Figure 4-4: No-build Condition AM and PM Weekday Peak Turning Movement Volumes

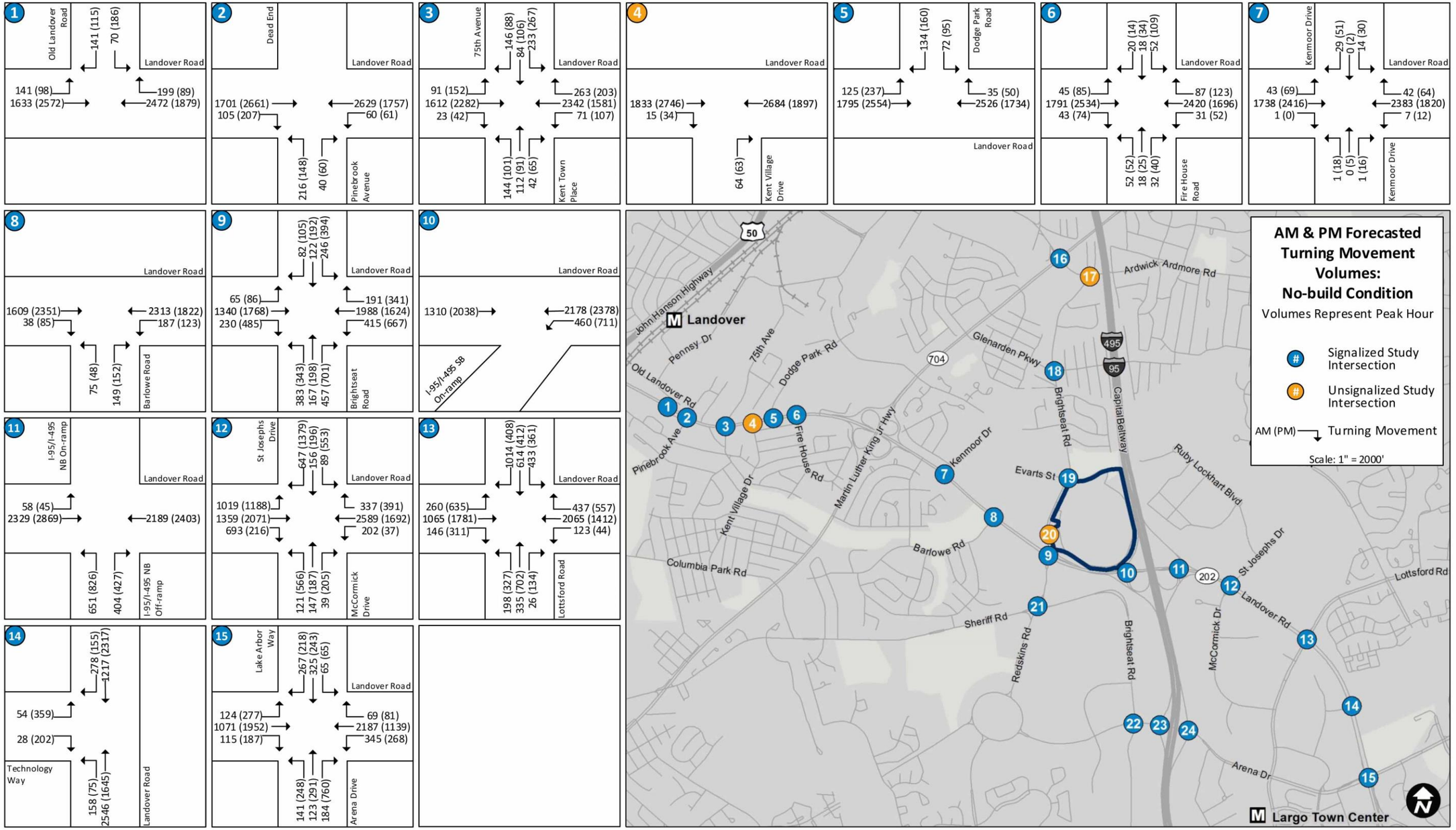
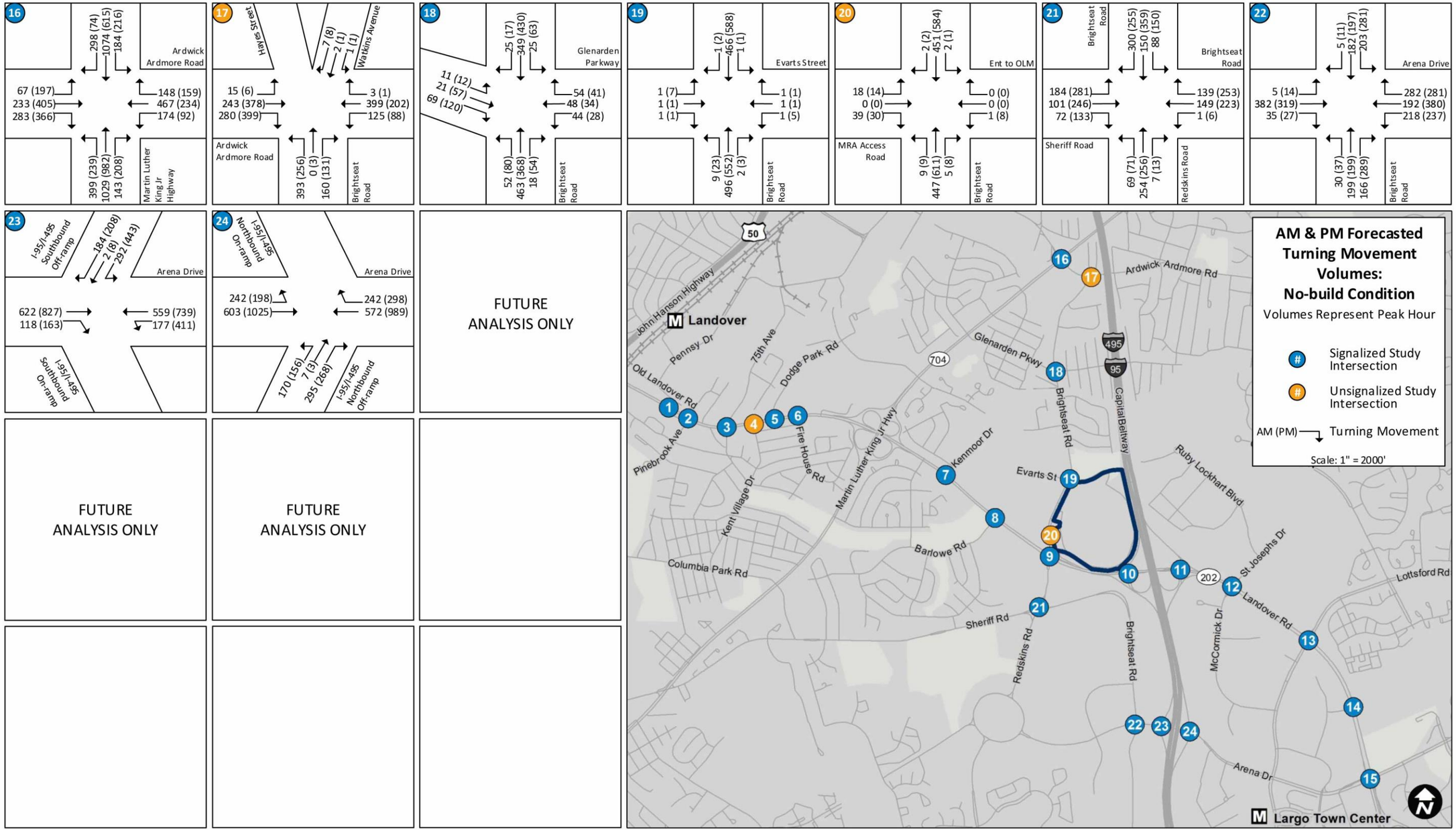


Figure 4-4: No-build Condition AM and PM Weekday Peak Turning Movement Volumes (continued)



4.7.5 No-build Condition Operations Analysis

Synchro™ was used to calculate the vehicle delay and LOS operation based on the HCM 2000 method for each study area intersection. Custom-designed Excel sheets were used to calculate the LOS operation based on the CLV method.

4.7.5.1 Signalized Intersection Operations Analysis

Based on the Synchro™ and CLV-based Excel worksheet analysis, many of the signalized study area intersections operate at acceptable overall conditions during the morning and afternoon peak hours (average control delay is less than 55 seconds). However, the following intersections in the study area operate with overall unacceptable conditions, which include LOS E or LOS F using the HCM 2000 method or LOS F using the CLV method:

- Landover Road and Kent Town Place/75th Avenue (Intersection #3) operates at CLV LOS F during the AM peak hour
- Landover Road and Brightseat Road (Intersection #9) operates at HCM LOS E and CLV LOS F during the PM peak hour
- Landover Road and the I-95/I-495 Southbound On-ramp (Intersection #10) operates at CLV LOS F during the PM peak hour
- Landover Road and the I-95/I-495 Northbound Off-ramp (Intersection #11) operates at CLV LOS F during the AM peak hour and HCM LOS E and CLV LOS F during the PM peak hour
- Landover Road and St. Joseph's Drive/McCormick Drive (Intersection #12) operates at HCM LOS F and CLV LOS F during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13) operates at HCM LOS E during the PM peak hour
- Martin Luther King Jr. Highway and Ardwick-Ardmore Road (Intersection #16) operates at LOS F for both HCM and CLV during the AM peak hour and HCM LOS E during the PM peak hour

Based on the Synchro™ analysis, the following individual signalized intersection lane groups or overall approaches operate under unacceptable conditions (LOS E or LOS F) during the morning or afternoon peak hours. The lane group within the approach that is operating under unacceptable conditions is noted in parentheses; when "overall" is noted, the overall approach movements operate under unacceptable conditions.

- Landover Road and Old Landover Road (Intersection #1)
    - Eastbound Landover Road (left turns) and southbound Old Landover Road (overall) at the intersection of Landover Road and Old Landover Road during the AM peak hour
    - Southbound Old Landover Road (overall) during the PM peak hours
- Landover Road and Pinebrook Avenue (Intersection #2)
    - Northbound Pinebrook Avenue (overall) during the AM Peak hour
    - Northbound Pinebrook Avenue (overall) and westbound Landover Road (left turns) during the PM peak hour
- Landover Road and Kent Town Place/75th Avenue (Intersection #3)
    - Eastbound Landover Road (left turns), northbound Kent Town Place (left turns), and southbound 75th Avenue (overall) during the AM peak hour
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns), and southbound 75th Avenue (overall) during the PM peak hour
- Landover Road and Dodge Park Road (Intersection #5)

    - Eastbound Landover Road (left turns) and southbound Dodge Park Road (overall) during both the AM and PM peak hours
- Landover Road and Fire House Road (Intersection #6)
    - Northbound Fire House Road (overall) and southbound Fire House Road (overall) during the AM peak hour
    - Southbound Fire House Road (overall) at the same intersection during the PM peak hour
- Landover Road and Kenmoor Drive (Intersection #7)
    - Northbound Kenmoor Drive (overall) and southbound Kenmoor Drive (overall) during both the AM and PM peak hours
- Landover Road and Barlowe Road (Intersection #8)
    - Northbound Barlowe Road (overall) during the AM peak hour
    - Westbound Landover Road (left turns) and northbound Barlowe Road (overall) during the PM peak hour
- Landover Road and Brightseat Road (Intersection #9)
    - Eastbound (left turns) and westbound (left turns) on Landover Road, and southbound Brightseat Road (overall) during the AM peak hour
    - Eastbound (left and through movements) and westbound (left turns) on Landover Road and both northbound and southbound (overall) on Brightseat Road during the PM peak hour
- Landover Road and I-95/I-495 Southbound On-Ramp (Intersection #10)
    - Eastbound Landover Road (through movements) and westbound Landover Road (left turns) during the PM peak hour
- Landover Road and I-95/I-495 Northbound Off-Ramp (Intersection #11)
    - Eastbound Landover Road (left turns) and northbound on the I-95/I-495 off ramp (overall) during the AM peak hour
    - Eastbound (left turns) and westbound (overall) on Landover Road and northbound on the I-95/I-495 off ramp (overall) during the PM peak hour
- Landover Road and St. Joseph's Drive/McCormick Drive (Intersection #12)
    - Eastbound (left turns) and westbound (left and through movements) on Landover Road, northbound McCormick Drive (overall), and southbound St. Joseph's Drive (overall) during the AM peak hour
    - Eastbound and westbound Landover Road (both), northbound McCormick Drive (overall), and southbound St. Joseph's Drive (overall) during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13)
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns), northbound Lottsford Road (overall), and southbound Lottsford Road (left and combined left and through movements) during the AM peak hour
    - Eastbound Landover Road (overall), westbound Landover Road (left turns), northbound Lottsford Road (overall), and southbound Lottsford Road (overall) during the PM peak hour
- Landover Road and Technology Way (Intersection #14)
    - Eastbound Technology Way (overall) during both the AM and PM peak hours
    - Northbound Landover Road (left turns) during the PM peak hour
- Landover Road and Arena Drive/Lake Arbor Way (Intersection #15)
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns), northbound Arena Drive (left and through movements), and southbound Lake Arbor Way (overall) at the intersection of Landover Road and Arena Drive/Lake Arbor Way during both the AM and PM peak hours
- Martin Luther King Jr. Highway and Ardwick-Ardmore Road (Intersection #16)

    - Eastbound Ardwick-Ardmore Road (overall), westbound Ardwick-Ardmore Road (overall), northbound Martin Luther King Jr. Highway (overall), and southbound Martin Luther King Jr. Highway (overall) during the AM peak hour
    - Eastbound Ardwick-Ardmore Road (through movements), westbound Ardwick-Ardmore Road (overall), northbound Martin Luther King Jr. Highway (overall) and southbound Martin Luther King Jr. Highway (overall) during the PM peak hour
- Brightseat Road/Redskins Road and Sheriff Road/Brightseat Road (Intersection #21)
    - Eastbound Sheriff Road (left turns), westbound Brightseat Road (overall), and southbound Brightseat Road (left turns) during the AM peak hour
    - Westbound Brightseat Road (through movements) during the PM peak hour
- Arena Drive and I-95/I-495 Southbound Ramps (Intersection #23)
    - Southbound I-95/I-495 off-ramp (overall) during both the AM and PM peak hours
- Arena Drive and I-95/I-495 Northbound Ramps (Intersection #24)
    - Eastbound Arena Drive (left turns) during the PM peak hour

4.7.5.2 Unsignalized Intersection Operations Analysis

Based on the unsignalized intersection analysis, only the intersection of Brightseat Road and Ardwick-Ardmore Road (Intersection #17) would operate with the Brightseat Road northbound approach exceeding an average control delay of 35 seconds during the AM peak hour. The other unsignalized intersections in the study area operate with no failing minor street approaches during either the AM or PM peak hours.

4.7.5.3 Complete Intersection Operations Analysis

This section summarizes the differences in LOS impacts between the Existing Condition and the No-Build Condition by quantifying the change in intersection operation failures. Following the summary, this section also includes the complete results of the operations analysis in both figures and a table.

A total of 18 signalized intersections and 1 unsignalized intersection would experience an unacceptable conditions for one or more turning movements. Compared to the Existing Condition, the No-build Condition would have two more intersections failing during the AM peak hour and there would be three more intersections failing during the PM peak hour. In the AM peak hour, compared to the Existing Condition, there are two intersections that passed overall but would now fail, 22 that would not change, and zero that were failing but would now pass. In the PM peak hour, there are three intersections that passed overall but would now fail, 21 that would not change, and zero that were failing but would now pass.

Table 4-14 shows a summary of the number of intersections that meet the following criteria for the overall directional approach that would change between the Existing Condition and the No-build Condition:

- New Failing Approach
    - Number of intersections that have at least one failing overall approach that did **NOT** have a failing overall approach in the previous condition

- Additional Failing Approaches
    - Number of intersections that had at least one failing overall approach in the previous condition and now would have additional/more failing overall approaches than before

- No Change
    - Number of intersections that would have no change in the number of failing overall approaches, or the number of failing overall approaches would be the same as in the previous condition

- Fewer Failing Approaches
    - Number of intersections that would have less failing overall approaches than the previous condition, but still would have some failing overall approaches

- No Failing Approaches
    - Number of intersections that had failing overall approaches in the previous condition, but no longer have failing overall approaches

Table 4-14: Intersection Operations Summary Comparing Existing Condition to No-build Condition

Type of Change Between Conditions	AM	PM
New Failing Approach	0	0
Additional Failing Approaches	3	3
No Change	20	20
Fewer Failing Approaches	1	1
No Failing Approaches	0	0
Total Signalized and Unsignalized Intersections Affected	**24**	**24**

The average LOS for the various approaches to the intersections and the overall intersection LOS grades for the No-build Condition are depicted in figures 4-5 and 4-6 for the AM and PM peak hours, respectively. Table 4-15 shows the results of the LOS capacity analysis and the intersection projected delay under the No-build Condition during the AM and PM peak hours.

Figure 4-5: No-build Condition Intersection LOS for AM Peak Hour

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.
[*] = Unsignalized intersection requires attention due to failing minor approach movement.

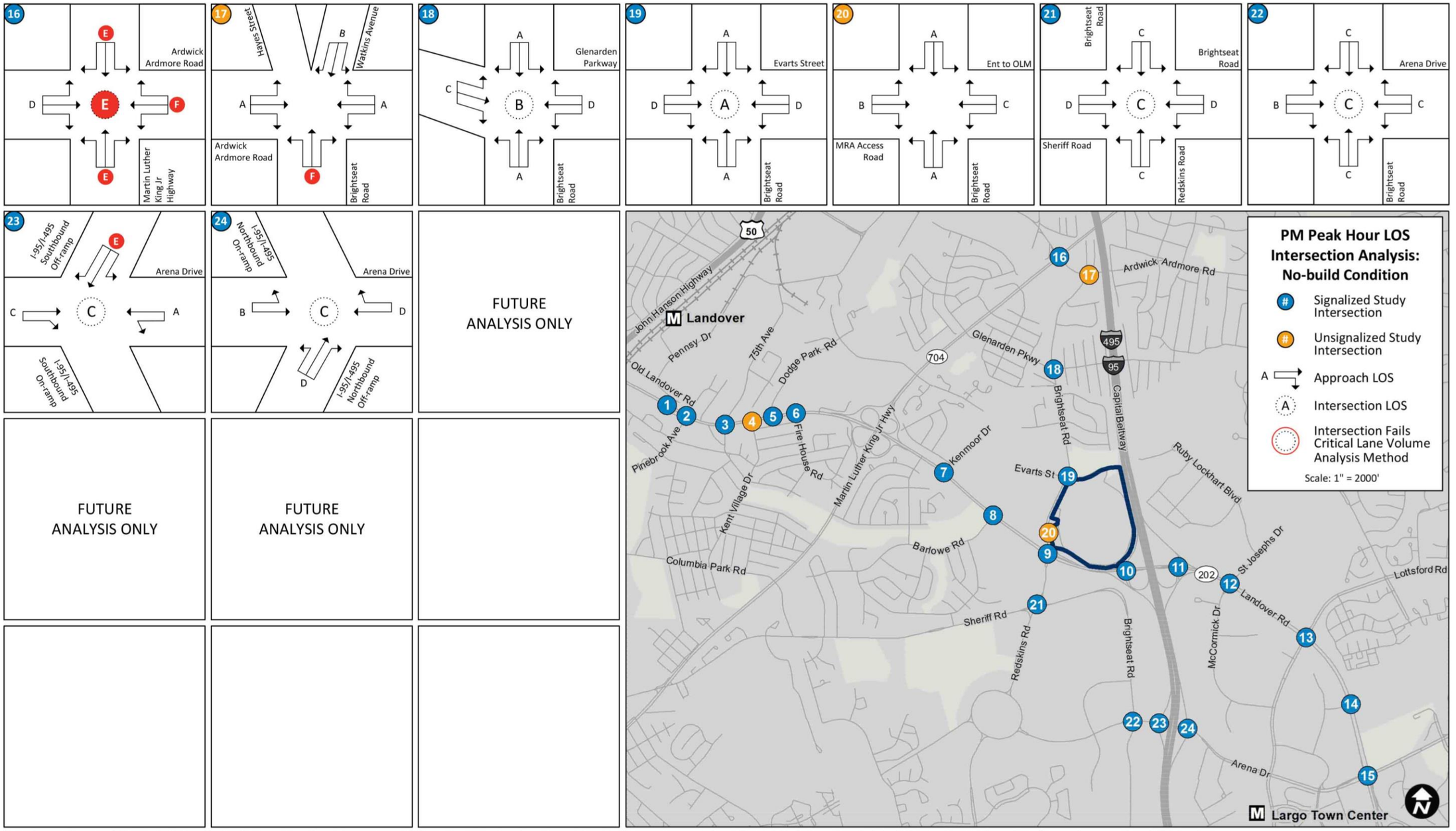
Figure 4-5: No-build Condition Intersection LOS for AM Peak Hour (continued)

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.
[*] = Unsignalized intersection requires attention due to failing minor approach movement.

Figure 4-6: No-build Condition Intersection LOS for PM Peak Hour

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.

Figure 4-6: No-build Condition Intersection LOS for PM Peak Hour (continued)



Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
1	**Landover Road & Old Landover Road (Signalized)**											
	EB (Landover Rd)	L	58.5	E				22.2	C			
	EB (Landover Rd)	T	2.3	A				6.2	A			
	EB Overall (Landover Rd)		**6.8**	**A**				**6.8**	**A**			
	WB (Landover Rd)	TR	4.7	A				4.4	A			
	WB Overall (Landover Rd)		**4.7**	**A**				**4.4**	**A**			
	SB (Old Landover Rd)	LR	66.9	E				65.9	E			
	SB Overall (Old Landover Rd)		**66.9**	**E**				**65.9**	**E**			
	Overall		**8.3**	**A**	**1,438**	**D**	**Pass**	**9.4**	**A**	**1,179**	**C**	**Pass**
2	**Landover Road & Pinebrook Avenue (Signalized)**											
	EB (Landover Rd)	TR	10.4	B				11.2	B			
	EB Overall (Landover Rd)		**10.4**	**B**				**11.2**	**B**			
	WB (Landover Rd)	L	19.7	B				57.3	E			
	WB (Landover Rd)	T	3.1	A				1.9	A			
	WB Overall (Landover Rd)		**3.5**	**A**				**3.8**	**A**			
	NB (Pinebrook Ave)	L	68.2	E				71.2	E			
	NB (Pinebrook Ave)	R	52.6	D				58.5	E			
	NB Overall (Pinebrook Ave)		**65.7**	**E**				**67.5**	**E**			
	Overall		**9.5**	**A**	**1,189**	**C**	**Pass**	**10.8**	**B**	**1,401**	**D**	**Pass**
3	**Landover Road & Kent Town Place/75th Avenue (Signalized)**											
	EB (Landover Rd)	L	95.6	F				76.5	E			
	EB (Landover Rd)	TR	12.0	B				22.0	C			
	EB Overall (Landover Rd)		**16.4**	**B**				**25.4**	**C**			
	WB (Landover Rd)	L	31.8	C				69.5	E			
	WB (Landover Rd)	TR	19.7	B				17.8	B			
	WB Overall (Landover Rd)		**20.0**	**C**				**20.7**	**C**			
	NB (Kent Town Pl)	L	61.0	E				41.6	D			
	NB (Kent Town Pl)	TR	42.9	D				39.6	D			
	NB Overall (Kent Town Pl)		**51.6**	**D**				**40.4**	**D**			
	SB (75th Ave)	L	98.8	F				84.0	F			
	SB (75th Ave)	TR	45.0	D				40.8	D			
	SB Overall (75th Ave)		**72.1**	**E**				**65.8**	**E**			
	Overall		**25.3**	**C**	**1,608**	**F**	**Fail**	**28.0**	**C**	**1,416**	**D**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
4	**Landover Road & Kent Village Drive (TWSC)**											
	EB (Landover Rd)	TR	-	-				-	-			
	EB Overall (Landover Rd)		**-**	**-**				**-**	**-**			
	WB (Landover Rd)	T	-	-				-	-			
	WB Overall (Landover Rd)		**-**	**-**				**-**	**-**			
	NB (Kent Village Dr)	R	9.8	A				12.0	B			
	NB Overall (Kent Village Dr)		**9.8**	**A**				**12.0**	**B**			
	Overall		**0.1**	**-**	**N/A**	**N/A**	**Pass**	**0.2**	**-**	**N/A**	**N/A**	**Pass**
5	**Landover Road & Dodge Park Road (Signalized)**											
	EB (Landover Rd)	L	74.2	E				74.8	E			
	EB (Landover Rd)	T	1.7	A				2.1	A			
	EB Overall (Landover Rd)		**6.5**	**A**				**8.3**	**A**			
	WB (Landover Rd)	TR	2.6	A				8.5	A			
	WB Overall (Landover Rd)		**2.6**	**A**				**8.5**	**A**			
	SB (Dodge Park Rd)	L	68.3	E				67.3	E			
	SB (Dodge Park Rd)	R	62.8	E				61.1	E			
	SB Overall (Dodge Park Rd)		**64.7**	**E**				**63.4**	**E**			
	Overall		**6.9**	**A**	**1,167**	**C**	**Pass**	**11.2**	**B**	**1,040**	**B**	**Pass**
6	**Landover Road & Fire House Road (Signalized)**											
	EB (Landover Rd)	L	30.0	C				28.7	C			
	EB (Landover Rd)	TR	5.8	A				8.8	A			
	EB Overall (Landover Rd)		**6.4**	**A**				**9.4**	**A**			
	WB (Landover Rd)	L	2.7	A				29.2	C			
	WB (Landover Rd)	TR	5.3	A				17.0	B			
	WB Overall (Landover Rd)		**5.3**	**A**				**17.4**	**B**			
	NB (Fire House Rd)	LTR	65.3	E				53.2	D			
	NB Overall (Fire House Rd)		**65.3**	**E**				**53.2**	**D**			
	SB (Fire House Rd)	LTR	63.4	E				63.3	E			
	SB Overall (Fire House Rd)		**63.4**	**E**				**63.3**	**E**			
	Overall		**8.2**	**A**	**1,186**	**C**	**Pass**	**15.3**	**B**	**1,295**	**C**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
7	**Landover Road & Kenmoor Drive (Signalized)**											
	EB (Landover Rd)	L	28.5	C				5.3	A			
	EB (Landover Rd)	TR	3.9	A				3.6	A			
	EB Overall (Landover Rd)		**4.5**	**A**				**3.6**	**A**			
	WB (Landover Rd)	L	8.2	A				6.8	A			
	WB (Landover Rd)	TR	10.4	B				1.9	A			
	WB Overall (Landover Rd)		**10.4**	**B**				**2.0**	**A**			
	NB (Kenmoor Dr)	LTR	66.6	E				83.0	F			
	NB Overall (Kenmoor Dr)		**66.6**	**E**				**83.0**	**F**			
	SB (Kenmoor Dr)	LT	68.4	E				86.4	F			
	SB (Kenmoor Dr)	R	66.7	E				79.9	E			
	SB Overall (Kenmoor Dr)		**67.3**	**E**				**82.5**	**F**			
	Overall		**8.5**	**A**	**956**	**A**	**Pass**	**5.1**	**A**	**977**	**A**	**Pass**
8	**Landover Road & Barlowe Road (Signalized)**											
	EB (Landover Rd)	TR	3.7	A				7.9	A			
	EB Overall (Landover Rd)		**3.7**	**A**				**7.9**	**A**			
	WB (Landover Rd)	L	45.3	D				84.5	F			
	WB (Landover Rd)	T	1.0	A				0.4	A			
	WB Overall (Landover Rd)		**4.3**	**A**				**5.7**	**A**			
	NB (Barlowe Rd)	L	66.5	E				82.0	F			
	NB (Barlowe Rd)	R	61.9	E				78.5	E			
	NB Overall (Barlowe Rd)		**63.4**	**E**				**79.3**	**E**			
	Overall		**7.1**	**A**	**931**	**A**	**Pass**	**10.1**	**B**	**1,072**	**B**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
9	**Landover Road & Brightseat Road (Signalized)**											
	EB (Landover Rd)	L	60.7	E				93.5	F			
	EB (Landover Rd)	T	35.7	D				56.0	E			
	EB (Landover Rd)	R	36.8	D				16.7	B			
	EB Overall (Landover Rd)		**36.9**	**D**				**49.2**	**D**			
	WB (Landover Rd)	L	71.0	E				106.7	F			
	WB (Landover Rd)	T	27.5	C				28.1	C			
	WB (Landover Rd)	R	0.1	A				0.3	A			
	WB Overall (Landover Rd)		**32.4**	**C**				**44.4**	**D**			
	NB (Brightseat Rd)	L	54.5	D				73.4	E			
	NB (Brightseat Rd)	TR	43.7	D				90.5	F			
	NB (Brightseat Rd)	R	31.1	C				47.4	D			
	NB Overall (Brightseat Rd)		**45.0**	**D**				**73.6**	**E**			
	SB (Brightseat Rd)	L	64.6	E				92.8	F			
	SB (Brightseat Rd)	LT	61.8	E				81.8	F			
	SB (Brightseat Rd)	R	**55.2**	**E**				64.3	E			
	SB Overall (Brightseat Rd)		**61.4**	**E**				**82.3**	**F**			
	Overall		**38.2**	**D**	**1,220**	**C**	**Pass**	**55.1**	**E**	**1,686**	**F**	**Fail**
10	**Landover Road & I-95/I-495 Southbound On-Ramp (Signalized)**											
	EB (Landover Rd)	T	16.2	B				67.5	E			
	EB (Landover Rd)	R	0.8	A				0.9	A			
	EB Overall (Landover Rd)		**11.0**	**B**				**46.6**	**D**			
	WB (Landover Rd)	L	18.1	B				92.4	F			
	WB (Landover Rd)	T	0.1	A				0.1	A			
	WB Overall (Landover Rd)		**3.2**	**A**				**21.4**	**C**			
	Overall		**6.5**	**A**	**1,181**	**C**	**Pass**	**27.7**	**C**	**1,832**	**F**	**Fail**
11	**Landover Road & I-95/I-495 Northbound Off-Ramp (Signalized)**											
	EB (Landover Rd)	L	193.8	F				116.0	F			
	EB (Landover Rd)	T	12.6	B				12.9	B			
	EB (Landover Rd)	R	0.1	A				**0.0**	**A**			
	EB Overall (Landover Rd)		**15.8**	**B**				13.9	B			
	WB (Landover Rd)	T	48.3	D				100.0	F			
	WB Overall (Landover Rd)		**48.3**	**D**				**100.0**	**F**			
	NB (I-95/I-495 NB Off-Ramp)	L	86.0	F				160.6	F			
	NB (I-95/I-495 NB Off-Ramp)	R	154.6	F				162.5	F			
	NB Overall (I-95/I-495 NB Off-Ramp)		**112.3**	**F**				**161.3**	**F**			
	Overall		**45.6**	**D**	**1,666**	**F**	**Fail**	**72.4**	**E**	**1,863**	**F**	**Fail**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
12	**Landover Road & St Josephs Drive/McCormick Drive (Signalized)**											
	EB (Landover Rd)	L	109.2	F				138.1	F			
	EB (Landover Rd)	T	21.3	C				39.6	D			
	EB (Landover Rd)	R	0.8	A				0.1	A			
	EB Overall (Landover Rd)		**45.8**	**D**				**70.8**	**E**			
	WB (Landover Rd)	L	80.9	F				129.9	F			
	WB (Landover Rd)	T	57.1	E				75.1	E			
	WB (Landover Rd)	R	13.9	B				219.3	F			
	WB Overall (Landover Rd)		**54.0**	**D**				**102.7**	**F**			
	NB (McCormick Dr)	L	61.3	E				151.1	F			
	NB (McCormick Dr)	LT	121.4	F				163.9	F			
	NB (McCormick Dr)	R	0.0	A				0.2	A			
	NB Overall (McCormick Dr)		**84.7**	**F**				**122.2**	**F**			
	SB (St Josephs Dr)	L	60.2	E				65.8	E			
	SB (St Josephs Dr)	LT	111.3	F				69.3	E			
	SB (St Josephs Dr)	R	43.9	D				108.1	F			
	SB Overall (St Josephs Dr)		**57.9**	**E**				**93.7**	**F**			
	Overall		**52.3**	**D**	**1,546**	**E**	**Pass**	**89.9**	**F**	**1,921**	**F**	**Fail**
13	**Landover Road & Lottsford Road (Signalized)**											
	EB (Landover Rd)	L	87.2	F				97.0	F			
	EB (Landover Rd)	T	49.8	D				62.0	E			
	EB (Landover Rd)	R	0.1	A				0.2	A			
	EB Overall (Landover Rd)		**51.5**	**D**				**63.1**	**E**			
	WB (Landover Rd)	L	83.9	F				142.6	F			
	WB (Landover Rd)	T	35.2	D				54.0	D			
	WB (Landover Rd)	R	16.0	B				46.3	D			
	WB Overall (Landover Rd)		**34.3**	**C**				**53.8**	**D**			
	NB (Lottsford Rd)	L	59.4	E				56.8	E			
	NB (Lottsford Rd)	LT	74.1	E				93.7	F			
	NB (Lottsford Rd)	R	0.0	A				0.1	A			
	NB Overall (Lottsford Rd)		**66.0**	**E**				**73.6**	**E**			
	SB (Lottsford Rd)	L	82.2	F				121.5	F			
	SB (Lottsford Rd)	LT	71.0	E				101.7	F			
	SB (Lottsford Rd)	R	2.7	A				0.4	A			
	SB Overall (Lottsford Rd)		**39.2**	**D**				**71.0**	**E**			
	Overall		**42.2**	**D**	**1,507**	**E**	**Pass**	**63.5**	**E**	**1,531**	**E**	**Fail**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
14	**Landover Road & Technology Way (Signalized)**											
	EB (Technology Way)	L	75.3	E				88.1	F			
	EB (Technology Way)	R	66.4	E				57.5	E			
	EB Overall (Technology Way)		**72.3**	**E**				**77.1**	**E**			
	NB (Landover Rd)	L	4.7	A				56.7	E			
	NB (Landover Rd)	T	1.3	A				10.6	B			
	NB Overall (Landover Rd)		**1.5**	**A**				**12.6**	**B**			
	SB (Landover Rd)	T	1.3	A				6.6	A			
	SB (Landover Rd)	R	1.0	A				1.7	A			
	SB Overall (Landover Rd)		**1.3**	**A**				**6.3**	**A**			
	Overall		**2.8**	**A**	**1,154**	**C**	**Pass**	**17.0**	**B**	**1,291**	**C**	**Pass**
15	**Landover Road & Arena Drive/Lake Arbor Way (Signalized)**											
	EB (Landover Rd)	L	59.6	E				90.9	F			
	EB (Landover Rd)	T	22.2	C				16.6	B			
	EB (Landover Rd)	R	0.1	A				0.1	A			
	EB Overall (Landover Rd)		**23.8**	**C**				**23.8**	**C**			
	WB (Landover Rd)	L	68.3	E				83.0	F			
	WB (Landover Rd)	T	25.7	C				22.6	C			
	WB (Landover Rd)	R	13.1	B				17.5	B			
	WB Overall (Landover Rd)		**31.0**	**C**				**33.2**	**C**			
	NB (Arena Dr)	L	72.0	E				82.1	F			
	NB (Arena Dr)	T	66.9	E				76.8	E			
	NB (Arena Dr)	R	0.2	A				1.2	A			
	NB Overall (Arena Dr)		**41.1**	**D**				**33.6**	**C**			
	SB (Lake Arbor Way)	L	55.8	E				74.8	E			
	SB (Lake Arbor Way)	T	61.7	E				80.3	F			
	SB (Lake Arbor Way)	R	65.8	E				73.0	E			
	SB Overall (Lake Arbor Way)		**62.8**	**E**				**76.6**	**E**			
	Overall		**34.2**	**C**	**1,161**	**C**	**Pass**	**33.3**	**C**	**1,166**	**C**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
16	**Martin Luther King Jr Highway (MLK Jr Hwy) & Ardwick-Ardmore Road (Signalized)**											
	EB (Ardwick Ardmore Rd)	L	67.4	E				53.0	D			
	EB (Ardwick Ardmore Rd)	T	185.6	F				97.4	F			
	EB (Ardwick Ardmore Rd)	R	0.3	A				0.4	A			
	EB Overall (Ardwick Ardmore Rd)		**82.0**	**F**				**51.7**	**D**			
	WB (Ardwick Ardmore Rd)	LTR	167.7	F				114.4	F			
	WB Overall (Ardwick Ardmore Rd)		**167.7**	**F**				**114.4**	**F**			
	NB (MLK Jr Hwy)	L	161.2	F				82.2	F			
	NB (MLK Jr Hwy)	T	50.6	D				67.5	E			
	NB (MLK Jr Hwy)	R	32.5	C				41.7	D			
	NB Overall (MLK Jr Hwy)		**77.0**	**E**				**66.2**	**E**			
	SB (MLK Jr Hwy)	L	125.8	F				117.6	F			
	SB (MLK Jr Hwy)	TR	77.9	E				51.3	D			
	SB Overall (MLK Jr Hwy)		**83.5**	**F**				**67.2**	**E**			
	Overall		**95.8**	**F**	**1,906**	**F**	**Fail**	**68.9**	**E**	**1,541**	**E**	**Fail**
17	**Brightseat Road & Ardwick-Ardmore Road (TWSC)**											
	EB (Ardwick Ardmore Rd)	LT	0.7	A				0.2	A			
	EB (Ardwick Ardmore Rd)	R	-	-				-	-			
	EB Overall (Ardwick Ardmore Rd)		**0.3**	**-**				**0.1**	**-**			
	WB (Ardwick Ardmore Rd)	LTR	4.5	A				5.6	A			
	WB Overall (Ardwick Ardmore Rd)		**2.8**	**-**				**3.6**	**-**			
	NB (Brightseat Rd)	LT	514.8	F				121.3	F			
	NB (Brightseat Rd)	R	-	-				-	-			
	NB Overall (Brightseat Rd)		**514.8**	**F**				**121.3**	**F**			
	SB (Brightseat Rd)	LTR	15.7	C				13.2	B			
	SB Overall (Brightseat Rd)		**15.7**	**C**				**13.2**	**B**			
	Overall		**176.1**	**-**	**N/A**	**N/A**	**Fail**	**32.9**	**-**	**N/A**	**N/A**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
18	**Brightseat Road & Glenarden Parkway (Signalized)**											
	EB (Glenarden Pkwy)	LT	30.4	C				35.8	D			
	EB (Glenarden Pkwy)	R	29.7	C				33.6	C			
	EB Overall (Glenarden Pkwy)		**29.9**	**C**				**34.4**	**C**			
	WB (Glenarden Pkwy)	LTR	36.1	D				37.2	D			
	WB Overall (Glenarden Pkwy)		**36.1**	**D**				**37.2**	**D**			
	NB (Brightseat Rd)	LTR	3.8	A				3.0	A			
	NB Overall (Brightseat Rd)		**3.8**	**A**				**3.0**	**A**			
	SB (Brightseat Rd)	LTR	3.7	A				3.2	A			
	SB Overall (Brightseat Rd)		**3.7**	**A**				**3.2**	**A**			
	Overall		**10.0**	**A**	**563**	**A**	**Pass**	**10.3**	**B**	**597**	**A**	**Pass**
19	**Brightseat Road & Evarts Street (Signalized)**											
	EB (Evarts St)	L	34.8	C				37.1	D			
	EB (Evarts St)	TR	34.9	C				34.4	C			
	EB Overall (Evarts St)		**34.8**	**C**				**36.5**	**D**			
	WB (Evarts St)	L	34.8	C				35.8	D			
	WB (Evarts St)	TR	34.9	C				34.4	C			
	WB Overall (Evarts St)		**34.8**	**C**				**35.4**	**D**			
	NB (Brightseat Rd)	L	1.3	A				1.4	A			
	NB (Brightseat Rd)	T	1.6	A				1.7	A			
	NB (Brightseat Rd)	R	1.2	A				1.3	A			
	NB Overall (Brightseat Rd)		**1.6**	**A**				**1.7**	**A**			
	SB (Brightseat Rd)	L	1.2	A				1.3	A			
	SB (Brightseat Rd)	TR	1.4	A				1.5	A			
	SB Overall (Brightseat Rd)		**1.4**	**A**				**1.5**	**A**			
	Overall		**1.7**	**A**	**281**	**A**	**Pass**	**2.1**	**A**	**322**	**A**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
20	**Brightseat Road & Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd) (TWSC)**											
	EB (MRA Access Rd)	LTR	12.0	B				14.0	B			
	EB Overall (MRA Access Rd)		**12.0**	**B**				**14.0**	**B**			
	WB (Ent to OLM)	LT	17.0	C				22.8	C			
	WB (Ent to OLM)	R	0.0	A				0.0	A			
	WB Overall (Ent to OLM)		**17.0**	**C**				**22.8**	**C**			
	NB (Brightseat Rd)	LTR	0.7	A				0.6	A			
	NB (Brightseat Rd)	R	-	-				-	-			
	NB Overall (Brightseat Rd)		**0.2**	**-**				**0.2**	**-**			
	SB (Brightseat Rd)	L	8.3	A				8.9	A			
	SB (Brightseat Rd)	TR	-	-				-	-			
	SB Overall (Brightseat Rd)		**0.0**	**-**				**0.0**	**-**			
	Overall		**0.8**	**-**	**N/A**	**N/A**	**Pass**	**0.7**	**-**	**N/A**	**N/A**	**Pass**
21	**Brightseat Road/Redskins Road & Sheriff Road/Brightseat Road (Signalized)**											
	EB (Sheriff Rd)	L	64.4	E				33.9	C			
	EB (Sheriff Rd)	T	42.0	D				39.5	D			
	EB (Sheriff Rd)	R	39.6	D				34.3	C			
	EB Overall (Sheriff Rd)		**53.1**	**D**				**36.1**	**D**			
	WB (Brightseat Rd)	L	50.0	D				45.2	D			
	WB (Brightseat Rd)	T	58.5	E				57.2	E			
	WB (Brightseat Rd)	R	51.8	D				48.0	D			
	WB Overall (Brightseat Rd)		**55.3**	**E**				**52.2**	**D**			
	NB (Redskins Rd)	L	13.0	B				16.9	B			
	NB (Redskins Rd)	TR	18.1	B				22.6	C			
	NB Overall (Redskins Rd)		**17.0**	**B**				**21.4**	**C**			
	SB (Brightseat Rd)	L	65.8	E				18.6	B			
	SB (Brightseat Rd)	T	18.2	B				24.2	C			
	SB (Brightseat Rd)	R	20.3	C				24.7	C			
	SB Overall (Brightseat Rd)		**27.2**	**C**				**23.2**	**C**			
	Overall		**36.4**	**D**	**413**	**A**	**Pass**	**33.0**	**C**	**596**	**A**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
22	**Brightseat Road & Arena Drive (Signalized)**											
	EB (Arena Dr)	LTR	21.8	C				17.3	B			
	EB Overall (Arena Dr)		**21.8**	**C**				**17.3**	**B**			
	WB (Arena Dr)	LTR	24.9	C				22.5	C			
	WB Overall (Arena Dr)		**24.9**	**C**				**22.5**	**C**			
	NB (Brightseat Rd)	L	20.2	C				27.0	C			
	NB (Brightseat Rd)	TR	23.9	C				33.1	C			
	NB Overall (Redskins Rd)		**23.6**	**C**				**32.6**	**C**			
	SB (Brightseat Rd)	L	10.7	B				24.9	C			
	SB (Brightseat Rd)	TR	13.2	B				21.3	C			
	SB Overall (Brightseat Rd)		**11.9**	**B**				**23.4**	**C**			
	Overall		**21.3**	**C**	**1,272**	**C**	**Pass**	**24.2**	**C**	**1,589**	**E**	**Pass**
23	**Arena Drive & I-95/I-495 Southbound Ramps (Signalized)**											
	EB (Arena Dr)	T	17.9	B				30.9	C			
	EB (Arena Dr)	R	14.8	B				23.3	C			
	EB Overall (Arena Dr)		**17.4**	**B**				**29.7**	**C**			
	WB (Arena Dr)	L	2.5	A				21.7	C			
	WB (Arena Dr)	T	2.1	A				2.9	A			
	WB Overall (Arena Dr)		**2.2**	**A**				**9.6**	**A**			
	SB (I-95/I-495 SB Off-Ramp)	L	62.3	E				64.5	E			
	SB (I-95/I-495 SB Off-Ramp)	LTR	62.5	E				66.0	E			
	SB Overall (I-95/I-495 SB Off-Ramp)		**62.4**	**E**				**65.2**	**E**			
	Overall		**22.7**	**C**	**880**	**A**	**Pass**	**29.8**	**C**	**1,344**	**D**	**Pass**

Table 4-15: No-build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
24	**Arena Drive & I-95/I-495 Northbound Ramps (Signalized)**											
	EB (Arena Dr)	L	26.3	C				66.7	E			
	EB (Arena Dr)	T	6.1	A				3.7	A			
	EB Overall (Arena Dr)		**11.9**	**B**				**13.9**	**B**			
	WB (Arena Dr)	TR	26.6	C				38.2	D			
	WB Overall (Arena Dr)		**26.6**	**C**				**38.2**	**D**			
	NB (I-95/I-495 NB Off-Ramp)	L	39.9	D				39.5	D			
	NB (I-95/I-495 NB Off-Ramp)	LTR	41.0	D				45.3	D			
	NB Overall (I-95/I-495 NB Off-Ramp)		**40.6**	**D**				**43.4**	**D**			
	Overall		**23.9**	**C**	**1,203**	**C**	**Pass**	**28.8**	**C**	**1,405**	**D**	**Pass**

Notes:

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LOS = Level of Service

LTR = left / through / right lanes

TWSC = Two-way STOP-Controlled unsignalized intersection (TWSC intersections do not have an overall LOS)

Delay is Measured in Seconds Per Vehicle.

Red cells denote intersections or approaches operating at unacceptable conditions.

4.7.6 No-build Condition Queuing Analysis

Synchro™ was used to calculate the 50th percentile queue lengths and SimTraffic™ was used to calculate the 95th percentile queue lengths. The SimTraffic simulations have a statistical accuracy of plus or minus 5.0 percent error for the AM and PM peak hour simulations. Based on the Synchro™ and SimTraffic™ analysis, the following signalized intersection approaches would experience failing queue lengths in Synchro™ or SimTraffic™ (queue exceeds available lane storage). The lane group within the approach that is operating under unacceptable conditions is noted in parentheses.

- Landover Road and Old Landover Road (Intersection #1)
  - Southbound Old Landover Road (left and right turns) during the PM peak hour
- Landover Road and Kent Town Place/75th Avenue (Intersection #3)
  - Eastbound Landover Road (left turns) during the PM peak hour
- Landover Road and Dodge Park Road (Intersection #5)
  - Eastbound Landover Road (left turns) during the PM peak hour
- Landover Road and Barlowe Road (Intersection #8)
  - Northbound Barlowe Road (right turns) during the AM and PM peak hours
- Landover Road and Brightseat Road (Signalized) (Intersection #9)
  - Westbound Landover Road (left turns), northbound Brightseat Road (left turns), and southbound Brightseat Road (left turns) during the PM peak hour
- Landover Road and I-95/I-495 Southbound On-Ramp (Signalized) (Intersection #10)

    - Eastbound Landover Road (through and right movements) and westbound Landover Road (left turns) during the PM peak hour
- Landover Road and I-95/I-495 Northbound Off-Ramp (Signalized) (Intersection #11)
    - Eastbound Landover Road (left turns), westbound Landover Road (through movements), and northbound I-95/I-495 off-ramp (left and right turns) during the AM peak hour
    - Eastbound Landover Road (through movement), westbound Landover Road (through movement), and northbound I-95/I-495 off-ramp (left and right turns) during the PM peak hour
- Landover Road and St. Joseph's Drive/McCormick Drive (Intersection #12)
    - Eastbound Landover Road (left turns) and westbound Landover Road (left turns, through movements, and right turns) during the AM peak hour
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns, through movements, and right turns), northbound McCormick Drive (left turns, combined left and through movements, and right turns), and southbound St. Joseph's Drive (left turns, combined left and through movements, and right turns) during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13)
    - Westbound Landover Road (through movement and right turns) and southbound Lottsford Road (left turns, combined left and through movements, and right turns) during the AM peak hour
    - Lottsford Road (left turns) during the PM peak hour
- Martin Luther King Jr. Highway and Ardwick-Ardmore Road (Intersection #16)
    - Eastbound Ardwick-Ardmore Road (all movements) westbound Ardwick-Ardmore Road (all movements), northbound Martin Luther King Jr. Highway (left turns and through movements), and southbound Martin Luther King Jr. Highway (left turns, through movements, and combined through and right movements) during the AM peak hour
    - Eastbound Ardwick-Ardmore Road (all movements), westbound Ardwick-Ardmore Road (all movements), and southbound Martin Luther King Jr. Highway (left turns and combined through and right movements) during the PM peak hour
- Brightseat Road and Ardwick-Ardmore Road (Intersection #17)
    - Northbound Brightseat Road (left turns/through movements, right turns) during the AM peak hour
    - Northbound Brightseat Road (right turns) during the PM peak hour
- Brightseat Road/Redskins Road and Sheriff Road/Brightseat Road (Intersection #21)
    - Eastbound Sheriff Road (left turns) during the PM peak hour
- Brightseat Road and Arena Drive (Signalized) (Intersection #22)
    - Southbound Brightseat Road (left turns) during the PM peak hour
- Arena Drive and I-95/I-495 Southbound Ramps (Signalized) (Intersection #23)
    - Westbound Arena Drive (left turns) during the PM peak hour

Two of the three unsignalized intersections would not experience failing queue lengths for the 95th percentile. However, the intersection of Brightseat Road and Ardwick-Ardmore Road (Intersection #17) would experience 95th percentile failing queues on northbound Brightseat Road (combined left and through movements) during the AM peak hour and northbound Brightseat Road (right turns) during both the AM and PM peak hours. The remaining intersections in the study area would all have acceptable No-build Condition queue lengths.

4.7.6.1 Complete Intersection Queuing Analysis

This section summarizes the differences in queuing impacts between the Existing Condition and the No-build Condition by quantifying the change in intersection queuing failures. Following the summary, this section also includes the complete results of the queuing analysis.

Based on the Synchro™ and SimTraffic™ analysis, 14 signalized intersections and one unsignalized intersection would experience queuing lengths that would exceed the available storage capacity. The remaining intersections in the study area would provide sufficient storage for the anticipated demand. Compared to the Existing Condition, the No-build Condition would have no change in the number of intersections with failing queues during the AM peak hour and would have three more intersections with failing queues during the PM peak hour. In the AM peak hour in the Existing Condition, there would be six intersections with a failing queue approach compared with 6 in the No-build Condition, neither an increase nor a decrease. In the PM peak hour in the Existing Condition, there would be 11 intersections with a failing queue approach compared with 14 in the No-build Condition, an increase of 3.

Table 4-16 shows a summary of the number of intersections that meet the following criteria for approach lane groups in a queue that would change between the Existing and No-build Conditions:

- New Failing Movement
  - Number of intersections that have a queuing problem in one or more movements that would **NOT** have a queuing problem in the previous condition
- Additional Failing Movement
  - Number of intersections that had at least one queuing movement failure in the previous condition and now would have additional/more queuing movement failures than before
- No Change
  - Number of intersections that would have no change in the number of queuing movement failures or the number of queuing movement failures would be the same as in the previous condition
- Fewer Failing Movements
  - Number of intersections that would have less queuing movement failures than in the previous condition, but still would have some failing movements
- No Failing Movements
  - Number of intersections that had queuing movement failures in the previous condition, but would no longer have queuing movement failures

Table 4-16: Queuing Summary Comparing Existing Condition to No-build Condition

Type of Change Between Conditions	AM	PM
New Failing Movement	2	3
Additional Failing Movement	4	3
No Change	16	17
Fewer Failing Movements	0	1
No Failing Movements	2	0
Total Signalized and Unsignalized Intersections	**24**	**24**

The results of the No-build queuing analysis for both signalized and unsignalized intersections are presented in table 4-17. Note that the percentile values are expressed in feet, and a car occupies about 25 linear feet of roadway, including the space between cars.

Table 4-17: No-build Condition Queuing

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
1	**Landover Road & Old Landover Road (Signalized)**						
	EB (Landover Rd)	L	1,000	96	181	24	116
	EB (Landover Rd)	T	1,689	95	141	334	246
	WB (Landover Rd)	TR	440	87	207	91	153
	SB (Old Landover Rd)	LR	147	37	140	120	#185
2	**Landover Road & Pinebrook Avenue (Signalized)**						
	EB (Landover Rd)	TR	440	347	180	365	313
	WB (Landover Rd)	L	250	7	80	34	103
	WB (Landover Rd)	T	881	122	155	65	77
	NB (Pinebrook Ave)	L	653	220	280	151	230
	NB (Pinebrook Ave)	R	653	0	95	0	112
3	**Landover Road & Kent Town Place/75th Avenue (Signalized)**						
	EB (Landover Rd)	L	200	61	141	121	#232
	EB (Landover Rd)	TR	881	139	192	617	458
	WB (Landover Rd)	L	250	14	95	78	133
	WB (Landover Rd)	TR	555	252	350	183	285
	NB (Kent Town Pl)	L	250	139	225	82	137
	NB (Kent Town Pl)	TR	511	120	246	103	189
	SB (75th Ave)	L	685	244	630	266	452
	SB (75th Ave)	TR	685	155	410	133	194
4	**Landover Road & Kent Village Drive (TWSC)**						
	EB (Landover Rd)	TR	555	-	2	-	65
	WB (Landover Rd)	T	408	-	2	-	-
	NB (Kent Village Dr)	R	612	-	75	-	85
5	**Landover Road & Dodge Park Road (Signalized)**						
	EB (Landover Rd)	L	275	135	206	260	#306
	EB (Landover Rd)	T	412	72	92	93	270
	WB (Landover Rd)	TR	526	52	154	121	181
	SB (Dodge Park Rd)	L	529	74	146	97	163
	SB (Dodge Park Rd)	R	200	0	158	0	148
6	**Landover Road & Fire House Road (Signalized)**						
	EB (Landover Rd)	L	275	7	75	29	114
	EB (Landover Rd)	TR	526	185	124	220	360
	WB (Landover Rd)	L	300	2	53	14	84
	WB (Landover Rd)	TR	887	369	244	394	308
	NB (Fire House Rd)	LTR	404	90	162	93	174
	SB (Fire House Rd)	LTR	240	82	154	149	217

Table 4-17: No-build Condition Queuing (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
7	**Landover Road & Kenmoor Drive (Signalized)**						
	EB (Landover Rd)	L	250	5	59	7	76
	EB (Landover Rd)	TR	602	93	124	191	205
	WB (Landover Rd)	L	250	1	17	1	23
	WB (Landover Rd)	TR	1,440	323	273	42	48
	NB (Kenmoor Dr)	LTR	259	0	12	29	89
	SB (Kenmoor Dr)	LT	191	14	47	41	85
	SB (Kenmoor Dr)	R	150	0	53	0	59
8	**Landover Road & Barlowe Road (Signalized)**						
	EB (Landover Rd)	TR	1,440	65	163	326	684
	WB (Landover Rd)	L	300	89	148	110	178
	WB (Landover Rd)	T	1,499	48	98	3	132
	NB (Barlowe Rd)	L	445	77	152	60	169
	NB (Barlowe Rd)	R	125	0	#134	0	#153
9	**Landover Road & Brightseat Road (Signalized)**						
	EB (Landover Rd)	L	340	36	89	59	250
	EB (Landover Rd)	T	1,499	278	361	819	1471
	EB (Landover Rd)	R	1,000	1	84	135	997
	WB (Landover Rd)	L	1,194	215	487	~465	366
	WB (Landover Rd)	T	1,788	666	385	473	353
	WB (Landover Rd)	R	-	0	-	0	-
	NB (Brightseat Rd)	L	250	169	215	200	#258
	NB (Brightseat Rd)	TR	519	89	177	201	323
	NB (Brightseat Rd)	R	519	109	164	239	361
	SB (Brightseat Rd)	L	390	136	165	271	#406
	SB (Brightseat Rd)	LT	390	136	189	267	331
	SB (Brightseat Rd)	R	390	0	16	0	25
10	**Landover Road & I-95/I-495 Southbound On-Ramp (Signalized)**						
	EB (Landover Rd)	T	1,788	404	225	~944	#2182
	EB (Landover Rd)	R	1,788	17	292	40	#2199
	WB (Landover Rd)	L	700	202	211	~584	#812
	WB (Landover Rd)	T	1,190	0	-	0	830

Table 4-17: No-build Condition Queuing (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
11	**Landover Road & I-95/I-495 Northbound Off-Ramp (Signalized)**						
	EB (Landover Rd)	L	425	~70	154	58	226
	EB (Landover Rd)	T	1,193	631	668	764	#1491
	EB (Landover Rd)	R	150	0	150	0	132
	WB (Landover Rd)	T	289	~1363	#366	~1904	#575
	NB (I-95/I-495 NB Off-Ramp)	L	194	358	#364	~648	#424
	NB (I-95/I-495 NB Off-Ramp)	R	194	~430	#386	~567	#384
12	**Landover Road & St Josephs Drive/McCormick Drive (Signalized)**						
	EB (Landover Rd)	L	703	~426	416	~618	413
	EB (Landover Rd)	T	730	188	260	641	312
	EB (Landover Rd)	R	-	0	-	0	-
	WB (Landover Rd)	L	250	223	#346	45	#299
	WB (Landover Rd)	T	1,318	~858	#1655	~690	#1663
	WB (Landover Rd)	R	500	5	#736	310	#717
	NB (McCormick Dr)	L	375	134	79	~398	#427
	NB (McCormick Dr)	LT	500	187	330	~406	#513
	NB (McCormick Dr)	R	250	0	134	0	#382
	SB (St Josephs Dr)	L	624	42	123	321	#736
	SB (St Josephs Dr)	LT	949	194	415	337	#1089
	SB (St Josephs Dr)	R	949	336	424	~1146	#1002
13	**Landover Road & Lottsford Road (Signalized)**						
	EB (Landover Rd)	L	700	144	205	443	393
	EB (Landover Rd)	T	736	261	314	797	608
	EB (Landover Rd)	R	727	0	-	0	128
	WB (Landover Rd)	L	500	114	496	57	108
	WB (Landover Rd)	T	587	619	#685	374	377
	WB (Landover Rd)	R	500	31	#650	153	114
	NB (Lottsford Rd)	L	500	101	208	184	371
	NB (Lottsford Rd)	LT	768	215	332	551	651
	NB (Lottsford Rd)	R	768	0	-	0	203
	SB (Lottsford Rd)	L	350	387	#436	359	#398
	SB (Lottsford Rd)	LT	962	407	#1061	370	501
	SB (Lottsford Rd)	R	962	0	#1291	0	268

Table 4-17: No-build Condition Queuing (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
14	**Landover Road & Technology Way (Signalized)**						
	EB (Technology Way)	L	556	57	105	449	487
	EB (Technology Way)	R	556	0	46	109	148
	NB (Landover Rd)	L	420	2	134	47	132
	NB (Landover Rd)	T	1,613	13	233	186	207
	SB (Landover Rd)	T	1,234	20	55	243	233
	SB (Landover Rd)	R	450	0	82	2	60
15	**Landover Road & Arena Drive/Lake Arbor Way (Signalized)**						
	EB (Landover Rd)	L	400	61	93	192	208
	EB (Landover Rd)	T	1,613	310	253	237	276
	EB (Landover Rd)	R	-	0	-	0	-
	WB (Landover Rd)	L	850	182	231	173	219
	WB (Landover Rd)	T	1,163	637	396	304	244
	WB (Landover Rd)	R	1,163	0	4	0	7
	NB (Arena Dr)	L	1,288	76	112	160	184
	NB (Arena Dr)	T	2,277	46	74	131	187
	NB (Arena Dr)	R	-	0	-	0	-
	SB (Lake Arbor Way)	L	300	62	114	79	119
	SB (Lake Arbor Way)	T	1,003	173	224	160	195
	SB (Lake Arbor Way)	R	1,000	141	233	12	89
16	**Martin Luther King Jr Highway (MLK Jr Hwy) & Ardwick-Ardmore Road (Signalized)**						
	EB (Ardwick Ardmore Rd)	L	275	74	#354	196	#370
	EB (Ardwick Ardmore Rd)	T	700	~323	#824	467	#754
	EB (Ardwick Ardmore Rd)	R	700	0	#939	0	#944
	WB (Ardwick Ardmore Rd)	LTR	731	~582	561	~287	295
	NB (MLK Jr Hwy)	L	720	~551	#877	269	349
	NB (MLK Jr Hwy)	T	1,094	568	#1205	577	479
	NB (MLK Jr Hwy)	R	1,094	34	345	62	105
	SB (MLK Jr Hwy)	L	200	219	#266	252	#261
	SB (MLK Jr Hwy)	T	1,175	577	#1380	246	424
	SB (MLK Jr Hwy)	TR	200	577	#246	246	#234

Table 4-17: No-build Condition Queuing (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
17	**Brightseat Road & Ardwick-Ardmore Road (TWSC)**						
	EB (Ardwick Ardmore Rd)	LT	731	-	39	-	17
	EB (Ardwick Ardmore Rd)	R	731	-	39	-	34
	WB (Ardwick Ardmore Rd)	LTR	716	-	105	-	86
	NB (Brightseat Rd)	LT	1,084	-	#1367	-	316
	NB (Brightseat Rd)	R	150	-	#229	-	#184
	SB (Brightseat Rd)	LTR	239	-	41	-	29
18	**Brightseat Road & Glenarden Parkway (Signalized)**						
	EB (Glenarden Pkwy)	LT	471	15	44	36	70
	EB (Glenarden Pkwy)	R	471	0	31	0	50
	WB (Glenarden Pkwy)	LTR	954	58	140	38	118
	NB (Brightseat Rd)	LTR	2,028	40	129	32	118
	SB (Brightseat Rd)	LTR	412	28	76	34	96
19	**Brightseat Road & Evarts Street (Signalized)**						
	EB (Evarts St)	L	180	0	5	3	20
	EB (Evarts St)	TR	1,195	0	14	0	14
	WB (Evarts St)	L	910	0	6	2	20
	WB (Evarts St)	TR	910	0	15	0	13
	NB (Brightseat Rd)	L	220	0	10	0	16
	NB (Brightseat Rd)	T	732	0	18	0	26
	NB (Brightseat Rd)	R	-	0	-	0	-
	SB (Brightseat Rd)	L	120	0	4	0	-
	SB (Brightseat Rd)	TR	446	0	19	0	30
20	**Brightseat Road & Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd) (TWSC)**						
	EB (MRA Access Rd)	LTR	206	-	47	-	81
	WB (Ent to OLM)	LT	249	-	9	-	34
	WB (Ent to OLM)	R	-	-	-	-	-
	NB (Brightseat Rd)	LTR	390	-	12	-	6
	NB (Brightseat Rd)	R	-	-	-	-	-
	SB (Brightseat Rd)	L	536	-	0	-	0
	SB (Brightseat Rd)	TR	536	-	4	-	99

Table 4-17: No-build Condition Queuing (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
21	**Brightseat Road/Redskins Road & Sheriff Road/Brightseat Road (Signalized)**						
	EB (Sheriff Rd)	L	150	89	144	102	#164
	EB (Sheriff Rd)	T	966	76	227	184	297
	EB (Sheriff Rd)	R	-	0	-	0	-
	WB (Brightseat Rd)	L	472	1	3	4	15
	WB (Brightseat Rd)	T	472	141	193	211	258
	WB (Brightseat Rd)	R	300	0	34	0	48
	NB (Redskins Rd)	L	250	24	45	30	38
	NB (Redskins Rd)	TR	622	45	50	52	45
	SB (Brightseat Rd)	L	240	43	21	32	35
	SB (Brightseat Rd)	T	521	26	4	74	43
	SB (Brightseat Rd)	R	-	0	-	0	-
22	**Brightseat Road & Arena Drive (Signalized)**						
	EB (Arena Dr)	LTR	511	56	111	47	98
	WB (Arena Dr)	LTR	465	71	158	127	191
	NB (Brightseat Rd)	L	320	7	57	13	52
	NB (Brightseat Rd)	TR	617	43	151	56	177
	SB (Brightseat Rd)	L	210	52	169	112	#214
	SB (Brightseat Rd)	TR	2,430	24	96	47	112
23	**Arena Drive & I-95/I-495 Southbound Ramps (Signalized)**						
	EB (Arena Dr)	T	465	168	166	317	302
	EB (Arena Dr)	R	465	0	55	0	66
	WB (Arena Dr)	L	250	9	141	209	#290
	WB (Arena Dr)	T	664	17	70	28	195
	SB (I-95/I-495 SB Off-Ramp)	L	964	242	251	324	310
	SB (I-95/I-495 SB Off-Ramp)	LTR	964	217	263	303	315

Table 4-17: No-build Condition Queuing (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
24	**Arena Drive & I-95/I-495 Northbound Ramps (Signalized)**						
	EB (Arena Dr)	L	280	44	147	116	195
	EB (Arena Dr)	T	664	47	126	32	104
	WB (Arena Dr)	TR	894	265	269	552	438
	NB (I-95/I-495 NB Off-Ramp)	L	784	121	127	111	148
	NB (I-95/I-495 NB Off-Ramp)	LTR	784	60	150	169	122

Notes:

~ 50th percentile volume exceeds capacity, queue is theoretically infinitive.

95th percentile volume exceeds capacity, queue may be longer.

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LTR = left / through / right lanes

TWSC = Two-way STOP-Controlled unsignalized intersection

Red cells denote approaches and lane groups whose queuing length exceeds capacity.

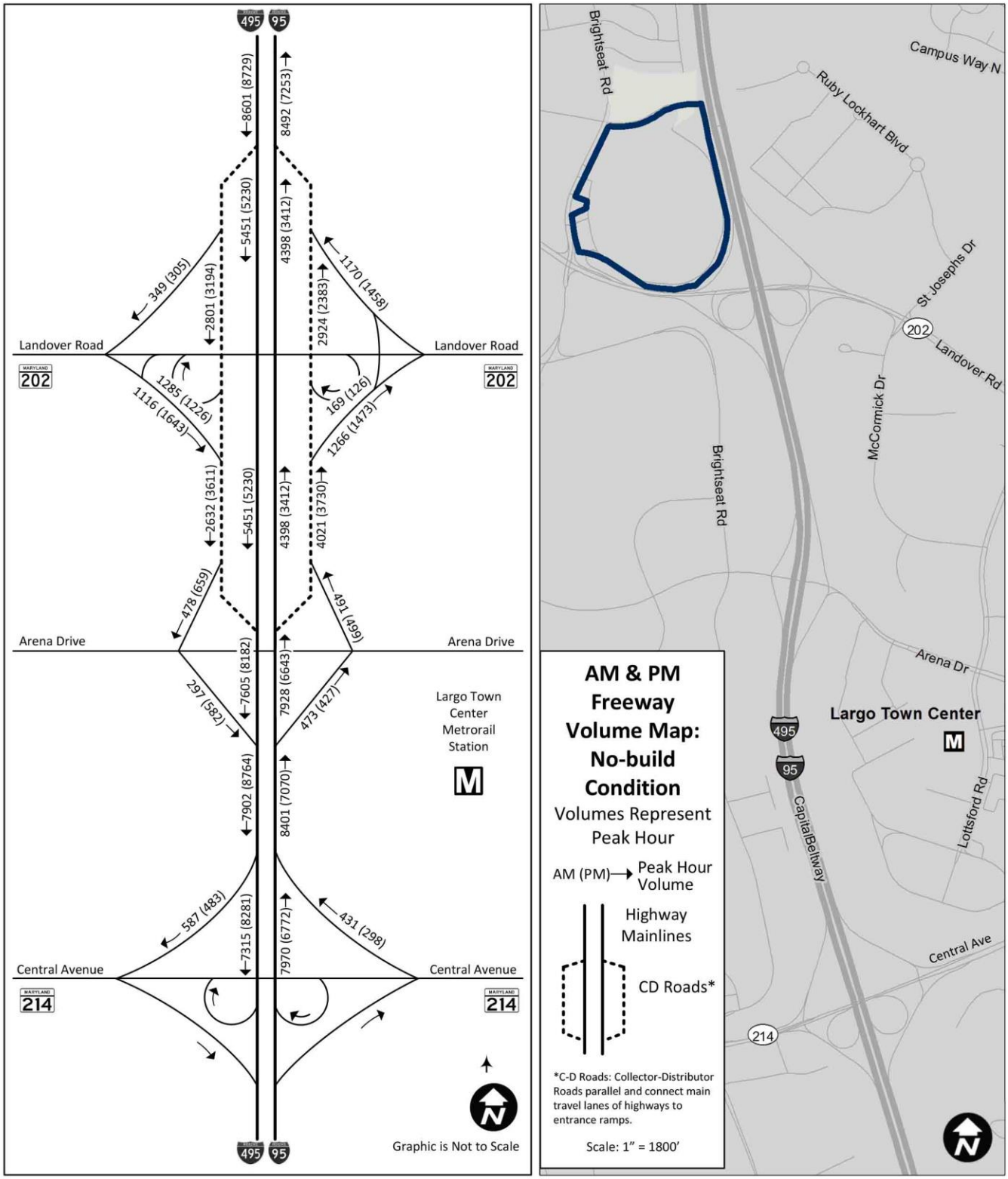
4.7.6.2 Overall Traffic Impact Assessment

Overall, the AM peak hour would experience corridor-based delays along Landover Road (MD 202) in the westbound direction beginning at McCormick Road/ St. Joseph's Drive and extending past Lottsford Road approaching Arena Drive/Lake Arbor Road. A similar condition would occur during the PM peak hour beginning at I-95/I-495 southbound on-ramp and extending past Barlowe Road. Together these conditions would result in direct, long-term, major adverse impacts. In addition, there would be isolated intersection impacts during the AM peak hour at the Martin Luther King Jr. Highway and Ardwick-Ardmore Road intersection and at the Brightseat Road and Ardwick-Ardmore Road intersection resulting in direct, long-term, adverse impacts.

4.7.7 No-build Condition Freeway Volumes

Although freeway analysis was not performed for the No-build Condition, freeway ramp volumes are included in figure 4-7 to allow a comparison to the Existing Condition, Build Condition, and Build with Mitigation Condition freeway ramp volumes presented in Sections 3.7, 5.8, and 6.6, respectively. Full analysis of the freeway volumes is included in the Build with Mitigation Condition in Section 6.6.

Figure 4-7: No-build Condition Freeway Volumes



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5.0 Analysis of Build Condition

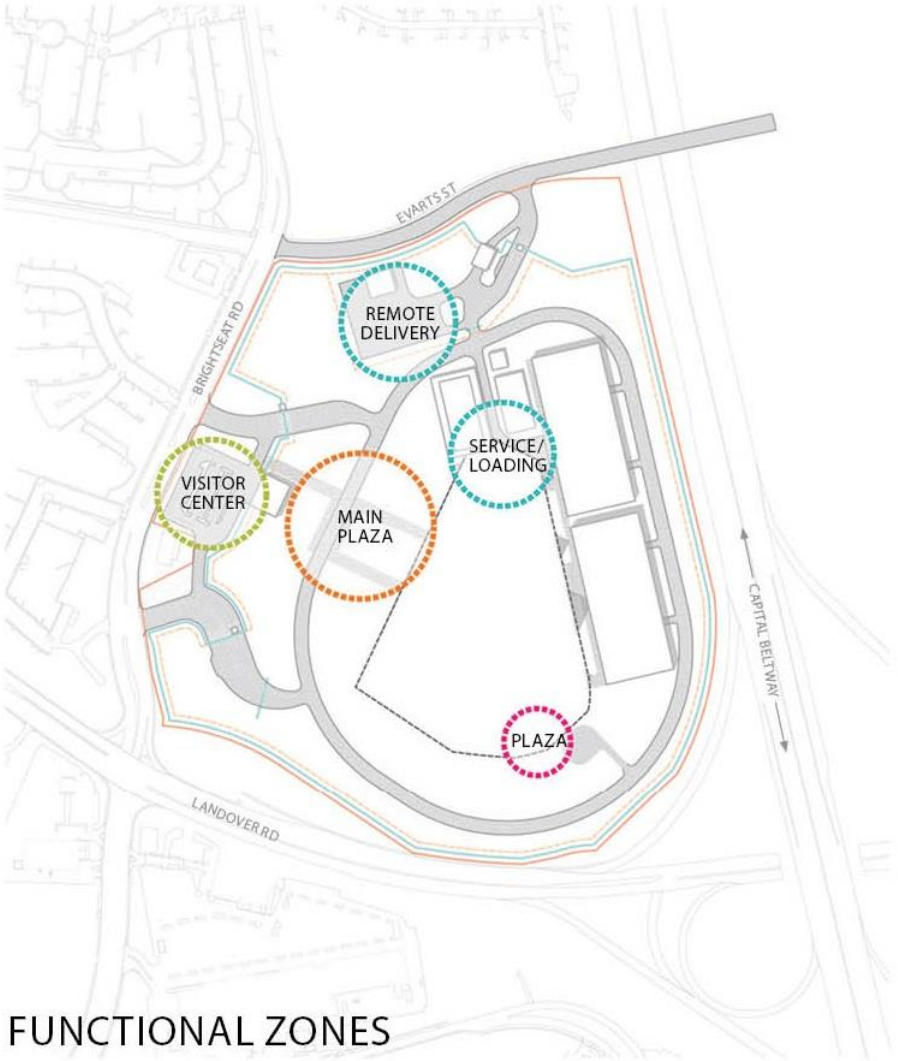
This chapter introduces the Landover Build Condition and summarizes the potential impact on the pedestrian network, bicycle network, public transit system, parking conditions, truck access, and traffic operations from the consolidation of the FBI HQ on the Landover site.

Under the Build Condition, GSA would not continue to maintain the FBI HQ building in Washington, D.C., and the Landover site would be selected. The Landover Build Condition is unique from the Action condition described in the FBI HQ Consolidation DEIS because it only analyzes the conditions at the Landover site and does not factor in the impacts from the exchange of the JEH parcel in Washington, D.C.

5.1 Description of Build Condition

Consolidation of the FBI HQ at Landover would include a Main Building or series of buildings of approximately 2.4 million GSF. The main HQ building would house the majority of the approximately 11,000 employees, plus approximately 400 non-seated contractors, such as custodial staff and food service workers. The Main Building would include general office space, collaborative workspaces, the Mission Briefing Center and auditorium (to be used for training and large meetings), a cafeteria/food court, retail spaces, fitness center, credit union, and medical clinic. The building(s) also would include support spaces such as loading docks, workshops, and police/security spaces. In addition to the Main Building, the site would also contain plaza areas, parking areas, a Central Utility Plant (CUP), a Remote Delivery Facility (RDF) and truck access, a Visitor Center (VC), and gate and access points. The location of some of these elements is shown in figure 5-1.

Figure 5-1: Landover Site Organization



The remote delivery zone, which would contain the truck screening facility and the RDF, would be located in the north central portion of the site, with trucks accessing the site from the Capital Beltway via Brightseat Road and Evarts Street through the truck gate on the north side of the site. The north gate would also be used for vehicular ingress and egress during morning and afternoon peak periods. The service and loading zone would be located southeast of the remote delivery zone, adjacent to the northern end of the Main Building and west of the northernmost parking structure. This zone would contain the CUP and generators/substation and provide access to the Main Building for loading and maintenance. The 15.81-acre developable area for the Main Building would be located in the center of the site. Based on the size and configuration of the developable area, the planning team determined that the Main Building would be up to 11 stories. The developable area in front of the Main Building would form the main plaza zone, which would be oriented toward the VC and Brightseat Road. This zone would provide a pedestrian-oriented open space for employees and visitors, as well as a stage for a grand entrance to the Main Building. A smaller plaza zone would be located on the opposite end of the building, isolated from the other functional zones. The visitor zone would be located along the western site boundary adjacent to Brightseat Road. This zone would contain the VC, visitor parking, and bus drop off. The visitor parking lot would accommodate up to 325 spaces. The main vehicular entrance would be located south of the visitor zone, and the

main vehicular exit would be located north of the visitor zone. Following a typical campus development model, a loop road would separate the remote delivery zone, VC, and vehicular and truck gates from the remainder of the facility components and functional zones.

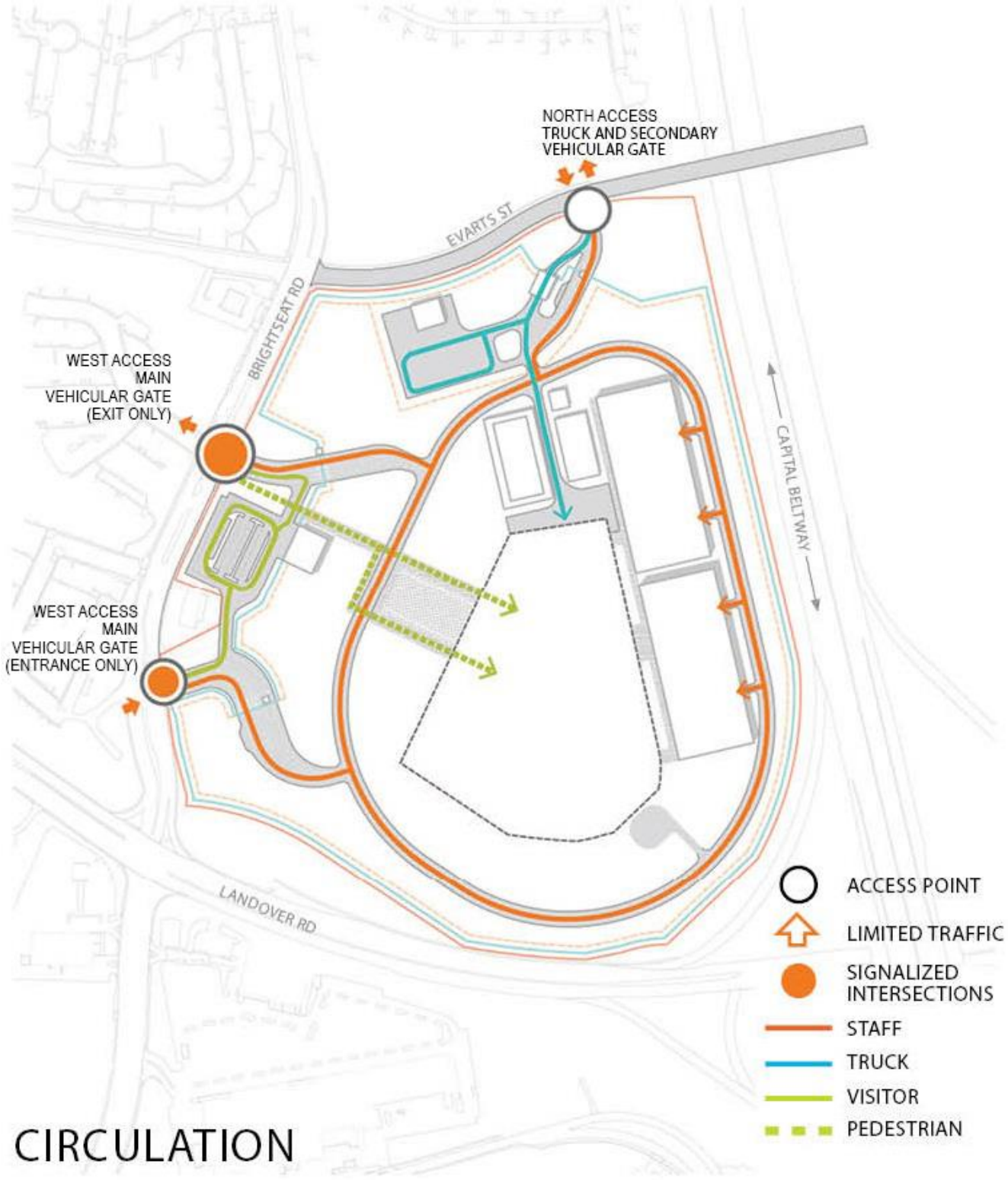
Access to the site would be primarily provided along Brightseat Road, as shown in figure 5-2. The preliminary conceptual site plan (a plan developed prior to studying the internal and external transportation impacts) contains two vehicular entry control facilities (ECFs); note that other resource topics in the EIS based their impact assessment on the revised conceptual site plan describe in the Build with Mitigation (Chapter 6).

- West Access: This separated ECF, located along Brightseat Road, would contain six lanes exclusively for inbound employee and visitor vehicular traffic south of the visitors' parking lot, and three lanes for outbound employee and visitor vehicular traffic north of the visitors' parking lot.

- North Access: This ECF, located along Evarts Street, would contain two lanes for employee vehicular traffic, one inbound lane and one outbound lane. This ECF would also provide the main access point for truck traffic during non-peak hours.

Visitor vehicular traffic would access the site through the main vehicular gate (West Access ECF) and proceed immediately to the visitors' parking lot along Brightseat Road, prior to entering the secured areas of the site (see figure 5-2). Visitor and employee pedestrian traffic would enter the site through or near the VC, adjacent to the visitor parking lot. Employee parking garages would be located to the east of the Main Building developable area along the eastern site boundary, adjacent to the Capital Beltway. In the conceptual site layout analyzed in the EIS, these spaces would be accommodated in two, 10-story parking structures. The final number and layout of the parking structures to accommodate the required employee and fleet vehicle parking would be determined during the design process.

Figure 5-2: Preliminary Landover Site Circulation



- The key components of the Landover Build Condition are as follows: Sidewalks along Brightseat Road would be upgraded as part of development of the site to Prince George's County standards and be ADA compliant. ADA accessibility and pedestrian access improvements would be made as needed at remaining entry locations.

- No offsite bicycle improvements are included as part of the Build Condition. Bicycle improvements such as bicycle parking and showers or locker rooms may be provided as part of the final design, but are not yet known at this time.

- All parking supporting the Build Condition would be accommodated onsite. In the conceptual site layout analyzed in the EIS, these spaces would be accommodated in two, 10-story parking structures.

- Truck access would be provided at the North Access ECF; trucks would be required to access the facility at off-peak hours.

- Three driveways leading to and/or from ECF facilities would be developed. These include a west entrance from Brightseat Road (six-lane entry only), west exit to Brightseat Road (three-lane exit only), and a north access to/from Evarts Street (two-lane entry and two-lane exit).

The Landover Build Condition includes the following transportation improvements that would be necessary for the site to function based on the magnitude of trips forecasted. These improvements are mitigation measures, discussed in Section 6, but they are also included in the Build Condition to accommodate trip volumes.

- Shuttle bus service is planned between Largo Town Center Metro Station and the Landover site to accommodate site patrons who use Metrorail. The shuttle route is proposed to have peak period headways of every 4 minutes and non-peak headways of every 15 minutes.

- Brightseat Road and Site West Exit/Maple Ridge Apartments north entrance: Install a new traffic signal at the northern Maple Ridge Apartment entrance that would also serve the site's west exit; create a three lane exit-only westbound approach with two left-turn lanes and one right-turn lane.

- Brightseat Road and Site West Entrance/ Maple Ridge Apartment south entrance: Reactivate the traffic signal to provide safe passage for the vehicles entering and exiting the apartments. For the Brightseat Road northbound approach, change the lane geometry to provide an approach with two right-turn lanes, two through lanes, and one left-turn lane.

The trip generation and modal split assumptions are discussed first, followed by a discussion for each transportation mode.

5.2 Trip Generation and Modal Split

This section covers the trip generation and modal split process and methods used to develop the Build Condition transit and traffic trip volumes.

5.2.1 Trip Generation

The process of trip generation calculation is based on forecasting the number of AM and PM peak hour trips generated by the proposed development. There are several proposed trip generators for the site including an estimated 11,055 FBI employees, a 500-seat Mission Briefing Center, and a fleet of pool cars, according to the FBI. Based on an estimate for commuter-based pool car use, there would be less than five trips produced. It is also assumed that the approximately 400 non-seated contractors providing custodial, food, fitness center, health,

and other services would travel outside the peak hours. Therefore, no trips were added to the trip generation calculation for commuter-based pool car use or non-seated contractors. The process for forecasting the FBI employee and Mission Briefing trips is discussed next.

5.2.1.1 FBI Employee Person Trips

Many employees choose to or are scheduled to begin or end work earlier or later than the peak hours to avoid traffic, to schedule shared childcare responsibilities, to take advantage of quiet time at work, and for other reasons. The ITE *Trip Generation Manual*, *9th Edition,* identifies estimates for peak hour trip generation rates for different types of office buildings based on various studies; however, most of these studies are in suburban rather than urban environments, "having little or no transit service, nearby pedestrian amenities, or travel demand management (TDM) programs" (ITE 2012). In addition, FBI employee patterns of arrivals and departures, including the number of employees who will be off-site or on field work at any given time is not typical of most office uses. For these reasons, it was determined that the future FBI trip generation rate is not accurately represented by the ITE *Trip Generation Manual*; therefore, a special study was undertaken to determine appropriate trip generation rates using the current FBI HQ, which houses more than 50 percent of staff. As stated in the Trip Generation Manual, "when practical, the user is encouraged to supplement the data in this document with local data that have been collected at similar sites" (ITE 2012).

Morning peak hour rates were calculated based on FBI turnstile counts obtained from the FBI representing all persons entering the JEH building (current FBI HQ). Following the guidance of the ITE *Trip Generation Handbook, 2nd edition* (ITE 2004), three days of turnstile counts (November 12, 2013 [Tuesday], December 4, 2013 [Wednesday], and January 9, 2014 [Thursday]) were obtained. The sample days for normal operations days were selected by the FBI. The survey results produced a peak hour count of 1,344 on November 12, 2013, 1,361 on December 4, 2013, and 1,324 on January 9, 2014, and a peak hour of 7:15 AM to 8:15 AM. To provide a more conservative forecast, the maximum count from the 3-day turnstile counts (1,361) was used, instead of the average. The turnstile counts only represent the inbound flows, but most organizations have two-way flows of workers, even in peak hours. Therefore the ITE *Trip Generation Manual* Corporate Headquarters land use entering/exiting percentages (AM: 93 percent entering / 7 percent exiting) were used to calculate the morning outbound peak hour flow, based on the maximum count from the survey results. The total person trips (entering and exiting) divided by 5,045 (current number of FBI employees working at the JEH building) was used to develop the AM peak hour rate, which resulted in a 0.29 person trip rate (29.0 percent of employees arrive or leave during the AM peak hour).

Afternoon peak hour rates were calculated based on a JEH building exit-only trip generation survey. Following the ITE guidance (ITE 2004), the trip generation survey was conducted for three days (September 16, 17, and 18, 2014) on a non-holiday week resulting in outgoing trip volumes of 1,174, 1,259, and 1,130, respectively. Based on the PM peak hour occurring between 4:30 PM and 5:30 PM, the PM rate was calculated from the trip generation survey (outbound flow) and the inbound turnstile counts from the inbound survey days.

Based on the turnstile volumes, the highest number of employees entering during the 4:30 to 5:30 PM time slot was 114. The average for the time slot was 73, higher than both the other days' values (68 and 36 respectively) for the same one-hour period. This meant that the 114 value was skewing the values when averaged and was not a good representation of a typical evening inbound flow. Therefore, the next 15-minute slot for an hourly average (4:45 PM-5:45 PM) was examined. The average of the 4:45 PM to 5:45 PM time slot equals the average of the 3 days for the 4:30 to 5:30 PM time slot, and therefore appears to be more typical of a normal operation. To follow the same process as the inbound flow, the highest value of this time slot was used, for a value of 98. Since the values for the inbound PM flows fluctuated between days and one day seemed to at least double the other two, the percent entering and exiting was adjusted to model the outbound flows in a more conservative manner. The calculated split was 7 percent inbound and 93 percent outbound. Instead the split was rounded down and up to a 5 percent inbound and 95 percent outbound split. The outbound split has the greatest impact on traffic; therefore a higher outbound split percentage is more conservative (worse case) than a lower outbound split.

This resulted in a 0.269 person PM peak hour trip rate (26.9 percent of employees arrive or leave during the PM peak hour) where 5 percent entered and 95 percent exited the JEH building based on the 5,045 existing employees working at the JEH building. Table 5-1 summarizes the JEH building trip generation rates.

Table 5-1: J. Edgar Hoover Building Existing Peak Hour Person Trips

Source	Independent Variable	Time Period	IN	OUT	TOTAL
Turnstiles (11/12/13, 12/4/13, and 1/9/14) Survey (9/16/14 - 9/18/14)	5,045 employees	AM Peak Hour	1,361	102	1,463
		PM Peak Hour	98	1,259	1,357
Existing number of employees at JEH building		5,045			
AM peak hour trip generation rate		0.290			
PM peak hour trip generation rate		0.269			

5.2.1.2 Mission Briefing Center

The Briefing Center is assumed to have 500 seats, according to the FBI. It is assumed that half (50 percent) of the facility capacity would arrive from offsite and that half would be onsite (walk) trips. The ITE *Trip Generation Manual* does not contain a "Conference Center" land use; therefore, the study followed the trip rates used by the traffic study for the Washington Convention Center published in the Old Post Office (OPO) Redevelopment Transportation Study (GSA in cooperation with NCPC 2013). The AM peak inbound trip generation rate reported by the OPO study was 0.36; the PM peak outbound trip rate was 0.29, assuming that 100 percent would be inbound in the AM peak and 100 percent outbound in the PM peak.

5.2.1.3 Total Site Forecasted Person Trips

The person trip generation representing the total number of estimated employees at the new site used the trip rates calculated through the JEH building trip generation study. The Mission Briefing Center uses the person trip generation rates provided by the OPO Redevelopment Transportation Study. Table 5-2 contains the Landover site forecasted person trip generation and trip generation assumptions.

Table 5-2: Landover Site Forecasted Trip Generation

Future FBI Person Trips	Time Period	Enter/Exit Percentages		Proportion of Trips during the Peak Hour	Future Employee Person Trips		
		IN	OUT		IN	OUT	TOTAL
Employees (based on JEH Turnstile Counts and Surveys)							
11,055	AM Peak Hour	93%	7%	29%	2,982	224	3,206
	PM Peak Hour	5%	95%	26.9%	149	2,825	2,974
Briefing Center (based on the Old Post Office Redevelopment Transportation Study)							
250	AM Peak Hour	100%	--	36%	90	--	90
	PM Peak Hour	--	100%	29%	--	73	73
Total People							
11,305	AM Peak Hour	--	--	--	3,072	224	3,296
	PM Peak Hour	--	--	--	149	2,898	3,046

5.2.2 Modal Split

Modal split is calculated by apportioning person trips to the available transportation modes used to commute. The process begins with calculating the split for carpools/vanpools, followed by single-occupancy vehicles (SOV), and then works systematically through the other modes. Employees and the Mission Briefing visitors are evaluated separately.

5.2.2.1 Employee Mode Split

Carpool/Vanpool: The number of vehicles is highly dependent on the number of parking spaces available. According to the NCPC Comprehensive Plan Transportation Element (NCPC 2004), the number of parking spaces for a suburban site more than 2,000 feet from a Metrorail station, is determined by a ratio of one parking space for every 1.5 employees, a ratio of 1:1.5. Because the site is projected to have 11,055 employees, the number of parking spaces is therefore assumed to be 7,370. ***It should be noted that this number does not reflect the non-seated workers, visitors, and pool fleet, which will require additional parking spaces and will not be subject to NCPC parking policy.*** Based on information from NCPC and project knowledge of carpool/vanpool mode split at other large Federal sites, the carpool/vanpool mode split was initially estimated at approximately 8 percent. The site is in proximity to U.S. Route 50 and I-95. Parking is limited at suburban Metrorail stations. Trip times in the area are long due to driving, parking, and using Metrorail. Onsite TDM programs would likely include vanpool incentives and ridematching programs. Thus, it is assumed that 10 percent (1,105) of FBI employees at this site would take advantage of carpools/vanpools. This is comparable to the 12.4 percent MWCOG estimate (2020 model projection; MWCOG 2014) for carpool/vanpool. Based on the Landover Site Transportation Agreement, the average vehicle occupancy would be three persons resulting in 368 vehicle trips and by extension 368 removed and potentially reserved parking spaces for carpools/ vanpools.

Single-Occupancy Vehicles: After 368 spaces are removed for carpool/vanpools, 7,002 spaces remain for SOV use, a 63.3 percent mode share. It is assumed that the FBI and GSA, through the application of a Transportation Management Plan, would implement policies and actions to deter any nearby on-street parking (i.e., Evarts Street) and offsite parking using the Largo Town Center Metro Station parking facilities. This can be accomplished through aggressive monitoring and punitive actions.

Bicycle: Given the suburban nature of the site characterized by low-density single-family residential, and the nature of the roadway network surrounding the site, it is expected that approximately 1 percent, or 111 employees, would bicycle to the site, which is consistent with the MWCOG 2010 State of the Commute (MWCOG 2011).

Walk: Given the supply of onsite parking, the primarily low-density, residential character of the surrounding land use, and the barriers of Landover Road and I-95, it is expected that approximately 1 percent, or 111 employees, would walk to the site.

Commuter Bus: It is likely that the Maryland Transit Administration (MTA) would develop commuter bus service to the Landover site, because it already has 37 trips operating in this area daily. This mode is particularly effective for long-distance commuters in the region because commuter buses typically pick up at a park-and-ride in the early AM and drop riders at or near their place of employment. Given the level of existing commuter bus service in proximity to the site, and its attractiveness to commuters, a 3 percent mode share for commuter bus, or 332 employees is assumed. It is expected that commuter bus providers would implement new services to meet the demand of employees commuting to this site providing service from park and ride locations throughout Maryland directly to the site.

Local Bus: There are five local bus routes (two Prince George's County and three Metrobus) serving the Landover site. The local routes focus on connecting transit and retail hubs in a relatively small area between New Carrollton to the north and Addison Road to the south. Consequently, the local buses do not capture many of the

suburban communities around the site. Its effectiveness is further limited by the infrequent headways employees would experience. In general, the areas served by these routes are suburban in nature and characterized by low-density, single-family residential use. Given the above factors, a 3 percent mode share, or 332 employees, is assumed.

Metrorail: Once the data points and assumptions for other modes were applied and the number of employees assigned to each was calculated, it is assumed that the remaining employees would travel to/ from the site via Metrorail via the Largo Town Center Metro Station, which is approximately 2.5 miles one way by roadway. When all other modes are combined, they equate to 8,993 trips, leaving 2,092 trips, or 18.7 percent of the total trips, that would use Metro and take a shuttle to the site. This is approximately half (56 percent) of the 2011 NCPC report estimate which indicates that 33 percent of Federal workers use Metrorail/commuter rail region-wide, but is basically consistent with the MWCOG *State of the Commute* (17 percent) (MWCOG 2011). Given the parking availability that is expected at the site and the distance from Metrorail requiring a shuttle, a lower Metrorail mode split percentage is reasonable.

Table 5-3 summarizes the relevant modal split information sources and percentages referenced in the discussion above.

Table 5-3: Modal Split Summary of Sources

Mode	MWCOG Forecasted 2020 Percent by Mode for TAZ 1113 [a]	MWCOG 2013 State of the Commute [b]	2011 NCPC [c] Federal Employee Commuting Patterns (2008)
Single-Occupancy Vehicles	76.8%	71.5%	54%
Carpool/ Vanpool [d]	12.4%	7.3%	8%
Bicycle	NA	2.4%	2%
Walk	0.0%		3%
Commuter Bus [e]	NA	NA	NA
Local Bus	5.8%	18.8%	33%
Metrorail/ Commuter Rail	5.0%		
Telework/ Compressed Work Schedules	NA	NA	NA
Total	**99.7%**	**100%**	**100%**

NA = Not Applicable. Percentages do not always equal 100% due to unreported modes and/or rounding.

[a] Represents the forecasted 2020 modal split based on a forecast of more than 2,700 total jobs within the MWCOG travel demand model traffic analysis zone (TAZ) 1113 located in the southeastern quadrant of the I-95/I-495 interchange with Landover Road (proposed site (TAZ 1114) is forecasted for less than 450 total jobs, thus TAZ 1113 is a better sample) (MWCOG 2014).

[b] MWCOG (2011; 2013) - modal split represents an average for the entire MWCOG region).

[c] NCPC (2012).

[d] Assumes an average occupancy of three persons per carpool//vanpool.

[e] Assumes an average of 30 persons per commuter bus; 332 people equates to 11 buses.

Table 5-4 summarizes the FBI employee mode split, as discussed above, and provides the resulting trips by mode.

Table 5-4: FBI Employee Modal Split Summary

Mode	FBI Development Percent by Mode	FBI Number of trips by Mode
Single-Occupancy Vehicles	63.3%	7,002
Carpool/ Vanpool [a]	10%	368 trips (1,105 persons)
Bicycle	1%	111
Walk	1%	111
Commuter Bus [b]	3%	11 trips (332 persons)
Local Bus	3%	332
Metrorail/ Commuter Rail	18.7%	2,062
Telework/ Compressed Work Schedules	0%	0
Total	**100%**	**11,055**

[a] Assumes an average occupancy of three persons per carpool//vanpool.
[b] Assumes an average of 30 persons per commuter bus; 332 people equates to 11 buses.

5.3 Pedestrian Network

Under the Build Condition, Brightseat Road would undergo several improvements with the addition of a new access point to the Landover site and accommodation of the lane requirements for the ECF improvements. Therefore, with construction already planned for this length of roadway, it is expected that sidewalk accommodations on Brightseat Road would be upgraded to meet Prince George's County standards and ADA compliance during the Build Condition. ADA accessibility and pedestrian access improvements would also be made as needed at remaining entry locations. Within the site, multiple pedestrian pathways would provide access to the Main Building and between site elements; the exact location of these pedestrian accommodations would be determined in the final site design process.

Not many pedestrians would access the Landover site via the surrounding pedestrian network because (1) the Landover site is not near Metrorail where riders could walk from the station and (2) the low-density suburban area means few employees are within a reasonable walking distance from the site or would travel there by foot. Pedestrians in the area would continue to use the sidewalk along Brightseat Road, and local area use of the sidewalk network may slightly increase with the improvements. Therefore, the Build Condition as planned would have direct, long-term, beneficial impacts on the pedestrian network. There would also be direct, short-term, adverse construction impacts on the pedestrian network from construction vehicles crossing the sidewalk and intermittent sidewalk closures.

5.4 Bicycle Network

The overall bicycle mode split to the Landover site is projected to be 1.0 percent, resulting in approximately 113 bicycle roundtrips daily. It is assumed that there would be bicycle facilities on site to encourage the use of the

bicycle mode of travel. The increase in bicycle trips from the Landover Build Condition would increase overall bicycle volumes in the study area. Given the lack of bicycle facilities in the study area and no assured date of completion for planned improvements noted in the No-build Condition (see Section 4.7), the increase in projected bicycle volumes would have a direct, long-term, adverse impact on the study area. There would be a negative impact because, without bicycle facilities, those who choose to bicycle would need to use sidewalks, conflicting with pedestrians, or use the roadways, creating conflicts with an increased number of vehicles on the road. There would be direct, short-term, adverse construction impacts on the bicycle network, caused by construction vehicles crossing the lanes and intermittent lane and sidewalk closures.

5.5 Public Transit

The following sections describe the Build Condition for Metrorail and bus modes within the Landover study area. Consistent with the No-build Condition, commuter rail, commuter bus, carsharing, slugging, and private shuttles are not evaluated because future ridership information or planning documents were not available. The projected use of shuttles for future FBI employees, however, is discussed.

5.5.1 Projected Trips

The projected person trips are explained in the Trip Generation and Modal Split section (see Section 5.2).

5.5.2 Metrorail Analysis

The Metrorail analysis was conducted using projected 2022 No-build Condition ridership and the additional passenger trips associated with the Landover Build Condition. Overall, with a Metrorail mode split of 18.7 percent, a total of 616 additional AM peak hour passenger trips and 570 additional PM peak hour passenger trips are projected. Table 5-5 summarizes the additional Metrorail trips associated with the Landover Build Condition.

Table 5-5: Landover Build Condition Additional Peak Hour Metrorail Passenger Trips

Employees	Time Period	IN	OUT	Proportion of Daily Total	Metrorail Mode Split	IN	OUT	TOTAL
11,055	AM Peak Hour	93%	7%	29%	18.7%	558	42	600
	PM Peak Hour	5%	95%	26.9%	18.7%	28	528	556
Briefing Center	**Time Period**	**IN**	**OUT**	**Proportion of Daily Total**	**Metrorail Mode Split**	**IN**	**OUT**	**TOTAL**
250	AM Peak Hour	100%	-	36%	18.7%	17	-	17
	PM Peak Hour	-	100%	29%	18.7%	-	14	14
Total People	**Time Period**					**Exits**	**Entries**	**TOTAL**
11,305	**AM Peak Hour**					**574**	**42**	**616**
	PM Peak Hour					**28**	**542**	**570**

Sources: Landover Site Transportation Agreement (Appendix D1)

The additional peak hour Metrorail passenger trips were further disaggregated into AM and PM peak 15-minute periods using existing PHF at Largo Town Center Metro Station. Overall, this resulted in an additional 167 passenger trips during the AM peak 15-minute period and an additional 171 passenger trips during the PM peak 15-minute period, as summarized in table 5-6.

Table 5-6: Landover Build Condition Additional Peak 15-Minute Metrorail Passenger Trips

Employees	Time Period	IN	OUT	TOTAL	Peak Hour Factor	Time Period	IN	OUT	TOTAL
11,055	AM Peak Hour	558	42	600	27%	AM Peak 15-Minute	151	11	162
	PM Peak Hour	28	528	556	30%	PM Peak 15-Minute	8	158	166
Briefing Center	**Time Period**	**IN**	**OUT**	**TOTAL**	**Peak Hour Factor**	**Time Period**	**IN**	**OUT**	**TOTAL**
250	AM Peak Hour	17	-	17	27%	AM Peak 15-Minute	5	-	5
	PM Peak Hour	-	14	14	30%	PM Peak 15-Minute	-	4	4
Total People	**Time Period**	**Exits**	**Entries**	**TOTAL**	**Peak Hour Factor**	**Time Period**	**Exits**	**Entries**	**TOTAL**
11,305	**AM Peak Hour**	**574**	**42**	**616**	**27%**	**AM Peak 15-Minute**	**156**	**11**	**167**
	PM Peak Hour	**28**	**542**	**570**	**30%**	**PM Peak 15-Minute**	**8**	**162**	**171**

Sources: Landover Site Transportation Agreement (Appendix D1); WMATA (2014c)

Overall, the Landover Build Condition would result in an additional 2,114 weekday entries at Largo Town Center Metro Station, bringing the weekday station entry total to 7,721 passengers (see table 5-7). Average weekday exits would theoretically be the same or similar to the average weekday entries.

Table 5-7: Weekday 2022 Projected Metrorail Ridership at Largo Town Center

Metro Station	Average Weekday Entries					
	2014	2022 Background Growth	2022 Development Projects	2022 Total No Build	2022 Additional Build Trips	2022 Total Build Trips
Largo Town Center	4,740	5,585	22	5,607	2,114	7,721

Source: Masog (2014); WMATA (2014c); MWCOG (2015); Landover Site Transportation Agreement (Appendix D1)

5.5.2.1 Metrorail Passenger Loads

Metrorail passenger loads at Largo Town Center Metro Station were calculated based on projected 2022 No-build Condition ridership (background growth plus planned development passenger trips) plus the additional Landover Build Condition passenger trips disaggregated to peak 15-minute periods. Because Largo Town Center is a terminal station, passenger loads are equal to the total number of exiting passengers per train in the outbound direction (trains ending at the station) or the total number of entering passengers per train in the inbound direction (trains beginning at the station). Outbound exiting passengers during the PM peak period were higher than inbound entering passengers during the AM peak period at the station; therefore, PM peak 15-minute exits were used for this analysis.

No expansion of WMATA's current Metrorail fleet was assumed for this analysis to provide the most conservative estimate of potential capacity issues. The Momentum Strategic Plan does call for all eight-car trains on all lines during peak periods by the year 2020; however, this would require significant upgrades to electrical systems and

a significant expansion of WMATA's current fleet of railcars (WMATA 2014a). All trains were assumed to have six cars with the exception of Blue line trains, which typically have eight during peak periods (WMATA 2014b).

WMATA has three thresholds for railcar occupancy: less than 100 passengers per car (acceptable), between 100 and 120 passengers per car (crowded), and greater than 120 passengers per car (extremely crowded). Capacity is generally considered to be 120 passengers per car. Projected passenger loads under future development conditions at the station are well below 100 passengers per car, and therefore would be considered acceptable. Table 5-8 summarizes passenger loads per car under future development conditions using PM peak 15-minute exits.

Table 5-8: Landover Build Condition Peak Metrorail Passenger Loads

Measure (PM Peak 15-Minute Exits)	Unit
2014 Maximum Passengers	356
2022 Passengers with Background Growth	419
2022 Development Projects (Passengers)	4
2022 Total No-build Passengers	423
2022 Minimum Trains [a]	3
2022 Train Cars [b]	20
2022 Total No-build Passengers Per Car	21
2022 Landover Build Additional Passengers	8
2022 Total Landover Build Passengers	431
2022 Total Landover Build Passengers Per Car	**22**

[a] A 4-minute headway equates to 3.75 trains every 15 minutes. This figure was rounded down to 3 in order to provide the most conservative load estimate.
[b] Assumes two 6-car Silver line trains and one 8-car Blue line train.
Source: Masog (2014); WMATA (2014b); MWCOG (2015); Landover Site Transportation Agreement (Appendix D1)

5.5.2.2 Station Capacity Analysis

A capacity analysis was conducted for the vertical elements (escalators and stairs), faregate aisles, fare vending machines, and platforms at Largo Town Center Metro Station. The analysis used 2022 Landover Build Condition peak 15-minute periods of ridership (entries and exits) at the station (see table 5-8).

Volume-to-capacity (v/c) ratios were calculated for the vertical elements and fare elements, and pedestrian LOS was calculated for the platform area. Analysis for vertical elements and faregate aisles used projected ridership from the peak exiting period at the station – the time period when the highest total number of passengers would use each element. Table 5-9 summarizes ridership during the peak exiting periods at Largo Town Center Metro Station.

Table 5-9: Landover Build Condition Weekday Peak 15-Minute Exiting Period Ridership

Metro Station	Time	2014		2022 No-build		2022 Build	
		Entries	Exits	Entries	Exits	Entries	Exits
Largo Town Center	5:00 PM – 5:15 PM	37	356	48	423	210	431

Source: WMATA (2014b); MWCOG (2015); Landover Site Transportation Agreement (Appendix D1)

The platform area and fare vending analysis used projected Landover Build Condition ridership from the peak entering period at the station – the time period when the most passengers would likely use fare vending machines and the highest number of passengers would be waiting on the platform. Table 5-10 summarizes ridership during the peak entering period at Largo Town Center Metro Station.

Table 5-10: Landover Build Condition Weekday Peak 15-Minute Entering Period Ridership

Metro Station	Time	2014		2022 No-build		2022 Build	
		Entries	Exits	Entries	Exits	Entries	Exits
Largo Town Center	7:30 AM – 7:45 AM	327	37	388	46	400	202

Source: WMATA (2014e); MWCOG (2015); Landover Site Transportation Agreement (Appendix D1)

Table 5-11 summarizes the results of the Largo Town Center Metro Station capacity analysis under the Landover Build Condition, including the vertical elements, fare elements, and platforms. Further details on the Metrorail station capacity analysis are found in Appendix D3.

Table 5-11: 2022 Landover Build Condition Station Capacity Analysis Summary

Element		Volume to Capacity (V/C) Ratio
Mezzanine/ Platform	Entry Escalators	0.07
	Exit Escalators	0.14
	Stairs	0.24
Mezzanine/ Street [a]	Entry Escalators	-
	Exit Escalators	0.29
	Stairs	0.09
Faregate Aisles		0.16
Fare Vending		0.12
Platform Peak LOS		B

[a] The mezzanine/street vertical element capacity analysis would not include future development passenger trips, since site patrons using the station would board shuttle buses on the north side of the station, which is at the same level as the mezzanine.

Source: WMATA (2014e); Largo Town Center Station Site Inventory conducted in December 2014; Landover Site Transportation Agreement (Appendix D1)

Overall, vertical elements, faregate aisles, and fare vending machines at the station are projected to operate within capacity, or below a v/c of 0.7. Additionally, platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to be at the acceptable LOS B.

5.5.2.3 NFPA 130 Emergency Evacuation Analysis

An emergency evacuation analysis was conducted to compare evacuation capacity of Largo Town Center Metro Station to standards set by the NFPA 130 code (TRB 2013). NFPA 130 requires that station platforms be fully evacuated with 4 minutes and that all passengers reach a point of safety within 6 minutes. WMATA Metrorail stations, however, are not required to meet these criteria. Details on the assumptions and calculations necessitated in NFPA 130 are found in Appendix D4. A summary of the emergency evacuation analysis is included below, with further details on the station analysis included in Appendix D4.

Using the Landover Build Condition peak 15-minute ridership period (5:00 PM to 5:15 PM; see table 5-9) and NFPA 130 assumptions and guidelines, the platform at Largo Town Center Metro Station could be evacuated in 1.5 minutes, and the entire station could be evacuated to a point of safety within 4.4 minutes.

5.5.3 Bus Analysis

Additional bus trips associated with the Landover Build Condition are summarized in table 5-12. At a local bus mode split of 3.0 percent, approximately 99 additional AM peak hour bus passenger trips and 91 additional PM peak hour bus passenger trips are projected in the study area.

Table 5-12: Landover Build Condition Additional Peak Hour Local Bus Passenger Trips

Employees	Time Period	Proportion of Daily Total	Local Bus Mode Split	TOTAL LOCAL BUS TRIPS
11,055	AM Peak Hour	29%	3.0%	96
	PM Peak Hour	26.9%	3.0%	89
Briefing Center	**Time Period**	**Proportion of Daily Total**	**Local Bus Mode Split**	**TOTAL LOCAL BUS TRIPS**
250	AM Peak Hour	36%	3.0%	3
	PM Peak Hour	29%	3.0%	2
Total People	**Time Period**			**TOTAL LOCAL BUS TRIPS**
11,305	AM Peak Hour			**99**
	PM Peak Hour			**91**

Source: Landover Site Transportation Agreement (Appendix D1)

The additional peak hour bus passenger trips associated with the Landover Build Condition were added to the peak hour bus volumes calculated for the study area in the 2022 No-build Condition. The trips were added proportionally to each route within the study area based on No-build ridership. The overall analysis was limited to Metrobus service because no ridership data were available for TheBus. It can be assumed, however, that TheBus would see some minor increases in ridership on routes that serve the site. For this analysis, it was assumed that there would be no major changes in bus service in the study area by 2022.

Overall, AM peak hour Landover Build Condition Metrobus volumes are projected to total 342 passengers, and PM peak hour volumes are projected to total 353 passengers. Both totals are below the overall capacity of services (see table 5-13) in the study area, meaning the additional passenger trips projected could be adequately handled by current service levels. At the individual route level, however, Route F14 in the northbound direction is projected to be over capacity by 2022 within the study area. Appendix D6 has further details on the bus capacity analysis.

Table 5-13: Landover Build Condition Bus Capacity Analysis

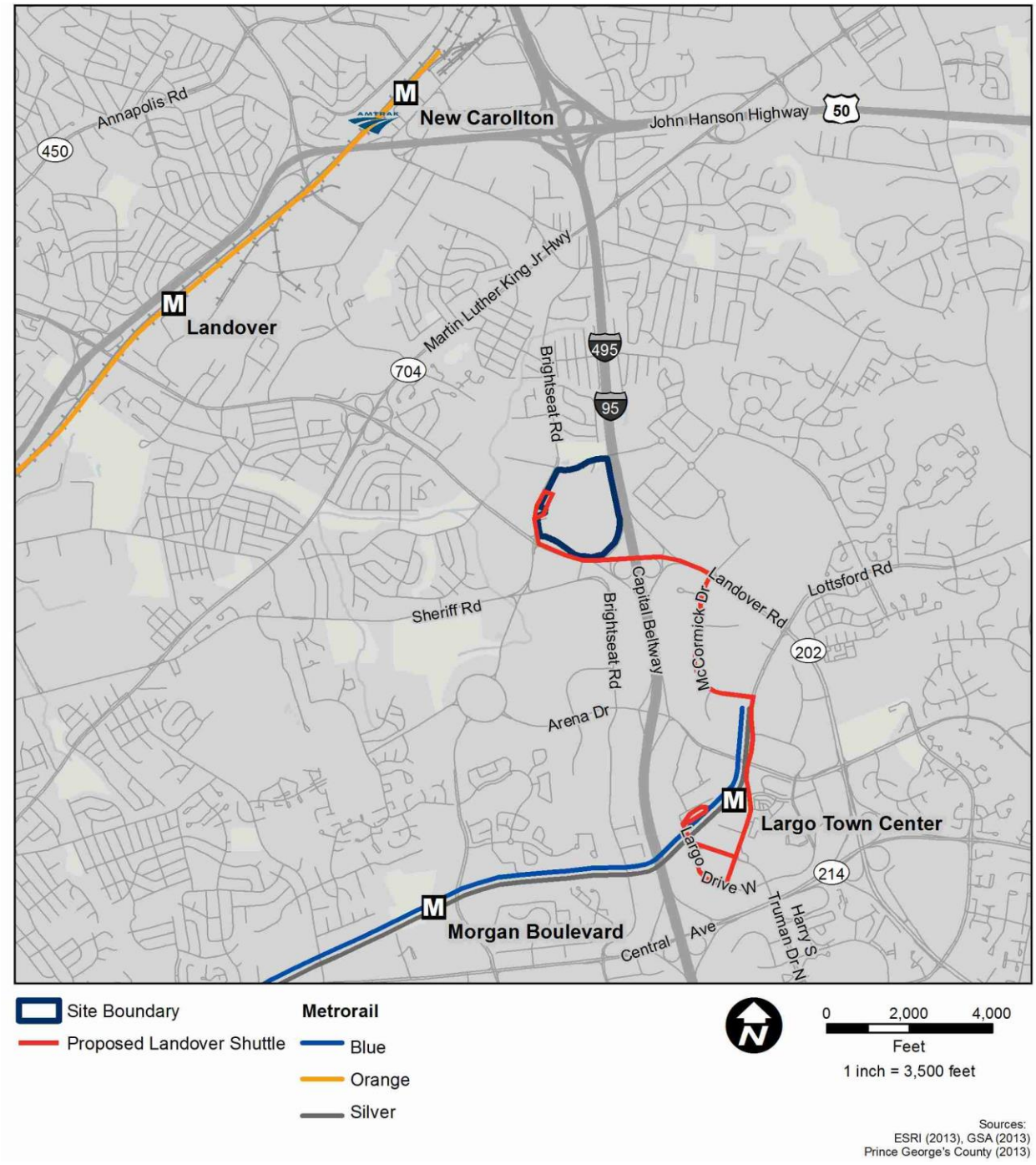
Measure	2014		2022 No-build		2022 Build	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Total Volume	210	226	243	262	342	353
Total Capacity	411	418	411	418	411	418
Volume to Capacity Ratio (V/C)	0.51	0.54	0.59	0.63	0.83	0.85

Source: Landover Site Transportation Agreement (Appendix D1); Masog (2014); WMATA (2014e); MWCOG (2015)

5.5.4 Shuttles

Shuttle bus service is planned between Largo Town Center Metro Station and the Landover site to accommodate site patrons who use Metrorail. The shuttle route would likely use Largo Drive W, Harry S Truman Drive N, Lottsford Road, McCormick Drive, Landover Road, and Brightseat Road, as shown in figure 5-3.

Figure 5-3: Landover – Largo Town Center Metro Station Anticipated Shuttle Route



5.5.4.1 *Ridership and Operating Characteristics*

Approximately 2,114 patrons (18.7 percent) would use Metrorail to access the Landover site on a daily basis based on the Landover Site Transportation Agreement, with 574 arriving during the AM peak hour and 542 leaving during the PM peak hour, including employees and visitors to the Mission Briefing Center. Using PHF of 27 percent during the AM peak hour and 30 percent during the PM peak hour, approximately 156 patrons would arrive at Largo Town Center Metro Station destined for the Landover site during the AM peak 15-minute period, and approximately 162 patrons would leave the Landover site destined for the Largo Town Center Metro Station during the PM peak 15-minute period. Table 5-14 summarizes projected Metrorail ridership to and from the site by time period.

Table 5-14: Site Patrons Using Metrorail

Time Period	Exits (to site)	Entries (from site)
AM Peak Hour	574	42
PM Peak Hour	28	542
AM Peak 15-Minute	156	11
PM Peak 15-Minute	8	162
Total Weekday	**2,114**	**2,114**

Sources: Landover Site Transportation Agreement (Appendix D1); WMATA (2014c)

During the AM peak 15-minute period, approximately 156 patrons would arrive at Largo Town Center Metro Station and board shuttle buses. With a capacity of 47 passengers on a typical 40-foot bus (WMATA 2013c), this would necessitate an AM peak period shuttle bus headway of 4.5 minutes. During the PM peak 15-minute period, approximately 162 patrons would need to travel from the site to Largo Town Center Metro Station on a shuttle bus, necessitating a shuttle bus headway of 4.3 minutes. To maximize Metrorail and shuttle use, however, shuttle buses would have to operate at the same headway as Metrorail, or every 4 minutes during peak periods. During off-peak periods, shuttle buses would operate every 15 minutes.

Each shuttle bus would travel 6.5 miles per roundtrip between Largo Town Center Metro Station and the site, resulting in a runtime of approximately 20 minutes, and a cycle time of approximately 24 minutes, including 2 minutes for loading and 2 minutes for offloading. To maintain a 4-minute headway with a 24-minute cycle time, six 40-foot buses would be necessary (cycle time divided by the desired headway). Appendix D9 has further details on the shuttle bus service plan.

5.5.4.2 *Operating and Capital Costs*

Final operating and capital costs for the proposed shuttle bus service would depend on the final contract negotiated between GSA and the contracted agency or entity (private or public). However, using an operating cost of $122 per hour (WMATA's 2009 system operating cost inflated to 2022 levels per the Bureau of Labor Statistics (BLS) Consumer Price Index (CPI) forecast) with 250 days of service per year, the annual operating cost of the shuttle bus would be approximately $1.25 million (WMATA 2009; BLS 2015). Additionally, six 40-foot buses would cost approximately $3.37 million (APTA 2013; BLS 2015). Table 5-15 summarizes the assumptions and operating and capital costs of the Landover shuttle.

Table 5-15: Landover Site Shuttle Bus Operating and Capital Costs

#	Assumption	Value	Note/Source/Formula
1	Peak Headway	4 minutes	-
2	Cycle Time	24 minutes	20 minute runtime, 4 minute load/unload time
3	Roundtrip Length	6.5 miles	-
4	Daily Roundtrips	103	30 AM peak trips, 24 midday trips, 45 PM peak trips, 4 evening trips
5	Daily Miles	669.5	= #3 X #4
6	Daily Hours	41.2	= #2 X #4 / 60
7	Annual Days	250	= 356 – 104 (weekend days) – 2 (holidays)
8	Annual Miles	167,375	= #5 X #7
9	Annual Hours	10,300	= #6 X #7
10	Cost per Hour	$122	WMATA, 2009; BLS, 2015 (rounded)
11	Annual Cost	$1,253,332	= #9 X #10 (rounded)
12	Capital Cost Per Vehicle (40')	$560,973	APTA, 2013; BLS, 2015
13	Vehicles	6	= #2 / #1 (rounded up)
14	Vehicle Purchase Cost	$3,365,840	= #12 X #13

Note: Calculations may not appear correct due to rounding.
Source: WMATA (2009); APTA (2013); BLS (2015)

Currently, Largo Town Center Metro Station has a total of 10 bus bays, 5 of which are occupied by WMATA routes or TheBus routes (WMATA n.d.) and 5 of which are currently unused. WMATA standards call for a maximum of six buses per hour per bay (WMATA 2008). The maximum acceptable capacity (based on a 2-minute loading/unloading time and a 3-minute layover time), however, is 12 buses per hour (WMATA 2013b). None of the occupied bus bays exceed six buses per hour during peak periods. With a planned peak headway of 4 minutes and 15 buses per hour, the Landover shuttle would likely need to occupy two of the five empty bays at the station.

The shuttle bus volumes were added to the mitigated roadway system to determine if the additional volume would impact the recommended roadway mitigation measures. A 4-minute shuttle headway or 15 buses per hour would equate to 23 passenger vehicle trips, assuming that each bus was the equivalent length of 1.5 passenger vehicles. This passenger car equivalent value was added to both the AM and PM peak hour mitigated roadway network to determine the operations and queuing. Based on the Synchro™ and SimTraffic™ results, no additional mitigation measures would be necessary to accommodate the 23 additional trips added to the peak hour networks. Note that the shuttle route is based on the preliminary conceptual site plan. A more definitive shuttle bus route would be determined through the Transportation Management Plan. Appendix D10 contains the Synchro™ and SimTraffic™ results for the affected intersections.

5.5.5 Level of Impact

The increase in public transit trips from the Landover Build Condition would have the following impacts to transit:

- Metrobus Route F14 would continue to have capacity issues due to its capacity issues present in the No-build Condition, given that no overall projected transit service increase or changes in Metrobus service

are assumed in the analysis. The overall capacity of bus services in the study area, however, would accommodate the projected ridership.

- Metrorail car passenger loads through the study area are projected to be at acceptable levels.
- Overall, Metrorail vertical elements, faregate aisles, and fare vending machines at Largo Town Center Metro Station are projected to operate below capacity.
- Metrorail platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to be at the acceptable LOS B at Largo Town Center Metro Station.
- Platform and station evacuation times would not increase over the No-build Condition, and therefore would continue to meet NFPA 130 standards.
- Site patrons using Metrorail would require a shuttle bus to reach the site from the Largo Town Center Metro Station, and the shuttle bus service would require the use of two bus bays at the station. The station currently has five unused bus bays, and therefore no new bus bays would need to be constructed at the station. The shuttle bus would contribute additional peak hour trips to the roadway network.

Therefore, the Landover Build Condition would have direct, long-term, adverse impacts to public transit capacity. In addition, bus operations (more than three bus routes) would have direct major long-term adverse impacts caused by the potential traffic delays forecasted along Brightseat Road (see Section 5.8, *Traffic Analysis*). Because buses regularly service Brightseat Road, there would be direct, short-term, adverse construction impacts to bus operations caused by construction vehicles blocking one or more lanes of the road and intermittent road closures.

The implementation of the shuttle between the Largo Town Center Metro Station and the Landover site would cause direct, long-term, beneficial impacts for the FBI employees. Based on limiting the shuttle service to the use of FBI employees, there would be no impact to the overall public transit system. The actual shuttle service could operate along a different route and/or could be integrated into an existing or new route provided by a public or private provider.

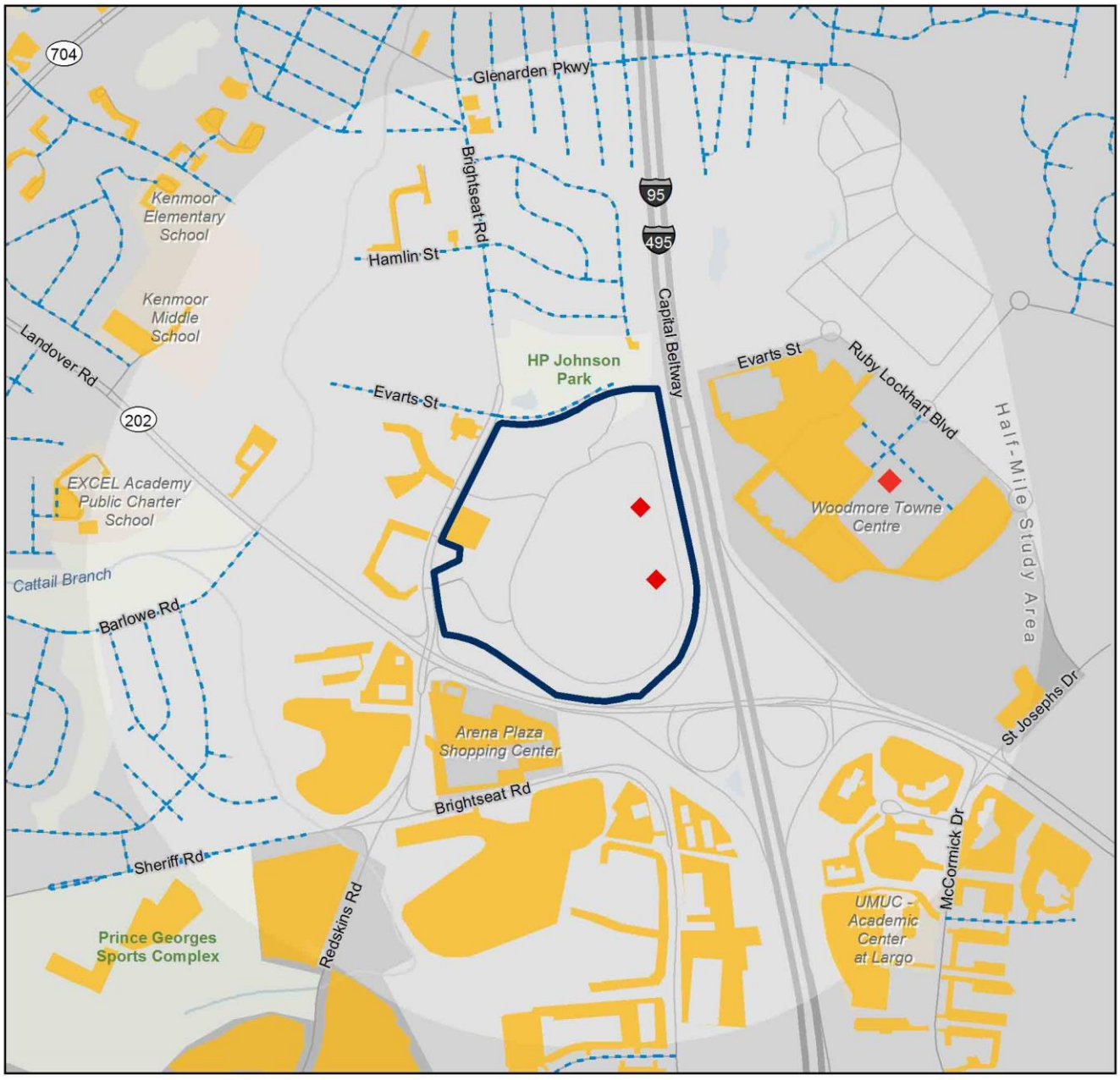
5.6 Parking

Under the Build Condition, employee parking garages would be located to the east of the Main Building developable area along the eastern site boundary, adjacent to the Capital Beltway (figure 5-4). Given the distance to the nearest transit station, and in accordance with NCPC parking policy, a parking ratio of one parking space for every 1.5 employees would be maintained, equating to approximately 7,370 parking spaces. It should be noted that this number does not reflect the non-seated workers and pool fleet, which will require additional parking spaces and will not be subject to NCPC parking policy. In the conceptual site layout analyzed in the EIS, these spaces would be accommodated in two, 10-story parking structures. The number and layout of the parking structures to accommodate the required employee and fleet vehicle parking would be finalized during the design process. Up to 325 visitor parking spaces would be provided near the Visitor Center.

While all employee and visitor parking is envisioned to be accommodated on site, it is likely that there will be more employee demand for driving than there are parking spaces due to the less than 1:1 ratio of parking spaces to employees (not all employees will have a parking spot). Furthermore, transit options to the Landover site are minimal or may not be very convenient, and a shuttle would need to transport Metrorail riders from the Metro station to the Landover site potentially making the total trip time longer compared to driving. Therefore, there will be pressure on the local parking network to sustain those who drive to work but may not park on site.

Development and implementation of a Transportation Management Plan (TMP), which includes Transportation Demand Management (TDM) measures that will encourage employees to use transit and discourage employees from driving and parking offsite, will address these issues and reduce any adverse parking impacts anticipated at the Landover site. With implementation, monitoring, and enforcement of a TMP, and revisions as needed, the Build Condition would result in no measurable direct impacts to local area parking. Assuming all construction equipment and employee parking areas would be contained to the Landover site, there would be no measurable direct impacts during the construction period.

Figure 5-4: Landover Build Condition Parking



Sources:
ESRI (2013), GSA (2013)
Prince George's County (2013), Google Maps (2015), Louis Berger (2015)

5.7 Truck Access

Truck access for the Landover site would occur at the north entrance to the Landover site off of Evarts Street. Trucks would also only be permitted to enter and exit during non-peak hours. Truck entrance and exit locations and restricted hours would be noted at entrance locations and communicated to those services that would provide regular truck delivery to the site.

Therefore, under the Build Condition, there would be no measurable direct, long-term impacts to truck access given communication of truck access regulations. Assuming the Landover site would have access entrances and exits assigned for construction equipment and general trucks during the construction period, there would be no measurable direct, short-term impacts for truck access.

5.8 Traffic Analysis

The future projected traffic analysis is based on the proposed alternative to consolidate FBI HQ at the Landover site. The next sections describe the process the study followed to project future traffic volumes through three primary assumptions: trip generation, modal split, and trip distribution, followed by the impacts as a result of the proposed alternative.

5.8.1.1 Total Vehicle Trips

The projected person trips are explained in the Trip Generation and Modal Split section (see Section 5.2). Based on the trip generation rates combined with the SOV and HOV modal split and persons per carpool, the total vehicle trips are forecasted to be 2,047 inbound and 149 outbound during the AM peak hour and 99 inbound and 1,931 outbound during the PM peak hour.

Tables 5-16 and 5-17 summarize the vehicle trips based on the trip generation and the mode split.

Table 5-16: AM Peak Hour Vehicle Trips

Calculated Steps	AM Peak Hour (7:30 AM – 8:30 AM)									
	FBI Employees				Briefing Center [a]				Total People	
	Inbound		Outbound		Inbound		Outbound		TOTAL	
	SOV	HOV	SOV	HOV	SOV	HOV	SOV	HOV	Inbound	Outbound
Employees or Seats	11,055				250					
Trip Generation	29%				36%					
Inbound/Outbound Split	93%		7%		100%		0%			
Modal Split	63.3%	10.0%	63.3%	10.0%	63.3%	10.0%	63.3%	10.0%		
Total Trips without HOV adjustment	1,887	298	142	22	57	9	0	0		
HOV Vehicle Occupancy		3		3		3		3		
Total Trips	**1,887**	**99**	**142**	**7**	**57**	**3**	**0**	**0**	**2,046**	**149**

[a] Assumes a 500-seat facility where external trips represent 50% of attendees.

Table 5-17: PM Peak Hour Vehicle Trips

Calculated Steps	PM Peak Hour (5:00 PM – 6:00 PM)									
	FBI Employees				Briefing Center [a]				Total People	
	Inbound		Outbound		Inbound		Outbound		TOTAL	
	SOV	HOV	SOV	HOV	SOV	HOV	SOV	HOV	Inbound	Outbound
Employees or Seats	11,055				250					
Trip Generation	26.9%				29%					
Inbound/Outbound Split	5%		95%		0%		100%			
Modal Split	63.3%	10.0%	63.3%	10.0%	63.3%	10.0%	63.3%	10.0%		
Total Trips without HOV adjustment	94	15	1,788	283	0	0	46	7		
HOV Vehicle Occupancy		3		3		3		3		
Total Trips	**94**	**5**	**1,788**	**94**	**0**	**0**	**46**	**2**	**99**	**1,931**

[a] Assumes a 500-seat facility where external trips represent 50% of attendees.

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5.8.2 Trip Distribution

Based on the Landover Site Transportation Agreement, it is assumed that 50 percent of existing FBI employees would relocate to the new site, and the other 50 percent would represent new FBI employees who would choose to locate in proximity to the Landover site.

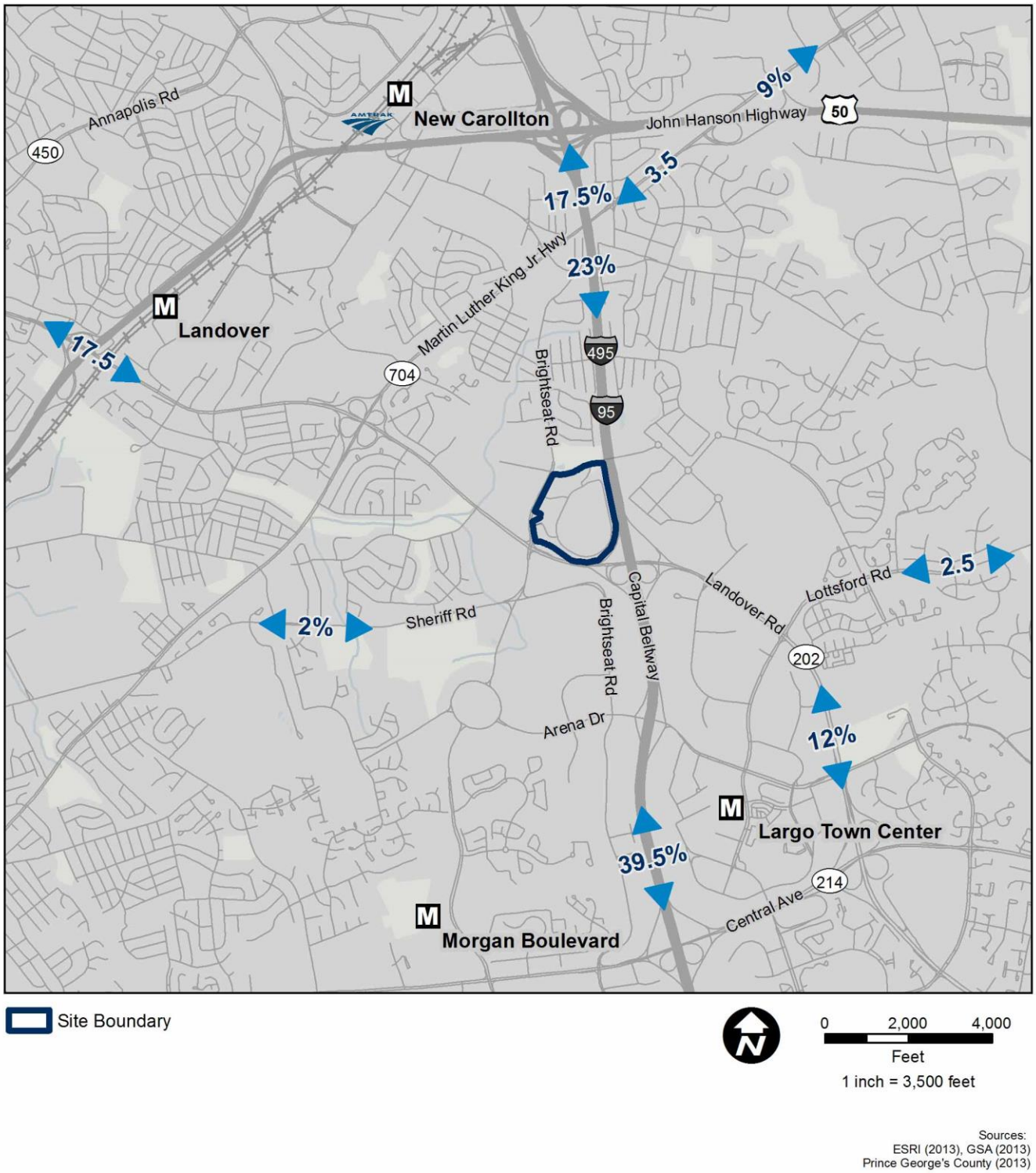
The trip distribution for work trips was determined using two sources: the existing FBI home zip codes and MWCOG travel demand model. The FBI estimates that approximately 50 percent of the existing FBI staff would retire, transfer to another FBI site outside the National Capital Region, or resign once the new HQ is operational; therefore, 50 percent of the distribution would be based on the FBI zip code database. The existing FBI home zip codes are used as the home origin and home destination. The other 50 percent of trips are based on distribution patterns in the Landover area from the 2020 MWCOG travel demand model for home-based work trips because the model trip tables represent a more local distribution reflecting new employee interest in residing close to the new FBI HQ (MWCOG 2014). The two distribution patterns (home zip code plus MWCOG trip tables) were averaged to form a blended trip distribution. Because the Mission Briefing Center external vehicle trips would most likely not resemble a localized trip pattern, the study used the same blended trip distribution for these vehicle trips.

Table 5-18 shows the Landover Site Transportation Agreement approved blended trip distribution percentages to/from each origin/destination. Note that the inbound versus outbound distribution patterns for vehicle trips destined to/from I-95 North and MD 704 are different, due to the expected travel pattern to reach U.S. Route 50 east of the site. It is assumed that inbound vehicles would use I-95/I-495 to U.S. Route 50 from the east and would use MD 704 NB north of the site to reach U.S. Route 50 East. Figure 5-5 depicts the Landover site trip distribution.

Table 5-18: Landover Site Trip Distribution Summary

Roadway and Direction	Percentages		AM Trips		PM Trips	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
I-95/I-495 NB North of Site	0.0%	17.5%	0	26	0	338
I-95/I-495 SB North of Site	23.0%	0.0%	471	0	23	0
I-95/I-495 South of Site	39.5%	39.5%	809	59	39	763
MD 704 NB North of Site	0.0%	9.0%	0	13	0	174
MD 704 SB North of Site	3.5%	0.0%	72	0	3	0
MD 202 WB	17.5%	17.5%	358	26	17	338
MD 202 EB	12.0%	12.0%	246	18	12	232
Lottsford Road EB	2.5%	2.5%	51	4	2	48
Sheriff Road WB	2.0%	2.0%	41	3	2	39
Total	**100.0%**	**100.0%**	**2,047**	**149**	**99**	**1,931**

Figure 5-5: Landover Site Trip Distribution



5.8.3 Entry Control Facility

The ECF is a security check point for all vehicles to pass through to access the internal roadway serving the parking garages, loading docks, and other components of the proposed Landover site. Each vehicle would be expected to stop at the facility while FBI security personnel screen the vehicle and occupants before allowing it to proceed. Similar to a tollgate along a highway, the ECF might cause a queue; therefore, the analysis must determine if a queue might spill beyond the planned driveway onto the street network.

The ECF has four elements: separate lanes for FBI security personnel to process each vehicle as it arrives at the Landover site; barriers separating each lane; a stop line where each vehicle would be processed; and a merging area after the processing area. Each of these components was coded in the TransModeler™ Traffic Simulation Software (TransModeler™) to best represent the conditions each vehicle would experience as it enters the Landover site. Based on the preliminary conceptual site plan, TransModeler™ allows the ECF components to be situated at their proper location based on the set-back distances already determined through the site plan planning process. Because the preliminary conceptual site plan called for six lanes serving the ECF from Brightseat Road, six lanes were initially coded to ensure enough capacity. The preliminary conceptual site plan called for one lane serving the ECF from Evarts Street; however, to avoid any potential delays two lanes were initially coded.

The ECF processing times are a critical component of the analysis because they determine the number of lanes required at each ECF to avoid the queue spilling onto the external roadways (Brightseat Road and Evarts Street in this case). It was determined that existing processing times at the JEH building would provide the best indication of future processing time at the three alternative sites. A special ECF processing study was undertaken on December 4, 2014, between 6:20 AM and 7:50 AM during the AM peak period. Processing times and vehicle occupancy were recorded for each vehicle (78 vehicles) entering the JEH parking garage under the building. A parking garage guard shift change occurred during the survey midpoint allowing approximately half the sampling during the first guard and half during the second guard, thereby providing a good cross section of processing times. Processing times ranged from 7 seconds for SOVs up to 103 seconds for vanpools.

Based on the processing times obtained through the survey, a probability triangle was created to develop a range of vehicle processing times to code into TransModeler™. These probabilities range from 10 percent to 90 percent, fitting a triangular distribution (a continuous probability distribution shaped like a triangle defined by three values: the minimum or 10th percentile value, the maximum or 90th percentile value, and the peak or 50th percentile value). Based on the survey, there was an average of 14.1 seconds per vehicle, which includes carpools and vanpools entering. Because the carpool and vanpools represent a small number of vehicles entering and have much higher processing times than SOVs, the average without those vehicles was calculated, resulting in 12.3 seconds per SOV vehicle. The 14.1 second value was assigned the 90th percentile, and the 12.3 seconds was assigned the 50th percentile. To be conservative, the 10th percentile was calculated based on the percent difference between 50th percentile value (12.3 seconds) and 90th percentile value (14.1 seconds). The difference of 1.73 percent subtracted from 12.3 seconds resulted in a 10th percentile value of 10.6 seconds per vehicle. Because TransModeler™ requires a percentage assigned to each processing time, the 15th and 85th percentiles were interpolated to fill in the remaining 30 percent in the processing times. Table 5-19 shows the processing probabilities.

Table 5-19: Processing Probabilities

	10th Percentile	15th Percentile	50th Percentile	85th Percentile	90th Percentile
Percentage used in TransModeler™	10	15	50	15	10
Vehicles per Second	10.6	10.8	12.3	13.9	14.1

Once the ECFs were coded, simulations were run to observe how TransModeler™ assigned each vehicle to the available lanes. Calibrations were entered to balance the use of available lanes, thus providing the highest capacity given the available queuing space. The ECF analysis was conducted after all the external roadway mitigation measures (recommended improvements to address failing traffic operations) were determined. This allowed for TransModeler™ to be coded with the recommended lane geometry (number of left-turn, through, and right-turn lanes) and traffic signal timings before testing the ECF queuing, thus the maximum number of inbound FBI vehicles would be entering the Landover site.

The ECF simulation analysis followed a statistical approach. This was performed by running the simulation 25 times to calculate the standard deviation based on the VHT metric. VHT provides a good indication of vehicle delays by requiring more simulations given facility operation and queuing issues. Using the calculated standard deviation, the number of simulations required was calculated to be within plus or minus 2 percent at the 95th percentile confidence interval (when all the required simulation runs are averaged, 95 percent of the results will be accurate to within plus or minus 2 percent).

Once the simulations were completed, three different measures were extracted from TransModeler™ to report the estimated queuing based on the total number of available lanes. These measures included vehicles processed per hour, average queue length (similar to the 50th percentile queue length) and maximum queue length (similar to a 100th percentile queue length). Together, these values provide an indication whether or not the available queue space would provide enough storage or the queue would impact Brightseat Road or Evarts Street.

Based on the ECF processing time probabilities entered into TransModeler™, the software reported an upper limit of approximately 200 vehicles per hour per entry lane being processed. By comparison, *Better Military Traffic Engineering Pamphlet 55-17* (SDDCTEA 2011), reports the lowest range of vehicle throughput for manually controlled operations as 300 vehicles per hour per lane. This value represents conditions at a military base under the BRAVO Force Protection alert status or a condition where each vehicle would be required to be inspected as well as each occupant. The ECF processing time, therefore, represents a reasonable and conservative estimate.

5.8.4 Development of Build Condition

Because multiple routes could be accessed between I-95/I-495 and the Landover site, TransModeler™ also performed the selection of which route to assign vehicle trips. Performing the vehicle assignments required validating and calibrating the TransModeler™-developed roadway network. Appendix D11 contains the TransModeler™ validation and calibration process.

Once calibrated and validated based on the existing conditions, the study area intersections (modeled network) were adjusted to match the optimized traffic signal settings calculated through the No-build Condition. This reflects adjusted signal timings based on the No-build Condition projected vehicle volumes because Maryland SHA likely would revise the traffic signals to improve the vehicle flow over the next 8 years, leading to 2022 projections based on vehicle volumes changing as a result of planned developments.

The Landover site internal roadway network was added to the modeled network based on the preliminary conceptual site plan, which includes roadway connections to the external network. Because of the magnitude of the proposed development in terms of FBI vehicle trips, the intersections serving the Landover site were designed with traffic signals and optimized to handle an estimate of the future Build Condition traffic volumes. These intersection upgrades are probably mitigation measures and are further analyzed in the Build with Mitigation Condition to determine their final recommended design. Synchro™ was used to develop the traffic signal timing plans and entry and exit driveway lane geometry based on forecasted FBI vehicle volumes. The following potential mitigation measures were coded to reflect necessary upgrades to the intersections serving the site driveways.

- Brightseat Road and Site West Exit/Maple Ridge Apartments north entrance: Install a new traffic signal at the northern Maple Ridge Apartment entrance that would also serve the site's west exit; create a three lane exit-only westbound approach with two left-turn lanes and one right-turn lane.
- Brightseat Road and Site West Entrance/ Maple Ridge Apartment south entrance: Reactivate the traffic signal to provide safe passage for the vehicles entering and exiting the apartments. For the Brightseat Road northbound approach, change the lane geometry to provide an approach with two right-turn lanes, two through lanes, and one left-turn lane.

The entry driveways leading to ECFs were coded to match or exceed the number of entry lanes designed in the preliminary conceptual site plan to minimize trip assignment (trip redistributions that would occur in the model) based on ECF facility delays. (Note that the revised conceptual site plan shows 10 total inbound lanes due to the analysis performed in the mitigation section; however, the preliminary conceptual site plan showed 7 total inbound lanes). These facilities are considered part of the preliminary conceptual site plan and are not mitigation measures. The following three locations were coded in TransModeler™ to serve as entrances or exits leading to or from the ECFs:

- Site West Entrance from Brightseat Road: Six-lane entry only
- Site West Exit to Brightseat Road: Three-lane exit only
- Site North Access to/from Evarts Street: Two-lane entry and two-lane exit

Once the modeled network contained the No-build Condition traffic signal timings, connections between the Landover site and external roadways, and traffic signals directly serving the proposed site driveways, TransModeler™ was used to assign vehicle trips to the modeled network through a dynamic traffic assignment (DTA). The DTA is a process where vehicle trips are assigned through a testing process during a number of simulation runs. The DTA goal is to develop a trip assignment that provides the best travel times for all vehicles. Once the vehicle travel times are minimized, the number of vehicles assigned to each route where multiple routes between the same origin and destination exist are balanced. This mimics the activity that commuters undertake when they seek alternative routes to avoid traffic delays. Commuters naturally improve traffic conditions where an alternative route has the capacity to handle the increase in vehicle volumes. To allow the software to test a number of options, the software was set for 30 simulation runs. At the conclusion of the simulation runs, the software recorded the version with the best vehicle travel times; these vehicle routes were used to perform the operation and queue analysis using Synchro™. Because there are not many alternative routes available, the DTA result provided a split in one inbound vehicle flow (from I-95/I-495 South) between the Arena Drive interchange and Landover Road interchange. Table 5-20 contains the DTA vehicle assignment. Figure 5-6 shows the Build Condition lane geometry, figure 5-7 shows the Build Condition trip generation turning movement volumes, and figure 5-8 shows Build Condition turning movement volumes.

Table 5-20: DTA Vehicle Assignments

Route Origin	Primary Route to Site	AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
I-95/I-495 North	Landover Road	100%	100%	100%	100%
I-95/I-495 South	Landover Road	46%	100%	100%	100%
	Arena Drive/Brightseat Road	54%	0%	0%	0%
Landover Road West	Landover Road	100%	100%	100%	100%
Landover Road East	Landover Road	100%	100%	100%	100%
Martin Luther King Jr. Highway North	Brightseat Road	100%	100%	100%	100%
Lottsford Road North	Landover Road	100%	100%	100%	100%
Sheriff Road West	Brightseat Road	100%	100%	100%	100%

Figure 5-6: Landover Build Condition Lane Geometry

Figure 5-6: Landover Build Condition Lane Geometry (continued)

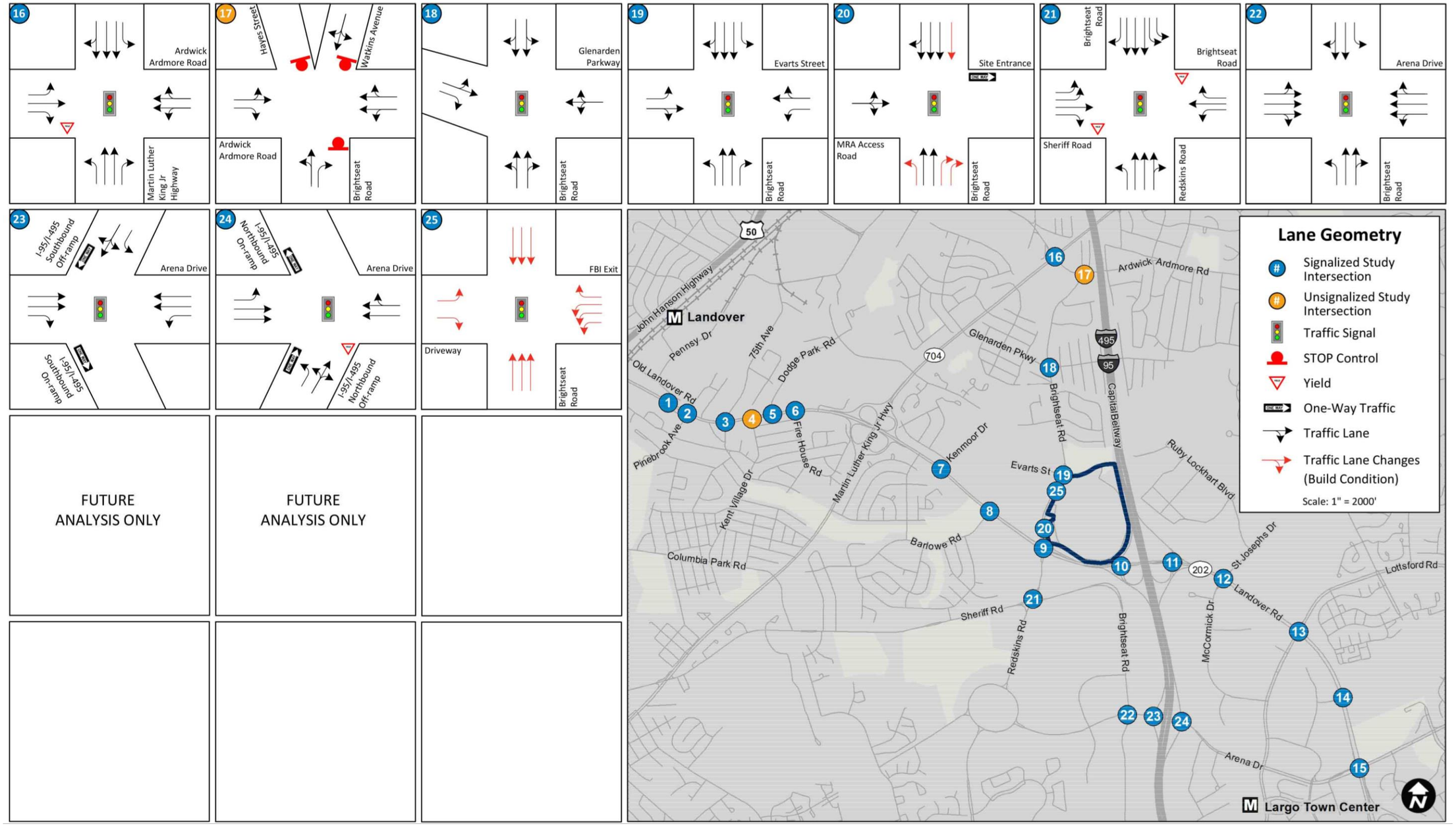


Figure 5-7: Landover Build Condition Trip Generation

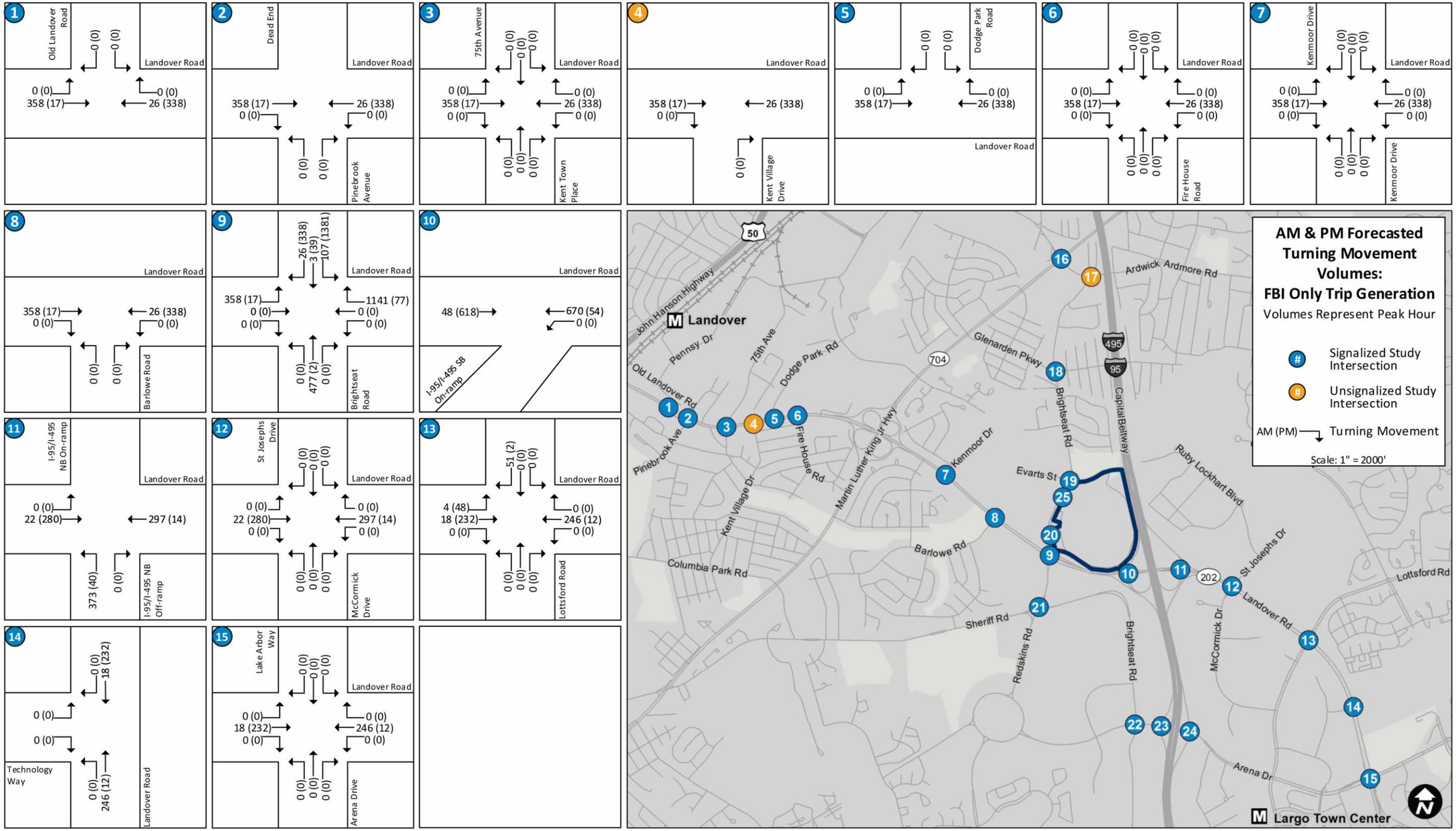


Figure 5-7: Landover Build Condition Trip Generation (continued)

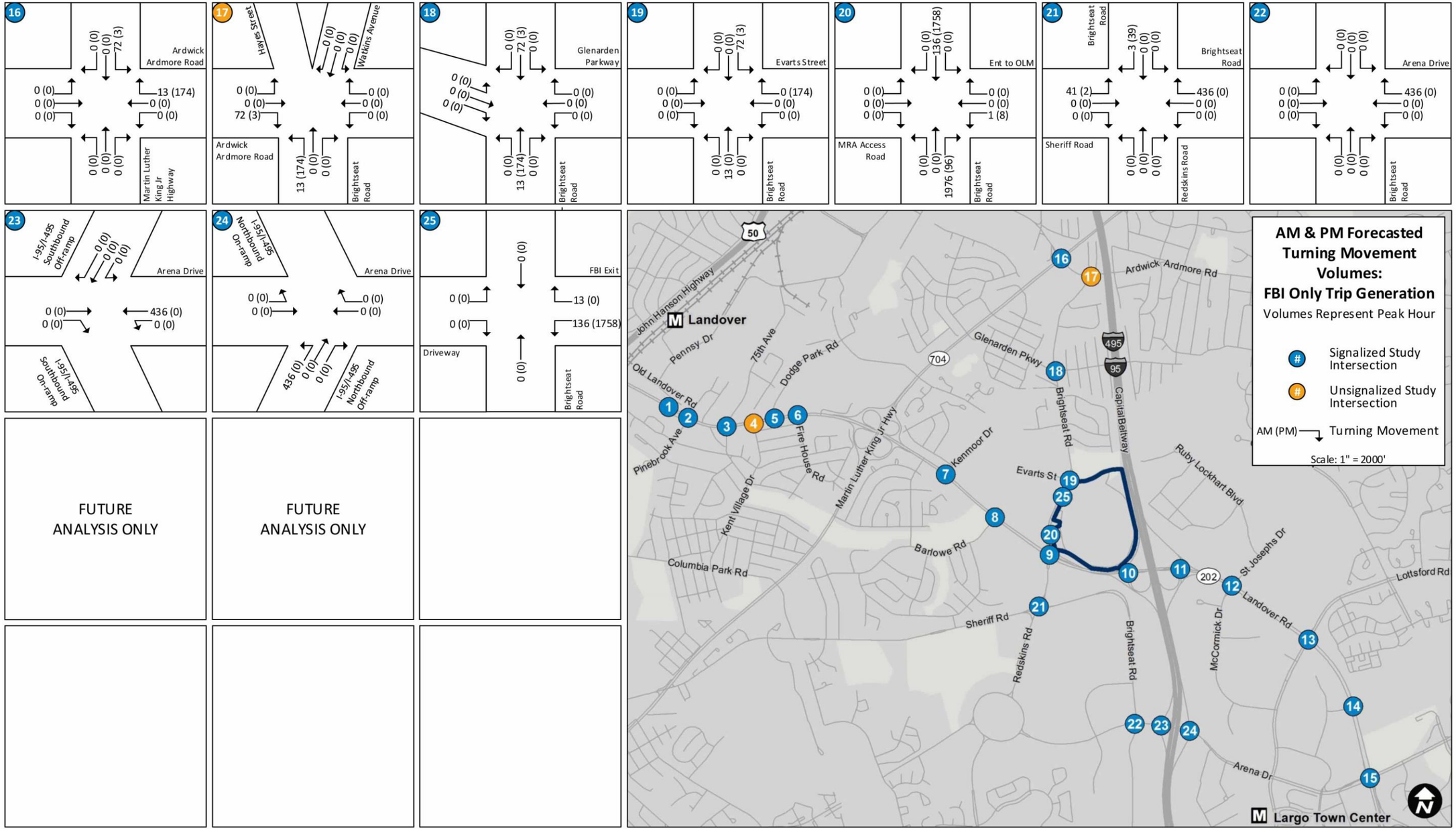


Figure 5-8: Landover Build Condition Turning Movement Volumes

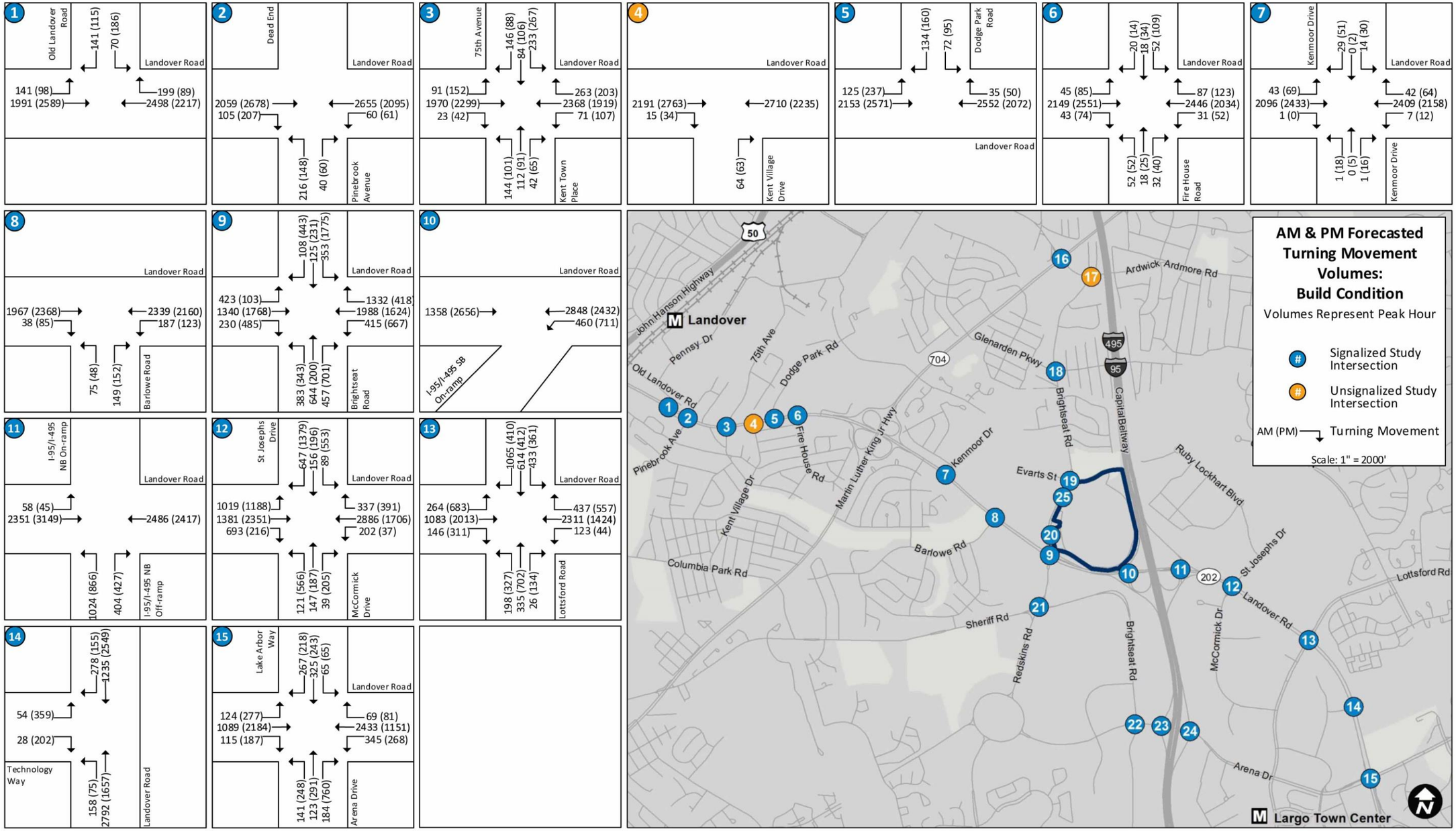
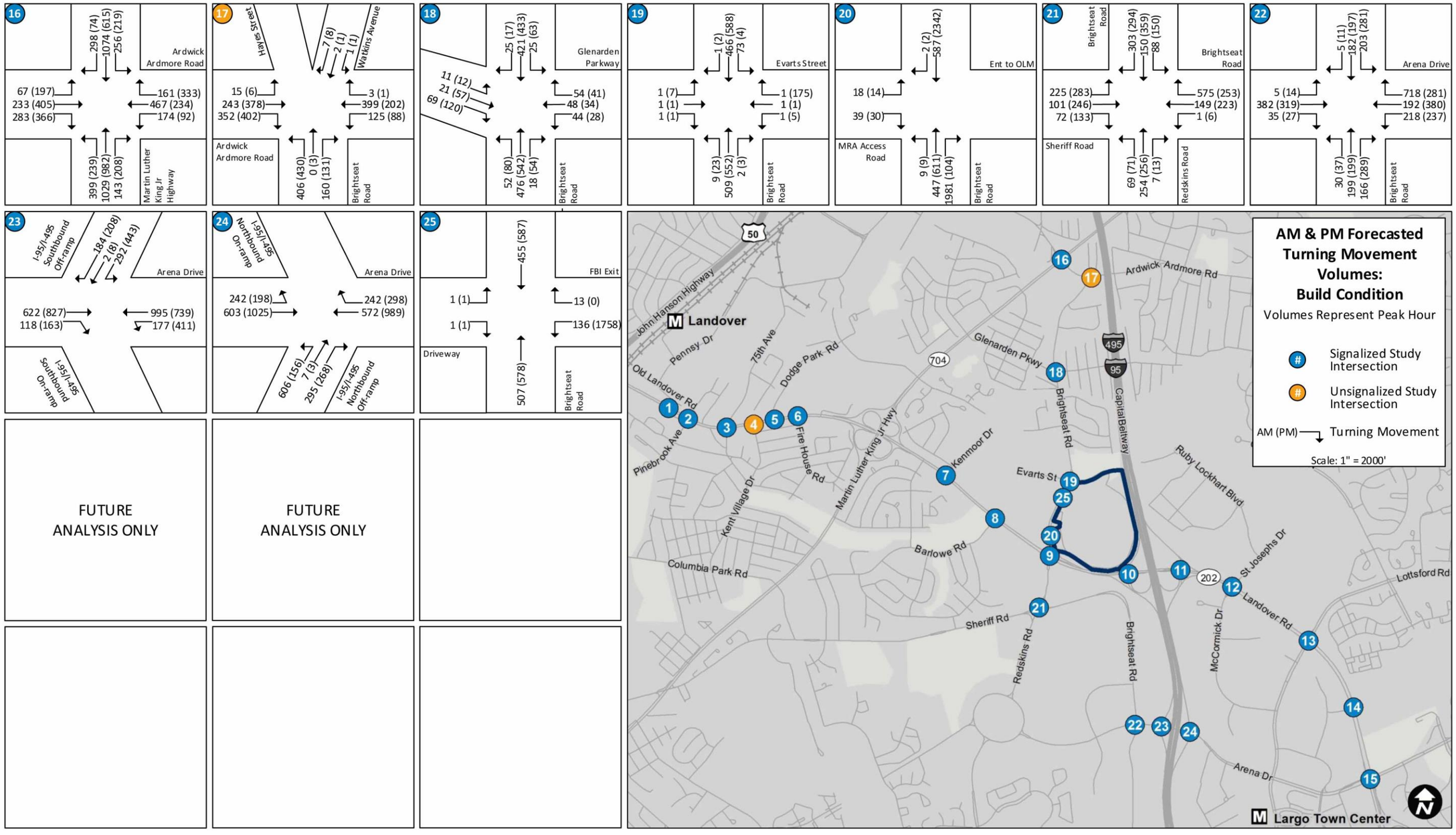


Figure 5-8: Landover Build Condition Turning Movement Volumes (continued)



5.8.5 Build Condition Operations Analysis

Synchro™ was used to calculate the vehicle delay and LOS operation based on the HCM 2000 method for each study area intersection. Custom-designed Excel sheets were used to calculate the LOS operation based on the CLV method.

5.8.5.1 Signalized Intersection Operations Analysis

Based on the Synchro™ and CLV-based Excel worksheet analysis, many of the signalized study area intersections would operate at acceptable overall conditions during the morning and afternoon peak hours. However, the following intersections in the study area would operate with overall unacceptable conditions, which include LOS E or LOS F using the HCM 2000 method or LOS F using the CLV method:

- Landover Road and Kent Town Place/75th Avenue would operate at CLV LOS F during the AM peak hour (same failure in No-build Condition)
- Landover Road and Brightseat Road would operate at HCM LOS F and CLV LOS F during the AM and PM peak hour (only a PM failure in No-build Condition)
- Landover Road and the I-95/I-495 Southbound On-ramp would operate at HCM LOS F and CLV LOS F during the PM peak hour (same failure in No-build Condition)
- Landover Road and the I-95/I-495 Northbound Off-ramp would operate at HCM LOS F and CLV LOS F during the AM peak hour and HCM LOS E and CLV LOS F during the PM peak hour (same failure in No-build Condition)
- Landover Road and St. Joseph's Drive/McCormick Drive would operates at HCM LOS E and CLV LOS F during the AM peak hour and HCM LOS F and CLV LOS F during the PM peak hour (only a PM failure in No-build Condition)
- Landover Road and Lottsford Road would operate at HCM LOS E during the PM peak hour (same failure in No-build Condition)
- Martin Luther King Jr. Highway and Ardwick-Ardmore Road would operate at LOS F for both HCM and CLV during the AM and PM peak hour (same failure in No-build Condition)
- Brightseat Road and Arena Drive would operate at CLV LOS F during the AM peak hour

Compared to the No-build Condition, one additional intersection would fail overall (Brightseat Road and Arena Drive), and two would have additional failures in either the AM or PM peak hour.

Based on the Synchro™ analysis, the following individual signalized intersection lane groups or overall approaches would operate under unacceptable conditions (LOS E or LOS F) during the morning or afternoon peak hours. The lane group within the approach that would be operating under unacceptable conditions is noted in parentheses; when "overall" is noted, the overall approach movements would operate under unacceptable conditions.

- Landover Road and Old Landover Road (Intersection #1)
    - Eastbound Landover Road (left turns) and southbound Old Landover Road (overall) during the AM peak hour
    - Southbound Old Landover Road (overall) during the PM peak hour
- Landover Road and Pinebrook Avenue (Intersection #2)
    - Northbound Pinebrook Avenue (overall) during both the AM peak hour

    - Northbound Pinebrook Avenue (overall) and westbound Landover Road (left turns) during the PM peak hour
- Landover Road and Kent Town Place/75th Avenue (Intersection #3)
    - Eastbound Landover Road (left turns), northbound Kent Town Place (left turns), and southbound 75th Avenue (overall) during the AM peak hour
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns), and southbound 75th Avenue (overall) during the PM peak hour
- Landover Road and Dodge Park Road (Intersection #5)
    - Eastbound Landover Road (left turns) and southbound Dodge Park Road (overall) during both the AM and PM peak hours
- Landover Road and Fire House Road (Intersection #6)
    - Northbound Fire House Road (overall) and southbound Fire House Road (overall) during the AM peak hour
    - Southbound Fire House Road (overall) at the same intersection during the PM peak hour
- Landover Road and Kenmoor Drive (Intersection #7)
    - Northbound Kenmoor Drive (overall) and southbound Kenmoor Drive (overall) during both the AM and PM peak hours
- Landover Road and Barlowe Road (Intersection #8)
    - Northbound Barlowe Road (overall) and westbound Landover Road (left turns) during the AM peak hour
    - Westbound Landover Road (left turns) and northbound Barlowe Road (overall) during the PM peak hour
- Landover Road and Brightseat Road (Intersection #9)
    - Eastbound (overall) and westbound (left turns) on Landover Road, southbound Brightseat Road (overall), and northbound Brightseat Road (overall) during the AM peak hour
    - Eastbound (left and through movements) and westbound (left turns) on Landover Road and both northbound and southbound (overall) on Brightseat Road during the PM peak hour
- Landover Road and I-95/I-495 Southbound On-Ramp (Intersection #10)
    - Eastbound Landover Road (overall) and westbound Landover Road (left turns) during the PM peak hour
- Landover Road and I-95/I-495 Northbound Off-Ramp (Intersection #11)
    - Eastbound (left turns) and westbound (overall) on Landover Road and northbound on the I-95/I-495 off ramp (overall) during the AM and PM peak hours
- Landover Road and St. Joseph's Drive/McCormick Drive (Intersection #12)
    - Eastbound (left turns) and westbound (overall) on Landover Road, northbound McCormick Drive (overall), and southbound St. Joseph's Drive (overall) during the AM peak hour
    - Eastbound Landover Road (overall), westbound Landover Road (overall), northbound McCormick Drive (overall), and southbound St. Joseph's Drive (overall) during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13)
    - Eastbound Landover Road (left turns), westbound Landover Road (left and through movements), northbound Lottsford Road (overall), and southbound Lottsford Road (left and combined left and through movements) during the AM peak hour
    - Eastbound Landover Road (overall), westbound Landover Road (left and through movements), northbound Lottsford Road (overall), and southbound Lottsford Road (overall) during the PM peak hour
- Landover Road and Technology Way (Intersection #14)
    - Eastbound Technology Way (overall) during both the AM and PM peak hours
    - Northbound Landover Road (left turns) during the PM peak hour

- Landover Road and Arena Drive/Lake Arbor Way (Intersection #15)
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns), northbound Arena Drive (left and through movements), and southbound Lake Arbor Way (overall) at the intersection of Landover Road and Arena Drive/Lake Arbor Way during both the AM and PM peak hours
- Martin Luther King Jr Highway (MLK Jr Hwy) and Ardwick-Ardmore Road (Intersection #16)
    - Eastbound and westbound Ardwick-Ardmore Road (overall), northbound (lefts) and southbound (overall) on Martin Luther King Jr. Highway during the AM peak hour
    - Eastbound Ardwick-Ardmore Road (throughs), westbound Ardwick-Ardmore Road (overall), northbound (lefts and throughs) and southbound (overall) on Martin Luther King Jr. Highway during both the PM peak hour
- Brightseat Road and Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd) (formerly unsignalized in No–build Condition) (Intersection #20)
    - Northbound Brightseat Road (left turns) during the AM peak hour
- Brightseat Road/Redskins Road and Sheriff Road/Brightseat Road (Intersection #21)
    - Eastbound Sheriff Road (overall), westbound Brightseat Road (overall), and southbound Brightseat Road (left turns) during the AM peak hour
    - Westbound Brightseat Road (through movements) during the PM peak hour
- Arena Drive and I-95/I-495 Southbound Ramps (Intersection #23)
    - Southbound I-95/I-495 off-ramp (overall) during both the AM and PM peak hours
- Arena Drive and I-95/I-495 Northbound Ramps (Intersection #24)
    - Northbound I-95/I-495 NB Off-Ramp (overall) during the AM peak hour
    - Eastbound Arena Drive (left turns) during the PM peak hour

5.8.5.2 Unsignalized Intersection Operations Analysis

Based on the unsignalized intersection analysis, similar to the No-build Condition, only the intersection of Brightseat Road and Ardwick-Ardmore Road (Intersection #17) would operate with the northbound Brightseat Road approach (overall) exceeding an average control delay of 35 seconds during the AM peak hour. The two other unsignalized intersections in the study area would operate with no failing minor street approaches during the AM and PM peak hours.

5.8.5.3 Complete Intersection Operations Analysis

This section summarizes the differences in LOS impacts between the Build Condition and the No-build Condition by quantifying the change in intersection operation failures. Following the summary, this section also includes the complete results of the operations analysis in figures and a table.

A total of 19 signalized intersections and 1 unsignalized intersection would experience unacceptable conditions for one or more turning movements. Compared to the No-build Condition, the Build Condition would have three more intersections failing during the AM peak hour and there would be one more intersection failing during the PM peak hour. In the AM peak hour, compared to the No-build Condition, there are three intersections that passed overall but would now fail, 22 that would not change, and zero that were failing but would now pass. In the PM peak hour, one intersection that passed overall would now fail, 24 that would not change, and zero that were failing but would now pass.

Table 5-21 provides a summary of the number of intersections that meet the following criteria for the overall directional approach that would change between the Build Condition and the No-build Condition:

Table 5-21: Intersection Operations Summary Comparing No-build Condition to Build Condition

Type of Change Between Conditions	AM	PM
New Failing Approach	1	0
Additional Failing Approaches	4	2
No Change	20	23
Fewer Failing Approaches	0	0
No Failing Approaches	0	0
Total Signalized and Unsignalized Intersections Affected	**25**	**25**

The average LOS for the various approaches to the intersections and the overall intersection LOS grades for the Build Condition are shown in figures 5-9 and 5-10 for the AM and PM peak hours, respectively. Table 5-22 shows the results of the LOS capacity analysis and the intersection projected delay under the No-build Condition compared to the Build Condition during the AM and PM peak hours.

Figure 5-9: Build Condition Intersection LOS for AM Peak Hour

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.
[*] = Unsignalized intersection requires attention due to failing minor approach movement.

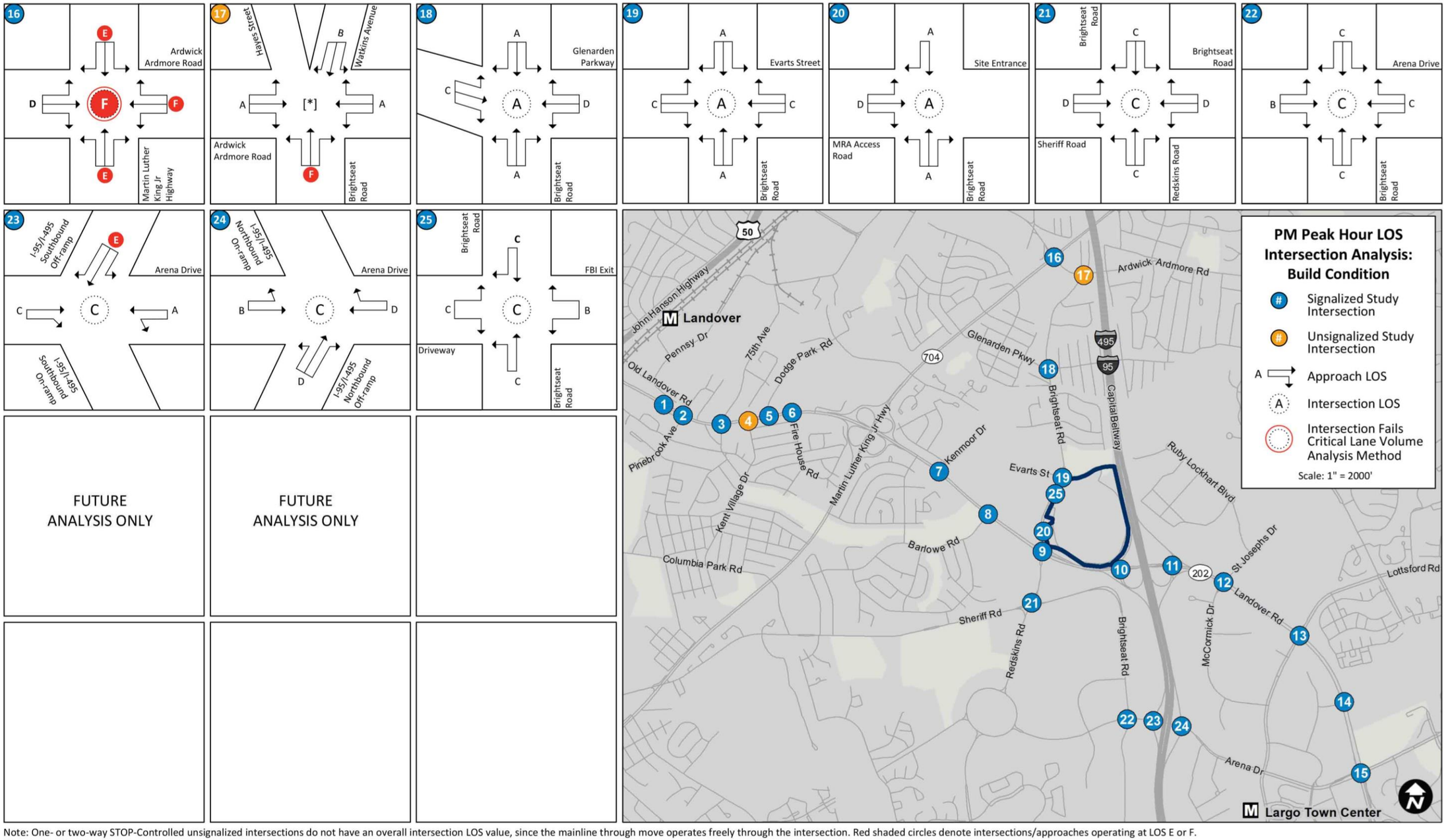
Figure 5-9: Build Condition Intersection LOS for AM Peak Hour (continued)

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.
[*] = Unsignalized intersection requires attention due to failing minor approach movement.

Figure 5-10: Build Condition Intersection LOS for PM Peak Hour

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.
[*] = Unsignalized intersection requires attention due to failing minor approach movement.

Figure 5-10: Build Condition Intersection LOS for PM Peak Hour (continued)



Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.
[*] = Unsignalized intersection requires attention due to failing minor approach movement.

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition								
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour			
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV	
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
1	**Landover Road & Old Landover Road (Signalized)**																				
	EB (Landover Rd)	L	58.5	E				22.2	C				58.7	E				46.1	D		
	EB (Landover Rd)	T	2.3	A				6.2	A				2.7	A				6.2	A		
	EB Overall (Landover Rd)		**6.8**	**A**				**6.8**	**A**				**6.4**	**A**				**7.7**	**A**		
	WB (Landover Rd)	TR	4.7	A				4.4	A				4.7	A				4.7	A		
	WB Overall (Landover Rd)		**4.7**	**A**				**4.4**	**A**				**4.7**	**A**				**4.7**	**A**		
	SB (Old Landover Rd)	LR	66.9	E				65.9	E				66.9	E				65.9	E		
	SB Overall (Old Landover Rd)		**66.9**	**E**				**65.9**	**E**				**66.9**	**E**				**65.9**	**E**		
	Overall		**8.3**	**A**	**1,438**	**D**	**Pass**	**9.4**	**A**	**1,179**	**C**	**Pass**	**8.0**	**A**	**1,447**	**D**	**Pass**	**9.7**	**A**	**1,234**	**C**	**Pass**
2	**Landover Road & Pinebrook Avenue (Signalized)**																				
	EB (Landover Rd)	TR	10.4	B				11.2	B				12.3	B				11.3	B		
	EB Overall (Landover Rd)		**10.4**	**B**				**11.2**	**B**				**12.3**	**B**				**11.3**	**B**		
	WB (Landover Rd)	L	19.7	B				57.3	E				35.0	D				58.0	E		
	WB (Landover Rd)	T	3.1	A				1.9	A				3.1	A				1.7	A		
	WB Overall (Landover Rd)		**3.5**	**A**				**3.8**	**A**				**3.8**	**A**				**3.3**	**A**		
	NB (Pinebrook Ave)	L	68.2	E				71.2	E				68.2	E				71.2	E		
	NB (Pinebrook Ave)	R	52.6	D				58.5	E				52.6	D				58.5	E		
	NB Overall (Pinebrook Ave)		**65.7**	**E**				**67.5**	**E**				**65.7**	**E**				**67.5**	**E**		
	Overall		**9.5**	**A**	**1,189**	**C**	**Pass**	**10.8**	**B**	**1,401**	**D**	**Pass**	**10.5**	**B**	**1,198**	**C**	**Pass**	**10.2**	**B**	**1,407**	**D**	**Pass**
3	**Landover Road & Kent Town Place/75th Avenue (Signalized)**																				
	EB (Landover Rd)	L	95.6	F				76.5	E				91.2	F				80.3	F		
	EB (Landover Rd)	TR	12.0	B				22.0	C				13.0	B				22.5	C		
	EB Overall (Landover Rd)		**16.4**	**B**				**25.4**	**C**				**16.4**	**B**				**26.0**	**C**		
	WB (Landover Rd)	L	31.8	C				69.5	E				43.7	D				65.0	E		
	WB (Landover Rd)	TR	19.7	B				17.8	B				21.2	C				26.3	C		
	WB Overall (Landover Rd)		**20.0**	**C**				**20.7**	**C**				**21.8**	**C**				**28.2**	**C**		
	NB (Kent Town Pl)	L	61.0	E				41.6	D				61.0	E				41.6	D		
	NB (Kent Town Pl)	TR	42.9	D				39.6	D				42.9	D				39.6	D		
	NB Overall (Kent Town Pl)		**51.6**	**D**				**40.4**	**D**				**51.6**	**D**				**40.4**	**D**		
	SB (75th Ave)	L	98.8	F				84.0	F				98.8	F				84.0	F		
	SB (75th Ave)	TR	45.0	D				40.8	D				45.0	D				40.8	D		
	SB Overall (75th Ave)		**72.1**	**E**				**65.8**	**E**				**72.1**	**E**				**65.8**	**E**		
	Overall		**25.3**	**C**	**1,608**	**F**	**Fail**	**28.0**	**C**	**1,416**	**D**	**Pass**	**25.5**	**C**	**1,617**	**F**	**Fail**	**30.9**	**C**	**1,488**	**E**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition									
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
4	**Landover Road & Kent Village Drive (TWSC)**																				
	EB (Landover Rd)	TR	-	-				-	-				-	-				-	-			
	EB Overall (Landover Rd)		**-**	**-**				**-**	**-**				**-**	**-**				**-**	**-**			
	WB (Landover Rd)	T	-	-				-	-				-	-				-	-			
	WB Overall (Landover Rd)		**-**	**-**				**-**	**-**				**-**	**-**				**-**	**-**			
	NB (Kent Village Dr)	R	9.8	A				12.0	B				10.5	B				12.1	B			
	NB Overall (Kent Village Dr)		**9.8**	**A**				**12.0**	**B**				**10.5**	**B**				**12.1**	**B**			
	Overall		**0.1**	**-**	**N/A**	**N/A**	**Pass**	**0.2**	**-**	**N/A**	**N/A**	**Pass**	**0.1**	**-**	**N/A**	**N/A**	**Pass**	**0.1**	**-**	**N/A**	**N/A**	**Pass**
5	**Landover Road & Dodge Park Road (Signalized)**																				
	EB (Landover Rd)	L	74.2	E				74.8	E				71.3	E				74.6	E			
	EB (Landover Rd)	T	1.7	A				2.1	A				2.0	A				2.1	A			
	EB Overall (Landover Rd)		**6.5**	**A**				**8.3**	**A**				**5.8**	**A**				**8.2**	**A**			
	WB (Landover Rd)	TR	2.6	A				8.5	A				2.6	A				9.1	A			
	WB Overall (Landover Rd)		**2.6**	**A**				**8.5**	**A**				**2.6**	**A**				**9.1**	**A**			
	SB (Dodge Park Rd)	L	68.3	E				67.3	E				68.3	E				67.3	E			
	SB (Dodge Park Rd)	R	62.8	E				61.1	E				62.8	E				61.1	E			
	SB Overall (Dodge Park Rd)		**64.7**	**E**				**63.4**	**E**				**64.7**	**E**				**63.4**	**E**			
	Overall		**6.9**	**A**	**1,167**	**C**	**Pass**	**11.2**	**B**	**1,040**	**B**	**Pass**	**6.6**	**A**	**1,176**	**C**	**Pass**	**11.3**	**B**	**1,149**	**B**	**Pass**
6	**Landover Road & Fire House Road (Signalized)**																				
	EB (Landover Rd)	L	30.0	C				28.7	C				29.7	C				46.4	D			
	EB (Landover Rd)	TR	5.8	A				8.8	A				6.6	A				8.9	A			
	EB Overall (Landover Rd)		**6.4**	**A**				**9.4**	**A**				**7.1**	**A**				**10.1**	**B**			
	WB (Landover Rd)	L	2.7	A				29.2	C				28.1	C				29.5	C			
	WB (Landover Rd)	TR	5.3	A				17.0	B				5.4	A				20.2	C			
	WB Overall (Landover Rd)		**5.3**	**A**				**17.4**	**B**				**5.6**	**A**				**20.4**	**C**			
	NB (Fire House Rd)	LTR	65.3	E				53.2	D				65.3	E				53.2	D			
	NB Overall (Fire House Rd)		**65.3**	**E**				**53.2**	**D**				**65.3**	**E**				**53.2**	**D**			
	SB (Fire House Rd)	LTR	63.4	E				63.3	E				63.4	E				63.3	E			
	SB Overall (Fire House Rd)		**63.4**	**E**				**63.3**	**E**				**63.4**	**E**				**63.3**	**E**			
	Overall		**8.2**	**A**	**1,186**	**C**	**Pass**	**15.3**	**B**	**1,295**	**C**	**Pass**	**8.6**	**A**	**1,196**	**C**	**Pass**	**17.0**	**B**	**1,301**	**D**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition								
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour			
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV	
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
7	**Landover Road & Kenmoor Drive (Signalized)**																				
	EB (Landover Rd)	L	28.5	C				5.3	A				31.0	C				12.0	B			
	EB (Landover Rd)	TR	3.9	A				3.6	A				3.9	A				3.6	A			
	EB Overall (Landover Rd)		**4.5**	**A**				**3.6**	**A**				**4.5**	**A**				**3.8**	**A**			
	WB (Landover Rd)	L	8.2	A				6.8	A				9.6	A				7.8	A			
	WB (Landover Rd)	TR	10.4	B				1.9	A				10.5	B				3.8	A			
	WB Overall (Landover Rd)		**10.4**	**B**				**2.0**	**A**				**10.4**	**B**				**3.8**	**A**			
	NB (Kenmoor Dr)	LTR	66.6	E				83.0	F				66.6	E				83.0	F			
	NB Overall (Kenmoor Dr)		**66.6**	**E**				**83.0**	**F**				**66.6**	**E**				**83.0**	**F**			
	SB (Kenmoor Dr)	LT	68.4	E				86.4	F				68.4	E				86.4	F			
	SB (Kenmoor Dr)	R	66.7	E				79.9	E				66.7	E				79.9	E			
	SB Overall (Kenmoor Dr)		**67.3**	**E**				**82.5**	**F**				**67.3**	**E**				**82.5**	**F**			
	Overall		**8.5**	**A**	**956**	**A**	**Pass**	**5.1**	**A**	**977**	**A**	**Pass**	**8.2**	**A**	**966**	**A**	**Pass**	**5.8**	**A**	**983**	**A**	**Pass**
8	**Landover Road & Barlowe Road (Signalized)**																				
	EB (Landover Rd)	TR	3.7	A				7.9	A				5.3	A				8.0	A			
	EB Overall (Landover Rd)		**3.7**	**A**				**7.9**	**A**				**5.3**	**A**				**8.0**	**A**			
	WB (Landover Rd)	L	45.3	D				84.5	F				64.9	E				71.7	E			
	WB (Landover Rd)	T	1.0	A				0.4	A				0.7	A				1.6	A			
	WB Overall (Landover Rd)		**4.3**	**A**				**5.7**	**A**				**5.4**	**A**				**5.4**	**A**			
	NB (Barlowe Rd)	L	66.5	E				82.0	F				66.5	E				82.0	F			
	NB (Barlowe Rd)	R	61.9	E				78.5	E				61.9	E				78.5	E			
	NB Overall (Barlowe Rd)		**63.4**	**E**				**79.3**	**E**				**63.4**	**E**				**79.3**	**E**			
	Overall		**7.1**	**A**	**931**	**A**	**Pass**	**10.1**	**B**	**1,072**	**B**	**Pass**	**8.1**	**A**	**1,004**	**B**	**Pass**	**9.7**	**A**	**1,079**	**B**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition										Build Condition									
			AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
9	**Landover Road & Brightseat Road (Signalized)**																					
	EB (Landover Rd)	L	60.7	E				93.5	F				659.2	F				98.5	F			
	EB (Landover Rd)	T	35.7	D				56.0	E				44.7	D				56.0	E			
	EB (Landover Rd)	R	36.8	D				16.7	B				65.8	E				17.5	B			
	EB Overall (Landover Rd)		**36.9**	**D**				**49.2**	**D**				**177.6**	**F**				**50.0**	**D**			
	WB (Landover Rd)	L	71.0	E				106.7	F				67.6	E				106.2	F			
	WB (Landover Rd)	T	27.5	C				28.1	C				35.2	D				28.0	C			
	WB (Landover Rd)	R	0.1	A				0.3	A				7.4	A				0.3	A			
	WB Overall (Landover Rd)		**32.4**	**C**				**44.4**	**D**				**28.9**	**C**				**43.0**	**D**			
	NB (Brightseat Rd)	L	54.5	D				73.4	E				60.7	E				91.1	F			
	NB (Brightseat Rd)	TR	43.7	D				90.5	F				265.3	F				127.6	F			
	NB (Brightseat Rd)	R	31.1	C				47.4	D				38.2	D				47.6	D			
	NB Overall (Brightseat Rd)		**45.0**	**D**				**73.6**	**E**				**161.5**	**F**				**95.0**	**F**			
	SB (Brightseat Rd)	L	64.6	E				92.8	F				70.2	E				1252.9	F			
	SB (Brightseat Rd)	LT	61.8	E				81.8	F				60.1	E				642.4	F			
	SB (Brightseat Rd)	R	**55.2**	**E**				64.3	E				52.5	D				311.4	F			
	SB Overall (Brightseat Rd)		**61.4**	**E**				**82.3**	**F**				**61.8**	**E**				**803.5**	**F**			
	Overall		**38.2**	**D**	**1,220**	**C**	**Pass**	**55.1**	**E**	**1,686**	**F**	**Fail**	**94.6**	**F**	**1,750**	**F**	**Fail**	**264.9**	**F**	**2,537**	**F**	**Fail**
10	**Landover Road & I-95/I-495 Southbound On-Ramp (Signalized)**																					
	EB (Landover Rd)	T	16.2	B				67.5	E				14.4	B				229.0	F			
	EB (Landover Rd)	R	0.8	A				0.9	A				0.8	A				119.3	F			
	EB Overall (Landover Rd)		**11.0**	**B**				**46.6**	**D**				**9.7**	**A**				**186.3**	**F**			
	WB (Landover Rd)	L	18.1	B				92.4	F				20.0	C				92.3	F			
	WB (Landover Rd)	T	0.1	A				0.1	A				0.3	A				0.1	A			
	WB Overall (Landover Rd)		**3.2**	**A**				**21.4**	**C**				**3.1**	**A**				**21.0**	**C**			
	Overall		**6.5**	**A**	**1,181**	**C**	**Pass**	**27.7**	**C**	**1,832**	**F**	**Fail**	**5.5**	**A**	**1,207**	**C**	**Pass**	**97.5**	**F**	**2,172**	**F**	**Fail**
11	**Landover Road & I-95/I-495 Northbound Off-Ramp (Signalized)**																					
	EB (Landover Rd)	L	193.8	F				116.0	F				190.7	F				114.7	F			
	EB (Landover Rd)	T	12.6	B				12.9	B				12.2	B				16.7	B			
	EB (Landover Rd)	R	0.1	A				**0.0**	**A**				0.1	A				**0.0**	**A**			
	EB Overall (Landover Rd)		**15.8**	**B**				13.9	B				**15.3**	**B**				15.8	B			
	WB (Landover Rd)	T	48.3	D				100.0	F				112.0	F				103.2	F			
	WB Overall (Landover Rd)		**48.3**	**D**				**100.0**	**F**				**112.0**	**F**				**103.2**	**F**			
	NB (I-95/I-495 NB Off-Ramp)	L	86.0	F				160.6	F				306.8	F				183.7	F			
	NB (I-95/I-495 NB Off-Ramp)	R	154.6	F				162.5	F				154.6	F				162.5	F			
	NB Overall (I-95/I-495 NB Off-Ramp)		**112.3**	**F**				**161.3**	**F**				**263.7**	**F**				**176.7**	**F**			
	Overall		**45.6**	**D**	**1,666**	**F**	**Fail**	**72.4**	**E**	**1,863**	**F**	**Fail**	**106.6**	**F**	**2,039**	**F**	**Fail**	**72.7**	**E**	**1,894**	**F**	**Fail**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition								
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour			
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV	
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
12	**Landover Road & St Josephs Drive/McCormick Drive (Signalized)**																				
	EB (Landover Rd)	L	109.2	F				138.1	F				108.4	F				139.6	F		
	EB (Landover Rd)	T	21.3	C				39.6	D				22.1	C				42.1	D		
	EB (Landover Rd)	R	0.8	A				0.1	A				0.8	A				0.1	A		
	EB Overall (Landover Rd)		**45.8**	**D**				**70.8**	**E**				**45.8**	**D**				**70.5**	**E**		
	WB (Landover Rd)	L	80.9	F				129.9	F				78.7	E				127.5	F		
	WB (Landover Rd)	T	57.1	E				75.1	E				110.2	F				80.3	F		
	WB (Landover Rd)	R	13.9	B				219.3	F				17.2	B				195.4	F		
	WB Overall (Landover Rd)		**54.0**	**D**				**102.7**	**F**				**99.2**	**F**				**102.2**	**F**		
	NB (McCormick Dr)	L	61.3	E				151.1	F				61.3	E				151.1	F		
	NB (McCormick Dr)	LT	121.4	F				163.9	F				121.4	F				163.9	F		
	NB (McCormick Dr)	R	0.0	A				0.2	A				0.0	A				0.2	A		
	NB Overall (McCormick Dr)		**84.7**	**F**				**122.2**	**F**				**84.7**	**F**				**122.2**	**F**		
	SB (St Josephs Dr)	L	60.2	E				65.8	E				60.2	E				65.8	E		
	SB (St Josephs Dr)	LT	111.3	F				69.3	E				111.3	F				69.3	E		
	SB (St Josephs Dr)	R	43.9	D				108.1	F				43.9	D				108.1	F		
	SB Overall (St Josephs Dr)		**57.9**	**E**				**93.7**	**F**				**57.9**	**E**				**93.7**	**F**		
	Overall		**52.3**	**D**	**1,546**	**E**	**Pass**	**89.9**	**F**	**1,921**	**F**	**Fail**	**72.4**	**E**	**1,632**	**F**	**Fail**	**89.1**	**F**	**1,925**	**F**	**Fail**
13	**Landover Road & Lottsford Road (Signalized)**																				
	EB (Landover Rd)	L	87.2	F				97.0	F				88.8	F				115.3	F		
	EB (Landover Rd)	T	49.8	D				62.0	E				49.5	D				72.7	E		
	EB (Landover Rd)	R	0.1	A				0.2	A				0.1	A				0.2	A		
	EB Overall (Landover Rd)		**51.5**	**D**				**63.1**	**E**				**51.6**	**D**				**74.9**	**E**		
	WB (Landover Rd)	L	83.9	F				142.6	F				83.7	F				142.4	F		
	WB (Landover Rd)	T	35.2	D				54.0	D				57.2	E				55.9	E		
	WB (Landover Rd)	R	16.0	B				46.3	D				22.4	C				49.4	D		
	WB Overall (Landover Rd)		**34.3**	**C**				**53.8**	**D**				**53.0**	**D**				**56.0**	**E**		
	NB (Lottsford Rd)	L	59.4	E				56.8	E				59.4	E				56.8	E		
	NB (Lottsford Rd)	LT	74.1	E				93.7	F				74.5	E				93.7	F		
	NB (Lottsford Rd)	R	0.0	A				0.1	A				0.0	A				0.1	A		
	NB Overall (Lottsford Rd)		**66.0**	**E**				**73.6**	**E**				**66.3**	**E**				**73.6**	**E**		
	SB (Lottsford Rd)	L	82.2	F				121.5	F				81.8	F				121.5	F		
	SB (Lottsford Rd)	LT	71.0	E				101.7	F				71.0	E				101.7	F		
	SB (Lottsford Rd)	R	2.7	A				0.4	A				3.2	A				0.4	A		
	SB Overall (Lottsford Rd)		**39.2**	**D**				**71.0**	**E**				**38.5**	**D**				**70.8**	**E**		
	Overall		**42.2**	**D**	**1,507**	**E**	**Pass**	**63.5**	**E**	**1,531**	**E**	**Fail**	**49.4**	**D**	**1,581**	**E**	**Pass**	**68.8**	**E**	**1,564**	**E**	**Fail**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition								
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour			
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV	
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
14	**Landover Road & Technology Way (Signalized)**																				
	EB (Technology Way)	L	75.3	E				88.1	F			75.3	E				88.1	F			
	EB (Technology Way)	R	66.4	E				57.5	E			66.4	E				57.6	E			
	EB Overall (Technology Way)		**72.3**	**E**				**77.1**	**E**			**72.3**	**E**				**77.1**	**E**			
	NB (Landover Rd)	L	4.7	A				56.7	E			4.3	A				64.2	E			
	NB (Landover Rd)	T	1.3	A				10.6	B			1.9	A				10.5	B			
	NB Overall (Landover Rd)		**1.5**	**A**				**12.6**	**B**			**2.0**	**A**				**12.9**	**B**			
	SB (Landover Rd)	T	1.3	A				6.6	A			1.4	A				8.8	A			
	SB (Landover Rd)	R	1.0	A				1.7	A			1.0	A				1.3	A			
	SB Overall (Landover Rd)		**1.3**	**A**				**6.3**	**A**			**1.3**	**A**				**8.4**	**A**			
	Overall		**2.8**	**A**	**1,154**	**C**	**Pass**	**17.0**	**B**	**1,291**	**C**	**Pass**	**3.0**	**A**	**1,245**	**C**	**Pass**	**17.7**	**B**	**1,377**	**D**	**Pass**
15	**Landover Road & Arena Drive/Lake Arbor Way (Signalized)**																				
	EB (Landover Rd)	L	59.6	E				90.9	F			59.7	E				88.1	F			
	EB (Landover Rd)	T	22.2	C				16.6	B			22.4	C				19.9	B			
	EB (Landover Rd)	R	0.1	A				0.1	A			0.1	A				0.1	A			
	EB Overall (Landover Rd)		**23.8**	**C**				**23.8**	**C**			**24.0**	**C**				**25.6**	**C**			
	WB (Landover Rd)	L	68.3	E				83.0	F			68.3	E				83.0	F			
	WB (Landover Rd)	T	25.7	C				22.6	C			30.0	C				22.7	C			
	WB (Landover Rd)	R	13.1	B				17.5	B			13.1	B				17.5	B			
	WB Overall (Landover Rd)		**31.0**	**C**				**33.2**	**C**			**34.2**	**C**				**33.2**	**C**			
	NB (Arena Dr)	L	72.0	E				82.1	F			72.0	E				82.1	F			
	NB (Arena Dr)	T	66.9	E				76.8	E			66.9	E				76.8	E			
	NB (Arena Dr)	R	0.2	A				1.2	A			0.2	A				1.2	A			
	NB Overall (Arena Dr)		**41.1**	**D**				**33.6**	**C**			**41.1**	**D**				**33.6**	**C**			
	SB (Lake Arbor Way)	L	55.8	E				74.8	E			55.8	E				74.8	E			
	SB (Lake Arbor Way)	T	61.7	E				80.3	F			61.7	E				80.3	F			
	SB (Lake Arbor Way)	R	65.8	E				73.0	E			65.8	E				73.1	E			
	SB Overall (Lake Arbor Way)		**62.8**	**E**				**76.6**	**E**			**62.8**	**E**				**76.6**	**E**			
	Overall		**34.2**	**C**	**1,161**	**C**	**Pass**	**33.3**	**C**	**1,166**	**C**	**Pass**	**35.8**	**D**	**1,252**	**C**	**Pass**	**33.7**	**C**	**1,252**	**C**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition								
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour			
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV	
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
16	**Martin Luther King Jr Highway (MLK Jr Hwy) & Ardwick-Ardmore Road (Signalized)**																				
	EB (Ardwick Ardmore Rd)	L	67.4	E				53.0	D				67.4	E				53.0	D			
	EB (Ardwick Ardmore Rd)	T	185.6	F				97.4	F				185.6	F				97.4	F			
	EB (Ardwick Ardmore Rd)	R	0.3	A				0.4	A				0.3	A				0.4	A			
	EB Overall (Ardwick Ardmore Rd)		**82.0**	**F**				**51.7**	**D**				**82.0**	**F**				**51.7**	**D**			
	WB (Ardwick Ardmore Rd)	LTR	167.7	F				114.4	F				175.7	F				207.7	F			
	WB Overall (Ardwick Ardmore Rd)		**167.7**	**F**				**114.4**	**F**				**175.7**	**F**				**207.7**	**F**			
	NB (MLK Jr Hwy)	L	161.2	F				82.2	F				161.2	F				82.2	F			
	NB (MLK Jr Hwy)	T	50.6	D				67.5	E				50.6	D				67.5	E			
	NB (MLK Jr Hwy)	R	32.5	C				41.7	D				32.5	C				41.7	D			
	NB Overall (MLK Jr Hwy)		**77.0**	**E**				**66.2**	**E**				**77.0**	**E**				**66.2**	**E**			
	SB (MLK Jr Hwy)	L	125.8	F				117.6	F				257.8	F				121.0	F			
	SB (MLK Jr Hwy)	TR	77.9	E				51.3	D				77.9	E				51.3	D			
	SB Overall (MLK Jr Hwy)		**83.5**	**F**				**67.2**	**E**				**106.2**	**F**				**68.1**	**E**			
	Overall		**95.8**	**F**	**1,906**	**F**	**Fail**	**68.9**	**E**	**1,541**	**E**	**Fail**	**105.3**	**F**	**1,919**	**F**	**Fail**	**86.6**	**F**	**1,718**	**F**	**Fail**
17	**Brightseat Road & Ardwick-Ardmore Road (TWSC)**																				
	EB (Ardwick Ardmore Rd)	LT	0.7	A				0.2	A				0.7	A				0.2	A			
	EB (Ardwick Ardmore Rd)	R	-	-				-	-				-	-				-	-			
	EB Overall (Ardwick Ardmore Rd)		**0.3**	**-**				**0.1**	**-**				**0.3**	**-**				**0.1**	**-**			
	WB (Ardwick Ardmore Rd)	LTR	4.5	A				5.6	A				4.7	A				5.6	A			
	WB Overall (Ardwick Ardmore Rd)		**2.8**	**-**				**3.6**	**-**				**2.9**	**-**				**3.6**	**-**			
	NB (Brightseat Rd)	LT	514.8	F				121.3	F				552.3	F				473.7	F			
	NB (Brightseat Rd)	R	-	-				-	-				-	-				-	-			
	NB Overall (Brightseat Rd)		**514.8**	**F**				**121.3**	**F**				**552.3**	**F**				**473.7**	**F**			
	SB (Brightseat Rd)	LTR	15.7	C				13.2	B				16.5	C				13.2	B			
	SB Overall (Brightseat Rd)		**15.7**	**C**				**13.2**	**B**				**16.5**	**C**				**13.2**	**B**			
	Overall		**176.1**	**-**	**N/A**	**N/A**	**Fail**	**32.9**	**-**	**N/A**	**N/A**	**Pass**	**183.7**	**-**	**N/A**	**N/A**	**Fail**	**162.6**	**-**	**N/A**	**N/A**	**Fail**
18	**Brightseat Road & Glenarden Parkway (Signalized)**																				
	EB (Glenarden Pkwy)	LT	30.4	C				35.8	D				30.4	C				35.8	D			
	EB (Glenarden Pkwy)	R	29.7	C				33.6	C				29.7	C				33.6	C			
	EB Overall (Glenarden Pkwy)		**29.9**	**C**				**34.4**	**C**				**29.9**	**C**				**34.4**	**C**			
	WB (Glenarden Pkwy)	LTR	36.1	D				37.2	D				36.1	D				37.2	D			
	WB Overall (Glenarden Pkwy)		**36.1**	**D**				**37.2**	**D**				**36.1**	**D**				**37.2**	**D**			
	NB (Brightseat Rd)	LTR	3.8	A				3.0	A				3.8	A				3.3	A			
	NB Overall (Brightseat Rd)		**3.8**	**A**				**3.0**	**A**				**3.8**	**A**				**3.3**	**A**			
	SB (Brightseat Rd)	LTR	3.7	A				3.2	A				3.8	A				3.3	A			
	SB Overall (Brightseat Rd)		**3.7**	**A**				**3.2**	**A**				**3.8**	**A**				**3.3**	**A**			
	Overall		**10.0**	**A**	**563**	**A**	**Pass**	**10.3**	**B**	**597**	**A**	**Pass**	**9.6**	**A**	**570**	**A**	**Pass**	**9.6**	**A**	**693**	**A**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition								
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour			
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV	
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
19	**Brightseat Road & Evarts Street (Signalized)**																				
	EB (Evarts St)	L	34.8	C				37.1	D				34.8	C				26.8	C			
	EB (Evarts St)	TR	34.9	C				34.4	C				34.9	C				26.4	C			
	EB Overall (Evarts St)		**34.8**	**C**				**36.5**	**D**				**34.8**	**C**				**26.7**	**C**			
	WB (Evarts St)	L	34.8	C				35.8	D				34.8	C				26.5	C			
	WB (Evarts St)	TR	34.9	C				34.4	C				34.9	C				27.0	C			
	WB Overall (Evarts St)		**34.8**	**C**				**35.4**	**D**				**34.8**	**C**				**27.0**	**C**			
	NB (Brightseat Rd)	L	1.3	A				1.4	A				1.3	A				3.0	A			
	NB (Brightseat Rd)	T	1.6	A				1.7	A				1.6	A				3.6	A			
	NB (Brightseat Rd)	R	1.2	A				1.3	A				1.2	A				2.8	A			
	NB Overall (Brightseat Rd)		**1.6**	**A**				**1.7**	**A**				**1.6**	**A**				**3.5**	**A**			
	SB (Brightseat Rd)	L	1.2	A				1.3	A				1.7	A				2.8	A			
	SB (Brightseat Rd)	TR	1.4	A				1.5	A				1.4	A				3.3	A			
	SB Overall (Brightseat Rd)		**1.4**	**A**				**1.5**	**A**				**1.5**	**A**				**3.3**	**A**			
	Overall		**1.7**	**A**	**281**	**A**	**Pass**	**2.1**	**A**	**322**	**A**	**Pass**	**1.7**	**A**	**360**	**A**	**Pass**	**6.7**	**A**	**502**	**A**	**Pass**
20	**Brightseat Road & Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd)** [a]																				
	EB (MRA Access Rd)	LTR	12.0	B				14.0	B				37.7	D				36.7	D			
	EB Overall (MRA Access Rd)		**12.0**	**B**				**14.0**	**B**				**37.7**	**D**				**36.7**	**D**			
	WB (Ent to OLM)	LT	17.0	C				22.8	C				-	-				-	-			
	WB (Ent to OLM)	R	0.0	A				0.0	A				-	-				-	-			
	WB Overall (Ent to OLM)		**17.0**	**C**				**22.8**	**C**				**-**	**-**				**-**	**-**			
	NB (Brightseat Rd)	L	-	-				-	-				56.8	E				48.7	D			
	NB (Brightseat Rd)	LTR / T	0.7	A				0.6	A				1.9	A				1.8	A			
	NB (Brightseat Rd)	R	-	-				-	-				6.0	A				1.5	A			
	NB Overall (Brightseat Rd)		**0.2**	**-**				**0.2**	**-**				**5.4**	**A**				**2.4**	**A**			
	SB (Brightseat Rd)	L	8.3	A				8.9	A				-	-				-	-			
	SB (Brightseat Rd)	TR	-	-				-	-				3.3	A				4.9	A			
	SB Overall (Brightseat Rd)		**0.0**	**-**				**0.0**	**-**				**3.3**	**A**				**4.9**	**A**			
	Overall		**0.8**	**-**	**N/A**	**N/A**	**Pass**	**0.7**	**-**	**N/A**	**N/A**	**Pass**	**5.6**	**A**	**303**	**A**	**Pass**	**4.8**	**A**	**734**	**A**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition								
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour			
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV	
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
21	**Brightseat Road/Redskins Road & Sheriff Road/Brightseat Road (Signalized)**																				
	EB (Sheriff Rd)	L	64.4	E				33.9	C				72.8	E				33.9	C		
	EB (Sheriff Rd)	T	42.0	D				39.5	D				38.6	D				39.4	D		
	EB (Sheriff Rd)	R	39.6	D				34.3	C				36.7	D				34.3	C		
	EB Overall (Sheriff Rd)		**53.1**	**D**				**36.1**	**D**				**57.6**	**E**				**36.0**	**D**		
	WB (Brightseat Rd)	L	50.0	D				45.2	D				48.3	D				45.3	D		
	WB (Brightseat Rd)	T	58.5	E				57.2	E				54.7	D				57.2	E		
	WB (Brightseat Rd)	R	51.8	D				48.0	D				68.7	E				48.0	D		
	WB Overall (Brightseat Rd)		**55.3**	**E**				**52.2**	**D**				**65.8**	**E**				**52.2**	**D**		
	NB (Redskins Rd)	L	13.0	B				16.9	B				17.9	B				17.0	B		
	NB (Redskins Rd)	TR	18.1	B				22.6	C				23.9	C				22.7	C		
	NB Overall (Redskins Rd)		**17.0**	**B**				**21.4**	**C**				**22.7**	**C**				**21.5**	**C**		
	SB (Brightseat Rd)	L	65.8	E				18.6	B				73.6	E				18.7	B		
	SB (Brightseat Rd)	T	18.2	B				24.2	C				24.1	C				24.3	C		
	SB (Brightseat Rd)	R	20.3	C				24.7	C				26.5	C				25.2	C		
	SB Overall (Brightseat Rd)		**27.2**	**C**				**23.2**	**C**				**33.5**	**C**				**23.6**	**C**		
	Overall		**36.4**	**D**	**413**	**A**	**Pass**	**33.0**	**C**	**596**	**A**	**Pass**	**48.3**	**D**	**811**	**A**	**Pass**	**32.9**	**C**	**597**	**A**	**Pass**
22	**Brightseat Road & Arena Drive (Signalized)**																				
	EB (Arena Dr)	LTR	21.8	C				17.3	B				18.7	B				17.3	B		
	EB Overall (Arena Dr)		**21.8**	**C**				**17.3**	**B**				**18.7**	**B**				**17.3**	**B**		
	WB (Arena Dr)	LTR	24.9	C				22.5	C				24.3	C				22.5	C		
	WB Overall (Arena Dr)		**24.9**	**C**				**22.5**	**C**				**24.3**	**C**				**22.5**	**C**		
	NB (Brightseat Rd)	L	20.2	C				27.0	C				24.7	C				27.0	C		
	NB (Brightseat Rd)	TR	23.9	C				33.1	C				30.0	C				33.1	C		
	NB Overall (Redskins Rd)		**23.6**	**C**				**32.6**	**C**				**29.6**	**C**				**32.6**	**C**		
	SB (Brightseat Rd)	L	10.7	B				24.9	C				15.8	B				24.9	C		
	SB (Brightseat Rd)	TR	13.2	B				21.3	C				18.9	B				21.3	C		
	SB Overall (Brightseat Rd)		**11.9**	**B**				**23.4**	**C**				**17.3**	**B**				**23.4**	**C**		
	Overall		**21.3**	**C**	**1,272**	**C**	**Pass**	**24.2**	**C**	**1,589**	**E**	**Pass**	**23.0**	**C**	**1,708**	**F**	**Fail**	**24.2**	**C**	**1,589**	**E**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition									
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
23	**Arena Drive & I-95/I-495 Southbound Ramps (Signalized)**																				
	EB (Arena Dr)	T	17.9	B				30.9	C				17.9	B				30.9	C			
	EB (Arena Dr)	R	14.8	B				23.3	C				14.8	B				23.3	C			
	EB Overall (Arena Dr)		**17.4**	**B**				**29.7**	**C**				**17.4**	**B**				**29.7**	**C**			
	WB (Arena Dr)	L	2.5	A				21.7	C				13.3	B				21.7	C			
	WB (Arena Dr)	T	2.1	A				2.9	A				12.0	B				2.9	A			
	WB Overall (Arena Dr)		**2.2**	**A**				**9.6**	**A**				**12.2**	**B**				**9.6**	**A**			
	SB (I-95/I-495 SB Off-Ramp)	L	62.3	E				64.5	E				62.3	E				64.5	E			
	SB (I-95/I-495 SB Off-Ramp)	LTR	62.5	E				66.0	E				62.5	E				66.0	E			
	SB Overall (I-95/I-495 SB Off-Ramp)		**62.4**	**E**				**65.2**	**E**				**62.4**	**E**				**65.2**	**E**			
	Overall		**22.7**	**C**	**880**	**A**	**Pass**	**29.8**	**C**	**1,344**	**D**	**Pass**	**23.8**	**C**	**1,427**	**D**	**Pass**	**29.8**	**C**	**1,346**	**D**	**Pass**
24	**Arena Drive & I-95/I-495 Northbound Ramps (Signalized)**																				
	EB (Arena Dr)	L	26.3	C				66.7	E				26.3	C				66.7	E			
	EB (Arena Dr)	T	6.1	A				3.7	A				6.1	A				3.7	A			
	EB Overall (Arena Dr)		**11.9**	**B**				**13.9**	**B**				**11.9**	**B**				**13.9**	**B**			
	WB (Arena Dr)	TR	26.6	C				38.2	D				26.6	C				38.2	D			
	WB Overall (Arena Dr)		**26.6**	**C**				**38.2**	**D**				**26.6**	**C**				**38.2**	**D**			
	NB (I-95/I-495 NB Off-Ramp)	L	39.9	D				39.5	D				108.6	F				39.5	D			
	NB (I-95/I-495 NB Off-Ramp)	LTR	41.0	D				45.3	D				79.5	E				45.3	D			
	NB Overall (I-95/I-495 NB Off-Ramp)		**40.6**	**D**				**43.4**	**D**				**94.6**	**F**				**43.4**	**D**			
	Overall		**23.9**	**C**	**1,203**	**C**	**Pass**	**28.8**	**C**	**1,405**	**D**	**Pass**	**45.8**	**D**	**1,465**	**E**	**Pass**	**28.8**	**C**	**1,405**	**D**	**Pass**

Table 5-22: Comparison of No-build and Build Condition Intersection AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	No-build Condition									Build Condition									
			AM Peak Hour					PM Peak Hour				AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV			HCM 2000		CLV		
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check	Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	Check
25	**Brightseat Road & Driveway/Site Exit (Signalized)** [b]																				
	EB (Driveway)	LTR	-	-				-	-				20.5	C				33.2	C			
	EB Overall (Driveway)		**-**	**-**				**-**	**-**				**20.5**	**C**				**33.2**	**C**			
	WB (FBI Exit)	L	-	-				-	-				16.9	B				17.5	B			
	WB (FBI Exit)	R	-	-									16.2	B				-	-			
	WB Overall (Site Exit)		**-**	**-**				**-**	**-**				**16.8**	**B**				**17.5**	**B**			
	NB (Brightseat Rd)	T	-	-				-	-				9.9	A				25.3	C			
	NB Overall (Brightseat Rd)		**-**	**-**				**-**	**-**				**9.9**	**A**				**25.3**	**C**			
	SB (Brightseat Rd)	T	-	-				-	-				9.7	A				25.5	C			
	SB Overall (Brightseat Rd)		**-**	**-**				**-**	**-**				**9.7**	**A**				**25.5**	**C**			
	Overall		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10.8**	**B**	**242**	**A**	**Pass**	**20.7**	**C**	**1,405**	**D**	**Pass**

Notes:

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LOS = Level of Service

LTR = left / through / right lanes

LTR/LTR = No-Build/Build with Mitigation

TWSC = Two-way STOP-Controlled unsignalized intersection (TWSC intersections do not have an overall LOS)

Delay is Measured in Seconds Per Vehicle.

Red cells denote intersections or approaches operating at unacceptable conditions.

[a] Intersection would operate as a TWSC under the No-build Condition and signalized under the Build Condition.

[b] Intersection would be added as part of the Build Condition.

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5.8.6 Build Condition Queuing Analysis

Synchro™ was used to calculate the 50th percentile queue lengths, and SimTraffic™ was used to calculate the 95th percentile queue lengths. The SimTraffic simulations have a statistical accuracy of plus or minus 3.2 percent error for the AM peak hour and 4.3 percent error for the PM peak hour simulation. Based on the Synchro™ and SimTraffic™ analysis, the following signalized intersection approaches would experience failing queue lengths in Synchro™ or SimTraffic™. The lane group within the approach that would be operating under unacceptable conditions is noted in parentheses.

- Landover Road and Old Landover Road (Intersection #1)
  - Southbound Old Landover Road (left and right turns) during the PM peak hour
- Landover Road and Kent Town Place/75th Avenue (Intersection #3)
  - Eastbound Landover Road (left turns) during the PM peak hour
- Landover Road and Dodge Park Road (Intersection #5)
  - Eastbound Landover Road (left turns) during the PM peak hour
- Landover Road and Kenmoor Drive (Intersection #7)
  - Eastbound Landover Road (combined through and right movements) during the AM peak hour
- Landover Road and Barlowe Road (Intersection #8)
  - Northbound Barlowe Road (all movements) and eastbound Landover Road (through and right movements) during the AM peak hour
  - Northbound Barlowe Road (right turns) during the PM peak hour
- Landover Road and Brightseat Road (Intersection #10)
  - Eastbound Landover Road (left turns and through movements) and northbound Brightseat Road (all movements) during the AM peak hour
  - Westbound Landover Road (left turns), northbound Brightseat Road (left turns), and southbound Brightseat Road (all movements) during the PM peak hour
- Landover Road and I-95/I-495 Southbound On-Ramp (Intersection #10)
  - Eastbound Landover Road (through and right movements) and westbound Landover Road (left turns) during the PM peak hour
- Landover Road and I-95/I-495 Northbound Off-Ramp (Intersection #11)
  - Eastbound Landover Road (left and right turns), westbound Landover Road (through movements), and northbound I-95/I-495 off-ramp (left and right turns) during the AM peak hour
  - Eastbound Landover Road (through and right movements), westbound Landover Road (through movement), and northbound I-95/I-495 off-ramp (left and right turns) during the PM peak hour
- Landover Road and St. Joseph's Drive/McCormick Drive (Intersection #12)
  - Eastbound Landover Road (left turns) and westbound Landover Road (left turns, through movements, and right turns) during the AM peak hour
  - Eastbound Landover Road (left turns), westbound Landover Road (left turns, through movements, and right turns), northbound McCormick Drive (left turns, combined left and through movements, and right turns), and southbound St. Joseph's Drive (left turns, combined left and through movements, and right turns) during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13)
  - Westbound Landover Road (all movements) and southbound Lottsford Road (left turns, combined left and through movements, and right turns) during the AM peak hour
  - Southbound Lottsford Road (left turns) and eastbound Landover Road (left turns) during the PM peak hour
- Landover Road and Technology Way (Intersection #14)
  - Northbound Landover Road (left turns) during the PM peak hour

- Martin Luther King Jr. Highway (MLK Jr. Hwy) and Ardwick-Ardmore Road (Intersection #16)
    - Eastbound (left turns and through movements) and westbound (all movements) on Ardwick-Ardmore Road, northbound Martin Luther King Jr. Highway (left turns and through movements), and southbound Martin Luther King Jr. Highway (left turns, through movement, and combined through and right movements) during the AM peak hour
    - Eastbound Ardwick-Ardmore Road (left turns and through movements), westbound Ardwick-Ardmore Road (all movements), and southbound Martin Luther King Jr. Highway (left turns and combined through and right movements) during the PM peak hour
- Brightseat Road and Evarts Street (Intersection #19)
    - Southbound Brightseat Road (combined through and right movements) during the PM peak hour
- Brightseat Road and Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd) (formerly unsignalized) (Intersection #20)
    - Southbound Brightseat Road (through movements and combined through and right movements) during the PM peak hour
- Brightseat Road/Redskins Road and Sheriff Road/Brightseat Road (Intersection #21)
    - Eastbound Sheriff Road (left turns) during the AM and PM peak hour
    - Westbound Brightseat Road (through and right movements) during the AM peak hour
- Brightseat Road and Arena Drive (Signalized) (Intersection #22)
    - Southbound Brightseat Road (left turns) during the PM peak hour
- Arena Drive and I-95/I-495 Southbound Ramps (Intersection #23)
    - Westbound Arena Drive (left turns) during the PM peak hour
- Arena Drive and I-95/I-495 Northbound Ramps (Intersection #24)
    - Northbound I-95/I-495 Northbound Ramps (left turns) during the AM peak hour
- Brightseat Road and Driveway/Site Exit (Intersection #25)
    - Westbound FBI exit (left and right turns) and northbound and southbound Brightseat Road (through movements) during the PM peak hour

5.8.6.1 Unsignalized Queuing Analysis

The intersection of Brightseat Road and Ardwick-Ardmore Road (Intersection #17) would experience 95th percentile failing queues on northbound Brightseat Road (right turns) during the AM peak hour and northbound Brightseat Road (combined left and through movements and right turns) PM peak hours. This intersection also would fail in the No-build Condition.

5.8.6.2 Complete Intersection Queuing Analysis

This section summarizes the differences in queuing impacts between the No-build Condition and the Build Condition by quantifying the change in intersection queuing failures. Following the summary, this section also includes the complete results of the queuing analysis.

Based on the Synchro™ and SimTraffic™ analysis, 19 signalized intersections and 1 unsignalized intersection would experience queuing lengths that would exceed the available storage capacity. The remaining intersections in the study area would provide sufficient storage for the anticipated demand. Compared to the No-build Condition, the Build Condition, would have five more intersections with failing queues during the AM peak hour and would have three more intersections with failing queues during the PM peak hour. In the AM peak hour in the No-build Condition, there would be six intersections with a failing queue approach compared with 11 in the Build Condition, an increase of 5. In the PM peak hour in the No-build Condition, there would be 14 intersections with a failing queue approach compared with 17 in the Build Condition, an increase of 3.

Table 5-23 provides a summary of the number of intersections that meet the following criteria for approach lane groups in a queue that would change between the No-build and the Build Conditions:

Table 5-23: Queuing Summary Comparing No-build Condition to Build Condition

Type of Change Between Conditions	AM	PM
New Failing Movement	5	3
Additional Failing Movement	3	4
No Change	15	17
Fewer Failing Movements	2	1
No Failing Movements	0	0
Total Signalized and Unsignalized Intersections	**25**	**25**

The results of the No-build Condition compared to the Build Condition queuing analysis for both signalized and unsignalized intersections are presented in table 5-24. Note that the percentile values are expressed in feet, and a car occupies about 25 linear feet of roadway, including the space between cars.

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Table 5-24: Comparison of No-build and Build Condition Queueing Analysis

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	No-build Condition				Build Condition			
				AM Peak		PM Peak		AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
1	**Landover Road & Old Landover Road (Signalized)**										
	EB (Landover Rd)	L	1,000	96	181	24	116	96	176	54	113
	EB (Landover Rd)	T	1,689	95	141	334	246	132	175	338	253
	WB (Landover Rd)	TR	440	87	207	91	153	87	198	92	166
	SB (Old Landover Rd)	LR	147	37	140	120	#185	37	135	120	#182
2	**Landover Road & Pinebrook Avenue (Signalized)**										
	EB (Landover Rd)	TR	440	347	180	365	313	477	218	367	308
	WB (Landover Rd)	L	250	7	80	34	103	23	81	34	86
	WB (Landover Rd)	T	881	122	155	65	77	123	146	65	94
	NB (Pinebrook Ave)	L	653	220	280	151	230	220	275	151	249
	NB (Pinebrook Ave)	R	653	0	95	0	112	0	91	0	108
3	**Landover Road & Kent Town Place/75th Avenue (Signalized)**										
	EB (Landover Rd)	L	200	61	141	121	#232	61	143	121	#244
	EB (Landover Rd)	TR	881	139	192	617	458	170	239	624	454
	WB (Landover Rd)	L	250	14	95	78	133	36	80	78	139
	WB (Landover Rd)	TR	555	252	350	183	285	254	334	399	327
	NB (Kent Town Pl)	L	250	139	225	82	137	139	211	82	148
	NB (Kent Town Pl)	TR	511	120	246	103	189	120	223	103	191
	SB (75th Ave)	L	685	244	630	266	452	244	550	266	433
	SB (75th Ave)	TR	685	155	410	133	194	155	329	133	202
4	**Landover Road & Kent Village Drive (TWSC)**										
	EB (Landover Rd)	TR	560	-	2	-	65	-	-	-	45
	WB (Landover Rd)	T	408	-	2	-	-	-	4	-	-
	NB (Kent Village Dr)	R	612	-	75	-	85	-	84	-	90
5	**Park Road (Signalized)**										
	EB (Landover Rd)	L	275	135	206	260	#306	136	220	261	#313
	EB (Landover Rd)	T	412	72	92	93	270	87	134	93	273
	WB (Landover Rd)	TR	526	52	154	121	181	52	154	139	189
	SB (Dodge Park Rd)	L	529	74	146	97	163	74	145	97	162
	SB (Dodge Park Rd)	R	200	0	158	0	148	0	154	0	146
6	**Landover Road & Fire House Road (Signalized)**										
	EB (Landover Rd)	L	275	7	75	29	114	8	71	51	135
	EB (Landover Rd)	TR	526	185	124	220	360	209	182	220	369
	WB (Landover Rd)	L	300	2	53	14	84	2	60	14	87
	WB (Landover Rd)	TR	887	369	244	394	308	375	224	547	316
	NB (Fire House Rd)	LTR	404	90	162	93	174	90	168	93	175
	SB (Fire House Rd)	LTR	240	82	154	149	217	82	145	149	226

Table 5-24: Comparison of No-build and Build Condition Queueing Analysis (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	No-build Condition				Build Condition			
				AM Peak		PM Peak		AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
7	**Landover Road & Kenmoor Drive (Signalized)**										
	EB (Landover Rd)	L	250	5	59	7	76	4	233	7	65
	EB (Landover Rd)	TR	602	93	124	191	205	108	#828	194	185
	WB (Landover Rd)	L	250	1	17	1	23	1	18	1	26
	WB (Landover Rd)	TR	1,440	323	273	42	48	306	247	178	45
	NB (Kenmoor Dr)	LTR	259	0	12	29	89	0	14	29	77
	SB (Kenmoor Dr)	LT	191	14	47	41	85	14	50	41	81
	SB (Kenmoor Dr)	R	150	0	53	0	59	0	49	0	64
8	**Landover Road & Barlowe Road (Signalized)**										
	EB (Landover Rd)	TR	1,440	65	163	326	684	80	#1937	328	272
	WB (Landover Rd)	L	300	89	148	110	178	128	199	106	153
	WB (Landover Rd)	T	1,499	48	98	3	132	6	132	98	83
	NB (Barlowe Rd)	L	445	77	152	60	169	77	#530	60	168
	NB (Barlowe Rd)	R	125	0	#134	0	#153	0	#186	0	#152
9	**Landover Road & Brightseat Road (Signalized)**										
	EB (Landover Rd)	L	340	36	89	59	250	~386	#369	72	250
	EB (Landover Rd)	T	1,499	278	361	819	1471	313	#1888	819	915
	EB (Landover Rd)	R	1,000	1	84	135	997	23	532	144	530
	WB (Landover Rd)	L	1,194	215	487	~465	366	219	518	~463	363
	WB (Landover Rd)	T	1,788	666	385	473	353	686	662	477	351
	WB (Landover Rd)	R	775	0	-	0	-	11	114	0	-
	NB (Brightseat Rd)	L	250	169	215	200	#258	163	#282	226	#274
	NB (Brightseat Rd)	TR	519	89	177	201	323	~612	#589	283	346
	NB (Brightseat Rd)	R	519	109	164	239	361	173	#611	300	368
	SB (Brightseat Rd)	L	385	136	165	271	#406	194	228	~2229	#439
	SB (Brightseat Rd)	LT	385	136	189	267	331	162	223	~1270	#435
	SB (Brightseat Rd)	R	385	0	16	0	25	0	17	~609	#552
10	**Landover Road & I-95/I-495 Southbound On-Ramp (Signalized)**										
	EB (Landover Rd)	T	1,788	404	225	~944	#2182	412	629	~2436	1209
	EB (Landover Rd)	R	1,788	17	292	40	#2199	24	610	~2416	1234
	WB (Landover Rd)	L	700	202	211	~584	#812	180	183	~584	556
	WB (Landover Rd)	T	1,193	0	-	0	830	272	25	0	259

Table 5-24: Comparison of No-build and Build Condition Queueing Analysis (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	No-build Condition				Build Condition			
				AM Peak		PM Peak		AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
11	**Landover Road & I-95/I-495 Northbound Off-Ramp (Signalized)**										
	EB (Landover Rd)	L	425	~70	154	58	226	~71	139	58	96
	EB (Landover Rd)	T	1,193	631	668	764	#1491	603	698	869	#1387
	EB (Landover Rd)	R	150	0	150	0	132	0	#165	0	#165
	WB (Landover Rd)	T	289	~1363	#366	~1904	#575	~1717	#369	~1924	#593
	NB (I-95/I-495 NB Off-Ramp)	L	194	358	#364	~648	#424	~784	#378	~702	#422
	NB (I-95/I-495 NB Off-Ramp)	R	194	~430	#386	~567	#384	~430	#443	~567	#377
12	**Landover Road & St Josephs Drive/McCormick Drive (Signalized)**										
	EB (Landover Rd)	L	703	~426	416	~618	413	~426	353	~620	371
	EB (Landover Rd)	T	730	188	260	641	312	202	209	766	331
	EB (Landover Rd)	R	-	0	-	0	-	0	-	0	-
	WB (Landover Rd)	L	250	223	#346	45	#299	224	#350	45	#279
	WB (Landover Rd)	T	1,320	~858	#1655	~690	#1663	~1051	#1565	~700	#1677
	WB (Landover Rd)	R	500	5	#736	310	#717	19	#728	277	#710
	NB (McCormick Dr)	L	394	134	79	~398	#427	59	133	~398	#429
	NB (McCormick Dr)	LT	500	187	330	~406	#513	187	329	~406	#545
	NB (McCormick Dr)	R	250	0	134	0	#382	0	124	0	#387
	SB (St Josephs Dr)	L	562	42	123	321	#736	42	149	321	#671
	SB (St Josephs Dr)	LT	824	194	415	337	#1089	194	434	337	#1004
	SB (St Josephs Dr)	R	824	336	424	~1146	#1002	336	467	~1146	#897
13	**Landover Road & Lottsford Road (Signalized)**										
	EB (Landover Rd)	L	700	144	205	443	393	147	189	~507	362
	EB (Landover Rd)	T	736	261	314	797	608	257	295	989	610
	EB (Landover Rd)	R	-	0	-	0	128	0	-	0	-
	WB (Landover Rd)	L	500	114	496	57	108	117	#630	58	139
	WB (Landover Rd)	T	587	619	#685	374	377	~763	#707	397	347
	WB (Landover Rd)	R	500	31	#650	153	114	23	#764	199	76
	NB (Lottsford Rd)	L	500	101	208	184	371	101	199	184	377
	NB (Lottsford Rd)	LT	768	215	332	551	651	216	317	551	634
	NB (Lottsford Rd)	R	768	0	-	0	203	0	-	0	164
	SB (Lottsford Rd)	L	350	387	#436	359	#398	386	#406	359	#402
	SB (Lottsford Rd)	LT	962	407	#1061	370	501	407	#1142	370	455
	SB (Lottsford Rd)	R	962	0	#1291	0	268	0	#1416	0	139

Table 5-24: Comparison of No-build and Build Condition Queueing Analysis (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	No-build Condition				Build Condition			
				AM Peak		PM Peak		AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
14	**Landover Road & Technology Way (Signalized)**										
	EB (Technology Way)	L	556	556	57	105	449	57	118	449	464
	EB (Technology Way)	R	556	556	0	46	109	0	46	110	138
	NB (Landover Rd)	L	420	420	2	134	47	2	#478	47	138
	NB (Landover Rd)	T	1,613	1613	13	233	186	20	1546	187	208
	SB (Landover Rd)	T	1,234	1233.5	20	55	243	23	53	248	243
	SB (Landover Rd)	R	450	450	0	82	2	0	78	1	63
15	**Landover Road & Arena Drive/Lake Arbor Way (Signalized)**										
	EB (Landover Rd)	L	400	400	61	93	192	61	89	192	200
	EB (Landover Rd)	T	1,613	1613	310	253	237	315	250	333	303
	EB (Landover Rd)	R	-	-	0	-	0	0	-	0	-
	WB (Landover Rd)	L	850	850	182	231	173	182	346	173	220
	WB (Landover Rd)	T	1,163	1162.5	637	396	304	785	738	308	247
	WB (Landover Rd)	R	1,163	1162.5	0	4	0	0	411	1	10
	NB (Arena Dr)	L	1,288	1288.25	76	112	160	76	104	160	182
	NB (Arena Dr)	T	2,277	2276.5	46	74	131	46	72	131	191
	NB (Arena Dr)	R	-	-	0	-	0	0	-	0	-
	SB (Lake Arbor Way)	L	300	300	62	114	79	62	119	79	120
	SB (Lake Arbor Way)	T	1,003	1003	173	224	160	173	229	160	204
	SB (Lake Arbor Way)	R	1,000	1000	141	233	12	141	280	13	66
16	**Martin Luther King Jr Highway (MLK Jr Hwy) & Ardwick-Ardmore Road (Signalized)**										
	EB (Ardwick Ardmore Rd)	L	275	275	74	#354	196	74	#352	196	#381
	EB (Ardwick Ardmore Rd)	T	700	700	~323	#824	467	~323	#806	467	#848
	EB (Ardwick Ardmore Rd)	R	700	700	0	#939	0	0	364	0	70
	WB (Ardwick Ardmore Rd)	LTR	731	731	~582	561	~287	~597	507	~421	400
	NB (MLK Jr Hwy)	L	720	720	~551	#877	269	~551	#852	269	343
	NB (MLK Jr Hwy)	T	1,094	1093.5	568	#1205	577	568	#1191	577	457
	NB (MLK Jr Hwy)	R	1,094	1093.5	34	345	62	34	361	62	107
	SB (MLK Jr Hwy)	L	200	200	219	#266	252	~390	#232	256	#259
	SB (MLK Jr Hwy)	T	1,175	1175	577	#1380	246	577	#1504	246	434
	SB (MLK Jr Hwy)	TR	200	200	577	#246	246	577	#235	246	#235

Table 5-24: Comparison of No-build and Build Condition Queueing Analysis (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	No-build Condition				Build Condition			
				AM Peak		PM Peak		AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
17	**Brightseat Road & Ardwick-Ardmore Road (TWSC)**										
	EB (Ardwick Ardmore Rd)	LT	731	731	-	39	-	-	31	-	17
	EB (Ardwick Ardmore Rd)	R	731	731	-	39	-	-	51	-	41
	WB (Ardwick Ardmore Rd)	LTR	716	716	-	105	-	-	115	-	78
	NB (Brightseat Rd)	LT	1,084	1083.5	-	#1367	-	-	1074	-	#1428
	NB (Brightseat Rd)	R	150	150	-	#229	-	-	#245	-	#246
	SB (Brightseat Rd)	LTR	239	239	-	41	-	-	42	-	26
18	**Brightseat Road & Glenarden Parkway (Signalized)**										
	EB (Glenarden Pkwy)	LT	471	470.5	15	44	36	15	42	36	176
	EB (Glenarden Pkwy)	R	471	470.5	0	31	0	0	27	0	314
	WB (Glenarden Pkwy)	LTR	954	954	58	140	38	58	130	38	231
	NB (Brightseat Rd)	LTR	2,028	2028	40	129	32	42	89	48	215
	SB (Brightseat Rd)	LTR	412	412	28	76	34	34	84	34	365
19	**Brightseat Road & Evarts Street (Signalized)**										
	EB (Evarts St)	L	180	180	0	5	3	0	3	3	18
	EB (Evarts St)	TR	1,195	1195	0	14	0	0	15	0	19
	WB (Evarts St)	L	910	910	0	6	2	0	6	2	32
	WB (Evarts St)	TR	910	910	0	15	0	0	14	0	83
	NB (Brightseat Rd)	L	220	220	0	10	0	0	9	2	24
	NB (Brightseat Rd)	T	480	732	0	18	0	0	18	31	124
	NB (Brightseat Rd)	R	480	-	0	-	0	0	-	0	0
	SB (Brightseat Rd)	L	120	120	0	4	0	0	43	0	45
	SB (Brightseat Rd)	TR	446	446	0	19	0	0	20	22	#689
20	**Brightseat Road & Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd)** [a]										
	EB (MRA Access Rd)	LTR	206	205.5	-	47	-	0	57	0	157
	WB (Ent to OLM)	LT	-	249	-	9	-	-	-	-	-
	WB (Ent to OLM)	R	-	-	-	-	-	-	-	-	-
	NB (Brightseat Rd)	L	150	-	-	-	-	6	16	5	20
	NB (Brightseat Rd)	LTR /T	385	390	-	12	-	23	136	34	91
	NB (Brightseat Rd)	R	385	-	-	-	-	11	272	0	49
	SB (Brightseat Rd)	L	-	535.5	-	0	-	-	-	-	-
	SB (Brightseat Rd)	T	150	-	-	-	-	16	32	100	#181
	SB (Brightseat Rd)	TR	564	535.5	-	4	-	16	54	100	#646

Table 5-24: Comparison of No-build and Build Condition Queueing Analysis (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	No-build Condition				Build Condition			
				AM Peak		PM Peak		AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
21	**Brightseat Road/Redskins Road & Sheriff Road/Brightseat Road (Signalized)**										
	EB (Sheriff Rd)	L	150	150	89	144	102	126	#174	103	#159
	EB (Sheriff Rd)	T	966	966	76	227	184	77	337	184	304
	EB (Sheriff Rd)	R	-	-	0	-	0	0	-	0	-
	WB (Brightseat Rd)	L	472	471.5	1	3	4	1	4	4	15
	WB (Brightseat Rd)	T	472	471.5	141	193	211	146	#630	211	264
	WB (Brightseat Rd)	R	300	300	0	34	0	173	#472	0	82
	NB (Redskins Rd)	L	250	250	24	45	30	34	45	30	48
	NB (Redskins Rd)	TR	622	622	45	50	52	59	61	53	47
	SB (Brightseat Rd)	L	240	240	43	21	32	50	20	32	35
	SB (Brightseat Rd)	T	521	520.5	26	4	74	34	4	75	41
	SB (Brightseat Rd)	R	-	-	0	-	0	0	-	0	-
22	**Brightseat Road & Arena Drive (Signalized)**										
	EB (Arena Dr)	LTR	511	511	56	111	47	56	112	47	96
	WB (Arena Dr)	LTR	465	465	71	158	127	107	287	127	184
	NB (Brightseat Rd)	L	320	320	7	57	13	10	56	13	56
	NB (Brightseat Rd)	TR	617	616.5	43	151	56	56	156	56	174
	SB (Brightseat Rd)	L	210	210	52	169	112	78	162	112	#211
	SB (Brightseat Rd)	TR	2,430	2430	24	96	47	43	94	47	103
23	**Arena Drive & I-95/I-495 Southbound Ramps (Signalized)**										
	EB (Arena Dr)	T	465	465	168	166	317	168	168	317	298
	EB (Arena Dr)	R	465	465	0	55	0	0	54	0	65
	WB (Arena Dr)	L	250	250	9	141	209	52	200	209	#296
	WB (Arena Dr)	T	664	663.5	17	70	28	179	282	28	245
	SB (I-95/I-495 SB Off-Ramp)	L	964	963.5	242	251	324	242	255	324	302
	SB (I-95/I-495 SB Off-Ramp)	LTR	964	963.5	217	263	303	217	264	303	307
24	**Arena Drive & I-95/I-495 Northbound Ramps (Signalized)**										
	EB (Arena Dr)	L	280	280	44	147	116	44	145	116	177
	EB (Arena Dr)	T	664	663.5	47	126	32	47	119	32	105
	WB (Arena Dr)	TR	894	894	265	269	552	265	270	552	421
	NB (I-95/I-495 NB Off-Ramp)	L	784	784	121	127	111	~524	425	111	142
	NB (I-95/I-495 NB Off-Ramp)	LTR	784	784	60	150	169	372	474	169	136

Table 5-24: Comparison of No-build and Build Condition Queueing Analysis (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	No-build Condition				Build Condition			
				AM Peak		PM Peak		AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th Percentile (feet)
25	**Brightseat Road & Driveway/Site Exit (Signalized)** [b]										
	EB (Driveway)	LTR	373	-	-	-	-	0	10	0	14
	WB (FBI Exit)	L	439	-	-	-	-	6	48	172	#398
	WB (FBI Exit)	R	439	-	-	-	-	0	33	-	#538
	NB (Brightseat Rd)	T	157	-	-	-	-	22	51	73	#251
	SB (Brightseat Rd)	T	480	-	-	-	-	20	42	75	#559

Notes:

~ 50th percentile volume exceeds capacity, queue is theoretically infinitive.

95th percentile volume exceeds capacity, queue may be longer.

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LTR = left / through / right lanes

LTR/LTR = No-Build/Build with Mitigation

TWSC = Two-way STOP-Controlled unsignalized intersection

Red cells denote approaches and lane groups whose queuing length exceeds capacity.

[a] Intersection would operate as a TWSC under the No-build Condition and signalized under the Build Condition.

[b] Intersection would be added as part of the Build Condition.

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5.8.7 Overall Traffic Impact Assessment

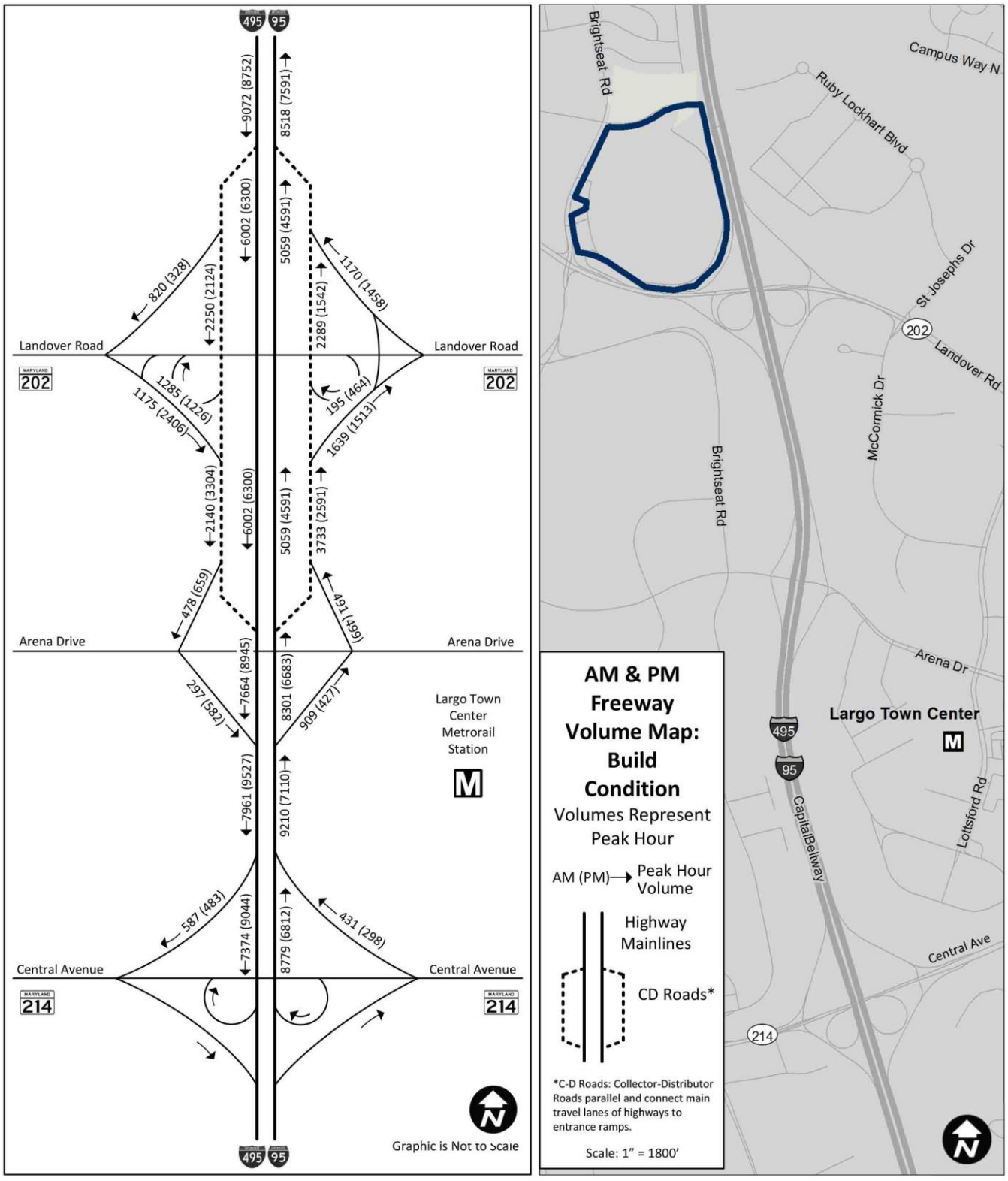
Overall, the AM peak hour would experience corridor-based delays along Landover Road (MD 202) in the westbound direction beginning at the I-95/I-495 northbound off-ramp intersection and extending past Brightseat Road. A similar condition would occur during the PM peak hour beginning at Brightseat Road and extending past McCormick Road/ St. Joseph's Drive. Together these conditions would result in direct, long-term, major adverse impacts to corridors in the study area. In addition, there would be isolated intersection impacts during the AM and PM peak periods at the Martin Luther King Jr. Highway and Ardwick-Ardmore Road intersection and during the PM at the Brightseat Road and Ardwick-Ardmore Road intersection, resulting in direct, long-term, adverse impacts to intersections.

Because the intersections between the Landover site and access to I-95/I-495 are forecasted to fail during the No-build Condition, adding construction-related trips along this route from trucks, employees, and equipment would have corridor-based impacts. Other construction-related trips may add to other isolated study area intersections forecasted to fail during the No-build Condition. Together, these conditions would result in direct, short-term, major adverse impacts during the construction period.

5.8.8 Interstate Analysis

Although freeway analysis was not performed for the Build Condition, freeway ramp volumes are included in figure 5-11 to allow a comparison to the Existing Condition, No-build Condition, and Build with Mitigation Condition freeway ramp volumes presented in Sections 3.7, 4.7, and 6.6, respectively. Full analysis of the freeway volumes is included in the Build with Mitigation Condition in Section 6.6.7.

Figure 5-11: Build Condition Interstate Volumes



5.1 Transportation Demand Management

TDM is “a set of strategies, programs, services, and physical elements that influence travel behavior by mode, frequency, time, route, or trip length in order to help achieve highly efficient and sustainable use of transportation facilities” (DDOT 2010, p.5). TDM measures for the Landover Build with Mitigation Condition would be developed as part of a Transportation Management Plan accompanying the Final EIS if the Landover site is chosen as the preferred consolidation location for the FBI HQ. The TDM measures would encourage the reduction of SOV trips by “focusing the demand for transportation services on alternative modes and providing the public with the incentives as well as information to use these alternatives.”

The introduction of TDM measures would serve to ensure the transportation mode splits planned in this study were achieved as well as serve to mitigate travel mode, frequency, time, route, and/or trip length associated with future trips of the consolidated FBI HQ.

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