TRAFFIC IMPACT STUDY

FIVE POINTS MASTER PLAN
KNOXVILLE, TENNESSEE

PREPARED FOR:
CIVIL & ENVIRONMENTAL CONSULTANTS, INC

Transportation
Consultants, LLC

1101 17TH AVENUE SOUTH
NASHVILLE, TN 37212

APRIL 2015

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1. INTRODUCTION

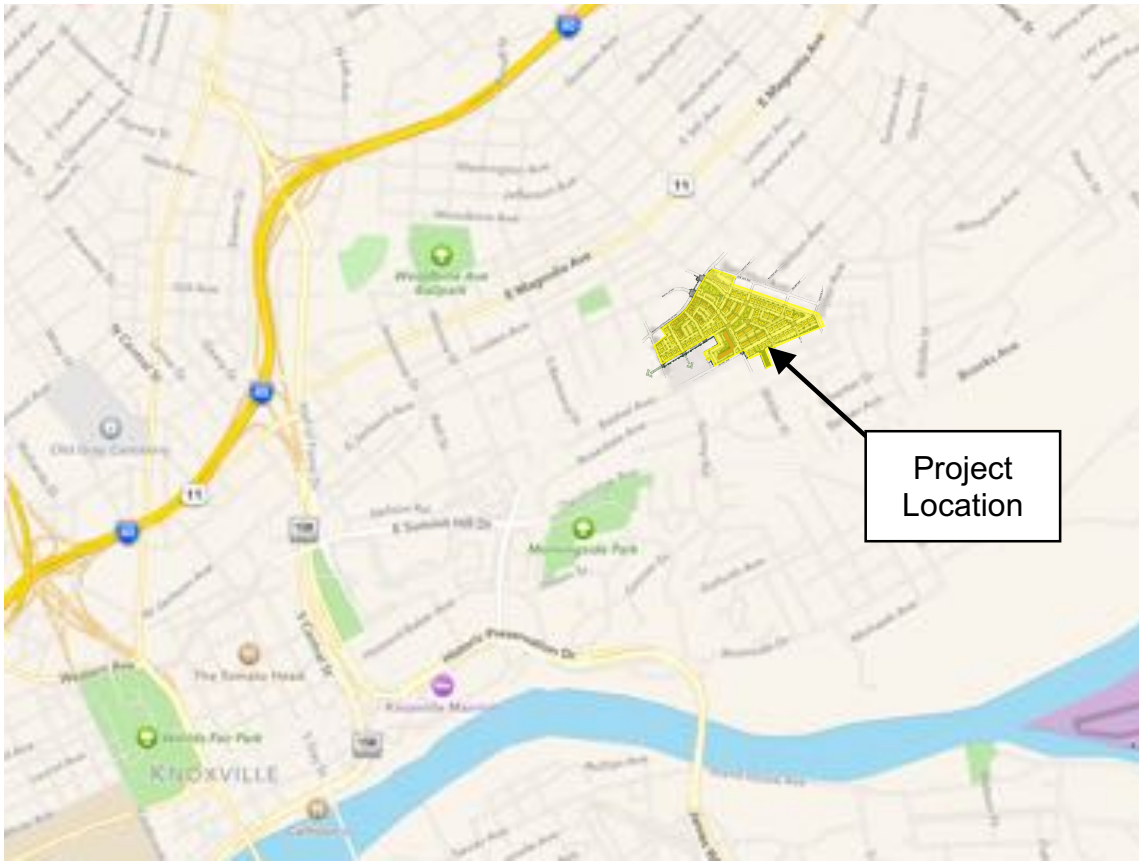
The purpose of this study is to analyze the traffic impacts associated with the redevelopment of the Five Points community and identify appropriate recommendations and conceptual designs for accommodating the projected traffic that will be generated by the site. The Five Points community is located in East Knoxville, and was originally known as Park City. The "Five Points" name comes from the historic junction of McCalla Avenue, Martin Luther King, Jr. Avenue, and Olive Street.

In this study, the current operating characteristics of the critical intersections within the study area are evaluated. The expected trips generated by the proposed redevelopment are determined and distributed to the roadway network. The study area roadways and critical intersections are then re-evaluated to determine the anticipated traffic impacts of the project. Finally, recommendations are presented, including roadway improvements and/or traffic control improvements that are needed to accommodate the expected traffic.

2. PROJECT DESCRIPTION

The Knoxville Community Development Corporation (KCDC) has been working towards the revitalization of the Five Points community since 2009. As of February 2014, the KCDC has constructed 122 units of affordable housing in the neighborhood. The first phase of redevelopment began in August 2012 with the demolition of 183 units of public housing. In July 2013, KCDC and a team of consultants began developing a master plan of the public housing sites.

The proposed redevelopment area is located in East Knoxville, Tennessee, and consists of a mix of residential land uses. As shown by Figure 1, the target housing project sites are generally bounded by Martin Luther King, Jr. Avenue to the north, Bethel Avenue to the south, South Olive Street to the east, and South Kyle Street to the west.



Location of the Project Site
(Not to Scale) **Figure 1.**

The master plan includes a phasing strategy for the redevelopment intended to minimize adverse impact on current residents of the Five Points community and the surrounding neighborhood. Four phases are currently proposed in the redevelopment master plan:

Phase 1

FIGURE 2: FIVE POINTS MASTER PLAN - PHASE 1

Phase 1 consists of approximately 90 units of medium-density senior apartments. As shown in Figure 2, Phase 1 is to be located on the northwest corner of the intersection of McConnell Street and Bethel Avenue.

Phase 2

FIGURE 3: FIVE POINTS MASTER PLAN - PHASE 2

As shown in Figure 3, Phase 2 is located between South Kyle Street and Olive Street on the north side of Kenner Avenue, and on the south side of Bethel Avenue between McConnell Street and Olive Street. Phase 2 consists of the following residential use types:

- ±50 senior/disabled housing units (single family attached/detached);
- ±19 family housing units (single family attached/detached);
- ±20 family housing units (townhomes);

Phase 3

FIGURE 4: FIVE POINTS MASTER PLAN - PHASE 3

As shown in Figure 4, Phase 3 is located between a new proposed roadway (Access 1) and McConnell Street, on the south side of MLK Jr. Avenue. Phase 3 consists of ±114 family housing units (walk-up apartments), with ±60 units reserved for public housing.

Phase 4

FIGURE 5: FIVE POINTS MASTER PLAN - PHASE 4

As shown in Figure 5, Phase 4 is located between McConnell Street and Olive Street on the north side of Bethel Avenue. Phase 4 consists of the following residential use types:

- ±41 family housing units (single family attached/detached)
- ±27 family housing units (townhomes);
- ±36 family housing units (walk-up apartments) – potential off-site.

3. EXISTING CONDITIONS

3.1 Existing Roadway Network

Local access to the site will be provided Martin Luther King, Jr. Avenue, McConnell Street, Bethel Avenue, South Kyle Street, South Olive Street, Kenner Avenue, and proposed internal roadways. Descriptions of the roadways within the project vicinity are as follows:

Looking west on MLK Jr. Avenue Adjacent to the Project Site

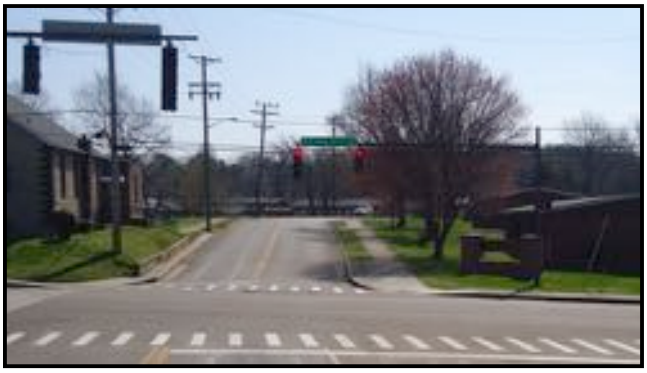
Martin Luther King, Jr. Avenue (MLK Jr. Avenue) generally travels in an northeast-southwest direction between downtown Knoxville and Magnolia Avenue (US 70/11/25W) to the east. In the project vicinity, the cross-section of MLK Jr. Avenue includes curb and gutter, one 12-foot lane in each direction, and a 12-foot center two-way left-turn lane. According to the *Major Road Plan for the City of Knoxville and Knox County, Tennessee (*Knoxville Major Road Plan), MLK Jr. Avenue is categorized as a major collector near the project site. The posted speed limit on MLK Jr. Avenue is 30 mph along the project frontage, and 35 mph immediately to the west. Sidewalks are provided on both the north and south sides of MLK Jr. Avenue. Bus service is provided on MLK Jr. Avenue via the #33 route of the Knoxville Area Transit (KAT), with daytime frequency approximately every 60 minutes. KAT stops are located on both sides of the street at South Kyle Street and Olive Street, with shelters provided at Olive Street. Bike facilities are provided on MLK Jr. Avenue in the form of shared-lane markings or “sharrows” at the project site.

Southbound on McCalla Avenue at MLK Jr. Avenue

McCalla Avenue generally travels in an east-west direction to the north of MLK Jr. Avenue. Near the project site, McCalla Avenue curves to the south forming the north leg of a signalized intersection with MLK Jr. Avenue, opposite McConnell Street. According to the Knoxville Major Road Plan, McCalla Avenue is categorized as a minor collector. McCalla Avenue has

a curb and gutter cross-section with a traveled way width of 40 feet. At the intersection with MLK Jr. Avenue, the McCalla Avenue approach includes one shared left-turn/through lane with 90 feet of storage and one right-turn lane. Sidewalks are provided on both sides of McCalla Avenue. A posted speed limit was not observed on McCalla Avenue. Bike facilities are not provided along McCalla Avenue in the project vicinity.

McConnell Street is categorized as a minor collector according to the Knoxville Major Road Plan, traveling in a north-south direction between MLK Jr. Avenue and Harold Avenue. McConnell Street is a two-lane roadway with a cross-section that includes curb and gutter and a 30-foot wide travel way with one lane in each direction. A posted speed limit was not observed on McConnell Street in the project vicinity. Bike facilities are not provided but there are sidewalks on both the east and west side of the roadway. Bus service is not available on McConnell Street, but can be found on MLK Jr. Avenue to the north or Bethel Avenue to the south.



Looking south toward McConnell approach to MLK Jr. Avenue

Bethel Avenue is a local street and generally travels in an east-west direction from South Olive Street to a cul-de-sac near South Bertrand Street. Bethel Avenue has one lane in each direction and curbs on both sides of the street. The pavement width on Bethel Avenue varies between 26 feet and 40 feet along the project frontage. Bethel Avenue has sidewalks on both the north and south side of the street from its eastern terminus at South Olive Street to New Salem Baptist Church. West of New Salem Baptist Church to the western end of the project site, Bethel Avenue has sidewalk on the south side of the street. Similarly, the pavement decreases from east to west, with 40 feet of pavement east of McConnell Street, approximately 32 feet of pavement between McConnell Street and New Salem Baptist Church, and 26 feet of pavement from New Salem Baptist Church to South Kyle Street. On-street parking is available on both sides of Bethel Avenue in the project vicinity. Bus service is provided on Bethel Avenue by Knoxville Area Transit via the #34 Burlington Route, with daytime frequency approximately every 60 minutes.

Looking east on Bethel Avenue Adjacent to the Project Site

South Kyle Street is a local street that travels north-south on the western edge of the project site. South Kyle Street has one lane in each direction and curb on the east side of the street. The pavement width varies in the project vicinity. From MLK Jr. Avenue to Kenner Street South Kyle Street has 32 feet of pavement, but from Kenner Street to Bethel Avenue the pavement width is only 12 feet. There is sidewalk, as well as on-street parking, on the east side of the street for the portion of South Kyle Street with existing housing facing the street.

Looking north down South Kyle Street near the project site

Olive Street is a two-lane local street that generally travels in the southeast-northwest direction from MLK Jr. Avenue to Jefferson Avenue. Olive Street has a pavement width of approximately 36 feet in the project vicinity. The cross-section of Olive Street also includes curb and gutter, as well as sidewalks on both sides of the street. There is no bus service or bike facilities available on Olive Street.

Looking east on MLK Jr. Avenue toward Olive Street

The study area includes six existing intersections that are considered critical. The critical existing intersections are described as follows:

The intersection of **MLK Jr. Avenue and South Kyle Street** is an unsignalized intersection with four approaches. The eastbound approach of MLK Jr. Avenue includes one left turn lane with approximately 60 feet of storage, one through lane, and one shared through/right-turn lane. Approximatelty 150 feet east of the intersection the pavement markings on MLK Jr. Avenue transition back to a

Looking Eastbound on MLK Jr. Avenue at South Kyle Street

single eastbound lane. The westbound approach of MLK Jr. Avenue includes one left turn lane with approximately 115 feet of storage and one shared through/right-turn lane. There are Knoxville Area Transit bus stops eastbound and westbound on the nearside of the intersection in the shared through/right-turn lane. The northbound and southbound approaches of South Kyle Street each include one shared lane for left-turns, through movements, and right-turns.

The intersection of **Bethel Avenue and South Kyle Street** is an unsignalized T-intersection with three approaches, although there is a driveway for a single-family residence aligned with South Kyle Street that could be considered a fourth approach. The southbound approach of South Kyle Street is stop-controlled. All approaches consist of one lane in each direction shared between each turning movement.

Looking Northbound on South Kyle Street at Bethel Avenue

The intersection of **Bethel Avenue and McConnell Street** is an unsignalized intersection with four approaches. Each approach consists of a single shared lane for each turning movement. The intersection is all-way stop-controlled.

There are three signalized intersections in the study area, the **MLK Jr. Avenue intersections with McCalla Avenue / McConnell Street, Olive Street, and Ben Hur Avenue**. The signalized intersections are relatively closely spaced with approximately 275 feet between McCalla Avenue / McConnell Street and Olive Street, and approximately 200 feet between Olive Street and Ben Hur Avenue. The three intersections currently operate using a single traffic controller.

Looking Eastbound on MLK Jr. Avenue at Olive Street

The existing laneage at the study intersections is illustrated in Figure 6.

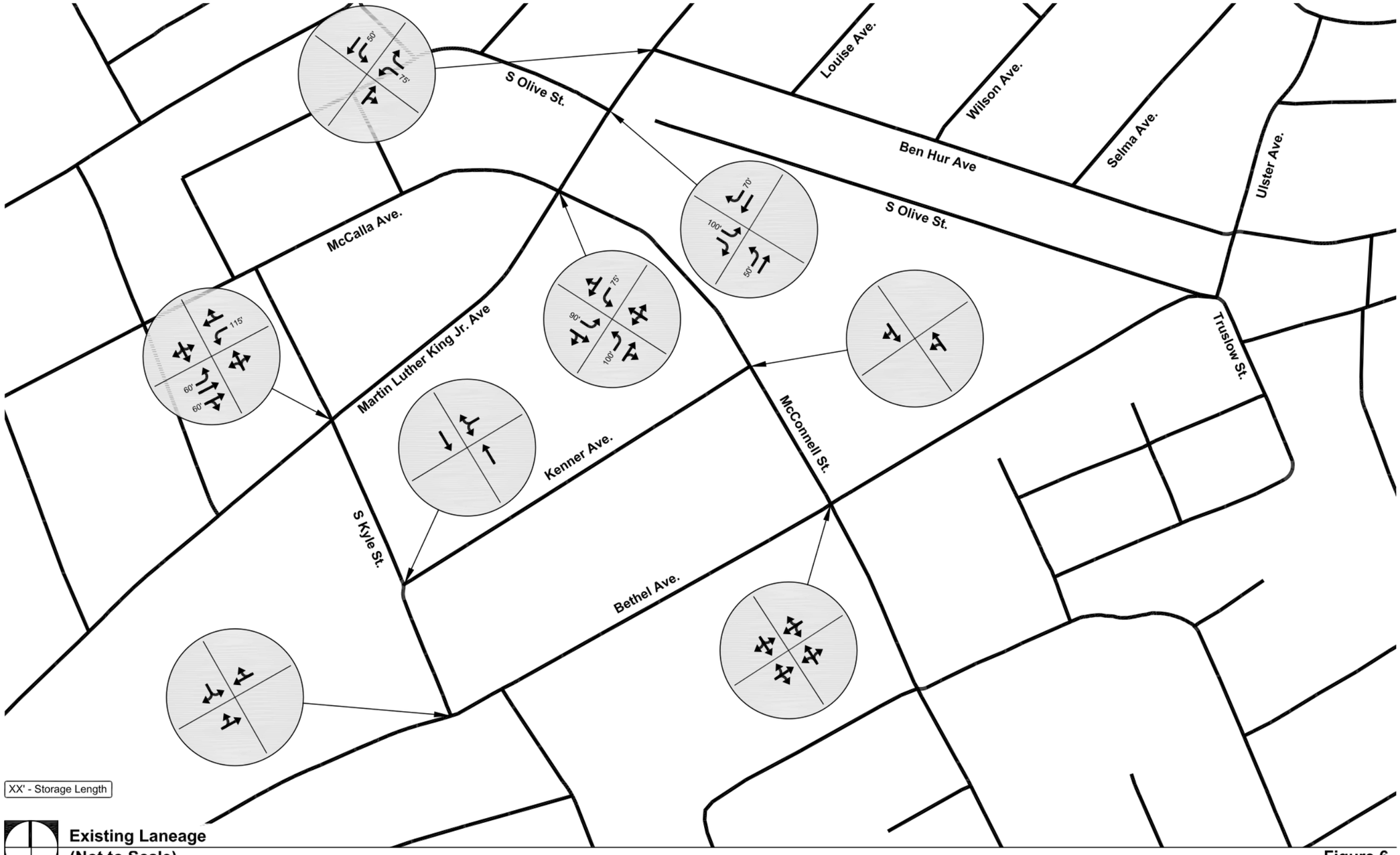

S Olive St.
Louise Ave.
Wilson Ave.
Ben Hur Ave
Selma Ave.
Ulster Ave.
S Olive St.
McCalla Ave.
Martin Luther King Jr. Ave
Kenner Ave.
McConnell St.
Truslow St.
S Kyle St.
Bethel Ave.
50'
75'
70'
100'
50'
75'
90'
100'
115'
60'
60'
XX' - Storage Length
Existing Laneage
(Not to Scale)

Figure 6.

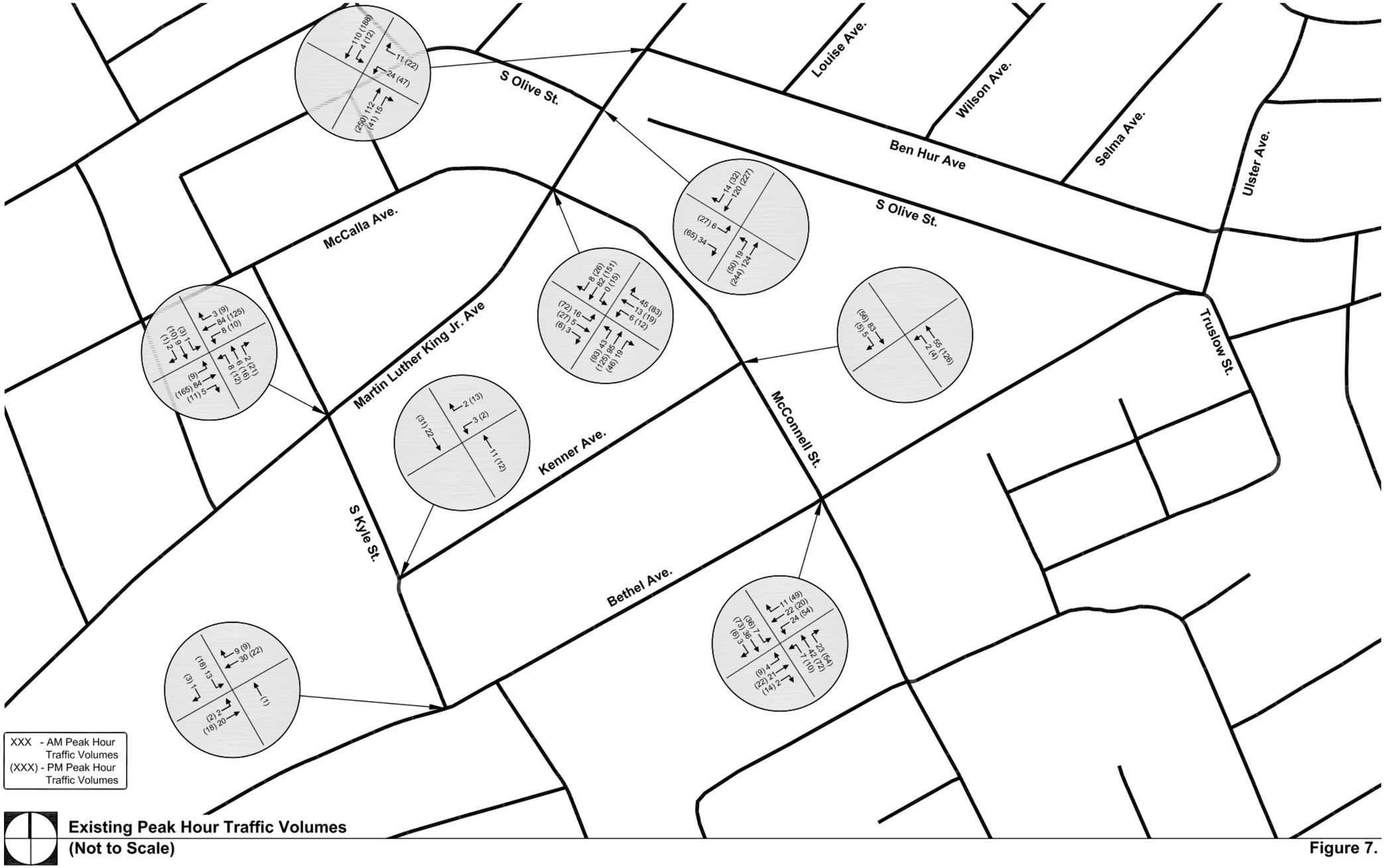
3.2 Existing Traffic Volumes

In order to provide data for the traffic impact analysis, turning movement counts were conducted at the following intersections:

- MLK Jr. Avenue & Ben Hur Avenue;
- MLK, Jr Avenue & Olive Street;
- MLK, Jr Avenue & McConnell Street;
- MLK, Jr Avenue & S Kyle Street;
- Bethel Avenue & McConnell Street;
- Bethel Avenue & S Kyle Street;
- McConnell Avenue & Kenner Avenue (pedestrians and turns only);
- S. Kyle Street & Kenner Avenue (turns from Kenner Avenue only).

Traffic counts for the eight intersections were conducted in March 2015 by RPM Transportation Consultants, LLC (RPM). Specifically, the traffic counts were collected from 7:00 - 9:00 AM and 4:00 - 6:00 PM on a typical weekday. From the counts, it was determined that the AM and PM peak hours of traffic flow at the intersections occur from 7:15 - 8:15 AM and 4:30 - 5:30 PM, respectively. The existing peak hour turning movement volumes are presented in Figure 7. A detailed summary of the turning movement counts are included in Appendix B.

In addition to the above information, average daily traffic volumes were obtained from the Tennessee Department of Transportation (TDOT). A count station is located on MLK Jr. Avenue to the west of the project site between South Cruze Street and South Dewey Roberts Sr. Street. According to the TDOT count data, the annual average daily traffic (AADT) in 2013 on MLK Jr. Avenue, west of the project site was approximately 3,408 vehicles per day. TDOT Count Station data is included in Appendix C.



Existing Peak Hour Traffic Volumes
(Not to Scale)

Figure 7.

3.3 Existing Traffic Operations

To determine the current operation of the critical study intersections, capacity analyses were performed for the AM and PM peak hours. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, TRB 2010. However, since the HCM 2010 methodology does not support multiple intersections using a single traffic signal controller, capacity analyses for the signalized intersections were performed using HCM 2000 methods. The capacity analyses result in the determination of a Level of Service (LOS) for an intersection. The LOS is a concept used to describe how well an intersection or roadway operates. LOS A is the best, while LOS F is the worst. LOS D is typically considered as the minimum acceptable LOS for an intersection in an urbanized area. Table 1 presents the descriptions of LOS for signalized intersections and Table 2 presents the descriptions of LOS for unsignalized intersections.

TABLE 1: DESCRIPTIONS OF LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (sec/veh)
A	Operations with very low delay. This occurs when progression is extremely favorable. Most vehicles do not stop at all.	≤ 10
B	Operations with stable flows. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	>10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression and/or longer cycle lengths. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	>20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop.	>35 and ≤ 55
E	Unstable flow. This is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high V/C ratios.	>55 and ≤ 80
F	Unacceptable delay. This condition often occurs with over saturation or with high V/C ratios. Poor progression and long cycle lengths may also cause such delay levels.	>80.0

Source: *Highway Capacity Manual*, TRB 2000

TABLE 2: DESCRIPTIONS OF LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (sec/veh)
A	Little or no delay	≤ 10.0
B	Short traffic delay	>10 and ≤ 15
C	Average traffic delay	>15 and ≤ 25
D	Long traffic delay	>25 and ≤ 35
E	Very long traffic delay	>35 and ≤ 50
F	Extreme traffic delay	> 50.0

Source: *Highway Capacity Manual*, TRB 2010

The results of the capacity analyses for the existing conditions at the study area intersections are presented in Table 3. As shown in Table 3, capacity analyses indicate that the MLK Jr. Avenue signalized intersections with McCalla Avenue / McConnell Street, Olive Street, and Ben Hur Avenue operate at LOS C or better during both AM and PM peak hours. The critical turning movements at the unsignalized critical intersections operate at LOS B or better during both AM and PM peak periods. Capacity analyses worksheets are included in Appendix D.

TABLE 3: EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE			
		AM Peak Hour	Average Approach Delay (sec/veh)	PM Peak Hour	Average Approach Delay (sec/veh)
MLK Jr. Avenue & Ben Hur Avenue	Overall Intersection	B	12.2	B	12.1
MLK Jr. Avenue & Olive Street	Overall Intersection	B	12.0	B	13.1
MLK Jr. Avenue & McCalla Avenue / McConnell Street	Overall Intersection	B	17.8	C	28.8
MLK Jr. Avenue & South Kyle Street	Eastbound Left Turns	A	0	A	7.6
	Westbound Left Turns	A	7.5	A	7.7
	Northbound Left Turns	B	10.5	B	12.2
	Southbound Left Turns	B	10.4	B	12.4
McConnell Street & Bethel Avenue	Eastbound Approach	A	7.7	A	8.9
	Westbound Approach	A	7.9	A	9.4
	Northbound Approach	A	7.7	A	9.2
	Southbound Approach	A	7.7	A	9.5
Bethel Avenue & South Kyle Street	Eastbound Left Turns	A	7.3	A	7.3
	Southbound Left Turns	A	9.0	A	8.9
South Kyle Street & Kenner Avenue	Westbound Approach	A	8.6	A	8.6

Note: For two-way stop controlled intersections, an LOS is presented for each critical turning movement. For all-way stop controlled intersections, an LOS is presented for each approach. For signalized intersections, an overall LOS is presented.

4. IMPACTS

4.1 Trip Generation

A traffic generation process was used to estimate the amount of traffic expected to be generated by the proposed land uses and intensities in the Five Points Master Plan. Factors for the trip generation were taken from ITE's *Trip Generation*, Ninth Edition.

Some of the existing traffic volumes in the project vicinity are derived from sites that will be demolished and redeveloped as a result of this project. Conservatively, no reductions to existing traffic volumes were made to remove this existing site traffic. Likewise, since the redevelopment consists of residential land uses only, no reductions were made to the trip generation to account for pass-by trips, diverted-linked trips, or internal capture.

Table 5 presents the daily, AM, and PM peak hour trip generation for the proposed residential land uses in each phase of the redevelopment project. As shown by Table 5, the full build out of the redevelopment can be expected to generate approximately 2,546 new trips per day. The AM and PM peak hour trip generations will equal approximately 228 and 252 new trips, respectively. Table 6 presents the total trip generation data for the entire redevelopment, with the trips for a given land use type summed for all phases. The calculations for trip generation are included in Appendix E.

TABLE 5: DEVELOPMENT TRIP GENERATION BY PHASE

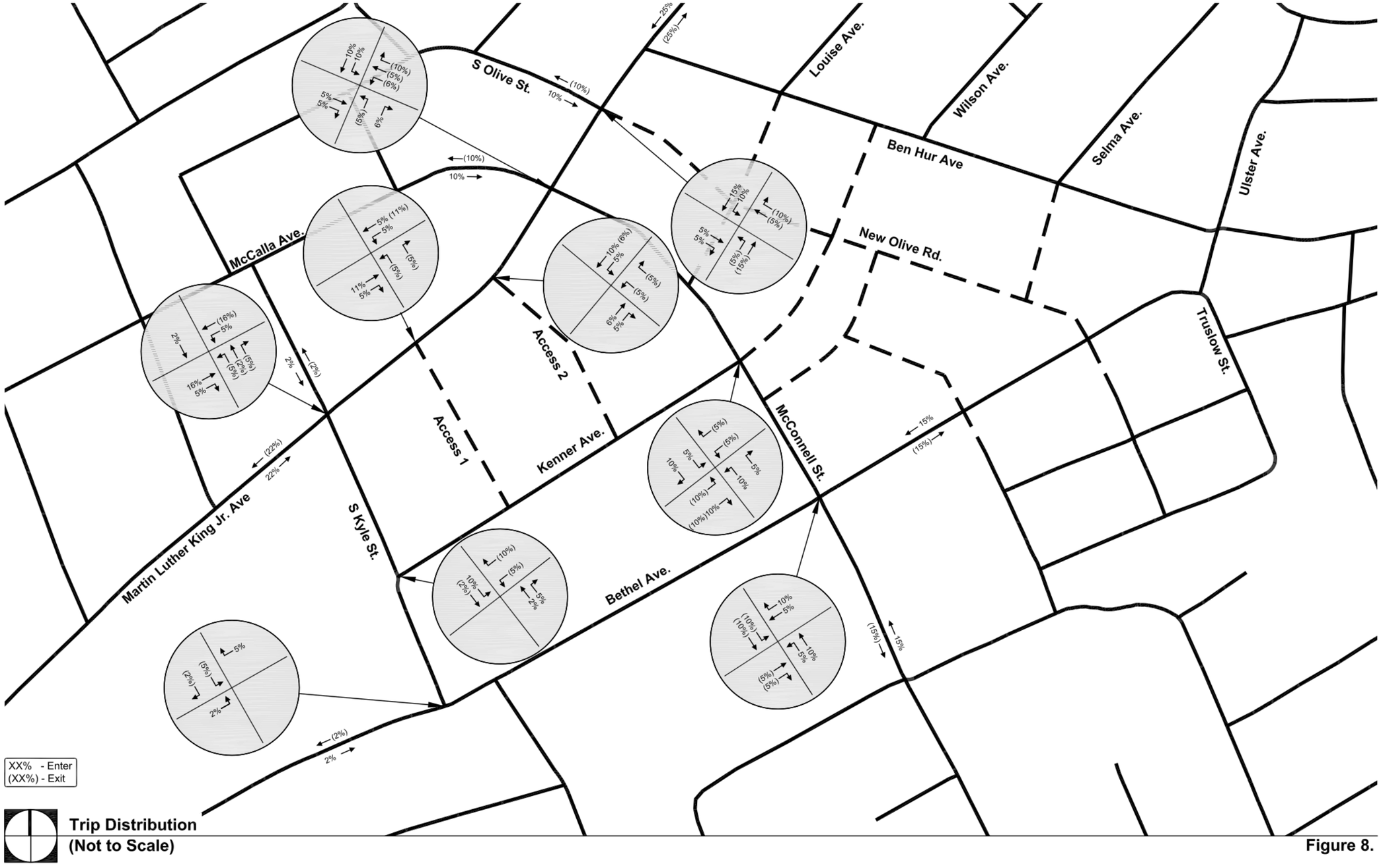
Phase	Land Use	Size (Dwelling Units)	Daily Traffic	AM Peak Hour		PM Peak Hour	
				Enter	Exit	Enter	Exit
1	Senior Housing (Attached) (LUC 252)	90	289	6	12	12	11
2	Single-Family Detached Housing (LUC 210)	19	228	6	17	15	9
	Senior Housing (Detached) (LUC 251)	50	255	13	25	16	11
	Townhomes (LUC230)	20	159	2	12	11	5
3	Apartments (LUC 220)	114	814	12	48	52	28
4a	Single-Family Detached Housing (LUC 210)	27	315	7	22	20	12
	Townhomes (LUC230)	17	138	2	11	9	5
4b	Single-Family Detached Housing (LUC 210)	20	261	6	19	17	10
	Townhomes (LUC 230)	10	87	1	7	6	3
TOTAL			**2,546**	**55**	**173**	**158**	**94**

TABLE 6: TOTAL TRIP GENERATION BY LAND USE

Land Use	Size (Dwelling Units)	Daily	AM Peak Hour		PM Peak Hour	
			Enter	Exit	Enter	Exit
Senior Housing (Attached) (LUC 252)	90	289	6	12	12	11
Single-Family Detached Housing (LUC 210)	66	804	19	58	52	31
Senior Housing (Detached) (LUC 251)	50	255	13	25	16	11
Townhomes (LUC230)	47	384	5	30	26	13
Apartments (LUC 220)	114	814	12	48	52	28
TOTAL	**367**	**2,546**	**55**	**173**	**158**	**94**

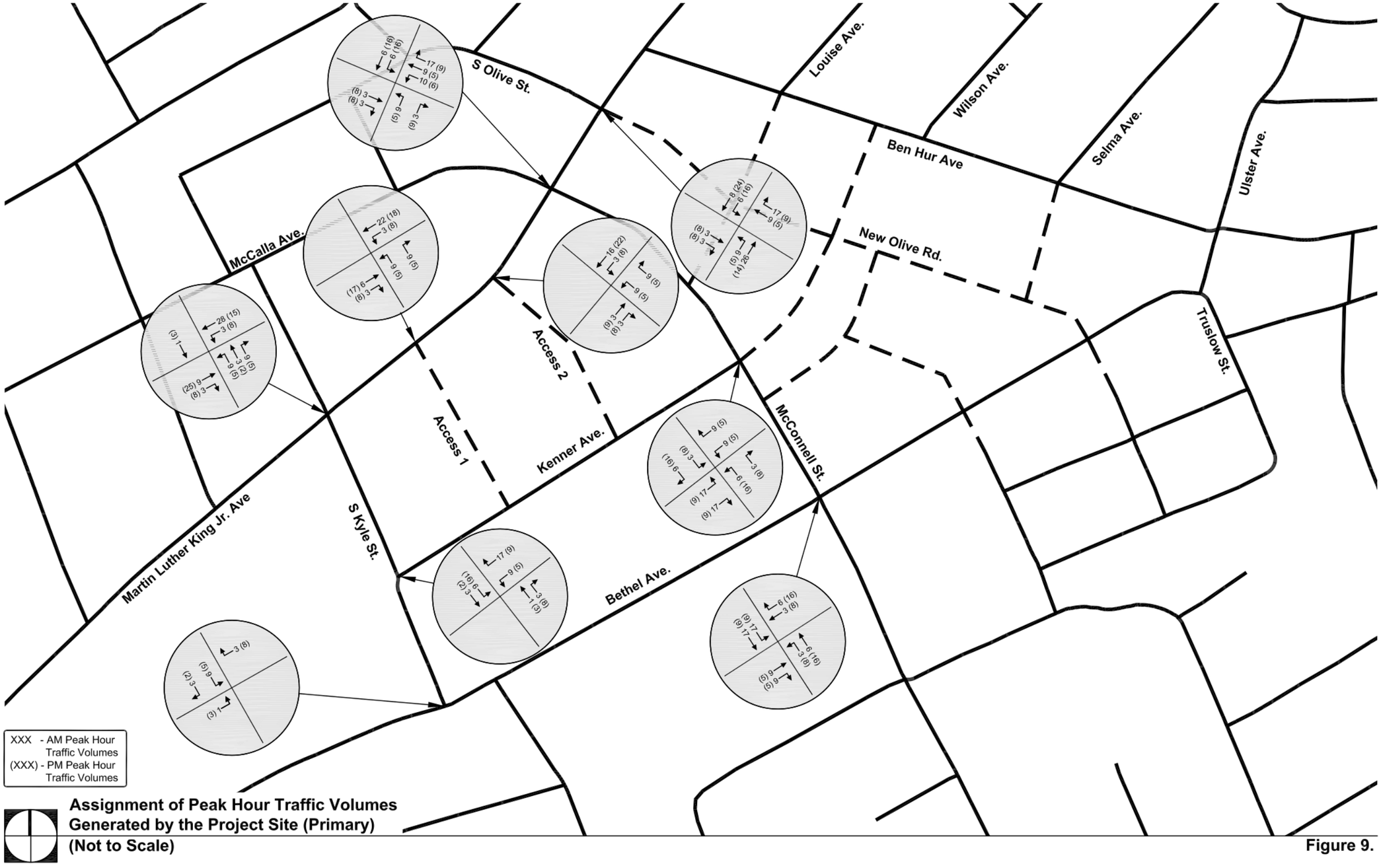
4.2 Trip Distribution and Traffic Assignment

A directional distribution of traffic generated by the proposed redevelopment was established based on the proposed accesses, the existing roadway network, and the existing travel patterns developed from the existing peak hour traffic counts. The directional distribution for redevelopment is shown in Figure 8. Based on these directional distributions, the project-generated traffic was assigned to the roadway network. The total traffic assignment for the redevelopment is shown in Figure 9.



Trip Distribution
(Not to Scale)

Figure 8.



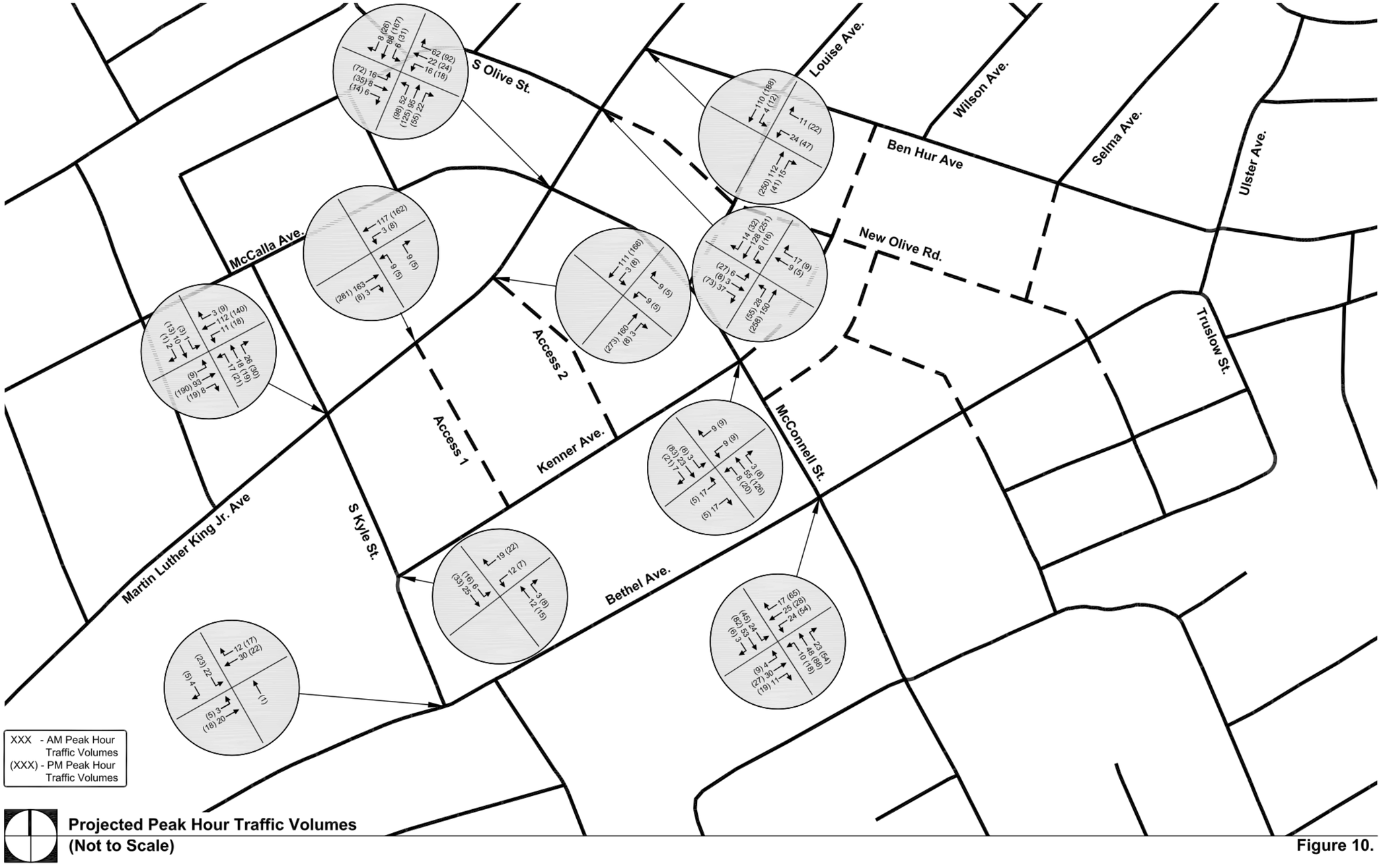
Assignment of Peak Hour Traffic Volumes Generated by the Project Site (Primary) (Not to Scale)

Figure 9.

4.3 Capacity / Level of Service Analyses

The total site generated traffic volumes for the proposed Five Points redevelopment were added to the existing peak hour traffic volumes in order to obtain the total projected traffic volumes for the intersections within the study area. Figure 10 presents the total projected AM and PM peak hour traffic volumes expected at the completion of the proposed redevelopment. Conservatively, no growth rate was applied to the existing traffic volumes because the average 10-year growth rate at the TDOT count station on MLK Jr. Avenue west of the project site was negative, approximately -0.8 percent.

Capacity analyses were performed in order to determine the impact of the project on the study intersections. These capacity analyses were also used to evaluate the need for roadway and traffic control improvements at the intersections studied. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, TRB 2010. However, since the HCM 2010 methodology does not support multiple intersections using a single traffic signal controller, capacity analyses for the signalized intersections were performed using HCM 2000 methods. The results of the capacity analyses for the projected conditions at the study area intersections are presented in Table 6. Because the roadway network in the project vicinity provides good connectivity and residential land uses generate relatively low amounts of traffic, the capacity analyses for the projected condition considered the full build out of the Five Points redevelopment. Capacity analyses worksheets are included in Appendix D.



Projected Peak Hour Traffic Volumes
(Not to Scale)

Figure 10.

TABLE 6: PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE			
		AM Peak	Delay (sec/veh)	PM Peak	Delay (sec/veh)
MLK Jr. Avenue & Ben Hur Avenue	Overall Intersection	B	16.3	B	16.6
MLK Jr. Avenue & Olive Street	Overall Intersection	B	14.7	B	16.3
MLK Jr. Avenue & McCalla Avenue / McConnell Street	Overall Intersection	C	27.5	C	31.9
MLK Jr. Avenue & South Kyle Street	Eastbound Left Turns	A	0	A	7.6
	Westbound Left Turns	A	7.5	A	7.8
	Northbound Left Turns	B	10.6	B	12.5
	Southbound Left Turns	B	10.3	B	12.4
McConnell Street & Bethel Avenue	Eastbound Approach	A	8.0	A	9.1
	Westbound Approach	A	8.1	A	9.9
	Northbound Approach	A	8.1	A	9.9
	Southbound Approach	A	8.3	B	10.1
Bethel Avenue & South Kyle Street	Eastbound Left Turns	A	7.4	A	7.4
	Southbound Left Turns	A	9.1	A	9.1
McConnell Street & Kenner Avenue	Eastbound Approach	A	9.2	B	10.4
	Westbound Approach	A	9.2	B	10.5
	Northbound Left Turn	A	7.3	A	7.6
	Southbound Left Turn	A	7.4	A	7.6
South Kyle Street & Kenner Avenue	Westbound Approach	A	8.8	A	8.8
	Southbound Left Turn	A	7.3	A	7.3
MLK Jr. Avenue & Access 1	Westbound Left Turns	A	7.6	A	7.9
	Northbound Left Turns	A	9.8	B	11.0
MLK Jr. Avenue & Access 2	Westbound Left Turns	A	7.6	A	7.9
	Northbound Left Turns	A	9.7	B	10.5

Note: For two-way stop controlled intersections, LOS for each critical movement. For all-way stop, LOS for each approach. For signalized intersections, an overall LOS is presented.

As shown in Table 6, under the projected conditions, the capacity analyses indicate that the MLK Jr. Avenue signalized intersections with McCalla Avenue / McConnell Street, Olive Street, and Ben Hur Avenue are projected to continue to operate at LOS C or better during both the AM and PM peak periods.

As shown in Table 6, the capacity analyses indicate that the critical turning movements at the unsignalized critical intersections are projected to continue to operate at LOS B or better during both AM and PM peak periods. Each critical turning movement is projected to maintain the same LOS during both AM and PM peak periods, with one exception. The southbound approach at the intersection of McConnell Street and Bethel Avenue is expected to deteriorate from LOS A to LOS B during the PM peak hour. LOS B is generally considered to be a good level of service for an all-way stop-controlled intersection.

In Phase 2 of the redevelopment, a new north-south roadway is proposed between MLK Jr. Avenue and Kenner Avenue (referred to as Access 1). In Phase 3, a second north-south roadway between MLK Jr. Avenue and Kenner Avenue is proposed (Access 2). The critical turning movements at the proposed Access 1 and Access 2 are expected to operate at LOS A during the AM peak period and LOS B during the PM peak period.

The proposed new intersections on MLK Jr. Avenue were evaluated against the volume-related traffic signal warrants in the *2009 Manual on Uniform Traffic Control Devices* (MUTCD). It was found that the projected peak hour traffic volumes at the intersection of MLK Jr. Avenue and Access 1 or Access 2 do not satisfy the traffic volume requirements for the consideration of a traffic signal.

Queue lengths at the study intersections were also analyzed. During both the AM and PM peak hour, the existing available storage for turning movements at the existing study area intersections is expected to accommodate the projected 95th-percentile queue lengths. This includes reconfiguring the signalized intersection at MLK Jr. Avenue and Olive Street to accommodate the proposed fourth leg. The queuing reports from SimTraffic are included in Appendix D.

5. SITE PLAN REVIEW & RECOMMENDATIONS

Driveway Location and Spacing

Spacing between successive driveways or between a driveway and a roadway should be designed to provide safe and relatively unimpeded movement on the through roadway. Knoxville generally requires a minimum corner clearance (the distance between an intersection and an adjacent driveway) of 25 feet for driveways, measured from the Right-of-Way line of the crossing street to the near side of the driveway. For the intersection of streets, the minimum spacing between intersections depends on the classification of the road between both intersections. According to the Knoxville-Knox County *Minimum Subdivision Regulations*, the minimum intersection spacing for local, collector, and arterial streets is 125 feet, 300 feet, and 400 feet, respectively. The intersection spacing is measured from centerline to centerline.

The rendering of the proposed site was analyzed to determine of the proposed street, driveway and intersection designs are consistent with Knoxville-Knox County regulations and with good traffic engineering practice. Per Knoxville-Knox County regulations, the minimum intersection spacing along MLK Jr. Avenue would typically be 300 feet since MLK Jr. Avenue is classified as a minor collector. The two proposed intersections of new roadways on MLK Jr. Avenue (Access 1 and Access 2) appear to meet the spacing criteria, with each spaced at least 300 feet from each other and from the nearest existing intersection.

The New Olive Street connection to the existing MLK Jr. Avenue intersection with Olive Street is spaced less than 300 feet from the nearest intersection in both directions along MLK Jr. Avenue. Olive Street is approximately 200 feet west of Ben Hur Avenue and approximately 265 feet east McConnell Avenue. The connection will form the fourth leg of an existing intersection and capacity analyses indicated that the intersection would have an acceptable level of service under projected conditions. Also, the New Olive Street connection will help form an effective internal street grid for the master plan. For these reasons, we consider the spacing of the intersections to be acceptable.

Driveways generally should not be located within the functional area of an intersection. The functional area includes decision and maneuvering distance, plus any required vehicle storage length. The loop driveway shown on the conceptual site plan connecting McConnell Street to Bethel Avenue has approximately 75 feet of clearance on McConnell and 55 feet of clearance on Bethel Avenue (Figure 11). The driveway on Bethel Avenue is acceptable because it is on a local street and is on the far side of the intersection with McConnell Street. The McConnell driveway is located within the functional area of the intersection of McConnell and Bethel Avenue. Also, the McConnell driveway is offset approximately 25 feet to the south from a proposed driveway on the opposite side of McConnell Street. This offset could result in traffic operational issues if motorists attempt to drive from one driveway to the other.

Recommendation

Consider revising the loop driveway design and place both driveways on Bethel Avenue.

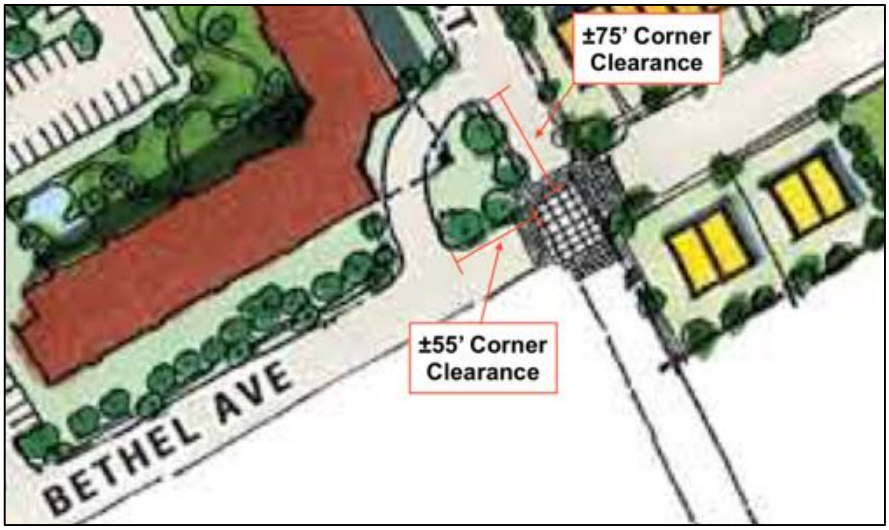


FIGURE 11: SENIOR HOUSING DRIVEWAY CORNER CLEARANCE

The spacing between Kenner Avenue and a parallel roadway that is unlabeled on the conceptual site plan (Figure 12) is not consistent with Knoxville-Knox County regulations. This unlabeled roadway appears to be intended to become a public street since there are no parking spaces shown in the conceptual site plan. Knoxville-Knox County design standards for intersection placement requirement require 300 foot spacing between intersections on McConnell (a collector) and 125 foot spacing along New Olive Street (a local street). However, other aspects of the street and intersection designs, such as adequate sight lines and the streets intersecting at approximate 90 degree angles represent good engineering practice. For these reasons and due to low traffic volumes projected for these streets and intersections, we consider the conceptual design of these streets and intersections to be acceptable.

FIGURE 12: ROADWAY CLEARANCE FROM KENNER AVENUE

Sight Distance

Sight distance is an important safety element in the design of streets and driveways. In addition to evaluating roadway curves and angle of intersection to ensure adequate sight distance, the City of Knoxville requires the provision of a "visibility triangle". Within the "visibility triangle" there shall be no wall, fence, sign, structure, plant growth or other object which obscures the vision at elevations between 2.5 and 10 feet above the crown of the adjacent roadway. The "visibility triangle" is illustrated in Figure 13 from the Knoxville *Land Development Manual*.

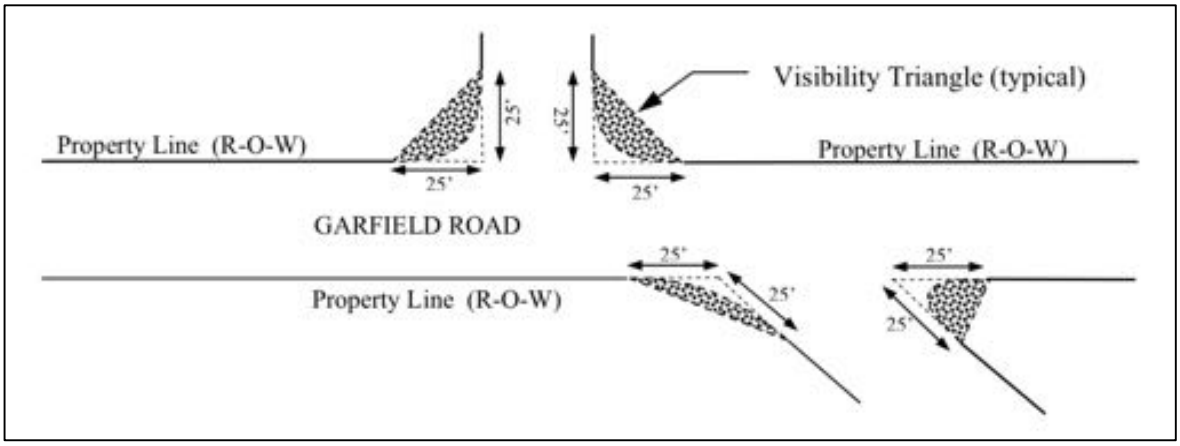


FIGURE 13: VISIBILITY TRIANGLE

In addition to maintaining a clear "visibility triangle", the design should provide adequate stopping sight distance for a design speed of 30 mph.

Recommendation

For this study, the conceptual designs of the intersections within the master plan area were evaluated to determine if there were noticeable issues with sight distance and locations with potential sight distance concerns are identified and discussed. However, the final design of the master plan streets and intersections should include an evaluation of sight distance to ensure that the final designs meet sight distance requirements.

Geometric Issues

There are a few intersections that may have restricted sight distance or other geometric issues as configured on the conceptual site plan. As presented in Figure 14, the intersection of Selma Avenue and New Olive Street has skewed geometry, with an intersection angle of approximately 48 degrees. Skewed geometry can introduce several potential problems due to an increased period of exposure to cross-street traffic while traversing the intersection, difficulty turning one's head or neck to get adequate line of sight from the acute angle approach, etc. Furthermore, the Knoxville *Land Development Manual* specifies a minimum intersection angle of 60 degrees for streets within a subdivision.

Recommendation

Consideration should be given to realigning the south approach of Selma Street to intersect New Olive Street at an approximate 90 degree angle . This would result in an offset intersection for Selma Avenue and New Olive Street and would require a reconfiguration of a portion of the master plan.

FIGURE 14: NEW OLIVE STREET AT SELMA AVENUE

The intersection on the southeast border of the project site has an unusual elongated geometry (Figure 15) that could result in sight distance and traffic operational issues. There are four legs to the intersection: Olive Street, Bethel Avenue, Ulster Avenue, and Truslow Street.

FIGURE 15: SOUTH OLIVE STREET / BETHEL AVENUE INTERSECTION

Recommendation

Reconfiguration of the intersection should be considered. Figure 15 presents a conceptual schematic of a potential modification to the plan that removes the skew between the Olive Street and Bethel Avenue approaches and separates the intersection into two offset T-intersections.

FIGURE 15: INTERSECTION IMPROVEMENT CONCEPT

Lane Widths

The minimum roadway width in the subdivision regulations for a local road is 26 feet. However, given the relatively low traffic volumes on roadways internal to the project site, lane widths of 11 feet are expected to be sufficient (22 foot total width) for all roadways on the project site. Kenner Avenue currently has a total pavement width of 18 feet, which is sufficient for its current one-way operation. In Phase 1, Kenner Avenue is planned to become two-way from McConnell Street to the entrance to the parking facility for the Phase 1 senior apartments. In Phase 2, Kenner Avenue will become a two-way street for the full length between South Kyle Street and McConnell Street.

Recommendation

Kenner Avenue will need to be widened to approximately 22 feet of total pavement width for Phase 1 up to the driveway for the senior apartments. For Phase 2 Kenner Avenue will need to be widened to provide one travel lane in each direction for the full segment. Lane widths of approximately 11 feet will be adequate for the two lane Kenner Avenue

Pedestrian Accessibility

It is important for good pedestrian accessibility and connectivity to be provided. Pedestrian signal heads and push buttons are currently provided at the signalized intersections in the study area. In general, sidewalks are provided in the study area and also shown in the conceptual site plan. Also, crosswalks are shown on the master plan at most intersections. One element included in the conceptual plan which will be beneficial for pedestrian safety is the contrasting pavement colors, material textures, or markings shown in intersections and other locations where vehicle-pedestrian conflicts may occur. This will provide conspicuity and help alert motorists to the presence of a potential conflict point.

Recommendation

With the addition of the New Olive Street approach to the signalized intersection at MLK Jr. Avenue, pedestrian signals, push buttons, and crosswalks should be provided.

APPENDICES

APPENDIX A
CONCEPTUAL SITE PLAN

APPENDIX B
DETAILED TURNING MOVEMENT COUNTS

APPENDIX C
TDOT COUNT DATA

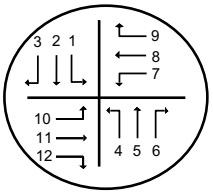
APPENDIX D
CAPACITY ANALYSES

APPENDIX E
TRIP GENERATION CALCULATIONS

APPENDIX A
CONCEPTUAL SITE PLAN

Figure 1.4: Conceptual Site Plan
Source: Lord Aeck Sargent in association with Johnson Architecture

APPENDIX B
DETAILED TURNING MOVEMENT COUNTS



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION MLK jr Ave & Ben Hur
DATE
RECORDER Scott English & Courtney Small
NOTES

	S/B			N/B			W/B			E/B		
LOCATION				Ben Hur			MLK			MLK		
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
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7 15-7 30				8		4		20			24	5
7 30-7 45				6		2		24			29	4
7 45-8 00				6		2	4	36			34	4
8 00-8 15				4		3		30			25	2
8 15-8 30				5		1	1	23			27	4
8 30-8 45				8		4	1	24			24	2
8 45-9 00				9		1	2	24			22	5
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
10 15-10 30												
10 30-10 45												
10 45-11 00												
11 00-11 15												
11 15-11 30												
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2 30-2 45												
2 45-3 00												
3 00-3 15												
3 15-3 30												
3 30-3 45												
3 45-4 00												
4 00-4 15				8		10	1	50			63	11
4 15-4 30				8		9	1	41			52	6
4 30-4 45				12		7	1	64			50	6
4 45-5 00				12		4	2	37			68	12
5 00-5 15				7		7	6	55			70	13
5 15-5 30				16		4	3	32			62	10
5 30-5 45				10		5	3	52			58	18
5 45-6 00				7		3	2	54			62	11
6 00-6 15												
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL				128		68	29	579			681	115
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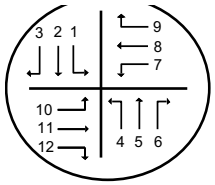
MID PK HR												
PM PK HR				40		19	14	193			252	52



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION	MLK jr Ave & Olive
DATE	03/24/2015 & 03/25/2015
RECORDER	Darryl Glascock
NOTES	

	S/B			N/B			W/B			E/B		
LOCATION	Olive						MLK			MLK		
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7 00-7 15	10		5					14	1	2	11	
7 15-7 30	3		14					21	5	4	27	
7 30-7 45	2		10					33	1	6	37	
7 45-8 00	1		5					34	5	4	33	
8 00-8 15			5					32	3	5	27	
8 15-8 30	5		6					25	4	5	25	
8 30-8 45	1		11					32	5	5	21	
8 45-9 00	2		1					23	4	9	27	
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
10 15-10 30												
10 30-10 45												
10 45-11 00												
11 00-11 15												
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2 00-2 15												
2 15-2 30												
2 30-2 45												
2 45-3 00												
3 00-3 15												
3 15-3 30												
3 30-3 45												
3 45-4 00												
4 00-4 15	4		1					56	1	6	65	
4 15-4 30	3		19					48	5	9	53	
4 30-4 45	4		16					62	11	19	57	
4 45-5 00	8		17					42	7	8	70	
5 00-5 15	6		18					74	9	9	55	
5 15-5 30	9		14					49	5	14	62	
5 30-5 45	16		10					47	9	8	65	
5 45-6 00												
6 00-6 15												
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL	74		152					592	75	113	635	
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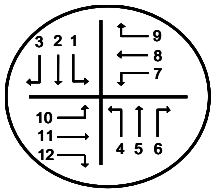
MID PK HR												
PM PK HR	27		65					227	32	50	244	



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION MLK & McConnell
DATE 03/24/2015 & 03/25/2015
RECORDER Scott English
NOTES

	S/B			N/B			W/B			E/B		
LOCATION												
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7 00-7 15	2			4		2		8	4	3	12	3
7 15-7 30	4	2	1	1	3	12		16	1	12	19	6
7 30-7 45	6		1		5	14		17	3	11	28	4
7 45-8 00	3	3		2	2	7		32	1	10	26	5
8 00-8 15	3		1	3	3	12		17	3	10	22	4
8 15-8 30	4		1	3	4	11	1	15	2	7	16	6
8 30-8 45	2	2		4	5	13	2	14	3	12	16	8
8 45-9 00	3	2	1	5	5	16	1	19	3	15	14	10
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
10 15-10 30												
10 30-10 45												
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2 45-3 00												
3 00-3 15												
3 15-3 30												
3 30-3 45												
3 45-4 00												
4 00-4 15	16	5	2	2	9	15	1	38	7	16	35	13
4 15-4 30	16	5	1	4	5	14		31	7	25	29	11
4 30-4 45	20	13		2	4	21	4	31	8	28	35	11
4 45-5 00	18	5		5	7	16	2	44	4	22	30	12
5 00-5 15	20	5	1	3	5	24	7	39	2	24	31	11
5 15-5 30	14	4	5	2	3	22	2	37	12	19	29	12
5 30-5 45	22	10	2	1	8	18	2	29	10	26	20	17
5 45-6 00	11	3		2	9	19	4	46	5	25	33	9
6 00-6 15												
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL	164	59	16	43	77	236	26	433	75	265	395	142
AM PK HR	16	5	3	6	13	45		82	8	43	95	19
MID PK HR												
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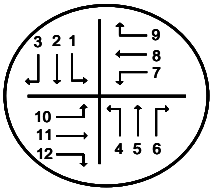

North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION	MLK Ave & Kyle
DATE	3/24/2015 pm & 03/25/2015 am
RECORDER	Courtney Small
NOTES	

	S/B			N/B			W/B			E/B		
LOCATION												
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7 00-7 15	1	2		2	1	1	2	10			9	3
7 15-7 30		1	1	3	1		2	17			14	
7 30-7 45				2	3	1	2	30			19	2
7 45-8 00	1	3		2		1	2	23	1		28	1
8 00-8 15		5	1	1	2		2	14	2		23	2
8 15-8 30		1	1	1		1	1	25			16	
8 30-8 45		1		1		2	2	25			19	2
8 45-9 00		2					1	21			19	4
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
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2 45-3 00												
3 00-3 15												
3 15-3 30												
3 30-3 45												
3 45-4 00												
4 00-4 15		2		4	6	2	5	29		1	37	2
4 15-4 30		3	2	4	2	6	3	33	1	1	27	2
4 30-4 45	2	1		3	4	8	4	24	3	3	26	3
4 45-5 00	1	3		1	2	5	3	40	3	3	47	3
5 00-5 15		3	1	3	5	5	2	33	1	1	43	1
5 15-5 30		3		5	5	3	1	28	2	2	49	4
5 30-5 45	2	1		6	1	3	2	28		3	43	4
5 45-6 00	5	4		5	5	7	3	28		2	37	1
6 00-6 15	1	7		3	3	7	6	25	2		32	5
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL	13	42	6	46	40	52	43	433	15	16	488	39
AM PK HR	1	9	2	6	5	3	7	92	3		86	5
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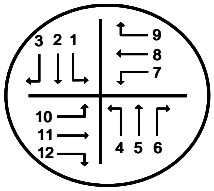

North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION Bethel Avenue & McConnell Street
DATE
RECORDER
NOTES

	S/B			N/B			W/B			E/B		
LOCATION												
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7 00-7 15	2	3		1	7	5	4	6	4	1	1	
7 15-7 30		9	1	2	9	6	6	6	3	1	2	
7 30-7 45	1	8	1	1	13	6	4	12	4	2	11	
7 45-8 00	4	10		3	8	8	6	3	2		4	
8 00-8 15	2	9	1	1	12	3	8	1	2	1	4	2
8 15-8 30	1	5			11	3	5	4	4	1	1	2
8 30-8 45	6	9	3		17	2	2	1	4		6	1
8 45-9 00	2	17			13	3	7	1	2		1	
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
10 15-10 30												
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3 45-4 00												
4 00-4 15	8	12		2	18	10	9	1	7	4	2	4
4 15-4 30	12	22	2	1	12	9	6	9	10	3	5	1
4 30-4 45	13	27	2	1	13	15	15	5	14	1	5	1
4 45-5 00	5	17	2	2	22	10	13	2	17	5	5	2
5 00-5 15	14	18		1	22	19	13	4	10	1	2	3
5 15-5 30	4	11	2	6	15	10	13	9	8	2	10	8
5 30-5 45	15	24	1		12	12	7	2	8	1	9	1
5 45-6 00	2	7	1	7	11	12	9	15	7	2	17	7
6 00-6 15												
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL	91	208	16	28	215	133	127	81	106	25	85	32
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MID PK HR												
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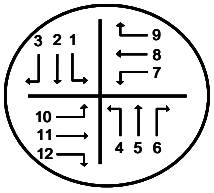

North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION Bethel & South Kyle
DATE 03/24/2015 pm & 03/25/2015 am
RECORDER Drew Randolph
NOTES

	S/B			N/B			W/B			E/B		
LOCATION												
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7 00-7 15	1		1					4	2			
7 15-7 30								5	3		6	
7 30-7 45	4		1					11	2	1	8	
7 45-8 00	5							11	3		1	
8 00-8 15	4							3	1	1	5	
8 15-8 30	3							7			5	
8 30-8 45	3							2			4	
8 45-9 00	1										1	
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
10 15-10 30												
10 30-10 45												
10 45-11 00												
11 00-11 15												
11 15-11 30												
11 30-11 45												
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12 30-12 45												
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1 30-1 45												
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2 00-2 15												
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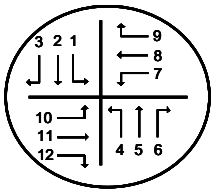
2 30-2 45												
2 45-3 00												
3 00-3 15												
3 15-3 30												
3 30-3 45												
3 45-4 00												
4 00-4 15	7	1	1					2	4		8	
4 15-4 30	6							8	5		5	
4 30-4 45	4		1		1			4	2		1	
4 45-5 00	8							2	2	1	6	
5 00-5 15	3		2					5	3		6	
5 15-5 30	3							11	2	1	5	
5 30-5 45	8							5	7		6	
5 45-6 00	5							6	4	2	5	
6 00-6 15												
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL	65	1	6		1			86	40	6	72	
AM PK HR	16		1					32	6	2	19	
MID PK HR												
PM PK HR	19		2					27	16	3	22	

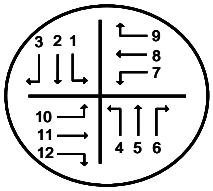


North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION	McConnell Avenue & Kenner Avenue
DATE	3/24/15 - 3/25/15
RECORDER	Nathan Quinn
NOTES	Pedestrians and turns onto Kenner only

	S/B			N/B			W/B			E/B		
LOCATION												
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7 00-7 15			1	1								
7 15-7 30				1								
7 30-7 45			1	1								
7 45-8 00												
8 00-8 15												
8 15-8 30			1									
8 30-8 45				1								
8 45-9 00			3	1								
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
10 15-10 30												
10 30-10 45												
10 45-11 00												
11 00-11 15												
11 15-11 30												
11 30-11 45												
11 45-12 00												
12 00-12 15												
12 15-12 30												
12 30-12 45												
12 45-1 00												
1 00-1 15												
1 15-1 30												
1 30-1 45												
1 45-2 00												
2 00-2 15												
2 15-2 30												
2 30-2 45												
2 45-3 00												
3 00-3 15												
3 15-3 30												
3 30-3 45												
3 45-4 00												
4 00-4 15			2									
4 15-4 30				1								
4 30-4 45			3									
4 45-5 00			1	2								
5 00-5 15			1	1								
5 15-5 30				1								
5 30-5 45				1								
5 45-6 00				2								
6 00-6 15												
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL			13	13								
AM PK HR			4	2								
MID PK HR												



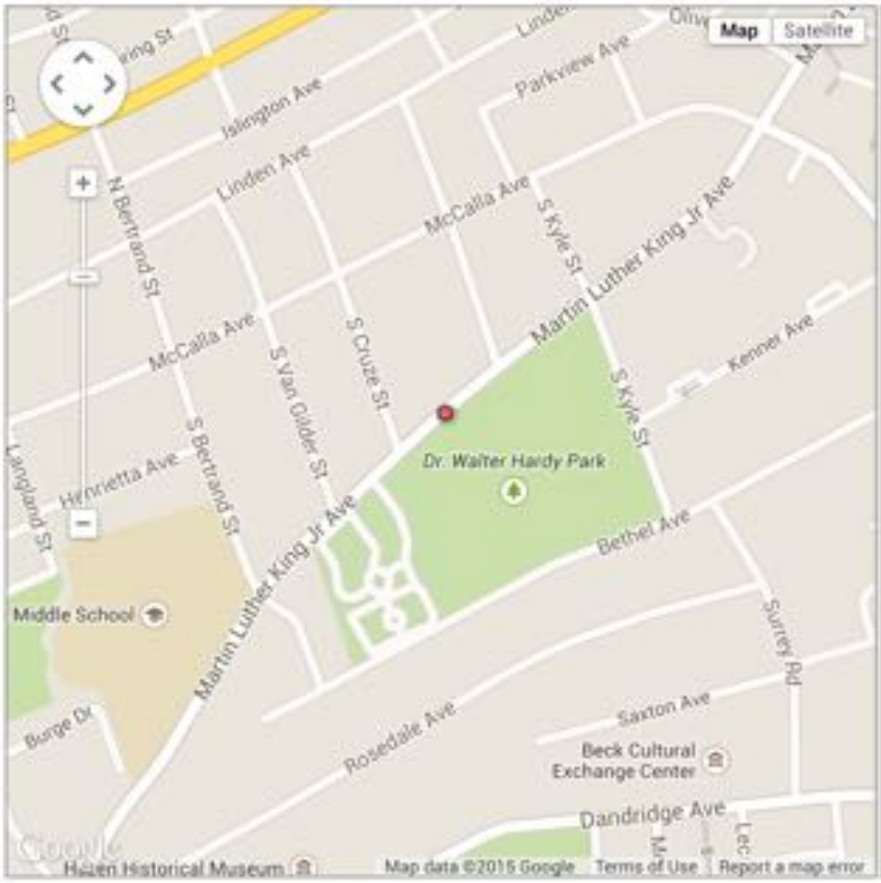
North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION	S Kyle Street & Kenner Avenue
DATE	3/24/15 - 3/25/15
RECORDER	Drew Randolph
NOTES	urns rom Kenner only

	S/B			N/B			W/B			E/B		
LOCATION												
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7 00-7 15									1			
7 15-7 30												
7 30-7 45							1		2			
7 45-8 00							2					
8 00-8 15												
8 15-8 30									1			
8 30-8 45							2		1			
8 45-9 00												
9 00-9 15												
9 15-9 30												
9 30-9 45												
9 45-10 00												
10 00-10 15												
10 15-10 30												
10 30-10 45												
10 45-11 00												
11 00-11 15												
11 15-11 30												
11 30-11 45												
11 45-12 00												
12 00-12 15												
12 15-12 30												
12 30-12 45												
12 45-1 00												
1 00-1 15												
1 15-1 30												
1 30-1 45												
1 45-2 00												
2 00-2 15												
2 15-2 30												
2 30-2 45												
2 45-3 00												
3 00-3 15												
3 15-3 30												
3 30-3 45												
3 45-4 00												
4 00-4 15									5			
4 15-4 30									4			
4 30-4 45									1			
4 45-5 00							1		3			
5 00-5 15									6			
5 15-5 30							1		3			
5 30-5 45							2		2			
5 45-6 00							1		3			
6 00-6 15												
6 15-6 30												
6 30-6 45												
6 45-7 00												
TOTAL							10		32			
AM PK HR							3		3			
MID PK HR												
PM PK HR							4		14			

APPENDIX C
TDOT COUNT DATA



Station Information	
Station	000390
Route	03788
Location	VINE AVE-KNOXVILLE
County	Knox
2013	3408
2012	3280
2011	3390
2010	5031
2009	5185
2008	4412
2007	4180
2006	4118
2005	4368
2004	4491
2003	4041
2002	4243
2001	4319
2000	4574
1999	4517
1998	4351
1997	4816
1996	5208
1995	5000
1994	4975
1993	5213

APPENDIX D
CAPACITY ANALYSES

EXISTING CONDITIONS
AM PEAK HOUR

HCM Signalized Intersection Capacity Analysis
1: Ben Hur Ave & MLK, Jr. Ave

Existing Conditions
Existing AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	112	15	4	110	24	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1831		1770	1863	1770	1583
Flt Permitted	1.00		0.66	1.00	0.95	1.00
Satd. Flow (perm)	1831		1225	1863	1770	1583
Peak-hour factor, PHF	0.82	0.75	0.25	0.76	0.75	0.69
Adj. Flow (vph)	137	20	16	145	32	16
RTOR Reduction (vph)	4	0	0	0	0	15
Lane Group Flow (vph)	153	0	16	145	32	1
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2 4 5 6			2 4 5 6	3	
Permitted Phases			2 4 5 6			3
Actuated Green, G (s)	50.8		50.8	50.8	4.2	4.2
Effective Green, g (s)	50.8		50.8	50.8	4.2	4.2
Actuated g/C Ratio	0.60		0.60	0.60	0.05	0.05
Clearance Time (s)					6.0	6.0
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)	1094		732	1113	87	78
v/s Ratio Prot	c0.08			0.08	c0.02	
v/s Ratio Perm			0.01			0.00
v/c Ratio	0.14		0.02	0.13	0.37	0.01
Uniform Delay, d1	7.5		7.0	7.5	39.1	38.4
Progression Factor	1.10		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.0	0.1	2.6	0.1
Delay (s)	8.3		7.0	7.5	41.7	38.5
Level of Service	A		A	A	D	D
Approach Delay (s)	8.3			7.5	40.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Five Points Redevelopment
RPM Transportation Consultants

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
2: MLK, Jr. Ave & Olive Street

Existing Conditions
Existing AM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	19	124	120	14	6	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.67	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1248	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.79	0.84	0.88	0.70	0.50	0.61
Adj. Flow (vph)	24	148	136	20	12	56
RTOR Reduction (vph)	0	0	0	8	0	53
Lane Group Flow (vph)	24	148	136	12	12	3
Turn Type	Perm	NA	NA	Prot	Prot	Prot
Protected Phases		2 3 5 6	2 3 5 6	2 3 5 6	4	4
Permitted Phases	2 3 5 6					4
Actuated Green, G (s)	50.1	50.1	50.1	50.1	4.9	4.9
Effective Green, g (s)	50.1	50.1	50.1	50.1	4.9	4.9
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.06	0.06
Clearance Time (s)					6.0	6.0
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)	735	1098	1098	933	102	91
v/s Ratio Prot		c0.08	0.07	0.01	c0.01	0.00
v/s Ratio Perm	0.02					
v/c Ratio	0.03	0.13	0.12	0.01	0.12	0.04
Uniform Delay, d1	7.3	7.8	7.7	7.2	38.0	37.8
Progression Factor	1.01	1.12	0.57	0.41	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.1	0.0	0.5	0.2
Delay (s)	7.4	8.8	4.4	2.9	38.5	38.0
Level of Service	A	A	A	A	D	D
Approach Delay (s)		8.6	4.2		38.1	
Approach LOS		A	A		D	

Intersection Summary				
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.15			
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	36.0	
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Five Points Redevelopment
RPM Transportation Consultants

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
3: McConnell Street/McCalla Avenue & MLK, Jr. Ave

Existing Conditions
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	95	19	0	82	8	6	13	45	16	5	3
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
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.97			0.99			0.91			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99			0.97	1.00
Satd. Flow (prot)	1770	1813			1839			1691			1803	1583
Flt Permitted	0.67	1.00			1.00			0.99			0.97	1.00
Satd. Flow (perm)	1244	1813			1839			1691			1803	1583
Peak-hour factor, PHF	0.90	0.85	0.79	1.00	0.64	0.67	0.50	0.65	0.80	0.67	0.42	0.75
Adj. Flow (vph)	48	112	24	0	128	12	12	20	56	24	12	4
RTOR Reduction (vph)	0	6	0	0	3	0	0	49	0	0	0	4
Lane Group Flow (vph)	48	130	0	0	137	0	0	39	0	0	36	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	1	2 3 4		1	2 3 4		5	5		6	6	
Permitted Phases	2 3 4			2 3 4								6
Actuated Green, G (s)	47.5	41.5			41.5			6.0			7.5	7.5
Effective Green, g (s)	47.5	41.5			41.5			6.0			7.5	7.5
Actuated g/C Ratio	0.56	0.49			0.49			0.07			0.09	0.09
Clearance Time (s)	6.0							6.0			6.0	6.0
Vehicle Extension (s)	3.0							3.0			3.0	3.0
Lane Grp Cap (vph)	732	885			897			119			159	139
v/s Ratio Prot	c0.00	0.07			c0.07			c0.02			c0.02	
v/s Ratio Perm	0.03											0.00
v/c Ratio	0.07	0.15			0.15			0.33			0.23	0.00
Uniform Delay, d1	8.6	12.0			12.0			37.6			36.1	35.3
Progression Factor	1.00	1.00			0.64			1.00			1.00	1.00
Incremental Delay, d2	0.0	0.1			0.1			1.6			0.7	0.0
Delay (s)	8.6	12.1			7.8			39.2			36.8	35.3
Level of Service	A	B			A			D			D	D
Approach Delay (s)		11.2			7.8			39.2			36.6	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Existing Conditions
3: McConnell Street/McCalla Avenue & MLK, Jr. Ave — Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	95	19	0	82	8	6	13	45	16	5	3
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
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.97			0.99			0.91			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99			0.97	1.00
Satd. Flow (prot)	1770	1813			1839			1691			1803	1583
Flt Permitted	0.67	1.00			1.00			0.99			0.97	1.00
Satd. Flow (perm)	1244	1813			1839			1691			1803	1583
Peak-hour factor, PHF	0.90	0.85	0.79	1.00	0.64	0.67	0.50	0.65	0.80	0.67	0.42	0.75
Adj. Flow (vph)	48	112	24	0	128	12	12	20	56	24	12	4
RTOR Reduction (vph)	0	6	0	0	3	0	0	49	0	0	0	4
Lane Group Flow (vph)	48	130	0	0	137	0	0	39	0	0	36	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	1	2 3 4		1	2 3 4		5	5		6	6	
Permitted Phases	2 3 4			2 3 4								6
Actuated Green, G (s)	47.5	41.5			41.5			6.0			7.5	7.5
Effective Green, g (s)	47.5	41.5			41.5			6.0			7.5	7.5
Actuated g/C Ratio	0.56	0.49			0.49			0.07			0.09	0.09
Clearance Time (s)	6.0							6.0			6.0	6.0
Vehicle Extension (s)	3.0							3.0			3.0	3.0
Lane Grp Cap (vph)	732	885			897			119			159	139
v/s Ratio Prot	c0.00	0.07			c0.07			c0.02			c0.02	
v/s Ratio Perm	0.03											0.00
v/c Ratio	0.07	0.15			0.15			0.33			0.23	0.00
Uniform Delay, d1	8.6	12.0			12.0			37.6			36.1	35.3
Progression Factor	1.00	1.00			0.64			1.00			1.00	1.00
Incremental Delay, d2	0.0	0.1			0.1			1.6			0.7	0.0
Delay (s)	8.6	12.1			7.8			39.2			36.8	35.3
Level of Service	A	B			A			D			D	D
Approach Delay (s)		11.2			7.8			39.2			36.6	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Existing Conditions
3: McConnell Street/McCalla Avenue & MLK, Jr. Ave — Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	95	19	0	82	8	6	13	45	16	5	3
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
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.97			0.99			0.91			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99			0.97	1.00
Satd. Flow (prot)	1770	1813			1839			1691			1803	1583
Flt Permitted	0.67	1.00			1.00			0.99			0.97	1.00
Satd. Flow (perm)	1244	1813			1839			1691			1803	1583
Peak-hour factor, PHF	0.90	0.85	0.79	1.00	0.64	0.67	0.50	0.65	0.80	0.67	0.42	0.75
Adj. Flow (vph)	48	112	24	0	128	12	12	20	56	24	12	4
RTOR Reduction (vph)	0	6	0	0	3	0	0	49	0	0	0	4
Lane Group Flow (vph)	48	130	0	0	137	0	0	39	0	0	36	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	1	2 3 4		1	2 3 4		5	5		6	6	
Permitted Phases	2 3 4			2 3 4								6
Actuated Green, G (s)	47.5	41.5			41.5			6.0			7.5	7.5
Effective Green, g (s)	47.5	41.5			41.5			6.0			7.5	7.5
Actuated g/C Ratio	0.56	0.49			0.49			0.07			0.09	0.09
Clearance Time (s)	6.0							6.0			6.0	6.0
Vehicle Extension (s)	3.0							3.0			3.0	3.0
Lane Grp Cap (vph)	732	885			897			119			159	139
v/s Ratio Prot	c0.00	0.07			c0.07			c0.02			c0.02	
v/s Ratio Perm	0.03											0.00
v/c Ratio	0.07	0.15			0.15			0.33			0.23	0.00
Uniform Delay, d1	8.6	12.0			12.0			37.6			36.1	35.3
Progression Factor	1.00	1.00			0.64			1.00			1.00	1.00
Incremental Delay, d2	0.0	0.1			0.1			1.6			0.7	0.0
Delay (s)	8.6	12.1			7.8			39.2			36.8	35.3
Level of Service	A	B			A			D			D	D
Approach Delay (s)		11.2			7.8			39.2			36.6	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 AWSC
5: McConnell Street & Bethel Ave

Existing Conditions
Existing AM

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	7	36	3
Peak Hour Factor	1.00	0.44	0.90	0.75
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	16	40	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.7
HCM LOS	A

Lane

HCM 2010 TWSC
6: Bethel Ave & S Kyle St

Existing Conditions
Existing AM

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	2	20	30	9	13	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	59	73	50	80	25
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	34	41	18	16	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	59	0	-	0	92	50
Stage 1	-	-	-	-	50	-
Stage 2	-	-	-	-	42	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1545	-	-	-	908	1018
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	980	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1545	-	-	-	905	1018
Mov Cap-2 Maneuver	-	-	-	-	905	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	977	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1545	-	-	-	925
HCM Lane V/C Ratio	0.003	-	-	-	0.022
HCM Control Delay (s)	7.3	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 2010 TWSC
8: S Kyle St & Kenner Ave

Existing Conditions
Existing AM

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	3	2	11	0	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	38	38	92	100	100	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	12	0	0	31

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	43	12	0	0	12	0
Stage 1	12	-	-	-	-	-
Stage 2	31	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	968	1069	-	-	1607	-
Stage 1	1011	-	-	-	-	-
Stage 2	992	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	968	1069	-	-	1607	-
Mov Cap-2 Maneuver	968	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1006	1607	-
HCM Lane V/C Ratio	-	-	0.013	-	-
HCM Control Delay (s)	-	-	8.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

EXISTING CONDITIONS
PM PEAK HOUR

HCM Signalized Intersection Capacity Analysis
1: Ben Hur Ave & MLK, Jr. Ave

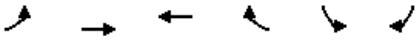
Existing Conditions
Existing PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	250	41	12	188	47	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1824		1770	1863	1770	1583
Flt Permitted	1.00		0.52	1.00	0.95	1.00
Satd. Flow (perm)	1824		964	1863	1770	1583
Peak-hour factor, PHF	0.82	0.75	0.25	0.76	0.75	0.69
Adj. Flow (vph)	305	55	48	247	63	32
RTOR Reduction (vph)	4	0	0	0	0	30
Lane Group Flow (vph)	356	0	48	247	63	2
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2 4 5 6			2 4 5 6	3	
Permitted Phases			2 4 5 6			3
Actuated Green, G (s)	64.8		64.8	64.8	7.6	7.6
Effective Green, g (s)	64.8		64.8	64.8	7.6	7.6
Actuated g/C Ratio	0.63		0.63	0.63	0.07	0.07
Clearance Time (s)					6.0	6.0
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)	1155		610	1180	131	117
v/s Ratio Prot	c0.19			0.13	c0.04	
v/s Ratio Perm			0.05			0.00
v/c Ratio	0.31		0.08	0.21	0.48	0.02
Uniform Delay, d1	8.5		7.2	7.9	45.5	43.9
Progression Factor	0.73		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.1	0.1	2.8	0.1
Delay (s)	6.3		7.3	8.0	48.2	44.0
Level of Service	A		A	A	D	D
Approach Delay (s)	6.3			7.9	46.8	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	36.0
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: MLK, Jr. Ave & Olive Street

Existing Conditions
Existing PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	244	227	32	27	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.60	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1117	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.79	0.84	0.88	0.70	0.50	0.61
Adj. Flow (vph)	63	290	258	46	54	107
RTOR Reduction (vph)	0	0	0	12	0	98
Lane Group Flow (vph)	63	290	258	34	54	9
Turn Type	Perm	NA	NA	Prot	Prot	Prot
Protected Phases		2 3 5 6	2 3 5 6	2 3 5 6	4	4
Permitted Phases	2 3 5 6					4
Actuated Green, G (s)	69.7	69.7	69.7	69.7	8.7	8.7
Effective Green, g (s)	69.7	69.7	69.7	69.7	8.7	8.7
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.09	0.09
Clearance Time (s)					6.0	6.0
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)	761	1269	1269	1078	150	134
v/s Ratio Prot		c0.16	0.14	0.02	c0.03	0.01
v/s Ratio Perm	0.06					
v/c Ratio	0.08	0.23	0.20	0.03	0.36	0.07
Uniform Delay, d1	5.5	6.2	6.0	5.3	44.2	43.1
Progression Factor	0.87	0.82	0.92	1.60	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.1	0.0	1.5	0.2
Delay (s)	4.8	5.2	5.6	8.5	45.6	43.3
Level of Service	A	A	A	A	D	D
Approach Delay (s)		5.1	6.0		44.1	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	36.0
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: McConnell Street/McCalla Avenue & MLK, Jr. Ave

Existing Conditions
Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	125	46	15	151	26	12	19	83	72	27	6
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
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.96		1.00	0.98			0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	1.00
Satd. Flow (prot)	1770	1784		1770	1823			1683			1806	1583
Flt Permitted	0.52	1.00		0.60	1.00			0.99			0.97	1.00
Satd. Flow (perm)	963	1784		1118	1823			1683			1806	1583
Peak-hour factor, PHF	0.90	0.85	0.79	1.00	0.64	0.67	0.50	0.65	0.80	0.67	0.42	0.75
Adj. Flow (vph)	103	147	58	15	236	39	24	29	104	107	64	8
RTOR Reduction (vph)	0	11	0	0	5	0	0	53	0	0	0	7
Lane Group Flow (vph)	103	194	0	15	270	0	0	104	0	0	171	1
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	1	2 3 4		1	2 3 4		5	5		6	6	
Permitted Phases	2 3 4			2 3 4								6
Actuated Green, G (s)	46.7	40.8		46.7	40.8			11.2			14.4	14.4
Effective Green, g (s)	46.7	40.8		46.7	40.8			11.2			14.4	14.4
Actuated g/C Ratio	0.46	0.40		0.46	0.40			0.11			0.14	0.14
Clearance Time (s)	6.0			6.0				6.0			6.0	6.0
Vehicle Extension (s)	3.0			3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	486	711		547	727			184			254	222
v/s Ratio Prot	c0.01	0.11		0.00	c0.15			c0.06			c0.09	
v/s Ratio Perm	0.08			0.01								0.00
v/c Ratio	0.21	0.27		0.03	0.37			0.57			0.67	0.01
Uniform Delay, d1	19.9	20.7		16.4	21.7			43.3			41.7	37.8
Progression Factor	1.00	1.00		0.79	0.70			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.2		0.0	0.3			4.0			6.9	0.0
Delay (s)	20.1	21.0		12.9	15.6			47.2			48.6	37.8
Level of Service	C	C		B	B			D			D	D
Approach Delay (s)		20.7			15.5			47.2			48.1	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	36.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
4: S Kyle St & MLK, Jr. Ave

Existing Conditions
Existing PM

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	165	11	10	125	9	12	16	21	3	10	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	77	63	88	77	38	75	42	75	25	45	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	214	17	11	162	24	16	38	28	12	22	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	186	0	0	232	0	0	450	450	116	341	447	174
Stage 1	-	-	-	-	-	-	241	241	-	197	197	-
Stage 2	-	-	-	-	-	-	209	209	-	144	250	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2.218	-	-	2.22	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1388	-	-	1333	-	-	506	504	915	601	506	869
Stage 1	-	-	-	-	-	-	742	706	-	804	737	-
Stage 2	-	-	-	-	-	-	792	729	-	845	699	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1388	-	-	1333	-	-	482	497	915	542	499	869
Mov Cap-2 Maneuver	-	-	-	-	-	-	482	497	-	542	499	-
Stage 1	-	-	-	-	-	-	737	701	-	799	731	-
Stage 2	-	-	-	-	-	-	760	723	-	770	694	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	12.2	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	585	1388	-	-	1333	-	-	525
HCM Lane V/C Ratio	0.14	0.006	-	-	0.009	-	-	0.069
HCM Control Delay (s)	12.2	7.6	-	-	7.7	-	-	12.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.2

HCM 2010 AWSC
5: McConnell Street & Bethel Ave

Existing Conditions
Existing PM

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	9	22	14	0	54	20	49	0	10	72	54
Peak Hour Factor	1.00	0.50	0.48	0.25	1.00	0.75	0.46	0.69	1.00	0.58	0.81	0.72
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	46	56	0	72	43	71	0	17	89	75
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.9	9.4	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	20%	44%	31%
Vol Thru, %	53%	49%	16%	63%
Vol Right, %	40%	31%	40%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	136	45	123	115
LT Vol	10	9	54	36
Through Vol	72	22	20	73
RT Vol	54	14	49	6
Lane Flow Rate	181	120	186	171
Geometry Grp	1	1	1	1
Degree of Util (X)	0.235	0.162	0.247	0.234
Departure Headway (Hd)	4.663	4.864	4.772	4.92
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	764	731	746	725
Service Time	2.728	2.937	2.839	2.987
HCM Lane V/C Ratio	0.237	0.164	0.249	0.236
HCM Control Delay	9.2	8.9	9.4	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.6	1	0.9

HCM 2010 AWSC
5: McConnell Street & Bethel Ave

Existing Conditions
Existing PM

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	36	73	6
Peak Hour Factor	1.00	0.44	0.90	0.75
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	82	81	8
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.5
HCM LOS	A

Lane

HCM 2010 TWSC
6: Bethel Ave & S Kyle St

Existing Conditions
Existing PM

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	2	18	22	9	18	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	59	73	50	80	25
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	31	30	18	22	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	48	0	-	0	78	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	39	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1559	-	-	-	925	1033
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	983	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1559	-	-	-	922	1033
Mov Cap-2 Maneuver	-	-	-	-	922	-
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	980	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1559	-	-	-	958
HCM Lane V/C Ratio	0.003	-	-	-	0.036
HCM Control Delay (s)	7.3	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 2010 TWSC
8: S Kyle St & Kenner Ave

Existing Conditions
Existing PM

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	2	13	12	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	38	38	92	100	100	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	34	13	0	0	44

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	57	13	0	0	13	0
Stage 1	13	-	-	-	-	-
Stage 2	44	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	950	1067	-	-	1606	-
Stage 1	1010	-	-	-	-	-
Stage 2	978	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	950	1067	-	-	1606	-
Mov Cap-2 Maneuver	950	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	978	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1050	1606	-
HCM Lane V/C Ratio	-	-	0.038	-	-
HCM Control Delay (s)	-	-	8.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

PROJECTED CONDITIONS
AM PEAK HOUR

HCM Signalized Intersection Capacity Analysis
1: Ben Hur Ave & MLK, Jr. Ave

Projected Conditions
Proposed AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	112	15	4	110	24	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1829		1770	1863	1770	1583
Flt Permitted	1.00		0.67	1.00	0.95	1.00
Satd. Flow (perm)	1829		1240	1863	1770	1583
Peak-hour factor, PHF	0.90	0.80	0.80	0.88	0.80	0.80
Adj. Flow (vph)	124	19	5	125	30	14
RTOR Reduction (vph)	3	0	0	0	0	13
Lane Group Flow (vph)	140	0	5	125	30	1
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2 4 5 6			2 4 5 6	3	
Permitted Phases			2 4 5 6			3
Actuated Green, G (s)	53.9		53.9	53.9	4.1	4.1
Effective Green, g (s)	53.9		53.9	53.9	4.1	4.1
Actuated g/C Ratio	0.55		0.55	0.55	0.04	0.04
Clearance Time (s)					6.0	6.0
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)	1012		686	1030	74	66
v/s Ratio Prot	c0.08			0.07	c0.02	
v/s Ratio Perm			0.00			0.00
v/c Ratio	0.14		0.01	0.12	0.41	0.01
Uniform Delay, d1	10.5		9.8	10.4	45.5	44.7
Progression Factor	1.13		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.0	0.1	3.6	0.1
Delay (s)	11.9		9.8	10.5	49.1	44.8
Level of Service	B		A	B	D	D
Approach Delay (s)	11.9			10.4	47.7	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	42.0
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Five Points Redevelopment 7:15 am 3/24/2015 Proposed AM
RPM Transportation Consultants

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
2: MLK, Jr. Ave & Olive Street

Projected Conditions
Proposed AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	150	0	6	128	14	0	9	17	6	3	37
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	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863		1770	1834			1863	1583		1797	1583
Flt Permitted	0.64	1.00		0.65	1.00			1.00	1.00		0.96	1.00
Satd. Flow (perm)	1201	1863		1208	1834			1863	1583		1797	1583
Peak-hour factor, PHF	0.80	0.87	0.92	0.92	0.80	0.80	0.92	0.92	0.92	0.80	0.92	0.90
Adj. Flow (vph)	35	172	0	7	160	18	0	10	18	8	3	41
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	17	0	0	40
Lane Group Flow (vph)	35	172	0	7	176	0	0	10	1	0	11	1
Turn Type	Perm	NA		Perm	NA			NA	Perm	Split	NA	custom
Protected Phases		2 3 5 6			2 3 5 6			8		4	4	4
Permitted Phases	2 3 5 6			2 3 5 6			8		8			4
Actuated Green, G (s)	48.7	48.7		48.7	48.7			3.3	3.3		3.3	3.3
Effective Green, g (s)	48.7	48.7		48.7	48.7			3.3	3.3		3.3	3.3
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.03	0.03		0.03	0.03
Clearance Time (s)								6.0	6.0		6.0	6.0
Vehicle Extension (s)								3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	600	931		604	917			63	53		60	53
v/s Ratio Prot		0.09			c0.10			c0.01			c0.01	0.00
v/s Ratio Perm	0.03			0.01					0.00			
v/c Ratio	0.06	0.18		0.01	0.19			0.16	0.01		0.18	0.03
Uniform Delay, d1	12.5	13.4		12.2	13.5			45.7	45.5		45.7	45.5
Progression Factor	0.73	0.76		0.49	0.45			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.1		0.0	0.1			1.2	0.1		1.5	0.2
Delay (s)	9.2	10.3		6.0	6.2			46.9	45.6		47.2	45.7
Level of Service	A	B		A	A			D	D		D	D
Approach Delay (s)		10.1			6.2			46.0			46.0	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	42.0
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: McConnell Street/McCalla Avenue & MLK, Jr. Ave

Projected Conditions
Proposed AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	95	22	6	88	8	16	22	62	16	8	6
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
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.97		1.00	0.99			0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	1.00
Satd. Flow (prot)	1770	1813		1770	1838			1698			1805	1583
Flt Permitted	0.68	1.00		0.67	1.00			0.99			0.97	1.00
Satd. Flow (perm)	1276	1813		1255	1838			1698			1805	1583
Peak-hour factor, PHF	0.83	0.89	0.96	0.80	0.86	0.80	0.80	0.80	0.86	0.90	0.80	0.80
Adj. Flow (vph)	63	107	23	8	102	10	20	28	72	18	10	8
RTOR Reduction (vph)	0	5	0	0	3	0	0	34	0	0	0	7
Lane Group Flow (vph)	63	125	0	8	109	0	0	86	0	0	28	1
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	1	2 3 4		1	2 3 4		5	5		6	6	
Permitted Phases	2 3 4			2 3 4								6
Actuated Green, G (s)	40.1	34.0		40.1	34.0			10.6			7.4	7.4
Effective Green, g (s)	40.1	34.0		40.1	34.0			10.6			7.4	7.4
Actuated g/C Ratio	0.41	0.35		0.41	0.35			0.11			0.08	0.08
Clearance Time (s)	6.0			6.0				6.0			6.0	6.0
Vehicle Extension (s)	3.0			3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	556	632		548	641			184			137	120
v/s Ratio Prot	c0.01	c0.07		0.00	0.06			c0.05			c0.02	
v/s Ratio Perm	0.04			0.01								0.00
v/c Ratio	0.11	0.20		0.01	0.17			0.47			0.20	0.01
Uniform Delay, d1	17.7	22.2		17.0	21.9			40.8			42.2	41.6
Progression Factor	1.00	1.00		1.01	0.83			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.2		0.0	0.1			1.9			0.7	0.0
Delay (s)	17.8	22.3		17.2	18.4			42.6			43.0	41.6
Level of Service	B	C		B	B			D			D	D
Approach Delay (s)		20.8			18.4			42.6			42.7	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	42.0	
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 TWSC
4: S Kyle St & MLK, Jr. Ave

Projected Conditions
Proposed AM

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	93	8	11	112	3	17	9	11	1	10	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	93	75	67	81	50	63	65	80	38	83	25
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	100	11	16	138	6	27	14	14	3	12	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	144	0	0	111	0	0	289	282	55	231	285	141
Stage 1	-	-	-	-	-	-	105	105	-	174	174	-
Stage 2	-	-	-	-	-	-	184	177	-	57	111	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2.218	-	-	2.22	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1438	-	-	1477	-	-	652	626	1001	714	624	906
Stage 1	-	-	-	-	-	-	890	808	-	827	754	-
Stage 2	-	-	-	-	-	-	817	752	-	948	803	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1438	-	-	1477	-	-	631	619	1001	686	617	906
Mov Cap-2 Maneuver	-	-	-	-	-	-	631	619	-	686	617	-
Stage 1	-	-	-	-	-	-	890	808	-	827	746	-
Stage 2	-	-	-	-	-	-	788	744	-	919	803	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.8	10.6	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	692	1438	-	-	1477	-	-	704
HCM Lane V/C Ratio	0.079	-	-	-	0.011	-	-	0.032
HCM Control Delay (s)	10.6	0	-	-	7.5	-	-	10.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

HCM 2010 AWSC
5: McConnell Street & Bethel Ave

Projected Conditions
Proposed AM

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	4	30	11	0	24	25	17	0	10	48	23
Peak Hour Factor	1.00	0.45	0.55	0.44	1.00	0.90	0.56	0.72	1.00	0.42	0.82	0.71
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	55	25	0	27	45	24	0	24	59	32
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8	8.1	8.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	9%	36%	30%
Vol Thru, %	59%	67%	38%	66%
Vol Right, %	28%	24%	26%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	81	45	66	80
LT Vol	10	4	24	24
Through Vol	48	30	25	53
RT Vol	23	11	17	3
Lane Flow Rate	115	88	95	119
Geometry Grp	1	1	1	1
Degree of Util (X)	0.138	0.109	0.118	0.15
Departure Headway (Hd)	4.345	4.449	4.487	4.519
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	826	807	800	795
Service Time	2.365	2.47	2.509	2.538
HCM Lane V/C Ratio	0.139	0.109	0.119	0.15
HCM Control Delay	8.1	8	8.1	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.4	0.4	0.5

HCM 2010 AWSC
5: McConnell Street & Bethel Ave

Projected Conditions
Proposed AM

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	24	53	3
Peak Hour Factor	1.00	0.64	0.68	0.75
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	37	78	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.3
HCM LOS	A

Lane

HCM 2010 TWSC
6: Bethel Ave & S Kyle St

Projected Conditions
Proposed AM

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	3	20	30	12	22	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	38	92	61	57	59	25
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	22	49	21	37	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	98	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	38	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1531	-	-	-	901	1005
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	984	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1531	-	-	-	896	1005
Mov Cap-2 Maneuver	-	-	-	-	896	-
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	979	-

Approach	EB	WB	SB
HCM Control Delay, s	2	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1531	-	-	-	926
HCM Lane V/C Ratio	0.005	-	-	-	0.058
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

HCM 2010 TWSC
7: McConnell Street & Kenner Ave

Projected Conditions
Proposed AM

Intersection													
Int Delay, s/veh	3.2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Vol, veh/h	17	0	17	9	0	9	8	55	3	3	23	7	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	100	92	100	92	92	92	50	71	92	92	87	42	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	17	0	17	10	0	10	16	77	3	3	26	17	

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	157	154	35	161	161	79	43	0	0	81	0	0
Stage 1	41	41	-	111	111	-	-	-	-	-	-	-
Stage 2	116	113	-	50	50	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	809	738	1038	804	731	981	1566	-	-	1517	-	-
Stage 1	974	861	-	894	804	-	-	-	-	-	-	-
Stage 2	889	802	-	963	853	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	793	728	1038	783	722	981	1566	-	-	1517	-	-
Mov Cap-2 Maneuver	793	728	-	783	722	-	-	-	-	-	-	-
Stage 1	963	859	-	884	795	-	-	-	-	-	-	-
Stage 2	870	793	-	945	851	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	9.2	1.2	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1566	-	-	899	871	1517	-	-
HCM Lane V/C Ratio	0.01	-	-	0.038	0.022	0.002	-	-
HCM Control Delay (s)	7.3	0	-	9.2	9.2	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

HCM 2010 TWSC
8: S Kyle St & Kenner Ave

Projected Conditions
Proposed AM

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	12	19	12	3	6	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	58	68	100	100	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	33	18	3	6	33

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	64	19	0	0	21	0
Stage 1	19	-	-	-	-	-
Stage 2	45	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	942	1059	-	-	1595	-
Stage 1	1004	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	938	1059	-	-	1595	-
Mov Cap-2 Maneuver	938	-	-	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	973	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1004	1595	-
HCM Lane V/C Ratio	-	-	0.057	0.004	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

HCM 2010 TWSC
9: Access 1 & MLK, Jr. Ave

Projected Conditions
Proposed AM

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	163	3	3	117	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	177	3	3	127	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	177	0	311	177
Stage 1	-	-	-	-	177	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1399	-	681	866
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1399	-	680	866
Mov Cap-2 Maneuver	-	-	-	-	680	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	890	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	762	-	-	1399	-
HCM Lane V/C Ratio	0.026	-	-	0.002	-
HCM Control Delay (s)	9.8	-	-	7.6	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 2010 TWSC
10: Access 2 & MLK, Jr. Ave

Projected Conditions
Proposed AM

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	160	3	3	111	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	174	3	3	121	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	177	0	303	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	127	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1399	-	689	867
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	899	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1399	-	688	867
Mov Cap-2 Maneuver	-	-	-	-	713	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	897	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	782	-	-	1399	-
HCM Lane V/C Ratio	0.025	-	-	0.002	-
HCM Control Delay (s)	9.7	-	-	7.6	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

PROJECTED CONDITIONS
PM PEAK HOUR

HCM Signalized Intersection Capacity Analysis
1: Ben Hur Ave & MLK, Jr. Ave

Projected Conditions
Proposed PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	250	41	12	188	47	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1824		1770	1863	1770	1583
Flt Permitted	1.00		0.52	1.00	0.95	1.00
Satd. Flow (perm)	1824		975	1863	1770	1583
Peak-hour factor, PHF	0.90	0.80	0.80	0.88	0.80	0.80
Adj. Flow (vph)	278	51	15	214	59	28
RTOR Reduction (vph)	3	0	0	0	0	26
Lane Group Flow (vph)	326	0	15	214	59	2
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2 4 5 6			2 4 5 6	3	
Permitted Phases			2 4 5 6			3
Actuated Green, G (s)	61.6		61.6	61.6	7.3	7.3
Effective Green, g (s)	61.6		61.6	61.6	7.3	7.3
Actuated g/C Ratio	0.57		0.57	0.57	0.07	0.07
Clearance Time (s)					6.0	6.0
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)	1047		559	1069	120	107
v/s Ratio Prot	c0.18			0.11	c0.03	
v/s Ratio Perm			0.02			0.00
v/c Ratio	0.31		0.03	0.20	0.49	0.02
Uniform Delay, d1	11.8		9.9	11.0	48.2	46.7
Progression Factor	0.97		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.0	0.1	3.1	0.1
Delay (s)	11.6		9.9	11.1	51.4	46.7
Level of Service	B		A	B	D	D
Approach Delay (s)	11.6			11.0	49.9	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	42.0
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Five Points Redevelopment 4:30 pm 3/24/2015 Proposed PM
RPM Transportation Consultants

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis
2: MLK, Jr. Ave & Olive Street

Projected Conditions
Proposed PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	0	16	251	32	0	5	9	27	8	73
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	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863		1770	1831			1863	1583		1792	1583
Flt Permitted	0.49	1.00		0.54	1.00			1.00	1.00		0.96	1.00
Satd. Flow (perm)	906	1863		1000	1831			1863	1583		1792	1583
Peak-hour factor, PHF	0.80	0.87	0.92	0.92	0.80	0.80	0.92	0.92	0.92	0.80	0.92	0.90
Adj. Flow (vph)	69	297	0	17	314	40	0	5	10	34	9	81
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	10	0	0	76
Lane Group Flow (vph)	69	297	0	17	352	0	0	5	0	0	43	5
Turn Type	Perm	NA		Perm	NA			NA	Perm	Split	NA	custom
Protected Phases		2 3 5 6			2 3 5 6			8		4	4	4
Permitted Phases	2 3 5 6			2 3 5 6			8		8			4
Actuated Green, G (s)	56.4	56.4		56.4	56.4			2.1	2.1		6.5	6.5
Effective Green, g (s)	56.4	56.4		56.4	56.4			2.1	2.1		6.5	6.5
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.02	0.02		0.06	0.06
Clearance Time (s)								6.0	6.0		6.0	6.0
Vehicle Extension (s)								3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	476	979		525	962			36	30		108	95
v/s Ratio Prot		0.16			c0.19			c0.00			c0.02	0.00
v/s Ratio Perm	0.08			0.02					0.00			
v/c Ratio	0.14	0.30		0.03	0.37			0.14	0.01		0.40	0.05
Uniform Delay, d1	13.1	14.4		12.3	14.9			51.7	51.6		48.5	47.5
Progression Factor	0.81	0.81		0.81	0.56			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.2		0.0	0.2			1.8	0.1		2.4	0.2
Delay (s)	10.7	11.8		7.6	8.6			53.5	51.7		50.9	47.7
Level of Service	B	B		A	A			D	D		D	D
Approach Delay (s)		11.6			8.5			52.3			48.8	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	42.0
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: McConnell Street/McCalla Avenue & MLK, Jr. Ave

Projected Conditions
Proposed PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	125	55	31	167	26	18	24	92	72	35	14
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
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.96		1.00	0.98			0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	1.00
Satd. Flow (prot)	1770	1782		1770	1823			1682			1805	1583
Flt Permitted	0.55	1.00		0.59	1.00			0.99			0.97	1.00
Satd. Flow (perm)	1030	1782		1103	1823			1682			1805	1583
Peak-hour factor, PHF	0.83	0.89	0.96	0.80	0.86	0.80	0.80	0.80	0.86	0.90	0.80	0.80
Adj. Flow (vph)	118	140	57	39	194	32	22	30	107	80	44	18
RTOR Reduction (vph)	0	10	0	0	4	0	0	47	0	0	0	16
Lane Group Flow (vph)	118	187	0	39	222	0	0	112	0	0	124	2
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA		Split	NA	Perm
Protected Phases	1	2 3 4		1	2 3 4		5	5		6	6	
Permitted Phases	2 3 4			2 3 4								6
Actuated Green, G (s)	44.3	38.0		44.3	38.0			12.3			12.6	12.6
Effective Green, g (s)	44.3	38.0		44.3	38.0			12.3			12.6	12.6
Actuated g/C Ratio	0.41	0.35		0.41	0.35			0.11			0.12	0.12
Clearance Time (s)	6.0			6.0				6.0			6.0	6.0
Vehicle Extension (s)	3.0			3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	468	631		494	645			192			211	185
v/s Ratio Prot	c0.01	0.11		0.00	c0.12			c0.07			c0.07	
v/s Ratio Perm	0.09			0.03								0.00
v/c Ratio	0.25	0.30		0.08	0.34			0.58			0.59	0.01
Uniform Delay, d1	23.3	25.0		20.7	25.5			45.1			44.9	41.8
Progression Factor	1.00	1.00		0.96	0.83			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	0.3			4.5			4.1	0.0
Delay (s)	23.6	25.3		20.0	21.5			49.5			49.0	41.9
Level of Service	C	C		B	C			D			D	D
Approach Delay (s)		24.6			21.3			49.5			48.1	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.45				
Actuated Cycle Length (s)	107.3	Sum of lost time (s)		42.0	
Intersection Capacity Utilization	45.4%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM 2010 TWSC
4: S Kyle St & MLK, Jr. Ave

Projected Conditions
Proposed PM

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	190	19	18	140	9	17	18	26	3	13	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	93	75	67	81	50	63	65	80	38	83	25
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	204	25	27	173	18	27	28	32	8	16	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	191	0	0	230	0	0	486	486	115	376	490	182
Stage 1	-	-	-	-	-	-	241	241	-	236	236	-
Stage 2	-	-	-	-	-	-	245	245	-	140	254	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2.218	-	-	2.22	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1383	-	-	1335	-	-	478	481	916	569	478	860
Stage 1	-	-	-	-	-	-	742	706	-	766	709	-
Stage 2	-	-	-	-	-	-	758	703	-	849	696	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1383	-	-	1335	-	-	453	467	916	513	464	860
Mov Cap-2 Maneuver	-	-	-	-	-	-	453	467	-	513	464	-
Stage 1	-	-	-	-	-	-	736	700	-	759	695	-
Stage 2	-	-	-	-	-	-	723	689	-	780	690	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	1	12.5	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	565	1383	-	-	1335	-	-	512
HCM Lane V/C Ratio	0.154	0.009	-	-	0.02	-	-	0.054
HCM Control Delay (s)	12.5	7.6	-	-	7.8	-	-	12.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.2

HCM 2010 AWSC
5: McConnell Street & Bethel Ave

Projected Conditions
Proposed PM

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	9	27	19	0	54	28	65	0	18	88	54
Peak Hour Factor	1.00	0.45	0.55	0.44	1.00	0.90	0.56	0.72	1.00	0.42	0.82	0.71
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	20	49	43	0	60	50	90	0	43	107	76
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	9.1	9.9	9.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	16%	37%	34%
Vol Thru, %	55%	49%	19%	62%
Vol Right, %	34%	35%	44%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	160	55	147	133
LT Vol	18	9	54	45
Through Vol	88	27	28	82
RT Vol	54	19	65	6
Lane Flow Rate	226	112	200	199
Geometry Grp	1	1	1	1
Degree of Util (X)	0.3	0.158	0.273	0.278
Departure Headway (Hd)	4.78	5.055	4.914	5.024
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	744	701	723	708
Service Time	2.863	3.151	3	3.109
HCM Lane V/C Ratio	0.304	0.16	0.277	0.281
HCM Control Delay	9.9	9.1	9.9	10.1
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	1.3	0.6	1.1	1.1

HCM 2010 AWSC
5: McConnell Street & Bethel Ave

Projected Conditions
Proposed PM

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	45	62	6
Peak Hour Factor	1.00	0.64	0.68	0.75
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	70	121	8
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.1
HCM LOS	B

Lane

HCM 2010 TWSC
6: Bethel Ave & S Kyle St

Projected Conditions
Proposed PM

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	5	18	22	17	23	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	38	92	61	57	59	25
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	20	36	30	39	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	66	0	-	0	97	51
Stage 1	-	-	-	-	51	-
Stage 2	-	-	-	-	46	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1536	-	-	-	902	1017
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	976	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1536	-	-	-	894	1017
Mov Cap-2 Maneuver	-	-	-	-	894	-
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	967	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1536	-	-	-	932
HCM Lane V/C Ratio	0.009	-	-	-	0.063
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

HCM 2010 TWSC
7: McConnell Street & Kenner Ave

Projected Conditions
Proposed PM

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	0	9	5	0	5	20	126	8	8	83	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	92	100	92	92	92	50	71	92	92	87	42
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	9	5	0	5	40	177	9	9	95	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	403	404	120	404	425	182	145	0	0	186	0	0
Stage 1	138	138	-	262	262	-	-	-	-	-	-	-
Stage 2	265	266	-	142	163	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	558	536	931	557	521	861	1437	-	-	1388	-	-
Stage 1	865	782	-	743	691	-	-	-	-	-	-	-
Stage 2	740	689	-	861	763	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	538	516	931	536	501	861	1437	-	-	1388	-	-
Mov Cap-2 Maneuver	538	516	-	536	501	-	-	-	-	-	-	-
Stage 1	838	777	-	720	670	-	-	-	-	-	-	-
Stage 2	713	668	-	847	758	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	10.5	1.3	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1437	-	-	682	661	1388	-	-
HCM Lane V/C Ratio	0.028	-	-	0.026	0.016	0.006	-	-
HCM Control Delay (s)	7.6	0	-	10.4	10.5	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.1	0	-	-

HCM 2010 TWSC
8: S Kyle St & Kenner Ave

Projected Conditions
Proposed PM

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	7	22	15	8	16	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	58	68	100	100	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	38	22	8	16	44

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	102	26	0	0	30	0
Stage 1	26	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	896	1050	-	-	1583	-
Stage 1	997	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	887	1050	-	-	1583	-
Mov Cap-2 Maneuver	887	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	938	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1000	1583	-
HCM Lane V/C Ratio	-	-	0.052	0.01	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

HCM 2010 TWSC
9: Access 1 & MLK, Jr. Ave

Projected Conditions
Proposed PM

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	281	8	8	162	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	305	9	9	176	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	305	0	498	305
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	193	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1256	-	532	735
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	840	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1256	-	528	735
Mov Cap-2 Maneuver	-	-	-	-	528	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	834	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	615	-	-	1256	-
HCM Lane V/C Ratio	0.018	-	-	0.007	-
HCM Control Delay (s)	11	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 2010 TWSC
10: Access 2 & MLK, Jr. Ave

Projected Conditions
Proposed PM

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	273	8	8	166	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	297	9	9	180	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	305	0	499	301
Stage 1	-	-	-	-	301	-
Stage 2	-	-	-	-	198	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1256	-	531	739
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	835	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1256	-	527	739
Mov Cap-2 Maneuver	-	-	-	-	598	-
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	829	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	661	-	-	1256	-
HCM Lane V/C Ratio	0.016	-	-	0.007	-
HCM Control Delay (s)	10.5	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

PROJECTED CONDITIONS
AM QUEUEING REPORT

Queuing and Blocking Report
Proposed AM

Five Points Redevelopment

Intersection: 1: Ben Hur Ave & MLK, Jr. Ave

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	68	20	86	52	27
Average Queue (ft)	20	2	25	13	8
95th Queue (ft)	58	14	63	38	28
Link Distance (ft)	94		624		1087
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)		50		75	
Storage Blk Time (%)		0	1	0	
Queuing Penalty (veh)		0	0	0	

Intersection: 2: MLK, Jr. Ave & Olive Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	R
Maximum Queue (ft)	47	73	23	52	24	29	33	52
Average Queue (ft)	12	19	1	11	7	11	9	21
95th Queue (ft)	37	53	9	32	23	33	29	45
Link Distance (ft)		206		94	595		684	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50		75			50		100
Storage Blk Time (%)	0	1		0				
Queuing Penalty (veh)	0	0		0				

Intersection: 3: McConnell Street/McCalla Avenue & MLK, Jr. Ave

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	63	94	27	88	100	54	30
Average Queue (ft)	19	36	1	22	46	17	5
95th Queue (ft)	47	71	11	55	85	44	24
Link Distance (ft)		236		206	682		658
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		75			90	
Storage Blk Time (%)		0		0			
Queuing Penalty (veh)		0		0			

Queuing and Blocking Report
Proposed AM

Five Points Redevelopment

Intersection: 4: S Kyle St & MLK, Jr. Ave

Movement	WB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	7	30	27
Average Queue (ft)	0	17	8
95th Queue (ft)	4	32	24
Link Distance (ft)		391	296
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	115		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: McConnell Street & Bethel Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	74	66	58	61
Average Queue (ft)	23	32	30	32
95th Queue (ft)	54	56	46	53
Link Distance (ft)	1098	1192	424	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Bethel Ave & S Kyle St

Movement	SB
Directions Served	LR
Maximum Queue (ft)	38
Average Queue (ft)	15
95th Queue (ft)	41
Link Distance (ft)	339
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Proposed AM

Five Points Redevelopment

Intersection: 7: McConnell Street & Kenner Ave

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	36	30	8
Average Queue (ft)	23	13	0
95th Queue (ft)	44	37	5
Link Distance (ft)	1086	235	682
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: S Kyle St & Kenner Ave

Movement	WB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	18
95th Queue (ft)	41
Link Distance (ft)	1086
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: Access 1 & MLK, Jr. Ave

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	10	41
Average Queue (ft)	0	12
95th Queue (ft)	6	34
Link Distance (ft)		358
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Proposed AM

Five Points Redevelopment

Intersection: 10: Access 2 & MLK, Jr. Ave

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	20	31
Average Queue (ft)	1	14
95th Queue (ft)	8	39
Link Distance (ft)		419
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Zone Summary

Zone wide Queuing Penalty: 1

PROJECTED CONDITIONS
PM QUEUEING REPORT

Queuing and Blocking Report
Proposed PM

Five Points Redevelopment

Intersection: 1: Ben Hur Ave & MLK, Jr. Ave

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	106	31	124	74	41
Average Queue (ft)	52	8	41	23	15
95th Queue (ft)	104	30	88	58	38
Link Distance (ft)	94		624		1087
Upstream Blk Time (%)	1				
Queuing Penalty (veh)	4				
Storage Bay Dist (ft)		50		75	
Storage Blk Time (%)		0	3	1	
Queuing Penalty (veh)		0	0	0	

Intersection: 2: MLK, Jr. Ave & Olive Street

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	R
Maximum Queue (ft)	66	119	30	89	24	29	75	58
Average Queue (ft)	23	40	7	29	4	7	23	30
95th Queue (ft)	58	92	24	64	17	27	57	51
Link Distance (ft)		206		94	595		684	
Upstream Blk Time (%)				0				
Queuing Penalty (veh)				0				
Storage Bay Dist (ft)	50		75			50		100
Storage Blk Time (%)	2	4		0			0	
Queuing Penalty (veh)	6	2		0			0	

Intersection: 3: McConnell Street/McCalla Avenue & MLK, Jr. Ave

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	115	120	84	137	118	103	78
Average Queue (ft)	36	52	17	59	56	57	15
95th Queue (ft)	82	102	51	116	101	96	57
Link Distance (ft)		236		206	682		658
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100		75			90	
Storage Blk Time (%)	0	1	0	4		3	
Queuing Penalty (veh)	0	1	0	1		0	

Queuing and Blocking Report
Proposed PM

Five Points Redevelopment

Intersection: 4: S Kyle St & MLK, Jr. Ave

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	12	22	49	27
Average Queue (ft)	1	3	17	9
95th Queue (ft)	9	15	38	26
Link Distance (ft)			391	296
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	60	115		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: McConnell Street & Bethel Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	53	81	58	72
Average Queue (ft)	25	41	38	40
95th Queue (ft)	47	63	58	61
Link Distance (ft)	1098	1192	424	393
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Bethel Ave & S Kyle St

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	17
95th Queue (ft)	42
Link Distance (ft)	339
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Proposed PM

Five Points Redevelopment

Intersection: 7: McConnell Street & Kenner Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	37	30	30	18
Average Queue (ft)	13	10	2	1
95th Queue (ft)	38	34	13	11
Link Distance (ft)	1066	235	393	682
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: S Kyle St & Kenner Ave

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	38	10
Average Queue (ft)	14	0
95th Queue (ft)	39	6
Link Distance (ft)	1066	391
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Access 1 & MLK, Jr. Ave

Movement	EB	WB	NB
Directions Served	T	L	LR
Maximum Queue (ft)	10	30	32
Average Queue (ft)	0	3	6
95th Queue (ft)	6	18	25
Link Distance (ft)	163		358
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Five Points Redevelopment
RPM Transportation Consultants

SimTraffic Report

Queuing and Blocking Report
Proposed PM

Five Points Redevelopment

Intersection: 10: Access 2 & MLK, Jr. Ave

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	31	31
Average Queue (ft)	2	8
95th Queue (ft)	15	30
Link Distance (ft)		419
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Zone Summary

Zone wide Queuing Penalty: 15

APPENDIX E
TRIP GENERATION CALCULATIONS

TRIP GENERATION – Five Points Master Plan: Phase 1

Senior/Disabled Housing (Attached) –90 units

Use ITE Land Use Code 252 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic

T = 2.98(X) + 21.05
T = 2.98(90) + 21.05
T = 289

A.M. Peak Hour - Use the fitted curve equation for the AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 0.20 (X) – 0.13
T = 0.20 (90) – 0.13
T = 18

Enter = 0.34(18) = 6
Exit = 0.66(18) = 12

P.M. Peak Hour - Use the fitted curve equation for the PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

T = 0.24(X) + 1.64
T = 0.24(90) + 1.64
T = 23

Enter = 0.54(23) = 12
Exit = 0.46(23) = 11

TRIP GENERATION – Five Points Master Plan: Phase 2

Single-Family Detached Housing – 19 units

Use ITE Land Use Code 210 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic

Ln(T) = 0.92 Ln(X) + 2.72
Ln(T) = 0.92 Ln(19) + 2.72
T = 228

A.M. Peak Hour - Use the fitted curve equation for the AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 0.70 (X) + 9.74
T = 0.70 (19) + 9.74
T = 23

Enter = 0.25(23) = 6
Exit = 0.75(23) = 17

P.M. Peak Hour - Use the fitted curve equation for the PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

Ln(T) = 0.90 Ln(X) + 0.51
Ln(T) = 0.90 Ln(19) + 0.51
T = 24

Enter = 0.63(24) = 15
Exit = 0.37(24) = 9

Senior/Disabled Housing (Detached) – 50 units

Use ITE Land Use Code 251 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic

Ln(T) = 0.89 Ln(X) + 2.06
Ln(T) = 0.89 Ln(50) + 2.06
T = 255

A.M. Peak Hour - Use the fitted curve equation for the AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 0.17 (X) + 29.95
T = 0.17 (50) + 29.95
T = 38

Enter = 0.35(38) = 13
Exit = 0.65(38) = 25

P.M. Peak Hour - Use the fitted curve equation for the PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

Ln(T) = 0.75 Ln(X) + 0.35
Ln(T) = 0.75 Ln(50) + 0.35
T = 27

Enter = 0.61(27) = 16
Exit = 0.39(27) = 11

Residential Condominium/Townhouse – 20 Units

Use ITE Land Use Code 230 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic
Ln(T) = 0.87 Ln(X) + 2.46
Ln(T) = 0.87 Ln(20) + 2.46
T = 159

A.M. Peak Hour - Use fitted curve equation for AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

Ln(T) = 0.80 Ln (X) + 0.26
Ln(T) = 0.80 Ln (20) + 0.26
T = 14

Enter = 0.17(14) = 2
Exit = 0.83(14) = 12

P.M. Peak Hour - Use fitted curve equation for PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

Ln(T) = 0.82 Ln(X) + 0.32
Ln(T) = 0.82 Ln(20) + 0.32
T = 16

Enter = 0.67(16) = 11
Exit = 0.33(16) = 5

TRIP GENERATION – Five Points Master Plan: Phase 3

Apartment – 114 Units

Use ITE Land Use Code 220 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic

T = 6.06(X) + 123.56
T = 6.06(114) + 123.56
T = 814

A.M. Peak Hour - AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 0.49(X) + 3.73
T = 0.49(114) + 3.73
T = 60

Enter = 0.20(60) = 12
Exit = 0.80(60) = 48

P.M. Peak Hour - PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

T = 0.55(X) + 17.65
T = 0.55(114) + 17.65
T = 80

Enter = 0.65(80) = 52
Exit = 0.35(80) = 28

TRIP GENERATION – Five Points Master Plan: Phase 4a

Single-Family Detached Housing – 27 units

Use ITE Land Use Code 210 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic

Ln(T) = 0.92 Ln(X) + 2.72
Ln(T) = 0.92 Ln(27) + 2.72
T = 315

A.M. Peak Hour - Use the fitted curve equation for the AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 0.70 (X) + 9.74
T = 0.70 (27) + 9.74
T = 29

Enter = 0.25(29) = 7
Exit = 0.75(29) = 22

P.M. Peak Hour - Use the fitted curve equation for the PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

Ln(T) = 0.90 Ln(X) + 0.51
Ln(T) = 0.90 Ln(27) + 0.51
T = 32

Enter = 0.63(32) = 20
Exit = 0.37(32) = 12

Residential Condominium/Townhouse – 17 Units

Use ITE Land Use Code 230 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic
Ln(T) = 0.87 Ln(X) + 2.46
Ln(T) = 0.87 Ln(17) + 2.46
T = 138

A.M. Peak Hour - Use fitted curve equation for AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

Ln(T) = 0.80 Ln (X) + 0.26
Ln(T) = 0.80 Ln (17) + 0.26
T = 13

Enter = 0.17(8) = 2
Exit = 0.83(8) = 11

P.M. Peak Hour - Use fitted curve equation for PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

Ln(T) = 0.82 Ln(X) + 0.32
Ln(T) = 0.82 Ln(17) + 0.32
T = 14

Enter = 0.67(14) = 9
Exit = 0.33(14) = 5

TRIP GENERATION – Five Points Master Plan: Phase 4b

Single-Family Detached Housing – 22 units

Use ITE Land Use Code 210 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic

Ln(T) = 0.92 Ln(X) + 2.72
Ln(T) = 0.92 Ln(22) + 2.72
T = 261

A.M. Peak Hour - Use the fitted curve equation for the AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

T = 0.70 (X) + 9.74
T = 0.70 (22) + 9.74
T = 25

Enter = 0.25(25) = 6
Exit = 0.75(25) = 19

P.M. Peak Hour - Use the fitted curve equation for the PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

Ln(T) = 0.90 Ln(X) + 0.51
Ln(T) = 0.90 Ln(22) + 0.51
T = 27

Enter = 0.63(27) = 17
Exit = 0.37(27) = 10

Residential Condominium/Townhouse – 10 Units

Use ITE Land Use Code 230 and associated trip generation rates for 24-hour total trips and peak hour trips.

Average Daily Traffic
Ln(T) = 0.87 Ln(X) + 2.46
Ln(T) = 0.87 Ln(10) + 2.46
T = 87

A.M. Peak Hour - Use fitted curve equation for AM Peak Hour of the Adjacent Street (between 7:00 AM and 9:00 AM)

Ln(T) = 0.80 Ln (X) + 0.26
Ln(T) = 0.80 Ln (10) + 0.26
T = 8

Enter = 0.17(8) = 1
Exit = 0.83(8) = 7

P.M. Peak Hour - Use fitted curve equation for PM Peak Hour of the Adjacent Street (between 4:00 PM and 6:00 PM)

Ln(T) = 0.82 Ln(X) + 0.32
Ln(T) = 0.82 Ln(10) + 0.32
T = 9

Enter = 0.67(9) = 6
Exit = 0.33(9) = 3