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4.0 TRAVEL DEMAND ANALYSIS

The travel analysis evaluates the ability of the alternative transportation plans to meet future travel demand in the US 52 Corridor. In the Tier 1 Analysis, the first phase of the US 52 Corridor Land Use and Transportation Plan, various alternative plans were developed and analyzed. From this analysis, four alternatives were selected for further planning analysis in Tier 2. At the end of the Tier 2 Analysis, a preliminary locally preferred alternative (LPA) was identified which meets the overall transportation needs of the US 52 Corridor. In Tier 3 Analysis, the LPA was subjected to a more detailed traffic analysis that identifies the specific mainline and auxiliary lane, ramp and intersection requirements for the US 52 Corridor.

The travel analysis forecasts future travel for the highway demand using travel forecast model data and evaluates the ability of the alternative transportation plans to meet future travel demand using Highway Capacity Analysis techniques.

4.1 Future Travel Demand

The future travel demand for the year 2025 for the US 52 Corridor was developed using the 1994 Piedmont Triad Regional Transportation Model developed by the North Carolina Department of Transportation (NCDOT) and covering the Greensboro Metropolitan Planning Organization (MPO), the High Point MPO and the Winston-Salem/Forsyth County MPO. That model follows the standard four-step travel forecasting procedure consisting of trip generation, trip distribution, modal split and travel assignment. A detailed description of the model validation procedure is included in the Technical Appendix A: Model Validation Review and Application. The following is a brief discussion of the process.

The 1994 version of this transportation model was verified for the US 52 Corridor by comparing the model output to the 1993 and 1995 traffic count volume and roadway conditions data provided by the Winston-Salem Department of Transportation. The 1994 model output was manually adjusted at locations where it predicted traffic substantially different from current patterns or where it diverted too much or too little traffic away from US 52 to parallel routes.

Four future 2025 travel networks were then developed for the four alternatives: the No-Build Alternative, the Minimum Design Alternative, Interstate Alternative 1 and Interstate Alternative 2. The Long-Range Transportation Plan for Winston-Salem/Forsyth County formed the basis of the future roadway network for the Minimum Design Alternative. This network was further modified to obtain the Interstate Alternatives 1 and 2. The model next assigned trips to the roadway networks of each alternative using the equilibrium assignment method.

An analysis of the projected traffic volumes for the US 52 Corridor indicated that under the No Build Alternative, traffic in the Corridor is expected to increase at a rate of one percent per year throughout the Corridor. For the segment of US 52 between I-40 and Business 40, traffic is expected to increase at a faster rate of about two percent per year. The segment of US 52 located closest to Winston-Salem downtown is expected to increase at a lower rate. As expected, the traffic forecasts for the Minimum Design Alternative and Interstate Alternatives 1 and 2 were somewhat higher than the No-Build volumes.

The final stage of capacity analysis of the US 52 study corridor was performed to determine if the proposed transportation improvement plans would meet future travel needs.

4.2 Roadway Capacity Analysis Methodology

Roadway capacity was analyzed for the US 52 study using a three level “tier analysis approach”. For all levels of analysis, the 2000 Highway Capacity Manual methodology and related software programs were used for this analysis. Copies of the capacity analysis worksheets for each Tier are included in the appendices of this document.

For the Tier 1 Analysis, because only the alignment is varied among alternative plans, a No Build Analysis of the mainline is used to establish the number of travel lanes needed for the mainline cross-section. The AADT volumes for the No Build model projections were used for this analysis.

For the Tier 2 Analysis, four alternative plans that included mainline and interchange modifications were developed. For these alternatives, the traffic analysis focused on an evaluation of the mainline and ramp capacities.

For the Tier 3 Analysis, a Locally Preferred Alternative was developed in greater detail. The travel analysis at this stage included mainline and ramp capacity analyses, merge, diverge and weaving analyses and intersection capacity analyses.

4.3 Tier 1 Analysis

The Tier 1 Analysis focused on developing a range of alternative mainline alignments for evaluation. For traffic analysis purposes, the number of travel lanes needed to meet future demand was the only travel data that could be developed at this level of detail. An unconstrained assignment of the 2025 No-Build travel model was executed to obtain the desired travel demand for US 52. The resulting Average Annual Daily Traffic (AADT) of that assignment are summarized in Figure 4-1.

As is summarized in Table 4-1, 2025 Mainline Capacity Analysis, US 52 will have to be widened to eight lanes downtown and six lanes elsewhere in the study corridor to meet 2025 travel demand. The capacity of a four-lane freeway is 81,700 ADT; a six-lane freeway is 125,400 ADT; and an eight-lane freeway is 171,100 ADT.¹ Section 6.0, Tier 1 Analysis of this report, describes the alternative alignments developed for Tier 1.

Table 4 -1. 2025 Mainline Capacity Analysis Tier 1 Analysis

Mainline and Corridor Crossroad	Volume AADT*	Capacity AADT*	Level of Service
US 52			
Interstate 40			
Sprague St.	68,700	81,700	E
Waughtown St.	57,700	81,700	D
Vargrave St.	67,400	81,700	E
Stadium Dr.	74,000	81,700	E
Business 40	82,100	81,700	F
5th St. / 3rd St.	96,000	81,700	F
Martin Luther King, Jr. Dr.	85,800	81,700	F
Liberty St./12th St.	82,400	81,700	F
Northwest Blvd.	82,400	81,700	F
Liberty St/19th St.	83,500	81,700	F
27th/28th St.	83,100	81,700	F
Liberty St/Airport Rd.	71,700	81,700	E
Akron Dr.	64,700	81,700	D
Patterson Ave.	52,000	81,700	D
Germanton Rd.	52,500	81,700	D
University Pkwy.	50,700	81,700	C
Hanes Mill Rd.	67,300	81,700	D
	81,400	81,700	E

*Average Annual Daily Traffic

Figure 4-1

1 of 2

Figure 4-1

2 of 2

4.4 Tier 2 Analysis

The Tier 2 travel analysis evaluated traffic flow conditions on US 52 and its interchange ramps for the morning and evening peak hour conditions. The morning and evening peak hour conditions were obtained by adjusting the AADT volumes for each alternative using a peak hour factor (k) of 0.10 and a directional distributional factor (d) of 0.60 in the peak direction. For one-way ramps or streets, the two-way AADT was obtained by combining the inbound and outbound movements for the paired one-way movements. From this two-way AADT, the peak hour volumes were estimated using the above factors. Peak hour travel conditions were then analyzed for the Corridor.

Four alternative scenarios were identified in the Tier 1 Analysis for further consideration in Tier 2. The Tier 2 alternatives are summarized as follows:

- **No-Build Alternative:** The No-Build alternative assumed Year 2025 travel conditions with no improvement to the existing transportation systems beyond the 2002 transportation network. US 52 would remain a four-lane facility with closely-spaced interchanges, many with only partial access.
- **The Minimum Design Alternative:** This alternative included the minimum improvements necessary to upgrade US 52 to current freeway standards. The alternative incorporated the improvements adopted by the Winston-Salem/ Forsyth County MPO in the 2025 Long-Range Transportation Plan including widening US 52 to six lanes, consolidating access at ten full interchanges and one partial interchange, and planned improvements to other roads in the metropolitan area.
- **Interstate Alternative 1:** This alternative included widening US 52 to eight lanes between Business 40 and Martin Luther King, Jr. Drive and to six lanes elsewhere. The alternative also included a northbound collector-distributor road and southbound auxiliary lane between University Parkway and Hanes Mill Road. Access was consolidated at ten full interchanges and one partial interchange.
- **Interstate Alternative 2:** This alternative also calls for widening US 52 to six lanes with auxiliary lanes between Business 40 and Martin Luther King, Jr. Drive and a northbound collector-distributor road and southbound auxiliary lane between University Parkway and Hanes Mill Road. Access was consolidated at ten full interchanges.

It should be noted that the proposed Winston-Salem Beltway was assumed to be in place for all four alternatives, including the No-Build Alternative. The Beltway will extend from I-40 to the west, crossing US 52 at the northern city limit and continuing around to I-40 in eastern Winston-Salem. It is estimated that this route could divert as much as ten percent of US 52's through-traffic to the Western Beltway, and another 30 percent of the through-traffic to the Eastern Beltway. This analysis shows that, even with this diverted traffic, US 52 will need to be widened to accommodate future traffic demand. Without the development of the Beltway, the travel demand would be even greater.

4.4.1 No-Build Analysis

The No-Build Alternative analyzed US 52 as a four-lane facility with interchanges at the following locations:

- I-40 (full cloverleaf);
- Sprague Street (half diamond),
- Waughtown Street (half diamond),
- Diggs Boulevard/ Vargrave Street (full interchange),
- Stadium Drive (full interchange)
- Business 40 (full cloverleaf),
- Third Street (half diamond),
- Fifth Street (half diamond),
- Martin Luther King, Jr. Drive (full diamond),
- Liberty Street (half interchange) Northwest Boulevard (quarter diamond),
- Liberty Street at 19th Street (half diamond) Liberty Street at 25th/28th Street (full diamond),
- Akron Drive (full diamond),
- Patterson Avenue (full interchange),
- Germanton Road (full interchange),

- University Parkway (full interchange), and
- Hanes Mill Road (full interchange).

All of the interchanges listed above have single-lane entrance and exit ramps.

An analysis of 2025 No-Build traffic flow conditions in the US 52 Corridor indicated that congestion would worsen if nothing is done to improve area travel conditions. On the US 52 mainline, traffic demand would be at or over capacity (Level of Service F) between I-40 and Akron Drive and would be approaching capacity (Level of Service E) in the vicinity of University Parkway and Hanes Mill Road. Figure Series 4-2 illustrates the peak hour volumes for the No-Build Alternative. Table 4-2 summarizes the AM and PM peak hour volumes and the mainline capacity analyses for the No-Build Alternative. Tables 4-3 and 4-4 summarize the AM and PM peak hour volumes and the ramp capacity analyses for the No-Build Alternative.

Table 4-2. Mainline Capacity Analysis
2025 No-Build Alternative
Tier 2 Analysis

Mainline Section and Corridor Crossroad	AM PEAK HOUR						PM PEAK HOUR					
	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service
US 52	Southbound Lanes			Northbound Lanes			Southbound Lanes			Northbound Lanes		
Interstate 40	2875	4500	D	4455	4500	E	4455	4500	E	2875	4500	D
Sprague St.	2430	4500	C	3790	4500	E	3790	4500	E	2430	4500	C
Waughtown St.	2820	4500	D	4370	4500	E	4370	4500	E	2820	4500	D
Vargrave Ave.	2905	4500	D	4495	4500	E	4495	4500	E	2905	4500	D
Stadium Dr.	3230	4500	D	4980	4500	F	4980	4500	F	3230	4500	D
Business 40	4525	4500	F	5075	4500	F	5075	4500	F	4525	4500	F
5th St. / 3rd St.	4275	4500	E	4310	4500	E	4310	4500	E	4275	4500	E
Martin Luther King, Jr. Dr.	4390	4500	E	4390	4500	E	4390	4500	E	4390	4500	E
Liberty St./12th St.	3920	4500	E	4005	4500	E	4080	4500	E	3810	4500	E
Northwest Blvd.	4140	4500	E	4005	4500	E	4225	4500	E	3810	4500	E
Liberty St./19th St.	3670	4500	E	4320	4500	E	3910	4500	E	4280	4500	E
27th/28th St.	2980	4500	D	3860	4500	E	3450	4500	D	3590	4500	E
Liberty St/Airport	2980	4500	D	3580	4500	E	3450	4500	D	3170	4500	D
Akron Dr.	2220	4500	C	3075	4500	D	2945	4500	D	2410	4500	C
Patterson Ave.	2250	4500	C	3095	4500	D	2965	4500	D	2440	4500	C
Germanton Rd.	2145	4500	C	3025	4500	D	2895	4500	D	2335	4500	C
University Pkwy.	3290	4500	D	3690	4500	E	3560	4500	E	3330	4500	D
Hanes Mill Rd.												

¹Vehicles Per Hour

Figure 4-2

1 of 2

Figure 4-2

2 of 2

Table 4-3. Ramp Capacity Analysis
2025 No Build Alternative
Tier 2 Analysis - AM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?
US 52	Southbound Lanes				Northbound Lanes			
Interstate 40	EB-SB entrance	355	1800	No	NB-EB exit	1400	1800	No
	SB-EB exit loop	220	1400	No	EB-NB ent loop	960	1400	No
	WB-SB ent loop	920	1400	No	NB-WB exit loop	535	1400	No
	SB-WB exit	640	1800	No	WB-NB entrance	330	1800	No
Sprague Street	Entrance	445	1800	No	Exit	665	1800	No
Waughtown Street	Exit	390	1800	No	Entrance	580	1800	No
Vargrave Street	Entrance	385	1800	No	Exit	580	1800	No
	Exit	470	1800	No	Entrance	705	1800	No
Stadium Drive	Entrance	85	1400	No	Exit	130	1400	No
	Exit	410	1800	No	Entrance	615	1800	No
Business 40	EB-SB entrance	375	1800	No	NB-EB exit	830	1800	No
	SB-EB exit loop	920	1400	No	EB-NB ent loop	870	1400	No
	WB-SB ent loop	555	1400	No	NB-WB exit loop	560	1400	No
	SB-WB exit	1305	1800	No	WB-NB entrance	615	1800	No
5th St. / 3rd Street	Entrance	720	1800	No	Exit	1080	1800	No
	Exit	470	1800	No	Entrance	315	1800	No
Martin Luther King, Jr. Drive	Entrance	675	1400	No	Exit	450	1800	No
	Exit	790	1800	No	Entrance	530	1400	No
Liberty St./12th Street	Entrance	580	1400	No	Exit	385	1800	No
	Exit	110	1800	No				
Northwest Boulevard	Exit	220	1800	No				
Liberty St/19th Street	Entrance	470	1800	No	Entrance	315	1800	No
27th/28th Street	Entrance	1075	1800	No	Exit	720	1800	No
	Exit	385	1800	No	Entrance	260	1800	No
Liberty St/Airport Road					Exit	280	1800	No
Akron Drive	Entrance	1005	1800	No	Exit	670	1800	No
	Exit	245	1800	No	Entrance	165	1800	No
Patterson Avenue	Ent Loop	325	1400	No	Exit	215	1800	No
	Exit	355	1800	No	Entrance	235	1800	No
Germanton Road	Entrance	545	1800	No	Exit Loop	365	1400	No
	Exit	440	1800	No	Entrance	295	1800	No
University Parkway	Ent Loop	100	1400	No	Exit to EB Univ	125	1800	No
	Exit	1245	1800	No	Exit Loop to WB Univ	40	1400	No
					Entrance	830	1800	No
Hanes Mill Road	Ent Loop	35	1400	No	Exit Loop	25	1400	No
	Exit	875	1800	No	Entrance	585	1800	No

¹ Vehicles Per Hour

Table 4-4. Ramp Capacity Analysis
2025 No Build Alternative
Tier 2 Analysis - PM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?
US 52	Southbound Lanes				Northbound Lanes			
Interstate 40	EB-SB entrance	535	1800	No	NB-EB exit	920	1800	No
	SB-EB exit loop	330	1400	No	EB-NB ent loop	640	1400	No
	WB-SB ent loop	1400	1400	Yes	NB-WB exit loop	355	1400	No
	SB-WB exit	960	1800	No	WB-NB entrance	220	1800	No
Sprague Street	Entrance	665	1800	No	Exit	445	1800	No
Waughtown Street	Exit	580	1800	No	Entrance	390	1800	No
Vargrave Street	Entrance	580	1800	No	Exit	385	1800	No
	Exit	705	1800	No	Entrance	470	1800	No
Stadium Drive	Entrance	130	1800	No	Exit	85	1800	No
	Exit	615	1800	No	Entrance	410	1800	No
Business 40	EB-SB entrance	560	1800	No	NB-EB exit	555	1800	No
	SB-EB exit loop	615	1400	No	EB-NB ent loop	1305	1400	No
	WB-SB ent loop	830	1400	No	NB-WB exit loop	375	1400	No
	SB-WB exit	870	1800	No	WB-NB entrance	920	1800	No
5th St. / 3rd Street	Entrance	1080	1800	No	Exit	720	1800	No
	Exit	315	1800	No	Entrance	470	1800	No
Martin Luther King, Jr. Drive	Entrance	450	1800	No	Exit	675	1800	No
	Exit	530	1800	No	Entrance	790	1800	No
Liberty St./12th Street	Entrance	385	1800	No	Exit	580	1800	No
	Exit	75	1800	No				
Northwest Boulevard	Exit	145	1800	No				
Liberty St./19th Street	Entrance	315	1800	No	Entrance	470	1800	No
25th/28th Street	Entrance	720	1800	No	Exit	1075	1800	No
	Exit	260	1800	No	Entrance	385	1800	No
Liberty St					Exit	420	1800	No
Akron Drive	Entrance	670	1800	No	Exit	1005	1800	No
	Exit	165	1800	No	Entrance	245	1800	No
Patterson Avenue	Ent Loop	215	1400	No	Exit	325	1800	No
	Exit	235	1800	No	Entrance	355	1800	No
Germanton Road	Entrance	365	1800	No	Exit Loop	545	1400	No
	Exit	295	1800	No	Entrance	440	1800	No
University Parkway	Ent Loop	165	1400	No	Exit to EB Univ	190	1800	No
	Exit	830	1800	No	Exit Loop to WB Univ	60	1400	No
					Entrance	1245	1800	No
Hanes Mill Road	Ent Loop	25	1400	No	Exit Loop	35	1400	No
	Exit	585	1800	No	Entrance	875	1800	No

¹ Vehicles Per Hour

4.4.2 Minimum Design Alternative

The Minimum Design Alternative analyzed US 52 as a six-lane facility with the following additional lanes:

- between Business 40 and Martin Luther King, Jr. Drive - northbound and southbound auxiliary lanes;
- between University Parkway and Hanes Mill Road - a northbound collector-distributor road and a southbound auxiliary lane.

This alternative would provide interchanges at the following locations and would have single-lane entrance and exit ramps:

- I-40 (full cloverleaf),
- Waughtown Street (half diamond),
- Salem Creek Parkway (full interchange),
- Business 40 (full cloverleaf),
- Third Street (half diamond),
- Martin Luther King, Jr. Drive (full diamond),
- Liberty Street at 25th/28th Street (full diamond),
- Akron Drive (full diamond),
- Patterson Avenue (full interchange),
- Germanton Road (full interchange),
- University Parkway (full interchange), and
- Hanes Mill Road (full interchange).

For the Minimum Design Alternative, analysis of 2025 traffic flow conditions in the US 52 corridor indicated that traffic will flow at Level Of Service D during peak hour conditions on the mainline between I-40 and Akron Drive and at Level of Service C or better for the remainder of the study area if US 52 is widened to eight lanes downtown and six lanes within the remaining study corridor. Figure Series 4-3 illustrates the peak hour volumes for the Minimum Design Alternative. Table 4-5 summarizes the AM and PM peak hour volumes and the mainline capacity analyses for the Minimum Design Alternative.

**Table 4-5. Mainline Capacity Analysis
2025 Minimum Design Alternative
Tier 2 Analysis**

Corridor Crossroad	AM Peak Hour Volumes			PM Peak Hour Volumes								
	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service						
US 52	Southbound Lanes		Northbound Lanes		Southbound Lanes		Northbound Lanes					
Interstate 40	3225	6750	C	4215	6750	D	4215	6750	D	3225	6750	C
Waughtown Street	3655	6750	C	4860	6750	D	4860	6750	D	3655	6750	C
Salem Creek Parkway	3875	6750	C	5190	6750	D	5190	6750	D	3875	6750	C
Business 40	5135	9000	C	5100	9000	C	5100	9000	C	5135	9000	C
Martin Luther King, Jr. Drive	5040	6750	D	5040	6750	D	5040	6750	D	5040	6750	D
27th/28th Street	4210	6750	D	4490	6750	D	4490	6750	D	4210	6750	D
Akron Drive	3390	6750	C	3945	6750	C	3945	6750	C	3390	6750	C
Patterson Avenue	3395	6750	C	3945	6750	C	3945	6750	C	3395	6750	C
Germanton Road	3285	6750	C	3875	6750	C	3875	6750	C	3285	6750	C
University Parkway	3885	6750	C	3515	6750	C	4275	6750	C	2745	6750	B
Hanes Mill Road												

¹Vehicles Per Hour

**Table 4-6. Ramp Capacity Analysis
2025 Minimum Design Alternative
Tier 2 Analysis - AM Peak Hour Volumes**

Corridor Crossroad	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?
US 52	Southbound Lanes				Northbound Lanes			
Interstate 40	EB-SB entrance	390	1800	No	NB-EB exit	1380	1800	No
	SB-EB exit loop	325	1400	No	EB-NB ent loop	975	1400	No
	WB-SB ent loop	960	1400	No	NB-WB exit loop	580	1400	No
	SB-WB exit	650	1800	No	WB-NB entrance	485	1800	No
Waughtown Street	Exit	430	1800	No	Entrance	645	1800	No
Salem Creek Parkway	Entrance	415	1400	No	Exit	620	1400	No
	Exit	635	1800	No	Entrance	950	1800	No
Business 40	EB-SB entrance	380	1800	No	NB-EB exit	1110	1800	No
	SB-EB exit	940	1800	No	EB-NB entrance	960	1800	No
	WB-SB ent loop	740	1400	No	NB-WB exit loop	570	1400	No
	SB-WB exit	1440	1800	No	WB-NB entrance	630	1800	No
Martin Luther King, Jr. Drive	Entrance	1345	1800	No	Exit	895	1800	No
	Exit	1250	1800	No	Entrance	835	1400	No
27th/28th Street	Entrance	1600	1800	No	Exit	1065	1800	No
	Exit	770	1800	No	Entrance	515	1800	No
Akron Drive	Entrance	1270	1800	No	Exit	845	1800	No
	Exit	450	1800	No	Entrance	300	1800	No
Patterson Avenue	Ent Loop	370	1400	No	Exit	250	1800	No
	Exit	375	1800	No	Entrance	250	1800	No
Germanton Road	Entrance	765	1800	No	Exit Loop	510	1400	No
	Exit	655	1800	No	Entrance	440	1800	No
University Parkway	Ent Loop	330	1400	No	Exit ²	360	1800	No
	Exit	930	1800	No				
Hanes Mill Road	Ent Loop	210	1400	No	Entrance ²	1240	1800	No
	Exit	930	1800	No				

¹ Vehicles Per Hour

² Serves both University Parkway and Hanes Mill Road via a collector-distributor Road.

Capacity analyses of peak hour ramp conditions indicated that single lane ramps would be sufficient to accommodate traffic demand during peak travel conditions at all but two locations. At the I-40 interchange, traffic demand on the westbound I-40 to southbound US 52 loop ramp would be at capacity during peak hours. At the Hanes Mill Road interchange, the northbound entrance ramp would require two lanes to accommodate the peak hour demand. Tables 4-6 and 4-7 summarize the AM and PM peak hour volumes and the ramp capacity analyses for the Minimum Design Alternative.

Figure 4-3

1 of 2

Figure 4-3

2 of 2

Table 4-7. Ramp Capacity Analysis
 2025 Minimum Design Alternative
 Tier 2 Analysis - PM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume VPH1	Capacity VPH1	Over Capacity?	Ramp	Volume VPH1	Capacity VPH1	Over Capacity?
US 52		Southbound Lanes			Northbound Lanes			
Interstate 40	EB-SB entrance	580	1800	No	NB-EB exit	960	1800	No
	SB-EB exit loop	485	1400	No	EB-NB ent loop	650	1400	No
	WB-SB ent loop	1380	1400	No	NB-WB exit loop	390	1400	No
	SB-WB exit	975	1800	No	WB-NB entrance	325	1800	No
Waughtown Street	Exit	645	1800	No	Entrance	430	1800	No
Salem Creek Parkway	Entrance	620	1400	No	Exit	415	1400	No
	Exit	950	1800	No	Entrance	635	1800	No
Business 40	EB-SB entrance	570	1800	No	NB-EB exit	740	1800	No
	SB-EB exit	630	1800	No	EB-NB entrance	1440	1800	No
	WB-SB ent loop	1110	1400	No	NB-WB exit loop	380	1400	No
	SB-WB exit	960	1800	No	WB-NB entrance	940	1800	No
Martin Luther King, Jr. Drive	Entrance	895	1800	No	Exit	1345	1800	No
	Exit	835	1800	No	Entrance	1250	1800	No
27th/28th Street	Entrance	1065	1800	No	Exit	1600	1800	No
	Exit	515	1800	No	Entrance	770	1800	No
Akron Drive	Entrance	845	1800	No	Exit	1270	1800	No
	Exit	300	1800	No	Entrance	450	1800	No
Patterson Avenue	Ent Loop	250	1400	No	Exit	370	1800	No
	Exit	250	1800	No	Entrance	375	1800	No
Germanton Road	Entrance	510	1800	No	Exit Loop	765	1400	No
	Exit	440	1800	No	Entrance	655	1800	No
University Parkway	Ent Loop	220	1400	No	Exit	540	1800	No
	Exit	620	1800	No				
Hanes Mill Road	Ent Loop	140	1400	No				
	Exit	620	1800	No	Entrance	1860	1800	Yes

¹ Vehicles Per Hour

4.4.3 Interstate Alternative 1

Interstate Alternative 1 analyzes US 52 as a six-lane facility with the following additional lanes:

- between Business 40 and Martin Luther King, Jr. Drive - northbound and southbound auxiliary lanes;
- between University Parkway and Hanes Mill Road - a northbound collector-distributor road and a southbound auxiliary lane.

This alternative would provide interchanges at the following locations:

- I-40 (full cloverleaf),
- Salem Creek Parkway (full interchange),
- Business 40 (full cloverleaf),
- Martin Luther King, Jr. Drive (full diamond),
- Liberty Street at 25th/28th Street (full diamond),
- Akron Drive (full diamond),
- Patterson Avenue (full interchange),
- Germanton Road (full interchange),
- University Parkway (full interchange), and
- Hanes Mill Road (full interchange).

All interchanges would have single-lane entrance and exit ramps.

Table 4-8. Mainline Capacity Analysis
2025 Interstate Alternative 1
Tier 2 Analysis

Corridor Crossroad	AM PEAK HOUR						PM PEAK HOUR					
	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service
US 52	Southbound Lanes			Northbound Lanes			Southbound Lanes			Northbound Lanes		
Interstate 40	2415	6750	B	4750	6750	D	5245	6750	D	2805	6750	B
Salem Creek Parkway	2870	6750	B	5435	6750	D	5930	6750	E	3260	6750	C
Business 40	4155	9000	B	5450	9000	C	5945	9000	C	4550	9000	C
3rd Street	3290	9000	B	4150	9000	B	4645	9000	C	3685	9000	B
Martin Luther King, Jr. Drive	5165	6750	D	5165	6750	D	5165	6750	D	5165	6750	D
27th/28th Street	4230	6750	C	4540	6750	C	4540	6750	C	4230	6750	C
Akron Drive	3415	6750	C	3995	6750	C	3995	6750	C	3415	6750	C
Patterson Avenue	3410	6750	C	3990	6750	C	3990	6750	C	3410	6750	C
Germanton Road	3280	6750	C	3905	6750	C	3905	6750	C	3280	6750	C
University Parkway	3880	9000	B	3540	6750	C	4305	9000	C	2730	6750	B
Hanes Mill Road												

¹ Vehicles Per Hour

For Interstate Alternative 1, analysis of 2025 traffic flow conditions in the US 52 Corridor indicated that traffic would be approaching capacity (Level of Service E) on only one segment which is southbound US 52 between Business 40 and Salem Creek Parkway during the PM peak hour. Traffic would flow at Level Of Service D during peak hour conditions on the mainline between I-40, and Business 40 and between Martin Luther King, Jr. Drive and Liberty Street/ 27th/28th Street. Traffic would flow at Level of Service C or better through the remainder of the study corridor. Figure Series 4-4 illustrates the peak hour volumes for the Interstate Alternative 1. Table 4-8 summarizes the 2025 mainline capacity analyses for Interstate Alternative 1.

Capacity analyses of peak hour ramp conditions indicated that single lane ramps would be sufficient to accommodate traffic demand during peak travel conditions at all locations with the exception of two interchanges: At the I-40 interchange, traffic demand on the westbound I-40 to southbound US 52 loop ramp would exceed the ramp's capacity during the PM peak hour. At the Hanes Mill Road interchange, the northbound entrance ramp would require two lanes to accommodate the PM peak hour demand. Tables 4-9 and 4-10 summarize the AM and PM peak hour volumes and the ramp capacity analyses for the Interstate Alternative 1.

Table 4-9. Ramp Capacity Analysis
2025 Interstate Alternative 1
Tier 2 Analysis - AM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume	Capacity	Over	Ramp	Volume	Capacity	Over
		VPH ¹	VPH ¹	Capacity?		VPH ¹	VPH ¹	Capacity?
US 52		Southbound Lanes			Northbound Lanes			
Interstate 40	EB-SB entrance	395	1800	No	NB-EB exit	1425	1800	No
	SB-EB exit loop	395	1400	No	EB-NB ent loop	990	1400	No
	WB-SB ent loop	950	1400	No	NB-WB exit loop	590	1400	No
	SB-WB exit	660	1800	No	WB-NB entrance	590	1800	No
Salem Creek Parkway	Entrance loop	385	1400	No	Exit loop	575	1400	No
	Exit	840	1800	No	Entrance	1260	1800	No
Business 40	EB-SB entrance	305	1800	No	NB-EB exit	1070	1800	No
	SB-EB exit ²	940	1800	No	EB-NB entrance	910	1800	No
	WB-SB ent loop	715	1400	No	NB-WB exit loop	455	1400	No
	SB-WB exit ²	1365	1800	No	WB-NB entrance	630	1800	No
3rd St.	Entrance	865	1800	No	Exit	1300	1800	No
Martin Luther King, Jr. Drive.	Entrance	865	1400	No	Exit	260	1800	No
	Exit	1370	1800	No	Entrance	365	1400	No
Liberty St./12th Street	Exit	1370	1800	No	Entrance	915	1400	No
27th/28th Street	Entrance	1595	1800	No	Exit	1065	1800	No
	Exit	660	1800	No	Entrance	440	1800	No
Akron Drive	Entrance	1250	1800	No	Exit	835	1800	No
	Exit	435	1800	No	Entrance	290	1800	No
Patterson Avenue	Ent Loop	380	1400	No	Exit	255	1800	No
	Exit	375	1800	No	Entrance	250	1800	No
Germanton Road	Entrance	770	1800	No	Exit Loop	515	1400	No
	Exit	640	1800	No	Entrance	430	1800	No
University Parkway	Ent Loop	330	1400	No	Exit	365	1800	No
	Exit	930	1800	No				
Hanes Mill Road	Ent Loop	220	1400	No				
	Exit	930	1800	No	Entrance	1240	1800	No

¹ Vehicles Per Hour

² All Southbound US 52 traffic traveling to either eastbound or westbound Business 40 exit via the same ramp. The total amount of exiting traffic is 2305 vph. Therefore, two lanes must be constructed on this ramp to provide adequate space for vehicles.

Table 4-10. Ramp Capacity Analysis
2025 Interstate Alternative 1
Tier 2 Analysis - PM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume	Capacity	Over	Ramp	Volume	Capacity	Over
		VPH ¹	VPH ¹	Capacity?		VPH ¹	VPH ¹	Capacity?
US 52		Southbound Lanes			Northbound Lanes			
Interstate 40	EB-SB entrance	590	1800	No	NB-EB exit	950	1800	No
	SB-EB exit loop	590	1400	No	EB-NB ent loop	660	1400	No
	WB-SB ent loop	1425	1400	Yes	NB-WB exit loop	395	1400	No
	SB-WB exit	990	1800	No	WB-NB entrance	395	1800	No
Salem Creek Parkway	Entrance loop	575	1400	No	Exit loop	385	1400	No
	Exit	1260	1800	No	Entrance	840	1800	No
Business 40	EB-SB entrance	455	1800	No	NB-EB exit	715	1800	No
	SB-EB exit	630	1800	No	EB-NB entrance ²	1365	1800	No
	WB-SB ent loop	1070	1400	No	NB-WB exit loop	305	1400	No
	SB-WB exit	910	1800	No	WB-NB entrance ²	940	1800	No
3rd St.	Entrance	1300	1800	No	Exit	865	1800	No
Martin Luther King, Jr. Drive	Entrance	1300	1800	No	Exit	435	1800	No
	Exit	915	1800	No	Entrance	550	1800	No
Liberty St./12th Street	Exit	915	1800	No	Entrance	1370	1800	No
27th/28th Street	Entrance	1065	1800	No	Exit	1595	1800	No
	Exit	440	1800	No	Entrance	660	1800	No
Akron Drive	Entrance	835	1800	No	Exit	1250	1800	No
	Exit	290	1800	No	Entrance	435	1800	No
Patterson Avenue	Ent Loop	255	1400	No	Exit	380	1800	No
	Exit	250	1800	No	Entrance	375	1800	No
Germanton Road	Entrance	515	1800	No	Exit Loop	770	1400	No
	Exit	430	1800	No	Entrance	640	1800	No
University Parkway	Ent Loop	220	1400	No	Exit	550	1800	No
	Exit	620	1800	No				
Hanes Mill Road	Ent Loop	150	1400	No				
	Exit	620	1800	No	Entrance	1860	1800	Yes

¹ Vehicles Per Hour

² All Northbound US 52 traffic traveling from either eastbound or westbound Business 40 enter via the same ramp. The total amount of entering traffic is 2305 vph. Therefore, two lanes must be constructed on this ramp to provide adequate space for vehicle.

Figure 4-4

1 of 2

Figure 4-4

2 of 2

4.4.4 Interstate Alternative 2

Interstate Alternative 2 analyzes US 52 as a six-lane facility with the following additional lanes:

- between Business 40 and Martin Luther King, Jr. Drive - northbound and southbound auxiliary lanes;
- between University Parkway and Hanes Mill Road - a northbound collector-distributor road and a southbound auxiliary lane.

This alternative would provide interchanges at the following locations and would have single-lane entrance and exit ramps:

- I-40 (full cloverleaf),
- Salem Creek Parkway (full interchange),
- Business 40 (full cloverleaf),
- Third Street (half diamond),
- Martin Luther King, Jr. Drive (full diamond),
- Liberty Street at 27th/28th Street (full diamond),
- Akron Drive (full diamond),
- Motor Road (full interchange),
- Germanton Road (full interchange),
- University Parkway (full interchange), and
- Hanes Mill Road (full interchange).

For Interstate Alternative 2, analysis of 2025 traffic flow conditions in the US 52 Corridor indicates that traffic will flow at Level Of Service D during peak hour conditions on the mainline between Salem Creek Parkway and Business 40, and between Martin Luther King, Jr. Drive and Liberty Street/27th/28th Street. Traffic will flow at Level or Service C or better throughout the remainder of the study corridor if US 52 is widened to eight lanes downtown and six lanes within the remaining study corridor. Figure Series 4-5 illustrates the peak hour volumes for the Interstate Alternative 2. Table 4-11 summarizes the AM and PM peak hour volumes and the mainline capacity analyses for Interstate Alternative 2.

Capacity analyses of peak hour ramp conditions indicated that single lane ramps would be sufficient to accommodate traffic demand during peak travel conditions at all locations with the exception of two interchanges. At the I-40 interchange, traffic demand on the westbound I-40 to southbound US 52 loop ramp will exceed the ramp's capacity during the PM peak hour. At the Hanes Mill Road interchange, the northbound entrance ramp would require two lanes to accommodate the PM peak hour demand. Tables 4-12 and 4-13 summarize the AM and PM peak hour volumes and the ramp capacity analyses for the Interstate Alternative 2.

**Table 4-11. Mainline Capacity Analysis
2025 Interstate Alternative 2
Tier 2 Analysis**

Corridor Crossroad	AM PEAK HOUR						PM PEAK HOUR					
	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service
US 52	Southbound Lanes			Northbound Lanes			Southbound Lanes			Northbound Lanes		
Interstate 40	3260	6750	C	4390	6750	C	4390	6750	C	3260	6750	C
Salem Creek Parkway	3685	6750	C	5025	6750	D	5025	6750	D	3685	6750	C
Business 40	5070	9000	C	5065	9000	C	5065	9000	C	5070	9000	C
Martin Luther King, Jr. Drive	5060	6750	D	5060	6750	D	5060	6750	D	5060	6750	D
27th/28th Street	4180	6750	C	4470	6750	C	4470	6750	C	4180	6750	C
Akron Drive	3195	6750	C	3815	6750	C	3815	6750	C	3195	6750	C
Motor Road	3735	6750	C	4170	6750	C	4170	6750	C	3735	6750	C
Germanton Road	3650	6750	C	4110	6750	C	4110	6750	C	3650	6750	C
University Parkway	4250	9000	C	3745	6750	C	4510	9000	C	3100	6750	B
Hanes Mill Road												

¹ Vehicles Per Hour

**Table 4-12. Ramp Capacity Analysis
2025 Interstate Alternative 2
Tier 2 Analysis - AM Peak Hour Volumes**

Corridor Crossroad	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?
US 52	Southbound Lanes				Northbound Lanes			
Interstate 40	EB-SB entrance	395	1800	No	NB-EB exit	1430	1800	No
	SB-EB exit loop	380	1400	No	EB-NB ent loop	975	1400	No
	WB-SB ent loop	955	1400	No	NB-WB exit loop	590	1400	No
	SB-WB exit	650	1800	No	WB-NB entrance	570	1800	No
Salem Creek Parkway	Entrance	385	1800	No	Exit	580	1800	No
	Exit	810	1800	No	Entrance	1215	1800	No
Business 40	EB-SB entrance	340	1800	No	NB-EB exit	1080	1800	No
	SB-EB exit ²	1005	1800	No	EB-NB entrance	960	1800	No
	WB-SB ent loop	720	1400	No	NB-WB exit loop	510	1400	No
	SB-WB exit ²	1440	1800	No	WB-NB entrance	670	1800	No
Martin Luther King, Jr. Drive	Entrance	1320	1800	No	Exit	880	1800	No
	Exit	1310	1800	No	Entrance	875	1400	No
27th/28th Street	Entrance	1640	1800	No	Exit	1095	1800	No
	Exit	760	1800	No	Entrance	505	1800	No
Akron Drive	Entrance	1410	1800	No	Exit	940	1800	No
	Exit	425	1800	No	Entrance	285	1800	No
Motor Road	Entrance	85	1800	No	Exit loop	60	1400	No
	Exit	625	1800	No	Entrance	415	1800	No
Germanton Road	Entrance	685	1800	No	Exit Ramp	420	1800	No
	Exit	600	1800	No	Exit Loop	40	1400	No
					Entrance	400	1800	No
University Parkway	Ent Loop	330	1400	No	Exit	365	1800	No
	Exit	930	1800	No				
Hanes Mill Road	Ent Loop	220	1400	No				
	Exit	930	1800	No	Entrance	1240	1800	No

¹ Vehicles Per Hour

² All Southbound US 52 traffic traveling to either eastbound or westbound Business 40 exit via the same ramp. The total amount of exiting traffic is 2445 vph. Therefore, two lanes must be constructed on this ramp to provide adequate space for vehicles.

Table 4-13. Ramp Capacity Analysis
 2025 Interstate Alternative 2
 Tier 2 Analysis - PM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?	Ramp	Volume VPH ¹	Capacity VPH ¹	Over Capacity?
US 52		Southbound Lanes			Northbound Lanes			
Interstate 40	EB-SB entrance	590	1800	No	NB-EB exit	955	1800	No
	SB-EB exit loop	570	1400	No	EB-NB ent loop	650	1400	No
	WB-SB ent loop	1430	1400	Yes	NB-WB exit loop	395	1400	No
	SB-WB exit	975	1800	No	WB-NB entrance	380	1800	No
Salem Creek Parkway	Entrance	580	1800	No	Exit	385	1800	No
	Exit	1215	1800	No	Entrance	810	1800	No
Business 40	EB-SB entrance	510	1800	No	NB-EB exit	720	1800	No
	SB-EB exit	670	1800	No	EB-NB entrance ²	1440	1800	No
	WB-SB ent loop	1080	1400	No	NB-WB exit loop	340	1400	No
	SB-WB exit	960	1800	No	WB-NB entrance ²	1005	1800	No
Martin Luther King, Jr. Drive	Entrance	880	1800	No	Exit	1320	1800	
	Exit	875	1800	No	Entrance	1310	1800	
27th/28th Street	Entrance	1095	1800	No	Exit	1640	1800	No
	Exit	505	1800	No	Entrance	760	1800	No
Akron Drive	Entrance	940	1800	No	Exit	1410	1800	No
	Exit	285	1800	No	Entrance	425	1800	No
Motor Road	Entrance	60	1800	No	Exit Loop	85	1400	No
	Exit	415	1800	No	Entrance	625	1800	No
Germanton Road	Entrance	460	1800	No	Exit Ramp	630	1800	No
	Exit	400	1800	No	Exit Loop	55	1400	No
					Entrance	600	1800	No
University Parkway	Ent Loop	220	1400	No	Exit	550	1800	No
	Exit	620	1800	No				
Hanes Mill Road	Ent Loop	150	1400	No				
	Exit	620	1800	No	Entrance	1860	1800	Yes

¹ Vehicles Per Hour

² All Northbound US 52 traffic traveling from either eastbound or westbound Business 40 enter via the same ramp. The total amount of entering traffic is 2445 vph. Therefore, two lanes must be constructed on this ramp to provide adequate capacity for veh

4.4.5 Conclusion

Interstate Alternative 2, with some modifications, was selected for development as the Locally Preferred Alternative (LPA). Specifically, as in Interstate Alternative 2, between I-40 and Mock Street, US 52 would be realigned to the west of the existing alignment to improve the horizontal alignment and to permit a full interchange at Waughtown Street. The LPA follows the same alignment as proposed for Interstate Alternative 2 for the remainder of the study corridor.

The Locally Preferred Alternative should be designed as a freeway with six through lanes for its entire length with the following additional lanes:

- auxiliary lanes between Business 40 and Martin Luther King, Jr. Drive;
- a northbound collector-distributor road and a southbound auxiliary lane between University Parkway and Hanes Mill Road.

The interchange configuration of Interstate Alternative 2 would be developed for the LPA with two additions. A new full interchange would be developed at Waughtown Street and the partial interchange at Third Street would be retained. The new interchange at Waughtown Street would require auxiliary lanes in both directions between I-40 and Waughtown Street.

Single lane ramps will be sufficient to accommodate future 2025 demand except at the following locations:

- on the westbound I-40 to southbound US 52 loop ramp, a two-lane ramp would be required to accommodate future traffic demand.
- at the Hanes Mill Road interchange, the northbound entrance ramp would require two lanes to accommodate future traffic demand.

Figure 4-5

1 of 2

Figure 4-5

2 of 2

4.5 Tier 3 Locally Preferred Alternative Analysis

4.5.1 Travel Network

The Locally Preferred Alternative proposes US 52 to be reconstructed as a six-lane facility with the following additional lanes:

- between I-40 and Waughtown Street - northbound and southbound auxiliary lanes;
- between Business 40 and Martin Luther King, Jr. Drive - northbound and southbound auxiliary lanes;
- between University Parkway and Hanes Mill Road - a northbound collector-distributor road and a southbound auxiliary lane.

The Locally Preferred Alternative would provide for interchanges at the following locations:

- I-40 (full cloverleaf),
- Waughtown Street (full diamond),
- Salem Creek Parkway (partial cloverleaf),
- Business 40 (full cloverleaf),
- Third Street (half diamond),
- Martin Luther King, Jr. Drive (full diamond),
- Liberty Street at 25th/28th Street (full diamond),
- Akron Drive (full diamond),
- Motor Road (full interchange),
- Germanton Road (full interchange),
- University Parkway (full interchange), and
- Hanes Mill Road (full interchange).

All are single-lane ramps except at the Hanes Mill Road interchange where the northbound entrance ramp would be designed as a two-lane ramp.

For nearby intersections, this analysis assumed that roadway improvements programmed as part of the Winston-Salem / Forsyth County Long Range Transportation Plan will be in place by 2025.

4.5.2 Traffic Volumes

The Tier 3 Travel Analysis used the same technique as the Tier 2 Analysis for the mainline and ramp capacity analyses. The AM and PM peak hour conditions were obtained by adjusting the AADT volumes for each alternative using a peak hour factor (k) of 0.10 and a directional distributional factor (d) of 0.60 in the peak direction. For one-way ramps or streets, the two-way AADT was obtained by combining the inbound and outbound movements for the paired one-way movements. From this two-way AADT, the peak hour volumes were developed using the above factors. Peak hour travel conditions were then analyzed for the Corridor.

In addition to the mainline and ramp analyses, the adjacent intersections were analyzed for the Locally Preferred Alternative. Intersections at ramp terminals and at nearby cross-streets that could be affected by changes in traffic flow on US 52 were analyzed for peak hour conditions. The peak hour traffic demand was obtained in a two-step process. As with the mainline and ramps, the AADT volumes were factored with the peak hour and directional distribution factors to obtain peak hour volumes at intersections. Then, where the 2025 network is similar to the existing intersection configurations, the 2000 turning volume counts were used to proportion turning traffic at intersections. These volumes were then adjusted to reflect any significant changes in traffic patterns in the future network (i.e. at the ramp intersection of US 52 northbound ramps at University Parkway, the volume of westbound traffic turning onto the northbound ramp is expected to increase significantly because of the future beltway nearby). For locations where the 2025 network is significantly different from the existing roadway network (e.g. at the Salem Creek Parkway), turning traffic was proportioned by the volumes on the other three intersection legs. A final review of traffic volumes was checked to verify that the estimated traffic was reasonable compared to current traffic flow conditions. The 2025 mainline and ramp traffic volumes for the Locally Preferred Alternative are shown in Figure Series 4-6 and the intersection traffic volumes are shown in Figure Series 4-7.

4.5.3 Capacity Analysis

The capacity analysis for the Locally Preferred Alternative includes peak hour analyses for the mainline, ramps, weaving sections and affected intersections within the US 52 Corridor.

4.5.3.1 Mainline Analysis

For the Locally Preferred Alternative, the analysis of 2025 traffic flow conditions in the US 52 Corridor indicated that traffic will flow at Level of Service D during peak hour conditions on the mainline between I-40 and Business 40 and between Martin Luther King, Jr. Drive and Liberty Street/27th/28th Street. Traffic would flow at Level of Service C or better throughout the remainder of the study corridor if US 52 is widened to six continuous through lanes and auxiliary lanes as needed throughout the study corridor. Figure Series 4-6 illustrates the peak hour volumes for the Locally Preferred Alternative. Table 4-14 summarizes the AM and PM peak hour volumes and the mainline capacity analyses for the Locally Preferred Alternative.

4.5.3.2 Ramp Analysis

Capacity analyses of peak hour ramp conditions indicated that single lane ramps would be sufficient to accommodate traffic demand during peak travel conditions at all locations with the exception of two interchanges. At the I-40 interchange, traffic demand on the westbound I-40 to southbound US 52 loop ramp would exceed the ramp's capacity during the PM peak hour. At the Hanes Mill Road interchange, the northbound entrance ramp would require two lanes to accommodate the PM peak hour demand. Tables 4-15 and 4-16 summarize the AM and PM peak hour volumes and the ramp capacity analyses for the Locally Preferred Alternative. It should be noted that although the traffic analysis includes the I-40 interchange, the design of that interchange is beyond the scope of this project.

4.5.3.3 Intersection Analysis

The intersection capacity analyses indicate that 2025 traffic volumes will continue to flow through most intersections at Level of Service D or better, an acceptable rate of traffic flow for peak hour conditions. However, there are several locations where additional turning lanes may be necessary to meet future travel demand. It should be noted that traffic flow through intersections may vary significantly as new roads are opened and existing routes are improved. It is therefore recommended that the results of this analysis be used as a guide for future planning rather than for intersection improvements at this time. The analysis should be further refined as the project goes forward. Tables 4-17 and 4-18 summarize the intersection capacity analyses for the study area. A brief description of the intersections analyzed and recommended improvements follows.

Waughtown Street

The US 52 Corridor Plan recommends the following improvements in the vicinity of the Waughtown Street interchange.

- US 52 near the Waughtown Street interchange is relocated farther west;
- A full diamond interchange replaces the existing partial interchange at Waughtown Street;
- The intersection of North Vargrave Street at Waughtown Street (east of US 52) is relocated farther to the east; and
- The intersection of South Vargrave Street at Waughtown Street (west of US 52) is relocated farther west.

Vargrave Street is no longer a continuous street but rather intersects Waughtown Street at two intersections: to the west of US 52 and south of Waughtown Street; and to the east of US 52 and north of Waughtown Street.

Taking into consideration these improvements, the following three intersections on Waughtown Street were analyzed for 2025 traffic flow conditions:

- Waughtown Street at US 52 southbound on/off ramps
- Waughtown Street at US 52 northbound on/off ramps

Figure 4-6

1 of 2

Figure 4-6

2 of 2

Figure 4-7

1 of 4

Figure 4-7

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Figure 4-7

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Figure 4-7

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- Waughtown Street at N. Vargrave Street

Waughtown Street at US 52 southbound and northbound on/off ramps: These are new intersections. With the installation of a traffic signal timed with a 90-second cycle length, traffic will flow at Level of Service C, a good rate of traffic flow.

Waughtown Street at North Vargrave Street: The intersection of Waughtown Street with North Vargrave Street is a new “T” intersection, which will be formed with the proposed relocation of Vargrave Street. Intersection capacity analyses indicated that, with a proposed stop sign controlling traffic on North Vargrave Street traffic will flow at Level of Service D or better throughout the day, which is an acceptable rate of traffic flow.

Salem Creek Parkway

The US 52 Corridor Plan recommends adding a half cloverleaf interchange at Salem Creek Parkway. Salem Creek Parkway is a proposed east-west thoroughfare having two through lanes and separate left-turn lanes at intersections. Taking into consideration the above improvements, the following three intersections on Salem Creek Parkway were analyzed for 2025 traffic flow conditions:

- Salem Creek Parkway at US 52 southbound on/off ramps
- Salem Creek Parkway at US 52 northbound on/off ramps
- Salem Creek Parkway at N. Vargrave Street

Salem Creek Parkway at US 52 southbound on/off ramps: This is a new “T” intersection located west of US 52. Intersection capacity analyses indicated that a traffic signal will be needed at the intersection. With the installation of a signal with a 90-

Table 4-14. Mainline Capacity Analysis
2025 Locally Preferred Alternative
Tier 3 Analysis

Corridor Crossroad	AM PEAK HOUR						PM PEAK HOUR					
	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service	Volume VPH ¹	Capacity VPH ¹	Level of Service
US 52	Southbound Lanes			Northbound Lanes			Southbound Lanes			Northbound Lanes		
Interstate 40	3425	6750	C	4890	6750	D	4890	6750	D	3425	6750	C
Waughtown Street	3515	6750	C	5025	6750	D	5025	6750	D	3515	6750	C
Salem Creek Parkway	3790	6750	C	5445	6750	D	5445	6750	D	3790	6750	C
Business 40	5245	9000	C	5565	9000	C	5565	9000	C	5245	9000	C
3rd Street	4675	9000	C	4710	9000	C	4710	9000	C	4675	9000	C
Martin Luther King, Jr. Drive	4770	6750	D	4770	6750	D	4770	6750	D	4770	6750	D
27th/28th Street	4060	6750	C	4295	6750	C	4295	6750	C	4060	6750	C
Akron Drive	3150	6750	C	3690	6750	C	3690	6750	C	3150	6750	C
Motor Road	3675	6750	C	4040	6750	C	4040	6750	C	3675	6750	C
Germanton Road	3480	6750	C	3910	6750	C	3910	6750	C	3480	6750	C
University Parkway	4105	6750	C	3510	6750	C	4330	6750	C	2880	6750	B
Hanes Mill Road												

¹ Vehicles Per Hour

second cycle length, traffic will flow at Level of Service C, which is a good rate of traffic flow.

Salem Creek Parkway at US 52 northbound on/off ramps: This is a new “T” intersection located to the east of US 52. Intersection capacity analyses indicated that a traffic signal will be needed at the intersection. With the installation of a signal with a 90-second cycle length, traffic will flow at Level of Service C, which is a good rate of traffic flow.

Salem Creek Parkway at North Vargrave Street: Intersection capacity analyses performed for this intersection for 2025 traffic flow conditions indicated traffic will flow through the intersection at Level of Service D or better throughout the day if traffic on North Vargrave Street is controlled by a stop sign.

Third Street

The Third Street southbound entrance ramp and northbound exit ramp will remain but will be braided with the ramps to and from Business 40 to eliminate the substandard weaving sections in this area. The only improvements anticipated other than reassigning lane use and those associated with upgrading US 52 would be as part of the Piedmont Triad Research Park Master Plan which had not been completed by May 2003. This analysis represents the minimum improvements needed to accommodate traffic demand with the changes in access due to the US 52 Corridor Plan. The following three intersections were analyzed, taking into consideration the above conditions:

- Third Street at Linden Street
- Third Street at Maple Street/ US 52 southbound on ramp
- Third Street at Metropolitan Avenue/ US 52 northbound off ramp

Third Street at Linden Street: The lane usage on Third Street is reallocated to carry the four-lane cross-section through the intersection and eliminating the separate eastbound left-turn lane at the intersection today. With the lane use change, an analysis of 2025 traffic flow conditions indicates that a traffic signal having a 100-second cycle length would be needed for traffic to flow at Level of Service D or better, an acceptable rate of traffic flow for peak periods.

Third Street at Maple Street/ US 52 southbound on ramp: The lane marking on Third Street would continue to carry a four-lane cross-section through the intersection as it does today. Maple Street would be marked with a single through lane and a separate left-turn lane as it is today. The intersection is controlled by a traffic signal with a 70-second cycle length. With the existing lane use in place, an analysis of 2025 traffic flow conditions indicates that traffic will flow at Level of Service B or better, a very good rate of traffic flow for peak periods.

Third Street at Metropolitan Avenue/ US 52 northbound off ramp: The lane marking on Third Street would continue to carry a four-lane cross-section through the intersection as it does today. The northbound exit ramp would be marked with two combined through/ turn lanes as it is today. The intersection is controlled by a traffic signal with a 70-second cycle length. With the existing lane use in place, an analysis of 2025 traffic flow conditions indicates that traffic will flow at Level of Service B or better, a very good rate of traffic flow for peak periods.

Martin Luther King, Jr. Drive

The US 52 Corridor Plan recommends replacing the interchange with an urban diamond to improve ramp geometry. This includes relocating both the US 52 northbound and southbound on/off ramps on Martin Luther King, Jr. Drive. Taking into consideration the above improvements, the following five intersections on Martin Luther King, Jr. Drive were analyzed for 2025 traffic flow conditions:

- Martin Luther King, Jr. Drive at Patterson Avenue
- Martin Luther King, Jr. Drive at Linden Street/Ivy Avenue
- Martin Luther King, Jr. Drive at US 52 southbound on/off ramps
- Martin Luther King, Jr. Drive at US 52 northbound on/off ramps
- Martin Luther King, Jr. Drive at Cleveland Avenue

Table 4-15. Ramp Capacity Analysis
2025 Locally Preferred Alternative
Tier 3 Analysis - AM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume Capacity			Over Capacity?	Ramp	Volume Capacity			Over Capacity?
		VPH ¹	VPH ¹	VPH ¹			VPH ¹	VPH ¹	VPH ¹	
US 52		Southbound Lanes				Northbound Lanes				
Interstate 40	EB-SB entrance	385	1800	No	NB-EB exit	1410	1800	No		
	SB-EB exit loop	410	1400	No	EB-NB ent loop	1120	1400	No		
	WB-SB ent loop	940	1400	No	NB-WB exit loop	575	1400	No		
	SB-WB exit	745	1800	No	WB-NB entrance	615	1800	No		
Waughtown Street	Entrance	455	1800	No	Exit	685	1800	No		
	Exit	545	1800	No	Entrance	820	1800	No		
Salem Creek Parkway	Entrance loop	270	1400	No	Exit loop	400	1400	No		
	Exit	545	1800	No	Entrance	820	1800	No		
Business 40	EB-SB entrance	370	1800	No	NB-EB exit	985	1800	No		
	SB-EB exit ²	965	1800	No	EB-NB entrance ³	1010	1800	No		
	WB-SB ent loop	655	1400	No	NB-WB exit loop	550	1400	No		
	SB-WB exit ²	1515	1800	No	WB-NB entrance ³	645	1800	No		
3rd Stret	Entrance	570	1800	No	Exit	855	1800	No		
Martin Luther King, Jr. Drive	Entrance	985	1800	No	Exit	660	1800	No		
	Exit	1080	1800	No	Entrance	720	1400	No		
27th/28th Street	Entrance	1415	1800	No	Exit	945	1800	No		
	Exit	705	1800	No	Entrance	470	1800	No		
Akron Drive	Entrance	1365	1800	No	Exit	910	1800	No		
	Exit	455	1800	No	Entrance	305	1800	No		
Motor Road	Entrance	85	1800	No	Exit loop	55	1400	No		
	Exit	610	1800	No	Entrance	405	1800	No		
Germanton Road	Entrance	745	1800	No	Exit Ramp	445	1800	No		
	Exit	550	1800	No	Exit Loop	50	1400	No		
					Entrance	365	1800	No		
University Parkway	Ent Loop	300	1400	No	Exit	400	1800	No		
	Exit	925	1800	No						
Hanes Mill Road	Ent Loop	300	1400	No						
	Exit	925	1800	No	Entrance	1250	1800	No		

¹ Vehicles Per Hour

² All Southbound US 52 traffic traveling to either eastbound or westbound Business 40 exit via the same ramp. The total amount of exiting traffic is 2480 vph. Therefore, two lanes must be constructed on this ramp to provide adequate space for vehicles.

³ Two-Lane Ramp

Table 4-16. Ramp Capacity Analysis
2025 Locally Preferred Alternative
Tier 3 Analysis - PM Peak Hour Volumes

Corridor Crossroad	Ramp	Volume Capacity			Over Capacity?	Ramp	Volume Capacity			Over Capacity?
		VPH ¹	VPH ¹	VPH ¹			VPH ¹	VPH ¹	VPH ¹	
US 52		Southbound Lanes				Northbound Lanes				
Interstate 40	EB-SB entrance	385	1800	No	NB-EB exit	1410	1800	No		
	SB-EB exit loop	410	1400	No	EB-NB ent loop	1120	1400	No		
	WB-SB ent loop	940	1400	No	NB-WB exit loop	575	1400	No		
	SB-WB exit	745	1800	No	WB-NB entrance	615	1800	No		
Waughtown St.	Entrance	455	1800	No	Exit	685	1800	No		
	Exit	545	1800	No	Entrance	820	1800	No		
Salem Creek Pkwy.	Entrance loop	270	1400	No	Exit loop	400	1400	No		
	Exit	545	1800	No	Entrance	820	1800	No		
Business 40	EB-SB entrance	370	1800	No	NB-EB exit	985	1800	No		
	SB-EB exit ²	965	1800	No	EB-NB entrance ³	1010	1800	No		
	WB-SB ent loop	655	1400	No	NB-WB exit loop	550	1400	No		
	SB-WB exit ²	1515	1800	No	WB-NB entrance ³	645	1800	No		
3rd St.	Entrance	570	1800	No	Exit	855	1800	No		
Martin Luther King, Jr. Dr.	Entrance	985	1800	No	Exit	660	1800	No		
	Exit	1080	1800	No	Entrance	720	1400	No		
27th/28th St.	Entrance	1415	1800	No	Exit	945	1800	No		
	Exit	705	1800	No	Entrance	470	1800	No		
Akron Dr.	Entrance	1365	1800	No	Exit	910	1800	No		
	Exit	455	1800	No	Entrance	305	1800	No		
Motor Rd.	Entrance	85	1800	No	Exit loop	55	1400	No		
	Exit	610	1800	No	Entrance	405	1800	No		
Germanton Rd.	Entrance	745	1800	No	Exit Ramp	445	1800	No		
	Exit	550	1800	No	Exit Loop	50	1400	No		
					Entrance	365	1800	No		
University Pkwy.	Ent Loop	300	1400	No	Exit	400	1800	No		
	Exit	925	1800	No						
Hanes Mill Rd.	Ent Loop	300	1400	No						
	Exit	925	1800	No	Entrance	1250	1800	No		

¹ Vehicles Per Hour

² All Southbound US 52 traffic traveling to either eastbound or westbound Business 40 exit via the same ramp. The total amount of exiting traffic is 2480 vph. Therefore, two lanes must be constructed on this ramp to provide adequate space for vehicles.

³ Two-Lane Ramp

Table 4-17. Intersection Capacity Analysis
2025 Locally Preferred Alternative
AM Peak Hour Level of Service (LOS)

East-West Street	North-South Street	Control *	Approach LOS				Inter** LOS
			EB	WB	NB	SB	
Interchange 1 -- Waughtown Street							
Waughtown Street	US 52 SB off	Signal	C	C	N/A	B	C
Waughtown Street	US 52 NB off	Signal	D	C	C	N/A	C
Waughtown Street	N. Vargrave Street	Stop	B	N/A	N/A	D	N/A
Interchange 2 -- Salem Creek							
Salem Creek Road	US 52 SB on/off	Signal	C	C	N/A	B	C
Salem Creek Road	US 52 NB on/off	Signal	C	C	N/A	C	C
Salem Creek Road	N. Vargrave Street	Stop	N/A	A	D	N/A	N/A
Interchange 3 -- 3rd Street							
3rd Street	Linden Street	Signal	C	D	N/A	D	D
3rd Street	US 52 SB on	Signal	A	B	N/A	B	B
3rd Street	US 52 NB off	Signal	C	B	B	N/A	B
Interchange 4 -- Martin Luther King, Jr. Drive							
Martin Luther King, Jr. Drive	Patterson Avenue	Signal	B	B	C	C	B
Martin Luther King, Jr. Drive	Linden Street / Ivy Road	Signal	D	C	D	D	D
Martin Luther King, Jr. Drive	US 52 SB on/off	Signal	C	C	N/A	D	C
Martin Luther King, Jr. Drive	US 52 NB on/off	Signal	C	C	C	N/A	C
Martin Luther King, Jr. Drive	Cleveland Avenue	Signal	A	A	N/A	C	B
Interchange 5 -- 27th/28th Street							
27th/28th Street	Indiana Avenue	Signal	N/A	B	C	C	C
28th Street	US 52 SB on/off	Signal	B	C	N/A	C	C
28th Street	US 52 NB on/off	Signal	C	C	C	N/A	C
28th Street	Liberty Street	Signal	D	D	D	D	D
28th/26th Street	Cleveland Avenue	Stop	N/A	B	B	N/A	N/A
Interchange 6 -- Akron Drive							
Akron Drive	US 52 SB on/off	Signal	C	B	N/A	C	C
Akron Drive	US 52 NB on/off	Signal	B	D	D	N/A	D
Akron Drive	Ogburn Avenue	Signal	B	B	C	C	B
Interchange 7 -- Motor Road							
Motor Road	US 52 Southbound on/off	Signal	A	B	N/A	D	C
Motor Road	US 52 Northbound on/off	Stop	B	N/A	N/A	F	N/A
Motor Road	Patterson Avenue	Signal	D	D	D	D	D
Interchange 8 -- Germanton Road							
US 52 Southbound on/off	Germanton Road	Signal	B	N/A	D	D	D
US 52 Northbound on/off	Germanton Road	Signal	D	A	D	D	D
Patterson Avenue	Germanton Road	Signal	C	C	B	C	C
Interchange 9 -- University Parkway							
US 52 Southbound on/off	University Parkway	Signal	B	N/A	C	C	C
US 52 Northbound on/off	University Parkway	Signal	N/A	C	C	B	B
Patterson Avenue	University Parkway	Signal	N/A	C	C	B	B
Interchange 10 -- Hanes Mill Road							
US 52 Southbound on/off	Hanes Mill Road	Signal	D	N/A	C	D	C
US 52 Northbound on/off	Hanes Mill Road	Signal	N/A	E	D	D	D
University Parkway	Hanes Mill Road	Signal	D	D	D	D	D

Notes:
 1) N/A - Not Applicable
 2) The interchanges detailed in this table can be cross referred to the LPA 2025 Intersection Traffic Volumes Figure 4-7
 * Signal - Intersection controlled by a Traffic Signal
 * Stop - Intersection controlled by a Stop Sign
 ** Inter LOS - Intersection Level of Service

Table 4-18. Intersection Capacity Analysis
2025 Locally Preferred Alternative
PM Peak Hour Level of Service (LOS)

East-West Street	North-South Street	Control *	Approach LOS				Inter LOS
			EB	WB	NB	SB	
Interchange 1 -- Waughtown Street							
Waughtown Street	US 52 SB off	Signal	C	C	N/A	C	C
Waughtown Street	US 52 NB off	Signal	C	C	B	N/A	C
Waughtown Street	N. Vargrave St	Stop	A	N/A	N/A	D	N/A
Interchange 2 -- Salem Creek							
Salem Creek Road	US 52 SB on/off	Signal	C	C	N/A	C	C
Salem Creek Road	US 52 NB on/off	Signal	C	C	N/A	C	C
Salem Creek Road	N. Vargrave St	Stop	N/A	A	C	N/A	N/A
Interchange 3 -- 3rd Street							
3rd Street	Linden Street	Signal	C	C	N/A	C	C
3rd Street	US 52 SB on	Signal	B	C	N/A	B	B
3rd Street	US 52 NB off	Signal	C	B	B	N/A	B
Interchange 4 -- Martin Luther King, Jr. Drive							
Martin Luther King, Jr. Drive	Patterson Avenue	Signal	B	B	C	C	B
Martin Luther King, Jr. Drive	Linden Street / Ivy Street	Signal	D	C	C	D	D
Martin Luther King, Jr. Drive	US 52 SB on/off	Signal	C	C	N/A	D	D
Martin Luther King, Jr. Drive	US 52 NB on/off	Signal	D	D	C	N/A	C
Martin Luther King, Jr. Drive	Cleveland Avenue	Signal	A	A	N/A	C	A
Interchange 5 -- 27th/28th Street							
27th/28th Street	Indiana Avenue	Signal	N/A	C	C	D	C
28th Street	US 52 SB on/off	Signal	B	C	N/A	C	C
28th Street	US 52 NB on/off	Signal	D	B	C	N/A	C
28th Street	Liberty Street	Signal	D	D	D	D	D
28th/26th Street	Cleveland Avenue	Stop	N/A	A	B	N/A	N/A
Interchange 6 -- Akron Drive							
Akron Drive	US 52 SB on/off	Signal	B	B	N/A	C	B
Akron Drive	US 52 NB on/off	Signal	C	C	D	N/A	C
Akron Drive	Ogburn Avenue	Signal	C	B	C	C	B
Interchange 7 -- Motor Road							
Motor Road	US 52 Southbound on/off	Signal	B	A	N/A	C	B
Motor Road	US 52 Northbound on/off	Stop	B	N/A	N/A	F	N/A
Motor Road	Patterson Avenue	Signal	C	D	D	D	D
Interchange 8 -- Germanton Road							
US 52 Southbound on/off	Germanton Road	Signal	C	N/A	D	D	D
US 52 Northbound on/off	Germanton Road	Stop	D	C	D	D	D
Patterson Avenue	Germanton Road	Signal	C	C	B	C	C
Interchange 9 -- University Parkway							
US 52 Southbound on/off	University Parkway	Signal	B	N/A	C	B	C
US 52 Northbound on/off	University Parkway	Signal	N/A	C	C	B	C
Patterson Avenue	University Parkway	Signal	N/A	C	B	C	C
Interchange 10 -- Hanes Mill Road							
US 52 Southbound on/off	Hanes Mill Road	Signal	C	N/A	C	C	C
US 52 Northbound on/off	Hanes Mill Road	Signal	N/A	D	D	D	D
University Parkway	Hanes Mill Road	Signal	D	D	D	D	D

Notes:
 1) N/A - Not Applicable
 2) The interchanges detailed in this table can be cross referred to the LPA 2025 Intersection Traffic Volumes Figure 4-7
 * Signal - Intersection controlled by a Traffic Signal
 * Stop - Intersection controlled by a Stop Sign
 ** Inter LOS - Intersection Level of Service

Martin Luther King, Jr. Drive at Patterson Avenue: Under the existing conditions, traffic flows through this signalized intersection at Level of Service B, with a 90-second cycle length. Intersection capacity analyses for 2025 traffic flow conditions indicated that the same cycle length and timing plan will maintain the same Level of Service B which is a very good rate of traffic flow. It should be noted that the Piedmont Triad Research Park may include other changes to the intersection as part of its master plan.

Martin Luther King, Jr. Drive at Linden Street/ Ivy Avenue: The US 52 Corridor Plan proposes relocation of Linden Street farther west and aligning it with Ivy Avenue. Martin Luther King, Jr. Drive would remain a four-lane road with left-turn lanes at intersections. It is likely that Linden Street will be redesigned as part of the Piedmont Triad Research Park Master Plan, but the route is analyzed as a two-lane roadway in this study. Ivy Avenue is analyzed as a two-lane roadway with a left-turn lanes at the Martin Luther King, Jr. intersection. To accommodate the 2025 traffic demand, the intersection was analyzed for a traffic signal with a proposed 120-second cycle length. With this intersection configuration, 2025 traffic will flow at Level of Service D or better throughout the day which is an acceptable rate of traffic flow.

Martin Luther King, Jr. Drive at US 52 southbound on/off ramps: Under the existing conditions (year 2001) traffic flow through the intersection is controlled by a stop sign on the exit ramp. Martin Luther King, Jr. Drive Capacity analyses of 2025 traffic flow conditions indicates that a signal would be needed at the intersection. With the traffic signal in place, traffic will flow at Level of Service C during the AM peak hour, and Level of Service D during the PM peak hour.

Martin Luther King, Jr. Drive at US 52 northbound on/off ramps: Under the existing conditions (year 2001) the intersection is controlled by a stop sign on the exit ramp. Capacity analyses of 2025 traffic flow conditions indicate that a traffic signal would be needed at the intersection. With this improvement, traffic will flow at Level of Service C during peak hour conditions, which is a good rate of traffic flow for peak hour conditions.

Martin Luther King, Jr. Drive at Cleveland Avenue: In the year 2001, traffic flow through the intersection is controlled by a traffic signal with a 90-second cycle length. Traffic flows at Level of Service B, a very good rate of traffic flow. An analysis of 2025 traffic flow conditions indicates that, with minor changes to the signal timing plan, traffic will flow at Level of Service A which is an excellent rate of traffic flow.

Liberty Street/ 27th/28th Streets

The US 52 Corridor Plan recommends realigning US 52 and rebuilding the 25th/28th Street interchange. These changes will create an opportunity to improve traffic flow conditions across US 52 in Northeast Winston. As part of this project, 27th/28th Street will be widened to four through lanes between Indiana Avenue and Cleveland Avenue. Separate left and right turn lanes will be added at intersections as needed. Liberty Street will also be relocated and rebuilt with four through lanes and separate turn lanes as needed. Taking into consideration the above improvements, the following five intersections on 27th/28th Street were analyzed for 2025 traffic flow conditions:

- 27th/28th Street at Indiana Avenue
- 27th/28th Street at US 52 southbound on/off ramps
- 27th/28th Street at US 52 northbound on/off ramps
- 27th/28th Street at Liberty Street
- 27th/28th Street at Cleveland Avenue

27th/28th Street at Indiana Avenue: At Indiana Avenue, 27th Street and 28th Street are realigned to form a single leg of the intersection and the railroad underpass on 28th Street is rebuilt to accommodate four lanes of traffic. This permits a separate through and right-turn lane on the westbound approach on 28th Street. The intersection is controlled by a traffic signal timed for a 90-second cycle length. With these improvements in place, 2025 traffic will flow at Level of Service C or better throughout the day, a good rate of traffic flow.

28th Street at US 52 southbound on/off ramps: Improving the capacity of the 28th Street corridor and upgrading the interchange will increase traffic demand at this interchange significantly, particularly on the southbound entrance ramp in the morning and on the northbound exit ramp in the evening. Because of the high demand volume in 2025, the US 52 Corridor Plan recommends that the US 52 bridge over 28th Street accommodate four through lanes and a double left-turn lane westbound at this intersection. The southbound exit ramp should be designed for two approach lanes at the intersection. The eastbound approach to the intersection should have an exclusive right-turn lane. The intersection will be controlled by a traffic signal timed for a 90-second cycle length. With these improvements in place, traffic will flow through the intersection at Level of Service C or better throughout the day.

28th Street at US 52 northbound on/off ramps: Improving the capacity of the 27th/28th Street corridor and upgrading the interchange will increase traffic demand at this interchange significantly, particularly on the southbound entrance ramp in the morning and on the northbound exit ramp in the evening. Because of the high demand volume in 2025, the US 52 Corridor Plan recommends that the US 52 bridge over 28th Street accommodate four through lanes and a single left-turn lane eastbound at this intersection. The northbound exit ramp should be designed for two approach lanes at the intersection. The westbound approach to the intersection should have an exclusive right-turn lane. The intersection will be controlled by a traffic signal timed for a 90-second cycle length. With these improvements in place, traffic will flow through the intersection at Level of Service C or better throughout the day.

27th/28th Street at Liberty Street: As part of the US 52 Corridor Plan, Liberty Street will be relocated to the east and rebuilt as a three to four-lane facility with separate left-turn lanes at its intersections. 28th Street will also have a four-lane cross-section with left turn lanes at the intersection with Liberty Street. The intersection will be controlled by a traffic signal timed for a 100-second cycle length. With these improvements in place, 2025 traffic demand will flow through the intersection at Level of Service D during peak traffic periods, an acceptable rate of traffic flow for peak hour conditions. It should be noted that the four signals proposed for the 28th Street corridor must be interconnected and timed in progression to assure that the optimum capacity is reached at these intersections.

28th Street at Cleveland Avenue: When Liberty Street is realigned east of US 52, the east-west streets between New Hope Lane and 25th Street will be reconnected to Liberty Street, reducing the traffic demand on Cleveland Avenue. Therefore, we recommend that traffic flow through the intersection of 28th Street with Cleveland Avenue be controlled by a stop sign on Cleveland Avenue. The absence of a traffic signal will divert left-turning traffic from Cleveland Avenue to northbound Liberty Street where the left-turn maneuver can be safely executed. Cleveland Avenue will have separate left and right-turn lanes on its northbound approach. Westbound 28th Street will have one through lane and an exclusive eastbound right-turn lane, and an exclusive left-turn lane on its approaches. With these changes in place, stopped traffic on Cleveland Avenue will flow through the intersection at Level of Service E, however, this condition is acceptable because traffic can be diverted to the nearby signal at Liberty Street if delays become extreme.

Akron Drive

The US 52 Corridor Plan recommends redesigning the southbound entrance and exit ramps as one way ramps intersecting directly with Akron Drive and eliminating the direct connection between Leo Street and Akron Drive. Taking into consideration the above improvements, the following three intersections on Akron Drive were analyzed for 2025 traffic flow conditions:

- Akron Drive at US 52 southbound on/off ramps
- Akron Drive at US 52 northbound on/off ramps
- Akron Drive at Ogburn Avenue

Akron Drive at US 52 southbound on/off ramps: Under the existing conditions, the intersection of Akron Drive with Leo Street/ US 52 southbound on/off ramps has a traffic signal with 90-second cycle length. Traffic flows through the intersection today at Level of Service B or better throughout the day. For the 2025 traffic flow conditions, intersection signal analyses indicated that if the traffic signal were re-timed with the same 90-second cycle length, traffic will flow at a Level of Service C during the AM peak hour and Level of Service B during the PM peak hour, which are good rates of traffic flow.

Akron Drive at US 52 northbound on/off ramps: Under the existing conditions, the intersection of Akron Drive with the US 52

northbound on/off ramps has a traffic signal with 90-second cycle length. Traffic flows through the intersection today at Level of Service C or better throughout the day. For the 2025 traffic flow conditions, intersection signal analyses indicated that if the traffic signal were re-timed with the same 90-second cycle length, traffic will flow at Level of Service D during the AM peak hour and Level of Service C during the PM peak hour, which are acceptable rates of traffic flow for peak hour conditions.

Akron Drive at Ogburn Avenue: Under the existing conditions, this intersection has a traffic signal with an 80-second cycle length and traffic flows at Level of Service A. Intersection capacity analyses for 2025 traffic flow conditions indicated that by re-timing the signal for 90-second cycle length, traffic will flow at Level of Service B, which is a very good rate of traffic flow.

Motor Road

The US 52 Corridor Plan recommends adding a full interchange at Motor Road and relocating Patterson Avenue to east to increase intersection distance from the ramps. By considering the above two improvements, the following three intersections on Motor Road were analyzed for 2025 traffic flow conditions:

- Motor Road at US 52 southbound on/off ramps
- Motor Road at US 52 northbound on/off ramps
- Motor Road at Patterson Avenue

Motor Road at US 52 southbound on/off ramps: The intersection of Motor Road at US 52 southbound on/off ramps is a new intersection. The 2025 intersection capacity analyses indicated that a signal will be needed at the intersection when the interchange is built. Therefore, capacity analyses of the intersection with a traffic signal having a 90-second cycle length indicates that traffic will flow at Level of Service C during the AM peak hour and Level of Service B during the PM peak hour, which are good rates of traffic flow.

Motor Road at US 52 northbound on/off ramps: The intersection of Motor Road at US 52 northbound on/off ramps is a new intersection. Because exiting ramp traffic is right-turn only, only yield signs will control ramp traffic at this intersection. Left-turning traffic from eastbound Motor Road to the northbound entrance ramp should be able to take advantage of gaps in the traffic stream created by the two new signals on either side of the intersection.

Motor Road at Patterson Avenue: The US 52 Corridor Plan calls for widening Patterson Avenue to a boulevard with four through lanes and left-turn lanes at intersections. Motor Road would remain a two-lane road but left-turn lanes would be added to both approaches at this intersection. With these improvements in place, 2025 traffic will flow at Level of Service D, which is an acceptable rate of traffic flow.

Germanton Road (NC 8)

The US 52 Corridor Plan recommends adding a northbound exit ramp to the existing interchange to eliminate left-turning maneuvers at the northbound exit ramps. Germanton Road would remain a two-lane facility but Patterson Avenue would be upgraded to a four-lane boulevard with left-turn lanes at intersections as part of the proposed business park corridor development. Taking into consideration these improvements, the following three intersections were analyzed for 2025 traffic flow conditions:

- Germanton Road at southbound on/off ramps;
- Germanton Road at northbound on/off ramps; and
- Germanton Road at Patterson Avenue

Germanton Road at southbound on/off ramps: Under existing conditions, traffic exiting from the southbound ramp is controlled by a stop sign. An analysis of 2025 traffic flow conditions indicated that separate right-turn lane and left-turn lanes and a signal will be needed for traffic to continue to flow below the intersection's capacity. With these improvements in place, traffic is expected to flow at Level of Service D, an acceptable rate of traffic flow for peak periods.

Germanton Road at northbound on/off ramps: Under existing conditions, traffic exiting from the northbound ramp is controlled

by a stop sign. An analysis of 2025 traffic flow conditions indicated that an exclusive eastbound right-turn lane is needed for traffic to continue to flow below the intersection's capacity. With these improvements in place, traffic is expected to flow at Level of Service B, a very good rate of traffic flow for peak periods. It should be noted that the signals at the intersections either side of this intersection should create sufficient gaps for left-turning traffic on Germanton Road to flow without excessive delay.

Germanton Road at Patterson Avenue: The US 52 Corridor Plan calls for widening Patterson Avenue to a boulevard with four through lanes and left-turn lanes at intersections. Germanton Road would remain a two-lane road with left-turn lanes on both approaches. With the improvements to Patterson Avenue in place, 2025 traffic will flow at Level of Service C a good rate of traffic flow.

University Parkway

The 2025 Multi-modal Long Range Transportation Plan proposes widening of the existing four/five lane University Parkway to a six-lane road. By considering these improvements, the following three intersections on University Parkway were analyzed for the 2025 traffic flow conditions:

- University Parkway at US 52 southbound on/off ramps
- University Parkway at US 52 northbound on/off ramps
- University Parkway at Patterson Avenue

University Parkway at US 52 southbound on/off ramps: Under the existing conditions, traffic flow through this intersection is controlled by a signal having a 90-second cycle length. Maintaining the same cycle length and changing the signal timing will allow 2025 traffic to flow at Level of Service C or better though out the day, which is a good rate of traffic flow.

University Parkway at US 52 northbound on/off ramps: Under the existing conditions, the US 52 northbound on and off ramps intersect University Parkway across from Patterson Avenue. The US 52 Corridor Plan proposes replacing the northbound exit loop with a ramp, relocating the ramps farther west- closer to US 52, and thus forming a new intersection: University Parkway at northbound on/off ramps. To accommodate the 2025 traffic, a traffic signal with 90-second cycle length is recommended at this intersection. With the signal in place, traffic will flow at Level of Service C or better throughout the day.

University Parkway at Patterson Avenue: It should be noted that the US 52 northbound entrance and exit ramps form the north leg of this intersection today. Under the existing conditions, this intersection is controlled by a traffic signal with 90-second cycle length and traffic flows at Level of Service C or better throughout the day. Maintaining the same cycle length, signal times were changed to accommodate the 2025 traffic demand. The 2025 intersection capacity analyses indicated that the intersection would function at Level of Service C or better though out the day, which is a good rate of traffic flow.

Hanes Mill Road

The 2025 Multi-modal Long Range Transportation Plan proposes widening of the existing two-lane Hanes Mill Road to four through-lanes with a center turn lane. Taking into consideration this improvement, the following three intersections on Hanes Mill Road were analyzed for 2025 traffic flow conditions:

- Hanes Mill Road at US 52 southbound on/off ramps
- Hanes Mill Road at US 52 northbound on/off ramps
- Hanes Mill Road at University Parkway

Hanes Mill Road at US 52 southbound on/off ramps: Under the existing conditions (year 2001) traffic on the US 52 southbound exist ramp is controlled by a stop sign. An analysis of 2025 traffic flow conditions indicates that a traffic signal will be needed if traffic is to flow at acceptable levels of delay. With the installation of a traffic signal at the intersection, traffic will flow at Level of Service C or better throughout the day, which is a good rate of traffic flow.

Hanes Mill Road at US 52 northbound on/off ramps: Under the existing conditions (year 2001) traffic on the US 52 northbound

exist ramp is controlled by a stop sign. An analysis of 2025 traffic flow conditions indicates that a traffic signal will be needed if traffic is to flow at acceptable levels of delay. With the installation of a traffic signal at the intersection, traffic will flow at Level of Service D or better throughout the day, which is an acceptable rate of traffic flow.

Hanes Mill Road at University Parkway: Currently, traffic flow at the intersection of Hanes Mill Road with University Parkway is controlled by a traffic signal with a 90-second cycle length. This intersection was analyzed with the improvements proposed in the 2025 Multi modal Long Range Transportation Plan- four through lanes and a separate left turn lane on each approach of Hanes Mill Road and two through lanes and one left turn lane on University Parkway. With these improvements in place and by re-timing the signal for same 120-second cycle length, traffic will flow at Level of Service D or better throughout the day, which is an acceptable rate of traffic flow.

4.5.3.4 Merge and Diverge Analysis

In addition to capacity analyses, the ramp areas were further analyzed for merge, diverge and weaving conditions. This section addresses merging and diverging conditions throughout the US 52 Corridor. Ramp merge diverge analyses were performed for the following interchange ramps:

- 1) Waughtown Street: southbound diverge and northbound merge;
- 2) Salem Creek Parkway: southbound merge and northbound diverge;
- 3) 3rd Street: southbound merge and northbound diverge;
- 4) MLK Jr. Drive: southbound diverge and northbound merge;
- 5) 27th/28th Street: southbound merge and diverge, northbound merge and diverge;
- 6) Akron Drive: southbound merge and diverge, northbound merge and diverge;
- 7) Motor Road: southbound merge and northbound diverge;
- 8) Germanton Road: southbound diverge and northbound merge;
- 9) University Parkway: southbound merge and northbound diverge;
- 10) Hanes Mill Road: southbound diverge and northbound merge.

This analysis assumed that ramp areas will be designed to meet interstate design standards.

An analysis of the merge/diverge sections indicates that traffic will flow through the merge/diverge areas at LOS C or better through out the day. Tables 4-19 and 4-20 summarize the merge/diverge analyses.

Table 4-19. Merge / Diverge Analysis
2025 Locally Preferred Alternative
Tier 3 Analysis - AM Peak Hour Volumes

Corridor Crossroad	Ramp	Density PCPHPL ¹	LOS	Ramp	Density PCPHPL ¹	LOS
US 52		Southbound Lanes		Northbound Lanes		
Waughtown St.	Diverge	18.2	B	Merge	27.3	C
Salem Creek Pkwy.	Merge	18.5	B	Diverge	25.4	C
3rd Street	Merge	15.3	B	Diverge	20.9	C
Martin Luther King, Jr. Dr.	Diverge	25.6	C	Merge	26.6	C
27th/28th St.	Merge	27.6	C	Diverge	25.3	C
	Diverge	21.3	C	Merge	23.3	C
Akron Dr.	Merge	24.7	C	Diverge	22.9	C
	Diverge	16.0	C	Merge	19.5	B
Motor Rd.	Merge	15.9	B	Diverge	18.2	B
Germanton Rd.	Diverge	18.0	B	Merge	20.9	C
University Pkwy	Merge	23.6	C	Diverge	20.0	B
Hanes Mill Rd	Diverge	25.0	C	Merge ²	16.4	B

¹ Passenger Cars Per Hour Per Lane

² Lane ramp

Table 4-20. Merge / Diverge Analysis
2025 Locally Preferred Alternative
Tier 3 Analysis - PM Peak Hour Volumes

Corridor Crossroad	Ramp	Density PCPHPL ¹	LOS	Ramp	Density PCPHPL ¹	LOS
US 52		Southbound Lanes		Northbound Lanes		
Waughtown Street	Diverge	26.1	C	Merge	18.2	C
Salem Creek Pkwy	Merge	27.1	C	Diverge	17.6	B
3rd Street	Merge	22.4	B	Diverge	14.0	B
Martin Luther King, Jr. Dr	Diverge	24.8	C	Merge	27.7	C
27th/28th St	Merge	26.1	C	Diverge	26.4	C
	Diverge	19.6	B	Merge	22.7	C
Akron Dr	Merge	24.6	C	Diverge	23.0	C
	Diverge	18.6	C	Merge	17.0	B
Motor Rd	Merge	18.8	B	Diverge	15.3	B
Germanton Rd	Diverge	19.9	B	Merge	19.1	B
University Pkwy	Merge	23.9	C	Diverge	18.1	B
Hanes Mill Rd	Diverge	24.5	C	Merge ²	18.4	B

¹ Passenger Cars Per Hour Per Lane

² Lane ramp

4.5.3.5 Weaving Analysis

The Locally Preferred Alternative reduces the number of weaving sections from fourteen to four. The following roadway sections are locations where auxiliary lanes between interchanges will require weaving maneuvers:

- Between I-40 and Waughtown Street (both directions);
- Between Salem Creek Parkway and Business 40 (both directions);
- Between Third Street and Martin Luther King, Jr. Drive (both directions); and
- Between University Parkway and Hanes Mill Road (northbound on the collector-distributor road and southbound on US 52).

An analysis of the weaving sections indicates that traffic will flow through the weaving areas at LOS D during the peak hours. Tables 4-21 and 4-22 summarize the weaving analysis for the Locally Preferred Alternative.

Table 4-21. Weaving Sections Analysis
2025 Locally Preferred Alternative
AM Peak Hour Volumes

Mainline Section Corridor Crossroad	Density*	Level of Service	Density*	Level of Service
US 52		Southbound lanes	Northbound Lanes	
Interstate 40 to Waughtown St	18.92	B	27.26	C
Salem Creek Pkwy to Business 40	19.25	B	33.28	D
Business 40 to Martin Luther King Jr. Dr.	21.35	C	18.76	B
University Parkway to Hanes Mill Rd	23.06	C	4.88	A

* Density figures are passenger cars per mile per lane

** Third St merges with southbound US 52 and exits northbound US 52 before the weaving section between Business 40 and MLK begins. For simplicity, Third Street is not shown on this table as a corridor crossroad, however it is an access point to US 52.

Table 4-22. Weaving Sections Analysis
2025 Locally Preferred Alternative
PM Peak Hour Volumes

Mainline Section Corridor Crossroad	Density*	Level of Service	Density*	Level of Service
US 52		Southbound lanes	Northbound Lanes	
Interstate 40 to Waughtown St	29.32	D	17.23	B
Salem Creek Pkwy to Business 40	30.11	D	20.91	C
Business 40 to Martin Luther King Jr. Dr	18.81	B	21.27	C
University Parkway to Hanes Mill Rd	22.32	C	11.30	A

* Density figures are passenger cars per mile per lane

** Third St merges with southbound US 52 and exits northbound US 52 before the weaving section between Business 40 and MLK begins. For simplicity, Third Street is not shown on this table as a corridor crossroad, however it is an access point to US 52.

(Footnotes)

¹ Table 5-4, Generalized Annual Average Daily Volumes for Florida's Urbanized Areas, Level of Service Handbook, Florida Department of Transportation, 1991, p. 91.