted	Local
S. Bell St.	2	Not Posted	Local
Georgia St.	2	Not Posted	Local
Willow Ave.	2 (On-Street Parking Each Side)	Not Posted	Local
Burge Dr.	1 (One-Way EB)	Not Posted	Not Classified as a Street
E. New St.	1 (One-Way WB)	Not Posted	Not Classified as a Street

The following descriptions pertain to roadway conditions within the project vicinity.

- E. Summit Hill Ave. has two through lanes in each direction with a raised median and left-turn lanes at each cross-street. The pavement width is approximately 62-feet within the study area. Curb and gutter and sidewalks are provided on both sides of the roadway. A pedestrian crossing is provided at Lula Powell Dr. connecting the sidewalks on each side of the roadway. A pedestrian walkway with stairs is provided north of E. Summit Hill Ave. to facilitate pedestrian connectivity to the study area. The steep slopes are not conducive to provide ADA access north of E. Summit Hill Ave. Knoxville Area Transit (KAT) provides bus service for routes 12, 30, 33, and 34 each providing nearby access to Knoxville Station.
- Martin Luther King Jr. Ave. has two through lanes in each direction south of Harriet Tubman St. with turn lanes at the signalized intersection with E. Summit Hill Ave and a shared bike lane. The pavement width is approximately 62-feet within the study area. North of Harriet Tubman St. there is a dedicated bike lane with one lane in each direction and a two-way left-turn lane. Curb and gutter and sidewalks are provided on both sides of the roadway. KAT provides bus service for routes 12, 30, 33, and 34 each providing nearby access to Knoxville Station.



- Harriet Tubman St. has one lane in each direction with bike lanes on each side. The pavement width is approximately 45-feet within the study area. Curb and gutter and sidewalks are provided on both sides of the roadway. KAT provides bus service for routes 12 and 34 each providing nearby access to Knoxville Station.
- S. Bell St. has one lane in each direction with sidewalk on each side. The pavement width is approximately 26-feet within the study area with curb and gutter. KAT provides bus service for route 34 providing nearby access to Knoxville Station.
- Lula Powell Dr. has two lanes in each direction with sidewalk on each side. The pavement width is approximately 26-feet within the study area with curb and gutter. KAT provides bus service for route 34 providing nearby access to Knoxville Station. This roadway is the primary access road to Green Elementary School.
- McCalla Ave. provides one lane in each direction with a 36-foot traveled way, bike lanes on each side, curb and gutter, and sidewalks on each side. KAT provides bus service for routes 34 and 12 providing nearby access to Knoxville Station.
- Georgia St. provides one lane in each direction with a 36-foot traveled way, curb and gutter, and sidewalks on each side.
- Willow Ave. provides one lane in each direction with a 46-foot traveled way, on-street parking on each side, curb and gutter, and sidewalks on each side.
- E. New St. is a westbound one-way driveway providing 10-20 feet of pavement including sections of on-street parking on the north side of the roadway. This roadway provides eastbound connection from S. Bell St. to Harriet Tubman St. No sidewalks are provided along the roadway.
- Burge Dr. is an eastbound one-way driveway providing 10-20 feet of pavement including sections of on-street parking on the south side of the roadway. This roadway provides westbound connection from Harriet Tubman St. to S. Bell St. No sidewalks are provided along the roadway.

### 3.2 Traffic Data

Annualized Average Daily Traffic (AADT) volumes were obtained from TDOT along roads in proximity to the proposed redevelopment. **Table 3** provides a summary of the AADT. During the last ten (10) years in the vicinity of the proposed redevelopment, the aggregate traffic volumes have experienced a negative growth of approximately -0.6% per year from 2009-2018. Over the past five (5) years, traffic volumes has experienced a growth of approximately 0.9% per year.

<b>Table 3 – TDOT Traffic History</b>	
<b>Year</b>	<b>Station 000373 E. Summit Hill Avenue West of Redevelopment</b>
2009	11,111
2010	9,796
2011	10,112
2012	10,415
2013	10,257
2014	10,031
2015	9,732
2016	9,995
2017	10,031
2018	10,510

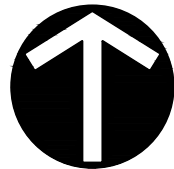
CEC’s sub-consultant, Marr Traffic, performed weekday morning and afternoon peak-period vehicle turning movement counts on Tuesday, October 15, 2019. Traffic counts were obtained at the seven (7) existing intersections described in **Table 1** and are included in **Appendix B**. The volumes were collected in 15-minute intervals to determine the AM (7:00 AM-9:00 AM) and PM (2:00 PM-6:00 PM) peak hour volumes as well as the peak hour factors.

Intersection peak hours are summarized in **Table 4**.

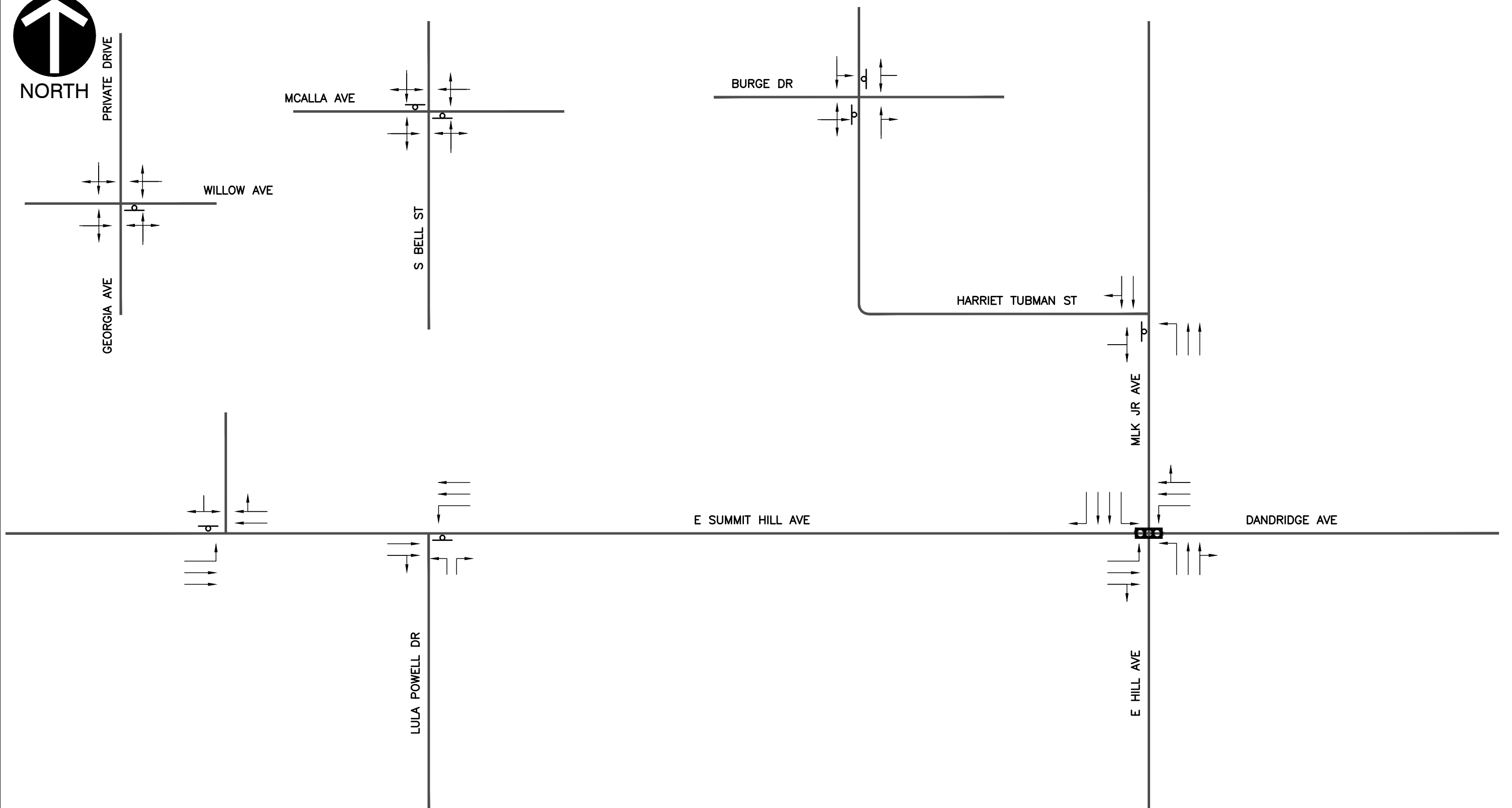
<b>Table 4 – Intersection Peak Hours</b>		
<b>Intersection</b>	<b>AM Peak Hour</b>	<b>PM Peak Hour</b>
E. Summit Hill Ave. at S. Bell St.	7:30 AM - 8:30 AM	5:00 PM - 6:00 PM
E. Summit Hill Ave. at Lula Powell Dr.	7:15 AM - 8:15 AM	5:00 PM - 6:00 PM
E. Summit Hill Ave. at Martin Luther King Jr. Ave	7:15 AM - 8:15 AM	4:45 PM - 5:45 PM
Martin Luther King Jr. Ave. at Harriet Tubman St.	7:15 AM - 8:15 AM	3:30 PM - 4:30 PM
Harriet Tubman St. at Burge Dr. / E. New St.	7:15 AM - 8:15 AM	3:15 PM - 4:15 PM
S. Bell St. at McCalla Ave.	7:15 AM - 8:15 AM	3:30 PM - 4:30 PM
Georgia St. at Willow Ave.	7:15 AM - 8:15 AM	4:15 PM - 5:15 PM

The Existing 2019 Intersection Geometry is documented in **Figure 3**, and the Existing 2019 Peak Hour Traffic Volumes are included in **Figure 4**. The AADT data as well as the peak hour turning movement counts are provided in **Appendix C**. Although intersections listed above in **Table 4** did not experience the same peak hours, the peak hour volumes of each intersection were used as a more conservative approach.

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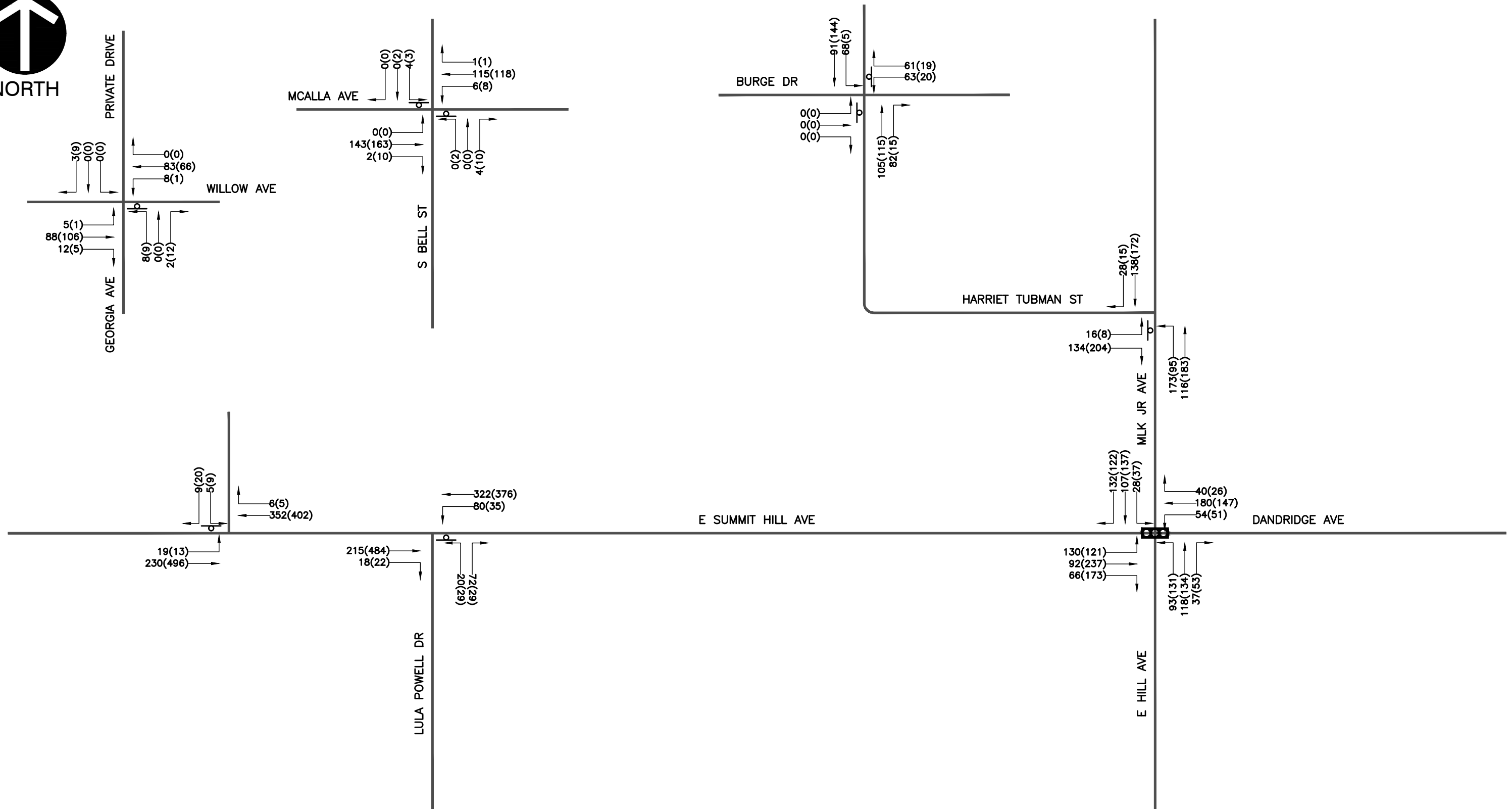
-  EXISTING INTERSECTION GEOMETRY
-  EXISTING STOP SIGN
-  EXISTING TRAFFIC SIGNAL

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<b>EXISTING 2019 INTERSECTION GEOMETRY</b>			
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DATE:	NOVEMBER 2019	DWG SCALE:	NTS
APPROVED BY:	KLB	PROJECT NO:	194-594
			FIGURE NO.: <b>003</b>






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**LEGEND**

- TURNING MOVEMENT
- xx AM PEAK HOUR TRAFFIC VOLUME
- (xx) PM PEAK HOUR TRAFFIC VOLUME

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<b>EXISTING 2019 PEAK HOUR VOLUMES</b>			
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DATE:	NOVEMBER 2019	DWG SCALE:	NTS
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PROJECT NO.:	194-594		

## 4.0 BACKGROUND CONDITIONS

### 4.1 Background Traffic Growth

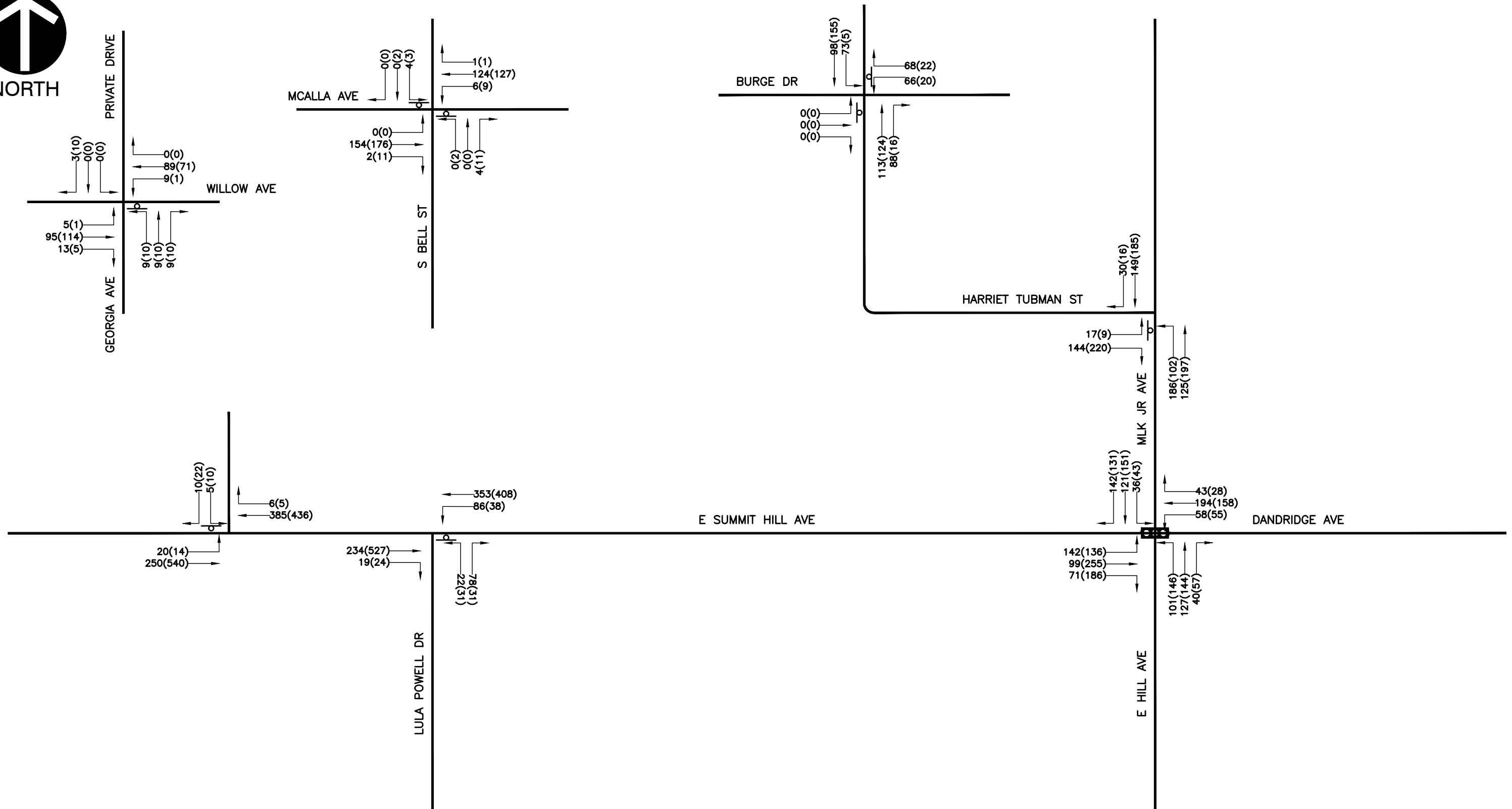
Historic traffic data from the TDOT count stations were used to evaluate historic traffic trends and determine an appropriate growth rate for the study area. TDOT Historic ADT data for Station 000373 along E. Summit Hill Ave. just west of the proposed redevelopment indicates a negative annual growth rate over 10 years and a 0.9% growth rate over the last 5 years. A higher growth rate than 0.9% is anticipated in the area based on regional growth observations. Therefore, a 1.5% annual growth rate was applied to existing traffic volumes to conservatively evaluate future conditions.

### 4.2 Other Future Developments

Traffic volumes associated with Phase 4 of the Five Points KCDC development are included as background traffic for this study. Phases 1-3 of the Five Points KCDC development are completed and associated traffic volumes are assumed to be included in the traffic counts obtained as part of this traffic study. This development is located east of S. Kyle Street along MLK Jr. Ave. At the time of completion of this study, CEC is not aware of any other future developments planned within the study area. The Background 2024 Peak Hour Traffic Volumes are shown in **Figure 5**.



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→ TURNING MOVEMENT

XX AM PEAK HOUR TRAFFIC VOLUME

(XX) PM PEAK HOUR TRAFFIC VOLUME

  
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**2024 BACKGROUND PEAK HOUR VOLUMES**

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DATE:	NOVEMBER 2019	DWG SCALE:	NTS	PROJECT NO.:	194-594		

## 5.0 PROJECT TRAFFIC

Project traffic used in this analysis is defined as the vehicle trips expected to be generated by the proposed redevelopment distributed onto the study area roadway network. The anticipated traffic associated with the redevelopment was forecasted using trip generation, trip distribution, and trip assignment.

### 5.1 Trip Generation

The proposed redevelopment will consist of residential uses across multiple phases and is provided in **Table 5**. Traffic expected to be generated by the proposed redevelopment was calculated using the local trip generation rates from Knoxville-Knox County Planning for the local apartment land use. These calculations result in the total trips anticipated to be generated by the site.

Internal capture, pass by trips, and diverted linked trips were not considered for this site since the proposed land use is residential only. Large portions of the study area are currently developed with residential land uses. Trip generation associated with these existing land uses within the redevelopment site area were not included as a trip reduction providing a more conservative analysis on the study area roadway network.

Daily, AM peak hour, and PM peak hour trips for the proposed redevelopment were calculated and are summarized in **Table 5**.

Phase	Proposed Land Use	Density		Daily Trips	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
1A	Knoxville Local Apartment	105	Dwelling Units	997	56	12	44	81	45	36
1B	Knoxville Local Apartment	105	Dwelling Units	997	56	12	44	81	45	36
2	Knoxville Local Apartment	106	Dwelling Units	1,006	57	13	44	81	45	36
C	Knoxville Local Apartment	104	Dwelling Units	989	56	12	44	80	44	36
<b>Proposed Gross Trip Generation</b>				<b>3,989</b>	<b>225</b>	<b>49</b>	<b>176</b>	<b>323</b>	<b>179</b>	<b>144</b>
<b>10% Transit Trip Reduction</b>				<b>399</b>	<b>23</b>	<b>5</b>	<b>18</b>	<b>32</b>	<b>18</b>	<b>14</b>
<b>Total New Trips</b>				<b>3,590</b>	<b>202</b>	<b>44</b>	<b>158</b>	<b>291</b>	<b>161</b>	<b>130</b>



## 5.2 Trip Distribution and Assignment

Distribution of project traffic was determined based on the existing directional distribution of traffic along the project network and review of existing land uses. Site traffic is expected to be oriented along the roadway network as follows:

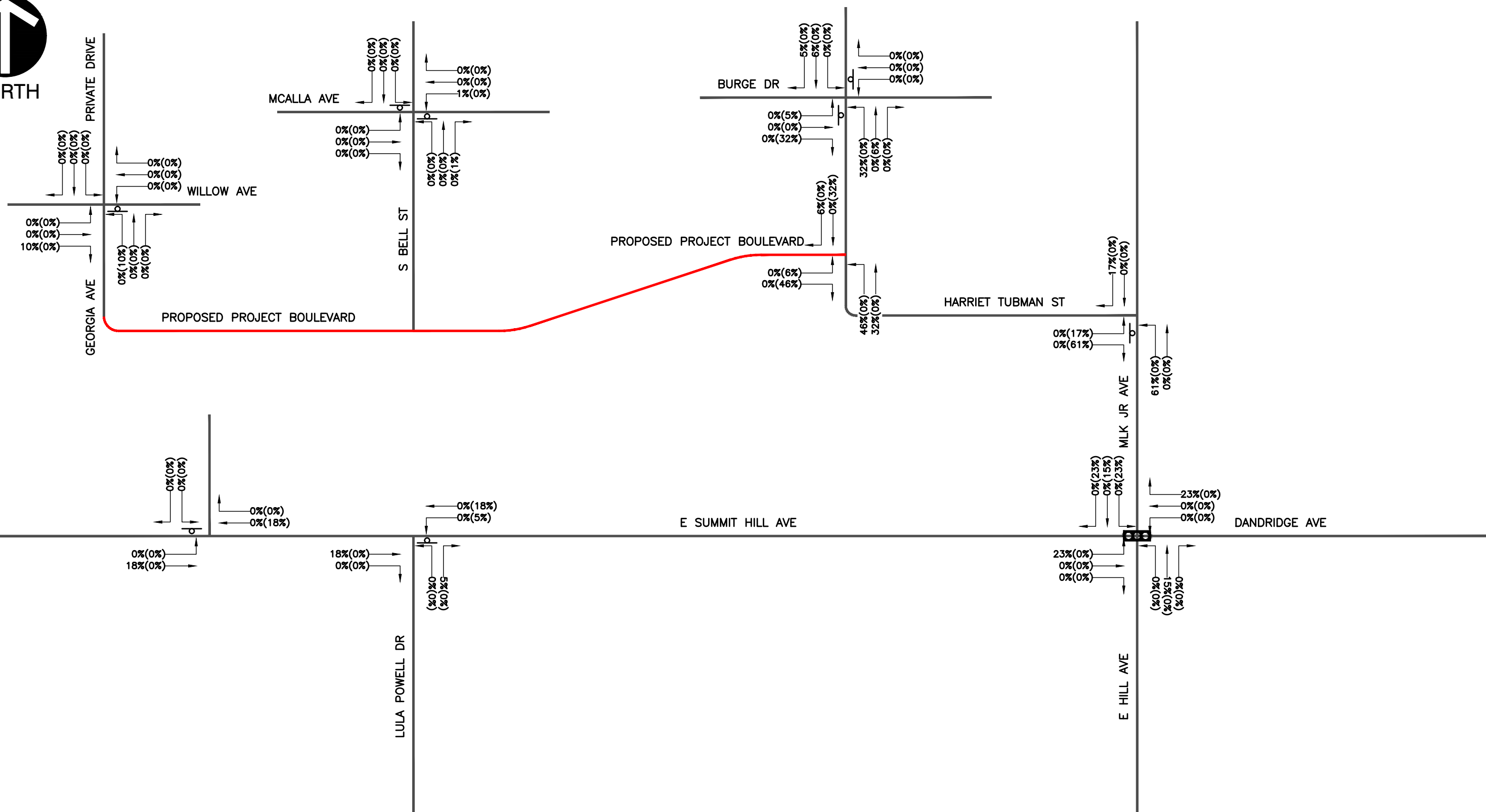
- 18% to/from the west along E. Summit Hill Ave.
- 23% to/from the east along Dandridge Ave.
- 17% to/from the east along MLK Jr. Ave.
- 15% to/from the south along E. Hill Ave.
- 11% to/from the north along Harriet Tubman St.
- 5% to/from the south along Lula Powell Dr.
- 1% to/from the north along McCalla Ave.
- 10% to/from the north along Georgia St. (Based on proposed extension crossing First Creek)

The Trip Distribution is illustrated in **Figure 6**. Project Trips for the proposed redevelopment are summarized in **Figure 7**. Worksheets that illustrate the trip generation for the proposed redevelopment and the volume worksheets for each of the study intersections are provided in **Appendix C**.

## 6.0 FUTURE CONDITIONS

The 2024 Future condition is defined as the forecasted traffic conditions on the roadway network with the completed proposed redevelopment and associated trips.

The 2024 Future Peak Hour Traffic Volumes are shown in **Figure 8**.



**LEGEND**

- TURNING MOVEMENT
- xx% ENTERING TRIP DISTRIBUTION
- (xx%) EXITING TRIP DISTRIBUTION

  
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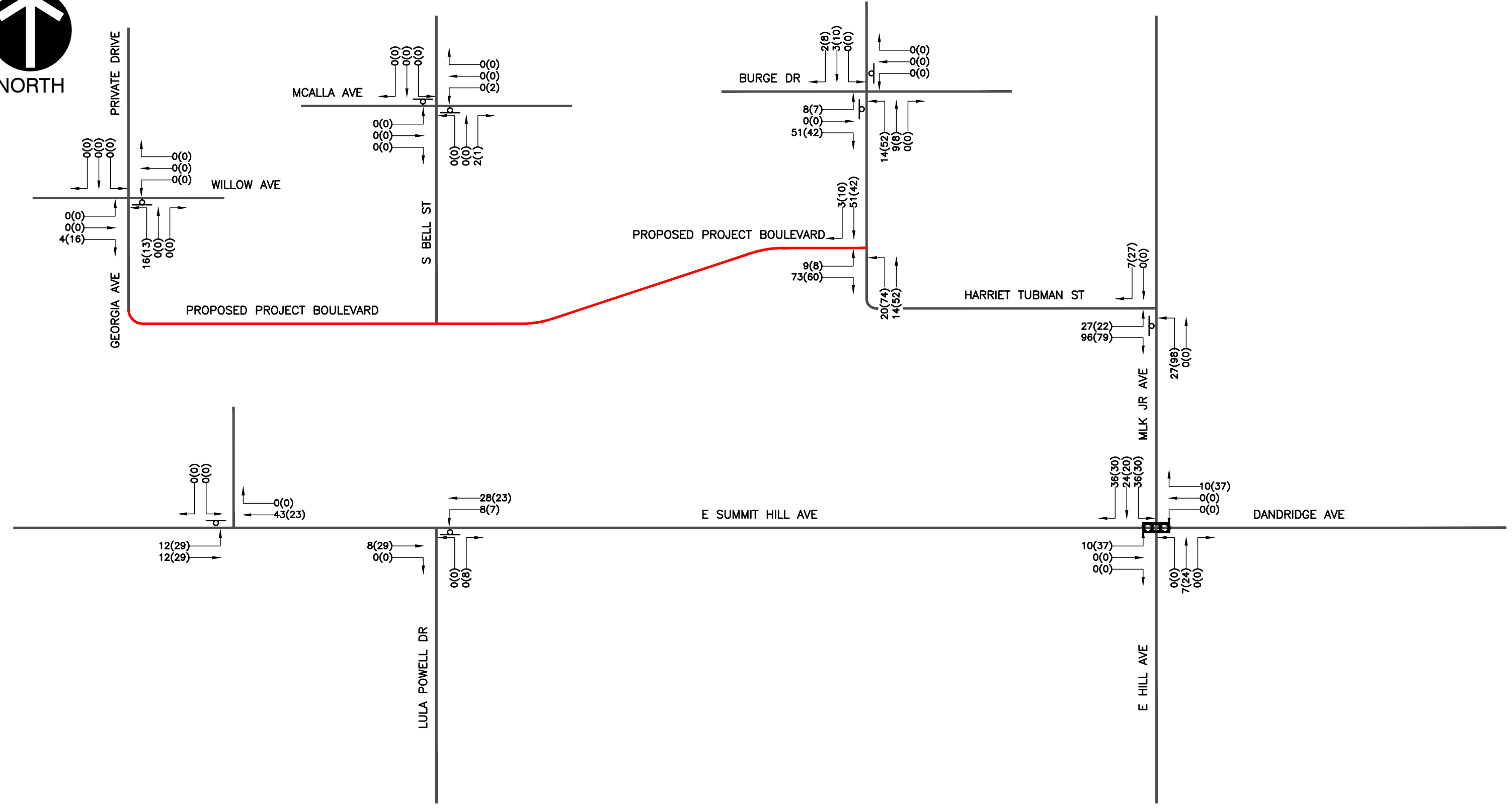
**TRIP DISTRIBUTION**

DRAWN BY:	AAS	CHECKED BY:	RGM	APPROVED BY:	KLB	FIGURE NO.:	<b>006</b>
DATE:	NOVEMBER 2019	DWG SCALE:	NTS	PROJECT NO.:	194-594		

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**LEGEND**

- TURNING MOVEMENT
- XX AM PEAK HOUR PROJECT TRIPS
- (XX) PM PEAK HOUR PROJECT TRIPS

  
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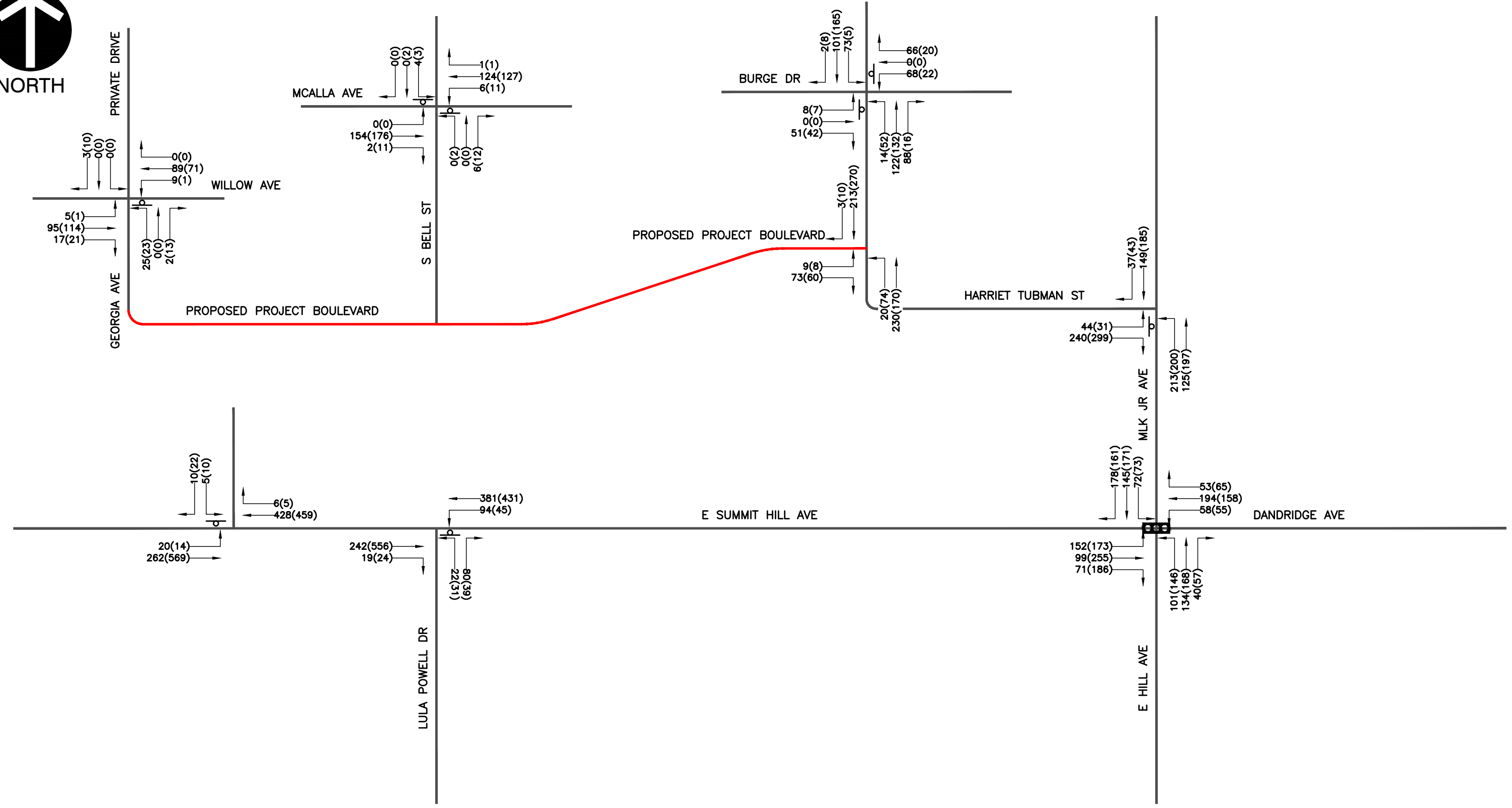
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DRAWN BY:	AAS	CHECKED BY:	RGM	APPROVED BY:	KLB	FIGURE NO.:	<b>007</b>
DATE:	NOVEMBER 2019	DWG SCALE:	NTS	PROJECT NO.:	194-594		

**PROJECT TRIPS**



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**LEGEND**

- XX AM PEAK HOUR PROJECT TRIPS
- (XX) PM PEAK HOUR PROJECT TRIPS



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2024 FUTURE PEAK HOUR VOLUMES

DRAWN BY:	AAS	CHECKED BY:	RGM	APPROVED BY:	KLB	FIGURE NO.:	<b>008</b>
DATE:	NOVEMBER 2019	DWG SCALE:	NTS	PROJECT NO.:	194-594		

## 7.0 CAPACITY ANALYSIS

### 7.1 Study Intersections

For existing roadways, municipalities typically consider LOS A through LOS D as the range of acceptable overall intersection operations, while LOS E and LOS F are generally considered unacceptable. Roadway laneage, traffic signalization, or other improvements are normally required at those intersections, which operate within the range of unacceptable LOS.

The operating conditions were analyzed for the weekday AM and PM peak hours using the *Synchro 10* software, which utilizes the methodologies contained in the *Highway Capacity Manual 2000*. The following eight (8) intersections were analyzed:

1. E. Summit Hill Ave. at S. Bell St. (Unsignalized, one-way stop)
2. E. Summit Hill Ave. at Lula Powell Dr. (Unsignalized, two-way stop)
3. E. Summit Hill Ave. at Martin Luther King Jr Ave (Signalized)
4. Martin Luther King Jr Ave at Harriet Tubman St. (Unsignalized, one-way stop)
5. Harriet Tubman St. at Burge Dr. (Unsignalized, two-way stop)
6. S. Bell St. at McCalla Ave. (Unsignalized, two-way stop)
7. Georgia St. at Willow Ave. (Unsignalized, four-way stop)
8. Project Proposed Boulevard (Georgia St. Extension) at Harriet Tubman St. (proposed Unsignalized, one-way stop)

Existing signal operations were provided by the City of Knoxville for the signalized intersection of E. Summit Hill Ave. at MLK Jr. Ave. Currently, this signalized intersection operates under free/basic timing operation. Capacity analysis for this signalized intersection was performed using signal operational data provided by the City. No changes were made to the signal phasing for capacity analyses. Intersection capacity analyses were conducted for the Existing 2019 and Future 2024 conditions within the study area.

A summary of the capacity analyses for the AM and PM peak hours are provided in **Table 6** and **Table 7**, respectively. A summary of 95<sup>th</sup> percentile queue lengths for all intersections with substantial queue lengths for the AM and PM peak hours are provided in **Table 8** and **Table 9**, respectively.

<b>Table 6 – Intersection Capacity Analysis Results - AM Peak Hour</b>				
<b>LOS (Delay)</b>				
<b>Intersection</b>	<b>Approach</b>	<b>Existing 2019 Conditions</b>	<b>Background 2024 Conditions</b>	<b>Future 2024 Conditions</b>
E. Summit Hill Dr. at Nelson St.	Eastbound	A (0.7)	A (0.6)	A (0.7)
	Westbound	A (0.0)	A (0.0)	A (0.0)
	Northbound	--	--	--
	Southbound	B (11.1)	B (11.4)	B (11.7)
	<b>Overall</b>	<b>A (0.5)</b>	<b>A (0.5)</b>	<b>A (0.5)</b>
E. Summit Hill Dr. at Lula Powell Dr. / S. Bell St.	Eastbound	A (0.0)	A (0.0)	A (0.0)
	Westbound	A (1.6)	A (1.6)	A (1.6)
	Northbound	B (10.6)	B (10.9)	B (11.6)
	Southbound	--	--	--
	<b>Overall</b>	<b>A (2.2)</b>	<b>A (2.2)</b>	<b>A (2.3)</b>
E. Summit Hill Dr. at MLK Jr. Ave.	Eastbound	B (12.8)	B (11.8)	B (11.9)
	Westbound	B (15.8)	B (16.5)	B (16.6)
	Northbound	C (23.8)	C (26.8)	C (29.0)
	Southbound	C (27.7)	C (29.6)	C (30.5)
	<b>Overall</b>	<b>B (19.8)</b>	<b>C (21.0)</b>	<b>C (22.3)</b>
MLK Jr. Ave. at Harriet Tubman St.	Eastbound	B (11.6)	B (12.1)	C (17.2)
	Westbound	--	--	--
	Northbound	A (4.9)	A (4.9)	A (5.3)
	Southbound	A (0.0)	A (0.0)	A (0.0)
	<b>Overall</b>	<b>A (5.2)</b>	<b>A (5.4)</b>	<b>A (8.3)</b>
Harriet Tubman St. at Burge St.	Eastbound	A (0.0)	A (0.0)	B (10.5)
	Westbound	B (13.3)	B (14.1)	C (17.0)
	Northbound	A (0.0)	A (0.0)	A (0.6)
	Southbound	A (3.7)	A (3.8)	A (3.7)
	<b>Overall</b>	<b>A (4.8)</b>	<b>A (5.0)</b>	<b>A (6.2)</b>
McCalla Ave. at S. Bell St.	Eastbound	A (0.0)	A (0.0)	A (0.0)
	Westbound	A (0.4)	A (0.4)	A (0.4)
	Northbound	A (9.3)	A (9.6)	A (9.6)
	Southbound	B (10.8)	B (11.8)	B (11.8)
	<b>Overall</b>	<b>A (0.5)</b>	<b>A (0.5)</b>	<b>A (0.5)</b>



**Table 6 – Continued AM Peak Hour LOS (Delay)**

<b>Intersection</b>	<b>Approach</b>	<b>Existing 2019 Conditions</b>	<b>Background 2024 Conditions</b>	<b>Future 2024 Conditions</b>
Georgia St. at Willow Ave.	Eastbound	A (0.4)	A (0.4)	A (0.4)
	Westbound	A (0.7)	A (0.7)	A (0.7)
	Northbound	A (9.7)	A (10.1)	A (10.4)
	Southbound	A (8.7)	A (8.8)	A (8.8)
	<b>Overall</b>	<b>A (1.1)</b>	<b>A (1.1)</b>	<b>A (1.7)</b>
Harriet Tubman St. at Project Blvd. (Proposed Roadway)	Eastbound	--	--	A (10.5)
	Westbound	--	--	--
	Northbound	--	--	A (0.8)
	Southbound	--	--	A (0.0)
	<b>Overall</b>	<b>--</b>	<b>--</b>	<b>A (1.9)</b>

<b>Table 7 – Intersection Capacity Analysis Results - PM Peak Hour</b>				
<b>LOS (Delay)</b>				
<b>Intersection</b>	<b>Approach</b>	<b>Existing 2019 Conditions</b>	<b>Background 2024 Conditions</b>	<b>Future 2024 Conditions</b>
E. Summit Hill Dr. at Nelson St.	Eastbound	A (0.2)	A (0.2)	A (0.3)
	Westbound	A (0.0)	A (0.0)	A (0.0)
	Northbound	--	--	--
	Southbound	B (11.6)	B (12.0)	B (12.3)
	<b>Overall</b>	<b>A (0.5)</b>	<b>A (0.5)</b>	<b>A (0.5)</b>
E. Summit Hill Dr. at Lula Powell Dr. / S. Bell St.	Eastbound	A (0.0)	A (0.0)	A (0.0)
	Westbound	A (0.7)	A (0.8)	A (0.8)
	Northbound	B (13.7)	B (14.7)	C (15.9)
	Southbound	--	--	--
	<b>Overall</b>	<b>A (1.1)</b>	<b>A (1.2)</b>	<b>A (1.3)</b>
E. Summit Hill Dr. at MLK Jr. Ave.	Eastbound	B (15.9)	B (15.5)	B (15.2)
	Westbound	B (16.9)	B (17.8)	B (18.0)
	Northbound	C (23.2)	C (24.9)	C (27.2)
	Southbound	C (27.9)	C (29.5)	C (30.5)
	<b>Overall</b>	<b>C (20.3)</b>	<b>C (21.1)</b>	<b>C (22.1)</b>
MLK Jr. Ave. at Harriet Tubman St.	Eastbound	B (11.7)	B (12.2)	C (17.3)
	Westbound	--	--	--
	Northbound	A (2.7)	A (2.7)	A (4.3)
	Southbound	A (0.0)	A (0.0)	A (0.0)
	<b>Overall</b>	<b>A (4.8)</b>	<b>A (5.0)</b>	<b>A (7.8)</b>
Harriet Tubman St. at Burge St.	Eastbound	A (0.0)	A (0.0)	B (10.5)
	Westbound	B (10.8)	B (11.0)	B (13.2)
	Northbound	A (0.0)	A (0.0)	A (2.3)
	Southbound	A (0.3)	A (0.3)	A (0.3)
	<b>Overall</b>	<b>A (1.5)</b>	<b>A (1.5)</b>	<b>A (3.4)</b>
McCalla Ave. at S. Bell St.	Eastbound	A (0.0)	A (0.0)	A (0.0)
	Westbound	A (0.5)	A (0.6)	A (0.7)
	Northbound	A (9.6)	B (10.0)	B (10.0)
	Southbound	B (10.9)	B (11.9)	B (12.0)
	<b>Overall</b>	<b>A (0.8)</b>	<b>A (0.8)</b>	<b>A (0.9)</b>

**Table 7 – Continued PM Peak Hour LOS (Delay)**

<b>Intersection</b>	<b>Approach</b>	<b>Existing 2019 Conditions</b>	<b>Background 2024 Conditions</b>	<b>Future 2024 Conditions</b>
Georgia St. at Willow Ave.	Eastbound	A (0.1)	A (0.1)	A (0.1)
	Westbound	A (0.1)	A (0.1)	A (0.1)
	Northbound	A (9.4)	A (9.8)	B (10.3)
	Southbound	A (8.6)	A (8.7)	A (8.7)
	<b>Overall</b>	<b>A (1.4)</b>	<b>A (1.4)</b>	<b>A (1.8)</b>
Harriet Tubman St. at Project Blvd. (Proposed Roadway)	Eastbound	--	--	B (11.1)
	Westbound	--	--	--
	Northbound	--	--	A (2.9)
	Southbound	--	--	A (0.0)
	<b>Overall</b>	<b>--</b>	<b>--</b>	<b>A (2.5)</b>

**Table 8 – Intersection 95th Percentile Queue Length - PM Peak Hour  
Feet (Queue Lengths below 20 feet are not shown)**

<b>Intersection</b>	<b>Approach</b>	<b>Movement</b>	<b>Existing 2019 Conditions</b>	<b>Background 2024 Conditions</b>	<b>Future 2024 Conditions</b>
E. Summit Hill Ave. at MLK Jr. Ave.	Eastbound	LT	63	70	82
	Eastbound	TH	38	41	44
	Westbound	LT	30	33	37
	Westbound	TH	65	71	77
	Northbound	LT	68	74	72
	Northbound	TH	57	61	63
	Southbound	LT	28	33	56
	Southbound	TH	51	55	75
	Southbound	RT	31	38	**
MLK Jr. Ave. at Harriet Tubman St.	Eastbound	LT, TH, RT	24	27	79
Harriet Tubman St. at Burge Dr.	Westbound	LT, TH, RT	27	32	41
* Queue length exceeds capacity of turn lane.					
** Channelized right-turn Removed in Future Condition and becomes shared with through lane					

<b>Table 9 – Intersection 95<sup>th</sup> Percentile Queue Length - PM Peak Hour Feet (Queue Lengths below 20 feet are not shown)</b>					
<b>Intersection</b>	<b>Approach</b>	<b>Movement</b>	<b>Existing 2019 Conditions</b>	<b>Background 2024 Conditions</b>	<b>Future 2024 Conditions</b>
E. Summit Hill Ave. at MLK Jr. Ave.	Eastbound	LT	58	65	88
	Eastbound	TH	78	86	91
	Westbound	LT	29	31	33
	Westbound	TH	51	55	59
	Northbound	LT	87	95	95
	Northbound	TH	61	65	75
	Southbound	LT	33	36	53
	Southbound	TH	58	63	80
	Southbound	RT	20	25	**
MLK Jr. Ave. at Harriet Tubman St.	Eastbound	LT, TH, RT	33	39	90
Harriet Tubman St. at Burge Dr.	Westbound	LT, TH, RT	-	-	-
* Queue length exceeds capacity of turn lane.					
** Channelized right-turn Removed in Future Condition and becomes shared with through lane					

As shown in **Table 6** and **Table 7**, all existing and proposed intersections currently operate and are expected to continue operating at an overall intersection level of service (LOS) C or better during the AM and PM peak hours. All approaches are expected to operate at LOS C or better under all conditions.

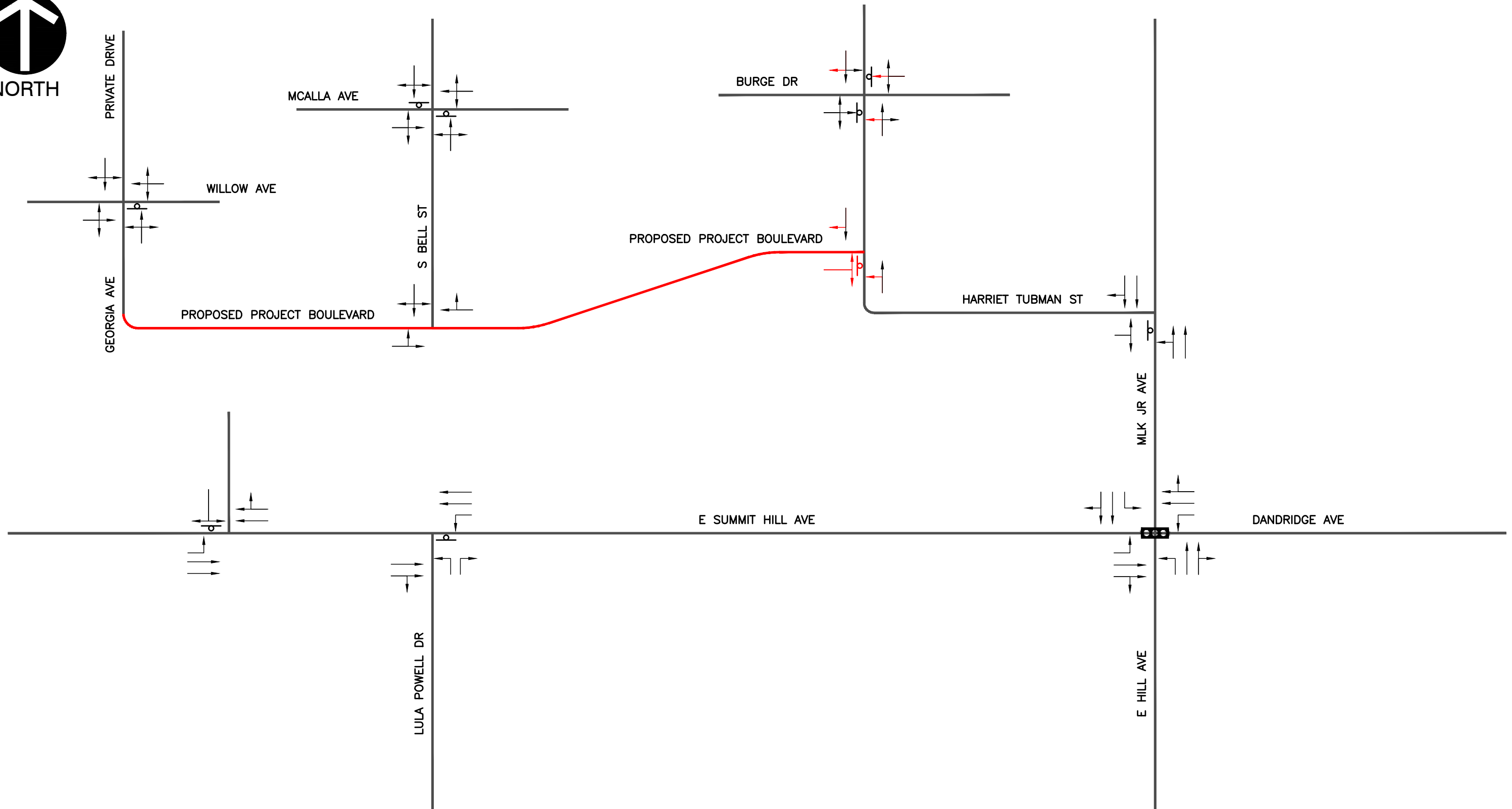
As shown in **Table 8** and **Table 9**, storage lengths provided for all intersection approaches under all existing and future conditions are expected to be adequate compared to the anticipated 95<sup>th</sup> Percentile queues.

The proposed redevelopment is not anticipated to have a significant impact on any of the study area roadways, as evidenced by the minor impact to level-of-service illustrated in the Synchro model and analysis.






The Future Intersection Geometry is illustrated in **Figure 9**. The intersection capacity analysis reports are included in **Appendix D**.



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### LEGEND

-  EXISTING INTERSECTION GEOMETRY
-  EXISTING STOP SIGN
-  EXISTING TRAFFIC SIGNAL
-  PROPOSED STOP SIGN
-  PROPOSED INTERSECTION GEOMETRY

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FUTURE INTERSECTION GEOMETRY

DRAWN BY:	AAS	CHECKED BY:	RGM	APPROVED BY:	KLB	FIGURE NO.:	<b>009</b>
DATE:	NOVEMBER 2019	DWG SCALE:	NTS	PROJECT NO:	194-594		



## 8.0 RECOMMENDATIONS

This Traffic Impact Analysis has been performed for the proposed Austin Homes redevelopment located in Knoxville, Tennessee.

The roadway network has been analyzed to determine the impact that the proposed redevelopment will have on the forecasted traffic operations of existing and future intersections.

The following mitigation measures will improve traffic operations under Future 2024 scenario with the proposed redevelopment:

### Sight Distance

It is recommended that adequate sight distance be provided at all proposed intersections and parking lot driveways. A visibility triangle shall be provided at all intersections consistent with AASHTO guidelines where there are no vertical obstructions (walls, fences, signs, structures, vegetation, etc.) to vision between 2.5 and 10 feet above the elevation of the center of the roadway. Based on the Site Plan in Appendix A, it appears that all proposed intersections provide at least a 60-degree angle of intersection. It is recommended that no objects be placed or constructed within the visibility triangle for any proposed or modified intersection. Any existing objects within visibility triangles should be removed during construction. As referenced in the Subdivision Regulations, AASHTO guidelines must be met. Measurements shall be taken 15-feet back from the edge of pavement. Sight triangles are provided to scale for all proposed access points to be modified on the Site Plan included in Appendix A.

#### E. Summit Hill Dr. at S. Bell St.

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

#### E. Summit Hill Dr. at Lula Powell Dr.

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.
- Pedestrian enhancements for the existing crosswalk should be considered including an actuated pedestrian crossing signal such as a rectangular rapid flash beacon (RRFB). The existing pedestrian stairway heading north from E. Summit Hill Ave. should be retained and ADA access be provided where shown throughout the development on the Site Plan in Appendix A.

#### E. Summit Hill Dr. at Martin Luther King Jr. Ave.

- Based upon the capacity analysis, this intersection is expected to continue operating at acceptable overall levels of service. It is proposed with the development to remove the existing channelized southbound right-turn lane. The southbound right-turn movement would then become a shared lane with the outside southbound through lane. The removal of

the channelized southbound right-turn is modeled in the capacity analysis provided under the Future 2024 condition with the proposed development. As shown in the capacity analysis, removal of the channelized southbound right-turn lane and utilizing the existing outside through lane as a shared southbound through/right-turn lane is expected to operate with acceptable levels of service and 95<sup>th</sup> percentile queue. Therefore, removal of the channelized right-turn lane as proposed is appropriate based on anticipated future conditions and provides better visibility for the turning movement without sacrificing level of service. The existing pavement and other infrastructure used to support the channelized right-turn lane will be removed as included on the site development plans submitted separately. Sidewalk extensions will be provided through to the existing sidewalk on the northern and western end of the existing median where the current channelized right-turn lane exists.

Should an exclusive right-turn lane ever be needed, there is sufficient space provided in the existing median requiring removal of an existing street light.

### **Martin Luther King Jr. Ave. at Harriet Tubman St.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **Harriet Tubman St. at Burge St.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **McCalla St. at S. Bell St.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **Georgia St. at Willow Ave.**

- This intersection is anticipated to continue operating at acceptable levels of service under all scenarios. Therefore, no improvements are recommended at this intersection.

### **Harriet Tubman St. at Proposed Project Boulevard (Georgia Street Extension)**

- This proposed intersection is anticipated to operate at LOS A under all conditions. Recommendations for the proposed intersection include 12-foot approach/departure lanes with a 22-foot median on the boulevard section. Additionally, pedestrian access should be provided to tie-into the existing pedestrian facilities along Harriet Tubman St.

### **Proposed Project Boulevard (Georgia Street Extension)**

- As shown on the Site Plan in Appendix A, a boulevard section is being proposed as an extension of Georgia Street across First Creek, intersecting S. Bell St. and terminating at

Harriet Tubman St. S. Bell St. is proposed to be removed south of the Georgia St. extension. This extension provides better east-west connectivity through the redevelopment area and additional access options should they be required with future development. The roadway section west of S. Bell St. is planned to provide one 12-foot lane in each direction and sidewalks on each side of the roadway. The roadway section east of S. Bell St. is planned to be a boulevard section with one 12-foot lane in each direction, a 22-foot median, on-street parking on each side, a multi-use path through the middle of the median, and pedestrian crosswalks at each internal driveway. Volumes through the area are expected to be evenly distributed and function at the same acceptable levels of service as surrounding external roadway connections. It is recommended to provide landscaping conducive to appropriate sight distance along the boulevard and at all internal roadway and driveway connections.

### **Proposed Burge Drive Modifications**

- Currently Burge Drive is a one-way driveway providing 10-20 feet of pavement including sections of on-street parking on the south side of the roadway. This roadway provides westbound connection from Harriet Tubman St. to S. Bell St. No sidewalks are provided along the roadway. As shown on the Site Plan in Appendix A, Burge Drive is proposed to be widened from S. Bell St. to Harriet Tubman St. and converted to allow traffic in each direction. The widening includes providing one 12-foot lane in each direction and on-street parking provided on both sides. In addition, sidewalk is proposed on both sides of the roadway.

### **General**

- It is recommended on each of the proposed roadways to provide sidewalks as illustrated on the Site Plan in **Appendix A**. Understanding that there are significant slopes on site that are not conducive to ADA compliance, areas where appropriate slopes are available should meet ADA guidelines. During the six hours of traffic counts completed on site, pedestrians and bicycles were also counted. While there were pedestrians observed at most intersections, there were no bicycles observed during the observation times. Therefore, bicycle lanes and shared bicycle lanes, in addition to the ones already provided, are not recommended at this time.

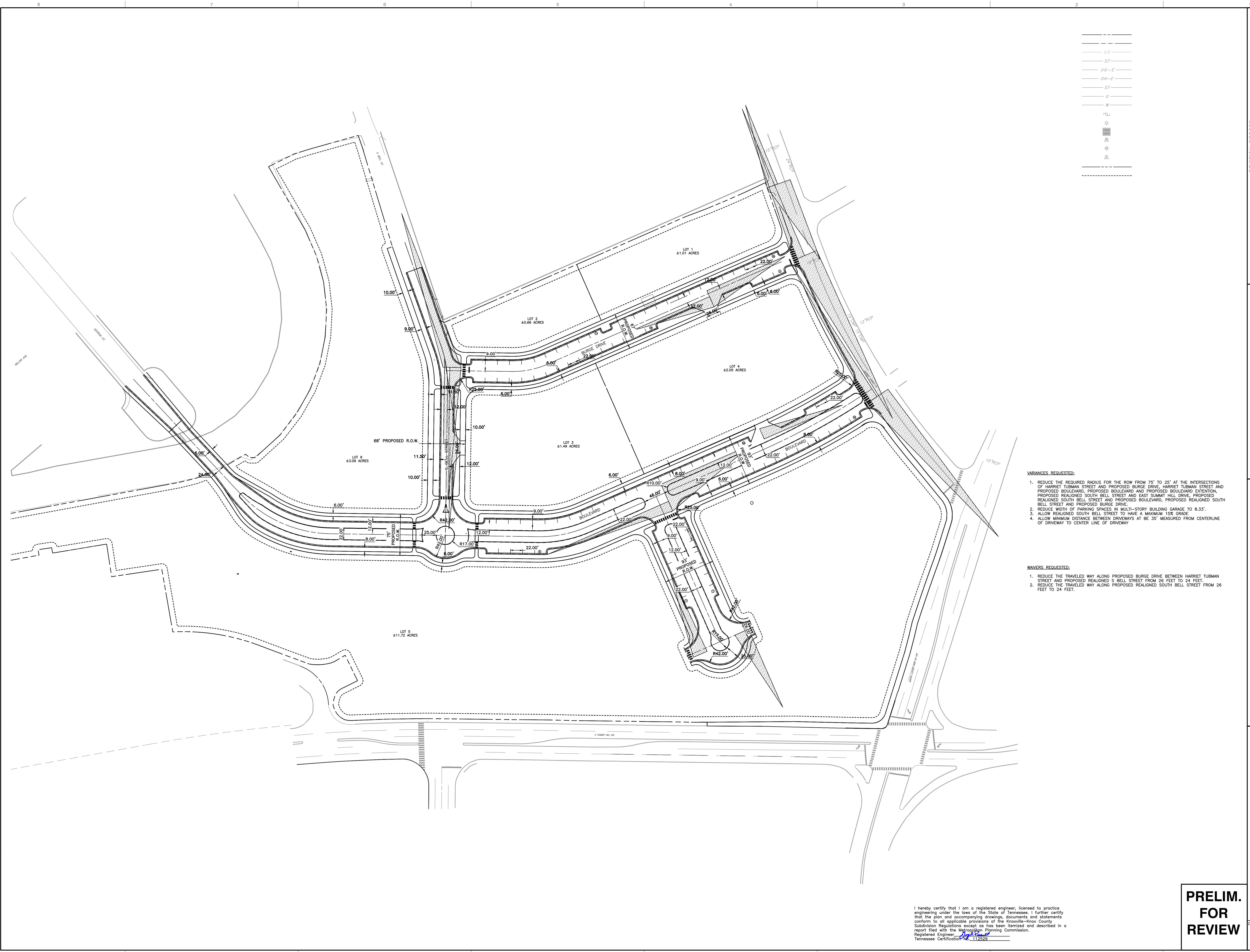
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**APPENDIX A**  
**SITE PLAN**

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PL 1919114.dwg (10/20/2019 10:45:27 AM) (1:18894-C01-0000-UNPROJ) 1.5172/6.2019 - dwd - LP: 12/26/2019 4:58 PM



- VARIANCES REQUESTED:**
1. REDUCE THE REQUIRED RADIUS FOR THE ROW FROM 75' TO 25' AT THE INTERSECTIONS OF HARRIET TUBMAN STREET AND PROPOSED BURGE DRIVE, HARRIET TUBMAN STREET AND PROPOSED BOULEVARD, PROPOSED BOULEVARD AND PROPOSED BOULEVARD EXTENTION, PROPOSED REALIGNED SOUTH BELL STREET AND EAST SUMMIT HILL DRIVE, PROPOSED REALIGNED SOUTH BELL STREET AND PROPOSED BOULEVARD, PROPOSED REALIGNED SOUTH BELL STREET AND PROPOSED BURGE DRIVE.
  2. REDUCE WIDTH OF PARKING SPACES IN MULTI-STORY BUILDING GARAGE TO 8.33'.
  3. ALLOW REALIGNED SOUTH BELL STREET TO HAVE A MAXIMUM 15% GRADE.
  4. ALLOW MINIMUM DISTANCE BETWEEN DRIVEWAYS AT BE 35' MEASURED FROM CENTERLINE OF DRIVEWAY TO CENTER LINE OF DRIVEWAY.
- WAIVERS REQUESTED:**
1. REDUCE THE TRAVELED WAY ALONG PROPOSED BURGE DRIVE BETWEEN HARRIET TUBMAN STREET AND PROPOSED REALIGNED S BELL STREET FROM 26 FEET TO 24 FEET.
  2. REDUCE THE TRAVELED WAY ALONG PROPOSED REALIGNED SOUTH BELL STREET FROM 26 FEET TO 24 FEET.

I hereby certify that I am a registered engineer, licensed to practice engineering under the laws of the State of Tennessee. I further certify that the plan and accompanying drawings, documents and statements conform to all applicable provisions of the Knoxville-Knox County Subdivision Regulations except as has been itemized and described in a report filed with the Metropolitan Planning Commission.  
 Registered Engineer: *[Signature]*  
 Tennessee Certification No. 112829

**PRELIM.  
FOR  
REVIEW**

<b>REVISION RECORD</b>			
NO.	DATE		
		<b>Civil &amp; Environmental Consultants, Inc.</b> 2704 Cherokee Farm Way - Suite 101 - Knoxville, TN 37920 Ph: 865.977.9997 - Fax: 865.977.9919 www.cecinc.com	
		<b>KNOXVILLE'S COMMUNITY DEVELOPMENT CORPORATION AUSTIN HOMES INFRASTRUCTURE IMPROVEMENTS KNOXVILLE, KNOX COUNTY, TN</b>	
		DATE:	OCTOBER 28, 2019
		DRAWN BY:	CRU
CHECKED BY:	AS SHOWN		
PROJECT NO.:	19A-494		
APPROVED BY:	CRU		

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**APPENDIX B**  
**TRAFFIC COUNT DATA**

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**Knoxville, TN**  
Classified Turn Movement Count

**Site 1 of 7**  
Nelson Ave  
E Summit Hill Dr SE (East)

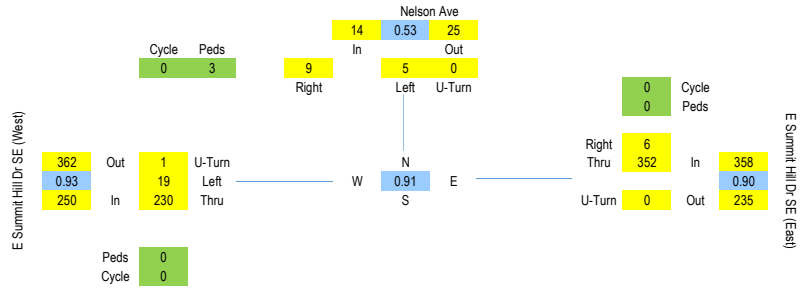
E Summit Hill Dr SE (West)

**Lat/Long**  
35.970402°, -83.910114°

**Date**  
15 October 2019

**Weather**  
Mostly Cloudy  
61°F

0700 - 0900 (Weekday 2h Session) (15-10-2019)  
Classification: ALL



Peak Hour: 0730 - 0830

TIME	Southbound Nelson Ave				Westbound E Summit Hill Dr SE (East)					
	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total
0700 - 0715	0	3	2	1	6	0	46	0	0	46
0715 - 0730	0	3	0	4	7	0	68	0	0	68
0730 - 0745	0	0	1	1	2	0	79	0	0	79
0745 - 0800	0	2	2	0	4	0	96	4	0	100
Hourly Total	0	8	5	6	19	0	289	4	0	293
0800 - 0815	0	3	4	1	8	0	92	2	0	94
0815 - 0830	0	0	2	1	3	0	85	0	0	85
0830 - 0845	0	1	3	1	5	0	66	2	0	68
0845 - 0900	0	0	4	0	4	0	57	4	0	61
Hourly Total	0	4	13	3	20	0	300	8	0	308
Grand Total	0	12	18	9	39	0	589	12	0	601
Approach (%)	0.00	30.77	46.15	23.08		0.00	98.00	2.00	0.00	
Total (%)	0.00	1.10	1.65	0.82	3.57	0.00	53.99	1.10	0.00	55.09
P/Cycle	0	0	0	-	0	0	0	0	-	0
Cars	0	12	11	-	23	0	568	11	-	579
Truck	0	0	7	-	7	0	21	1	-	22
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	100.00	61.11	-	76.67	0.00	96.43	91.67	-	96.34
Truck (%)	0.00	0.00	38.89	-	23.33	0.00	3.57	8.33	-	3.66

TIME	Eastbound E Summit Hill Dr SE (West)				Peds 1d	App Total	Int Total	Rolling Hour
	U-Turn 1.7	Left 1.8	Thru 1.9	App Total				
0700 - 0715	0	3	34	0	37	89	517	
0715 - 0730	0	2	46	0	48	123	593	
0730 - 0745	0	2	57	0	59	140	622	
0745 - 0800	1	3	63	0	67	171	613	
Hourly Total	1	10	200	0	211	523	-	
0800 - 0815	0	4	59	0	63	165	565	
0815 - 0830	0	10	51	0	61	149	-	
0830 - 0845	1	2	55	0	58	131	-	
0845 - 0900	0	8	50	0	58	123	-	
Hourly Total	1	24	215	0	240	568	-	
Grand Total	2	34	415	0	451	1091	-	
Approach (%)	0.44	7.54	92.02	0.00				
Total (%)	0.18	3.12	38.04	0.00	41.34			
P/Cycle	0	1	0	-	1			
Cars	2	26	399	-	427			
Truck	0	7	16	-	23			
P/Cycle (%)	0.00	2.94	0.00	-	0.22			
Cars (%)	100.00	76.47	96.14	-	94.68			
Truck (%)	0.00	20.59	3.86	-	5.10			

Peak Rolling Hour Flow Rates  
Classification: ALL

TIME	Southbound Nelson Ave				Westbound E Summit Hill Dr SE (East)					
	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total
0730 - 0745	0	0	1	1	2	0	79	0	0	79
0745 - 0800	0	2	2	0	4	0	96	4	0	100
0800 - 0815	0	3	4	1	8	0	92	2	0	94
0815 - 0830	0	0	2	1	3	0	85	0	0	85
Grand Total	0	5	9	3	17	0	352	6	0	358
Approach (%)	0.00	29.41	52.94	17.65		0.00	98.32	1.68	0.00	
Total (%)	0.00	0.80	1.44	0.48	2.72	0.00	56.32	0.96	0.00	57.28
PHF	0%	42%	56%			0%	92%	38%		
P/Cycle	0	0	0	-	0	0	0	0	-	0
Cars	0	5	6	-	11	0	339	6	-	345
Truck	0	0	3	-	3	0	13	0	-	13
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	100.00	66.67	-	78.57	0.00	96.31	100.00	-	96.37
Truck (%)	0.00	0.00	33.33	-	21.43	0.00	3.69	0.00	-	3.63

TIME	Eastbound E Summit Hill Dr SE (West)				Peds 1d	App Total	Int Total
	U-Turn 1.7	Left 1.8	Thru 1.9	App Total			
0730 - 0745	0	2	57	0	59	140	
0745 - 0800	1	3	63	0	67	171	
0800 - 0815	0	4	59	0	63	165	
0815 - 0830	0	10	51	0	61	149	
Grand Total	1	19	230	0	250	625	
Approach (%)	0.40	7.60	92.00	0.00			
Total (%)	0.16	3.04	36.80	0.00	40.00		
PHF	25%	48%	91%			91%	
P/Cycle	0	1	0	-	1	1	
Cars	1	14	222	-	237	593	
Truck	0	4	8	-	12	28	
P/Cycle (%)	0.00	5.26	0.00	-	0.40	0.16	
Cars (%)	100.00	73.68	96.52	-	94.80	94.88	
Truck (%)	0.00	21.05	3.48	-	4.80	4.48	

Peak Rolling 15min Flow Rates  
 Classification: ALL

TIME	Southbound Nelson Ave					Westbound E Summit Hill Dr SE (East)				
	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App
	1.1	1.2	1.3	1a	Total	1.4	1.5	1.6	1b	Total
Grand Total	0	8	8	0	16	0	384	16	0	400
Approach (%)	0.00	50.00	50.00	0.00		0.00	96.00	4.00	0.00	
Total (%)	0.00	1.17	1.17	0.00	2.34	0.00	56.14	2.34	0.00	58.48
P/Cycle	0	0	0	-	0	0	0	0	-	0
Cars	0	8	8	-	16	0	376	16	-	392
Truck	0	0	0	-	0	0	8	0	-	8
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	100.00	100.00	-	100.00	0.00	97.92	100.00	-	98.00
Truck (%)	0.00	0.00	0.00	-	0.00	0.00	2.08	0.00	-	2.00

TIME	Eastbound E Summit Hill Dr SE (West)					Int
	U-Turn	Left	Thru	Peds	App	
	1.7	1.8	1.9	1d	Total	
Grand Total	4	12	252	0	268	684
Approach (%)	1.49	4.48	94.03	0.00		
Total (%)	0.58	1.75	36.84	0.00	39.18	
P/Cycle	0	4	0	-	4	4
Cars	4	4	240	-	248	656
Truck	0	4	12	-	16	24
P/Cycle (%)	0.00	33.33	0.00	-	1.49	0.58
Cars (%)	100.00	33.33	95.24	-	92.54	95.91
Truck (%)	0.00	33.33	4.76	-	5.97	3.51

**Knoxville, TN**  
Classified Turn Movement Count

**Site 2 of 7**

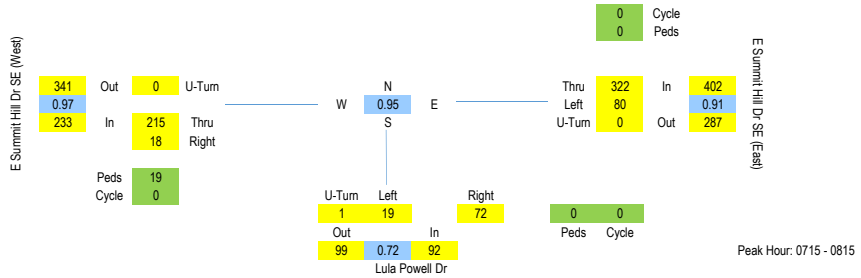
E Summit Hill Dr SE (East)  
Lula Powell Dr  
E Summit Hill Dr SE (West)

**Lat/Long**  
35.970343°, -83.909382°

**Date**  
15 October 2019

**Weather**  
Mostly Cloudy  
61°F

0700 - 0900 (Weekday 2h Session) (15-10-2019)  
Classification: ALL



TIME	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Right	Peds	App	Int	Rolling	
0700 - 0715	1	17	48	0	66	0	1	18	2	21	0	31	2	13	46	133	673
0715 - 0730	0	35	65	0	100	1	2	29	0	32	0	44	4	17	65	197	727
0730 - 0745	0	21	76	0	97	0	2	21	0	23	0	54	4	2	60	180	692
0745 - 0800	0	18	92	0	110	0	8	14	0	22	0	58	7	0	65	197	643
Hourly Total	1	91	281	0	373	1	13	82	2	98	0	187	17	32	236	707	-
0800 - 0815	0	6	89	0	95	0	7	8	0	15	0	59	3	0	62	172	571
0815 - 0830	0	8	78	0	86	0	7	1	0	8	0	50	1	0	51	145	-
0830 - 0845	0	3	61	0	64	0	4	4	0	8	0	55	2	0	57	129	-
0845 - 0900	0	5	54	0	59	0	5	9	0	14	1	49	2	1	53	126	-
Hourly Total	0	22	282	0	304	0	23	22	0	45	1	213	8	1	223	572	-
<b>Grand Total</b>	<b>1</b>	<b>113</b>	<b>563</b>	<b>0</b>	<b>677</b>	<b>1</b>	<b>36</b>	<b>104</b>	<b>2</b>	<b>143</b>	<b>1</b>	<b>400</b>	<b>25</b>	<b>33</b>	<b>459</b>	<b>1279</b>	
Approach (%)	0.15	16.69	83.16	0.00		0.70	25.17	72.73	1.40		0.22	87.15	5.45	7.19			
Total (%)	0.08	8.84	44.02	0.00	52.93	0.08	2.81	8.13	0.16	11.18	0.08	31.27	1.95	2.58	35.89		
P/Cycle	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0
Cars	1	105	543	-	649	1	35	100	-	136	0	385	25	-	410		
Truck	0	8	20	-	28	0	1	4	-	5	1	15	0	-	16		
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00		
Cars (%)	100.00	92.92	96.45	-	95.86	100.00	97.22	96.15	-	96.45	0.00	96.25	100.00	-	96.24		
Truck (%)	0.00	7.08	3.55	-	4.14	0.00	2.78	3.85	-	3.55	100.00	3.75	0.00	-	3.76		

**Peak Rolling Hour Flow Rates**  
Classification: ALL

TIME	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Right	Peds	App	Int	Total
0715 - 0730	0	35	65	0	100	1	2	29	0	32	0	44	4	17	65	197
0730 - 0745	0	21	76	0	97	0	2	21	0	23	0	54	4	2	60	180
0745 - 0800	0	18	92	0	110	0	8	14	0	22	0	58	7	0	65	197
0800 - 0815	0	6	89	0	95	0	7	8	0	15	0	59	3	0	62	172
<b>Grand Total</b>	<b>0</b>	<b>80</b>	<b>322</b>	<b>0</b>	<b>402</b>	<b>1</b>	<b>19</b>	<b>72</b>	<b>0</b>	<b>92</b>	<b>0</b>	<b>215</b>	<b>18</b>	<b>19</b>	<b>252</b>	<b>746</b>
Approach (%)	0.00	19.90	80.10	0.00		1.09	20.65	78.26	0.00		0.00	85.32	7.14	7.54		
Total (%)	0.00	10.72	43.16	0.00	53.89	0.13	2.55	9.65	0.00	12.33	0.00	28.82	2.41	2.55	33.78	
PHF	0%	57%	88%			25%	59%	62%			0%	91%	64%			95%
P/Cycle	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
Cars	0	76	311	-	387	1	18	70	-	89	0	205	18	-	223	699
Truck	0	4	11	-	15	0	1	2	-	3	0	10	0	-	10	28
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	
Cars (%)	0.00	95.00	96.58	-	96.27	100.00	94.74	97.22	-	96.74	0.00	95.35	100.00	-	95.71	93.70
Truck (%)	0.00	5.00	3.42	-	3.73	0.00	5.26	2.78	-	3.26	0.00	4.65	0.00	-	4.29	3.75

**Peak Rolling 15min Flow Rates**  
Classification: ALL

TIME	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Right	Peds	App	Int	Total
<b>Grand Total</b>	<b>0</b>	<b>72</b>	<b>368</b>	<b>0</b>	<b>440</b>	<b>0</b>	<b>32</b>	<b>56</b>	<b>0</b>	<b>88</b>	<b>0</b>	<b>232</b>	<b>28</b>	<b>0</b>	<b>260</b>	<b>788</b>
Approach (%)	0.00	16.36	83.64	0.00		0.00	36.36	63.64	0.00		0.00	89.23	10.77	0.00		
Total (%)	0.00	9.14	46.70	0.00	55.84	0.00	4.06	7.11	0.00	11.17	0.00	29.44	3.55	0.00	32.99	
P/Cycle	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
Cars	0	64	364	-	428	0	28	52	-	80	0	220	28	-	248	756
Truck	0	8	4	-	12	0	4	4	-	8	0	12	0	-	12	32
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	
Cars (%)	0.00	88.89	98.91	-	97.27	0.00	87.50	92.86	-	90.91	0.00	94.83	100.00	-	95.38	95.94
Truck (%)	0.00	11.11	1.09	-	2.73	0.00	12.50	7.14	-	9.09	0.00	5.17	0.00	-	4.62	4.06

Knoxville, TN  
Classified Turn Movement Count

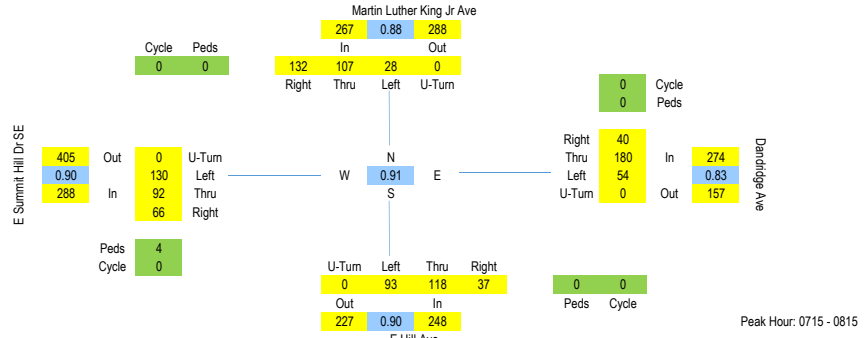
Site 3 of 7  
Martin Luther King Jr Ave  
Dandridge Ave  
E Hill Ave  
E Summit Hill Dr SE

Lat/Long  
35.970292°, -83.906582°

Date  
15 October 2019

Weather  
Mostly Cloudy  
61°F

0700 - 0900 (Weekday 2h Session) (15-10-2019)  
Classification: ALL



TIME	Southbound Martin Luther King Jr Ave						Westbound Dandridge Ave					Northbound E Hill Ave					Eastbound E Summit Hill Dr SE					Int Total	Rolling Hour			
	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds 3a	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds 3b	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds 3c	App Total	U-Turn 3.13	Left 3.14	Thru 3.15			Right 3.16	Peds 3d	App Total
0700 - 0715	0	2	11	24	1	38	0	12	28	4	0	44	0	10	21	9	0	40	0	13	27	8	3	51	173	1003
0715 - 0730	0	7	21	32	0	60	0	17	54	5	0	76	0	13	27	13	0	53	0	32	29	11	0	72	261	1077
0730 - 0745	0	9	27	40	0	76	0	15	36	8	0	59	0	25	29	9	0	63	0	34	29	17	1	81	279	1042
0745 - 0800	0	10	29	31	0	70	0	15	50	18	0	83	0	29	33	7	0	69	0	39	19	15	1	74	296	953
Hourly Total	0	28	88	127	1	244	0	59	168	35	0	262	0	77	110	38	0	225	0	118	104	51	5	278	1009	-
0800 - 0815	0	2	30	29	0	61	0	7	40	9	0	56	0	26	29	8	0	63	0	25	15	23	2	65	245	831
0815 - 0830	1	4	23	22	0	50	0	12	39	4	0	55	0	24	37	6	0	67	0	20	21	13	1	55	227	-
0830 - 0845	0	2	25	16	0	43	0	7	33	7	0	47	0	19	20	7	0	46	0	13	27	13	0	53	189	-
0845 - 0900	0	3	15	18	0	36	0	8	21	3	0	32	0	17	26	2	0	45	0	18	19	23	2	62	175	-
Hourly Total	1	11	93	85	0	190	0	34	133	23	0	190	0	86	112	23	0	221	0	76	82	72	5	235	836	-
Grand Total	1	39	181	212	1	434	0	93	301	58	0	452	0	163	222	61	0	446	0	194	186	123	10	513	1845	-

Approach (%)						Approach (%)						Approach (%)						Approach (%)											
Total (%)	0.23	8.99	41.71	48.85	0.23	0.00	20.58	66.59	12.83	0.00	0.00	36.55	49.78	13.68	0.00	0.00	37.82	36.26	23.98	1.95	0.00	10.51	10.08	6.67	0.54	23.52	24.50	24.17	27.80
P/Cycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	1	32	172	202	0	407	0	92	290	50	432	0	156	214	56	426	0	184	182	118	0	0	0	0	0	484	0	0	0
Truck	0	7	9	10	0	26	0	1	11	8	20	0	7	8	5	20	0	10	4	5	0	0	0	0	0	19	0	0	0

Peak Rolling Hour Flow Rates  
Classification: ALL

TIME	Southbound Martin Luther King Jr Ave						Westbound Dandridge Ave					Northbound E Hill Ave					Eastbound E Summit Hill Dr SE					Int Total			
	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds 3a	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds 3b	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds 3c	App Total	U-Turn 3.13	Left 3.14	Thru 3.15		Right 3.16	Peds 3d	App Total
0715 - 0730	0	7	21	32	0	60	0	17	54	5	0	76	0	13	27	13	0	53	0	32	29	11	0	72	261
0730 - 0745	0	9	27	40	0	76	0	15	36	8	0	59	0	25	29	9	0	63	0	34	29	17	1	81	279
0745 - 0800	0	10	29	31	0	70	0	15	50	18	0	83	0	29	33	7	0	69	0	39	19	15	1	74	296
0800 - 0815	0	2	30	29	0	61	0	7	40	9	0	56	0	26	29	8	0	63	0	25	15	23	2	65	245
Grand Total	0	28	107	132	0	267	0	54	180	40	0	274	0	93	118	37	0	248	0	130	92	66	4	292	1081

Peak Rolling 15min Flow Rates  
Classification: ALL

TIME	Southbound Martin Luther King Jr Ave						Westbound Dandridge Ave					Northbound E Hill Ave					Eastbound E Summit Hill Dr SE					Int Total			
	U-Turn 3.1	Left 3.2	Thru 3.3	Right 3.4	Peds 3a	App Total	U-Turn 3.5	Left 3.6	Thru 3.7	Right 3.8	Peds 3b	App Total	U-Turn 3.9	Left 3.10	Thru 3.11	Right 3.12	Peds 3c	App Total	U-Turn 3.13	Left 3.14	Thru 3.15		Right 3.16	Peds 3d	App Total
Grand Total	0	40	116	124	0	280	0	60	200	72	0	332	0	116	132	28	0	276	0	156	76	60	4	296	1184

**Knoxville, TN**  
Classified Turn Movement Count

**Site 4 of 7**  
Martin Luther King Jr Ave (North)

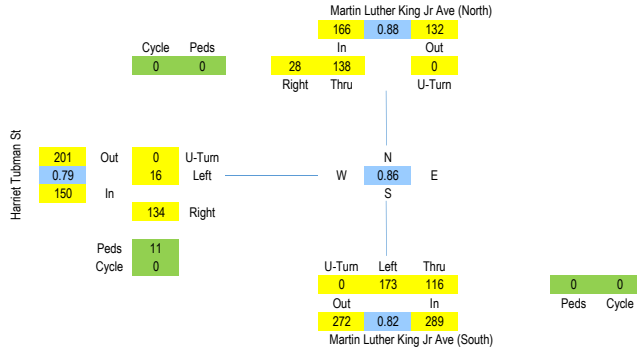
Martin Luther King Jr Ave (South)  
Harriet Tubman St

**Lat/Long**  
35.971517°, -83.906085°

**Date**  
15 October 2019

**Weather**  
Mostly Cloudy  
61°F

0700 - 0900 (Weekday 2h Session) (15-10-2019)  
Classification: ALL



Peak Hour: 0715 - 0815

Southbound					
Martin Luther King Jr Ave (North)					
TIME	U-Turn 4.1	Thru 4.2	Right 4.3	Peds 4a	App Total
0700 - 0715	0	24	3	0	27
0715 - 0730	0	34	6	0	40
0730 - 0745	0	39	8	0	47
0745 - 0800	0	31	10	0	41
Hourly Total	0	128	27	0	155
0800 - 0815	0	34	4	0	38
0815 - 0830	0	30	4	0	34
0830 - 0845	0	28	3	0	31
0845 - 0900	0	23	2	3	28
Hourly Total	0	115	13	3	131
<b>Grand Total</b>	<b>0</b>	<b>243</b>	<b>40</b>	<b>3</b>	<b>286</b>
Approach (%)	0.00	84.97	13.99	1.05	
Total (%)	0.00	24.50	4.03	0.30	28.83
P/Cycle	0	0	0	-	0
Cars	0	237	39	-	276
Truck	0	6	1	-	7
P/Cycle (%)	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	97.53	97.50	-	97.53
Truck (%)	0.00	2.47	2.50	-	2.47

Northbound						Eastbound						
Martin Luther King Jr Ave (South)						Harriet Tubman St						
TIME	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4c	App Total	U-Turn 4.7	Left 4.8	Right 4.9	Peds 4d	App Total	Int Total	Rolling Hour
0700 - 0715	0	22	15	0	37	0	1	13	1	15	79	553
0715 - 0730	0	40	26	0	66	0	4	25	4	33	139	605
0730 - 0745	0	48	25	0	73	0	2	41	3	46	166	587
0745 - 0800	0	56	32	0	88	0	7	41	3	51	180	510
Hourly Total	0	166	98	0	264	0	14	120	11	145	564	-
0800 - 0815	0	29	33	0	62	0	3	27	1	31	131	419
0815 - 0830	0	34	29	0	63	0	3	17	1	21	118	-
0830 - 0845	0	26	13	0	39	0	0	16	4	20	90	-
0845 - 0900	0	25	23	0	48	0	1	12	0	13	89	-
Hourly Total	0	114	98	0	212	0	7	72	6	85	428	-
<b>Grand Total</b>	<b>0</b>	<b>280</b>	<b>196</b>	<b>0</b>	<b>476</b>	<b>0</b>	<b>21</b>	<b>192</b>	<b>17</b>	<b>230</b>	<b>992</b>	<b>-</b>
Approach (%)	0.00	58.82	41.18	0.00		0.00	9.13	83.48	7.39			
Total (%)	0.00	28.23	19.76	0.00	47.98	0.00	2.12	19.35	1.71	23.19		
P/Cycle	0	0	0	-	0	0	0	0	-	0	0	0
Cars	0	262	188	-	450	0	18	172	-	190	190	190
Truck	0	18	8	-	26	0	3	20	-	23	23	23
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00
Cars (%)	0.00	93.57	95.92	-	94.54	0.00	85.71	89.58	-	89.20	89.20	89.20
Truck (%)	0.00	6.43	4.08	-	5.46	0.00	14.29	10.42	-	10.80	10.80	10.80

**Peak Rolling Hour Flow Rates**  
Classification: ALL

Southbound					
Martin Luther King Jr Ave (North)					
TIME	U-Turn 4.1	Thru 4.2	Right 4.3	Peds 4a	App Total
0715 - 0730	0	34	6	0	40
0730 - 0745	0	39	8	0	47
0745 - 0800	0	31	10	0	41
0800 - 0815	0	34	4	0	38
<b>Grand Total</b>	<b>0</b>	<b>138</b>	<b>28</b>	<b>0</b>	<b>166</b>
Approach (%)	0.00	83.13	16.87	0.00	
Total (%)	0.00	22.40	4.55	0.00	26.95
PHF	0%	88%	70%		
P/Cycle	0	0	0	-	0
Cars	0	135	28	-	163
Truck	0	3	0	-	3
P/Cycle (%)	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	97.83	100.00	-	98.19
Truck (%)	0.00	2.17	0.00	-	1.81

Northbound						Eastbound					
Martin Luther King Jr Ave (South)						Harriet Tubman St					
TIME	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4c	App Total	U-Turn 4.7	Left 4.8	Right 4.9	Peds 4d	App Total	Int Total
0715 - 0730	0	40	26	0	66	0	4	25	4	33	139
0730 - 0745	0	48	25	0	73	0	2	41	3	46	166
0745 - 0800	0	56	32	0	88	0	7	41	3	51	180
0800 - 0815	0	29	33	0	62	0	3	27	1	31	131
<b>Grand Total</b>	<b>0</b>	<b>173</b>	<b>116</b>	<b>0</b>	<b>289</b>	<b>0</b>	<b>16</b>	<b>134</b>	<b>11</b>	<b>161</b>	<b>616</b>
Approach (%)	0.00	59.86	40.14	0.00		0.00	9.94	83.23	6.83		
Total (%)	0.00	28.08	18.83	0.00	46.92	0.00	2.60	21.75	1.79	26.14	
PHF	0%	77%	88%			0%	57%	82%			86%
P/Cycle	0	0	0	-	0	0	0	0	-	0	0
Cars	0	162	112	-	274	0	14	121	-	135	572
Truck	0	11	4	-	15	0	2	13	-	15	33
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00
Cars (%)	0.00	93.64	96.55	-	94.81	0.00	87.50	90.30	-	90.00	92.86
Truck (%)	0.00	6.36	3.45	-	5.19	0.00	12.50	9.70	-	10.00	5.56

**Peak Rolling 15min Flow Rates**  
Classification: ALL

Southbound					
Martin Luther King Jr Ave (North)					
TIME	U-Turn 4.1	Thru 4.2	Right 4.3	Peds 4a	App Total
<b>Grand Total</b>	<b>0</b>	<b>124</b>	<b>40</b>	<b>0</b>	<b>164</b>
Approach (%)	0.00	75.61	24.39	0.00	
Total (%)	0.00	17.22	5.56	0.00	22.78
P/Cycle	0	0	0	-	0
Cars	0	124	40	-	164
Truck	0	0	0	-	0
P/Cycle (%)	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	100.00	100.00	-	100.00
Truck (%)	0.00	0.00	0.00	-	0.00

Northbound						Eastbound					
Martin Luther King Jr Ave (South)						Harriet Tubman St					
TIME	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4c	App Total	U-Turn 4.7	Left 4.8	Right 4.9	Peds 4d	App Total	Int Total
<b>Grand Total</b>	<b>0</b>	<b>224</b>	<b>128</b>	<b>0</b>	<b>352</b>	<b>0</b>	<b>28</b>	<b>164</b>	<b>12</b>	<b>204</b>	<b>720</b>
Approach (%)	0.00	63.64	36.36	0.00		0.00	13.73	80.39	5.88		
Total (%)	0.00	31.11	17.78	0.00	48.89	0.00	3.89	22.78	1.67	28.33	
P/Cycle	0	0	0	-	0	0	0	0	-	0	0
Cars	0	216	120	-	336	0	24	144	-	168	668
Truck	0	8	8	-	16	0	4	20	-	24	40
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00
Cars (%)	0.00	96.43	93.75	-	95.45	0.00	85.71	87.80	-	82.35	92.78
Truck (%)	0.00	3.57	6.25	-	4.55	0.00	14.29	12.20	-	11.76	5.56





**Knoxville, TN**  
Classified Turn Movement Count

**Site 6 of 7**

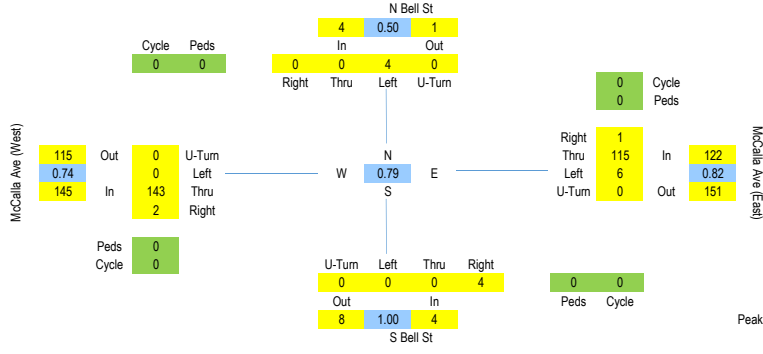
N Bell St  
McCalla Ave (East)  
S Bell St  
McCalla Ave (West)

Lat/Long  
35.975128°, -83.910492°

Date  
15 October 2019

Weather  
Mostly Cloudy  
61°F

0700 - 0900 (Weekday 2h Session) (15-10-2019)  
Classification: ALL



Peak Hour: 0715 - 0815

TIME	Southbound N Bell St						Westbound McCalla Ave (East)						Northbound S Bell St						Eastbound McCalla Ave (West)						Int Total	Rolling Hour
	U-Turn 6.1	Left 6.2	Thru 6.3	Right 6.4	Peds 6a	App Total	U-Turn 6.5	Left 6.6	Thru 6.7	Right 6.8	Peds 6b	App Total	U-Turn 6.9	Left 6.10	Thru 6.11	Right 6.12	Peds 6c	App Total	U-Turn 6.13	Left 6.14	Thru 6.15	Right 6.16	Peds 6d	App Total		
0700 - 0715	0	0	0	0	0	0	0	1	15	0	0	16	0	1	0	0	0	1	0	0	28	1	0	29	46	269
0715 - 0730	0	1	0	0	0	1	0	3	21	0	0	24	0	0	0	1	0	1	0	0	40	1	0	41	41	275
0730 - 0745	0	0	0	0	0	0	0	1	36	0	0	37	0	0	0	1	0	1	0	0	48	1	0	49	87	271
0745 - 0800	0	2	0	0	0	2	0	1	33	0	0	34	0	0	0	1	0	1	0	0	32	0	0	32	69	233
Hourly Total	0	3	0	0	0	3	0	6	105	0	0	111	0	1	0	3	0	4	0	0	148	3	0	151	269	-
0800 - 0815	0	1	0	0	0	1	0	1	25	1	0	27	0	0	0	1	0	1	0	0	23	0	0	23	52	214
0815 - 0830	0	0	0	0	0	0	0	0	21	0	0	21	0	0	0	1	0	1	0	0	41	0	0	41	63	63
0830 - 0845	0	2	0	0	0	3	0	2	23	1	0	26	0	0	0	4	0	4	0	1	16	0	0	17	50	50
0845 - 0900	0	1	0	0	0	1	0	1	16	0	0	17	0	0	0	5	0	5	0	0	27	0	0	27	50	50
Hourly Total	0	4	0	0	0	5	0	4	85	2	0	91	0	0	0	11	0	11	0	1	107	0	0	108	215	-
Grand Total	0	7	0	0	0	8	0	10	190	2	0	202	0	1	0	14	0	15	0	1	255	3	0	259	484	-
Approach (%)	0.00	87.50	0.00	0.00	12.50		0.00	4.95	94.06	0.99	0.00		0.00	6.67	0.00	93.33	0.00		0.00	0.39	98.46	1.16	0.00			
Total (%)	0.00	1.45	0.00	0.00	0.21	1.65	0.00	2.07	39.26	0.41	0.00	41.74	0.00	0.21	0.00	2.89	0.00	3.10	0.00	0.21	52.69	0.62	0.00	53.51		
P/Cycle	0	0	0	0	0	-	0	0	0	2	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	0
Cars	0	7	0	0	0	-	7	0	7	176	2	-	185	0	1	0	12	-	13	0	1	221	3	-	225	225
Truck	0	0	0	0	0	-	0	0	3	12	0	-	15	0	0	0	2	-	2	0	0	34	0	-	34	34
P/Cycle (%)	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	1.05	0.00	-	0.99	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00
Cars (%)	0.00	100.00	0.00	0.00	0.00	-	100.00	0.00	70.00	92.63	100.00	-	91.58	0.00	100.00	0.00	85.71	-	86.67	0.00	100.00	86.67	100.00	-	86.87	86.87
Truck (%)	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	30.00	6.32	0.00	-	7.43	0.00	0.00	0.00	14.29	-	13.33	0.00	0.00	13.33	0.00	-	13.13	13.13

Peak Rolling Hour Flow Rates  
Classification: ALL

TIME	Southbound N Bell St						Westbound McCalla Ave (East)						Northbound S Bell St						Eastbound McCalla Ave (West)						Int Total	
	U-Turn 6.1	Left 6.2	Thru 6.3	Right 6.4	Peds 6a	App Total	U-Turn 6.5	Left 6.6	Thru 6.7	Right 6.8	Peds 6b	App Total	U-Turn 6.9	Left 6.10	Thru 6.11	Right 6.12	Peds 6c	App Total	U-Turn 6.13	Left 6.14	Thru 6.15	Right 6.16	Peds 6d	App Total		
0715 - 0730	0	1	0	0	0	1	0	3	21	0	0	24	0	0	0	1	0	1	0	0	40	1	0	41	41	67
0730 - 0745	0	0	0	0	0	0	0	1	36	0	0	37	0	0	0	1	0	1	0	0	48	1	0	49	49	87
0745 - 0800	0	2	0	0	0	2	0	1	33	0	0	34	0	0	0	1	0	1	0	0	32	0	0	32	69	69
0800 - 0815	0	1	0	0	0	1	0	1	25	1	0	27	0	0	0	1	0	1	0	0	23	0	0	23	52	52
Grand Total	0	4	0	0	0	4	0	6	115	1	0	122	0	0	0	4	0	4	0	0	143	2	0	145	275	275
Approach (%)	0.00	100.00	0.00	0.00	0.00		0.00	4.92	94.26	0.82	0.00		0.00	0.00	0.00	100.00	0.00		0.00	0.00	98.62	1.38	0.00			
Total (%)	0.00	1.45	0.00	0.00	0.00	1.45	0.00	2.18	41.82	0.36	0.00	44.36	0.00	0.00	0.00	1.45	0.00	1.45	0.00	0.00	52.00	0.73	0.00	52.73		
PHF	50%						82%						100%						74%						79%	
P/Cycle	0	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	0
Cars	0	4	0	0	0	-	4	0	5	108	1	-	114	0	0	0	3	-	3	0	0	130	2	-	132	253
Truck	0	0	0	0	0	-	0	0	1	5	0	-	6	0	0	0	1	-	1	0	0	13	0	-	13	20
P/Cycle (%)	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	1.74	0.00	0.00	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73
Cars (%)	0.00	100.00	0.00	0.00	0.00	-	100.00	0.00	83.33	93.91	100.00	93.44	0.00	0.00	0.00	75.00	-	75.00	0.00	0.00	90.91	100.00	-	91.03	92.00	92.00
Truck (%)	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	16.67	4.35	0.00	4.92	0.00	0.00	0.00	25.00	-	25.00	0.00	0.00	9.09	0.00	0.00	-	8.97	7.27

Peak Rolling 15min Flow Rates  
Classification: ALL

TIME	Southbound N Bell St						Westbound McCalla Ave (East)						Northbound S Bell St						Eastbound McCalla Ave (West)						Int Total	
	U-Turn 6.1	Left 6.2	Thru 6.3	Right 6.4	Peds 6a	App Total	U-Turn 6.5	Left 6.6	Thru 6.7	Right 6.8	Peds 6b	App Total	U-Turn 6.9	Left 6.10	Thru 6.11	Right 6.12	Peds 6c	App Total	U-Turn 6.13	Left 6.14	Thru 6.15	Right 6.16	Peds 6d	App Total		
Grand Total	0	0	0	0	0	0	0	4	144	0	0	148	0	0	0	4	0	4	0	0	192	4	0	196	348	348
Approach (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70	97.30	0.00	0.00		0.00	0.00	0.00	100.00	0.00		0.00	0.00	97.96	2.04	0.00			
Total (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	41.38	0.00	0.00	42.53	0.00	0.00	0.00	1.15	0.00	1.15	0.00	0.00	55.17	1.15	0.00	56.32		
P/Cycle	0	0	0	0	0	-	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	-	0	4
Cars	0	0	0	0	0	-	0	0	4	136	0	-	140	0	0	0	4	-	4	0	0	180	4	-	184	328
Truck	0	0	0	0	0	-	0	0	0	4	0	-	4	0	0	0	0	-	0	0	0	12	0	-	12	16
P/Cycle (%)	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	2.78	0.00	0.00	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15
Cars (%)	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	100.00	94.44	0.00	94.59	0.00	0.00	0.00	100.00	-	100.00	0.00	0.00	93.75	100.00	-	93.88	94.25	94.25
Truck (%)	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	2.78	0.00	0.00	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	-	6.12	4.60

**Knoxville, TN**  
Classified Turn Movement Count

**Site 7 of 7**

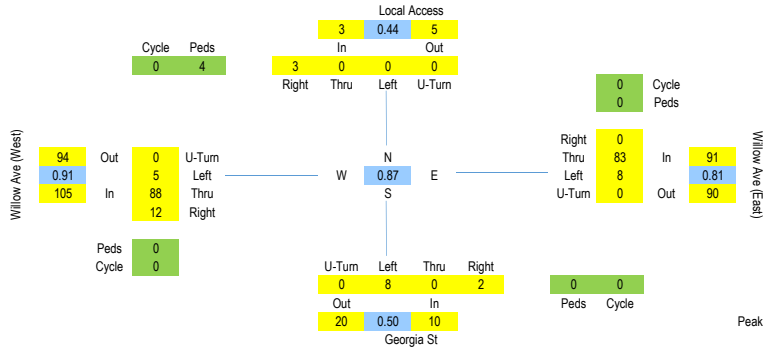
Local Access  
Willow Ave (East)  
Georgia St  
Willow Ave (West)

Lat/Long  
35.973067°, -83.912073°

Date  
15 October 2019

Weather  
Mostly Cloudy  
61°F

0700 - 0900 (Weekday 2h Session) (15-10-2019)  
Classification: ALL



TIME	Southbound Local Access						Westbound Willow Ave (East)					Northbound Georgia St					Eastbound Willow Ave (West)					Int Total	Rolling Hour			
	U-Turn 7.1	Left 7.2	Thru 7.3	Right 7.4	Peds 7a	App Total	U-Turn 7.5	Left 7.6	Thru 7.7	Right 7.8	Peds 7b	App Total	U-Turn 7.9	Left 7.10	Thru 7.11	Right 7.12	Peds 7c	App Total	U-Turn 7.13	Left 7.14	Thru 7.15			Right 7.16	Peds 7d	App Total
0700 - 0715	0	0	0	0	0	0	0	0	9	0	0	9	0	3	0	0	0	3	0	1	21	1	0	23	35	197
0715 - 0730	0	0	0	0	1	1	0	2	19	0	0	21	0	1	0	0	0	1	0	2	25	0	0	27	50	209
0730 - 0745	0	0	0	1	0	1	0	2	26	0	0	28	0	2	0	1	0	3	0	1	23	5	0	29	61	190
0745 - 0800	0	0	0	1	3	4	0	1	25	0	0	26	0	1	0	0	0	1	0	1	21	2	0	24	55	162
Hourly Total	0	0	0	2	4	6	0	5	79	0	0	84	0	7	0	1	0	8	0	5	90	8	0	103	201	-
0800 - 0815	0	0	0	1	0	1	0	3	13	0	0	16	0	4	0	1	0	5	0	1	19	5	0	25	47	152
0815 - 0830	0	0	0	0	0	0	0	2	6	0	0	8	0	1	0	0	0	1	0	0	20	1	0	21	30	-
0830 - 0845	0	0	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	0	1	15	1	0	17	33	-
0845 - 0900	0	0	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	0	0	20	1	0	21	42	-
Hourly Total	0	0	0	1	0	1	0	5	56	0	0	61	0	5	0	1	0	6	0	2	74	8	0	84	152	-
Grand Total	0	0	0	3	4	7	0	10	135	0	0	145	0	12	0	2	0	14	0	7	164	16	0	187	353	-
Approach (%)	0.00	0.00	0.00	42.86	57.14		0.00	6.90	93.10	0.00	0.00		0.00	85.71	0.00	14.29	0.00		0.00	3.74	87.70	8.56	0.00			
Total (%)	0.00	0.00	0.00	0.85	1.13	1.98	0.00	2.83	38.24	0.00	0.00	41.08	0.00	3.40	0.00	0.57	0.00	3.97	0.00	1.98	46.46	4.53	0.00	52.97		
P/Cycle	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars (%)	0	0	0	0	1	1	0	0	10	98	0	108	0	11	0	2	0	13	0	6	153	16	0	175		
Truck (%)	0	0	0	0	2	2	0	0	0	36	0	36	0	1	0	0	0	1	0	1	11	0	0	12		
P/Cycle (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cars (%)	0.00	0.00	0.00	33.33	-	33.33	0.00	100.00	72.59	0.00	74.48	0.00	91.67	0.00	100.00	0.00	92.86	0.00	85.71	93.29	100.00	-	-	93.58		
Truck (%)	0.00	0.00	0.00	66.67	-	66.67	0.00	0.00	26.67	0.00	24.83	0.00	8.33	0.00	0.00	0.00	7.14	0.00	14.29	6.71	0.00	-	-	6.42		

Peak Rolling Hour Flow Rates  
Classification: ALL

TIME	Southbound Local Access						Westbound Willow Ave (East)					Northbound Georgia St					Eastbound Willow Ave (West)					Int Total	Rolling Hour			
	U-Turn 7.1	Left 7.2	Thru 7.3	Right 7.4	Peds 7a	App Total	U-Turn 7.5	Left 7.6	Thru 7.7	Right 7.8	Peds 7b	App Total	U-Turn 7.9	Left 7.10	Thru 7.11	Right 7.12	Peds 7c	App Total	U-Turn 7.13	Left 7.14	Thru 7.15			Right 7.16	Peds 7d	App Total
0715 - 0730	0	0	0	0	1	1	0	2	19	0	0	21	0	1	0	0	0	1	0	2	25	0	0	27	50	-
0730 - 0745	0	0	0	1	0	1	0	2	26	0	0	28	0	2	0	1	0	3	0	1	23	5	0	29	61	-
0745 - 0800	0	0	0	1	3	4	0	1	25	0	0	26	0	1	0	0	0	1	0	1	21	2	0	24	55	-
0800 - 0815	0	0	0	1	0	1	0	3	13	0	0	16	0	4	0	1	0	5	0	1	19	5	0	25	47	-
Grand Total	0	0	0	3	4	7	0	8	83	0	0	91	0	8	0	2	0	10	0	5	88	12	0	105	213	-
Approach (%)	0.00	0.00	0.00	42.86	57.14		0.00	8.79	91.21	0.00	0.00		0.00	80.00	0.00	20.00	0.00		0.00	4.76	83.81	11.43	0.00			
Total (%)	0.00	0.00	0.00	1.41	1.88	3.29	0.00	3.76	38.97	0.00	0.00	42.72	0.00	3.76	0.00	0.94	0.00	4.69	0.00	2.35	41.31	5.63	0.00	49.30		
PHF	0%	0%	0%	75%			0%	67%	81%	0%			0%	50%	0%	50%			0%	63%	91%	68%	60%			87%
P/Cycle	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Cars (%)	0	0	0	1	-	1	0	8	54	0	-	62	0	8	0	2	-	10	0	4	85	12	-	101	174	
Truck (%)	0	0	0	0	2	2	0	0	28	0	-	28	0	0	0	0	-	0	0	1	3	0	-	4	34	
P/Cycle (%)	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	1.20	0.00	-	1.10	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	0.47	
Cars (%)	0.00	0.00	0.00	33.33	-	33.33	0.00	100.00	65.06	0.00	-	68.13	0.00	100.00	0.00	100.00	-	100.00	0.00	80.00	96.59	100.00	-	96.19	81.69	
Truck (%)	0.00	0.00	0.00	66.67	-	66.67	0.00	0.00	33.73	0.00	-	30.77	0.00	0.00	0.00	0.00	-	0.00	0.00	20.00	3.41	0.00	-	3.81	15.96	

Peak Rolling 15min Flow Rates  
Classification: ALL

TIME	Southbound Local Access						Westbound Willow Ave (East)					Northbound Georgia St					Eastbound Willow Ave (West)					Int Total	Rolling Hour			
	U-Turn 7.1	Left 7.2	Thru 7.3	Right 7.4	Peds 7a	App Total	U-Turn 7.5	Left 7.6	Thru 7.7	Right 7.8	Peds 7b	App Total	U-Turn 7.9	Left 7.10	Thru 7.11	Right 7.12	Peds 7c	App Total	U-Turn 7.13	Left 7.14	Thru 7.15			Right 7.16	Peds 7d	App Total
Grand Total	0	0	0	4	0	4	0	8	104	0	0	112	0	8	0	4	0	12	0	4	92	20	0	116	244	-
Approach (%)	0.00	0.00	0.00	100.00	0.00		0.00	7.14	92.86	0.00	0.00		0.00	66.67	0.00	33.33	0.00		0.00	3.45	79.31	17.24	0.00			
Total (%)	0.00	0.00	0.00	1.64	0.00	1.64	0.00	3.28	42.62	0.00	0.00	45.90	0.00	3.28	0.00	1.64	0.00	4.92	0.00	1.64	37.70	8.20	0.00	47.54		
P/Cycle	0	0	0	0	-	0	0	0	4	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	4	
Cars (%)	0	0	0	4	-	4	0	8	60	0	-	68	0	8	0	4	-	12	0	4	92	20	-	116	200	
Truck (%)	0	0	0	0	-	0	0	0	40	0	-	40	0	0	0	0	-	0	0	0	0	0	-	0	40	
P/Cycle (%)	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	3.85	0.00	-	3.57	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	1.64	
Cars (%)	0.00	0.00	0.00	100.00	-	100.00	0.00	100.00	57.69	0.00	-	60.71	0.00	100.00	0.00	100.00	-	100.00	0.00	100.00	100.00	100.00	-	100.00	81.97	
Truck (%)	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	38.46	0.00	-	35.71	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-	0.00	16.39	

**Knoxville, TN**  
Classified Turn Movement Count

Site 1 of 7  
Nelson Ave  
E Summit Hill Dr SE (East)

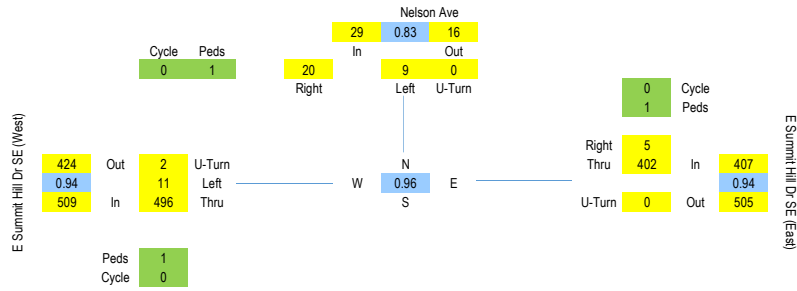
E Summit Hill Dr SE (West)

Lat/Long  
35.970402°, -83.9110114°

Date  
15 October 2019

Weather  
Mostly Cloudy  
61°F

1400 - 1800 (Weekday 4h Session) (15-10-2019)  
Classification: ALL



Peak Hour: 1700 - 1800

TIME	Southbound Nelson Ave				Westbound E Summit Hill Dr SE (East)					
	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total
1400 - 1415	0	1	5	0	6	0	84	0	0	84
1415 - 1430	0	3	7	0	10	0	56	1	0	57
1430 - 1445	0	2	7	0	9	0	79	3	0	82
1445 - 1500	0	0	3	2	5	0	74	1	0	75
Hourly Total	0	6	22	2	30	0	293	5	0	298
1500 - 1515	0	3	8	0	11	0	72	3	0	75
1515 - 1530	0	2	4	1	7	0	75	2	0	77
1530 - 1545	0	3	5	0	8	0	98	1	0	99
1545 - 1600	0	1	4	7	12	0	96	1	0	97
Hourly Total	0	9	21	8	38	0	341	7	0	348
1600 - 1615	0	3	6	0	9	0	110	0	0	110
1615 - 1630	0	2	4	2	8	0	72	3	0	75
1630 - 1645	0	0	4	3	7	0	103	0	0	103
1645 - 1700	0	1	4	2	7	0	88	1	0	89
Hourly Total	0	6	18	7	31	0	373	4	0	377
1700 - 1715	0	2	6	0	8	0	104	0	0	104
1715 - 1730	0	1	4	1	6	0	98	3	0	101
1730 - 1745	0	1	6	0	7	0	92	1	1	94
1745 - 1800	0	5	4	0	9	0	108	1	0	109
Hourly Total	0	9	20	1	30	0	402	5	1	408
Grand Total	0	30	81	18	129	0	1409	21	1	1431
Approach (%)	0.00	23.26	62.79	13.95		0.00	98.46	1.47	0.07	
Total (%)	0.00	0.94	2.54	0.56	4.04	0.00	44.10	0.66	0.03	44.79
P/Cycle	0	0	0	-	0	0	0	0	-	0
Cars	0	30	68	-	98	0	1371	21	-	1392
Truck	0	0	13	-	13	0	38	0	-	38
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	100.00	83.95	-	88.29	0.00	97.30	100.00	-	97.34
Truck (%)	0.00	0.00	16.05	-	11.71	0.00	2.70	0.00	-	2.66

TIME	Eastbound E Summit Hill Dr SE (West)				Peds 1d	App Total	Int Total	Rolling Hour
	U-Turn 1.7	Left 1.8	Thru 1.9	App Total				
1400 - 1415	1	2	75	0	78	168	660	
1415 - 1430	1	3	78	0	82	149	661	
1430 - 1445	2	0	81	0	83	174	700	
1445 - 1500	1	6	84	0	91	171	727	
Hourly Total	5	11	318	0	334	662	-	
1500 - 1515	0	3	80	0	83	169	752	
1515 - 1530	0	3	102	0	105	189	769	
1530 - 1545	0	2	92	0	94	201	763	
1545 - 1600	0	2	90	0	92	201	790	
Hourly Total	0	10	364	0	374	760	-	
1600 - 1615	0	2	65	0	67	186	818	
1615 - 1630	0	2	99	0	101	184	880	
1630 - 1645	0	2	119	0	121	231	937	
1645 - 1700	0	3	125	0	128	224	934	
Hourly Total	0	9	408	0	417	825	-	
1700 - 1715	1	3	132	0	136	248	945	
1715 - 1730	0	3	130	1	134	241	-	
1730 - 1745	0	1	124	0	125	226	-	
1745 - 1800	1	4	110	0	115	233	-	
Hourly Total	2	11	496	1	510	948	-	
Grand Total	7	41	1586	1	1635	3195	-	
Approach (%)	0.43	2.51	97.00	0.06				
Total (%)	0.22	1.28	49.64	0.03	51.17			
P/Cycle	0	0	0	-	0			
Cars	6	29	1551	-	1586			
Truck	1	12	35	-	48			
P/Cycle (%)	0.00	0.00	0.00	-	0.00			
Cars (%)	85.71	70.73	97.79	-	97.06			
Truck (%)	14.29	29.27	2.21	-	2.94			

Peak Rolling Hour Flow Rates  
Classification: ALL

TIME	Southbound Nelson Ave				Westbound E Summit Hill Dr SE (East)					
	U-Turn 1.1	Left 1.2	Right 1.3	Peds 1a	App Total	U-Turn 1.4	Thru 1.5	Right 1.6	Peds 1b	App Total
1700 - 1715	0	2	6	0	8	0	104	0	0	104
1715 - 1730	0	1	4	1	6	0	98	3	0	101
1730 - 1745	0	1	6	0	7	0	92	1	1	94
1745 - 1800	0	5	4	0	9	0	108	1	0	109
Grand Total	0	9	20	1	30	0	402	5	1	408
Approach (%)	0.00	30.00	66.67	3.33		0.00	98.53	1.23	0.25	
Total (%)	0.00	0.95	2.11	0.11	3.16	0.00	42.41	0.53	0.11	43.04
PHF	0%	45%	83%			0%	93%	42%		
P/Cycle	0	0	0	-	0	0	0	0	-	0
Cars	0	9	18	-	27	0	396	5	-	401
Truck	0	0	2	-	2	0	6	0	-	6
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	100.00	90.00	-	93.10	0.00	98.51	100.00	-	98.53
Truck (%)	0.00	0.00	10.00	-	6.90	0.00	1.49	0.00	-	1.47

TIME	Eastbound E Summit Hill Dr SE (West)				Peds 1d	App Total	Int Total
	U-Turn 1.7	Left 1.8	Thru 1.9	App Total			
1700 - 1715	1	3	132	0	136	248	
1715 - 1730	0	3	130	1	134	241	
1730 - 1745	0	1	124	0	125	226	
1745 - 1800	1	4	110	0	115	233	
Grand Total	2	11	496	1	510	948	
Approach (%)	0.39	2.16	97.25	0.20			
Total (%)	0.21	1.16	52.32	0.11	53.80		
PHF	50%	69%	94%			96%	
P/Cycle	0	0	0	-	0	0	
Cars	2	9	490	-	501	929	
Truck	0	2	6	-	8	16	
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	
Cars (%)	100.00	81.82	98.79	-	98.43	98.00	
Truck (%)	0.00	18.18	1.21	-	1.57	1.69	

Peak Rolling 15min Flow Rates  
 Classification: ALL

TIME	Southbound Nelson Ave					Westbound E Summit Hill Dr SE (East)				
	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App
	1.1	1.2	1.3	1a	Total	1.4	1.5	1.6	1b	Total
Grand Total	0	8	24	0	32	0	416	0	0	416
Approach (%)	0.00	25.00	75.00	0.00		0.00	100.00	0.00	0.00	
Total (%)	0.00	0.81	2.42	0.00	3.23	0.00	41.94	0.00	0.00	41.94
P/Cycle	0	0	0	-	0	0	0	0	-	0
Cars	0	8	20	-	28	0	408	0	-	408
Truck	0	0	4	-	4	0	8	0	-	8
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	100.00	83.33	-	87.50	0.00	98.08	0.00	-	98.08
Truck (%)	0.00	0.00	16.67	-	12.50	0.00	1.92	0.00	-	1.92

TIME	Eastbound E Summit Hill Dr SE (West)					Int
	U-Turn	Left	Thru	Peds	App	
	1.7	1.8	1.9	1d	Total	
Grand Total	4	12	528	0	544	992
Approach (%)	0.74	2.21	97.06	0.00		
Total (%)	0.40	1.21	53.23	0.00	54.84	
P/Cycle	0	0	0	-	0	0
Cars	4	12	516	-	532	968
Truck	0	0	12	-	12	24
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00
Cars (%)	100.00	100.00	97.73	-	97.79	97.58
Truck (%)	0.00	0.00	2.27	-	2.21	2.42

**Knorrville, TN**  
Classified Turn Movement Count

**Site 2 of 7**

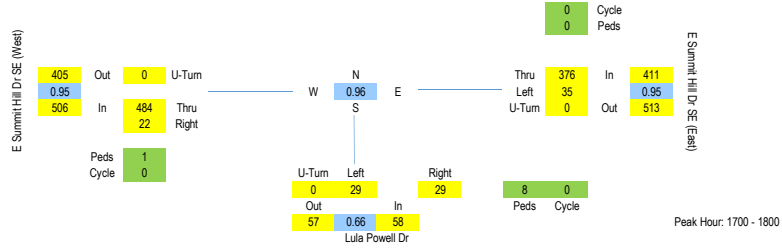
E Summit Hill Dr SE (East)  
Lula Powell Dr  
E Summit Hill Dr SE (West)

**Lat/Long**  
35.970343°, -83.909382°

**Date**  
15 October 2019

**Weather**  
Mostly Cloudy  
61°F

1400 - 1800 (Weekday 4h Session) (15-10-2019)  
Classification: ALL



TIME	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App	Int	Rolling
1400 - 1415	0	4	73	0	77	0	3	5	0	8	0	72	3	0	75	160	685
1415 - 1430	0	12	54	0	66	0	5	5	0	10	0	80	3	0	83	159	730
1430 - 1445	0	8	72	0	80	0	4	8	0	12	2	70	9	0	81	173	773
1445 - 1500	0	15	69	0	84	0	5	20	0	25	0	79	5	10	94	203	827
Hourly Total	0	39	268	0	307	0	17	38	0	55	2	301	20	10	333	695	-
1500 - 1515	0	17	70	0	87	0	3	32	0	35	0	80	3	0	83	205	838
1515 - 1530	0	11	75	0	86	0	2	9	0	11	0	98	7	0	105	202	832
1530 - 1545	0	14	99	0	113	0	3	15	3	21	0	92	4	0	96	230	829
1545 - 1600	0	9	96	6	111	0	6	5	2	13	0	85	3	2	90	214	833
Hourly Total	0	51	340	6	397	0	14	61	5	80	0	355	17	2	374	851	-
1600 - 1615	0	8	106	0	114	0	7	11	3	21	0	60	7	2	69	204	863
1615 - 1630	0	10	72	0	82	0	5	10	2	17	0	95	7	1	103	202	920
1630 - 1645	0	8	96	0	104	0	6	4	5	15	0	112	5	5	122	241	966
1645 - 1700	1	9	80	0	90	1	11	5	1	18	0	121	6	0	127	235	968
Hourly Total	1	35	354	0	390	1	29	30	11	71	0	388	25	8	421	882	-
1700 - 1715	0	13	95	0	108	0	6	8	1	15	0	127	7	0	134	257	975
1715 - 1730	0	9	96	0	105	0	4	5	1	10	0	130	1	0	131	246	-
1730 - 1745	0	5	90	0	95	0	5	7	4	16	0	121	5	0	126	237	-
1745 - 1800	0	8	95	0	103	0	14	9	2	25	0	106	9	1	116	244	-
Hourly Total	0	35	376	0	411	0	29	29	8	66	0	484	22	1	507	984	-
Grand Total	1	160	1338	6	1505	1	89	158	24	272	2	1528	84	21	1635	3412	-
Approach (%)	0.07	10.63	88.90	0.40		0.37	32.72	58.09	8.82		0.12	93.46	5.14	1.28			
Total (%)	0.03	4.69	39.21	0.18	44.11	0.03	2.61	4.63	0.70	7.97	0.06	44.78	2.46	0.62	47.92		
P/Cycle	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0		
Cars	1	147	1302	-	1450	1	87	148	-	236	2	1494	83	-	1579		
Truck	0	13	36	-	49	0	2	10	-	12	0	34	1	-	35		
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00		
Cars (%)	100.00	91.88	97.31	-	96.73	100.00	97.75	93.67	-	95.16	100.00	97.77	98.81	-	97.83		
Truck (%)	0.00	8.13	2.69	-	3.27	0.00	2.25	6.33	-	4.84	0.00	2.23	1.19	-	2.17		

**Peak Rolling Hour Flow Rates**  
Classification: ALL

TIME	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App	Int	Total
1700 - 1715	0	13	95	0	108	0	6	8	1	15	0	127	7	0	134	257	-
1715 - 1730	0	9	96	0	105	0	4	5	1	10	0	130	1	0	131	246	-
1730 - 1745	0	5	90	0	95	0	5	7	4	16	0	121	5	0	126	237	-
1745 - 1800	0	8	95	0	103	0	14	9	2	25	0	106	9	1	116	244	-
Grand Total	0	35	376	0	411	0	29	29	8	66	0	484	22	1	507	984	-
Approach (%)	0.00	8.52	91.48	0.00		0.00	43.94	43.94	12.12		0.00	95.46	4.34	0.20			
Total (%)	0.00	3.56	38.21	0.00	41.77	0.00	2.95	2.95	0.81	6.71	0.00	49.19	2.24	0.10	51.52		
PHF	0%	67%	98%	-	0%	52%	81%	81%		95%	61%	96%	61%		96%		
P/Cycle	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	
Cars	0	34	370	-	404	0	29	28	-	57	0	478	22	-	500	961	
Truck	0	1	6	-	7	0	0	1	-	1	0	6	0	-	6	14	
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	
Cars (%)	0.00	97.14	98.40	-	98.30	0.00	100.00	96.55	-	98.28	0.00	98.76	100.00	-	98.81	97.66	
Truck (%)	0.00	2.86	1.60	-	1.70	0.00	0.00	3.45	-	1.72	0.00	1.24	0.00	-	1.19	1.42	

**Peak Rolling 15min Flow Rates**  
Classification: ALL

TIME	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App	Int	Total
Grand Total	0	52	380	0	432	0	24	32	4	60	0	508	28	0	536	1028	-
Approach (%)	0.00	12.04	87.96	0.00		0.00	40.00	53.33	6.67		0.00	94.78	5.22	0.00			
Total (%)	0.00	5.06	36.96	0.00	42.02	0.00	2.33	3.11	0.39	5.84	0.00	49.42	2.72	0.00	52.14		
P/Cycle	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	
Cars	0	52	372	-	424	0	24	32	-	56	0	504	28	-	532	1012	
Truck	0	0	8	-	8	0	0	0	-	0	0	4	0	-	4	12	
P/Cycle (%)	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	-	0.00	0.00	
Cars (%)	0.00	100.00	97.89	-	98.15	0.00	100.00	100.00	-	93.33	0.00	99.21	100.00	-	99.25	98.44	
Truck (%)	0.00	0.00	2.11	-	1.85	0.00	0.00	0.00	-	0.00	0.00	0.79	0.00	-	0.75	1.17	





**Knorrville, TN**  
Classified Turn Movement Count

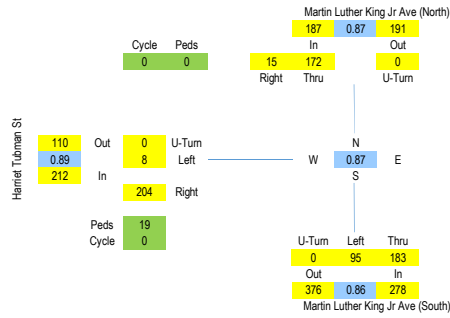
**Site 4 of 7**  
Martin Luther King Jr Ave (North)  
Martin Luther King Jr Ave (South)  
Harriet Tubman St

**Lat/Long**  
35.9715177, -83.906085

**Date**  
15 October 2019

**Weather**  
Mostly Cloudy  
61°F

1400 - 1800 (Weekday 4h Session) (15-10-2019)  
Classification: ALL



Peak Hour: 1530 - 1630

Southbound					
Martin Luther King Jr Ave (North)					
TIME	U-Turn 4.1	Thru 4.2	Right 4.3	Peds 4a	App Total
1400 - 1415	0	34	3	0	37
1415 - 1430	0	42	4	0	46
1430 - 1445	0	40	2	1	43
1445 - 1500	0	39	2	0	41
Hourly Total	0	155	11	1	167
1500 - 1515	0	43	3	0	46
1515 - 1530	0	41	4	0	45
1530 - 1545	0	45	6	0	51
1545 - 1600	0	50	4	0	54
Hourly Total	0	179	17	0	196
1600 - 1615	0	34	1	0	35
1615 - 1630	0	43	4	0	47
1630 - 1645	0	51	7	0	58
1645 - 1700	0	39	0	0	39
Hourly Total	0	167	12	0	179
1700 - 1715	0	51	3	0	54
1715 - 1730	0	41	4	0	45
1730 - 1745	0	47	4	1	52
1745 - 1800	0	37	7	0	44
Hourly Total	0	176	18	1	195
<b>Grand Total</b>	<b>0</b>	<b>677</b>	<b>58</b>	<b>2</b>	<b>737</b>
Approach (%)	0.00	91.86	7.87	0.27	
Total (%)	0.00	27.67	2.37	0.08	30.12
PI/Cycle (%)	0	0	0	-	0
Cars (%)	0	655	54	-	709
Truck (%)	0	22	4	-	26
PI/Cycle (%)	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	96.75	93.10	-	96.46
Truck (%)	0.00	3.25	6.90	-	3.54

Northbound					Eastbound							
Martin Luther King Jr Ave (South)					Harriet Tubman St							
TIME	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4c	App Total	U-Turn 4.7	Left 4.8	Right 4.9	Peds 4d	App Total	Int Total	Rolling Hour
1400 - 1415	0	20	33	0	53	0	1	26	0	27	117	518
1415 - 1430	0	25	30	3	58	0	1	30	2	33	137	543
1430 - 1445	0	17	41	0	58	0	1	25	2	28	129	560
1445 - 1500	0	32	44	0	76	0	0	26	1	27	144	613
Hourly Total	0	94	148	3	245	0	3	107	5	115	527	-
1500 - 1515	0	22	47	0	69	0	1	26	1	28	143	654
1515 - 1530	0	30	44	0	74	0	3	27	1	31	150	661
1530 - 1545	0	28	39	0	67	0	2	59	2	63	181	677
1545 - 1600	0	29	51	2	82	0	2	48	15	65	201	667
Hourly Total	0	109	181	2	292	0	8	160	19	187	675	-
1600 - 1615	0	22	35	1	58	0	1	56	0	57	150	617
1615 - 1630	0	16	58	0	74	0	3	41	2	46	167	627
1630 - 1645	0	20	48	0	68	0	0	43	0	43	169	626
1645 - 1700	0	12	46	0	58	0	3	34	1	38	135	605
Hourly Total	0	70	187	1	258	0	7	174	3	184	621	-
1700 - 1715	0	18	53	0	71	0	3	31	1	35	160	617
1715 - 1730	0	19	70	1	90	0	5	25	1	31	166	-
1730 - 1745	1	24	38	0	63	0	3	31	1	35	150	-
1745 - 1800	0	24	58	0	82	0	2	18	2	22	148	-
Hourly Total	1	85	219	1	306	0	13	105	5	123	624	-
<b>Grand Total</b>	<b>1</b>	<b>358</b>	<b>735</b>	<b>7</b>	<b>1101</b>	<b>0</b>	<b>31</b>	<b>546</b>	<b>32</b>	<b>609</b>	<b>2447</b>	
Approach (%)	0.09	32.52	66.76	0.64		0.00	5.09	89.66	5.25			
Total (%)	0.04	14.63	30.04	0.29	44.99	0.00	1.27	22.31	1.31	24.89		
PI/Cycle (%)	0	1	2	-	3	0	0	0	-	0		
Cars (%)	1	326	711	-	1038	0	31	520	-	551		
Truck (%)	0	31	22	-	53	0	0	26	-	26		
PI/Cycle (%)	0.00	0.28	0.27	-	0.27	0.00	0.00	0.00	-	0.00		
Cars (%)	100.00	91.06	96.73	-	94.88	0.00	100.00	95.24	-	95.49		
Truck (%)	0.00	8.66	2.99	-	4.84	0.00	0.00	4.76	-	4.51		

**Peak Rolling Hour Flow Rates**  
Classification: ALL

Southbound					
Martin Luther King Jr Ave (North)					
TIME	U-Turn 4.1	Thru 4.2	Right 4.3	Peds 4a	App Total
1530 - 1545	0	45	6	0	51
1545 - 1600	0	50	4	0	54
1600 - 1615	0	34	1	0	35
1615 - 1630	0	43	4	0	47
<b>Grand Total</b>	<b>0</b>	<b>172</b>	<b>15</b>	<b>0</b>	<b>187</b>
Approach (%)	0.00	91.98	8.02	0.00	
Total (%)	0.00	24.61	2.15	0.00	26.75
PHF	0%	86%	63%		
PI/Cycle (%)	0	0	0	-	0
Cars (%)	0	166	14	-	180
Truck (%)	0	6	1	-	7
PI/Cycle (%)	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	96.51	93.33	-	96.26
Truck (%)	0.00	3.49	6.67	-	3.74

Northbound					Eastbound						
Martin Luther King Jr Ave (South)					Harriet Tubman St						
TIME	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4c	App Total	U-Turn 4.7	Left 4.8	Right 4.9	Peds 4d	App Total	Int Total
1530 - 1545	0	28	39	0	67	0	2	59	2	63	181
1545 - 1600	0	29	51	2	82	0	2	48	15	65	201
1600 - 1615	0	22	35	1	58	0	1	56	0	57	150
1615 - 1630	0	16	58	0	74	0	3	41	2	46	167
<b>Grand Total</b>	<b>0</b>	<b>95</b>	<b>183</b>	<b>3</b>	<b>281</b>	<b>0</b>	<b>8</b>	<b>204</b>	<b>19</b>	<b>231</b>	<b>699</b>
Approach (%)	0.00	33.81	65.12	1.07		0.00	3.46	88.31	8.23		
Total (%)	0.00	13.59	26.18	0.43	40.20	0.00	1.14	29.18	2.72	33.05	
PHF	0%	82%	79%			0%	67%	86%			87%
PI/Cycle (%)	0	1	1	-	2	0	0	0	-	0	2
Cars (%)	0	88	178	-	266	0	8	195	-	203	649
Truck (%)	0	6	4	-	10	0	0	9	-	9	26
PI/Cycle (%)	0.00	1.05	0.55	-	0.72	0.00	0.00	0.00	-	0.00	0.29
Cars (%)	0.00	92.63	97.27	-	95.68	0.00	100.00	95.59	-	95.75	92.85
Truck (%)	0.00	6.32	2.19	-	3.60	0.00	0.00	4.41	-	4.25	3.72

**Peak Rolling 15min Flow Rates**  
Classification: ALL

Southbound					
Martin Luther King Jr Ave (North)					
TIME	U-Turn 4.1	Thru 4.2	Right 4.3	Peds 4a	App Total
<b>Grand Total</b>	<b>0</b>	<b>200</b>	<b>16</b>	<b>0</b>	<b>216</b>
Approach (%)	0.00	92.69	7.41	0.00	
Total (%)	0.00	24.88	1.99	0.00	26.87
PI/Cycle (%)	0	0	0	-	0
Cars (%)	0	192	16	-	208
Truck (%)	0	8	0	-	8
PI/Cycle (%)	0.00	0.00	0.00	-	0.00
Cars (%)	0.00	96.00	100.00	-	96.30
Truck (%)	0.00	4.00	0.00	-	3.70

Northbound					Eastbound						
Martin Luther King Jr Ave (South)					Harriet Tubman St						
TIME	U-Turn 4.4	Left 4.5	Thru 4.6	Peds 4c	App Total	U-Turn 4.7	Left 4.8	Right 4.9	Peds 4d	App Total	Int Total
<b>Grand Total</b>	<b>0</b>	<b>116</b>	<b>204</b>	<b>8</b>	<b>328</b>	<b>0</b>	<b>8</b>	<b>192</b>	<b>60</b>	<b>260</b>	<b>804</b>
Approach (%)	0.00	35.37	62.20	2.44		0.00	3.08	73.85	23.08		
Total (%)	0.00	14.43	25.37	1.00	40.80	0.00	1.00	23.88	7.46	32.34	
PI/Cycle (%)	0	0	4	-	4	0	0	0	-	0	4
Cars (%)	0	108	188	-	296	0	8	184	-	192	696
Truck (%)	0	8	12	-	20	0	0	8	-	8	36
PI/Cycle (%)	0.00	0.00	1.96	-	1.22	0.00	0.00	0.00	-	0.00	0.50
Cars (%)	0.00	93.10	92.16	-	90.24	0.00	100.00	95.83	-	73.85	86.57
Truck (%)	0.00	6.90	5.88	-	6.10	0.00	0.00	4.17	-	3.08	4.48







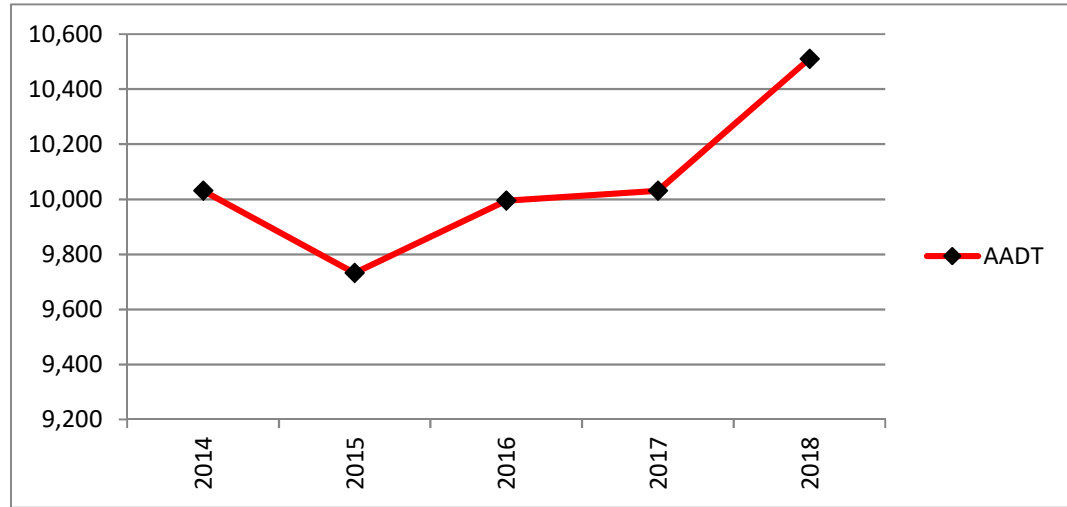
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**APPENDIX C**  
**TRIP GENERATION AND VOLUME WORKSHEETS**

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### Historic Traffic Data (Source: TDOT)

Station	000373
Route	Summit Hill Drive SE
Location	East of James White Parkway
2009	11,111
2010	9,796
2011	10,112
2012	10,415
2013	10,257
2014	10,031
2015	9,732
2016	9,995
2017	10,031
2018	10,510



Annual Growth for Last 5 Years --- Summit Hill Drive SE is 0.9%



**Trip Generation - Austin Homes (Apartments)**

Phase	Proposed Land Use	Density		Daily Trips	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
1A	Knoxville Local Apartment	105	Dwelling Units	997	56	12	44	81	45	36
1B	Knoxville Local Apartment	105	Dwelling Units	997	56	12	44	81	45	36
2	Knoxville Local Apartment	106	Dwelling Units	1,006	57	13	44	81	45	36
C	Knoxville Local Apartment	104	Dwelling Units	989	56	12	44	80	44	36
<b>Proposed Gross Trip Generation</b>				<b>3,989</b>	<b>225</b>	<b>49</b>	<b>176</b>	<b>323</b>	<b>179</b>	<b>144</b>
<b>10% Transit Trip Reduction</b>				<b>399</b>	<b>23</b>	<b>5</b>	<b>18</b>	<b>32</b>	<b>18</b>	<b>14</b>
<b>Total New Trips</b>				<b>3,590</b>	<b>202</b>	<b>44</b>	<b>158</b>	<b>291</b>	<b>161</b>	<b>130</b>

### Intersection Volume Summary Sheet

S Bell St at E Summit Hill Dr SE  
AM PEAK HOUR

Description	S Bell St <u>Northbound</u>			S Bell St <u>Southbound</u>			E Summit Hill Dr SE <u>Eastbound</u>			E Summit Hill Dr SE <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>				5		9	19	230			352	6
Existing Peak Hour Factor				0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicle %				0		33	21	3			4	0
Annual Growth Rate				1.5%		1.5%	0.9%	1.5%			1.5%	1.5%
Growth Factor				1.077		1.077	1.046	1.077			1.077	1.077
Growth Trips				0		1	1	18			27	0
<i>Five Points Phase 4 Development</i>								2			6	
<b>Background Trips (Total)</b>				0		1	1	20			33	0
<b>Background 2024 AM Volumes</b>				5		10	20	250			385	6
Future Peak Hour Factor				0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Trip Distribution IN								27%				
Trip Distribution OUT											27%	
Project Trips				0	0	0	0	12	0	0	43	0
Project Trips (unbalanced)				0	0	0	0	12	0	0	43	0
Balancing Adjustment												
<b>Project Trips</b>				0	0	0	0	12	0	0	43	0
<b>Future Buildout AM Volumes</b>				5	0	10	20	262	0	0	428	6

S Bell St at E Summit Hill Dr SE  
PM PEAK HOUR

Description	S Bell St <u>Northbound</u>			S Bell St <u>Southbound</u>			E Summit Hill Dr SE <u>Eastbound</u>			E Summit Hill Dr SE <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>				9		20	13	496			402	5
Existing Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Conflicting Pedestrians					1			1			1	
Heavy Vehicle %				0		10	18	1			1	0
Annual Growth Rate				1.5%		1.5%	1.5%	1.5%			1.5%	1.5%
Growth Factor				1.077		1.077	1.077	1.077			1.077	1.077
Growth Trips				1		2	1	38			31	0
<i>Five Points Phase 4 Development</i>								6			3	
<b>Background Trips (Total)</b>				0		0	0	6			3	0
<b>Background 2024 PM Volumes</b>				10		22	14	540			436	5
Future Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Trip Distribution IN								18%				
Trip Distribution OUT											18%	
Project Trips				0	0	0	0	29	0	0	23	0
Project Trips (unbalanced)				0	0	0	0	29	0	0	23	0
Balancing Adjustment												
<b>Project Trips</b>				0	0	0	0	29	0	0	23	0
<b>Future Buildout PM Volumes</b>				10	0	22	14	569	0	0	459	5

**Intersection Volume Summary Sheet**

Lula Powell Dr at E Summit Hill Dr SE  
**AM PEAK HOUR**

Description	Lula Powell Dr <b>Northbound</b>			Lula Powell Dr <b>Southbound</b>			E Summit Hill Dr SE <b>Eastbound</b>			E Summit Hill Dr SE <b>Westbound</b>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>	<b>20</b>		<b>72</b>					<b>215</b>	<b>18</b>	<b>80</b>	<b>322</b>	
Existing Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Conflicting Pedestrians		0						19			0	
Heavy Vehicle %	5		3					5	0	5	3	
Annual Growth Rate	1.5%		1.5%					1.5%	1.5%	1.5%	1.5%	
Growth Factor	1.077		1.077					1.077	1.077	1.077	1.077	
Growth Trips	2		6					17	1	6	25	
<i>Five Points Phase 4 Development</i>								2			6	
<b>Background Trips</b>	<b>0</b>		<b>0</b>					<b>2</b>	<b>0</b>	<b>0</b>	<b>6</b>	
<b>Background 2024 AM Volumes</b>	<b>22</b>		<b>78</b>					<b>234</b>	<b>19</b>	<b>86</b>	<b>353</b>	
Future Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Trip Distribution IN			5%					18%				
Trip Distribution OUT										5%	18%	
Project Trips	0	0	2	0	0	0	0	8	0	8	28	0
Project Trips (unbalanced)	0	0	2	0	0	0	0	8	0	8	28	0
Balancing Adjustment												
<b>Project Trips</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>28</b>	<b>0</b>
<b>Future Buildout AM Volumes</b>	<b>22</b>	<b>0</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>242</b>	<b>19</b>	<b>94</b>	<b>381</b>	<b>0</b>

Lula Powell Dr at E Summit Hill Dr SE  
**PM PEAK HOUR**

Description	Lula Powell Dr <b>Northbound</b>			S Bell St <b>Southbound</b>			E Summit Hill Dr SE <b>Eastbound</b>			E Summit Hill Dr SE <b>Westbound</b>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>	<b>29</b>		<b>29</b>					<b>484</b>	<b>22</b>	<b>35</b>	<b>376</b>	
Existing Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Conflicting Pedestrians		8						1			0	
Heavy Vehicle %	0		3					1	0	3	2	
Annual Growth Rate	1.5%		1.5%					1.5%	1.5%	1.5%	1.5%	
Growth Factor	1.077		1.077					1.077	1.077	1.077	1.077	
Growth Trips	2		2					37	2	3	29	
<i>Five Points Phase 4 Development</i>								6			3	
<b>Background Trips</b>	<b>0</b>		<b>0</b>					<b>6</b>	<b>0</b>	<b>0</b>	<b>3</b>	
<b>Background 2024 PM Volumes</b>	<b>31</b>		<b>31</b>					<b>527</b>	<b>24</b>	<b>38</b>	<b>408</b>	
Future Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Trip Distribution IN			5%					18%				
Trip Distribution OUT										5%	18%	
Project Trips	0	0	8	0	0	0	0	29	0	7	23	0
Project Trips (unbalanced)	0	0	8	0	0	0	0	29	0	7	23	0
Balancing Adjustment												
<b>Project Trips</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>7</b>	<b>23</b>	<b>0</b>
<b>Future Buildout PM Volumes</b>	<b>31</b>	<b>0</b>	<b>39</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>556</b>	<b>24</b>	<b>45</b>	<b>431</b>	<b>0</b>

### Intersection Volume Summary Sheet

E Summit Hill Dr SE/Dandridge Ave at E Hill Ave/Martin Luther King Jr Ave  
AM PEAK HOUR

Description	E Hill Ave <u>Northbound</u>			Martin Luther King Jr Ave <u>Southbound</u>			E Summit Hill Dr SE <u>Eastbound</u>			Dandridge Ave <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>	93	118	37	28	107	132	130	92	66	54	180	40
Existing 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
Conflicting Pedestrians								4				
Heavy Vehicle %	4	3	11	18	7	5	5	3	5	2	4	15
Annual Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Growth Factor	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077
Growth Trips	7	9	3	2	8	10	10	7	5	4	14	3
<i>Five Points Phase 4 Development</i>	1			6	6		2					
<b>Background Trips</b>	1	0	0	6	6	0	2	0	0	0	0	0
<b>Background 2024 AM Volumes</b>	101	127	40	36	121	142	142	99	71	58	194	43
Future 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
Trip Distribution IN		15%					23%					23%
Trip Distribution OUT				23%	15%	23%						
Project Trips	0	7	0	36	24	36	10	0	0	0	0	10
Project Trips (unbalanced)	0	7	0	36	24	36	10	0	0	0	0	10
Balancing Adjustment												
<b>Project Trips</b>	0	7	0	36	24	36	10	0	0	0	0	10
<b>Future Buildout AM Volumes</b>	101	134	40	72	145	178	152	99	71	58	194	53

E Summit Hill Dr SE/Dandridge Ave at E Hill Ave/Martin Luther King Jr Ave  
PM PEAK HOUR

Description	E Hill Ave <u>Northbound</u>			Martin Luther King Jr Ave <u>Southbound</u>			E Summit Hill Dr SE <u>Eastbound</u>			Dandridge Ave <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>	131	134	53	37	137	122	121	237	173	51	147	26
Existing Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Conflicting Pedestrians		3			1			2			6	
Heavy Vehicle %	0	6	4	8	1	3	4	1	1	2	2	8
Annual Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Growth Factor	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077
Growth Trips	10	10	4	3	11	9	9	18	13	4	11	2
<i>Five Points Phase 4 Development</i>	5			3	3		6					
<b>Background Trips</b>	5	0	0	3	3	0	6	0	0	0	0	0
<b>Background 2024 PM Volumes</b>	146	144	57	43	151	131	136	255	186	55	158	28
Future Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Trip Distribution IN		15%					23%					23%
Trip Distribution OUT				23%	15%	23%						
Project Trips	0	24	0	30	20	30	37	0	0	0	0	37
Project Trips (unbalanced)	0	24	0	30	20	30	37	0	0	0	0	37
Balancing Adjustment												
<b>Project Trips</b>	0	24	0	30	20	30	37	0	0	0	0	37
<b>Future Buildout PM Volumes</b>	146	168	57	73	171	161	173	255	186	55	158	65

### Intersection Volume Summary Sheet

Harriet Tubman St at Martin Luther King Jr Ave  
AM PEAK HOUR

Description	Martin Luther King Jr Ave <u>Northbound</u>			Martin Luther King Jr Ave <u>Southbound</u>			Harriet Tubman St <u>Eastbound</u>			<u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>	<b>173</b>	<b>116</b>			<b>138</b>	<b>28</b>	<b>16</b>		<b>134</b>			
Existing Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86			
Conflicting Pedestrians								11				
Heavy Vehicle %	6	3			2	0	13		10			
Annual Growth Rate	1.5%	1.5%			1.5%	1.5%	1.5%		1.5%			
Growth Factor	1.077	1.077			1.077	1.077	1.077		1.077			
Growth Trips	13	9			11	2	1		10			
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>	<b>0</b>	<b>0</b>			<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>			
<b>Background 2024 AM Volumes</b>	<b>186</b>	<b>125</b>			<b>149</b>	<b>30</b>	<b>17</b>		<b>144</b>			
Future Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86			
Trip Distribution IN	61%					17%						
Trip Distribution OUT							17%		61%			
Project Trips	27	0	0	0	0	7	27	0	96			
Project Trips (unbalanced)	27	0	0	0	0	7	27	0	96			
Balancing Adjustment												
<b>Project Trips</b>	<b>27</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>27</b>	<b>0</b>	<b>96</b>			
<b>Future Buildout AM Volumes</b>	<b>213</b>	<b>125</b>	<b>0</b>	<b>0</b>	<b>149</b>	<b>37</b>	<b>44</b>	<b>0</b>	<b>240</b>			

Harriet Tubman St at Martin Luther King Jr Ave  
PM PEAK HOUR

Description	Martin Luther King Jr Ave <u>Northbound</u>			Martin Luther King Jr Ave <u>Southbound</u>			Harriet Tubman St <u>Eastbound</u>			<u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>	<b>95</b>	<b>183</b>			<b>172</b>	<b>15</b>	<b>8</b>		<b>204</b>			
Existing Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Conflicting Pedestrians		3			0			19				
Heavy Vehicle %	6	2			3	7	0		4			
Annual Growth Rate	1.5%	1.5%			1.5%	1.5%	1.5%		1.5%			
Growth Factor	1.077	1.077			1.077	1.077	1.077		1.077			
Growth Trips	7	14			13	1	1		16			
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>	<b>0</b>	<b>0</b>			<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>			
<b>Background 2024 PM Volumes</b>	<b>102</b>	<b>197</b>			<b>185</b>	<b>16</b>	<b>9</b>		<b>220</b>			
Future Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Trip Distribution IN	61%					17%						
Trip Distribution OUT							17%		61%			
Project Trips	98	0	0	0	0	27	22	0	79			
Project Trips (unbalanced)	98	0	0	0	0	27	22	0	79			
Balancing Adjustment												
<b>Project Trips</b>	<b>98</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>22</b>	<b>0</b>	<b>79</b>			
<b>Future Buildout PM Volumes</b>	<b>200</b>	<b>197</b>	<b>0</b>	<b>0</b>	<b>185</b>	<b>43</b>	<b>31</b>	<b>0</b>	<b>299</b>			

### Intersection Volume Summary Sheet

Harriet Tubman St at Burge Dr  
AM PEAK HOUR

Description	Harriet Tubman St <u>Northbound</u>			Harriet Tubman St <u>Southbound</u>			Burge Dr <u>Eastbound</u>			Burge Dr <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>		105	82	68	91		0	0	0	63		61
Existing Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Conflicting Pedestrians		7								2		
Heavy Vehicle %		6	6	4	12					8		3
Annual Growth Rate		1.5%	1.5%	1.5%	1.5%					1.5%		1.5%
Growth Factor		1.077	1.077	1.077	1.077					1.077		1.077
Growth Trips		8	6	5	7					5		5
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>		0	0	0	0					0		0
<b>Background 2024 AM Volumes</b>		113	88	73	98					68		66
Future Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Trip Distribution IN	32%				6%	5%						
Trip Distribution OUT		6%					5%		32%			
Project Trips	14	9	0	0	3	2	8	0	51	0	0	0
Project Trips (unbalanced)	14	9	0	0	3	2	8	0	51	0	0	0
Balancing Adjustment												
<b>Project Trips</b>	<b>14</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>8</b>	<b>0</b>	<b>51</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Future Buildout AM Volumes</b>	<b>14</b>	<b>122</b>	<b>88</b>	<b>73</b>	<b>101</b>	<b>2</b>	<b>8</b>	<b>0</b>	<b>51</b>	<b>68</b>	<b>0</b>	<b>66</b>

Harriet Tubman St at Burge Dr  
PM PEAK HOUR

Description	Harriet Tubman St <u>Northbound</u>			Harriet Tubman St <u>Southbound</u>			Burge Dr <u>Eastbound</u>			Burge Dr <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>		115	15	5	144					20		19
Existing Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Conflicting Pedestrians		4			2			2		3		
Heavy Vehicle %		5	33	80	3					15		37
Annual Growth Rate		1.5%	1.5%	1.5%	1.5%					1.5%		1.5%
Growth Factor		1.077	1.077	1.077	1.077					1.077		1.077
Growth Trips		9	1	0	11					2		1
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>		0	0	0	0					0		0
<b>Background 2024 PM Volumes</b>		124	16	5	155					22		20
Future Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Trip Distribution IN	32%				6%	5%						
Trip Distribution OUT		6%					5%		32%			
Project Trips	52	8	0	0	10	8	7	0	42	0	0	0
Project Trips (unbalanced)	52	8	0	0	10	8	7	0	42	0	0	0
Balancing Adjustment												
<b>Project Trips</b>	<b>52</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>8</b>	<b>7</b>	<b>0</b>	<b>42</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Future Buildout PM Volumes</b>	<b>52</b>	<b>132</b>	<b>16</b>	<b>5</b>	<b>165</b>	<b>8</b>	<b>7</b>	<b>0</b>	<b>42</b>	<b>22</b>	<b>0</b>	<b>20</b>

### Intersection Volume Summary Sheet

McCalla Ave at Bell St  
AM PEAK HOUR

Description	Bell St <u>Northbound</u>			Bell St <u>Southbound</u>			McCalla Ave <u>Eastbound</u>			McCalla Ave <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>	0	0	4	4	0	0	0	143	2	6	115	1
Existing Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Conflicting Pedestrians		0			0	0	0	0			0	
Heavy Vehicle %	0	0	25	25	0	0	0	9	0	17	4	0
Annual Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Growth Factor	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077
Growth Trips	0	0	0	0	0	0	0	11	0	0	9	0
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Background 2024 AM Volumes</b>	0	0	4	4	0	0	0	154	2	6	124	1
Future Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Trip Distribution IN										1%		
Trip Distribution OUT			1%									
Project Trips	0	0	2	0	0	0	0	0	0	0	0	0
Project Trips (unbalanced)	0	0	2	0	0	0	0	0	0	0	0	0
Balancing Adjustment												
<b>Project Trips</b>	0	0	2	0	0	0	0	0	0	0	0	0
<b>Future Buildout AM Volumes</b>	0	0	6	4	0	0	0	154	2	6	124	1

McCalla Ave at Bell St  
PM PEAK HOUR

Description	Bell St <u>Northbound</u>			Bell St <u>Southbound</u>			McCalla Ave <u>Eastbound</u>			McCalla Ave <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>	2	0	10	3	2	0	0	163	10	8	118	1
Existing Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Conflicting Pedestrians		3						2				
Heavy Vehicle %	0	0	20	0	0	0	0	9	0	25	8	0
Annual Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Growth Factor	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077
Growth Trips	0	0	1	0	0	0	0	13	1	1	9	0
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Background 2024 PM Volumes</b>	2	0	11	3	2	0	0	176	11	9	127	1
Future Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Trip Distribution IN										1%		
Trip Distribution OUT			1%									
Project Trips	0	0	1	0	0	0	0	0	0	2	0	0
Project Trips (unbalanced)	0	0	1	0	0	0	0	0	0	2	0	0
Balancing Adjustment												
<b>Project Trips</b>	0	0	1	0	0	0	0	0	0	2	0	0
<b>Future Buildout PM Volumes</b>	2	0	12	3	2	0	0	176	11	11	127	1



### Intersection Volume Summary Sheet

Willow Ave at Georgia St/Local Access  
AM PEAK HOUR

Description	Georgia St <u>Northbound</u>			Local Access <u>Southbound</u>			Willow Ave <u>Eastbound</u>			Willow Ave <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>	8	0	2	0	0	3	5	88	12	8	83	0
Existing Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Conflicting Pedestrians					4							
Heavy Vehicle %	0	0	0	0	0	0	20	3	0	0	34	0
Annual Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Growth Factor	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077
Growth Trips	1	0	0	0	0	0	0	7	1	1	6	0
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Background 2024 AM Volumes</b>	9	0	2	0	0	3	5	95	13	9	89	0
Future Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Trip Distribution IN									10%			
Trip Distribution OUT	10%											
Project Trips	16	0	0	0	0	0	0	0	4	0	0	0
Project Trips (unbalanced)	16	0	0	0	0	0	0	0	4	0	0	0
Balancing Adjustment												
<b>Project Trips</b>	16	0	0	0	0	0	0	0	4	0	0	0
<b>Future Buildout AM Volumes</b>	25	0	2	0	0	3	5	95	17	9	89	0

Willow Ave at Georgia St/Local Access  
PM PEAK HOUR

Description	Georgia St <u>Northbound</u>			Local Access <u>Southbound</u>			Willow Ave <u>Eastbound</u>			Willow Ave <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>	9	0	12	0	0	9	1	106	5	1	66	0
Existing Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Conflicting Pedestrians					12							
Heavy Vehicle %	0	0	0	0	0	0	0	21	0	0	2	0
Annual Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Growth Factor	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077	1.077
Growth Trips	1	0	1	0	0	1	0	8	0	0	5	0
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Background 2024 PM Volumes</b>	10	0	13	0	0	10	1	114	5	1	71	0
Future Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Trip Distribution IN									10%			
Trip Distribution OUT	10%											
Project Trips	13	0	0	0	0	0	0	0	16	0	0	0
Project Trips (unbalanced)	13	0	0	0	0	0	0	0	16	0	0	0
Balancing Adjustment												
<b>Project Trips</b>	13	0	0	0	0	0	0	0	16	0	0	0
<b>Future Buildout PM Volumes</b>	23	0	13	0	0	10	1	114	21	1	71	0

### Intersection Volume Summary Sheet

Harriet Tubman St at Proposed Boulevard  
AM PEAK HOUR

Description	Harriet Tubman St <u>Northbound</u>			Harriet Tubman St <u>Southbound</u>			Proposed Boulevard <u>Eastbound</u>			<u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 AM Volumes</b>		<b>201</b>			<b>150</b>							
Existing Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86			
Conflicting Pedestrians												
Heavy Vehicle %												
Annual Growth Rate		1.5%			1.5%							
Growth Factor		1.077			1.077							
Growth Trips		15			12							
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>		<b>0</b>			<b>0</b>							
<b>Background 2024 AM Volumes</b>		<b>216</b>			<b>162</b>							
Future Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86			
Trip Distribution IN	46%	32%				6%						
Trip Distribution OUT					32%		6%		46%			
Project Trips	20	14	0	0	51	3	9	0	73			
Project Trips (unbalanced)	20	14	0	0	51	3	9	0	73			
Balancing Adjustment												
<b>Project Trips</b>	<b>20</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>51</b>	<b>3</b>	<b>9</b>	<b>0</b>	<b>73</b>			
<b>Future Buildout AM Volumes</b>	<b>20</b>	<b>230</b>	<b>0</b>	<b>0</b>	<b>213</b>	<b>3</b>	<b>9</b>	<b>0</b>	<b>73</b>			

Harriet Tubman St at Proposed Boulevard  
PM PEAK HOUR

Description	Harriet Tubman St <u>Northbound</u>			Harriet Tubman St <u>Southbound</u>			Proposed Boulevard <u>Eastbound</u>			0 <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
<b>Existing 2019 PM Volumes</b>		<b>110</b>			<b>212</b>							
Existing Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Conflicting Pedestrians												
Heavy Vehicle %												
Annual Growth Rate		1.5%			1.5%							
Growth Factor		1.077			1.077							
Growth Trips		8			16							
<i>Five Points Phase 4 Development</i>												
<b>Background Trips</b>		<b>0</b>			<b>0</b>							
<b>Background 2024 PM Volumes</b>		<b>118</b>			<b>228</b>							
Future Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Trip Distribution IN	46%	32%				6%						
Trip Distribution OUT					32%		6%		46%			
Project Trips	74	52	0	0	42	10	8	0	60			
Project Trips (unbalanced)	74	52	0	0	42	10	8	0	60			
Balancing Adjustment												
<b>Project Trips</b>	<b>74</b>	<b>52</b>	<b>0</b>	<b>0</b>	<b>42</b>	<b>10</b>	<b>8</b>	<b>0</b>	<b>60</b>			
<b>Future Buildout PM Volumes</b>	<b>74</b>	<b>170</b>	<b>0</b>	<b>0</b>	<b>270</b>	<b>10</b>	<b>8</b>	<b>0</b>	<b>60</b>			

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**APPENDIX D**  
**CAPACITY ANALYSES**

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HCM Unsignalized Intersection Capacity Analysis  
 1: E. Summit Hill Dr. & Nelson Ave.

2019 Existing AM Peak Hour  
 12/13/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↶	
Traffic Volume (veh/h)	19	230	352	6	5	9
Future Volume (Veh/h)	19	230	352	6	5	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	21	253	387	7	5	10
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)	1054					
pX, platoon unblocked						
vC, conflicting volume	394			559	197	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	394			559	197	
tC, single (s)	4.5			6.8	7.6	
tC, 2 stage (s)						
tF (s)	2.4			3.5	3.6	
p0 queue free %	98			99	99	
cM capacity (veh/h)	1036			454	723	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	21	126	126	258	136	15
Volume Left	21	0	0	0	0	5
Volume Right	0	0	0	0	7	10
cSH	1036	1700	1700	1700	1700	604
Volume to Capacity	0.02	0.07	0.07	0.15	0.08	0.02
Queue Length 95th (ft)	2	0	0	0	0	2
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	11.1
Lane LOS	A					B
Approach Delay (s)	0.7			0.0	11.1	
Approach LOS						B
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			25.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
2: Lula Powell Dr. & E. Summit Hill Dr.

2019 Existing AM Peak Hour  
12/13/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑		↵	↑↑	↵	↵	
Traffic Volume (veh/h)	215	18	80	322	20	72	
Future Volume (Veh/h)	215	18	80	322	20	72	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	226	19	84	339	21	76	
Pedestrians				19			
Lane Width (ft)				12.0			
Walking Speed (ft/s)				3.5			
Percent Blockage				2			
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)				826			
pX, platoon unblocked							
vC, conflicting volume			245		573	142	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			245		573	142	
tC, single (s)			4.2		6.9	6.9	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			94		95	91	
cM capacity (veh/h)			1297		414	865	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	151	94	84	170	170	21	76
Volume Left	0	0	84	0	0	21	0
Volume Right	0	19	0	0	0	0	76
cSH	1700	1700	1297	1700	1700	414	865
Volume to Capacity	0.09	0.06	0.06	0.10	0.10	0.05	0.09
Queue Length 95th (ft)	0	0	5	0	0	4	7
Control Delay (s)	0.0	0.0	8.0	0.0	0.0	14.2	9.6
Lane LOS			A			B	A
Approach Delay (s)	0.0		1.6			10.6	
Approach LOS						B	
Intersection Summary							
Average Delay			2.2				
Intersection Capacity Utilization			24.3%	ICU Level of Service		A	
Analysis Period (min)			15				

HCM Signalized Intersection Capacity Analysis  
 3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2019 Existing AM Peak Hour  
 12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘		↗	↗↘		↗	↗↘	↗
Traffic Volume (vph)	130	92	66	54	180	40	93	118	37	28	107	132
Future Volume (vph)	130	92	66	54	180	40	93	118	37	28	107	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3271		1787	3339		1736	3349		1543	3406	1553
Flt Permitted	0.55	1.00		0.64	1.00		0.51	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1004	3271		1208	3339		924	3349		1045	3406	1553
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	143	101	73	59	198	44	102	130	41	31	118	145
RTOR Reduction (vph)	0	44	0	0	19	0	0	33	0	0	0	125
Lane Group Flow (vph)	143	130	0	59	223	0	102	138	0	31	118	20
Heavy Vehicles (%)	4%	3%	4%	1%	3%	15%	4%	2%	10%	17%	6%	4%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	35.3	28.9		30.3	26.4		20.0	13.8		13.0	10.3	10.3
Effective Green, g (s)	35.3	28.9		30.3	26.4		20.0	13.8		13.0	10.3	10.3
Actuated g/C Ratio	0.48	0.39		0.41	0.36		0.27	0.19		0.18	0.14	0.14
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	547	1289		530	1202		320	630		203	478	218
v/s Ratio Prot	c0.02	0.04		0.01	0.07		c0.03	0.04		0.01	0.03	
v/s Ratio Perm	c0.10			0.04			c0.06			0.02		0.01
v/c Ratio	0.26	0.10		0.11	0.19		0.32	0.22		0.15	0.25	0.09
Uniform Delay, d1	10.8	14.0		13.0	16.1		20.7	25.2		25.3	28.0	27.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2		0.1	0.3		0.6	0.2		0.4	0.3	0.2
Delay (s)	11.0	14.2		13.1	16.4		21.3	25.4		25.7	28.3	27.6
Level of Service	B	B		B	B		C	C		C	C	C
Approach Delay (s)		12.8			15.8			23.8			27.7	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio	0.32	
Actuated Cycle Length (s)	73.3	Sum of lost time (s) 24.0
Intersection Capacity Utilization	42.8%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		

Queues  
3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2019 Existing AM Peak Hour  
12/13/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	143	174	59	242	102	171	31	118	145
v/c Ratio	0.24	0.12	0.10	0.19	0.31	0.24	0.12	0.29	0.42
Control Delay	10.6	10.4	9.7	16.2	21.5	21.0	19.4	32.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	10.4	9.7	16.2	21.5	21.0	19.4	32.2	7.1
Queue Length 50th (ft)	31	15	12	35	34	22	10	26	0
Queue Length 95th (ft)	63	38	30	65	68	57	28	51	31
Internal Link Dist (ft)		746		718		515		409	
Turn Bay Length (ft)	360		75		150		110		180
Base Capacity (vph)	605	1444	652	1270	361	1282	312	1277	696
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.12	0.09	0.19	0.28	0.13	0.10	0.09	0.21

Intersection Summary



HCM Unsignalized Intersection Capacity Analysis  
4: MLK Jr. Ave. & Harriet Tubman St.

2019 Existing AM Peak Hour  
12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	134	173	116	138	28
Future Volume (Veh/h)	16	134	173	116	138	28
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	19	156	201	135	160	33
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	489					
pX, platoon unblocked						
vC, conflicting volume	630	160	193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	630	160	193			
tC, single (s)	7.0	7.1	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	94	81	85			
cM capacity (veh/h)	334	835	1349			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	175	201	68	68	160	33
Volume Left	19	201	0	0	0	0
Volume Right	156	0	0	0	0	33
cSH	718	1349	1700	1700	1700	1700
Volume to Capacity	0.24	0.15	0.04	0.04	0.09	0.02
Queue Length 95th (ft)	24	13	0	0	0	0
Control Delay (s)	11.6	8.1	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	11.6	4.9	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay	5.2					
Intersection Capacity Utilization	36.0%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
5: Harriet Tubman St. & Burge Dr.

2019 Existing AM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	0	63	0	61	0	105	82	68	91	0
Future Volume (Veh/h)	0	0	0	63	0	61	0	105	82	68	91	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	81	0	78	0	135	105	87	117	0
Pedestrians		2									7	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	566	533	119	478	480	194	119			240		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	566	533	119	478	480	194	119			240		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	83	100	91	100			93		
cM capacity (veh/h)	374	425	936	464	455	839	1479			1315		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	159	240	204								
Volume Left	0	81	0	87								
Volume Right	0	78	105	0								
cSH	1700	594	1479	1315								
Volume to Capacity	0.00	0.27	0.00	0.07								
Queue Length 95th (ft)	0	27	0	5								
Control Delay (s)	0.0	13.3	0.0	3.7								
Lane LOS	A	B		A								
Approach Delay (s)	0.0	13.3	0.0	3.7								
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			4.8									
Intersection Capacity Utilization			36.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
6: S. Bell St. & McCalla Ave.

















2019 Existing AM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	143	2	6	115	1	0	0	4	4	0	0
Future Volume (Veh/h)	0	143	2	6	115	1	0	0	4	4	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	143	2	6	115	1	0	0	4	4	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	116			145			272	272	144	276	272	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116			145			272	272	144	276	272	116
tC, single (s)	4.1			4.3			7.1	6.5	6.5	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.5	3.7	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1485			1350			683	635	846	628	635	942
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	145	122	4	4								
Volume Left	0	6	0	4								
Volume Right	2	1	4	0								
cSH	1485	1350	846	628								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.0	0.4	9.3	10.8								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.4	9.3	10.8								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			21.0%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
7: Georgia St. & Willow Ave.

2019 Existing AM Peak Hour  
12/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	88	12	8	83	0	8	0	2	0	0	3
Future Volume (Veh/h)	5	88	12	8	83	0	8	0	2	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	88	12	8	83	0	8	0	2	0	0	3
Pedestrians								4				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	83			104			210	207	98	205	213	83
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	83			104			210	207	98	205	213	83
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	100	100	100	100
cM capacity (veh/h)	1408			1495			739	685	960	748	679	982
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	105	91	10	3								
Volume Left	5	8	8	0								
Volume Right	12	0	2	3								
cSH	1408	1495	775	982								
Volume to Capacity	0.00	0.01	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.4	0.7	9.7	8.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	0.7	9.7	8.7								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			1.1									
Intersection Capacity Utilization			21.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 1: E. Summit Hill Dr. & Nelson Ave.

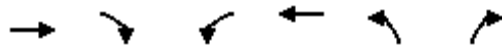
2019 Existing PM Peak Hour  
 12/13/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑	↑↑		↵	
Traffic Volume (veh/h)	13	496	402	5	9	20
Future Volume (Veh/h)	13	496	402	5	9	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	14	517	419	5	9	21
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1054			
pX, platoon unblocked						
vC, conflicting volume	424				709	213
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	424				709	213
tC, single (s)	4.5				6.8	7.1
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.4
p0 queue free %	99				98	97
cM capacity (veh/h)	1026				368	767
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	14	258	258	279	145	30
Volume Left	14	0	0	0	0	9
Volume Right	0	0	0	0	5	21
cSH	1026	1700	1700	1700	1700	579
Volume to Capacity	0.01	0.15	0.15	0.16	0.09	0.05
Queue Length 95th (ft)	1	0	0	0	0	4
Control Delay (s)	8.6	0.0	0.0	0.0	0.0	11.6
Lane LOS	A					B
Approach Delay (s)	0.2			0.0		11.6
Approach LOS						B
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			23.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
2: Lula Powell Dr. & E. Summit Hill Dr.

2019 Existing PM Peak Hour  
12/13/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑		↵	↑↑	↵	↵	
Traffic Volume (veh/h)	484	22	35	376	29	29	
Future Volume (Veh/h)	484	22	35	376	29	29	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	
Hourly flow rate (vph)	504	23	36	392	30	30	
Pedestrians				1			
Lane Width (ft)				12.0			
Walking Speed (ft/s)				3.5			
Percent Blockage				0			
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)				826			
pX, platoon unblocked							
vC, conflicting volume			527		784	264	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			527		784	264	
tC, single (s)			4.2		6.8	7.0	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			97		91	96	
cM capacity (veh/h)			1029		323	730	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	336	191	36	196	196	30	30
Volume Left	0	0	36	0	0	30	0
Volume Right	0	23	0	0	0	0	30
cSH	1700	1700	1029	1700	1700	323	730
Volume to Capacity	0.20	0.11	0.03	0.12	0.12	0.09	0.04
Queue Length 95th (ft)	0	0	3	0	0	8	3
Control Delay (s)	0.0	0.0	8.6	0.0	0.0	17.3	10.1
Lane LOS			A			C	B
Approach Delay (s)	0.0		0.7			13.7	
Approach LOS						B	
Intersection Summary							
Average Delay			1.1				
Intersection Capacity Utilization			30.7%	ICU Level of Service		A	
Analysis Period (min)			15				

HCM Signalized Intersection Capacity Analysis  
 3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2019 Existing PM Peak Hour  
 12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	237	173	51	147	26	131	134	53	37	137	122
Future Volume (vph)	121	237	173	51	147	26	131	134	53	37	137	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3348		1770	3429		1805	3279		1671	3574	1568
Flt Permitted	0.58	1.00		0.50	1.00		0.48	1.00		0.63	1.00	1.00
Satd. Flow (perm)	1062	3348		937	3429		918	3279		1107	3574	1568
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	126	247	180	53	153	27	136	140	55	39	143	127
RTOR Reduction (vph)	0	113	0	0	15	0	0	44	0	0	0	108
Lane Group Flow (vph)	126	314	0	53	165	0	136	151	0	39	143	19
Heavy Vehicles (%)	4%	1%	1%	2%	2%	8%	0%	6%	4%	8%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	34.5	28.0		29.5	25.5		23.5	15.2		15.3	11.1	11.1
Effective Green, g (s)	34.5	28.0		29.5	25.5		23.5	15.2		15.3	11.1	11.1
Actuated g/C Ratio	0.46	0.37		0.39	0.34		0.31	0.20		0.20	0.15	0.15
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	544	1243		410	1159		383	661		256	526	230
v/s Ratio Prot	c0.02	c0.09		0.01	0.05		c0.04	0.05		0.01	0.04	
v/s Ratio Perm	0.09			0.04			c0.07			0.02		0.01
v/c Ratio	0.23	0.25		0.13	0.14		0.36	0.23		0.15	0.27	0.08
Uniform Delay, d1	12.0	16.4		14.4	17.3		19.4	25.2		24.5	28.6	27.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.5		0.1	0.3		0.6	0.2		0.3	0.3	0.2
Delay (s)	12.2	16.9		14.5	17.6		20.0	25.4		24.8	28.8	27.9
Level of Service	B	B		B	B		C	C		C	C	C
Approach Delay (s)		15.9			16.9			23.2			27.9	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.32	
Actuated Cycle Length (s)	75.4	Sum of lost time (s) 24.0
Intersection Capacity Utilization	47.7%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		



Queues  
 3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2019 Existing PM Peak Hour  
 12/13/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	126	427	53	180	136	195	39	143	127
v/c Ratio	0.22	0.30	0.11	0.15	0.37	0.26	0.13	0.34	0.37
Control Delay	10.7	10.2	10.1	16.2	21.9	20.9	19.2	32.3	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	10.2	10.1	16.2	21.9	20.9	19.2	32.3	5.1
Queue Length 50th (ft)	28	40	11	26	45	30	12	32	0
Queue Length 95th (ft)	58	78	29	51	87	61	33	58	20
Internal Link Dist (ft)		746		718		515		409	
Turn Bay Length (ft)	360		75		150		110		180
Base Capacity (vph)	586	1442	523	1202	379	1172	348	1238	662
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.30	0.10	0.15	0.36	0.17	0.11	0.12	0.19

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis  
4: MLK Jr. Ave. & Harriet Tubman St.

2019 Existing PM Peak Hour  
12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	204	95	183	172	15
Future Volume (Veh/h)	8	204	95	183	172	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	9	234	109	210	198	17
Pedestrians						3
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	489					
pX, platoon unblocked						
vC, conflicting volume	524	198	215			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	524	198	215			
tC, single (s)	6.8	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	98	71	92			
cM capacity (veh/h)	446	804	1323			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	243	109	105	105	198	17
Volume Left	9	109	0	0	0	0
Volume Right	234	0	0	0	0	17
cSH	781	1323	1700	1700	1700	1700
Volume to Capacity	0.31	0.08	0.06	0.06	0.12	0.01
Queue Length 95th (ft)	33	7	0	0	0	0
Control Delay (s)	11.7	8.0	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	11.7	2.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization			37.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Harriet Tubman St. & Burge Dr.

2019 Existing PM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	0	20	0	19	0	115	15	5	144	0
Future Volume (Veh/h)	0	0	0	20	0	19	0	115	15	5	144	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	25	0	23	0	142	19	6	178	0
Pedestrians		3			2			2			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	372	356	183	346	346	158	181			163		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	372	356	183	346	346	158	181			163		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.6	4.1			4.9		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.6	2.2			2.9		
p0 queue free %	100	100	100	96	100	97	100			99		
cM capacity (veh/h)	564	567	861	578	574	799	1403			1052		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	48	161	184								
Volume Left	0	25	0	6								
Volume Right	0	23	19	0								
cSH	1700	667	1403	1052								
Volume to Capacity	0.00	0.07	0.00	0.01								
Queue Length 95th (ft)	0	6	0	0								
Control Delay (s)	0.0	10.8	0.0	0.3								
Lane LOS	A	B		A								
Approach Delay (s)	0.0	10.8	0.0	0.3								
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			1.5									
Intersection Capacity Utilization			21.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
6: S. Bell St. & McCalla Ave.

















2019 Existing PM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	163	10	8	118	1	2	0	10	3	2	0
Future Volume (Veh/h)	0	163	10	8	118	1	2	0	10	3	2	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	163	10	8	118	1	2	0	10	3	2	0
Pedestrians					2						3	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					3.5						3.5	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	122			173			304	306	170	318	310	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			173			304	306	170	318	310	122
tC, single (s)	4.1			4.3			7.1	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			99			100	100	99	100	100	100
cM capacity (veh/h)	1474			1276			647	605	828	624	602	932
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	173	127	12	5								
Volume Left	0	8	2	3								
Volume Right	10	1	10	0								
cSH	1474	1276	791	615								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.0	0.5	9.6	10.9								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.5	9.6	10.9								
Approach LOS			A	B								
<b>Intersection Summary</b>												
Average Delay			0.8									
Intersection Capacity Utilization			22.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
7: Georgia St. & Willow Ave.

2019 Existing PM Peak Hour  
12/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	106	5	1	66	0	9	0	12	0	0	9
Future Volume (Veh/h)	1	106	5	1	66	0	9	0	12	0	0	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	106	5	1	66	0	9	0	12	0	0	9
Pedestrians								12				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	66			123			200	190	120	190	193	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	66			123			200	190	120	190	193	66
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	99	100	100	99
cM capacity (veh/h)	1549			1460			741	699	926	756	697	1003
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	112	67	21	9								
Volume Left	1	1	9	0								
Volume Right	5	0	12	9								
cSH	1549	1460	836	1003								
Volume to Capacity	0.00	0.00	0.03	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	9.4	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.1	9.4	8.6								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			1.4									
Intersection Capacity Utilization			21.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 1: E. Summit Hill Dr. & Nelson Ave.

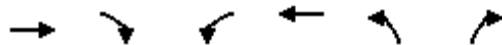
2024 Background AM Peak Hour  
 12/13/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↶	
Traffic Volume (veh/h)	20	250	385	6	5	10
Future Volume (Veh/h)	20	250	385	6	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	22	275	423	7	5	11
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)	1054					
pX, platoon unblocked						
vC, conflicting volume	430				608	215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	430				608	215
tC, single (s)	4.5				6.8	7.6
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.6
p0 queue free %	98				99	98
cM capacity (veh/h)	1002				423	702
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	22	138	138	282	148	16
Volume Left	22	0	0	0	0	5
Volume Right	0	0	0	0	7	11
cSH	1002	1700	1700	1700	1700	582
Volume to Capacity	0.02	0.08	0.08	0.17	0.09	0.03
Queue Length 95th (ft)	2	0	0	0	0	2
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	11.4
Lane LOS	A				B	
Approach Delay (s)	0.6	0.0			11.4	
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			26.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
2: Lula Powell Dr. & E. Summit Hill Dr.

2024 Background AM Peak Hour  
12/13/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑		↙	↑↑	↙	↗	
Traffic Volume (veh/h)	234	19	86	353	22	78	
Future Volume (Veh/h)	234	19	86	353	22	78	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	246	20	91	372	23	82	
Pedestrians				19			
Lane Width (ft)				12.0			
Walking Speed (ft/s)				3.5			
Percent Blockage				2			
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)				826			
pX, platoon unblocked							
vC, conflicting volume			266		624	152	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			266		624	152	
tC, single (s)			4.2		6.9	7.0	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			93		94	90	
cM capacity (veh/h)			1273		381	848	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	164	102	91	186	186	23	82
Volume Left	0	0	91	0	0	23	0
Volume Right	0	20	0	0	0	0	82
cSH	1700	1700	1273	1700	1700	381	848
Volume to Capacity	0.10	0.06	0.07	0.11	0.11	0.06	0.10
Queue Length 95th (ft)	0	0	6	0	0	5	8
Control Delay (s)	0.0	0.0	8.0	0.0	0.0	15.0	9.7
Lane LOS			A			C	A
Approach Delay (s)	0.0		1.6			10.9	
Approach LOS						B	
Intersection Summary							
Average Delay			2.2				
Intersection Capacity Utilization			25.2%	ICU Level of Service		A	
Analysis Period (min)			15				

HCM Signalized Intersection Capacity Analysis  
 3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Background AM Peak Hour

12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	↖
Traffic Volume (vph)	142	99	71	58	194	43	101	127	40	36	121	142
Future Volume (vph)	142	99	71	58	194	43	101	127	40	36	121	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3259		1770	3314		1736	3318		1530	3374	1538
Flt Permitted	0.51	1.00		0.63	1.00		0.54	1.00		0.64	1.00	1.00
Satd. Flow (perm)	923	3259		1181	3314		980	3318		1024	3374	1538
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	156	109	78	64	213	47	111	140	44	40	133	156
RTOR Reduction (vph)	0	46	0	0	18	0	0	37	0	0	0	137
Lane Group Flow (vph)	156	141	0	64	242	0	111	147	0	40	133	19
Heavy Vehicles (%)	5%	3%	5%	2%	4%	15%	4%	3%	11%	18%	7%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	39.9	31.4		31.3	27.1		18.3	11.7		13.7	9.4	9.4
Effective Green, g (s)	39.9	31.4		31.3	27.1		18.3	11.7		13.7	9.4	9.4
Actuated g/C Ratio	0.53	0.42		0.41	0.36		0.24	0.15		0.18	0.12	0.12
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	576	1353		521	1187		303	513		214	419	191
v/s Ratio Prot	c0.03	0.04		0.01	0.07		c0.03	0.04		0.01	0.04	
v/s Ratio Perm	c0.11			0.04			c0.06			0.02		0.01
v/c Ratio	0.27	0.10		0.12	0.20		0.37	0.29		0.19	0.32	0.10
Uniform Delay, d1	9.4	13.5		13.5	16.8		23.2	28.3		26.0	30.2	29.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2		0.1	0.4		0.8	0.3		0.4	0.4	0.2
Delay (s)	9.7	13.7		13.6	17.2		24.0	28.6		26.4	30.6	29.6
Level of Service	A	B		B	B		C	C		C	C	C
Approach Delay (s)		11.8			16.5			26.8			29.6	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.33	
Actuated Cycle Length (s)	75.6	Sum of lost time (s) 24.0
Intersection Capacity Utilization	44.4%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		



Queues  
3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Background AM Peak Hour

12/13/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	156	187	64	260	111	184	40	133	156
v/c Ratio	0.27	0.13	0.11	0.22	0.35	0.31	0.16	0.34	0.46
Control Delay	11.0	10.4	10.1	16.9	22.1	22.7	19.8	32.5	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	10.4	10.1	16.9	22.1	22.7	19.8	32.5	8.5
Queue Length 50th (ft)	35	17	14	40	37	31	13	30	0
Queue Length 95th (ft)	70	41	33	71	74	61	33	55	38
Internal Link Dist (ft)		746		718		515		409	
Turn Bay Length (ft)	360		75		150		110		180
Base Capacity (vph)	579	1491	637	1163	341	1174	296	1166	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.13	0.10	0.22	0.33	0.16	0.14	0.11	0.24

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis  
4: MLK Jr. Ave. & Harriet Tubman St.

2024 Background AM Peak Hour  
12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	144	186	125	149	30
Future Volume (Veh/h)	17	144	186	125	149	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	20	167	216	145	173	35
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	489					
pX, platoon unblocked						
vC, conflicting volume	678	173	208			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	678	173	208			
tC, single (s)	7.1	7.1	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	93	80	84			
cM capacity (veh/h)	304	816	1332			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>NB 3</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	187	216	72	72	173	35
Volume Left	20	216	0	0	0	0
Volume Right	167	0	0	0	0	35
cSH	691	1332	1700	1700	1700	1700
Volume to Capacity	0.27	0.16	0.04	0.04	0.10	0.02
Queue Length 95th (ft)	27	14	0	0	0	0
Control Delay (s)	12.1	8.2	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	12.1	4.9	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			5.4			
Intersection Capacity Utilization			38.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Harriet Tubman St. & Burge Dr.

















2024 Background AM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	0	68	0	66	0	113	88	73	98	0
Future Volume (Veh/h)	0	0	0	68	0	66	0	113	88	73	98	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	87	0	85	0	145	113	94	126	0
Pedestrians		2									7	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	610	574	128	516	518	208	128			258		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	610	574	128	516	518	208	128			258		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	80	100	90	100			93		
cM capacity (veh/h)	344	400	926	434	430	824	1468			1295		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	172	258	220								
Volume Left	0	87	0	94								
Volume Right	0	85	113	0								
cSH	1700	567	1468	1295								
Volume to Capacity	0.00	0.30	0.00	0.07								
Queue Length 95th (ft)	0	32	0	6								
Control Delay (s)	0.0	14.1	0.0	3.8								
Lane LOS	A	B		A								
Approach Delay (s)	0.0	14.1	0.0	3.8								
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			5.0									
Intersection Capacity Utilization			38.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
6: S. Bell St. & McCalla Ave.

2024 Background AM Peak Hour  
12/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	154	2	6	124	1	0	0	4	4	0	0
Future Volume (Veh/h)	0	154	2	6	124	1	0	0	4	4	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	195	3	8	157	1	0	0	5	5	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	158			198			370	370	196	375	372	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158			198			370	370	196	375	372	158
tC, single (s)	4.1			4.3			7.1	6.5	6.5	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.5	3.7	4.0	3.3
p0 queue free %	100			99			100	100	99	99	100	100
cM capacity (veh/h)	1434			1290			588	559	790	536	558	893
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	198	166	5	5								
Volume Left	0	8	0	5								
Volume Right	3	1	5	0								
cSH	1434	1290	790	536								
Volume to Capacity	0.00	0.01	0.01	0.01								
Queue Length 95th (ft)	0	0	0	1								
Control Delay (s)	0.0	0.4	9.6	11.8								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.4	9.6	11.8								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			21.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
7: Georgia St. & Willow Ave.

2024 Background AM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	95	13	9	89	0	9	0	2	0	0	3
Future Volume (Veh/h)	5	95	13	9	89	0	9	0	2	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	109	15	10	102	0	10	0	2	0	0	3
Pedestrians								4				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	102			128			258	254	120	252	262	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102			128			258	254	120	252	262	102
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	100	100	100	100
cM capacity (veh/h)	1385			1465			687	643	933	695	637	959
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	130	112	12	3								
Volume Left	6	10	10	0								
Volume Right	15	0	2	3								
cSH	1385	1465	719	959								
Volume to Capacity	0.00	0.01	0.02	0.00								
Queue Length 95th (ft)	0	1	1	0								
Control Delay (s)	0.4	0.7	10.1	8.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.4	0.7	10.1	8.8								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			1.1									
Intersection Capacity Utilization			22.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 1: E. Summit Hill Dr. & Nelson Ave.

2024 Background PM Peak Hour  
 12/13/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑	↑↑		↵	
Traffic Volume (veh/h)	14	540	436	5	10	22
Future Volume (Veh/h)	14	540	436	5	10	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	15	563	454	5	10	23
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1054			
pX, platoon unblocked						
vC, conflicting volume	459				769	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	459				769	230
tC, single (s)	4.5				6.8	7.1
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.4
p0 queue free %	98				97	97
cM capacity (veh/h)	993				336	747
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	15	282	282	303	156	33
Volume Left	15	0	0	0	0	10
Volume Right	0	0	0	0	5	23
cSH	993	1700	1700	1700	1700	545
Volume to Capacity	0.02	0.17	0.17	0.18	0.09	0.06
Queue Length 95th (ft)	1	0	0	0	0	5
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	12.0
Lane LOS	A					B
Approach Delay (s)	0.2			0.0		12.0
Approach LOS						B
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			24.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
2: Lula Powell Dr. & E. Summit Hill Dr.

2024 Background PM Peak Hour  
12/13/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑		↙	↑↑	↙	↗	
Traffic Volume (veh/h)	527	24	38	408	31	31	
Future Volume (Veh/h)	527	24	38	408	31	31	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	
Hourly flow rate (vph)	549	25	40	425	32	32	
Pedestrians				1			
Lane Width (ft)				12.0			
Walking Speed (ft/s)				3.5			
Percent Blockage				0			
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)				826			
pX, platoon unblocked							
vC, conflicting volume			574		854	288	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			574		854	288	
tC, single (s)			4.2		6.8	7.0	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			96		89	95	
cM capacity (veh/h)			988		289	705	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	366	208	40	212	212	32	32
Volume Left	0	0	40	0	0	32	0
Volume Right	0	25	0	0	0	0	32
cSH	1700	1700	988	1700	1700	289	705
Volume to Capacity	0.22	0.12	0.04	0.13	0.13	0.11	0.05
Queue Length 95th (ft)	0	0	3	0	0	9	4
Control Delay (s)	0.0	0.0	8.8	0.0	0.0	19.0	10.3
Lane LOS			A			C	B
Approach Delay (s)	0.0		0.8			14.7	
Approach LOS						B	
Intersection Summary							
Average Delay			1.2				
Intersection Capacity Utilization			32.0%	ICU Level of Service		A	
Analysis Period (min)			15				

HCM Signalized Intersection Capacity Analysis  
 3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Background PM Peak Hour

12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕		↘	↕		↘	↕		↘	↕	↘
Traffic Volume (vph)	136	255	186	55	158	28	146	144	57	43	151	131
Future Volume (vph)	136	255	186	55	158	28	146	144	57	43	151	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3348		1770	3430		1805	3279		1671	3574	1568
Flt Permitted	0.55	1.00		0.49	1.00		0.48	1.00		0.62	1.00	1.00
Satd. Flow (perm)	996	3348		908	3430		913	3279		1092	3574	1568
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	142	266	194	57	165	29	152	150	59	45	157	136
RTOR Reduction (vph)	0	118	0	0	15	0	0	48	0	0	0	117
Lane Group Flow (vph)	142	342	0	57	179	0	152	161	0	45	157	19
Heavy Vehicles (%)	4%	1%	1%	2%	2%	8%	0%	6%	4%	8%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	39.0	30.6		30.8	26.5		23.7	15.2		15.7	11.2	11.2
Effective Green, g (s)	39.0	30.6		30.8	26.5		23.7	15.2		15.7	11.2	11.2
Actuated g/C Ratio	0.50	0.39		0.39	0.34		0.30	0.19		0.20	0.14	0.14
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	573	1303		402	1156		371	634		251	509	223
v/s Ratio Prot	c0.03	c0.10		0.01	0.05		c0.04	0.05		0.01	0.04	
v/s Ratio Perm	0.10			0.05			c0.08			0.03		0.01
v/c Ratio	0.25	0.26		0.14	0.16		0.41	0.25		0.18	0.31	0.09
Uniform Delay, d1	11.0	16.3		15.0	18.2		21.1	26.9		25.9	30.2	29.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.5		0.2	0.3		0.7	0.2		0.3	0.3	0.2
Delay (s)	11.2	16.8		15.2	18.5		21.8	27.1		26.2	30.6	29.4
Level of Service	B	B		B	B		C	C		C	C	C
Approach Delay (s)		15.5			17.8			24.9			29.5	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.35	
Actuated Cycle Length (s)	78.6	Sum of lost time (s) 24.0
Intersection Capacity Utilization	49.4%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		



Queues  
3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Background PM Peak Hour

12/13/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	142	460	57	194	152	209	45	157	136
v/c Ratio	0.25	0.31	0.12	0.17	0.43	0.29	0.16	0.37	0.39
Control Delay	11.1	10.3	10.4	16.8	23.0	21.0	19.4	32.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	10.3	10.4	16.8	23.0	21.0	19.4	32.8	5.8
Queue Length 50th (ft)	32	44	12	29	52	33	14	35	0
Queue Length 95th (ft)	65	86	31	55	95	65	36	63	25
Internal Link Dist (ft)		746		718		515		409	
Turn Bay Length (ft)	360		75		150		110		180
Base Capacity (vph)	576	1506	512	1135	362	1110	333	1167	634
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.31	0.11	0.17	0.42	0.19	0.14	0.13	0.21

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis  
4: MLK Jr. Ave. & Harriet Tubman St.

2024 Background PM Peak Hour  
12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	220	102	197	185	16
Future Volume (Veh/h)	9	220	102	197	185	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	10	253	117	226	213	18
Pedestrians					3	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				489		
pX, platoon unblocked						
vC, conflicting volume	563	213	231			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	563	213	231			
tC, single (s)	6.8	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	98	68	91			
cM capacity (veh/h)	419	786	1305			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	263	117	113	113	213	18
Volume Left	10	117	0	0	0	0
Volume Right	253	0	0	0	0	18
cSH	761	1305	1700	1700	1700	1700
Volume to Capacity	0.35	0.09	0.07	0.07	0.13	0.01
Queue Length 95th (ft)	39	7	0	0	0	0
Control Delay (s)	12.2	8.0	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	12.2	2.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			5.0			
Intersection Capacity Utilization			39.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Harriet Tubman St. & Burge Dr.

2024 Background PM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	0	22	0	20	0	124	16	5	155	0
Future Volume (Veh/h)	0	0	0	22	0	20	0	124	16	5	155	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	27	0	25	0	153	20	6	191	0
Pedestrians		3			2			2			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	398	381	196	370	371	169	194			175		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	398	381	196	370	371	169	194			175		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.6	4.1			4.9		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.6	2.2			2.9		
p0 queue free %	100	100	100	95	100	97	100			99		
cM capacity (veh/h)	540	549	846	557	556	787	1387			1040		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	52	173	197								
Volume Left	0	27	0	6								
Volume Right	0	25	20	0								
cSH	1700	648	1387	1040								
Volume to Capacity	0.00	0.08	0.00	0.01								
Queue Length 95th (ft)	0	7	0	0								
Control Delay (s)	0.0	11.0	0.0	0.3								
Lane LOS	A	B		A								
Approach Delay (s)	0.0	11.0	0.0	0.3								
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			1.5									
Intersection Capacity Utilization			22.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
6: S. Bell St. & McCalla Ave.

2024 Background PM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	176	11	9	127	1	2	0	11	3	2	0
Future Volume (Veh/h)	0	176	11	9	127	1	2	0	11	3	2	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	217	14	11	157	1	2	0	14	4	2	0
Pedestrians					2						3	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					3.5						3.5	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	161			231			404	407	226	422	414	160
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161			231			404	407	226	422	414	160
tC, single (s)	4.1			4.3			7.1	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	99	100	100
cM capacity (veh/h)	1426			1213			554	530	769	528	526	887
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	231	169	16	6								
Volume Left	0	11	2	4								
Volume Right	14	1	14	0								
cSH	1426	1213	733	527								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	1	2	1								
Control Delay (s)	0.0	0.6	10.0	11.9								
Lane LOS		A	B	B								
Approach Delay (s)	0.0	0.6	10.0	11.9								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			0.8									
Intersection Capacity Utilization			24.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
7: Georgia St. & Willow Ave.

2024 Background PM Peak Hour

12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	114	5	1	71	0	10	0	13	0	0	10
Future Volume (Veh/h)	1	114	5	1	71	0	10	0	13	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	1	141	6	1	88	0	12	0	16	0	0	12
Pedestrians								12				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	88			159			260	248	156	252	251	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			159			260	248	156	252	251	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	98	100	100	99
cM capacity (veh/h)	1520			1416			674	650	885	686	647	976
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	148	89	28	12								
Volume Left	1	1	12	0								
Volume Right	6	0	16	12								
cSH	1520	1416	780	976								
Volume to Capacity	0.00	0.00	0.04	0.01								
Queue Length 95th (ft)	0	0	3	1								
Control Delay (s)	0.1	0.1	9.8	8.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.1	9.8	8.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			21.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 1: E. Summit Hill Dr. & Nelson Ave

2024 Future AM Peak Hour  
 12/13/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Volume (veh/h)	20	262	428	6	5	10
Future Volume (Veh/h)	20	262	428	6	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	22	288	470	7	5	11
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)	1307					
pX, platoon unblocked						
vC, conflicting volume	477			662	238	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	477			662	238	
tC, single (s)	4.5			6.8	7.6	
tC, 2 stage (s)						
tF (s)	2.4			3.5	3.6	
p0 queue free %	98			99	98	
cM capacity (veh/h)	959			391	676	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	
Volume Total	118	192	313	164	16	
Volume Left	22	0	0	0	5	
Volume Right	0	0	0	7	11	
cSH	959	1700	1700	1700	550	
Volume to Capacity	0.02	0.11	0.18	0.10	0.03	
Queue Length 95th (ft)	2	0	0	0	2	
Control Delay (s)	1.8	0.0	0.0	0.0	11.7	
Lane LOS	A					B
Approach Delay (s)	0.7	0.0				11.7
Approach LOS					B	
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			Err%	ICU Level of Service	H	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 2: Lula Powell Dr. & E. Summit Hill Dr.

2024 Future AM Peak Hour  
 12/13/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (veh/h)	242	19	94	381	22	80
Future Volume (Veh/h)	242	19	94	381	22	80
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	255	20	99	401	23	84
Pedestrians				19		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				3.5		
Percent Blockage				2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				826		
pX, platoon unblocked						
vC, conflicting volume			275			156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			275			156
tC, single (s)			4.2			7.0
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			92			90
cM capacity (veh/h)			1263			843
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	170	105	99	200	200	107
Volume Left	0	0	99	0	0	23
Volume Right	0	20	0	0	0	84
cSH	1700	1700	1263	1700	1700	652
Volume to Capacity	0.10	0.06	0.08	0.12	0.12	0.16
Queue Length 95th (ft)	0	0	6	0	0	15
Control Delay (s)	0.0	0.0	8.1	0.0	0.0	11.6
Lane LOS	A			B		
Approach Delay (s)	0.0	1.6				11.6
Approach LOS						B
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			28.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis  
 3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Future AM Peak Hour  
 12/13/2019



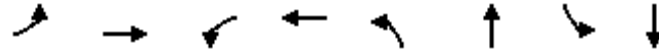
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	99	71	58	194	53	101	134	40	72	145	178
Future Volume (vph)	152	99	71	58	194	53	101	134	40	72	145	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.97		1.00	0.97		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	3259		1770	3285		1736	3324		1530	3127	
Flt Permitted	0.51	1.00		0.63	1.00		0.44	1.00		0.63	1.00	
Satd. Flow (perm)	917	3259		1181	3285		798	3324		1017	3127	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	167	109	78	64	213	58	111	147	44	79	159	196
RTOR Reduction (vph)	0	46	0	0	24	0	0	37	0	0	171	0
Lane Group Flow (vph)	167	141	0	64	247	0	111	154	0	79	184	0
Heavy Vehicles (%)	5%	3%	5%	2%	4%	15%	4%	3%	11%	18%	7%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	40.0	31.5		31.6	27.3		16.4	9.9		16.0	9.7	
Effective Green, g (s)	40.0	31.5		31.6	27.3		16.4	9.9		16.0	9.7	
Actuated g/C Ratio	0.53	0.41		0.42	0.36		0.22	0.13		0.21	0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	572	1350		524	1180		252	432		256	399	
v/s Ratio Prot	c0.03	0.04		0.01	0.08		c0.04	0.05		0.03	c0.06	
v/s Ratio Perm	c0.12			0.04			0.06			0.04		
v/c Ratio	0.29	0.10		0.12	0.21		0.44	0.36		0.31	0.46	
Uniform Delay, d1	9.6	13.6		13.5	16.9		25.0	30.1		25.0	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.1	0.4		1.2	0.5		0.7	0.8	
Delay (s)	9.9	13.8		13.6	17.3		26.2	30.7		25.7	31.6	
Level of Service	A	B		B	B		C	C		C	C	
Approach Delay (s)		11.9			16.6			29.0			30.5	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.36	C
Actuated Cycle Length (s)	76.0	Sum of lost time (s)
Intersection Capacity Utilization	50.8%	24.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A



Queues  
3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Future AM Peak Hour  
12/13/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	167	187	64	271	111	191	79	355
v/c Ratio	0.30	0.13	0.11	0.24	0.38	0.39	0.28	0.61
Control Delay	12.1	11.1	11.0	17.3	22.5	25.2	20.9	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	11.1	11.0	17.3	22.5	25.2	20.9	18.5
Queue Length 50th (ft)	39	17	14	41	37	33	26	36
Queue Length 95th (ft)	82	44	37	77	72	63	56	75
Internal Link Dist (ft)		746		718		515		409
Turn Bay Length (ft)	360		75		150		110	
Base Capacity (vph)	567	1469	626	1140	312	1156	308	1191
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.13	0.10	0.24	0.36	0.17	0.26	0.30
Intersection Summary								

HCM Unsignalized Intersection Capacity Analysis  
4: MLK Jr. Ave. & Harriet Tubman St.

















2024 Future AM Peak Hour  
12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	240	213	125	149	37
Future Volume (Veh/h)	44	240	213	125	149	37
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	51	279	248	145	173	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				489		
pX, platoon unblocked						
vC, conflicting volume	742	173	216			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	173	216			
tC, single (s)	7.1	7.1	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	81	66	81			
cM capacity (veh/h)	267	816	1322			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	330	248	72	72	173	43
Volume Left	51	248	0	0	0	0
Volume Right	279	0	0	0	0	43
cSH	619	1322	1700	1700	1700	1700
Volume to Capacity	0.53	0.19	0.04	0.04	0.10	0.03
Queue Length 95th (ft)	79	17	0	0	0	0
Control Delay (s)	17.2	8.3	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	17.2	5.3			0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			8.3			
Intersection Capacity Utilization			46.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 5: Harriet Tubman St. & Burge Dr.

2024 Future AM Peak Hour  
 12/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	51	68	0	66	14	122	88	73	101	2
Future Volume (Veh/h)	8	0	51	68	0	66	14	122	88	73	101	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	10	0	65	87	0	85	18	156	113	94	129	3
Pedestrians		2										7
Lane Width (ft)		12.0										12.0
Walking Speed (ft/s)		3.5										3.5
Percent Blockage		0										1
Right turn flare (veh)												
Median type								None				None
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	661	626	132	632	570	220	134			269		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	661	626	132	632	570	220	134			269		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	93	74	100	90	99			93		
cM capacity (veh/h)	314	369	920	334	396	812	1460			1283		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	75	172	287	226								
Volume Left	10	87	18	94								
Volume Right	65	85	113	3								
cSH	732	471	1460	1283								
Volume to Capacity	0.10	0.37	0.01	0.07								
Queue Length 95th (ft)	9	41	1	6								
Control Delay (s)	10.5	17.0	0.6	3.7								
Lane LOS	B	C	A	A								
Approach Delay (s)	10.5	17.0	0.6	3.7								
Approach LOS	B	C										
<b>Intersection Summary</b>												
Average Delay			6.2									
Intersection Capacity Utilization			46.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
6: S. Bell St. & McCalla Ave.

2024 Future AM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	154	2	6	124	1	0	0	6	4	0	0
Future Volume (Veh/h)	0	154	2	6	124	1	0	0	6	4	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	195	3	8	157	1	0	0	8	5	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	158			198			370	370	196	378	372	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158			198			370	370	196	378	372	158
tC, single (s)	4.1			4.3			7.1	6.5	6.5	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.5	3.7	4.0	3.3
p0 queue free %	100			99			100	100	99	99	100	100
cM capacity (veh/h)	1434			1290			588	559	790	532	558	893
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	198	166	8	5								
Volume Left	0	8	0	5								
Volume Right	3	1	8	0								
cSH	1434	1290	790	532								
Volume to Capacity	0.00	0.01	0.01	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.0	0.4	9.6	11.8								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.4	9.6	11.8								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			21.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
7: Georgia St. & Willow Ave.

2024 Future AM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	95	17	9	89	0	25	0	2	0	0	3
Future Volume (Veh/h)	5	95	17	9	89	0	25	0	2	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	109	20	10	102	0	29	0	2	0	0	3
Pedestrians								4				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	102			133			260	257	123	255	267	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102			133			260	257	123	255	267	102
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	100	100	100	100
cM capacity (veh/h)	1385			1459			684	641	930	693	633	959
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	135	112	31	3								
Volume Left	6	10	29	0								
Volume Right	20	0	2	3								
cSH	1385	1459	696	959								
Volume to Capacity	0.00	0.01	0.04	0.00								
Queue Length 95th (ft)	0	1	3	0								
Control Delay (s)	0.4	0.7	10.4	8.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.4	0.7	10.4	8.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			23.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 8: Harriet Tubman St. & Proposed Boulevard

2024 Future AM Peak Hour  
 12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	73	20	230	213	3
Future Volume (Veh/h)	9	73	20	230	213	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	10	85	23	267	248	3
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	562	250	251			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	562	250	251			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	89	98			
cM capacity (veh/h)	483	794	1326			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	95	290	251			
Volume Left	10	23	0			
Volume Right	85	0	3			
cSH	744	1326	1700			
Volume to Capacity	0.13	0.02	0.15			
Queue Length 95th (ft)	11	1	0			
Control Delay (s)	10.5	0.8	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.5	0.8	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.9			
Intersection Capacity Utilization			39.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 1: E. Summit Hill Dr. & Nelson Ave

2024 Future PM Peak Hour  
 12/13/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Volume (veh/h)	14	569	459	5	10	22
Future Volume (Veh/h)	14	569	459	5	10	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	15	593	478	5	10	23
Pedestrians		1	1			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		3.5	3.5			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			1307			
pX, platoon unblocked						
vC, conflicting volume	483				808	242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	483				808	242
tC, single (s)	4.5				6.8	7.1
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.4
p0 queue free %	98				97	97
cM capacity (veh/h)	971				317	734
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	213	395	319	164	33	
Volume Left	15	0	0	0	10	
Volume Right	0	0	0	5	23	
cSH	971	1700	1700	1700	525	
Volume to Capacity	0.02	0.23	0.19	0.10	0.06	
Queue Length 95th (ft)	1	0	0	0	5	
Control Delay (s)	0.8	0.0	0.0	0.0	12.3	
Lane LOS	A				B	
Approach Delay (s)	0.3		0.0		12.3	
Approach LOS					B	
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			Err%	ICU Level of Service		H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
2: Lula Powell Dr. & E. Summit Hill Dr.

2024 Future PM Peak Hour  
12/13/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (veh/h)	556	24	45	431	31	39
Future Volume (Veh/h)	556	24	45	431	31	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	579	25	47	449	32	41
Pedestrians				1		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				3.5		
Percent Blockage				0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				826		
pX, platoon unblocked						
vC, conflicting volume			604		910	303
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			604		910	303
tC, single (s)			4.2		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		88	94
cM capacity (veh/h)			963		264	689
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	386	218	47	224	224	73
Volume Left	0	0	47	0	0	32
Volume Right	0	25	0	0	0	41
cSH	1700	1700	963	1700	1700	404
Volume to Capacity	0.23	0.13	0.05	0.13	0.13	0.18
Queue Length 95th (ft)	0	0	4	0	0	16
Control Delay (s)	0.0	0.0	8.9	0.0	0.0	15.9
Lane LOS	A			C		
Approach Delay (s)	0.0		0.8			15.9
Approach LOS				C		
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			33.6%	ICU Level of Service	A	
Analysis Period (min)			15			



HCM Signalized Intersection Capacity Analysis  
 3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Future PM Peak Hour  
 12/13/2019

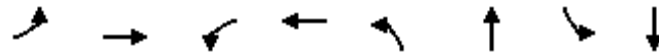


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	255	186	55	158	65	146	168	57	73	171	161
Future Volume (vph)	173	255	186	55	158	65	146	168	57	73	171	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.96		1.00	0.96		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	3348		1770	3327		1805	3293		1671	3282	
Flt Permitted	0.52	1.00		0.49	1.00		0.39	1.00		0.61	1.00	
Satd. Flow (perm)	950	3348		908	3327		742	3293		1066	3282	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	180	266	194	57	165	68	152	175	59	76	178	168
RTOR Reduction (vph)	0	118	0	0	44	0	0	42	0	0	144	0
Lane Group Flow (vph)	180	342	0	57	189	0	152	192	0	76	202	0
Heavy Vehicles (%)	4%	1%	1%	2%	2%	8%	0%	6%	4%	8%	1%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	39.6	30.9		30.8	26.5		21.7	13.2		17.5	11.1	
Effective Green, g (s)	39.6	30.9		30.8	26.5		21.7	13.2		17.5	11.1	
Actuated g/C Ratio	0.50	0.39		0.39	0.34		0.28	0.17		0.22	0.14	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	564	1312		401	1118		318	551		285	462	
v/s Ratio Prot	c0.04	0.10		0.01	0.06		c0.05	0.06		0.02	0.06	
v/s Ratio Perm	c0.13			0.05			c0.08			0.04		
v/c Ratio	0.32	0.26		0.14	0.17		0.48	0.35		0.27	0.44	
Uniform Delay, d1	11.0	16.2		15.1	18.4		22.7	29.0		25.0	31.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		0.2	0.3		1.1	0.4		0.5	0.7	
Delay (s)	11.4	16.7		15.3	18.7		23.8	29.4		25.5	31.6	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		15.2			18.0			27.2			30.5	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.41	
Actuated Cycle Length (s)	78.8	Sum of lost time (s) 24.0
Intersection Capacity Utilization	55.2%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

Queues  
3: MLK Jr. Ave. & E. Summit Hill Dr./Dandridge Ave.

2024 Future PM Peak Hour  
12/13/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	460	57	233	152	234	76	346
v/c Ratio	0.33	0.31	0.13	0.21	0.47	0.38	0.25	0.60
Control Delay	12.6	10.9	11.2	14.4	24.0	24.7	20.1	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	10.9	11.2	14.4	24.0	24.7	20.1	20.2
Queue Length 50th (ft)	43	45	13	28	52	42	25	41
Queue Length 95th (ft)	88	91	33	59	95	75	53	80
Internal Link Dist (ft)		746		718		515		409
Turn Bay Length (ft)	360		75		150		110	
Base Capacity (vph)	552	1494	503	1111	328	1089	339	1166
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.31	0.11	0.21	0.46	0.21	0.22	0.30

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis  
4: MLK Jr. Ave. & Harriet Tubman St.

2024 Future PM Peak Hour  
12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	299	200	197	185	43
Future Volume (Veh/h)	31	299	200	197	185	43
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	36	344	230	226	213	49
Pedestrians						3
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				489		
pX, platoon unblocked						
vC, conflicting volume	789	213	262			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	789	213	262			
tC, single (s)	6.8	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	87	56	82			
cM capacity (veh/h)	271	786	1271			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	380	230	113	113	213	49
Volume Left	36	230	0	0	0	0
Volume Right	344	0	0	0	0	49
cSH	666	1271	1700	1700	1700	1700
Volume to Capacity	0.57	0.18	0.07	0.07	0.13	0.03
Queue Length 95th (ft)	90	16	0	0	0	0
Control Delay (s)	17.3	8.5	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	17.3	4.3	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			7.8			
Intersection Capacity Utilization			51.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Harriet Tubman St. & Burge Dr.

2024 Future PM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	7	0	42	22	0	20	52	132	16	5	165	8
Future Volume (Veh/h)	7	0	42	22	0	20	52	132	16	5	165	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	9	0	52	27	0	25	64	163	20	6	204	10
Pedestrians		3			2			2			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	554	537	214	578	532	179	217			185		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	554	537	214	578	532	179	217			185		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.6	4.1			4.9		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.6	2.2			2.9		
p0 queue free %	98	100	94	93	100	97	95			99		
cM capacity (veh/h)	410	427	827	364	430	777	1361			1030		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	61	52	247	220								
Volume Left	9	27	64	6								
Volume Right	52	25	20	10								
cSH	719	489	1361	1030								
Volume to Capacity	0.08	0.11	0.05	0.01								
Queue Length 95th (ft)	7	9	4	0								
Control Delay (s)	10.5	13.2	2.3	0.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.5	13.2	2.3	0.3								
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			36.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
6: S. Bell St. & McCalla Ave.

















2024 Future PM Peak Hour  
12/13/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	176	11	11	127	1	2	0	12	3	2	0
Future Volume (Veh/h)	0	176	11	11	127	1	2	0	12	3	2	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	217	14	14	157	1	2	0	15	4	2	0
Pedestrians					2						3	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					3.5						3.5	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	161			231			410	413	226	430	420	160
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161			231			410	413	226	430	420	160
tC, single (s)	4.1			4.3			7.1	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	99	100	100
cM capacity (veh/h)	1426			1213			547	525	769	521	520	887
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	231	172	17	6								
Volume Left	0	14	2	4								
Volume Right	14	1	15	0								
cSH	1426	1213	734	520								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	1	2	1								
Control Delay (s)	0.0	0.7	10.0	12.0								
Lane LOS		A	B	B								
Approach Delay (s)	0.0	0.7	10.0	12.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			25.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
7: Georgia St. & Willow Ave.

2024 Future PM Peak Hour  
12/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	114	21	1	71	0	23	0	13	0	0	10
Future Volume (Veh/h)	1	114	21	1	71	0	23	0	13	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	1	141	26	1	88	0	28	0	16	0	0	12
Pedestrians								12				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	88			179			270	258	166	262	271	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			179			270	258	166	262	271	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	98	100	100	99
cM capacity (veh/h)	1520			1393			664	641	873	676	631	976
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	168	89	44	12								
Volume Left	1	1	28	0								
Volume Right	26	0	16	12								
cSH	1520	1393	727	976								
Volume to Capacity	0.00	0.00	0.06	0.01								
Queue Length 95th (ft)	0	0	5	1								
Control Delay (s)	0.0	0.1	10.3	8.7								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.0	0.1	10.3	8.7								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			1.8									
Intersection Capacity Utilization			23.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 8: Harriet Tubman St. & Proposed Boulevard

2024 Future PM Peak Hour  
 12/13/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	60	74	170	270	10
Future Volume (Veh/h)	8	60	74	170	270	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	9	69	85	195	310	11
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	680	316	321			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680	316	321			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	91	93			
cM capacity (veh/h)	391	730	1250			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	78	280	321			
Volume Left	9	85	0			
Volume Right	69	0	11			
cSH	663	1250	1700			
Volume to Capacity	0.12	0.07	0.19			
Queue Length 95th (ft)	10	5	0			
Control Delay (s)	11.1	2.9	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.1	2.9	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.5			
Intersection Capacity Utilization			42.0%	ICU Level of Service	A	
Analysis Period (min)			15			