INTERCHANGE MODIFICATION STUDY

Interstate 55
and
U.S. 64 (Crump Boulevard)
Shelby County
Memphis, Tennessee

PREPARED BY
CLINARD ENGINEERING ASSOCIATES, LLC
BRENTWOOD, TENNESSEE
FOR
THE TENNESSEE DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

Draft Submittal: June 2002
Final Submittal: April 2006

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U.S.Department
of Transportation
Federal Highway Administration

640 Grassmere Park Rd,
Ste 112
Nashville, TN 37211

September 5, 2006

In Reply Refer To: HFO-TN

Tennessee Division

Mr. Steve Allen
Director, Project Planning Division
Tennessee Department of Transportation
Suite 1000, James K. Polk Building
500 Deaderick Street
Nashville, TN 37243-0341

Subject: Interchange Modification Study, I-55 at US-64 (Crump Blvd.), City of Memphis, Shelby County

Dear Mr. Allen:

After review of the subject document and receipt of your August 22, 2006 letter stating the Department's preferred alternative, I concur that alternative B is acceptable with the addition of the optional exit lane at McLemore Rd. If you have any questions or concerns, please feel free to give Michael Smart a call at (615) 781-5775.

Sincerely,

Walter Boyd
Field Operations Team Leader

Cc: Ed Cole, Chief of Environment & Planning

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CHAPTER 1

Introduction

A. Purpose of Study

The purpose of this study is to evaluate the existing interchange at Interstate 55 and U.S. 64 (Crump Boulevard), and to request the approval for modifications of this interchange to improve its operation and safety. Benefits of this project include reduced congestion, reduced crashes, provide route continuity by eliminating the need for the mainline I-55 traffic to utilize ramps. Project alternatives have been developed to examine ways to implement improvements that maximize public safety through the use of appropriate design standards, while trying to minimize negative impacts to local neighborhoods and the environment.

Interstate 55 is currently a four-lane median-divided facility with auxiliary lanes and access control within the vicinity of the U.S. 64 (Crump Boulevard) interchange. This study was conducted to:

- Determine any operational deficiencies in the current interchange.
- Develop the needed interchange improvements to provide the desired level of service for the design year.
- Evaluate operational characteristics of the proposed improvements for the current conditions (2005) and the design year (2025).
- Develop construction cost estimates and evaluate the land use impacts of the construction.

B. Project Location and Description of the Area

The I-55 & U.S. 64 interchange is located in the western portion of Memphis near the Tennessee-Arkansas state line (Mississippi River), as shown in Figure 1. The interchange is located along I-55 approximately 1.0 mile north of the I-55 and McLemore Avenue interchange and less than 0.5 miles east of the I-55 and Metal Museum Drive interchange.

This section of I-55 is currently four-lane median-divided with one auxiliary lane in both the east and west bound directions between the U.S. 64 and Metal Museum Drive interchanges. The segment of I-55 between U.S. 64 and McLemore Avenue contains four-lanes median-divided with one auxiliary lane in the northbound and southbound direction.

Within the vicinity of the subject interchange, Interstate 55 was constructed in the mid 1960's with geometric design that does not meet the current Federal or state standards. Numerous weave areas are located within the subject area, as well as substandard acceleration and deceleration lengths for most ramp junctions. The existing I-55/U.S. 64 interchange is a full cloverleaf design with loop ramps in all four quadrants. With this full cloverleaf design, all exiting and entering traffic from

these loops are required to make weaving maneuvers. The posted speed limit for these ramps is 25 miles per hour. While the northbound exit loop ramp is posted for twenty-five miles per hour, actual speeds observed range from five (5) to ten (10) miles per hour during the peak hours, due to the geometry and large volume of traffic. Due to this low design speed and configuration, numerous angle and rear-end collisions have also occurred within this area. A summary of the accident history of the interchange area is included in Appendix I of this report.

As shown in Figure 2, those traveling from the south towards the north along I-55 are required to exit via a one-lane loop ramp at the I-55/U.S. 64 interchange, to remain on I-55 (towards the west) and cross the Mississippi River into the state of Arkansas. See Photo 1.

Photo 1: Northbound I-55 loop ramp to westbound I-55.

For those motorists entering the state of Tennessee from the west along I-55 must exit a one-lane ramp currently signed for 25 miles per hour (See Photo 2).

Photo 2: Eastbound I-55 to southbound I-55.

Considerable congestion occurs on both of these ramps and the mainline of I-55 due to six primary reasons:

1. Minimal design speed ramps from/to I-55
2. Heavy truck traffic (26%)
3. Large traffic volumes (39,245 ADT in the design year)
4. Lack of route continuity of the interstate
5. Reduced driver expectancy (mainline traffic must utilize exit ramps to remain on the interstate system)
6. One-lane ramps

There are also numerous merge, diverge and weave areas associated with the close proximity of the adjacent interchanges within the project limits.

The I-55 and McLemore Avenue interchange is located 1.0 mile to the south of the I-55 and U.S. 64 (Crump Boulevard) interchange. It is a modified diamond interchange with a one-quadrant (northbound) loop entrance ramp.

The I-55 and Metal Museum Drive interchange is located less than 0.5 miles west of the subject interchange. The entrance/exit ramp terminals are located approximately 600 feet from the bridge over the Mississippi River and 400 feet from the I-55 and U.S. 64 (Crump Boulevard) ramp terminals. The Mississippi River bridge is a four-lane structure with minimal shoulder and median widths.

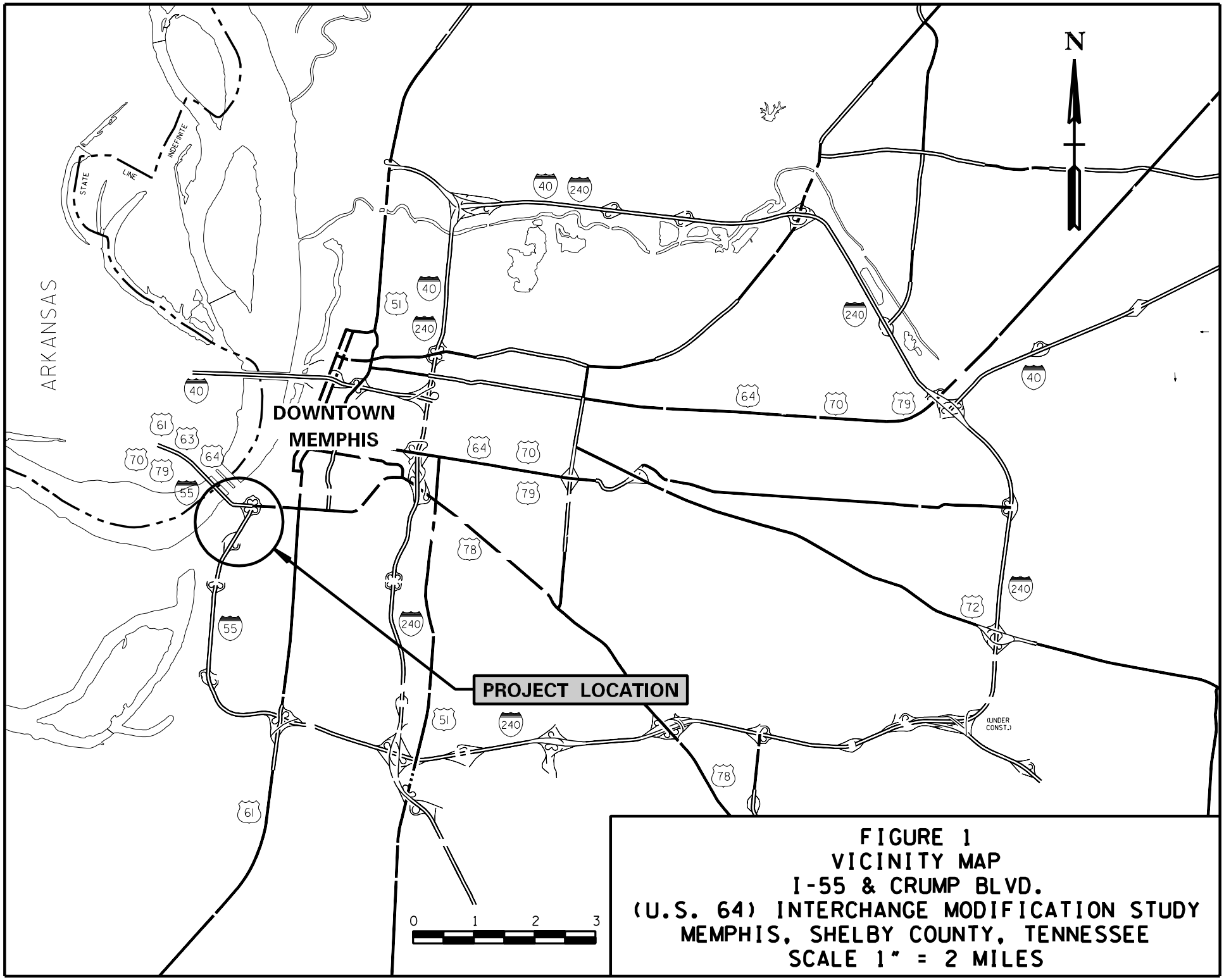


FIGURE 1
VICINITY MAP
I-55 & CRUMP BLVD.
(U.S. 64) INTERCHANGE MODIFICATION STUDY
MEMPHIS, SHELBY COUNTY, TENNESSEE
SCALE 1" = 2 MILES

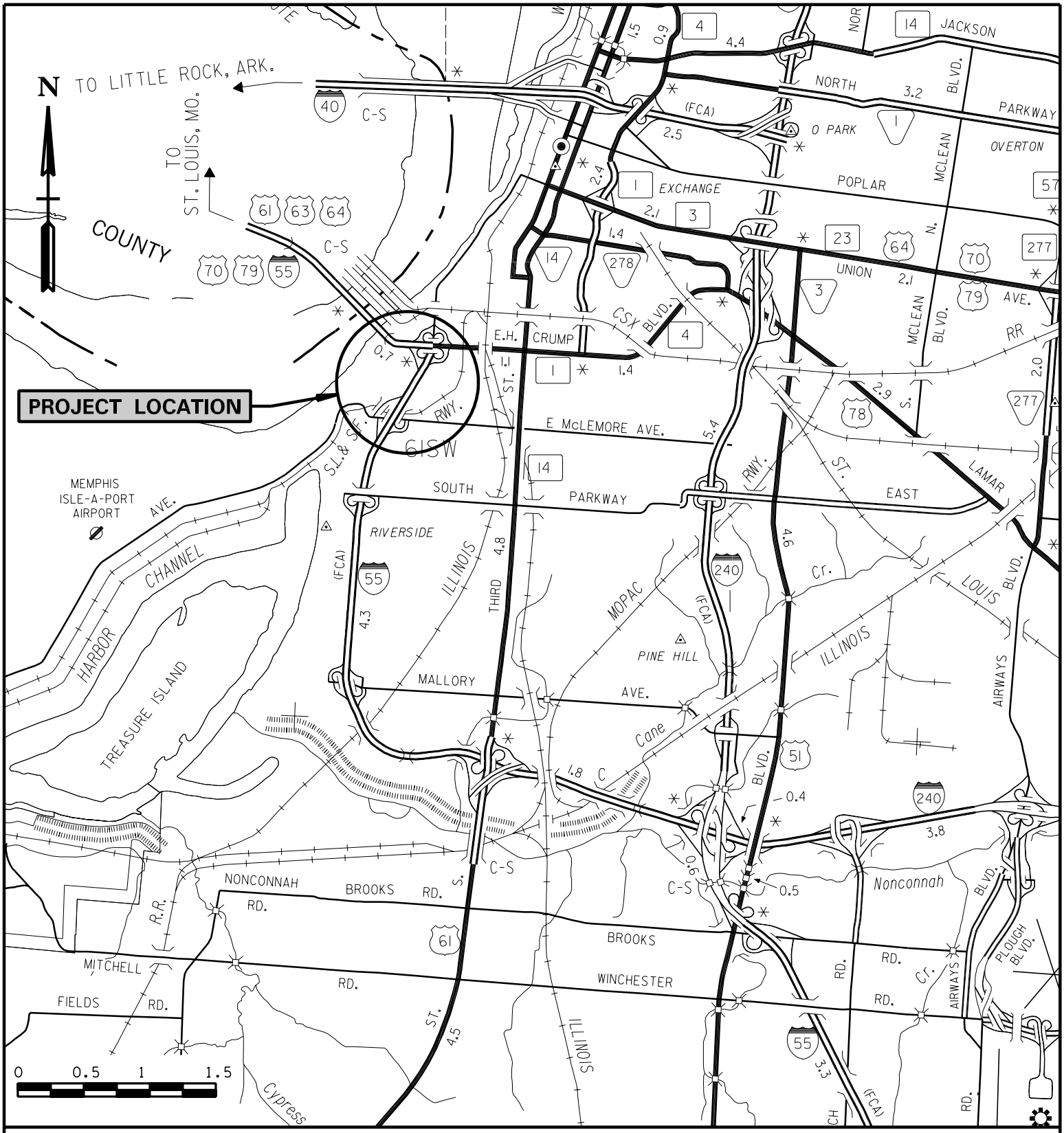


FIGURE 2
I-55 & U.S. 64 (CRUMP BLVD.)
INTERCHANGE MODIFICATION STUDY
MEMPHIS, SHELBY COUNTY, TENNESSEE
SCALE 1" = 1 MILE

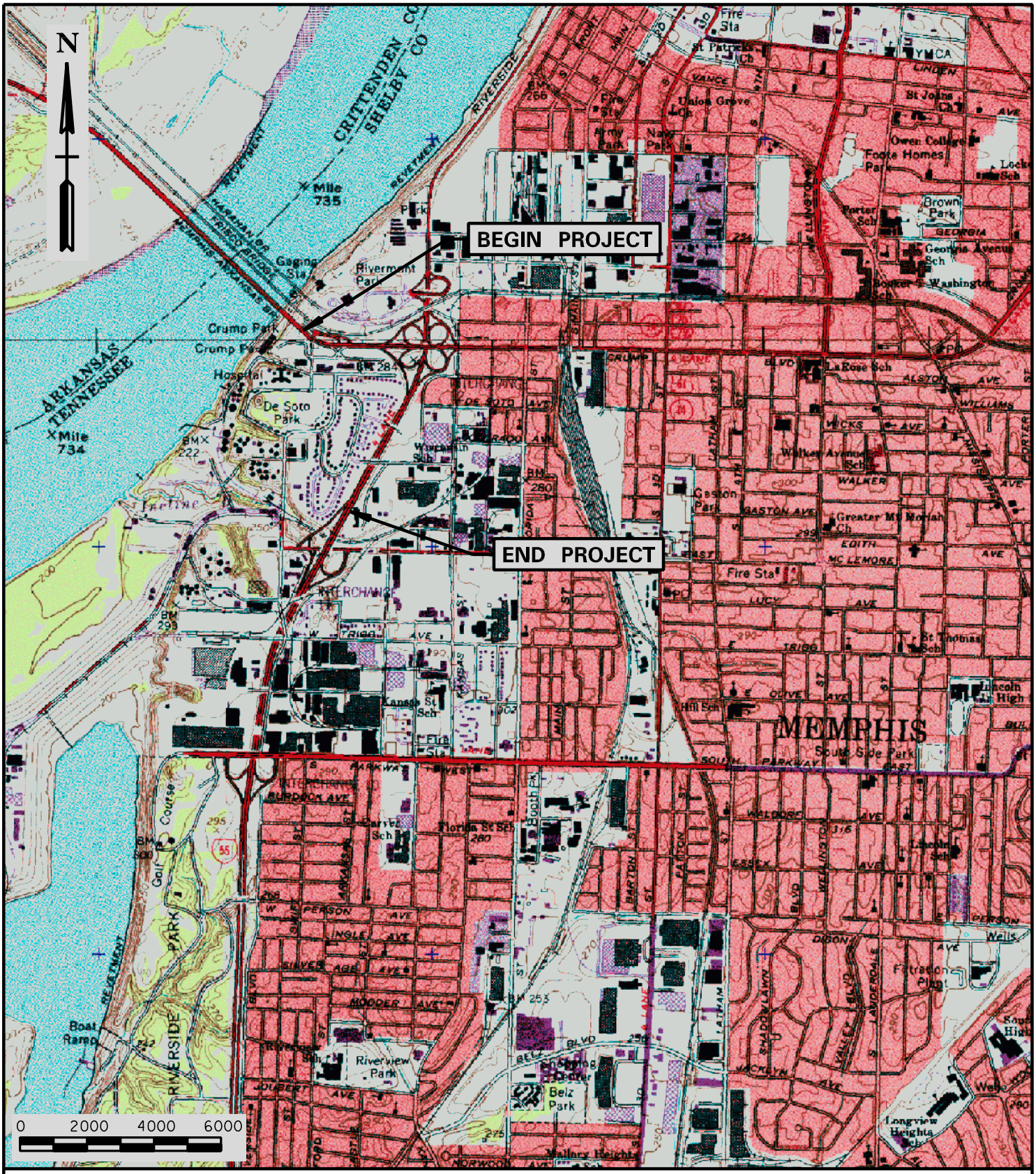


FIGURE 3
I-55 & U.S. 64 (CRUMP BLVD.)
INTERCHANGE MODIFICATION STUDY
MEMPHIS, SHELBY COUNTY, TENNESSEE
SCALE 1" = 2000'

C. Relationship to Other Highway Improvement Programs and Plans

The city currently has expressed interest in enhancing the Riverside Drive area north of the Interstate 55 and U.S. 64 (Crump Boulevard) interchange to create a more defined gateway into the Memphis business district, but at the time of this study no definite plans have been developed on what form this gateway would appear.

There are no plans to provide HOV lanes or widen I-55 within this area based upon the current long-range plans. There is no commuter rail or light rail transit available in this region; however, a limited trolley system operates in the central business district of Memphis.

CHAPTER 2

Preliminary Planning Data

A. Land Use

The land use in the vicinity of the interchange is a mixture of various commercial, industrial and residential (single family) developments. It includes hotels, industrial and manufacturing facilities.

The majority of the developments that are located in the southwest quadrant of the interchange utilize access from the Metal Museum Drive interchange, however, access to this area from the south is also available via the I-55 and McLemore Avenue interchange. Wisconsin Avenue located south of the subject interchange does connect the neighborhood south and west of the study area to the east and north of Interstate 55.

B. Traffic Served

The traffic data for this study was supplied by the Tennessee Department of Transportation (TDOT) and was based on proposed land use and existing conditions. The Design Hourly Volumes (DHV) for the years 2005 and 2025 are shown in Appendix A.

Interstate 55 is currently a four-lane section with one additional auxiliary lane in each direction between the adjacent interchanges. The year 2005 peak hour volumes are over 3,000 vehicles per hour in each direction. In the design year (2025), the DHV's are anticipated to grow to approximately 4,500 vehicles per hour in each direction. The design year volumes along the mainline of I-55 will result in a LOS F for this four-lane facility.

The figures in Appendix A provide a complete breakdown of traffic volumes for the subject interchange and the adjacent interchanges for the base year (2005) and the design year (2025). The heavy volumes shown for the I-55 ramps to/from the west leg of the interchange reflect the discontinuity of Interstate 55.

C. Proposed Modifications

Alternate A

The proposed modifications for the I-55 and US 64 (Crump Boulevard) interchange will improve traffic movements along and between the I-55 and McLemore Avenue interchange and the Mississippi River Bridge. Traffic movements along I-55 will no longer be required to exit one lane ramps to remain on the mainline of the interstate, but will be accommodated by providing free-flow mainline to mainline movements for the traffic traveling on I-55. The design speed for Alternate A is fifty (50) miles per hour.

This improvement will restore continuity of the mainline of the interstate. The existing loop ramp located in the southwest quadrant of the interchange will be eliminated; thus, eliminating the associated weave movement.

In addition to the primary goal of improving traffic flow and mobility, two additional goals of this proposed modification were to utilize as much of the existing infrastructure as feasible and to maintain driver expectancy through the corridor. The focus of this study is to improve mobility of the traveling public by eliminating the loop ramp for mainline traffic and, as the reports notes, thereby restoring the continuity of the interstate system.

In order to maintain mainline continuity, three new structures will be required. One bridge will span over the new ramp from southbound Riverside Drive and the second will cross over the new connector road linking Illinois Avenue and U.S. 64. The final structure will be a replacement bridge on Wisconsin Avenue over I-55 just south of the U.S. 64 (Crump Boulevard) interchange. Substantial retaining walls will also be necessary to begin transitioning the mainline grades over this new connector and to minimize impacts to the residential development located within the southwest quadrant of the interchange. It is estimated that approximately seven (7) residential establishments and two (2) businesses will require relocation with this alternative.

As part of this project, the existing ramps to Metal Museum will be eliminated with access maintained through the proposed at-grade intersection and new ramp configuration.

Northbound/Westbound I-55

For motorists traveling northbound I-55 traffic between McLemore Avenue and U.S. 64 (Crump Boulevard) and wishing to remain on I-55 will utilize the inside two (2) travel lanes with exiting traffic to the Memphis central business district via Riverside Drive will exit using the outside auxiliary lane. While those traveling northbound along I-55 to eastbound U.S. 64 will exit using the existing ramp. Some minor modification may be necessary to this ramp at its termini with the new I-55 ramp.

I-55 motorists will no longer use portions of the existing Metal Museum Drive interchange; however, northbound I-55 motorists can still access the Metal Museum Drive area by exiting the existing westbound loop to Crump Boulevard and making a left turn at the proposed traffic signal with the new Illinois Avenue connector.

Southbound/Eastbound I-55

Eastbound traffic along the mainline of Interstate 55 west of the U.S. 64 (Crump Boulevard) interchange will utilize two (2) travel lanes with a proposed exit ramp to the new connector. The exit ramp will begin just west of the Mississippi River Bridge. The ramp termini will be operated by a traffic signal at the intersection with the new connector road. This signal will operate at an acceptable level of service in the design year (2025). While the traffic analysis for the intersection shows the queue length of vehicles along the ramp will not extend onto the

mainline of the interstate, there is a potential for situations (traffic signal malfunctions, downstream crashes along I-55 or along Crump Boulevard, etc.,) to occur in which vehicles might queue onto the mainline of the interstate and thus create an unsafe condition. The configuration of this exit ramp from eastbound I-55 at the intersection of Illinois Avenue has the potential to create wrong-way encroachments, whereby errant drivers may turn on the ramp from the local street and travel the wrong-way on to the interstate mainline. Every effort should be made during the design phase to provide sufficient regulatory signing and possibly island channelization to reduce the risk of this unsafe occurrence. It is also important to note this exit ramp from I-55 eastbound to Illinois Avenue is a partial interchange and that partial interchanges are discouraged by Federal Highway Administration (FHWA) adopted AASHTO design standards for interstate systems.

U.S. 64 (Crump Boulevard)

Access from the westbound U.S. 64 (Crump Boulevard) to northbound I-55 will be via a tapered ramp in the vicinity of the former Metal Museum Drive exit. In addition, westbound U.S. 64 to southbound I-55 will be via the existing loop ramp in the northwest quadrant of the interchange to an auxiliary ramp, which then merges with the southbound motorists from Riverside Drive. Traffic control along the new Illinois Avenue connector will be handled under signalized operation.

Westbound U.S. 64 to northbound Riverside Drive traffic will utilize the existing ramp which ties to Riverside Drive just to the south of the CSX railroad overpass.

Riverside Drive

The Riverside Drive traffic traveling southbound to access westbound I-55 will utilize the existing ramp and will yield before merging with the mainline traffic. Access to the residential community to the south will be via the new connector road with two (2) new at grade intersections. Motorists traveling along Riverside Drive south of the interchange area and wishing go north on Riverside Drive will traverse the new connector road and utilize the existing I-55 loop ramp located in the southeast quadrant. With this new connector, motorists will now be able to travel between the north and south of the interchange area, without having to enter the interstate system.

For motorists traveling southbound on Riverside Drive (from the Memphis business district) to I-55 southbound will utilize the proposed ramp that will travel underneath the new four-lane mainline structure and serve as an auxiliary lane to the McLemore Avenue interchange.

Alternate B

Alternate B was incorporated into this modification study due to some concerns expressed about state route continuity for motorists traveling eastbound along I-55 from the westside of the Mississippi River. Unlike Alternate A, this option does not include direct access to the residential and commercial properties on Illinois Avenue from I-55 eastbound. However, this alternate does provide access from

the area located in the southwest quadrant of the interchange to eastbound Crump Boulevard via a single lane ramp which serves as an add lane from Metal Museum Drive.

The configuration of Alternate B does not include two signalized intersections on Illinois Avenue, but instead maintains the continuity of Crump Boulevard / U.S. Highway 64. This configuration allows vehicles on westbound Crump Boulevard / U.S. Highway 64 to exit onto the existing westbound ramp to Metal Museum Drive. Motorist traveling north on I-55 must exit at Crump Boulevard and go around the northeasterly loop ramp to access Metal Museum Drive. Under this alternative southbound Riverside Drive does not have access to eastbound Crump Boulevard. It is estimated that approximately seven (7) residential establishments and one (1) business will require relocation with this alternative.

Both Alternate A and B would improve the traffic operations and mobility within the study area by creating a roadway network that maintains the continuity of Interstate 55, eliminates the existing need for through volumes on Interstate 55 to use ramps, and reduces the existing capacity constraints. In addition, this alternative simplifies the traffic operations within the modified interchange by maintaining the continuity of Crump Boulevard / U.S. Highway 64 and eliminating the need for two at-grade intersections. Alternate B would also provide simpler and direct access to Crump Boulevard and Riverside Drive with free flow movements unlike Alternate A which will utilize the previously described traffic signals along the new Illinois connecter roadway.

An optional lane has been added to the exit ramp from Southbound I-55 to McLemore Avenue as part of this alternate to help reduce the amount of required weaving maneuvers. This extra lane will require an existing overpass structure to be widened. A retaining wall is proposed to eliminate the need for any additional Right-of-Way for the new lane.

As with Alternate A, these proposed improvements will meet a design speed of fifty (50) miles per hour.

Alternate C

Alternate C as shown, incorporates all the proposed improvements as shown in Alternate B as previously described with one minor modification. In order to provide some access to the residential and commercial properties located in the southwest quadrant of the interchange area, an exit ramp to this area from the I-55 eastbound to US-64 (Crump Boulevard) ramp was added. This connection will allow motorists to exit from the west to this portion of the project area, but will still require them to return via the I-55 and McLemore Avenue interchange located south of the subject interchange. Southbound Riverside Drive will not have access to eastbound Crump Boulevard. As with Alternate A, it is estimated that approximately seven (7) residential establishments and two (2) businesses will require relocation to construct the proposed improvements.

Alternate D

Following a public meeting in which the previously described three alternates were presented, a fourth option was developed. During this meeting several issues regarding access and residential impacts were discussed resulting in modifying the original Alternate A to reduce the impacts to the development located in the southwest quadrant of the interchange area. Several goals that were outlined for this requested fourth alternative are as follows:

1. Eliminate the acquisition of any residential or commercial properties located in the southwest quadrant of the interchange area
2. Reduce the amount of additional right-of-way required to construct the project
3. Eliminate the access and cut-through traffic from I-55 eastbound and westbound from and to the area located in the southwest quadrant of the interchange.

In order to attempt to meet the goals as outlined above, the proposed mainline of I-55 must be designed for a design speed of forty-five (45) miles per hour. This alternative reduces the radius of the mainline for Alternate B to minimize impacts to the neighborhood located in the area southwest of the interchange. Due to this reduced horizontal curve, a design exception will be required from the FHWA. In is important to note that the AASHTO "A Policy on Geometric Design of Highways and Streets" outlines the criteria for urban freeways in Chapter Eight of the text and states, "…design speed should not be less than 80 km/hr (50 mph)." This design guide also notes that, "…higher design speeds are closely related to the overall quality and safety of a facility."

Numerous retaining walls will also be necessary to avoid or minimize the acquisition of additional right-of-way in some locations. As with Alternate B, much of the existing infrastructure can remain, however the loop ramp located in the southwest quadrant of the existing interchange will be eliminated. In order to construct this realignment, grade changes to I-55 will be required to achieve adequate vertical clearances.

It is also anticipated the proposed grade for I-55 will be in the range of three (3) to four (4) percent; with substantial retaining walls needed. Due to the constrained right-of-way and other physical features, the length of the acceleration lane onto I-55 westbound from Crump Boulevard/Riverside Drive will be less than desirable and will include a taper on a curved section of this ramp.

Construction phasing and traffic control will be a major focus of this interchange reconstruction (for any alternative) and every effort should be made to provide safe travel during that period of the project. Based upon field observations and plans available for the existing interchange, it appears that the proposed ramps/frontage roads located north and south of realigned I-55 could be constructed early in the project, with interstate traffic utilizing these roadways, while the mainline of the interstate is being reconstructed. Detailed and comprehensive signing should be incorporated during the construction phase in order to provide motorists with sufficient warning when approaching the project area.

D. Discussion of Initial Concepts

Several alternatives to improve the safety and operational inadequacies of the existing I-55 and U.S. 64 (Crump Boulevard) interchange were assessed. Upon review of the project area, various physical constraints became apparent. The existing bridge over the Mississippi River was identified due to the minimal laneage and shoulder/median widths. The CSX railroad bridge over Riverside Drive located just north of the subject interchange allows only four (4) travel lanes underneath the structure. Any proposed alternative was to be sensitive to the residential community located within the southwestern quadrant of the interchange as well as the industrial and commercial development to the east.

I-55 Mainline Realignment

Upon reviewing traffic volumes provided by the Tennessee Department of Transportation, it became obvious the I-55 northbound to I-55 westbound movement and its reciprocal movement should be the focus. This alternative would provide a realignment of the mainline of the interstate system (I-55) and thus eliminate the substandard ramps the currently carry the majority of traffic within the project location. In order to construct this realignment to current design standards, approximately thirty-five to forty residential relocations would be required, as well as some commercial acquisitions and relocations. Appendix H contains the various single line sketches developed during the initial phases of this study with Single Line No. 5 representing the previously described concept.

Northbound Fly-Over

This alternative provided an outside exit ramp fly-over from northbound to westbound Interstate 55. This option would have required a lengthy (900 foot) structure that would have to have been constructed as a third level over the existing I-55/U.S. 64 bridge. In order to provide adequate design speeds for this new fly-over, the impacts and loss of access to the surrounding areas were deemed to be too extensive. The fly-over alternative would still have required the I-55 mainline traffic to use the outside two (2) travel lanes and thus retain the weave movements in this section of interstate.

I-55 Outside Fly-Over

A third alternative was developed to create free-flow movements of I-55 with exiting and entering traffic using the outside two lanes with the Riverside Drive/U.S. 64 traffic utilizing the inside lanes. This option did not eliminate the existing weave movements in the area and did not provide for safe driver expectancy within the project corridor.

Modified Loop Ramp

The final alternative developed was a “bare bones” modification meant to provide some operational improvement with minimal associated costs. This option would modify the existing I-55 northbound to I-55 westbound loop to a higher design speed with two (2) travel lanes. In order to achieve a design speed of 45 to 50 miles per hour for this loop ramp, relocation of the existing CSX railroad would

have been required to construct this modification. Some operational efficiency could be realized with a lower design speed (35 mph) loop ramp, however, weave areas would remain and discontinuity of the interstate system would not be addressed with this alternative.

E. Environmental Concerns

The Tennessee Department of Transportation will perform all necessary studies including ecological and historical studies. At the current time, the proposed design does not appear to impact any areas of environmental or historical significance.

CHAPTER 3

Engineering Investigations

A. Traffic Operations

An initial analysis was made which determined that the existing interchange configuration was inadequate to handle design year volumes. Appendix B contains figures summarizing the levels-of-service under the existing conditions for 2005 and 2025 traffic. The levels-of-service were determined using the peak hour volumes which represent the worst case condition for each location.

Existing Roadway Network

The capacity analysis of the existing ramp junctions within the study area are summarized below in Table 1 for the base year and design year (2025).

TABLE 1

CAPACITY ANALYSES OF RAMP JUNCTIONS WITHIN THE STUDY AREA

Ramp Junctions	Year 2005	Year 2025
E/B I-55 and off-ramp to Alston Avenue (AM)	E	F
E/B I-55 and off-ramp to Alston Avenue (PM)	D	F
E/B I-55 and on-ramp from Alston Avenue (AM)	D	F
E/B I-55 and on-ramp from Alston Avenue (PM)	C	F
W/B I-55 and off-ramp to Delaware Street (AM)	D	F
W/B I-55 and off-ramp to Delaware Street (PM)	D	F
W/B I-55 and on-ramp from Delaware Street (AM)	D	F
W/B I-55 and on-ramp from Delaware Street (PM)	D	F
E/B I-55 / Crump Boulevard and off-ramp to S/B I-55 (AM)	F	F
E/B I-55 / Crump Boulevard and off-ramp to S/B I-55 (PM)	F	F
E/B I-55 / Crump Boulevard and on-ramp from S/B Riverside Dr. (AM)	A	A
E/B I-55 / Crump Boulevard and on-ramp from S/B Riverside Dr. (PM)	A	A
E/B I-55 / Crump Boulevard and off-ramp to N/B Riverside Dr. (AM)	A	A
E/B I-55 / Crump Boulevard and off-ramp to N/B Riverside Dr. (PM)	A	A
E/B I-55 / Crump Boulevard and on-ramp from N/B I-55 (AM)	A	B
E/B I-55 / Crump Boulevard and on-ramp from N/B I-55 (PM)	A	B
N/B I-55 and off-ramp to E/B Crump Boulevard (AM)	see note	see note
N/B I-55 and off-ramp to E/B Crump Boulevard (PM)	see note	see note
N/B I-55 and on-ramp from E/B I-55 / Crump Boulevard (AM)	D	F
N/B I-55 and on-ramp from E/B I-55 / Crump Boulevard (PM)	D	F
N/B I-55 and off-ramp to W/B I-55 (AM)	F	F
N/B I-55 and off-ramp to W/B I-55 (PM)	F	F
N/B I-55 and on-ramp from W/B Crump Boulevard (AM)	A	A
N/B I-55 and on-ramp from W/B Crump Boulevard (PM)	A	A

S/B Riverside Drive and on-ramp to W/B I-55 (AM)	A	A
S/B Riverside Drive and on-ramp to W/B I-55 (PM)	B	B
S/B Riverside Drive and off-ramp from W/B Crump Boulevard (AM)	A	B
S/B Riverside Drive and off-ramp from W/B Crump Boulevard (PM)	B	B
S/B Riverside Drive and on-ramp to E/B Crump Boulevard (AM)	A	A
S/B Riverside Drive and on-ramp to E/B Crump Boulevard (PM)	B	B
S/B Riverside Drive and off-ramp from E/B I-55 (AM)	see note	see note
S/B Riverside Drive and off-ramp from E/B I-55 (PM)	see note	see note
W/B I-55 / Crump Blvd. and off-ramp to N/B Riverside Dr. (AM)	A	A
W/B I-55 / Crump Blvd. and off-ramp to N/B Riverside Dr. (PM)	A	A
W/B I-55 / Crump Boulevard and on-ramp from N/B I-55 (AM)	D	F
W/B I-55 / Crump Boulevard and on-ramp from N/B I-55 (PM)	D	F
W/B I-55 / Crump Boulevard and off-ramp to S/B I-55 (AM)	F	F
W/B I-55 / Crump Boulevard and off-ramp to S/B I-55 (PM)	F	F
W/B I-55 / Crump Blvd. and on-ramp from S/B Riverside Dr. (AM)	D	F
W/B I-55 / Crump Blvd. and on-ramp from S/B Riverside Dr. (PM)	D	F
N/B I-55 at off-ramp to McLemore Avenue (AM)	see note	see note
N/B I-55 at off-ramp to McLemore Avenue (PM)	see note	see note
N/B I-55 at on-ramp from McLemore Avenue (AM)	see note	see note
N/B I-55 at on-ramp from McLemore Avenue (PM)	see note	see note
S/B I-55 at off-ramp to McLemore Avenue (AM)	see note	see note
S/B I-55 at off-ramp to McLemore Avenue (PM)	see note	see note
S/B I-55 at on-ramp from McLemore Avenue (AM)	see note	see note
S/B I-55 at on-ramp from McLemore Avenue (PM)	see note	see note

Note: Some ramp junctions within the study area result in a lane addition or lane drop. Analyses for these locations are shown in Table 2.

In addition to the ramp junctions shown in Table 1, several locations within the study area include an interchange ramp that is associated with a lane addition or a lane drop on I-55. These locations are as follows:

- **Northbound I-55 at the ramp to eastbound Crump Boulevard.** Upstream from this one-lane ramp, northbound I-55 includes three lanes of travel. However, the outermost lane is dropped from I-55 at the junction with eastbound Crump Boulevard.

- **Southbound Riverside Drive at the ramp from eastbound I-55.** Upstream from this one-lane ramp, southbound Riverside Drive includes two lanes of travel. However, this ramp results in a third southbound travel lane on Riverside Drive/I-55.

- **Northbound I-55 at the off-ramp to McLemore Avenue.** Upstream from this one-lane ramp, northbound I-55 includes three lanes of travel. However, the outermost lane is dropped at the junction with McLemore Avenue.

- **Northbound I-55 at the on-ramp from McLemore Avenue.** Between the ramps that serve McLemore Avenue, northbound I-55 includes two lanes of travel. However, this ramp results in a third northbound lane on I-55.

- **Southbound I-55 at the off-ramp to McLemore Avenue.** Upstream from this one-lane ramp, southbound I-55 includes three lanes of travel. However, the outermost lane is dropped at the junction with McLemore Avenue.

- **Southbound I-55 at the on-ramp from McLemore Avenue.** Between the ramps that serve McLemore Avenue, southbound I-55 includes two lanes of travel. However, this ramp results in a third southbound lane on I-55.

The Highway Capacity Manual (HCM) states the following about lane additions and lane drops:

> "Sometimes on-ramps are associated with lane additions and off-ramps with lane drops. Where a single-lane ramp results in a lane addition or deletion, the capacity of the ramp is governed by its geometry, as indicated in Table 5-6."

The information in Table 5-6 of the HCM indicates that for a free-flow ramp speed of 31-40 mph, a single-lane ramp has a capacity of 2,000 vehicles per hour. Table 2 includes the projected traffic volumes on each ramp which results in a lane addition or lane drop on I-55 at the interchanges within the study area.

TABLE 2

CAPACITY ANALYSES AT RAMP JUNCTIONS
WHICH RESULT IN A LANE ADDITION OR LANE DROP

Location	# of lanes	capacity (vph)	Year 2005	Year 2025
N/B I-55 and off-ramp to E/B Crump Boulevard (AM)	1	2,000	341	512
N/B I-55 and off-ramp to E/B Crump Boulevard (PM)	1	2,000	447	670
S/B Riverside Drive and off-ramp from E/B I-55 (AM)	1	2,000	2,650	3,974
S/B Riverside Drive and off-ramp from E/B I-55 (PM)	1	2,000	2,244	3,366
N/B I-55 at off-ramp to McLemore Avenue (AM)	1	2,000	719	913
N/B I-55 at off-ramp to McLemore Avenue (PM)	1	2,000	527	669
N/B I-55 at on-ramp from McLemore Avenue (AM)	1	2,000	328	416
N/B I-55 at on-ramp from McLemore Avenue (PM)	1	2,000	606	770
S/B I-55 at off-ramp to McLemore Avenue (AM)	1	2,000	531	797
S/B I-55 at off-ramp to McLemore Avenue (PM)	1	2,000	341	511
S/B I-55 at on-ramp from McLemore Avenue (AM)	1	2,000	527	670
S/B I-55 at on-ramp from McLemore Avenue (PM)	1	2,000	793	1,006

The results of these analyses indicate that, with the existing roadway network, the traffic projected to use the off-ramp from eastbound I-55 to southbound I-55 will exceed the capacity of the ramp by the year 2005. All of the other ramps which currently result in a lane addition or a lane drop on I-55 have adequate capacity to accommodate the traffic volumes projected on the existing roadway network in the Years 2005 and 2025.

Capacity analyses were conducted for the existing weaving movements within the study area, and these results are shown in Table 3. The analyses show that numerous weaving sections will operate at poor LOS better during the AM and PM peak hours in the Year 2005, as well as the Year 2025.

TABLE 3

CAPACITY ANALYSES AT WEAVING AREAS

Weaving Section	Year 2005	Year 2025
Eastbound I-55, between Alston Avenue and Riverside Drive (AM)	F	F
Eastbound I-55, between Alston Avenue and Riverside Drive (PM)	E	F
Westbound I-55, between Alston Avenue and Riverside Drive (AM)	C	F
Westbound I-55, between Alston Avenue and Riverside Drive (PM)	C	E
Eastbound I-55 / Crump Boulevard, between loops at Riverside Drive (AM)	A	A
Eastbound I-55 / Crump Boulevard, between loops at Riverside Drive (PM)	A	A
Northbound I-55, between loops at Crump Boulevard (AM)	F	F
Northbound I-55, between loops at Crump Boulevard (PM)	F	F
Southbound Riverside Drive, between loops at Crump Boulevard (AM)	A	A
Southbound Riverside Drive, between loops at Crump Boulevard (PM)	A	B
Westbound I-55 / Crump Boulevard, between loops at Riverside Drive (AM)	F	F
Westbound I-55 / Crump Boulevard, between loops at Riverside Drive (PM)	F	F
Northbound I-55, between McLemore Avenue and Crump Boulevard (AM)	C	E
Northbound I-55, between McLemore Avenue and Crump Boulevard (PM)	C	E
Southbound I-55, between Crump Boulevard and McLemore Avenue (AM)	E	F
Southbound I-55, between Crump Boulevard and McLemore Avenue (PM)	E	F

The results of the capacity analyses for the freeway segments within the study area are shown in Table 4. These results indicate the following freeway segments are projected to operate at an unacceptable LOS in the Year 2005, based on the existing roadway network:

- Eastbound I-55, west of Alston Avenue / Delaware Street (AM peak hour),
- Westbound I-55, west of Alston Avenue / Delaware Street (AM peak hour).

Also, all of the freeway segments within the study area are projected to operate at poor LOS in the Year 2025, based on the existing roadway network.

TABLE 4

CAPACITY ANALYSES OF FREEWAY SEGMENTS WITHIN THE STUDY AREA

Freeway Segments	Year 2005	Year 2025
Northbound I-55, south of McLemore Avenue (AM)	D	F
Northbound I-55, south of McLemore Avenue (PM)	C	E
Southbound I-55, south of McLemore Avenue (AM)	C	E
Southbound I-55, south of McLemore Avenue (PM)	D	E
Northbound I-55, between McLemore Avenue and Crump Boulevard (AM)	E	F
Northbound I-55, between McLemore Avenue and Crump Boulevard (PM)	E	F
Southbound I-55, between McLemore Avenue and Crump Boulevard (AM)	E	F
Southbound I-55, between McLemore Avenue and Crump Boulevard (PM)	E	F
Eastbound I-55, west of Alston Avenue / Delaware Street (AM)	E	F
Eastbound I-55, west of Alston Avenue / Delaware Street (PM)	D	F
Westbound I-55, west of Alston Avenue / Delaware Street (AM)	E	F
Westbound I-55, west of Alston Avenue / Delaware Street (PM)	D	F

PROPOSED ROADWAY NETWORK

The results of the capacity analyses conducted for the proposed roadway network are shown in the following tables. Specifically, as shown in Table 5, only one ramp junction within the study area is projected to operate at poor LOS in the Year 2005:

- **Eastbound I-55** and the off-ramp to Illinois Avenue (AM peak hour),

However, the following ramp junctions are expected to operate at poor Level of Service in the Year 2025, based on the proposed roadway network.

- **Eastbound I-55** and the off-ramp to Illinois Avenue (both peak hours),

- **Westbound I-55** and the on-ramp from Riverside Drive/Crump Boulevard (both peak hours).

It is important to note that these ramp junction failures could be eliminated with the addition of one mainline lane in each direction. In order to provide these lanes, the existing bridge over the Mississippi River would need to be widened.

Also, as with the existing roadway network, several locations within the study area will include an interchange ramp that is associated with a lane addition or a lane drop on I-55. These locations are as follows:

- **Northbound I-55 at the off-ramp to McLemore Avenue.** Upstream from this one-lane ramp, northbound I-55 includes three lanes of travel. However, the outermost lane is dropped at the junction with McLemore Avenue.

- **Northbound I-55 at the on-ramp from McLemore Avenue.** Between the ramps that serve McLemore Avenue, northbound I-55 includes two lanes of travel. However, this ramp results in a third northbound lane on I-55.

- **Southbound I-55 at the off-ramp to McLemore Avenue.** Upstream from this proposed two-lane ramp, southbound I-55 includes three lanes of travel. However, the outermost lane is dropped at the junction with McLemore Avenue.

- **Southbound I-55 at the on-ramp from McLemore Avenue.** Between the ramps that serve McLemore Avenue, southbound I-55 includes two lanes of travel. However, this ramp results in a third southbound lane on I-55.

The information in Table 5-6 of the HCM indicates that for a free-flow ramp speed of 31-40 mph, a single-lane ramp has a capacity of 2,000 vehicles per hour. Table 6 includes the projected traffic volumes on each ramp which will result in a lane addition or lane drop on I-55 at the interchanges within the study area. The results of these analyses indicate that the traffic projected to use the ramps which result in a lane addition or a lane drop on I-55 have adequate capacity to accommodate the traffic volumes projected on the proposed roadway network in the Years 2005 and 2025.

TABLE 5

CAPACITY ANALYSES OF RAMP JUNCTIONS WITHIN THE STUDY AREA

Ramp Junctions	Year 2005	Year 2025
E/B I-55 and off-ramp to Illinois Avenue (AM)	E	F
E/B I-55 and off-ramp to Illinois Avenue (PM)	D	F
W/B I-55 and on-ramp from Riverside Drive / Crump Boulevard (AM)	D	F
W/B I-55 and on-ramp from Riverside Drive / Crump Boulevard (PM)	D	F
N/B I-55 and off-ramp to E/B Crump Boulevard (AM)	A	A
N/B I-55 and off-ramp to E/B Crump Boulevard (PM)	A	A
N/B I-55 and on-ramp from E/B Crump Boulevard (AM)	A	A
N/B I-55 and on-ramp from E/B Crump Boulevard (PM)	A	A
N/B I-55 and on-ramp from W/B Crump Boulevard (AM)	A	A
N/B I-55 and on-ramp from W/B Crump Boulevard (PM)	A	A
S/B Riverside Drive and on-ramp to W/B I-55 (AM)	A	A
S/B Riverside Drive and on-ramp to W/B I-55 (PM)	A	B
S/B Riverside Drive and off-ramp from W/B Crump Boulevard (AM)	A	A
S/B Riverside Drive and off-ramp from W/B Crump Boulevard (PM)	B	B
N/B I-55 at off-ramp to McLemore Avenue (AM)	see note	see note
N/B I-55 at off-ramp to McLemore Avenue (PM)	see note	see note
N/B I-55 at on-ramp from McLemore Avenue (AM)	see note	see note
N/B I-55 at on-ramp from McLemore Avenue (PM)	see note	see note
S/B I-55 at off-ramp to McLemore Avenue (AM)	see note	see note
S/B I-55 at off-ramp to McLemore Avenue (PM)	see note	see note
S/B I-55 at on-ramp from McLemore Avenue (AM)	see note	see note
S/B I-55 at on-ramp from McLemore Avenue (PM)	see note	see note

Note: Some ramp junctions within the study area result in a lane addition or lane drop. Analyses for these locations are shown in Table 6.

TABLE 5A

CAPACITY ANALYSES OF RAMP JUNCTIONS WITHIN THE STUDY AREA

Ramp Junctions	Year 2005	Year 2025	Service Life
E/B I-55 and off-ramp to Illinois Avenue (AM)	E	F	2005
E/B I-55 and off-ramp to Illinois Avenue (PM)	D	F	2013
W/B I-55 and on-ramp from Riverside Drive / Crump Boulevard (AM)	D	F	2008
W/B I-55 and on-ramp from Riverside Drive / Crump Boulevard (PM)	D	F	2008

For those proposed ramp junctions within the study area that operate at LOS F in the design year (Table 5), additional analysis was performed to determine the service life for these movements (See Table 5A). As seen in the analysis, service life is short due to the lack of sufficient mainline lanes on I-55.

TABLE 6

CAPACITY ANALYSES AT RAMP JUNCTIONS WHICH RESULT IN A LANE ADDITION OR LANE DROP

Location	# of lanes	capacity (vph)	Year 2005	Year 2025
N/B I-55 at off-ramp to Riverside Drive (AM)	1	2,000	600	900
N/B I-55 at off-ramp to Riverside Drive (AM)	1	2,000	618	927
S/B I-55 at on-ramp from Riverside Drive (AM)	1	2,000	391	587
S/B I-55 at on-ramp from Riverside Drive (AM)	1	2,000	797	1,196
N/B I-55 at off-ramp to McLemore Avenue (AM)	1	2,000	719	913
N/B I-55 at off-ramp to McLemore Avenue (PM)	1	2,000	527	669
N/B I-55 at on-ramp from McLemore Avenue (AM)	1	2,000	328	416
N/B I-55 at on-ramp from McLemore Avenue (PM)	1	2,000	606	770
S/B I-55 at off-ramp to McLemore Avenue (AM)	2	4,000	531	797
S/B I-55 at off-ramp to McLemore Avenue (PM)	2	4,000	341	511
S/B I-55 at on-ramp from McLemore Avenue (AM)	1	2,000	527	670
S/B I-55 at on-ramp from McLemore Avenue (PM)	1	2,000	793	1,006

Capacity analyses were conducted for the weaving movements within the proposed roadway network. It is important to note that the proposed roadway network includes significantly fewer weaving sections than the existing roadway network (eight weave areas reduced to two).

The results of these analyses are shown in Table 7. The analyses show that the weaving sections within the study area will operate at acceptable LOS the AM and PM peak hours in the Year 2005. However, these weaving sections are proposed to operate at poor LOS in the Year 2025. It is important to note however, that the service life for these movements range from eight (8) to twelve (12) years of operation at an acceptable LOS.

TABLE 7

CAPACITY ANALYSES AT WEAVING AREAS

Weaving Section	Year 2005	Year 2025	Service Life
Northbound I-55, between McLemore Avenue and Crump Boulevard (AM)	C	F	2013
Northbound I-55, between McLemore Avenue and Crump Boulevard (PM)	C	F	2013
Southbound I-55, between Crump Boulevard and McLemore Avenue (AM)	C	E	2019
Southbound I-55, between Crump Boulevard and McLemore Avenue (PM)	C	E	2015

The results of the capacity analyses for the freeway segments within the study area are shown in Table 8.

All of the freeway segments within the study area are projected to operate at poor LOS in the Year 2025, based on the proposed roadway network. Analysis shows that freeway capacity operation is directly related to the number of travel lanes along the mainline of I-55. Table 8 also shows the service life for the freeway segments varies from zero (0) to fifteen (15) years.

TABLE 8

CAPACITY ANALYSES OF FREEWAY SEGMENTS

Freeway Segments	Year 2005	Year 2025	Service Life
Northbound I-55, south of McLemore Avenue (AM)	D	F	2008
Northbound I-55, south of McLemore Avenue (PM)	D	E	2016
Southbound I-55, south of McLemore Avenue (AM)	C	E	2020
Southbound I-55, south of McLemore Avenue (PM)	D	E	2013
Northbound I-55, between McLemore Avenue and Crump Boulevard (AM)	E	F	2005
Northbound I-55, between McLemore Avenue and Crump Boulevard (PM)	E	F	2007
Southbound I-55, between McLemore Avenue and Crump Boulevard (AM)	D	F	2011
Southbound I-55, between McLemore Avenue and Crump Boulevard (PM)	D	F	2011
Eastbound I-55, west of Alston Avenue / Delaware Street (AM)	E	F	2005
Eastbound I-55, west of Alston Avenue / Delaware Street (PM)	D	F	2007
Westbound I-55, west of Alston Avenue / Delaware Street (AM)	E	F	2005
Westbound I-55, west of Alston Avenue / Delaware Street (PM)	E	F	2005

Capacity analyses were conducted for the two new surface street intersections that are included within the proposed roadway network, and these results are shown in Table 9. The analyses show that two new surface street intersections will operate at acceptable LOS during the AM and PM peak hours in the Year 2005, as well as the Year 2025. However, it would be desirable to construct the new ramp from westbound I-55 so that it includes separate left and right turn lanes at Illinois Avenue.

TABLE 9

CAPACITY ANALYSES AT NEW SURFACE STREET INTERSECTIONS

INTERSECTION	Year 2005	Year 2025
Crump Boulevard and Riverside Drive ramp / new connector road (AM)	B	C
Crump Boulevard and Riverside Drive ramp / new connector road (PM)	B	C
Illinois Avenue and ramp from WB I-55 (AM)	B	C
Illinois Avenue and ramp from WB I-55 (PM)	B	B

Tables 1 through 9 reflect the traffic operational analyses for Alternate A. Because Alternate B includes the removal of elements of Alternate A, the previous traffic analysis conducted for ramp junctions, weaving sections, and freeway segments apply to both configurations. Also, it is important to note that the Alternative B does not require any additional analyses that were not required for the original configuration (Alternate A).

As stated previously, the improvements proposed in Alternate C are the same as in Alternate B, with one minor modification. A discreet exit ramp to Illinois Avenue is shown to provide access to the residential and commercial development in the southwest quadrant of the study area.

The proposed improvements contained in Alternate D have been also analyzed as various components of the previously mentioned alternatives.

B. Access Analysis

This study has been undertaken in accordance with the Federal Highway Administration's (FHWA) policy for granting new or revised interchange access. The FHWA policy, as described in FHWA Docket 98-3460, "Additional Interchanges to the Interstate System (Federal Register 63, No. 28, February 11, 1998) is provided in the following paragraphs accompanied by comments for consideration.

It is in the national interest to maintain the Interstate System to provide the highest level of service in terms of safety and mobility. Adequate control of access is critical to providing such service. Therefore, new or revised access points to the existing Interstate System should meet the following requirements.

1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design year traffic demands while at the same time providing the access intended by the proposal.

With the continual increase in traffic volumes along I-55, the merge, diverge and weave movements will continue to diminish the operation of the interstate system in the project area. This degradation will result in increased motorists delay, reduced traveler safety, and reduced air quality within the city of Memphis. No minor interchange improvements can be made (other than the recommended configurations) to eliminate the major problems outlined previously in this report.

2. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

There were several different design options developed and assessed in this study to improve the operation of the I-55 and U.S. 64 (Crump Boulevard) interchange. However, the proposed designs are the only ones that produced the desired levels of service and operational characteristics for the interchange.

The proposed modifications will provide the needed continuity of the interstate system within the project area and reduce congestion associated with the numerous merge, diverge and weave movements that currently exist in this area.

3. The proposed access point does not have a significant adverse impact on the safety and operation of the interstate facility based upon an analysis of current and future traffic. The operational

analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of interstate to an including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.

The continuity of Interstate 55 restored by this modification will improve traffic operations through the interchange area by reducing the number of merge/diverge and weave sections. The proposed modifications should not have any adverse impact on the safety and operation of the interstate facility.

4. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-Aid projects on the Interstate System.

The proposal is a modification of the existing interchange at Interstate 55 and U.S. 64 (Crump Boulevard). The proposed modifications for Alternate A and D is will provide for a "full interchange" while Alternates B and C will not allow for direct movements to and from the interstate system and Illinois Avenue. The proposed designs for Alternates A, B and C will meet the American Association of State Highway and Transportation Officials (AASHTO) criteria. Alternate D would require a design exception due to the reduced design speed (45 miles per hour) of the reconstructed mainline of Interstate 55.

5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.

The study was coordinated with both the Tennessee Department of Transportation and the City of Memphis. The proposal is consistent with all local, regional, and statewide land use and transportation plans.

6. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.

There are no long-range plans for additional interchanges in this area. The existing interchanges provide adequate access to the subject area.

7. The request for a new or revised access generated by a new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements

The request is not generated by new or expanded development within the vicinity of the interchange. This interchange modification is intended to correct operational inadequacies of the existing interchange configuration.

8. The request for a new or revised access contains information relative to the planning requirements and the status of environmental processing of the proposal.

The proposed modifications will be submitted to the TDOT Environmental Department to begin environmental studies at the time this report is submitted to the FHWA.

C. Proposed Interchange Cost

Alternate A

The total cost for this improvement to the I-55 and U.S. 64 (Crump Boulevard) interchange is approximately $14,814,000. An estimated cost breakdown is shown in Appendix F.

Alternate B

The total cost for this improvement to the I-55 and U.S. 64 (Crump Boulevard) interchange is approximately $13,794,000. An estimated cost breakdown is shown in Appendix F.

Alternate C

The total cost for this improvement to the I-55 and U.S. 64 (Crump Boulevard) interchange is approximately $13,035,000. An estimated cost breakdown is shown in Appendix F.

Alternate D

The total cost for this improvement to the I-55 and U.S. 64 (Crump Boulevard) interchange is approximately $9,737,000. An estimated cost breakdown is shown in Appendix F.

CHAPTER 4

Summary of Findings and Conclusions

The purpose of this study was to evaluate the existing interchange at Interstate 55 and U.S. 64, and to request the approval for modifications of this interchange to improve its operation and safety. Benefits of this project include reduced congestion, reduced crashes and restored interstate route continuity. Several viable alternatives have been developed, while attempting to minimize or prevent any possible negative impacts to local neighborhoods and the environment.

The traffic analysis indicates that the existing interchange is inadequate to handle the current and design year traffic volumes. The current configuration and close proximity of adjacent interchanges and the associated weave, merge problems severely congest this area. Accident history for the project area show a high number of angle crashes and rear-end collisions, which are directly attributable to the interchange configuration and heavy traffic volumes.

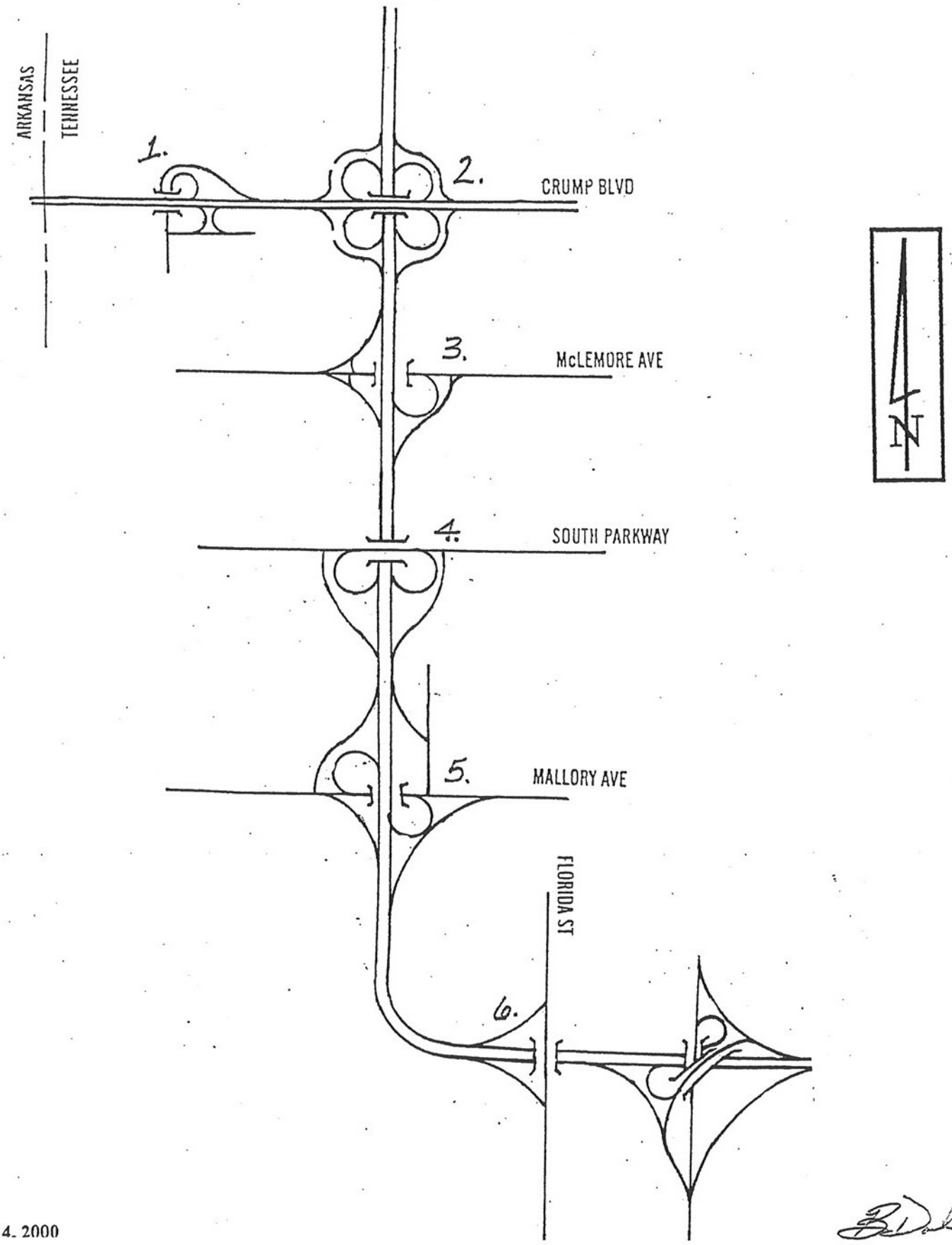
During this study, four alternatives to improvement were developed (Alternate A, B, C and D). All of the alternatives contain both positive and negative aspects in regards to both access and operation. Because all of these various alternatives outlined in this study do not have significantly different traffic-related impacts on the federal interstate system, the identification of a preferred alternative should include consideration of land use priorities established by the City of Memphis as well as the appropriate level of public involvement during the environmental process.

For each of the four alternatives developed, traffic operations will be improved with most movements operating at a desirable level of service. As stated previously in this report, in order for all the movements to operate at an acceptable LOS in the design year, the mainline of I-55 would require one additional mainline travel lane in each direction. This widening would require the existing bridge over the Mississippi River to be widened, which falls outside the scope of this improvement project.

APPENDIX A

TRAFFIC VOLUMES: 2005 AND 2025 DHV'S

SHELBY COUNTY / MEMPHIS
I-55 INTERCHANGE PROJECT



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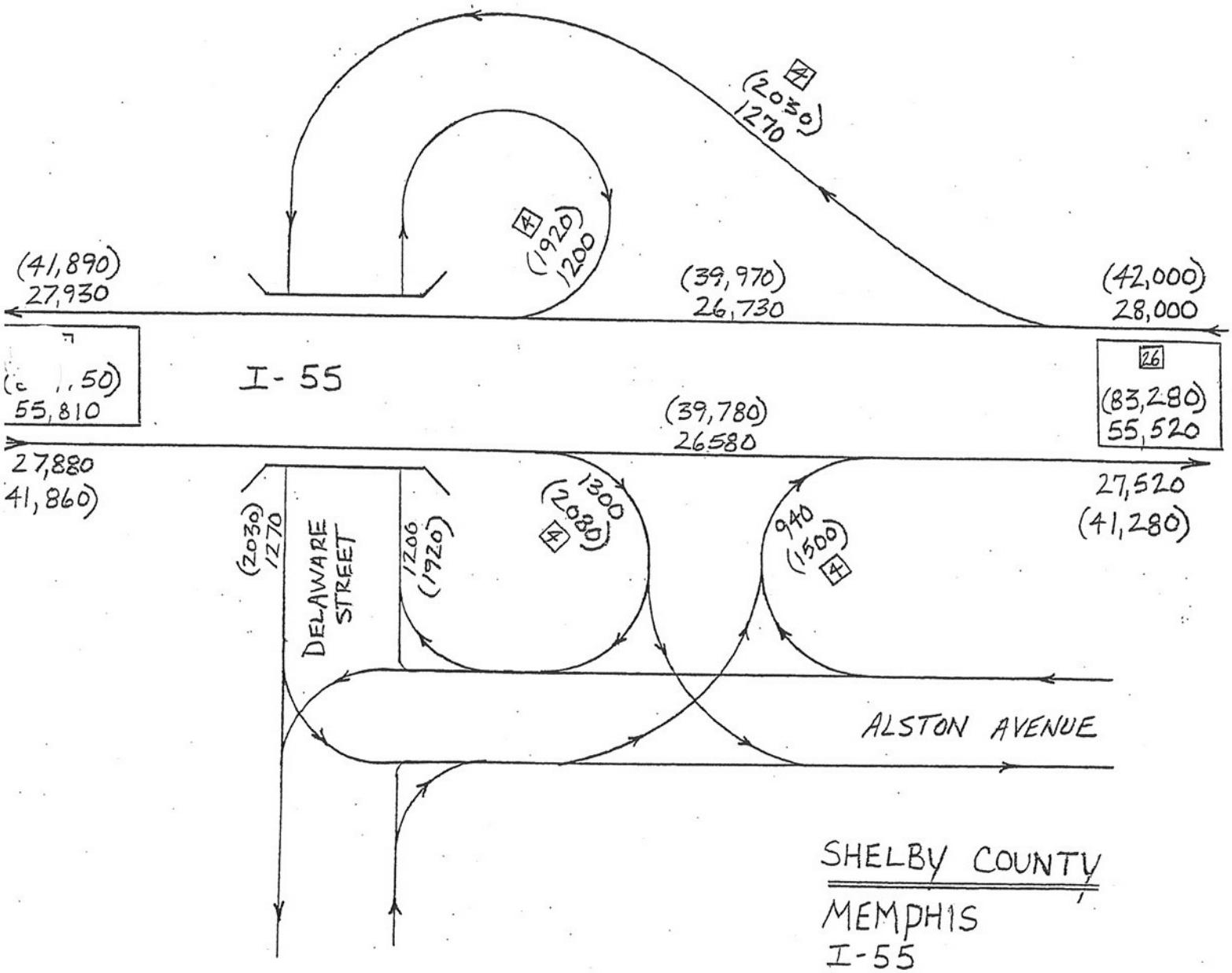


SHELBY COUNTY

MEMPHIS

I-55

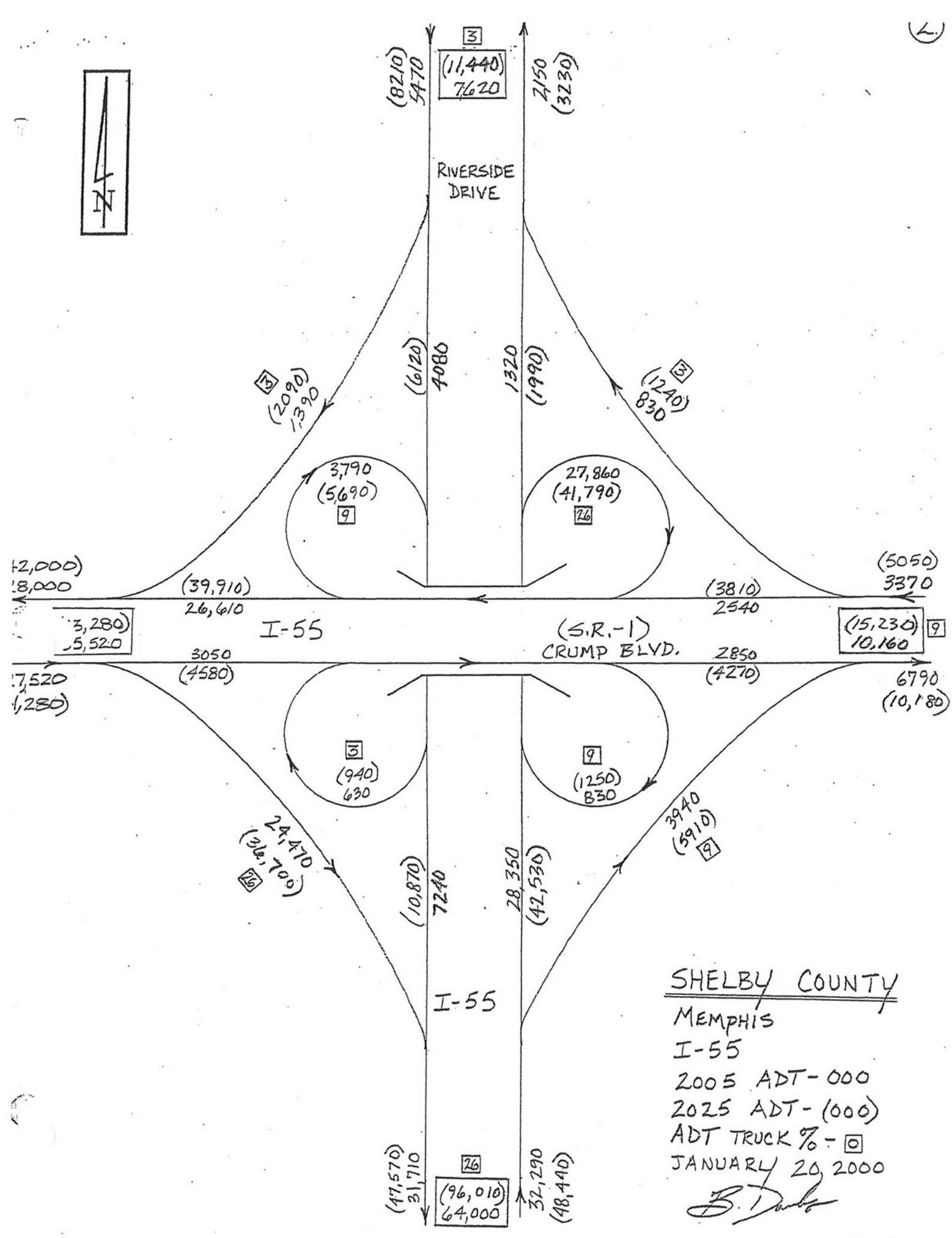
2005 ADT-000

2025 ADT-(000)

ADT TRUCK % - 0

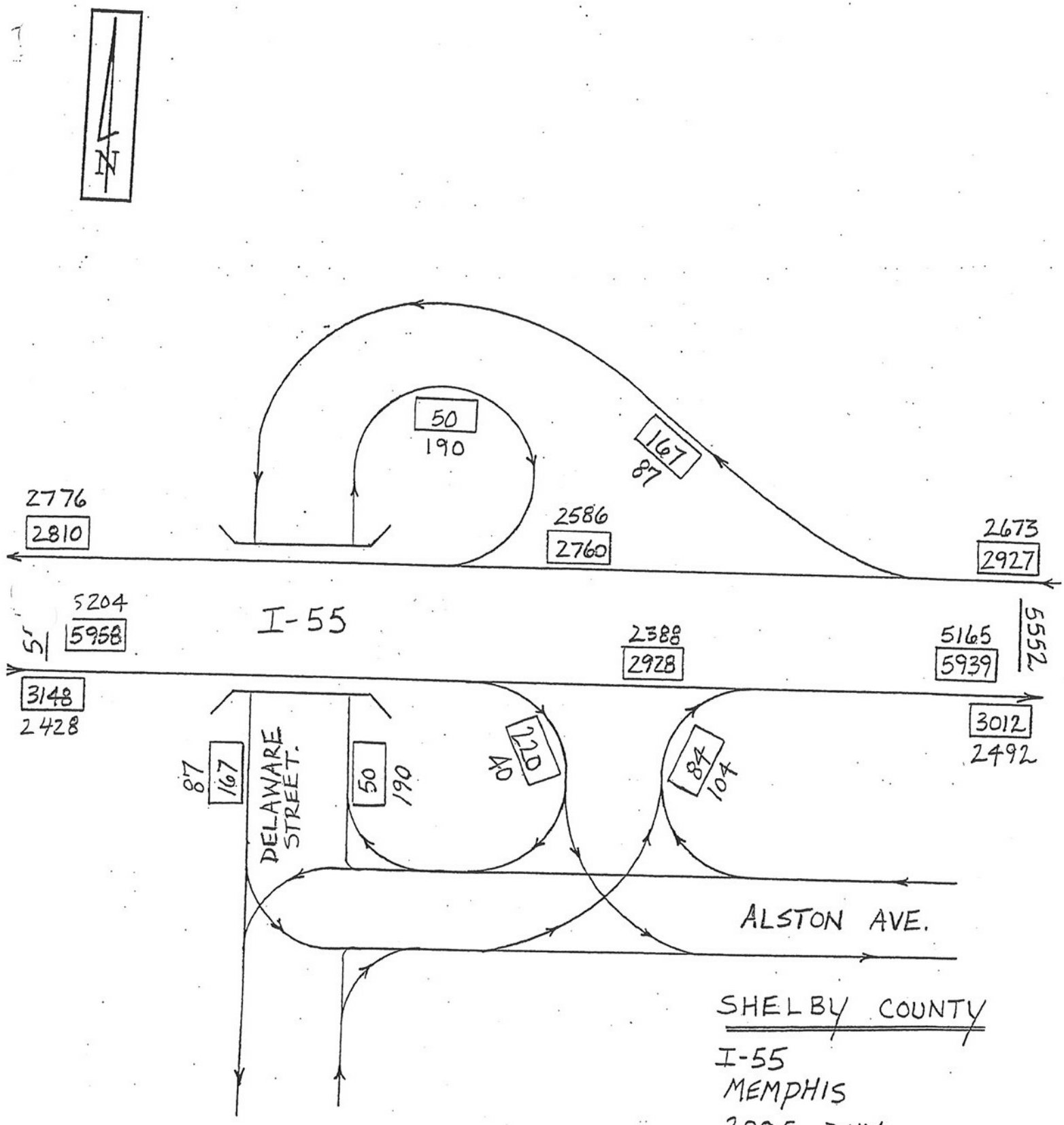
MARCH 13, 2000

B. Dark



SHELBY COUNTY
MEMPHIS
I-55
2005 ADT - 000
2025 ADT - (000)
ADT TRUCK % - 0
JANUARY 20, 2000

B. Davis



SHELBY COUNTY

I-55

MEMPHIS

2005 DHV

PM

AM

MARCH 13, 2000

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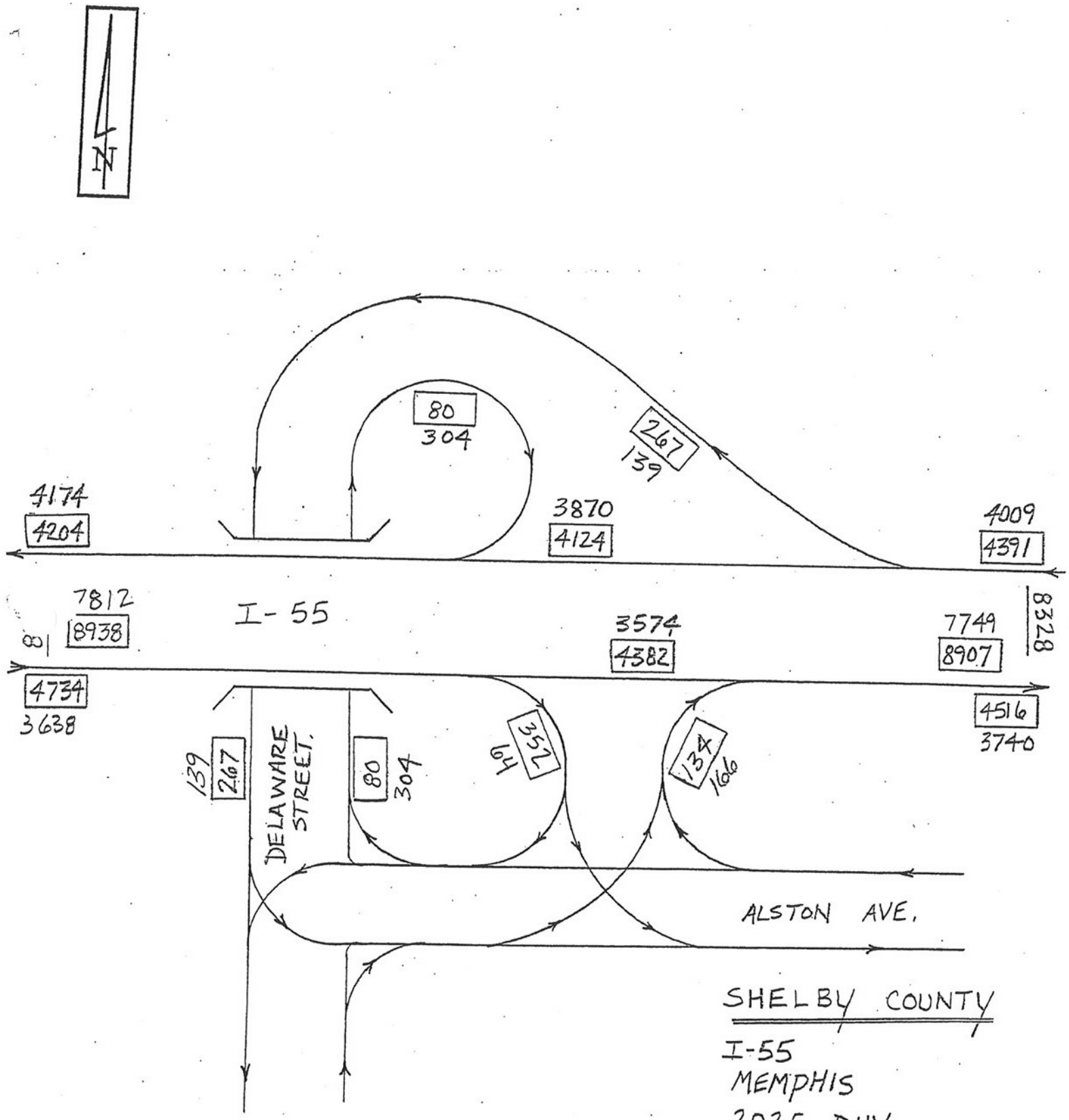
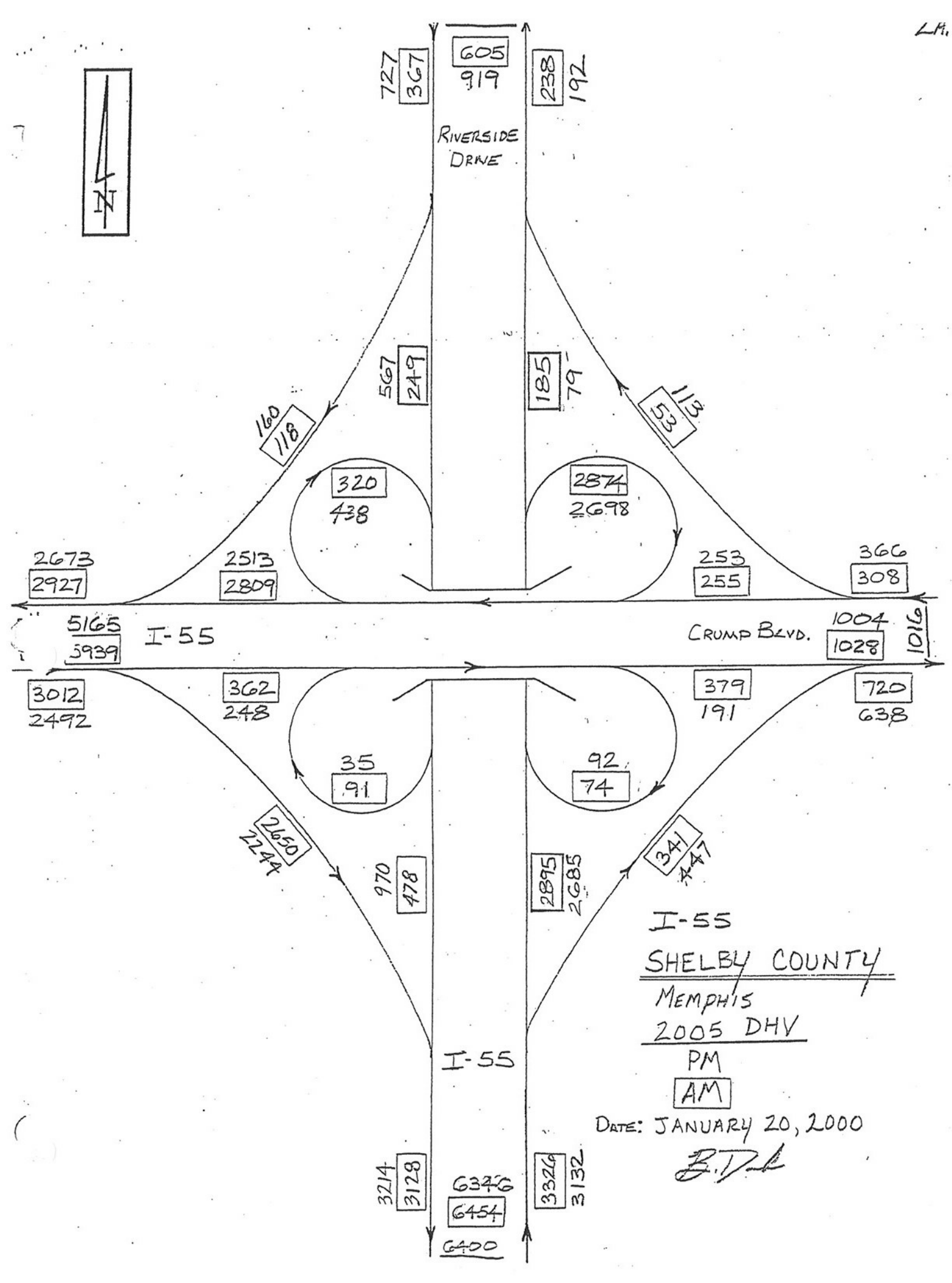


SHELBY COUNTY

I-55
MEMPHIS
2025 DHV
PM
AM
MARCH 13, 2000

B. Dark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3012
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I-55
SHELBY COUNTY
MEMPHIS
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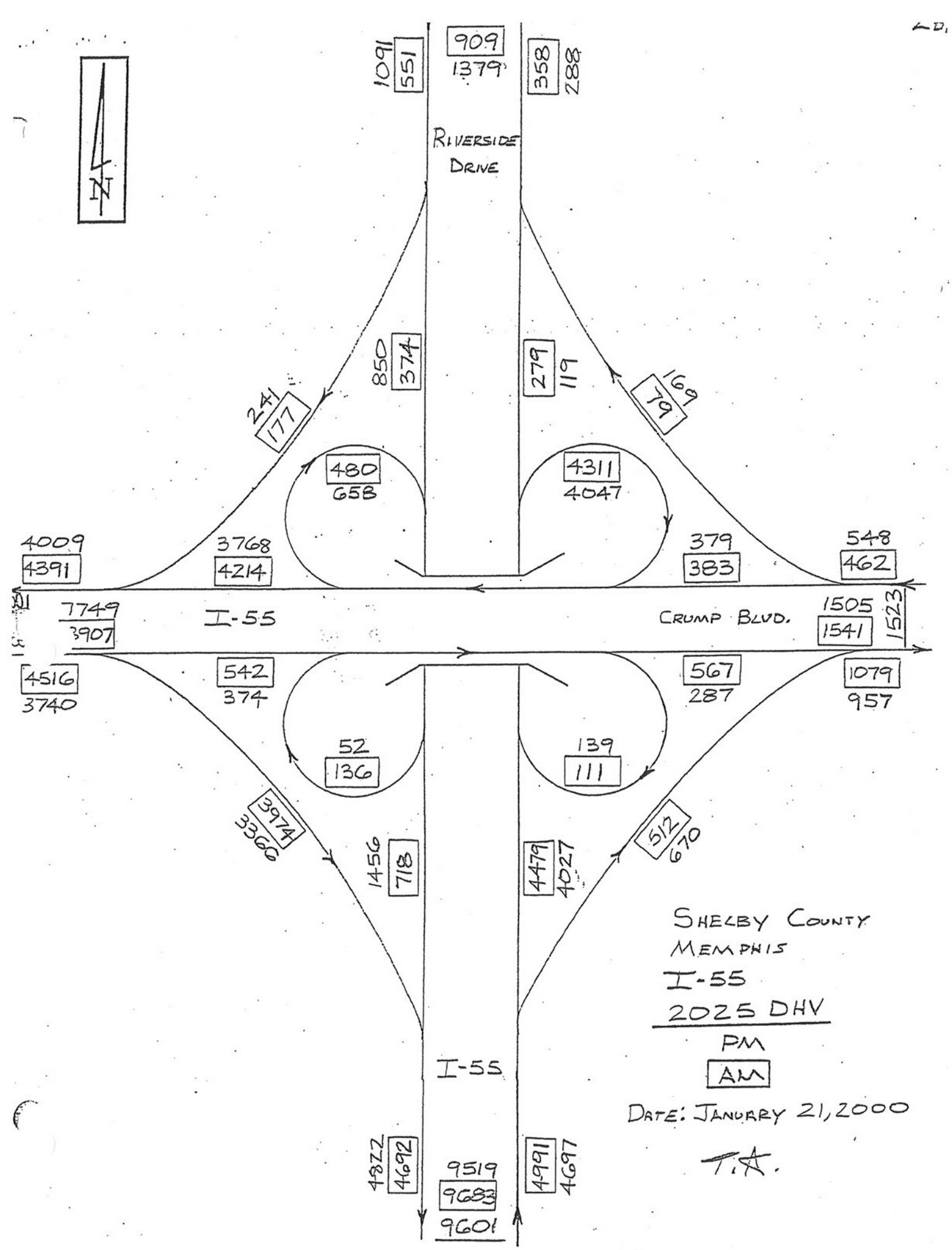
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CRUMP BLVD.
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SHELBY COUNTY
MEMPHIS
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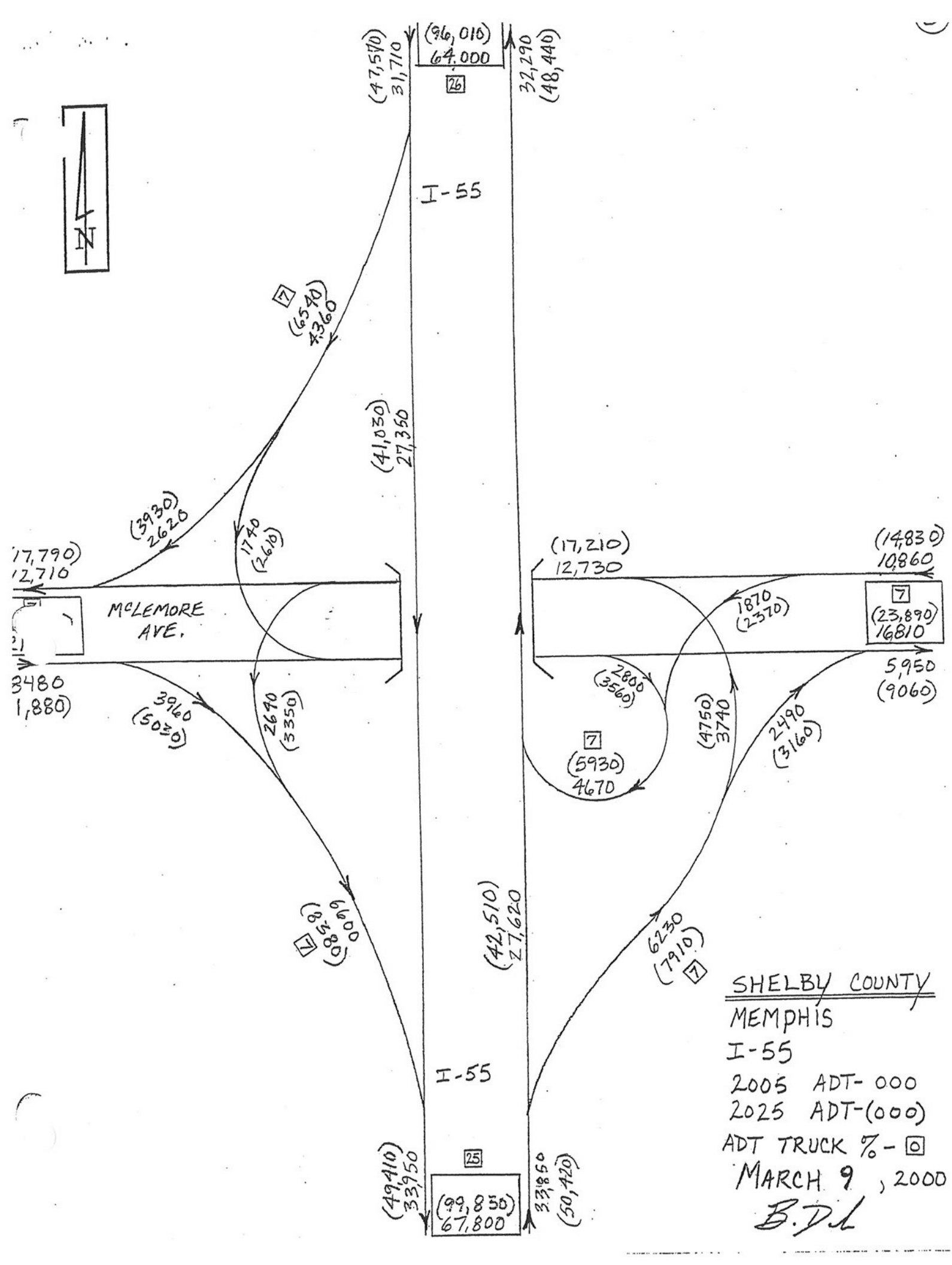
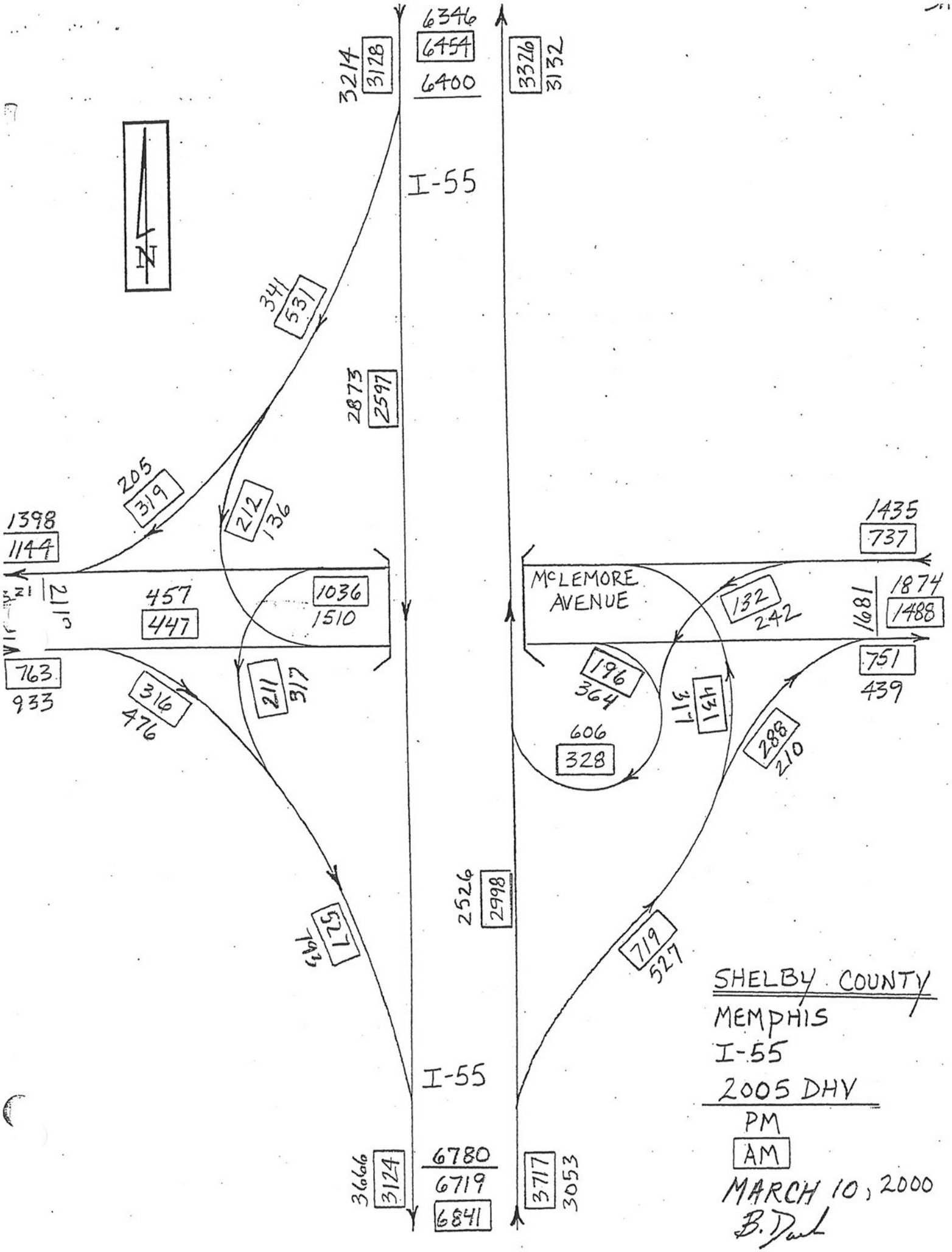
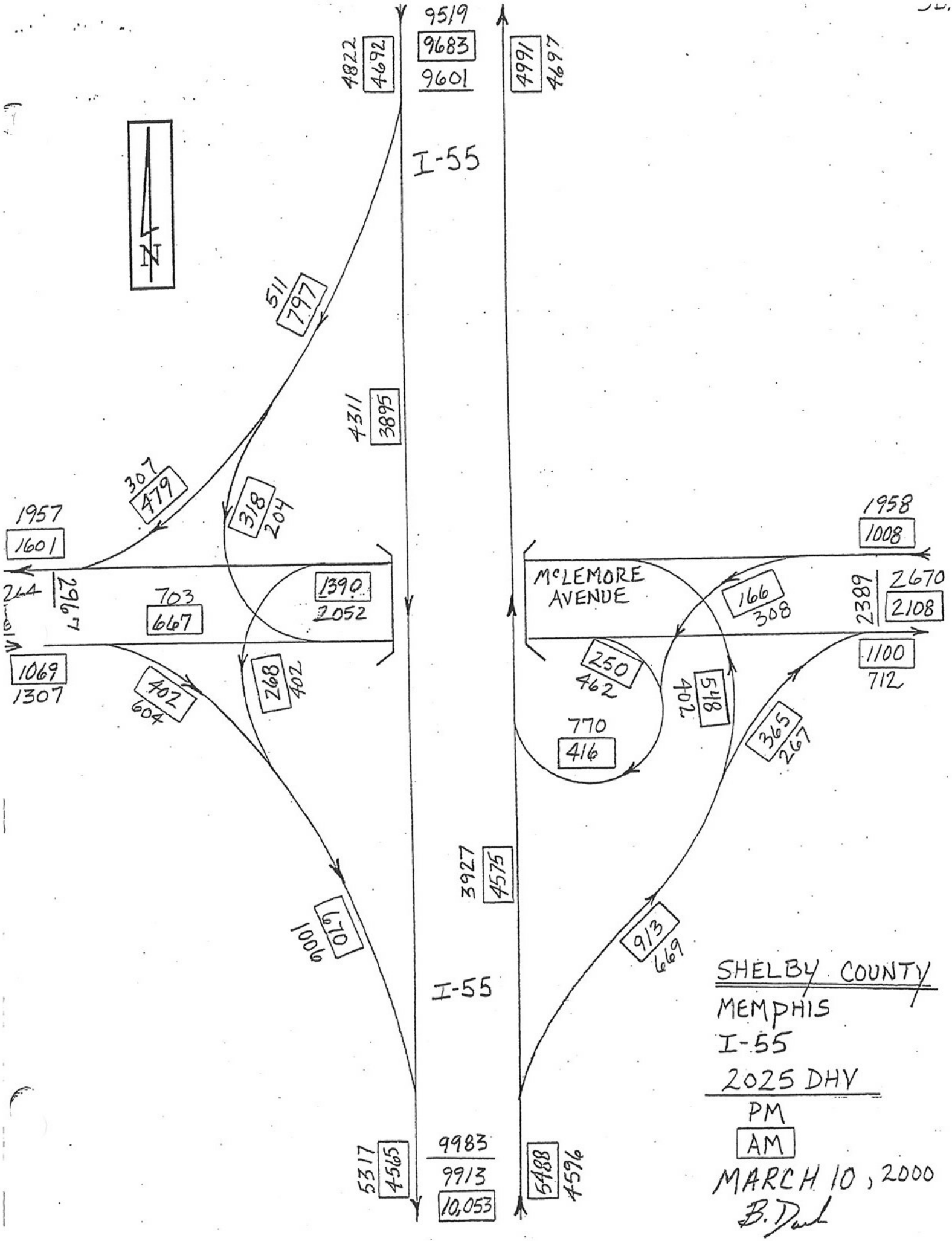


SHELBY COUNTY
MEMPHIS
I-55
2005 ADT- 000
2025 ADT-(000)
ADT TRUCK % - [0]
MARCH 9, 2000
B.D.L



SHELBY COUNTY
MEMPHIS
I-55
2005 DHV
PM
AM
MARCH 10, 2000
B. Park



SHELBY COUNTY

MEMPHIS

I-55

2025 DHV

PM

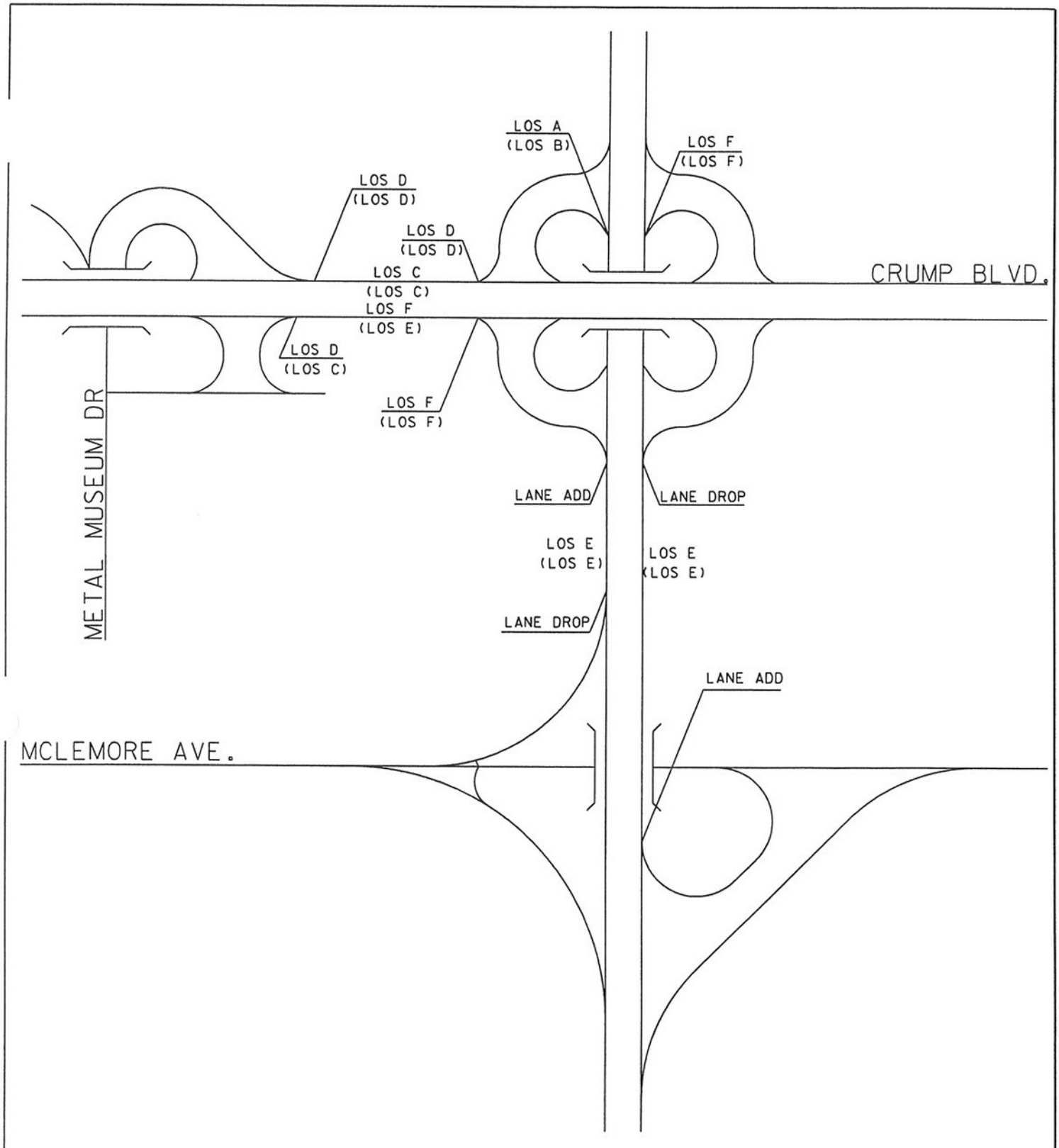
AM

MARCH 10, 2000

B. Dail

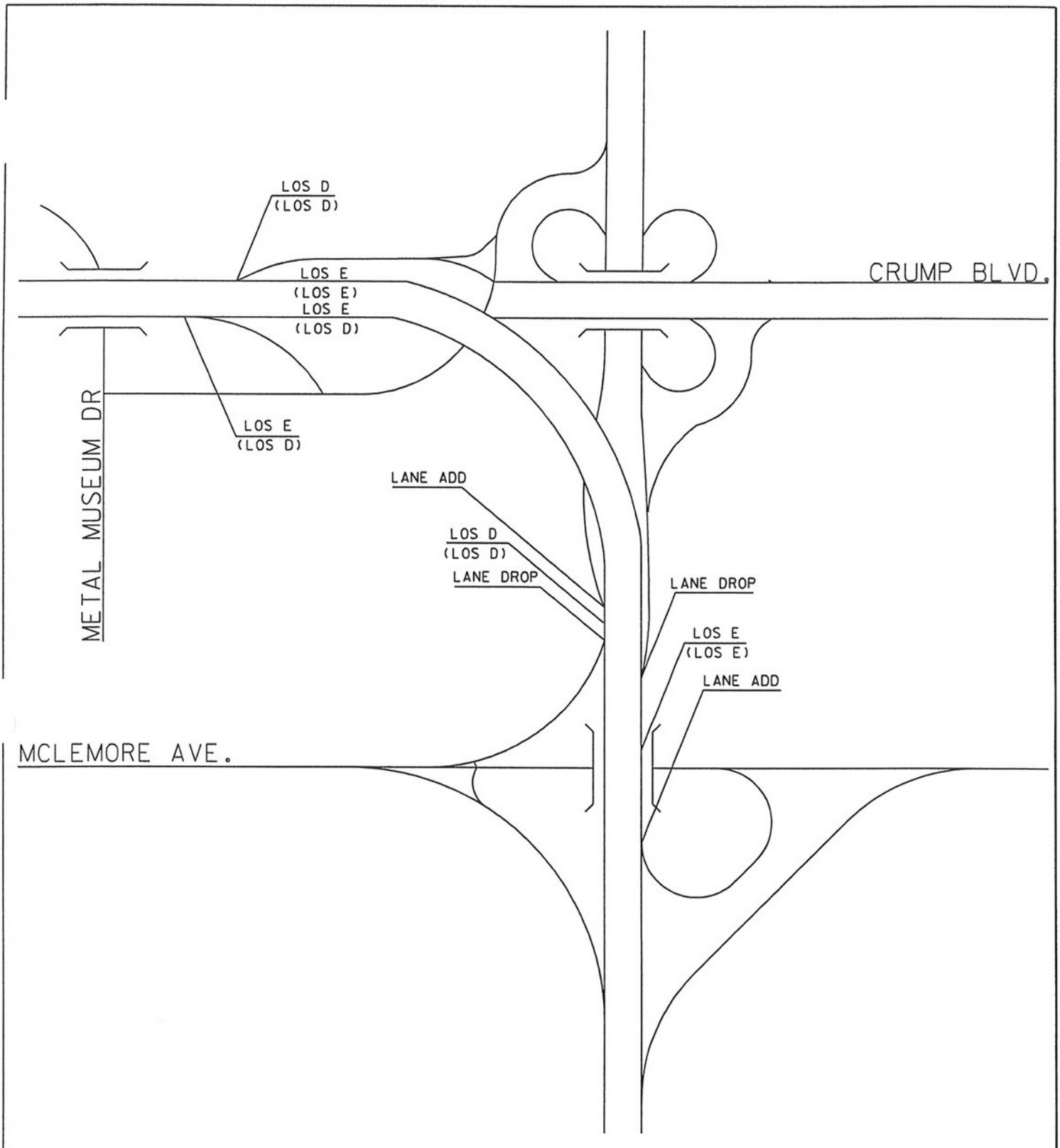
APPENDIX B

LEVEL OF SERVICE: EXISTING AND PROPOSED



I-55 & U.S. 64 (CRUMP BLVD.)
INTERCHANGE MODIFICATION STUDY
MEMPHIS, SHELBY COUNTY, TENNESSEE
EXISTING CONDITIONS
AM (PM)

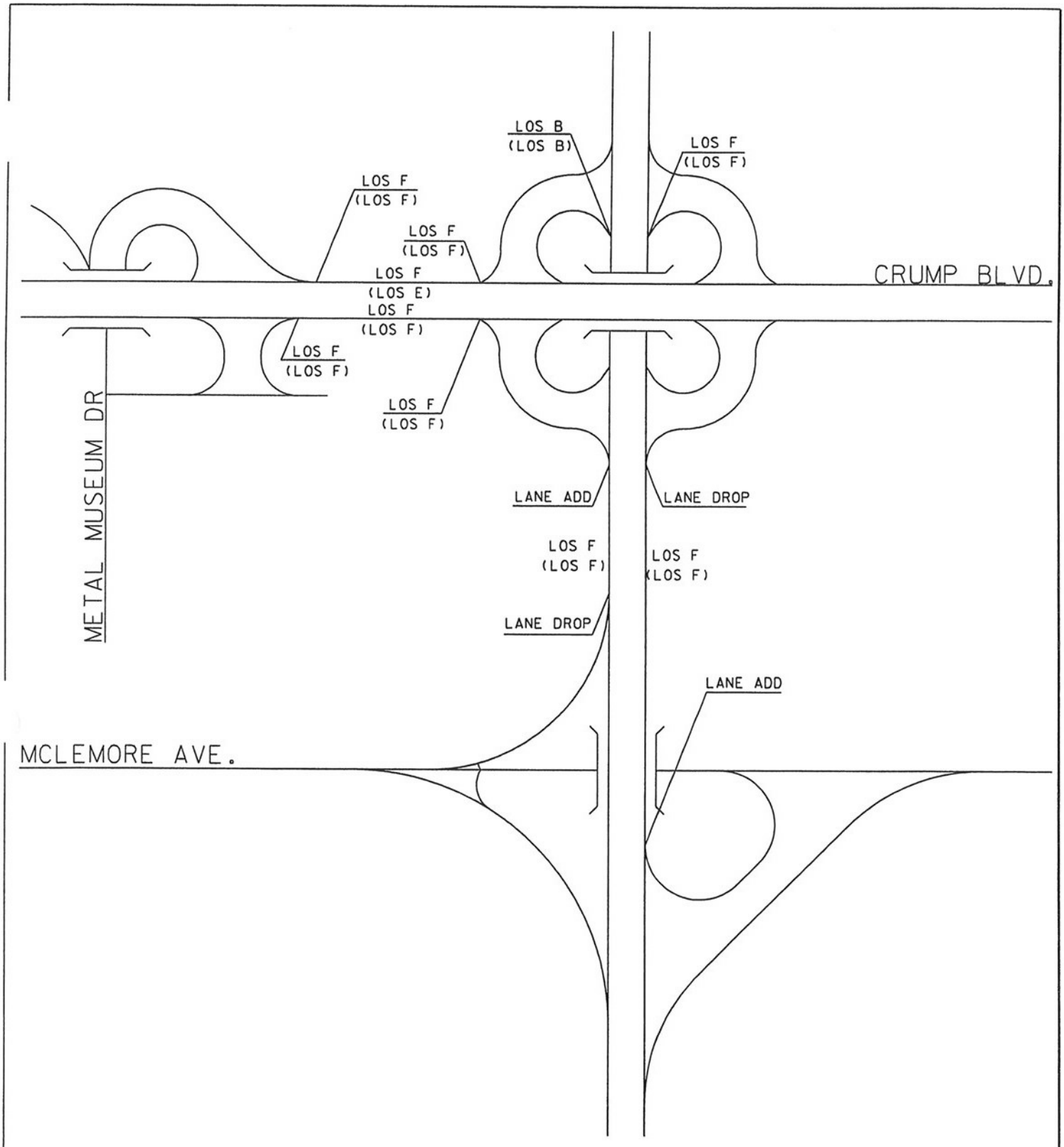
YEAR 2005



I-55 & U.S. 64 (CRUMP BLVD.)
INTERCHANGE MODIFICATION STUDY
MEMPHIS, SHELBY COUNTY, TENNESSEE
PROPOSED CONDITIONS

AM (PM)

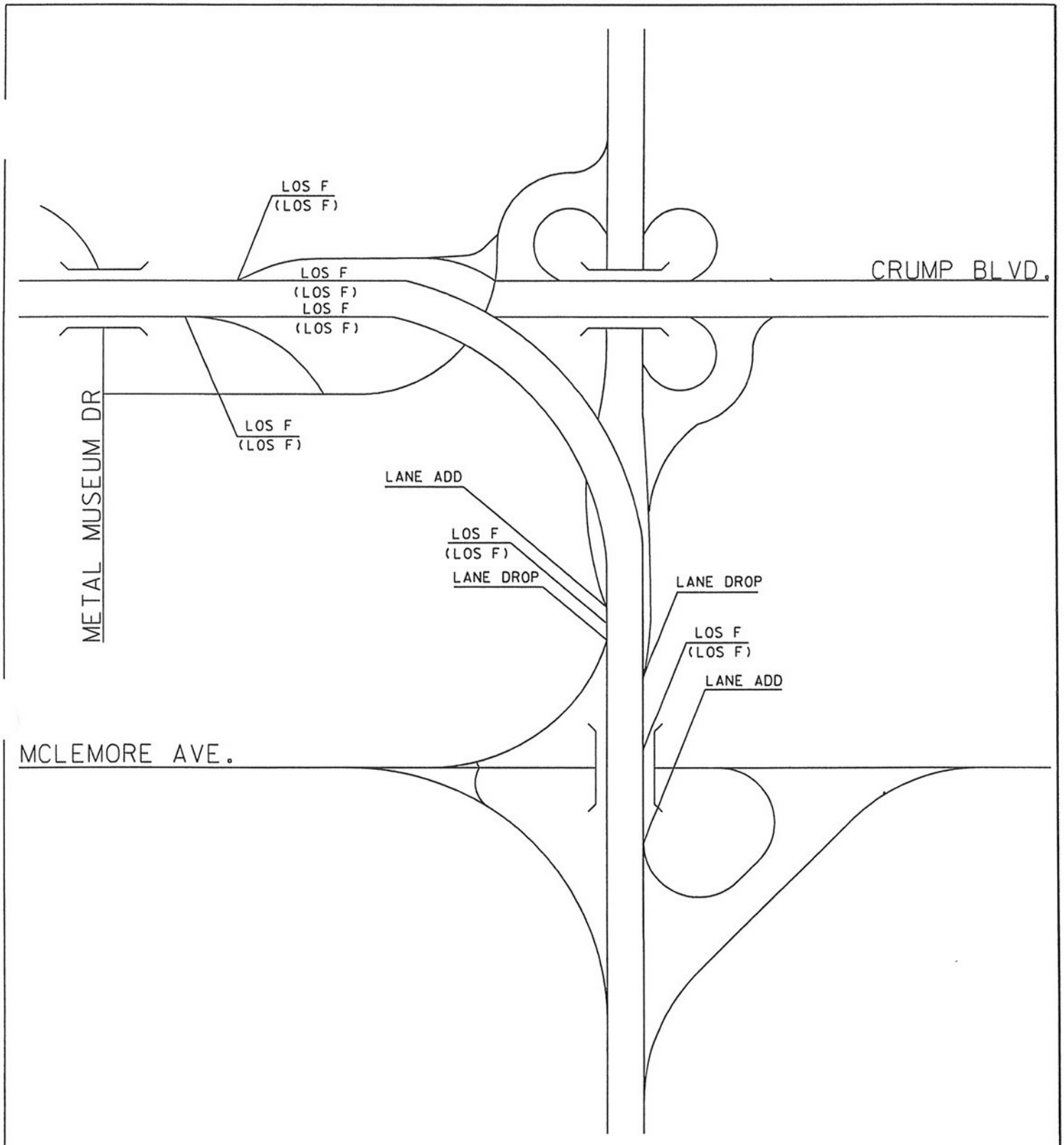
YEAR 2005



I-55 & U.S. 64 (CRUMP BLVD.)
INTERCHANGE MODIFICATION STUDY
MEMPHIS, SHELBY COUNTY, TENNESSEE
EXISTING CONDITIONS

AM (PM)

YEAR 2025



I-55 & U.S. 64 (CRUMP BLVD.)
INTERCHANGE MODIFICATION STUDY
MEMPHIS, SHELBY COUNTY, TENNESSEE
PROPOSED CONDITIONS
AM (PM)

YEAR 2025

APPENDIX C

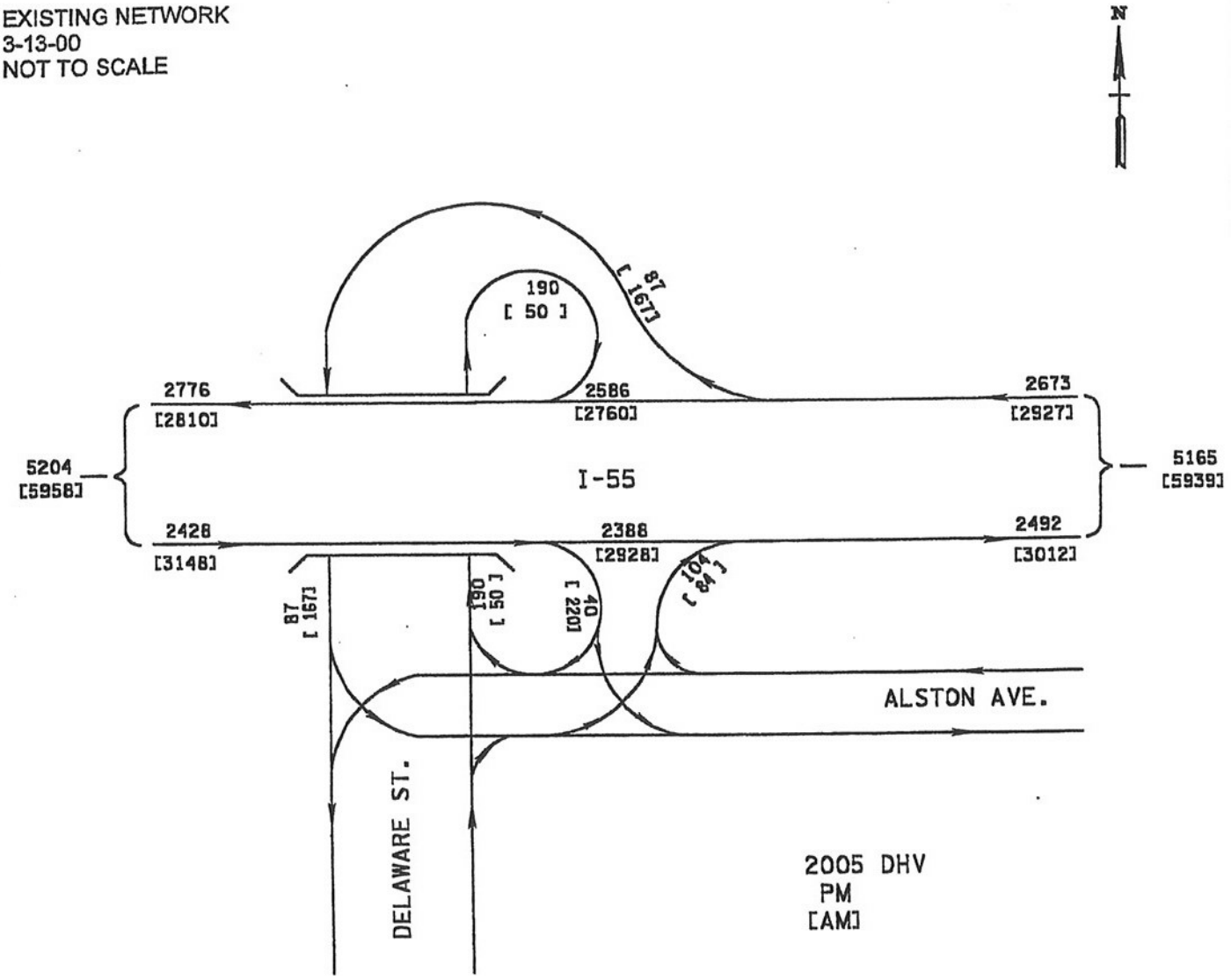
CAPACITY ANALYSIS: EXISTING CONDITIONS

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

EXISTING NETWORK
3-13-00
NOT TO SCALE



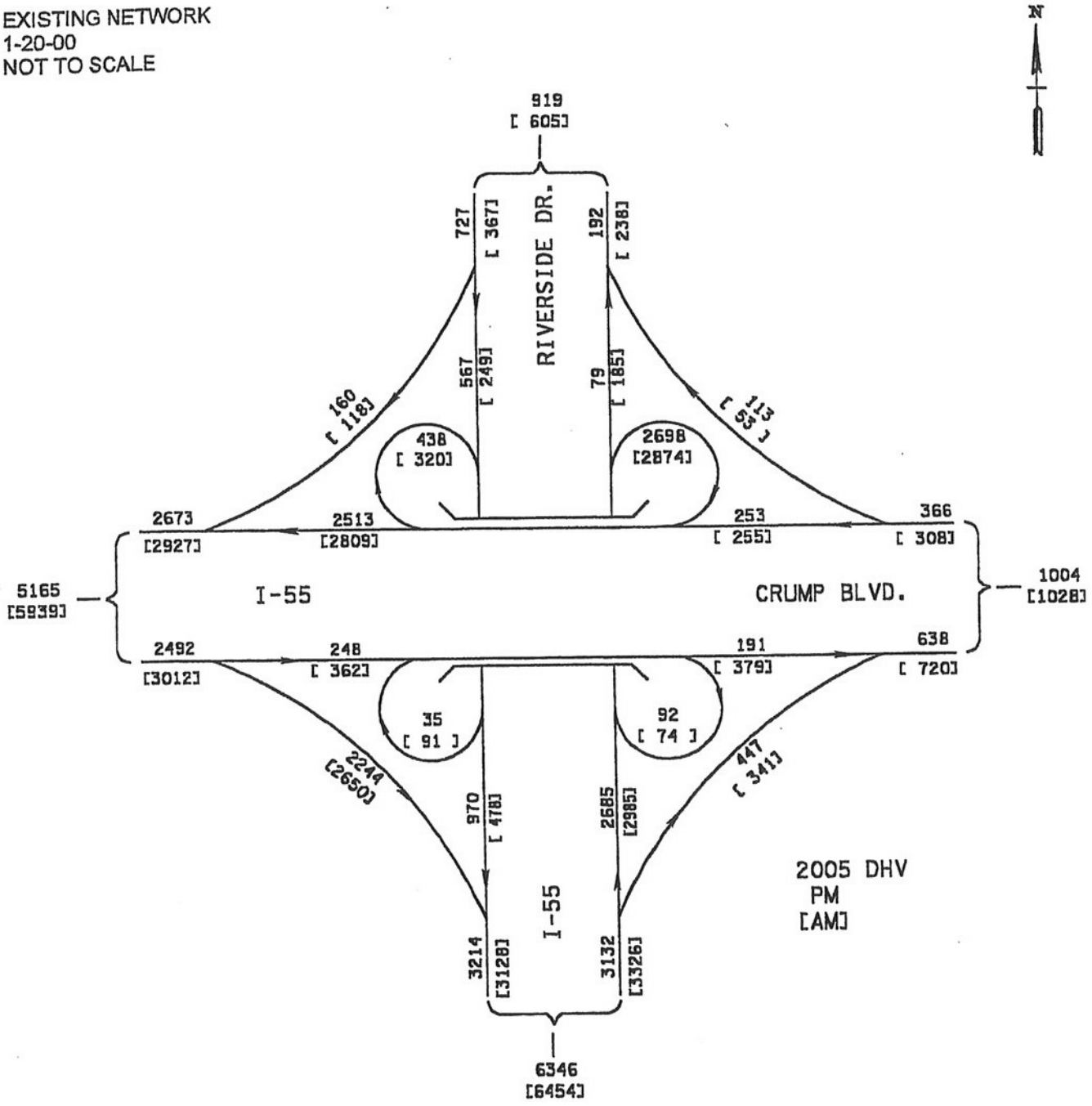
Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

EXISTING NETWORK
1-20-00
NOT TO SCALE



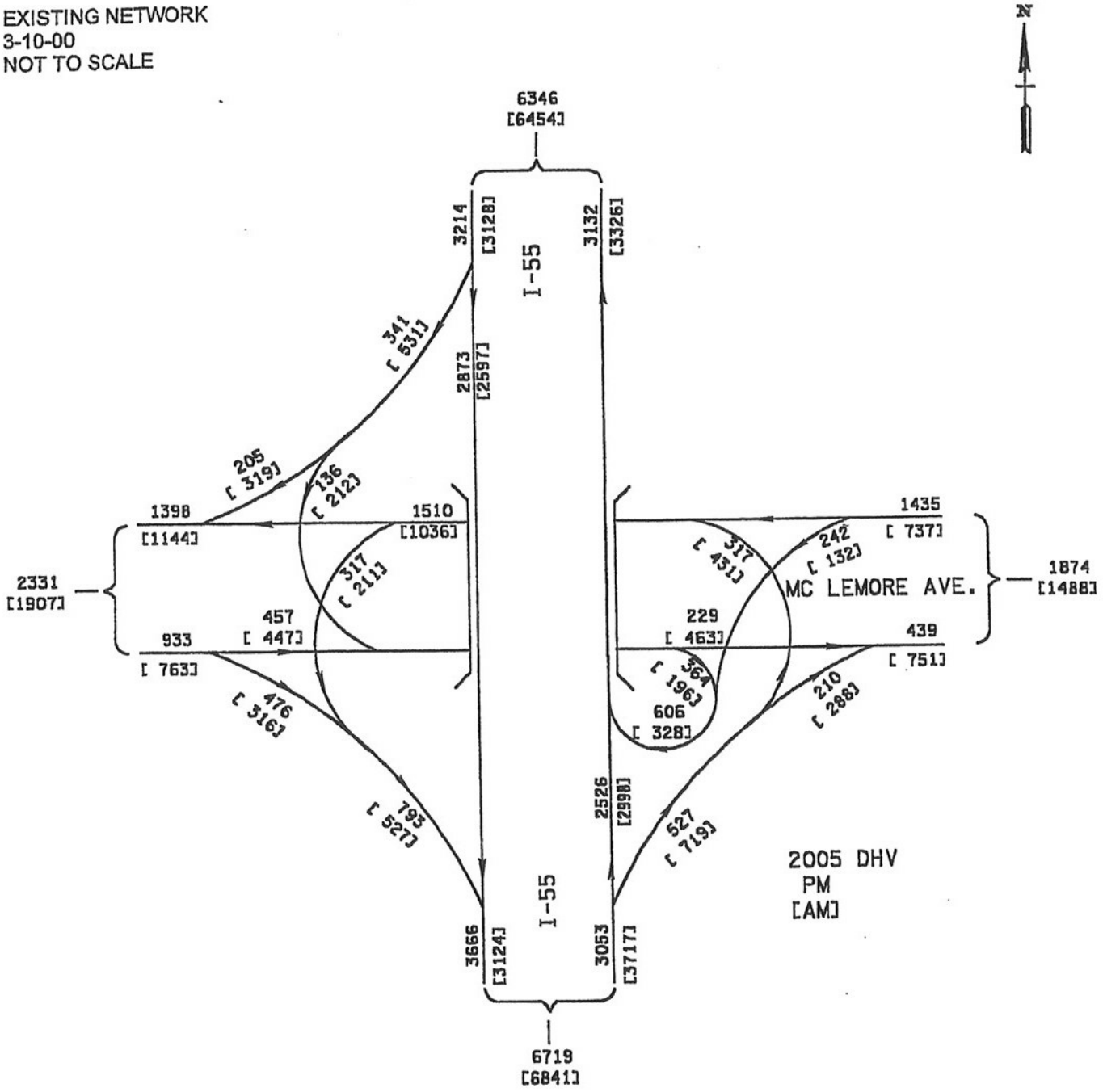
Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

EXISTING NETWORK
3-10-00
NOT TO SCALE



Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

RAMP JUNCTIONS

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3148	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	220	vph
Length of First Accel/Decel Lane	210	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	84	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3148	220	84	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	874	61	23	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3935	249	95	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3935 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3935	4500	No
v_{12}	3935	4400	No
$v_{FO} = v_F - v_R$	3686	4500	No
v_R	249	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 36+

Level of Service for Ramp-Freeway Junction Areas of Influence E

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2428	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	40	vph
Length of First Accel/Decel Lane	210	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	104	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	2428	40	104	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	674	11	29	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3035	45	118	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3035 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3035	4500	No
v_{12}	3035	4400	No
$v_{FO} = v_F - v_R$	2990	4500	No
v_R	45	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 28+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 @ on-ramp from Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2928	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	84	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	220	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2928	84	220	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	813	23	61	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3660	95	249	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3660 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3755	4500	No
v_{R12}	3755	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 32-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.1 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 @ on-ramp from Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2388	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	104	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	40	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2388	104	40	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	663	29	11	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	2985	118	45	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 2985 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3103	4500	No
v_{R12}	3103	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 26+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence C

Speed in Ramp Influence Area, S_R 50.2 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB I-55 @ off-ramp to Delaware Street
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2927	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	167	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	50	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	2927	167	50	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	813	46	14	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3659	189	57	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3659 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3659	4500	No
v_{12}	3659	4400	No
$v_{FO} = v_F - v_R$	3470	4500	No
v_R	189	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 31+

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB I-55 @ off-ramp to Delaware Street
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2673	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	87	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	190	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	2673	87	190	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	743	24	53	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3341	99	215	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3341 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3341	4500	No
v_{12}	3341	4400	No
$v_{FO} = v_F - v_R$	3242	4500	No
v_R	99	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 28+

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Delaware Street
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2760	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	50	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	167	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2760	50	167	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	767	14	46	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3450	57	189	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3450 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3507	4500	No
v_{R12}	3507	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 31-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.4 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Delaware Street
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2586	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	190	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	87	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2586	190	87	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	718	53	24	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3233	215	99	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3233 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3448	4500	No
v_{R12}	3448	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.5 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3012	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	2650	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	91	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3012	2650	91	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	837	736	25	v
Trucks and Buses	25	25	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3765	3313	103	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3765 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3765	4500	No
v_{12}	3765	4400	No
$v_{FO} = v_F - v_R$	452	4500	No
v_R	3313	2000	Yes

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32+

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 46 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2492	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	2244	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	35	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	2492	2244	35	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	692	623	10	v
Trucks and Buses	25	25	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3115	2805	39	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3115 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3115	4500	No
v_{12}	3115	4400	No
$v_{FO} = v_F - v_R$	310	4500	No
v_R	2805	2000	Yes

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 27- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 46 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from SB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	362	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	91	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2650	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	362	91	2650	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	101	25	736	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	408	103	3313	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 408 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	511	4500	No
v_{R12}	511	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 7+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from SB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	248	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	35	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2244	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	248	35	2244	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	69	10	623	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	280	39	2805	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 280 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	319	4500	No
v_{R12}	319	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 6- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.1 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to NB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	AM Peak
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	453	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	74	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	91	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	330	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	453	74	91	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	126	21	25	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	511	86	103	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 511 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	511	4500	No
v_{12}	511	4400	No
$v_{FO} = v_F - v_R$	425	4500	No
v_R	86	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 6- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to NB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	PM Peak
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	283	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	92	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	35	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	330	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	283	92	35	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	79	26	10	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	319	107	39	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 319 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	319	4500	No
v_{12}	319	4400	No
$v_{FO} = v_F - v_R$	212	4500	No
v_R	107	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 4+

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	379	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	341	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	74	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	310	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	379	341	74	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	105	95	21	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	440	396	86	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 440 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	836	4500	No
v_{R12}	836	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 9- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.2 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	191	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	447	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	92	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	310	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	191	447	92	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	53	124	26	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	222	519	107	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 222 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	741	4500	No
v_{R12}	741	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 8-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.2 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside @ on-ramp from EB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2985	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	74	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2874	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2985	74	2874	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	829	21	798	v
Trucks and Buses	25	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3731	86	3593	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3731 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3817	4500	No
v_{R12}	3817	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 33+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 48.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside @ on-ramp from EB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2685	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	92	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2698	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2685	92	2698	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	746	26	749	v
Trucks and Buses	25	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3356	107	3373	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3356 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3463	4500	No
v_{R12}	3463	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 31-pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.5 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ off-ramp to WB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2985	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	2874	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	74	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	2985	2874	74	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	829	798	21	v
Trucks and Buses	25	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3731	3593	86	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3731 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3731	4500	No
v_{12}	3731	4400	No
$v_{FO} = v_F - v_R$	138	4500	No
v_R	3593	2000	Yes

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 34- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 45 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ off-ramp to WB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2685	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	2698	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	92	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	2685	2698	92	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	746	749	26	v
Trucks and Buses	25	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3356	3373	107	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3356 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3356	4500	No
v_{12}	3356	4400	No
$v_{FO} = v_F - v_R$		4500	Yes
v_R	3373	2000	Yes

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 31- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence

Speed in Ramp Influence Area, S_R 45 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	185	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	53	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2874	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	185	53	2874	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	51	15	798	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	209	60	3593	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 209 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	269	4500	No
v_{R12}	269	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 7- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.9 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	79	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	113	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2698	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	79	113	2698	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	22	31	749	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	89	127	3373	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 89 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	216	4500	No
v_{R12}	216	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_{12}$ = 6+ pc/mi/ln
Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.9 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	367	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	118	vph
Length of First Accel/Decel Lane	125	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	320	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	367	118	320	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	102	33	89	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	414	133	372	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 414 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	414	4500	No
v_{12}	414	4400	No
$v_{FO} = v_F - v_R$	281	4500	No
v_R	133	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 7- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	727	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	160	vph
Length of First Accel/Decel Lane	125	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	438	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	727	160	438	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	202	44	122	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	820	180	509	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 820 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	820	4500	No
v_{12}	820	4400	No
$v_{FO} = v_F - v_R$	640	4500	No
v_R	180	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 10+

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Dr. @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	249	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	320	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	91	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	340	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	249	320	91	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	69	89	25	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	281	372	103	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 281 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	653	4500	No
v_{R12}	653	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 8+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Dr. @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	567	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	438	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	35	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	340	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	567	438	35	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	158	122	10	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	639	509	39	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 639 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	1148	4500	No
v_{R12}	1148	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 12+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	569	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	91	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2650	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	540	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	569	91	2650	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	158	25	736	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	661	103	3313	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 661 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	661	4500	No
v_{12}	661	4400	No
$v_{FO} = v_F - v_R$	558	4500	No
v_R	103	2000	No

Level of Service Operation (if not LOS F):
Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 7- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	1005	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	35	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2244	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	540	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	1005	35	2244	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	279	10	623	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	1167	39	2805	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1167 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1167	4500	No
v_{12}	1167	4400	No
$v_{FO} = v_F - v_R$	1128	4500	No
v_R	39	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 11+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to NB Riverside
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	308	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	53	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2874	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	295	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	308	53	2874	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	86	15	798	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	358	60	3593	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.748 Using Equation 7

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 283 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	358	6750	No
v_{12}	283	4400	No
$v_{FO} = v_F - v_R$	298	6750	No
v_R	60	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 2+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to NB Riverside
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	366	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	113	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2698	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	295	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	366	113	2698	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	102	31	749	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	425	127	3373	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.744 Using Equation 7

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 349 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	425	6750	No
v_{12}	349	4400	No
$v_{FO} = v_F - v_R$	298	6750	No
v_R	127	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 3-pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	255	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	2874	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	320	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	255	2874	320	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	71	798	89	v
Trucks and Buses	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	296	3593	372	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 0.588 Using Equation 2
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 174 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3889	6750	No
v_{R12}	3767	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 31- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	253	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	2698	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	438	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	253	2698	438	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	70	749	122	v
Trucks and Buses	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	294	3373	509	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 0.588 Using Equation 2
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 173 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3667	6750	No
v_{R12}	3546	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 29+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.4 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	255	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	320	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2874	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	255	320	2874	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	71	89	798	v
Trucks and Buses	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	296	372	3593	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.735 Using Equation 7
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 316 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	296	6750	No
v_{12}	316	4400	No
$v_{FO} = v_F - v_R$		6750	Yes
v_R	372	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 3+ D

Level of Service for Ramp-Freeway Junction Areas of Influence

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	253	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	438	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	2698	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	253	438	2698	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	70	122	749	v
Trucks and Buses	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	294	509	3373	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.729 Using Equation 7

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 352 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	294	6750	No
v_{12}	352	4400	No
$v_{FO} = v_F - v_R$		6750	Yes
v_R	509	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 4- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from SB Riverside
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2809	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	118	vph
Length of First Accel/Decel Lane	520	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	167	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	520	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2809	118	167	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	780	33	46	v
Trucks and Buses	25	3	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.985	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3511	133	189	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3511 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3644	4500	No
v_{R12}	3644	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 31-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.4 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from SB Riverside
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2513	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	160	vph
Length of First Accel/Decel Lane	520	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	267	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	520	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2513	160	267	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	698	44	74	v
Trucks and Buses	25	3	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.985	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3141	180	303	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3141 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3321	4500	No
v_{R12}	3321	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 28+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.9 mph

WEAVING SECTIONS

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55, btw Alston and Riverside
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	341	63	2587	21	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	95	18	719	6	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	426	71	3233	23	pcph

ANALYSIS

Type of Weaving Section	A	
	Non-Weaving	Weaving
Intensity Factor, W	2.93	4.73
Speeds, S	26.44	22.85
Type of Operation is	Constrained	
Number of Lanes Required	2.18	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	3256	2000	a
Section Capacity (pcphpl)	1251	2150	b
Volume Ratio, VR	0.87	0.45	c
Weaving Ratio, R	0.01	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	23.27	mph
Density, D	53.76	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55, btw Alston and Riverside
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	222	78	2166	26	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	62	22	602	7	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	277	88	2707	29	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	2.56	3.98
Speeds, S	27.64	24.04
Type of Operation is	Constrained	
Number of Lanes Required	2.15	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	2736	2000	a
Section Capacity (pcphpl)	1033	2150	b
Volume Ratio, VR	0.88	0.45	c
Weaving Ratio, R	0.01	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	24.42	mph
Density, D	42.34	pc/mi/ln
Level of Service, LOS	E	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55 btw Alston and Riverside
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2671	29	138	89	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	742	8	38	25	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3338	32	172	100	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.50	1.10
Speeds, S	45.08	36.44
Type of Operation is	Unconstrained	
Number of Lanes Required	0.45	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	272	2000	a
Section Capacity (pcphpl)	1214	2150	b
Volume Ratio, VR	0.07	0.45	c
Weaving Ratio, R	0.37	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	44.30	mph
Density, D	27.40	pc/mi/ln
Level of Service, LOS	C	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55 btw Alston and Riverside
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2466	40	47	120	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	685	11	13	33	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3082	45	58	136	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.41	0.97
Speeds, S	46.83	37.86
Type of Operation is	Unconstrained	
Number of Lanes Required	0.39	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	194	2000	a
Section Capacity (pcphpl)	1107	2150	b
Volume Ratio, VR	0.06	0.45	c
Weaving Ratio, R	0.30	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	46.19	mph
Density, D	23.97	pc/mi/ln
Level of Service, LOS	C	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	330	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	288	0	74	91	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	80	0	21	25	v
Trucks and Buses	9	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.99	0.96	0.99	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	334	0	85	102	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.17	0.42
Speeds, S	53.51	46.76
Type of Operation is	Unconstrained	
Number of Lanes Required	0.88	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	187	2000	a
Section Capacity (pcphpl)	173	2150	b
Volume Ratio, VR	0.36	0.45	c
Weaving Ratio, R	0.45	0.50	d
Weaving Length (ft)	330	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	50.87	mph
Density, D	3.41	pc/mi/ln
Level of Service, LOS	A	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	330	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	156	0	92	35	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	43	0	26	10	v
Trucks and Buses	9	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.99	0.96	0.99	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	181	0	106	39	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.12	0.30
Speeds, S	55.28	49.65
Type of Operation is	Unconstrained	
Number of Lanes Required	0.97	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	145	2000	a
Section Capacity (pcphpl)	108	2150	b
Volume Ratio, VR	0.44	0.45	c
Weaving Ratio, R	0.27	0.50	d
Weaving Length (ft)	330	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	52.63	mph
Density, D	2.06	pc/mi/ln
Level of Service, LOS	A	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw loops at Crump Boulevard
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	300	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	111	0	2874	74	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	31	0	798	21	v
Trucks and Buses	3	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.96	0.89	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	125	0	3592	85	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	5.26	9.27
Speeds, S	22.19	19.38
Type of Operation is	Constrained	
Number of Lanes Required	2.23	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	3677	2000	a
Section Capacity (pcphpl)	1267	2150	b
Volume Ratio, VR	0.97	0.45	c
Weaving Ratio, R	0.02	0.50	d
Weaving Length (ft)	300	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	19.46	mph
Density, D	65.12	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw loops at Crump Boulevard
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	300	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	10	23	2675	69	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	3	6	743	19	v
Trucks and Buses	3	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.96	0.89	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	11	26	3343	80	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	5.06	8.65
Speeds, S	22.43	19.66
Type of Operation is	Constrained	
Number of Lanes Required	2.24	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	3423	2000	a
Section Capacity (pcphpl)	1153	2150	b
Volume Ratio, VR	0.99	0.45	c
Weaving Ratio, R	0.02	0.50	d
Weaving Length (ft)	300	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	19.69	mph
Density, D	58.57	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB Riverside Drive btw loops at Crump Boulevard
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	350	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	158	0	91	320	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	44	0	25	89	v
Trucks and Buses	3	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.99	0.99	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	178	0	102	371	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.60	1.04
Speeds, S	43.09	37.09
Type of Operation is	Constrained	
Number of Lanes Required	1.41	
Maximum Number of Lanes	1.40	

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	473	2000	a
Section Capacity (pcphpl)	217	2150	b
Volume Ratio, VR	0.73	0.45	c
Weaving Ratio, R	0.22	0.50	d
Weaving Length (ft)	350	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	38.56	mph
Density, D	5.63	pc/mi/ln
Level of Service, LOS	A	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB Riverside Drive btw loops at Crump Boulevard
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	350	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	532	0	35	438	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	148	0	10	122	v
Trucks and Buses	3	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.99	0.99	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	599	0	39	508	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.62	1.05
Speeds, S	42.80	37.00
Type of Operation is	Unconstrained	
Number of Lanes Required	1.15	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	547	2000	a
Section Capacity (pcphpl)	382	2150	b
Volume Ratio, VR	0.48	0.45	c
Weaving Ratio, R	0.07	0.50	d
Weaving Length (ft)	350	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	39.82	mph
Density, D	9.59	pc/mi/ln
Level of Service, LOS	A	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	390	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	79	144	176	2730	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	22	40	49	758	v
Trucks and Buses	9	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.96	0.96	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	91	167	204	3412	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	4.26	7.18
Speeds, S	23.56	20.50
Type of Operation is	Constrained	
Number of Lanes Required	2.13	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	3616	2000	a
Section Capacity (pcphpl)	1291	2150	b
Volume Ratio, VR	0.93	0.45	c
Weaving Ratio, R	0.06	0.50	d
Weaving Length (ft)	390	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	20.68	mph
Density, D	62.44	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	390	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	85	270	168	2428	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	24	75	47	674	v
Trucks and Buses	9	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.96	0.96	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	98	313	195	3035	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	3.66	6.40
Speeds, S	24.65	21.08
Type of Operation is	Constrained	
Number of Lanes Required	2.04	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	3230	2000	a
Section Capacity (pcphpl)	1213	2150	b
Volume Ratio, VR	0.89	0.45	c
Weaving Ratio, R	0.06	0.50	d
Weaving Length (ft)	390	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	21.43	mph
Density, D	56.63	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw McLemore Avenue and Crump Boulevard
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2657	0	341	328	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	738	0	95	91	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3321	0	395	377	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.19	0.39
Speeds, S	52.82	47.27
Type of Operation is	Unconstrained	
Number of Lanes Required	0.99	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	772	2000	a
Section Capacity (pcphpl)	1364	2150	b
Volume Ratio, VR	0.19	0.45	c
Weaving Ratio, R	0.49	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	51.67	mph
Density, D	26.40	pc/mi/ln
Level of Service, LOS	C	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw McLemore Avenue and Crump Boulevard
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2079	0	447	606	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	578	0	124	168	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	2598	0	519	696	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.26	0.46
Speeds, S	50.65	45.79
Type of Operation is	Unconstrained	
Number of Lanes Required	1.36	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	1215	2000	a
Section Capacity (pcphpl)	1271	2150	b
Volume Ratio, VR	0.32	0.45	c
Weaving Ratio, R	0.43	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	48.99	mph
Density, D	25.94	pc/mi/ln
Level of Service, LOS	C	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB I-55 btw Crump Boulevard and McLemore Avenue
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	1800	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	79	132	399	2518	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	22	37	111	699	v
Trucks and Buses	3	7	7	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.97	0.97	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	89	151	458	3147	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	1.71	1.81
Speeds, S	31.64	31.03
Type of Operation is	Constrained	
Number of Lanes Required	2.68	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	3605	2000	a
Section Capacity (pcphpl)	1281	2150	b
Volume Ratio, VR	0.94	0.45	c
Weaving Ratio, R	0.13	0.50	d
Weaving Length (ft)	1800	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	31.06	mph
Density, D	41.26	pc/mi/ln
Level of Service, LOS	E	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB I-55 btw Crump Boulevard and McLemore Avenue
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	1800	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	629	0	341	2244	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	175	0	95	623	v
Trucks and Buses	3	7	7	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.97	0.97	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	709	0	392	2805	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	1.34	1.60
Speeds, S	34.22	32.33
Type of Operation is	Constrained	
Number of Lanes Required	2.44	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	3197	2000	a
Section Capacity (pcphpl)	1302	2150	b
Volume Ratio, VR	0.82	0.45	c
Weaving Ratio, R	0.12	0.50	d
Weaving Length (ft)	1800	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	32.65	mph
Density, D	39.87	pc/mi/ln
Level of Service, LOS	E	

FREEWAY SECTIONS

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	3717	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1033	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1549	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1549	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	28.2	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	3053	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	848	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1272	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1272	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of Service, LOS	C	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	3124	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	868	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1302	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1302	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	23.7	pc/mi/ln
Level of Service, LOS	C	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	3666	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1018	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1528	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1528	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	27.8	pc/mi/ln
Level of Service, LOS	D	

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	3326	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	924	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2079	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2079	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	53.3	mi/h
Number of lanes, N	2	
Density, D	39.0	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	3132	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	870	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	1958	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1958	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	54.5	mi/h
Number of lanes, N	2	
Density, D	35.9	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	3128	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	869	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	1955	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1955	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	54.5	mi/h
Number of lanes, N	2	
Density, D	35.9	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	3214	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	893	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2009	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2009	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	54.1	mi/h
Number of lanes, N	2	
Density, D	37.1	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	3148	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	874	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1968	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1968	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	53.3	mph
Number of Lanes, N	2	
Density, D	36.9	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	2428	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	674	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1518	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1518	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	2	
Density, D	27.6	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	2810	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	781	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1756	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1756	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	54.5	mph
Number of Lanes, N	2	
Density, D	32.2	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	2776	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	771	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1735	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

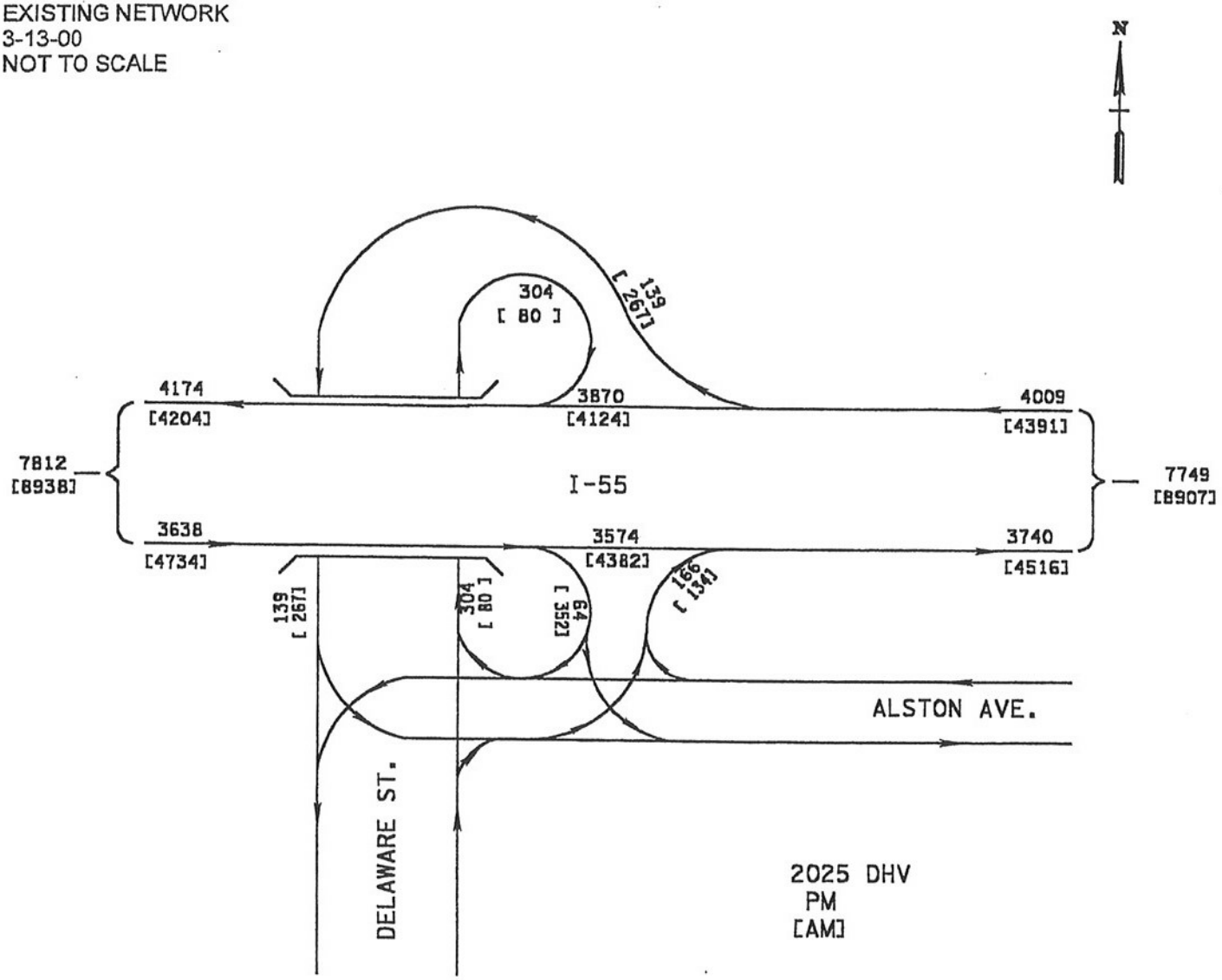
Adjusted Flow Rate, vp	1735	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	2	
Density, D	31.5	pc/mi/ln
Level of Service, LOS	D	

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

EXISTING NETWORK
3-13-00
NOT TO SCALE



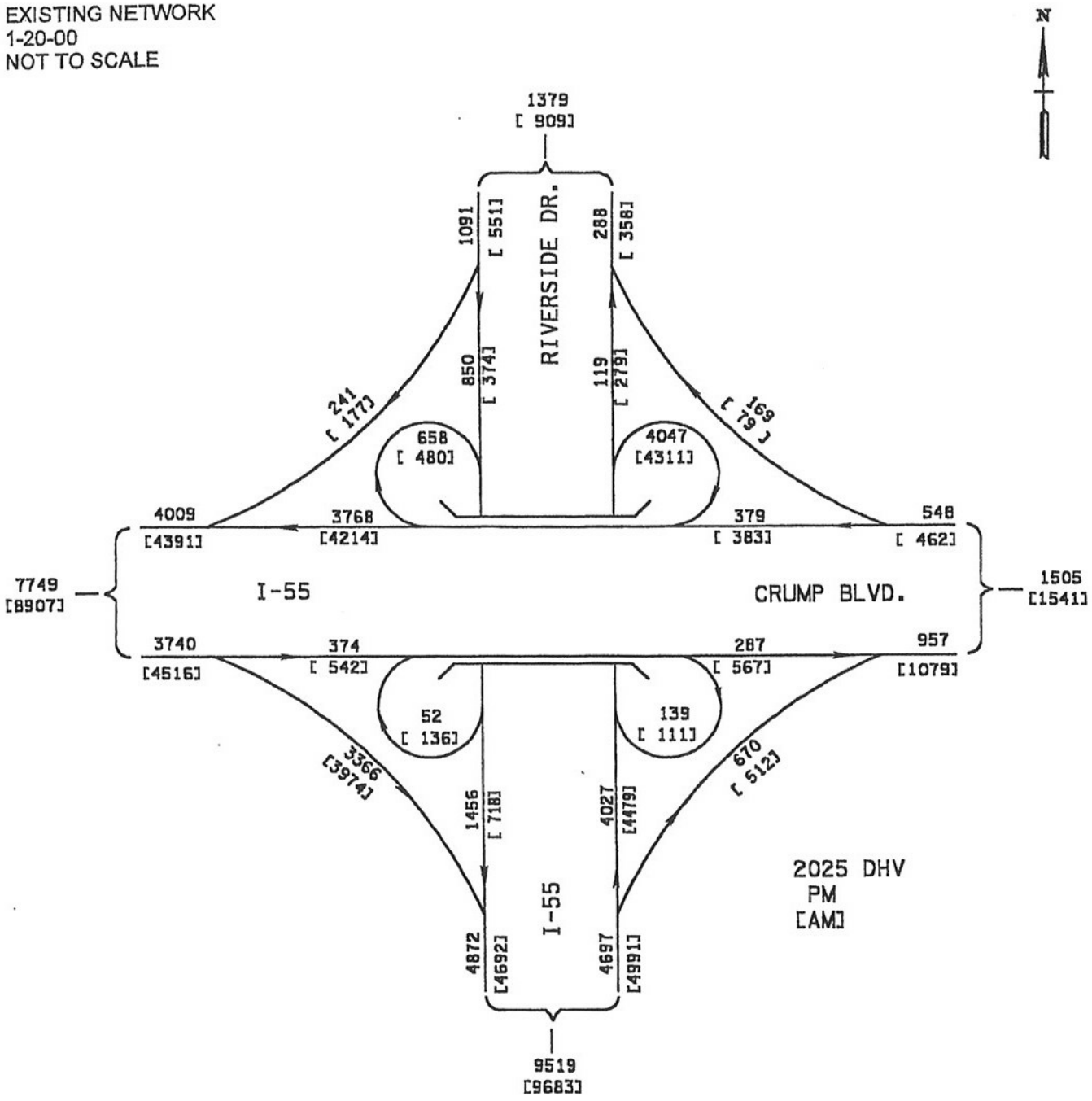
Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

EXISTING NETWORK
1-20-00
NOT TO SCALE



Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

RAMP JUNCTIONS

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4734	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	352	vph
Length of First Accel/Decel Lane	210	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	134	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	4734	352	134	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1315	98	37	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5918	399	152	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5918 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5918	4500	Yes
v_{12}	5918	4400	Yes
$v_{FO} = v_F - v_R$	5519	4500	Yes
v_R	399	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 53+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3638	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	64	vph
Length of First Accel/Decel Lane	210	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	166	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3638	64	166	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1011	18	46	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4548	73	188	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4548 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4548	4500	Yes
v_{12}	4548	4400	Yes
$v_{FO} = v_F - v_R$	4475	4500	No
v_R	73	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 41+

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 @ on-ramp from Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4382	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	134	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	352	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	4382	134	352	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1217	37	98	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5478	152	399	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 5478 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5630	4500	Yes
v_{R12}	5630	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 46+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 37.2 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 @ on-ramp from Alston Avenue
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3574	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	166	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	64	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	3574	166	64	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	993	46	18	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4468	188	73	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 4468 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	4656	4500	Yes
v_{R12}	4656	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 39-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 45.9 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB I-55 @ off-ramp to Delaware Street
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4391	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	267	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	80	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	4391	267	80	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1220	74	22	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5489	303	91	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5489 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5489	4500	Yes
v_{12}	5489	4400	Yes
$v_{FO} = v_F - v_R$	5186	4500	Yes
v_R	303	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 47- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB I-55 @ off-ramp to Delaware Street
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4009	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	139	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	304	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	4009	139	304	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1114	39	84	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5011	158	345	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5011 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5011	4500	Yes
v_{12}	5011	4400	Yes
$v_{FO} = v_F - v_R$	4853	4500	Yes
v_R	158	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 43- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Delaware Street
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4124	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	80	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	267	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	4124	80	267	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1146	22	74	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5155	91	303	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 5155 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5246	4500	Yes
v_{R12}	5246	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 44+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 41.5 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Delaware Street
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3870	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	304	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	139	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	235	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	3870	304	139	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1075	84	39	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4838	345	158	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 4838 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5183	4500	Yes
v_{R12}	5183	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 44-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 42.1 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4516	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	3974	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	136	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	4516	3974	136	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1254	1104	38	v
Trucks and Buses	25	25	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5645	4968	153	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5645 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5645	4500	Yes
v_{12}	5645	4400	Yes
$v_{FO} = v_F - v_R$	677	4500	No
v_R	4968	2000	Yes

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 48+

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 44 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3740	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	3366	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	52	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3740	3366	52	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1039	935	14	v
Trucks and Buses	25	25	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4675	4208	59	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4675 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4675	4500	Yes
v_{12}	4675	4400	Yes
$v_{FO} = v_F - v_R$	467	4500	No
v_R	4208	2000	Yes

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 40- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 45 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from SB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	542	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	136	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	3974	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	542	136	3974	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	151	38	1104	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	611	153	4968	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 611 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	764	4500	No
v_{R12}	764	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from SB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	374	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	52	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	3366	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	465	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	374	52	3366	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	104	14	935	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	422	59	4208	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 422 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	481	4500	No
v_{R12}	481	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 7+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to NB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	AM Peak
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	678	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	111	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	136	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	330	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	678	111	136	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	188	31	38	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	765	129	153	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 765 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	765	4500	No
v_{12}	765	4400	No
$v_{FO} = v_F - v_R$	636	4500	No
v_R	129	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 8- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 / Crump @ off-ramp to NB Riverside Dr.
Analyst:	Fischbach
Analysis Time Period:	PM Peak
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	426	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	139	vph
Length of First Accel/Decel Lane	330	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	52	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	330	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	426	139	52	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	118	39	14	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	480	161	59	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 480 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	480	4500	No
v_{12}	480	4400	No
$v_{FO} = v_F - v_R$	319	4500	No
v_R	161	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 5+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	567	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	512	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	111	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	310	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	567	512	111	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	158	142	31	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	658	594	129	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 658 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	1252	4500	No
v_{R12}	1252	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_{12}$ = 12-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 51.1 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	EB I-55 / Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	287	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	670	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	139	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	310	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	287	670	139	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	80	186	39	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	333	778	161	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1

Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 333 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	1111	4500	No
v_{R12}	1111	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 11-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 51.1 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside @ on-ramp from EB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4479	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	111	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4311	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	4479	111	4311	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1244	31	1198	v
Trucks and Buses	25	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5599	129	5389	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 5599 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5728	4500	Yes
v_{R12}	5728	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 48+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 35.5 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside @ on-ramp from EB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4027	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	139	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4047	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	4027	139	4047	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1119	39	1124	v
Trucks and Buses	25	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5034	161	5059	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 5034 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5195	4500	Yes
v_{R12}	5195	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 44+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 41.9 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ off-ramp to WB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4479	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	4311	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	111	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	4479	4311	111	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1244	1198	31	v
Trucks and Buses	25	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5599	5389	129	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5599 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5599	4500	Yes
v_{12}	5599	4400	Yes
$v_{FO} = v_F - v_R$	210	4500	No
v_R	5389	2000	Yes

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 50- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 43 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ off-ramp to WB I-55 / Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4027	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	4047	vph
Length of First Accel/Decel Lane	290	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	139	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	290	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	4027	4047	139	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1119	1124	39	v
Trucks and Buses	25	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5034	5059	161	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:

Proportion of Freeway Vehicles in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5034 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5034	4500	Yes
v_{12}	5034	4400	Yes
$v_{FO} = v_F - v_R$		4500	Yes
v_R	5059	2000	Yes

Level of Service Operation (if not LOS F):

Density, pc/mi/ln $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 45-

Level of Service for Ramp-Freeway Junction Areas of Influence

Speed in Ramp Influence Area, S_R 44 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	279	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	79	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4311	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	279	79	4311	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	78	22	1198	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	315	89	5389	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 315 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	404	4500	No
v_{R12}	404	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 8-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 / Riverside Dr. @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	119	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	169	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4047	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	119	169	4047	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	33	47	1124	v
Trucks and Buses	3	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	134	191	5059	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 134 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	325	4500	No
v_{R12}	325	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_{12}$ = 7+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	551	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	177	vph
Length of First Accel/Decel Lane	125	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	480	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	551	177	480	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	153	49	133	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	621	200	557	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 621 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	621	4500	No
v_{12}	621	4400	No
$v_{FO} = v_F - v_R$	421	4500	No
v_R	200	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 8+

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	1091	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	241	vph
Length of First Accel/Decel Lane	125	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	658	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	1091	241	658	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	303	67	183	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	1230	272	764	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1230 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1230	4500	No
v_{12}	1230	4400	No
$v_{FO} = v_F - v_R$	958	4500	No
v_R	272	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 14-

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Dr. @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	374	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	480	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	136	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	340	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	374	480	136	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	104	133	38	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	422	557	153	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 422 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	979	4500	No
v_{R12}	979	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 11- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Dr. @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	850	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	658	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	52	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	340	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	850	658	52	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	236	183	14	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	959	764	59	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 959 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	1723	4500	No
v_{R12}	1723	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 16+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 50.9 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	854	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	136	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	3974	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	540	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	854	136	3974	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	237	38	1104	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	992	153	4968	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 992 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	992	4500	No
v_{12}	992	4400	No
$v_{FO} = v_F - v_R$	839	4500	No
v_R	153	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 10- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Dr. @ on-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	1508	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	52	vph
Length of First Accel/Decel Lane	340	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	3366	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	540	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	1508	52	3366	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	419	14	935	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	1751	59	4208	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1751 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1751	4500	No
v_{12}	1751	4400	No
$v_{FO} = v_F - v_R$	1692	4500	No
v_R	59	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 16+

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to NB Riverside
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	462	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	79	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4311	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	295	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	462	79	4311	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	128	22	1198	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	536	89	5389	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.743 Using Equation 7

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 421 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	536	6750	No
v_{12}	421	4400	No
$v_{FO} = v_F - v_R$	447	6750	No
v_R	89	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 3+

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to NB Riverside
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	548	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	169	vph
Length of First Accel/Decel Lane	500	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4047	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	295	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	548	169	4047	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	152	47	1124	v
Trucks and Buses	9	3	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.985	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	636	191	5059	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.735 Using Equation 7

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 518 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	636	6750	No
v_{12}	518	4400	No
$v_{FO} = v_F - v_R$	445	6750	No
v_R	191	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 4+

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	383	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	4311	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	480	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	383	4311	480	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	106	1198	133	v
Trucks and Buses	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	445	5389	557	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 0.588 Using Equation 2
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 262 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5834	6750	No
v_{R12}	5651	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 45- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 36.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB Crump @ on-ramp from NB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	379	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	4047	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	658	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	379	4047	658	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	105	1124	183	v
Trucks and Buses	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.889	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	440	5059	764	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 0.588 Using Equation 2
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 259 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5499	6750	No
v_{R12}	5318	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 42+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 40.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	383	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	480	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4311	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	383	480	4311	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	106	133	1198	v
Trucks and Buses	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	445	557	5389	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.723 Using Equation 7
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 476 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	445	6750	No
v_{12}	476	4400	No
$v_{FO} = v_F - v_R$		6750	Yes
v_R	557	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 5- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	WB Crump @ off-ramp to SB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	3	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	379	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	658	vph
Length of First Accel/Decel Lane	390	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	4047	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	390	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	379	658	4047	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	105	183	1124	v
Trucks and Buses	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.889	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	440	764	5059	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 0.714 Using Equation 7

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 533 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	440	6750	No
v_{12}	533	4400	No
$v_{FO} = v_F - v_R$		6750	Yes
v_R	764	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 5+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from SB Riverside
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4214	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	177	vph
Length of First Accel/Decel Lane	520	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	267	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	520	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	4214	177	267	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1171	49	74	v
Trucks and Buses	25	3	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.985	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5268	200	303	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 5268 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5468	4500	Yes
v_{R12}	5468	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 45-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 39.3 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from SB Riverside
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3768	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	241	vph
Length of First Accel/Decel Lane	520	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	139	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	520	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	3768	241	139	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1047	67	39	v
Trucks and Buses	25	3	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.985	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4710	272	158	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 4710 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	4982	4500	Yes
v_{R12}	4982	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 41-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 43.9 mph

WEAVING SECTIONS

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55, btw Alston and Riverside
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	408	100	3874	134	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	113	28	1076	37	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	510	113	4842	151	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	4.38	7.26
Speeds, S	23.36	20.45
Type of Operation is	Constrained	
Number of Lanes Required	2.33	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	4993	2000	a
Section Capacity (pcphpl)	1872	2150	b
Volume Ratio, VR	0.89	0.45	c
Weaving Ratio, R	0.03	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	20.74	mph
Density, D	90.28	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55, btw Alston and Riverside
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	333	125	3241	41	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	93	35	900	11	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	416	141	4051	46	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	3.64	5.95
Speeds, S	24.69	21.47
Type of Operation is	Constrained	
Number of Lanes Required	2.27	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	4097	2000	a
Section Capacity (pcphpl)	1551	2150	b
Volume Ratio, VR	0.88	0.45	c
Weaving Ratio, R	0.01	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	21.81	mph
Density, D	71.13	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55 btw Alston and Riverside
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	3992	45	222	132	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	1109	13	62	37	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4990	51	277	149	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.85	1.66
Speeds, S	39.31	31.92
Type of Operation is	Unconstrained	
Number of Lanes Required	0.49	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	426	2000	a
Section Capacity (pcphpl)	1822	2150	b
Volume Ratio, VR	0.08	0.45	c
Weaving Ratio, R	0.35	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	38.62	mph
Density, D	47.19	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55 btw Alston and Riverside
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	550	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V (vph)	3690	61	78	180	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	1025	17	22	50	v
Trucks and Buses	25	4	25	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.98	0.89	0.98	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4612	69	97	204	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.71	1.46
Speeds, S	41.37	33.30
Type of Operation is	Unconstrained	
Number of Lanes Required	0.42	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	301	2000	a
Section Capacity (pcphpl)	1660	2150	b
Volume Ratio, VR	0.06	0.45	c
Weaving Ratio, R	0.32	0.50	d
Weaving Length (ft)	550	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	40.78	mph
Density, D	40.73	pc/mi/ln
Level of Service, LOS	E	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	330	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	431	0	111	136	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	120	0	31	38	v
Trucks and Buses	9	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.99	0.96	0.99	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	500	0	128	153	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.29	0.63
Speeds, S	49.99	42.67
Type of Operation is	Unconstrained	
Number of Lanes Required	0.92	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	281	2000	a
Section Capacity (pcphpl)	260	2150	b
Volume Ratio, VR	0.36	0.45	c
Weaving Ratio, R	0.46	0.50	d
Weaving Length (ft)	330	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	47.08	mph
Density, D	5.53	pc/mi/ln
Level of Service, LOS	A	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	EB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	330	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	235	0	139	52	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	65	0	39	14	v
Trucks and Buses	9	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.99	0.96	0.99	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	272	0	161	58	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.20	0.45
Speeds, S	52.50	46.02
Type of Operation is	Unconstrained	
Number of Lanes Required	1.00	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	219	2000	a
Section Capacity (pcphpl)	163	2150	b
Volume Ratio, VR	0.45	0.45	c
Weaving Ratio, R	0.26	0.50	d
Weaving Length (ft)	330	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	49.40	mph
Density, D	3.31	pc/mi/ln
Level of Service, LOS	A	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw loops at Crump Boulevard
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	300	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V (vph)	168	0	4311	111	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	47	0	1198	31	v
Trucks and Buses	3	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.96	0.89	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	189	0	5388	128	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	7.51	13.91
Speeds, S	20.29	18.02
Type of Operation is	Constrained	
Number of Lanes Required	2.31	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	5516	2000	a
Section Capacity (pcphpl)	1901	2150	b
Volume Ratio, VR	0.97	0.45	c
Weaving Ratio, R	0.02	0.50	d
Weaving Length (ft)	300	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	18.09 mph
Density, D	105.15 pc/mi/ln
Level of Service, LOS	F

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw loops at Crump Boulevard
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	300	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	15	35	4012	104	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	4	10	1114	29	v
Trucks and Buses	3	9	25	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.96	0.89	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	16	40	5015	120	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	7.23	12.97
Speeds, S	20.47	18.22
Type of Operation is	Constrained	
Number of Lanes Required	2.33	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	5135	2000	a
Section Capacity (pcphpl)	1730	2150	b
Volume Ratio, VR	0.99	0.45	c
Weaving Ratio, R	0.02	0.50	d
Weaving Length (ft)	300	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	18.24	mph
Density, D	94.85	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB Riverside Drive btw loops at Crump Boulevard
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	350	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	238	0	136	480	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	66	0	38	133	v
Trucks and Buses	3	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.99	0.99	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	268	0	153	557	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.86	1.56
Speeds, S	39.20	32.60
Type of Operation is	Constrained	
Number of Lanes Required	1.49	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	710	2000	a
Section Capacity (pcphpl)	326	2150	b
Volume Ratio, VR	0.73	0.45	c
Weaving Ratio, R	0.22	0.50	d
Weaving Length (ft)	350	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	34.18	mph
Density, D	9.54	pc/mi/ln
Level of Service, LOS	A	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB Riverside Drive btw loops at Crump Boulevard
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	350	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	798	0	52	658	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	222	0	14	183	v
Trucks and Buses	3	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.99	0.99	0.96	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	899	0	58	764	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	1.05	1.57
Speeds, S	36.94	32.50
Type of Operation is	Unconstrained	
Number of Lanes Required	1.21	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	822	2000	a
Section Capacity (pcphpl)	573	2150	b
Volume Ratio, VR	0.48	0.45	c
Weaving Ratio, R	0.07	0.50	d
Weaving Length (ft)	350	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	34.68	mph
Density, D	16.54	pc/mi/ln
Level of Service, LOS	B	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	390	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	119	216	264	4095	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	33	60	73	1138	v
Trucks and Buses	9	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.96	0.96	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	138	250	306	5118	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	6.09	10.77
Speeds, S	21.35	18.82
Type of Operation is	Constrained	
Number of Lanes Required	2.22	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	5424	2000	a
Section Capacity (pcphpl)	1937	2150	b
Volume Ratio, VR	0.93	0.45	c
Weaving Ratio, R	0.06	0.50	d
Weaving Length (ft)	390	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	18.97 mph
Density, D	102.11 pc/mi/ln
Level of Service, LOS	F

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	WB I-55/Crump btw loops at Riverside Drive
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	390	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	126	405	253	3642	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	35	113	70	1012	v
Trucks and Buses	9	9	9	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.96	0.96	0.96	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	146	470	293	4552	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	5.23	9.60
Speeds, S	22.22	19.25
Type of Operation is	Constrained	
Number of Lanes Required	2.13	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	4845	2000	a
Section Capacity (pcphpl)	1820	2150	b
Volume Ratio, VR	0.89	0.45	c
Weaving Ratio, R	0.06	0.50	d
Weaving Length (ft)	390	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	19.54	mph
Density, D	93.15	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw McLemore Avenue and Crump Boulevard
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	4063	0	512	416	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	1129	0	142	116	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5078	0	594	478	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.31	0.58
Speeds, S	49.42	43.53
Type of Operation is	Unconstrained	
Number of Lanes Required	0.99	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	1072	2000	a
Section Capacity (pcphpl)	2050	2150	b
Volume Ratio, VR	0.17	0.45	c
Weaving Ratio, R	0.45	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	48.28	mph
Density, D	42.46	pc/mi/ln
Level of Service, LOS	E	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw McLemore Avenue and Crump Boulevard
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	3257	0	670	770	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	905	0	186	214	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4071	0	777	885	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.41	0.66
Speeds, S	46.95	42.09
Type of Operation is	Unconstrained	
Number of Lanes Required	1.34	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	1662	2000	a
Section Capacity (pcphpl)	1911	2150	b
Volume Ratio, VR	0.29	0.45	c
Weaving Ratio, R	0.47	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	45.43	mph
Density, D	42.06	pc/mi/ln
Level of Service, LOS	E	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB I-55 btw Crump Boulevard and McLemore Avenue
Analysis Time Period:	AM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	1800	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	120	199	598	3775	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	33	55	166	1049	v
Trucks and Buses	3	7	7	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.97	0.97	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	135	228	687	4718	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	2.43	2.71
Speeds, S	28.11	27.13
Type of Operation is	Constrained	
Number of Lanes Required	2.84	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	5405	2000	a
Section Capacity (pcphpl)	1922	2150	b
Volume Ratio, VR	0.94	0.45	c
Weaving Ratio, R	0.13	0.50	d
Weaving Length (ft)	1800	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	27.19	mph
Density, D	70.72	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	SB I-55 btw Crump Boulevard and McLemore Avenue
Analysis Time Period:	PM Peak Hour
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	1800	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	945	0	511	3366	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	263	0	142	935	v
Trucks and Buses	3	7	7	25	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.99	0.97	0.97	0.89	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	1065	0	587	4207	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	1.92	2.40
Speeds, S	30.43	28.25
Type of Operation is	Constrained	
Number of Lanes Required	2.58	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	4794	2000	a
Section Capacity (pcphpl)	1953	2150	b
Volume Ratio, VR	0.82	0.45	c
Weaving Ratio, R	0.12	0.50	d
Weaving Length (ft)	1800	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	28.63	mph
Density, D	68.22	pc/mi/ln
Level of Service, LOS	F	

FREEWAY SECTIONS

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	5488	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1524	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2287	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2287	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	49.3	mph
Number of Lanes, N	3	
Density, D	46.3	pc/mi/ln
Level of Service, LOS	F	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	4596	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1277	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1915	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1915	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	53.7	mph
Number of Lanes, N	3	
Density, D	35.7	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	4565	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1268	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1902	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1902	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	53.8	mph
Number of Lanes, N	3	
Density, D	35.4	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	5317	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1477	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2215	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2215	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	50.6	mph
Number of Lanes, N	3	
Density, D	43.8	pc/mi/ln
Level of Service, LOS	E	

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	4991	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1386	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	3119	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3119	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	4692	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1303	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2933	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2933	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	4692	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1303	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2933	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2933	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Description:	

Flow Inputs and Adjustments

Volume, V	4822	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1339	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	3014	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3014	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	4734	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1315	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2959	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2959	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S		mph
Number of Lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS		

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	3638	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1011	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2274	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2274	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	49.6	mph
Number of Lanes, N	2	
Density, D	45.9	pc/mi/ln
Level of Service, LOS	F	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	4204	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1168	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2628	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2628	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S		mph
Number of Lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS		

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - existing network
Date Performed:	June 2000

VOLUME

Volume, V	4174	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1159	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2609	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2609	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S		mph
Number of Lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS		

APPENDIX D

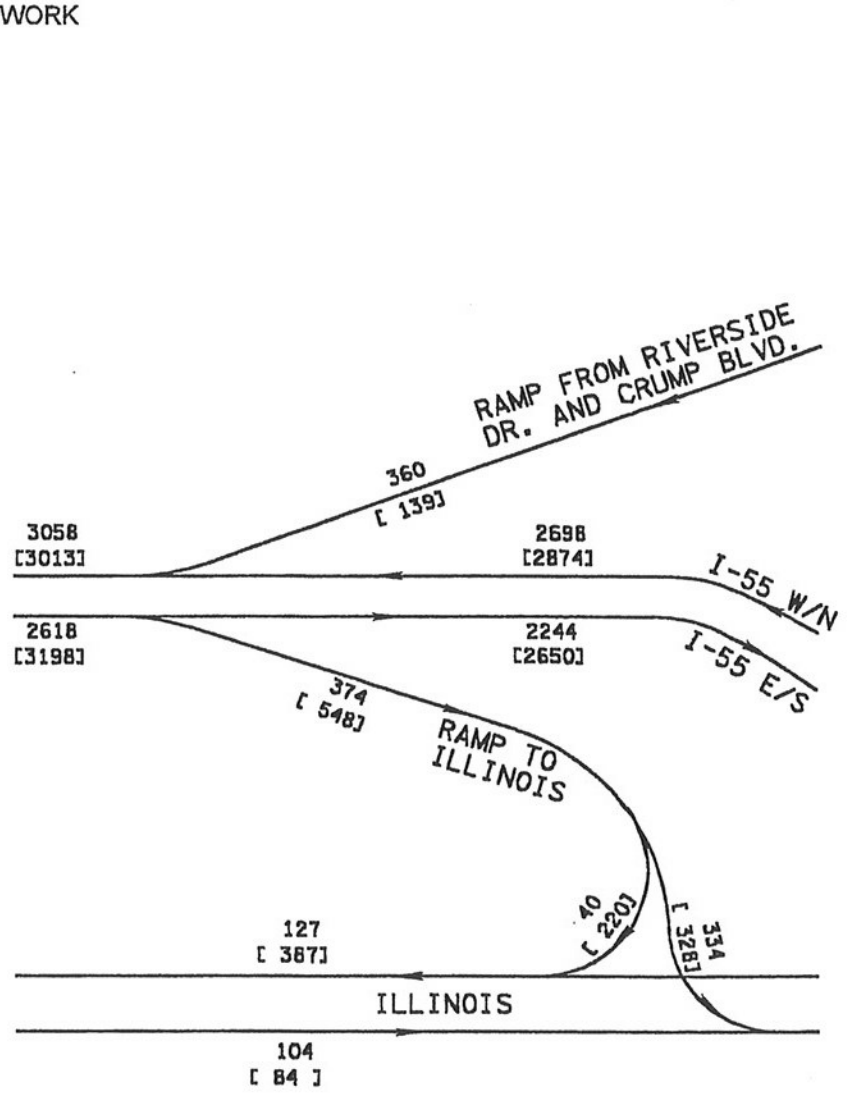
CAPACITY ANALYSIS: PROPOSED MODIFICATIONS

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY	PROJECT NO.: 10019

PROPOSED NETWORK
6-19-00
NOT TO SCALE



2005 DHV REASSIGNED
PM
[AM]

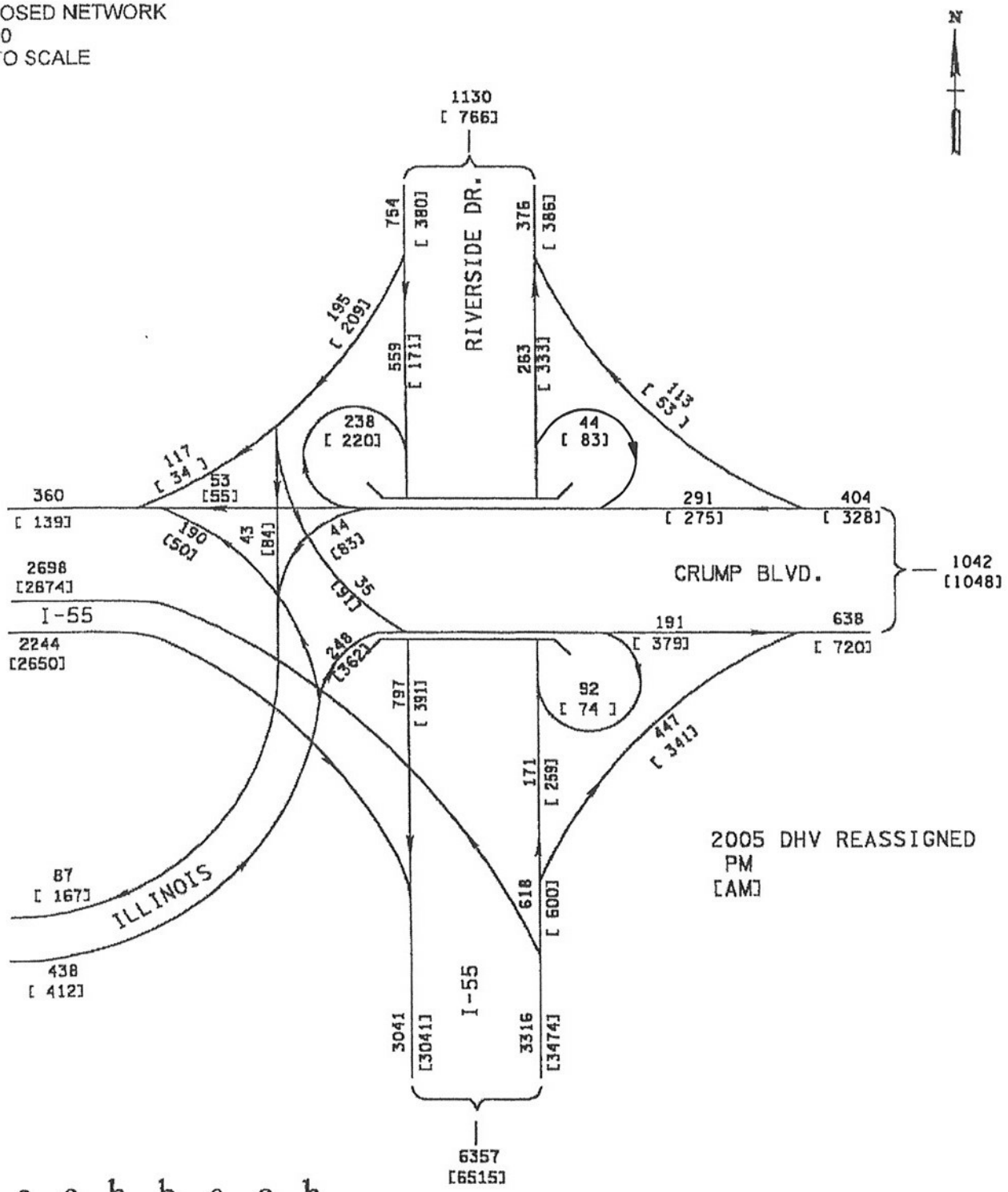
Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

PROPOSED NETWORK
6-19-00
NOT TO SCALE



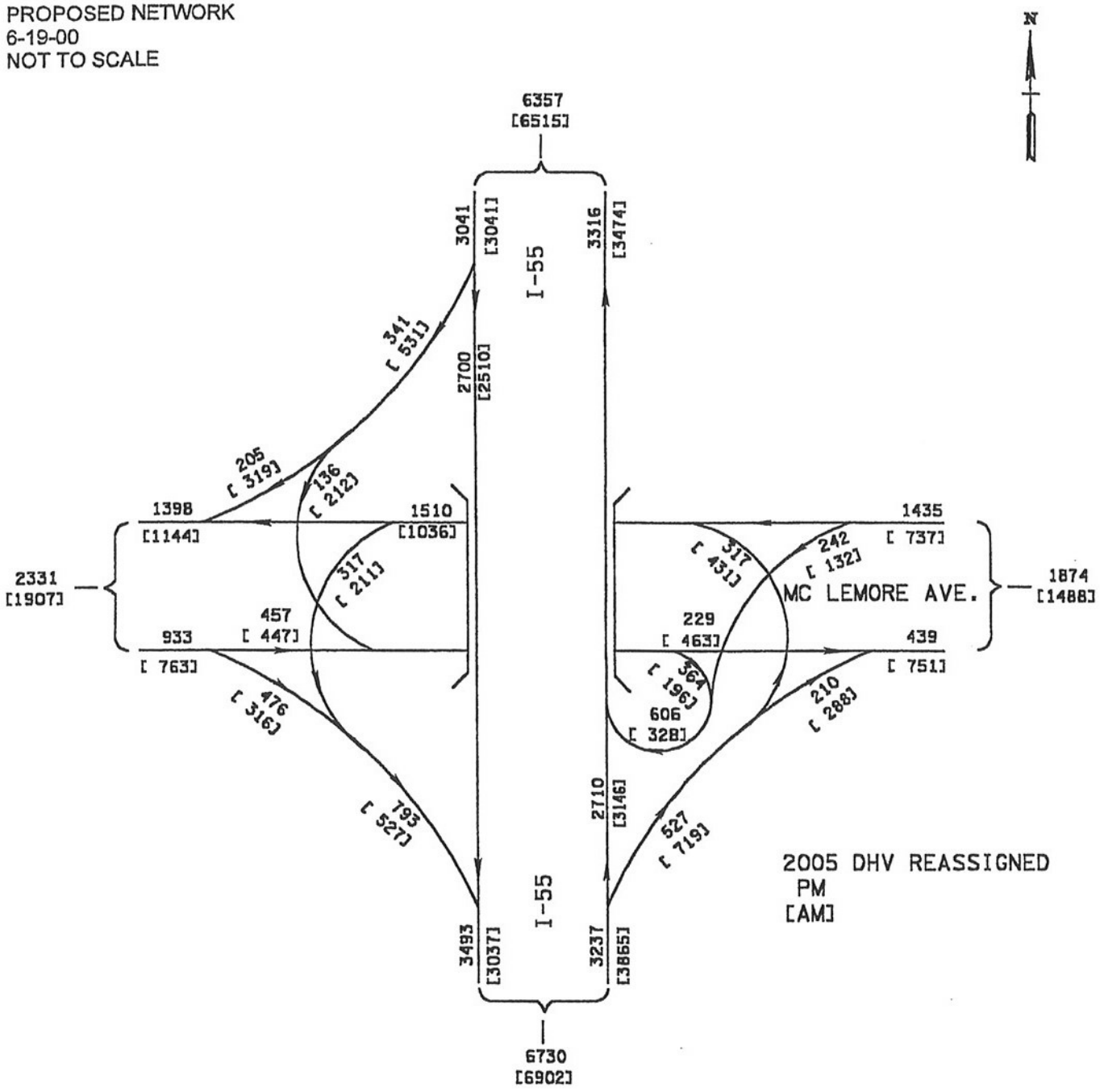
Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

PROPOSED NETWORK
6-19-00
NOT TO SCALE



Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

RAMP JUNCTIONS

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Illinois
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3198	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	548	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp	84	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3198	548	84	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	888	152	23	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3998	621	95	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3998 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3998	4500	No
v_{12}	3998	4400	No
$v_{FO} = v_F - v_R$	3377	4500	No
v_R	621	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 35+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence E

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Illinois
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2618	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	374	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp	84	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	165	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	2618	374	84	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	727	104	23	v
Trucks and Buses	25	4	4	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	0.980	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3273	424	95	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3273 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3273	4500	No
v_{12}	3273	4400	No
$v_{FO} = v_F - v_R$	2849	4500	No
v_R	424	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 29- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Riverside / Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2874	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	139	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2874	139		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	798	39		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	3593	158		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3593 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3751	4500	No
v_{R12}	3751	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{R12} - 0.00627 L_A$ = 32+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Riverside / Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2698	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	360	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2698	360		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	749	100		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	3373	408		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3373 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	3781	4500	No
v_{R12}	3781	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 32+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence D

Speed in Ramp Influence Area, S_R 49.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 @ off-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	600	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	341	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	74	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	600	341	74	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	167	95	21	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	697	396	86	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 697 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	697	4500	No
v_{12}	697	4400	No
$v_{FO} = v_F - v_R$	301	4500	No
v_R	396	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 7- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 @ off-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	618	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	447	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	92	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	618	447	92	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	172	124	26	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	718	519	107	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 718 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	718	4500	No
v_{12}	718	4400	No
$v_{FO} = v_F - v_R$	199	4500	No
v_R	519	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 7- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from EB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	259	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	74	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	341	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	259	74	341	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	72	21	95	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	301	86	396	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 301 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	387	4500	No
v_{R12}	387	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 7-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from EB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	171	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	92	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	447	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	171	92	447	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	48	26	124	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	199	107	519	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 199 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	306	4500	No
v_{R12}	306	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_{R12} + 0.0078\ v_{R12} - 0.00627\ L_A$ = 6- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	333	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	53	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	74	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	333	53	74	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	93	15	21	v
Trucks and Buses	3	3	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	376	60	83	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 376 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	436	4500	No
v_{R12}	436	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 8+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	263	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	113	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	92	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	263	113	92	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	73	31	26	v
Trucks and Buses	3	3	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	297	127	104	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 297 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	424	4500	No
v_{R12}	424	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 8+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Drive @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	380	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	209	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	220	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	380	209	220	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	106	58	61	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	429	236	255	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 429 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	429	4500	No
v_{12}	429	4400	No
$v_{FO} = v_F - v_R$	193	4500	No
v_R	236	2000	No

Level of Service Operation (if not LOS F):
Density, pc/mi/ln $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 5+

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Drive @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	754	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	195	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	238	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	754	195	238	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	209	54	66	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	850	220	276	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v - v_F) P_{FD}$ = 850 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	850	4500	No
v_{12}	850	4400	No
$v_{FO} = v - v_R$	630	4500	No
v_R	220	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 9- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Drive @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	171	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	220	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	209	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	250	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	171	220	209	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	48	61	58	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	193	255	236	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 193 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	448	4500	No
v_{R12}	448	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_{R12} + 0.0078\ v_{R12} - 0.00627\ L_A$ = 7- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Drive @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	559	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	238	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	195	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	250	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	559	238	195	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	155	66	54	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	630	276	220	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 630 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	906	4500	No
v_{R12}	906	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 51.0 mph

WEAVING SECTIONS

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	AM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2805	0	341	328	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	779	0	95	91	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3506	0	395	377	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.20	0.41
Speeds, S	52.63	47.00
Type of Operation is	Unconstrained	
Number of Lanes Required	0.97	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	772	2000	a
Section Capacity (pcphpl)	1426	2150	b
Volume Ratio, VR	0.18	0.45	c
Weaving Ratio, R	0.49	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	51.52	mph
Density, D	27.68	pc/mi/ln
Level of Service, LOS	C	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	PM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2005 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2263	0	447	606	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	629	0	124	168	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	2828	0	519	696	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.27	0.47
Speeds, S	50.49	45.51
Type of Operation is	Unconstrained	
Number of Lanes Required	1.32	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	1215	2000	a
Section Capacity (pcphpl)	1347	2150	b
Volume Ratio, VR	0.30	0.45	c
Weaving Ratio, R	0.43	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	48.88	mph
Density, D	27.57	pc/mi/ln
Level of Service, LOS	C	

HCS2000: Freeway Weaving Release 4.1d

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	AM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2005
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.20	
Weaving ratio, R	0.39	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	2251	132	399	259	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	625	37	111	72	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2813	151	458	297	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.51	0.22
Weaving and non-weaving speeds, Si	44.85	51.98
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	0.89
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

eaving segment speed, S	50.35	mph
Weaving segment density, D	24.62	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	6019	pc/h
Capacity as a 15-minute flow rate, c	5350	pc/h
Capacity as a full-hour volume, ch	4815	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	755	4000	a
Average flow rate (pcphpl)	1239	2250	b
Volume ratio, VR	0.20	0.80	c
Weaving ratio, R	0.39	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS2000: Freeway Weaving Release 4.1d

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	PM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2005
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.30	
Weaving ratio, R	0.26	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	1988	85	256	712	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	552	24	71	198	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2485	97	294	818	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.60	0.34
Weaving and non-weaving speeds, Si	43.12	48.46
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	1.19
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	46.72	mph
Weaving segment density, D	26.35	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	5548	pc/h
Capacity as a 15-minute flow rate, c	4932	pc/h
Capacity as a full-hour volume, ch	4439	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1112	4000	a
Average flow rate (pcphpl)	1231	2250	b
Volume ratio, VR	0.30	0.80	c
Weaving ratio, R	0.26	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

FREEWAY SECTIONS

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3865	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1074	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1610	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1610	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	29.3	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3237	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	899	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1349	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1349	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	24.5	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3037	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	844	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1265	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1265	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	23.0	pc/mi/ln
Level of Service, LOS	C	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3493	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	970	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1455	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1455	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	26.5	pc/mi/ln
Level of Service, LOS	D	

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3474	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	965	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2171	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2171	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	51.8	mi/h
Number of lanes, N	2	
Density, D	41.9	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3316	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	921	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2073	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2073	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	53.4	mi/h
Number of lanes, N	2	
Density, D	38.8	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3041	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	845	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	1901	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1901	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	54.8	mi/h
Number of lanes, N	2	
Density, D	34.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3041	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	845	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	1901	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1901	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	54.8	mi/h
Number of lanes, N	2	
Density, D	34.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3198	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	888	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1999	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1999	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	53.1	mph
Number of Lanes, N	2	
Density, D	37.6	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	2618	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	727	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1636	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1636	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	2	
Density, D	29.7	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3013	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	837	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1883	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1883	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	53.9	mph
Number of Lanes, N	2	
Density, D	34.9	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3058	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	849	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1911	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1911	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	53.7	mph
Number of Lanes, N	2	
Density, D	35.6	pc/mi/ln
Level of Service, LOS	E	

SURFACE STREET INTERSECTIONS

HCS: Signalized Intersections Release 3.1c

Inter: Crump Blvd. and I-55 ramps
Analyst: Fischbach
Date: 2005 DHVs
E/W St: Crump Boulevard

City/St: Memphis, TN
Proj #: 10019
Period: AM Peak Hour
N/S St: ramp / connector road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	1	0	1	0	0	0	1	0
LGConfig				L	T		L				LT	
Volume				83	55		50			91	84	
Lane Width				12.0	12.0		12.0				12.0	
RTOR Vol												

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left	A			
Thru						Thru				
Right						Right				
Peds						Peds				
WB Left		A			SB	Left		A		
Thru		A				Thru		A		
Right						Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green		30.0					5.0	10.0		
Yellow		5.0					5.0	5.0		
All Red		0.0					0.0	0.0		

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	903	1805	0.10	0.500	8.0	A		
T	950	1900	0.06	0.500	7.8	A	7.9	A
Northbound								
L	150	1805	0.37	0.083	27.6	C	27.6	C
Southbound								
LT	309	1852	0.63	0.167	27.4	C	27.4	C

Intersection Delay = 20.0- (sec/veh) Intersection LOS = B

HCS: Signalized Intersections Release 3.1c

Inter: Crump Blvd. and I-55 ramps
Analyst: Fischbach
Date: 2005 DHVs
E/W St: Crump Boulevard

City/St: Memphis, TN
Proj #: 10019
Period: PM Peak Hour
N/S St: ramp / connector road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	1	0	1	0	0	0	1	0
LGConfig				L	T		L				LT	
Volume				44	53		190			35	43	
Lane Width				12.0	12.0		12.0				12.0	
RTOR Vol												

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination 1 2 3 4 5 6 7 8

EB	Left				NB	Left	A		
	Thru					Thru			
	Right					Right			
	Peds					Peds			
WB	Left	A			SB	Left		A	
	Thru	A				Thru		A	
	Right					Right			
	Peds					Peds			
NB	Right				EB	Right			
SB	Right				WB	Right			
Green		20.0					15.0	10.0	
Yellow		5.0					5.0	5.0	
All Red		0.0					0.0	0.0	

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	602	1805	0.08	0.333	13.8	B		
T	633	1900	0.09	0.333	13.8	B	13.8	B
Northbound								
L	451	1805	0.47	0.250	19.9	B	19.9	B
Southbound								
LT	310	1858	0.28	0.167	22.4	C	22.4	C

Intersection Delay = 18.8 (sec/veh) Intersection LOS = B

HCS: Signalized Intersections Release 3.1c

Inter: Illinois Ave and I-55 ramp
Analyst: Fischbach
Date: 2005 DHVs
E/W St: Illinois Ave. extension

City/St: Memphis, TN
Proj #: 10019
Period: AM Peak Hour
N/S St: ramp from WB I-55

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	0	0	0
LGConfig		T			T						LR	
Volume		84			167					328		220
Lane Width		12.0			12.0						12.0	
RTOR Vol												0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru		A			Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left	A		
Thru		A			Thru			
Right					Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		10.0				40.0		
Yellow		5.0				5.0		
All Red		0.0				0.0		

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	317	1900	0.29	0.167	22.4	C	22.4	C
Westbound								
T	317	1900	0.59	0.167	25.9	C	25.9	C
Northbound								
Southbound								
LR	1040	1560	0.58	0.667	6.3	A	6.3	A

Intersection Delay = 12.1 (sec/veh) Intersection LOS = B

HCS: Signalized Intersections Release 3.1c

Inter: Illinois Ave and I-55 ramp
Analyst: Fischbach
Date: 2005 DHVs
E/W St: Illinois Ave. extension

City/St: Memphis, TN
Proj #: 10019
Period: PM Peak Hour
N/S St: ramp from WB I-55

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	0	0	0
LGConfig		T			T						LR	
Volume		104			87					334		40
Lane Width		12.0			12.0						12.0	
RTOR Vol												0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru		A						
Right								
Peds								
WB Left								
Thru		A						
Right								
Peds								
NB Right								
SB Right								
Green		15.0			35.0			
Yellow		5.0			5.0			
All Red		0.0			0.0			

NB Left
NB Thru
NB Right
NB Peds
SB Left A
SB Thru
SB Right A
SB Peds
EB Right
WB Right

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	475	1900	0.24	0.250	18.2	B	18.2	B
Westbound								
T	475	1900	0.20	0.250	18.0	B	18.0	B
Northbound								
Southbound								
LR	940	1611	0.44	0.583	7.3	A	7.3	A

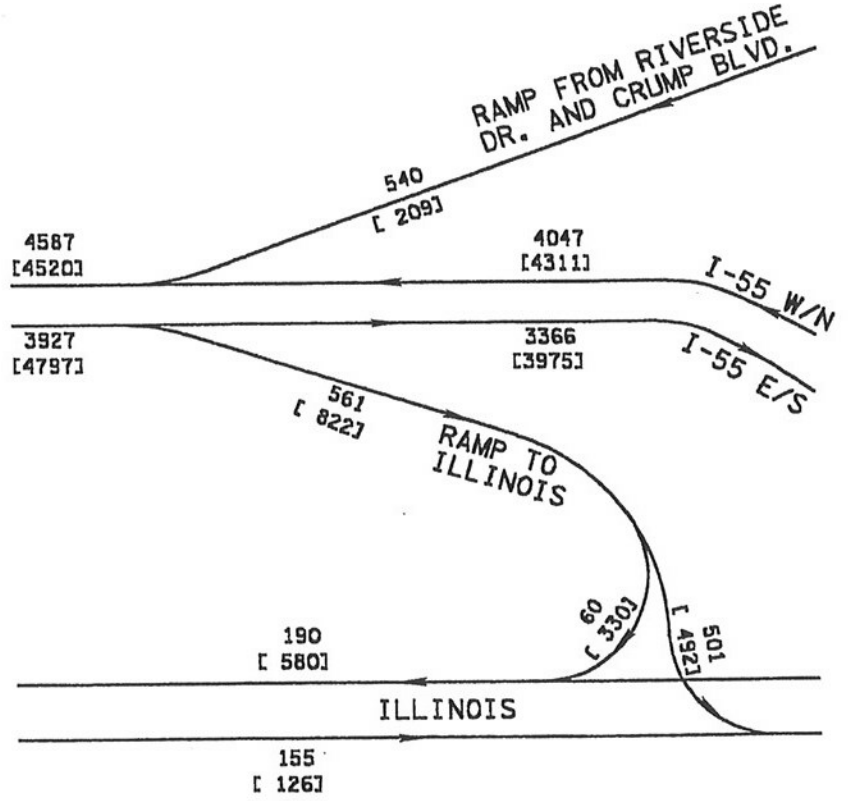
Intersection Delay = 11.0 (sec/veh) Intersection LOS = B

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

PROPOSED NETWORK
6-19-00
NOT TO SCALE



2025 DHV REASSIGNED
PM
[AM]

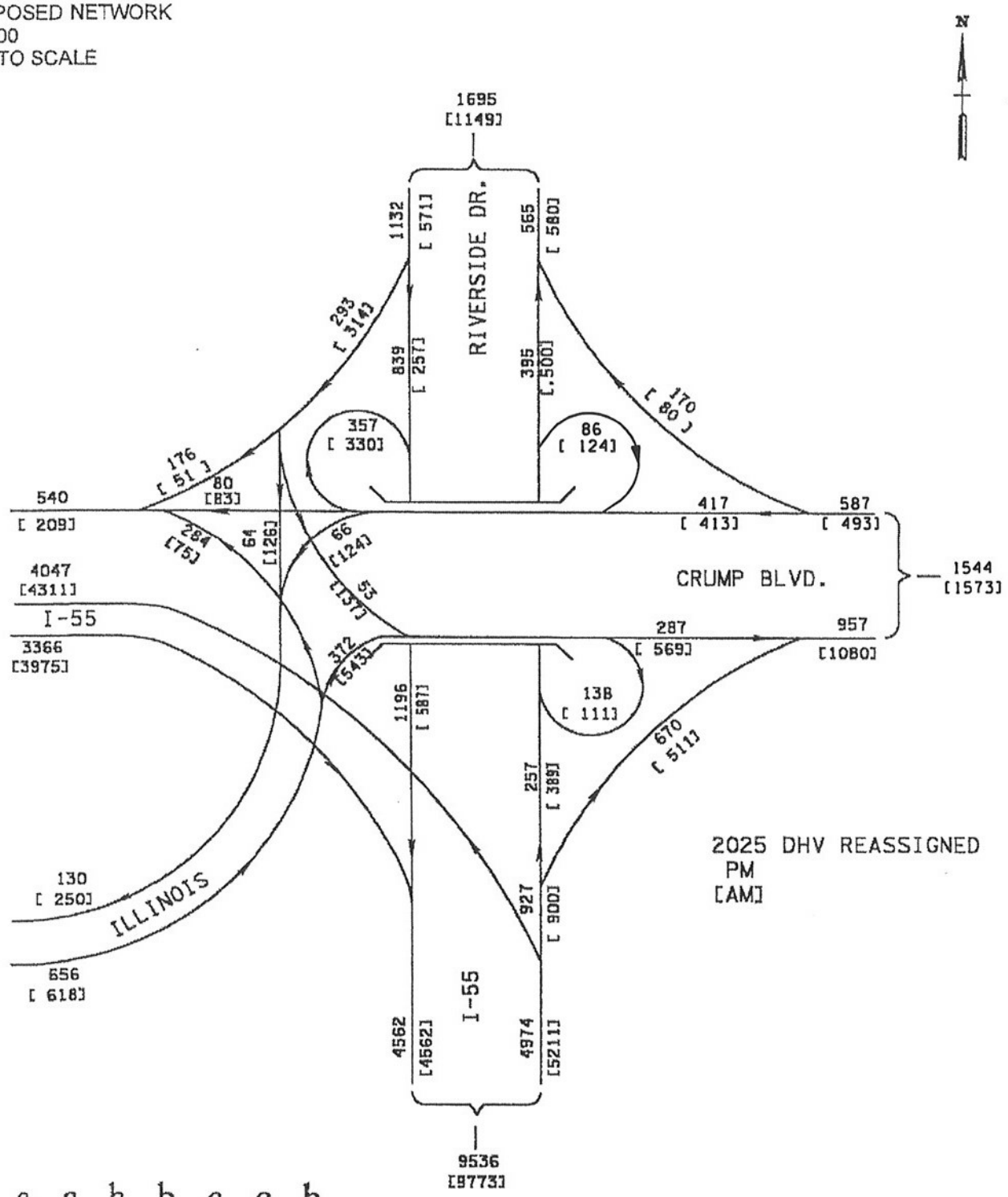
Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

PROPOSED NETWORK
6-19-00
NOT TO SCALE



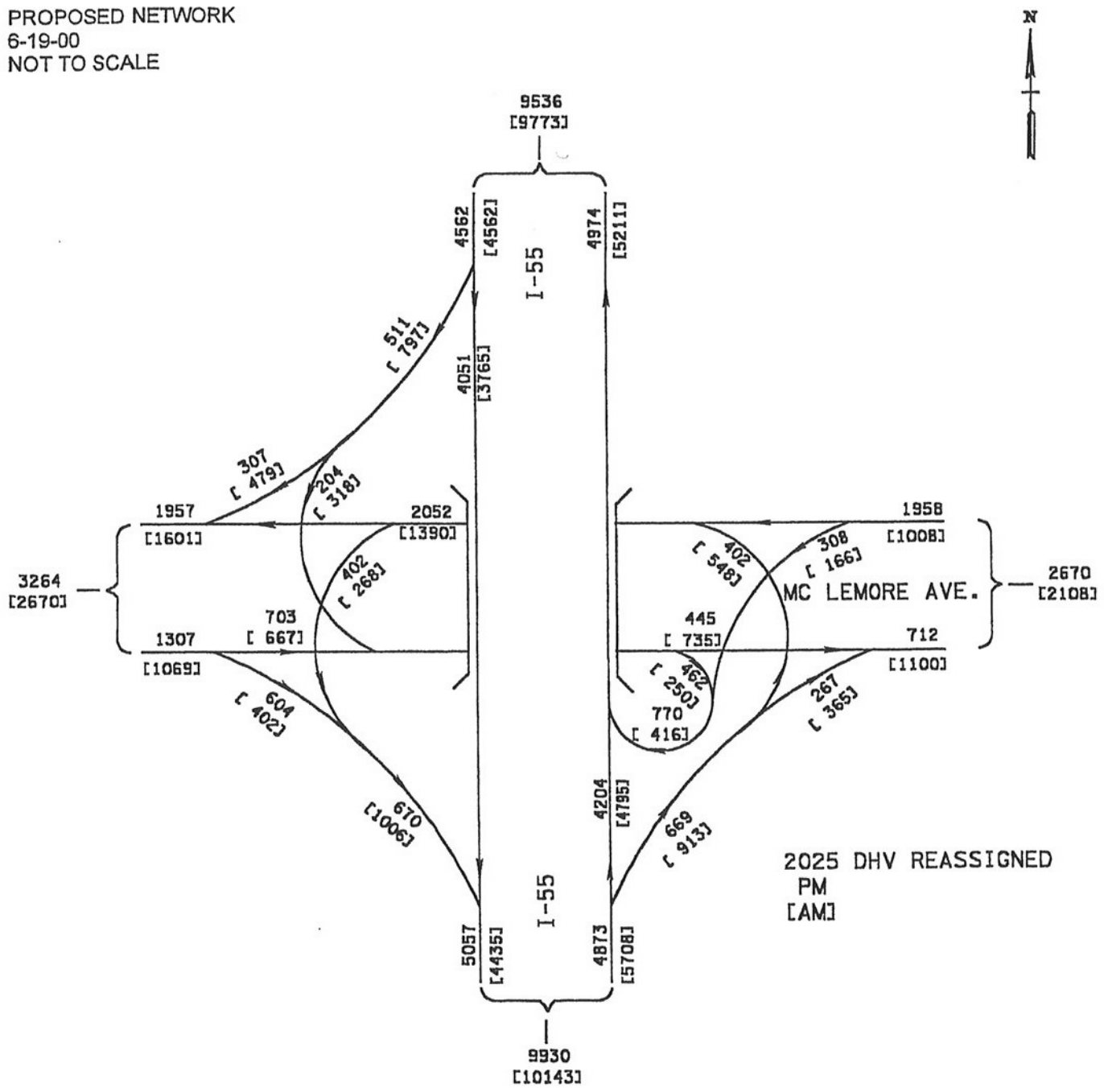
Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

TRAFFIC SCHEMATIC - DHV

I-55 IN MEMPHIS

COUNTY: SHELBY | PROJECT NO.: 10019

PROPOSED NETWORK
6-19-00
NOT TO SCALE



Fischbach
Transportation Group, Inc.
Traffic Engineering and Planning

RAMP JUNCTIONS

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Illinois
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4797	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	822	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp	0	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	1000	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	4797	822	0	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1333	228	0	v
Trucks and Buses	25	4	0	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	1.000	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5996	932	0	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6

Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5996 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5996	4500	Yes
v_{12}	5996	4400	Yes
$v_{FO} = v_F - v_R$	5064	4500	Yes
v_R	932	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 52+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 48 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	EB I-55 @ off-ramp to Illinois
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3927	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	561	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp	0	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	1000	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3927	561	0	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	1091	156	0	v
Trucks and Buses	25	4	0	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	1.000	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4909	636	0	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4909 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4909	4500	Yes
v_{12}	4909	4400	Yes
$v_{FO} = v_F - v_R$	4273	4500	No
v_R	636	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 43- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Riverside / Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4311	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	209	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	4311	209		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	1198	58		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	5389	237		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 5389 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5626	4500	Yes
v_{R12}	5626	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 47- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 37.1 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp from Riverside / Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	4047	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	540	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	4047	540		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	1124	150		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	5059	612		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 5059 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	5671	4500	Yes
v_{R12}	5671	4600	Yes

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 47-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence F

Speed in Ramp Influence Area, S_R 36.5 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 @ off-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2005 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	900	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	511	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	111	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	900	511	111	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	250	142	31	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	1045	593	129	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1045 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1045	4500	No
v_{12}	1045	4400	No
$v_{FO} = v_F - v_R$	452	4500	No
v_R	593	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 10- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	NB I-55 @ off-ramp to EB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	927	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	670	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	138	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	927	670	138	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	258	186	38	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	1076	778	160	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1076 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1076	4500	No
v_{12}	1076	4400	No
$v_{FO} = v_F - v_R$	298	4500	No
v_R	778	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 10- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from EB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	389	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	111	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	511	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	389	111	511	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	108	31	142	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	452	129	593	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 452 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	581	4500	No
v_{R12}	581	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 8+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from EB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak Hour
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	257	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	138	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	670	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	350	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	257	138	670	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	71	38	186	v
Trucks and Buses	9	9	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.957	0.957	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	298	160	778	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 298 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	458	4500	No
v_{R12}	458	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 7+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	500	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	80	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	111	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	500	80	111	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	139	22	31	v
Trucks and Buses	3	3	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	564	90	125	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 564 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	654	4500	No
v_{R12}	654	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 10- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	NB I-55 @ on-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	395	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	170	vph
Length of First Accel/Decel Lane	100	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	138	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	Off	
Distance to Adjacent Ramp	300	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	395	170	138	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	110	47	38	v
Trucks and Buses	3	3	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	445	192	156	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 445 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	637	4500	No
v_{R12}	637	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_{12}$ = 10-
pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 50.8 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Drive @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	571	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	314	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	330	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	571	314	330	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	159	87	92	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	644	354	383	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 644 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	644	4500	No
v_{12}	644	4400	No
$v_{FO} = v_F - v_R$	290	4500	No
v_R	354	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 7+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

DIVERGE ANALYSIS

Location:	SB Riverside Drive @ on-ramp to WB I-55
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	1132	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	293	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	357	vph
Position of Adjacent Ramp	Downstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	285	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	1132	293	357	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	314	81	99	v
Trucks and Buses	3	3	9	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.985	0.957	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	1277	330	415	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1277 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1277	4500	No
v_{12}	1277	4400	No
$v_{FO} = v_F - v_R$	947	4500	No
v_R	330	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 13- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 49 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Drive @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	257	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	330	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	314	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	250	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	257	330	314	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	71	92	87	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	290	383	354	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 290 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	673	4500	No
v_{R12}	673	4600	No

Level of Service Operation (if not LOS F):
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9- pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence A

Speed in Ramp Influence Area, S_R 51.0 mph

HCS: Ramps and Ramp Junctions Release 3.1c

MERGE ANALYSIS

Location:	SB Riverside Drive @ off-ramp from WB Crump
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2025 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	839	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	357	vph
Length of First Accel/Decel Lane	300	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	Yes	
Volume on Adjacent Ramp	293	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	250	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	839	357	293	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	233	99	81	v
Trucks and Buses	3	9	3	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.985	0.957	0.985	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	946	415	330	pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 946 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	1361	4500	No
v_{R12}	1361	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 14+ pc/mi/ln

Level of Service for Ramp-Freeway Junction Areas of Influence B

Speed in Ramp Influence Area, S_R 50.9 mph

WEAVING SECTIONS

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	AM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	4284	0	511	416	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	1190	0	142	116	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	5355	0	593	478	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.32	0.59
Speeds, S	49.17	43.22
Type of Operation is	Unconstrained	
Number of Lanes Required	0.96	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded See Note Maximum	Note
Weaving Volume, Vw	1071	2000	a
Section Capacity (pcphpl)	2142	2150	b
Volume Ratio, VR	0.17	0.45	c
Weaving Ratio, R	0.45	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	48.07	mph
Density, D	44.56	pc/mi/ln
Level of Service, LOS	F	

HCS: Weaving Areas Release 3.1c

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	PM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2025 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	3534	0	670	770	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	982	0	186	214	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4417	0	777	885	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.42	0.68
Speeds, S	46.72	41.76
Type of Operation is	Unconstrained	
Number of Lanes Required	1.30	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Volume, Vw	1662	2000	a
Section Capacity (pcphpl)	2026	2150	b
Volume Ratio, VR	0.27	0.45	c
Weaving Ratio, R	0.47	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:
a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average Space Mean Speed, S	45.25	mph
Density, D	44.78	pc/mi/ln
Level of Service, LOS	F	

HCS2000: Freeway Weaving Release 4.1d

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	AM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2025
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.20	
Weaving ratio, R	0.39	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	3377	199	598	388	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	938	55	166	108	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	4221	228	687	446	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
(Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.67	0.33
Weaving and non-weaving speeds, Si	41.88	48.95
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	0.89
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	47.33	mph
Weaving segment density, D	39.32	pc/mi/ln
Level of service, LOS	E	
Capacity of base condition, cb	6020	pc/h
Capacity as a 15-minute flow rate, c	5351	pc/h
Capacity as a full-hour volume, ch	4816	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1133	4000	a
Average flow rate (pcphpl)	1860	2250	b
Volume ratio, VR	0.20	0.80	c
Weaving ratio, R	0.39	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS2000: Freeway Weaving Release 4.1d

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	PM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2025
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.30	
Weaving ratio, R	0.26	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	2983	128	383	1068	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	829	36	106	297	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3728	147	440	1228	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
(Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.80	0.52
Weaving and non-weaving speeds, Si	40.04	44.66
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	1.23
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

eaving segment speed, S	43.16	mph
Weaving segment density, D	42.81	pc/mi/ln
Level of service, LOS	E	
Capacity of base condition, cb	5548	pc/h
Capacity as a 15-minute flow rate, c	4932	pc/h
Capacity as a full-hour volume, ch	4439	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1668	4000	a
Average flow rate (pcphpl)	1847	2250	b
Volume ratio, VR	0.30	0.80	c
Weaving ratio, R	0.26	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

b. Capacity constrained by basic freeway capacity.

c. Capacity occurs under constrained operating conditions.

d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.

f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).

g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.

h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.

i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

FREEWAY SECTIONS

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	5708	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1586	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2378	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2378	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	47.5	mph
Number of Lanes, N	3	
Density, D	50.1	pc/mi/ln
Level of Service, LOS	F	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4873	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1354	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2030	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2030	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	52.8	mph
Number of Lanes, N	3	
Density, D	38.4	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4435	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1232	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1848	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1848	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	54.1	mph
Number of Lanes, N	3	
Density, D	34.2	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	5057	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1405	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2107	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2107	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	52.0	mph
Number of Lanes, N	3	
Density, D	40.5	pc/mi/ln
Level of Service, LOS	E	

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	5211	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1448	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	3257	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3257	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	4974	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1382	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	3109	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3109	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	4562	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1267	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2851	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2851	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	4562	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1267	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2851	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2851	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS		

Overall results are not computed when free-flow speed is less than 55 mph.

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4797	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1333	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2998	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2998	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S		mph
Number of Lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS		

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	3927	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1091	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2454	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2454	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	45.6	mph
Number of Lanes, N	2	
Density, D	53.9	pc/mi/ln
Level of Service, LOS	F	

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4520	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1256	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2825	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2825	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S		mph
Number of Lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS		

HCS: Basic Freeway Sections Release 3.1c

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	WB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2025 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4587	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1274	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	2867	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Regular Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	2867	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S		mph
Number of Lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS		

SURFACE STREET INTERSECTIONS

HCS: Signalized Intersections Release 3.1c

Inter: Crump Blvd. and I-55 ramps
Analyst: Fischbach
Date: 2025 DHVs
E/W St: Crump Boulevard

City/St: Memphis, TN
Proj #: 10019
Period: AM Peak Hour
N/S St: ramp / connector road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	1	0	1	0	0	0	1	0
LGConfig				L	T		L				LT	
Volume				124	83		75			137	126	
Lane Width				12.0	12.0		12.0				12.0	
RTOR Vol												

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left	A			
Thru						Thru				
Right						Right				
Peds						Peds				
WB Left		A			SB	Left		A		
Thru		A				Thru		A		
Right						Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green		28.0					5.0	12.0		
Yellow		5.0					5.0	5.0		
All Red		0.0					0.0	0.0		

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	842	1805	0.16	0.467	9.3	A		
T	887	1900	0.10	0.467	9.0	A	9.2	A
Northbound								
L	150	1805	0.55	0.083	30.9	C		
							30.9	C
Southbound								
LT	370	1852	0.79	0.200	34.7	C	34.7	C

Intersection Delay = 24.5 (sec/veh) Intersection LOS = C

HCS: Signalized Intersections Release 3.1c

Inter: Crump Blvd. and I-55 ramps City/St: Memphis, TN
Analyst: Fischbach Proj #: 10019
Date: 2025 DHVs Period: PM Peak Hour
E/W St: Crump Boulevard N/S St: ramp / connector road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	1	0	1	0	0	0	1	0
LGConfig				L	T		L				LT	
Volume				66	80		284			53	64	
Lane Width				12.0	12.0		12.0				12.0	
RTOR Vol												

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left	A			
Thru						Thru				
Right						Right				
Peds						Peds				
WB Left		A			SB	Left		A		
Thru		A				Thru		A		
Right						Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green		20.0					15.0	10.0		
Yellow		5.0					5.0	5.0		
All Red		0.0					0.0	0.0		

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	602	1805	0.12	0.333	14.0	B		
T	633	1900	0.14	0.333	14.1	B	14.0	B
Northbound								
L	451	1805	0.70	0.250	25.4	C		
							25.4	C
Southbound								
LT	310	1858	0.42	0.167	23.3	C	23.3	C

Intersection Delay = 21.9 (sec/veh) Intersection LOS = C

HCS: Signalized Intersections Release 3.1c

Inter: Illinois Ave and I-55 ramp City/St: Memphis, TN
Analyst: Fischbach Proj #: 10019
Date: 2025 DHVs Period: AM Peak Hour
E/W St: Illinois Ave. extension N/S St: ramp from WB I-55

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	0	0	0
LGConfig		T			T						LR	
Volume		126			250					492		330
Lane Width		12.0			12.0						12.0	
RTOR Vol												0

Duration .1.00 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left					NB	Left				
	Thru		A				Thru				
	Right						Right				
	Peds						Peds				
WB	Left					SB	Left	A			
	Thru		A				Thru				
	Right						Right	A			
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green			10.0					40.0			
Yellow			5.0					5.0			
All Red			0.0					0.0			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	317	1900	0.44	0.167	23.5	C	23.5	C
Westbound								
T	317	1900	0.88	0.167	53.3	D	53.3	D
Northbound								
Southbound								
LR	1040	1560	0.88	0.667	17.8	B	17.8	B

Intersection Delay = 25.8 (sec/veh) Intersection LOS = C

HCS: Signalized Intersections Release 3.1c

Inter: Illinois Ave and I-55 ramp
Analyst: Fischbach
Date: 2025 DHVs
E/W St: Illinois Ave. extension

City/St: Memphis, TN
Proj #: 10019
Period: PM Peak Hour
N/S St: ramp from WB I-55

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	0	0	0
LGConfig		T			T						LR	
Volume		155			130					501		60
Lane Width		12.0			12.0						12.0	
RTOR Vol												0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru		A			Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left	A		
Thru		A			Thru			
Right					Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		15.0				35.0		
Yellow		5.0				5.0		
All Red		0.0				0.0		

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	475	1900	0.36	0.250	19.0	B	19.0	B
Westbound								
T	475	1900	0.30	0.250	18.6	B	18.6	B
Northbound								
Southbound								
LR	940	1611	0.66	0.583	10.3	B	10.3	B

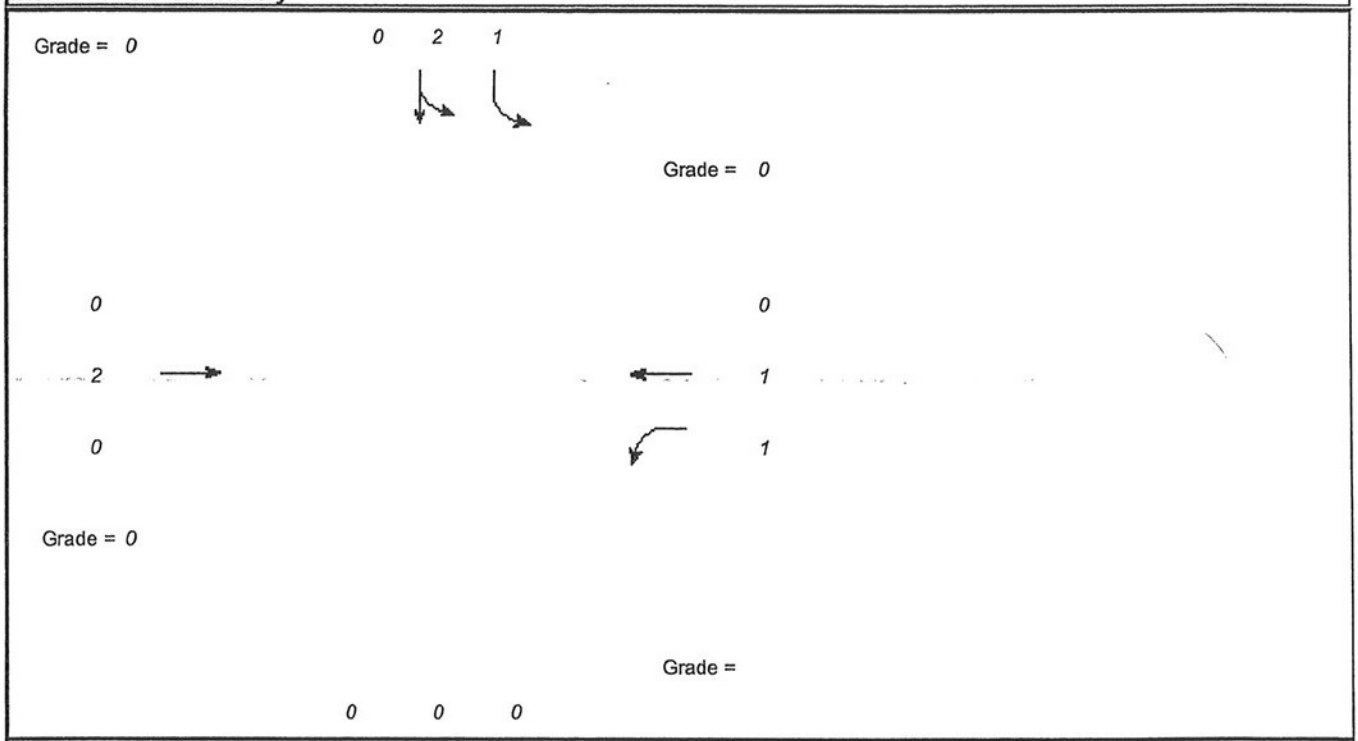
Intersection Delay = 13.2 (sec/veh) Intersection LOS = B

INPUT WORKSHEET

General Information		Site Information	
Analyst	*TMC*	Intersection	*PROPOSED AT-GRADE*
Agency or Co.	*T&M*	Area Type	*CBD or Similar*
Date Performed	*3/13/2002*	Jurisdiction	*MEMPHIS*
Time Period	*AM*	Analysis Year	*2005*

Project Description *ALTERNATE D*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)		*436*		*320*	*65*					*91*	*158*	
% Heavy veh		*0*		*0*	*0*					*0*	*0*	
PHF		*0.90*		*0.90*	*0.90*					*0.90*	*0.90*	
Actuated (P/A)		*P*		*P*	*P*					*P*	*P*	
Startup lost time		*2.0*		*2.0*	*2.0*					*2.0*	*2.0*	
Ext. eff. green		*2.0*		*2.0*	*2.0*					*2.0*	*2.0*	
Arrival type		*3*		*3*	*3*					*3*	*3*	
Unit Extension		*3.0*		*3.0*	*3.0*					*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*						*0*					
Lane Width		*12.0*		*12.0*	*12.0*					*12.0*	*12.0*	
Parking (Y or N)	*N*		*N*	*N*		*N*	*N*		*N*	*N*		*N*
Parking/hr												
Bus stops/hr		*0*		*0*	*0*					*0*	*0*	

	EB Only	WB Only	03	04	SB Only	06	07	08
Timing	G = *16.0*	G = *28.0*	G =	G =	G = *17.0*	G =	G =	G =
	Y = *3*	Y = *3*	Y =	Y =	Y = *3*	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25* Cycle Length C = *70.0*

CAPACITY AND LOS WORKSHEET

General Information

Project Description *ALTERNATE D*

Capacity Analysis

	EB		WB		NB		SB	
Lane group	T		L	T			L	LT
Adj. flow rate	484		356	72			101	176
Satflow rate	3249		1624	1710			1624	3249
Lost time	2.0		2.0	2.0			2.0	2.0
Green ratio	0.23		0.40	0.40			0.24	0.24
Lane group cap.	743		650	684			394	789
v/c ratio	0.65		0.55	0.11			0.26	0.22
Flow ratio	0.15		0.22	0.04			0.06	0.05
Crit. lane group	Y		Y	N			Y	N
Sum flow ratios	0.43							
Lost time/cycle	9.00							
Critical v/c ratio	0.49							

Lane Group Capacity, Control Delay, and LOS Determination

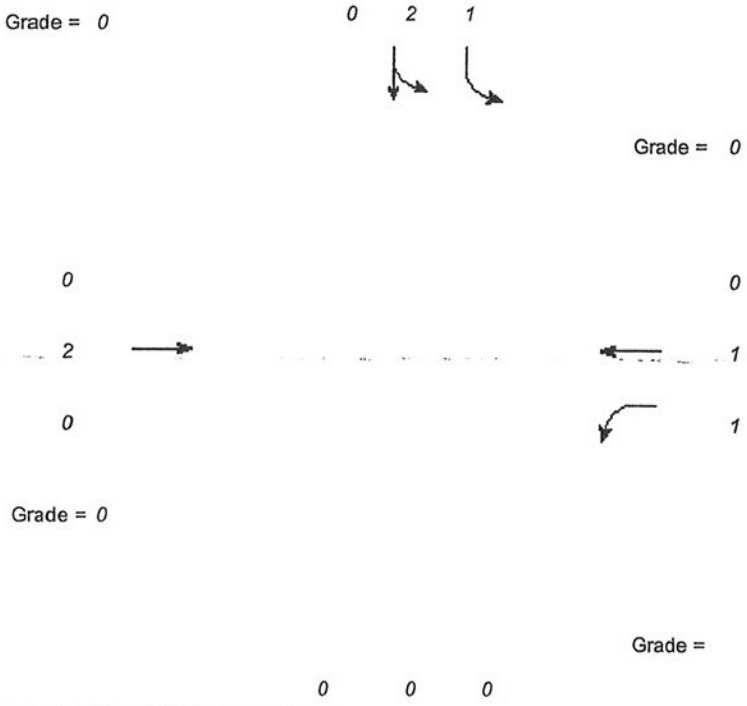
	EB		WB		NB		SB	
Lane group	T		L	T			L	LT
Adj. flow rate	484		356	72			101	176
Lane group cap.	743		650	684			394	789
v/c ratio	0.65		0.55	0.11			0.26	0.22
Green ratio	0.23		0.40	0.40			0.24	0.24
Unif. delay d1	24.5		16.1	13.2			21.4	21.2
Delay factor k	0.50		0.50	0.50			0.50	0.50
Increm. delay d2	4.4		3.3	0.3			1.6	0.7
PF factor	1.000		1.000	1.000			1.000	1.000
Control delay	28.9		19.4	13.5			23.0	21.9
Lane group LOS	C		B	B			C	C
Apprch. delay	28.9		18.4				22.3	
Approach LOS	C		B				C	
Intersec. delay	23.6		Intersection LOS				C	

INPUT WORKSHEET

General Information		Site Information	
Analyst	TMC	Intersection	PROPOSED AT-GRADE
Agency or Co.	T&M	Area Type	CBD or Similar
Date Performed	3/13/2002	Jurisdiction	MEMPHIS
Time Period	PM	Analysis Year	2005

Project Description *ALTERNATE D*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)		340		438	185					35	532	
% Heavy veh		0		0	0					0	0	
PHF		0.90		0.90	0.90					0.90	0.90	
Actuated (P/A)		P		P	P					P	P	
Startup lost time		2.0		2.0	2.0					2.0	2.0	
Ext. eff. green		2.0		2.0	2.0					2.0	2.0	
Arrival type		3		3	3					3	3	
Unit Extension		3.0		3.0	3.0					3.0	3.0	
Ped/Bike/RTOR Volume	0						0					
Lane Width		12.0		12.0	12.0					12.0	12.0	
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr		0		0	0					0	0	

	EB Only	WB Only	03	04	SB Only	06	07	08
Timing	G = 16.0	G = 26.0	G =	G =	G = 19.0	G =	G =	G =
	Y = 3	Y = 3	Y =	Y =	Y = 3	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

CAPACITY AND LOS WORKSHEET

General Information

Project Description *ALTERNATE D*

Capacity Analysis

	EB			WB			NB			SB		
Lane group		*T*		*L*	*T*					*L*	*LT*	
Adj. flow rate		*378*		*487*	*206*					*39*	*591*	
Satflow rate		*3249*		*1624*	*1710*					*1624*	*3249*	
Lost time		*2.0*		*2.0*	*2.0*					*2.0*	*2.0*	
Green ratio		*0.23*		*0.37*	*0.37*					*0.27*	*0.27*	
Lane group cap.		*743*		*603*	*635*					*441*	*882*	
v/c ratio		*0.51*		*0.81*	*0.32*					*0.09*	*0.67*	
Flow ratio		*0.12*		*0.30*	*0.12*					*0.02*	*0.18*	
Crit. lane group		*Y*		*Y*	*N*					*N*	*Y*	
Sum flow ratios	*0.60*											
Lost time/cycle	*9.00*											
Critical v/c ratio	*0.69*											

Lane Group Capacity, Control Delay, and LOS Determination

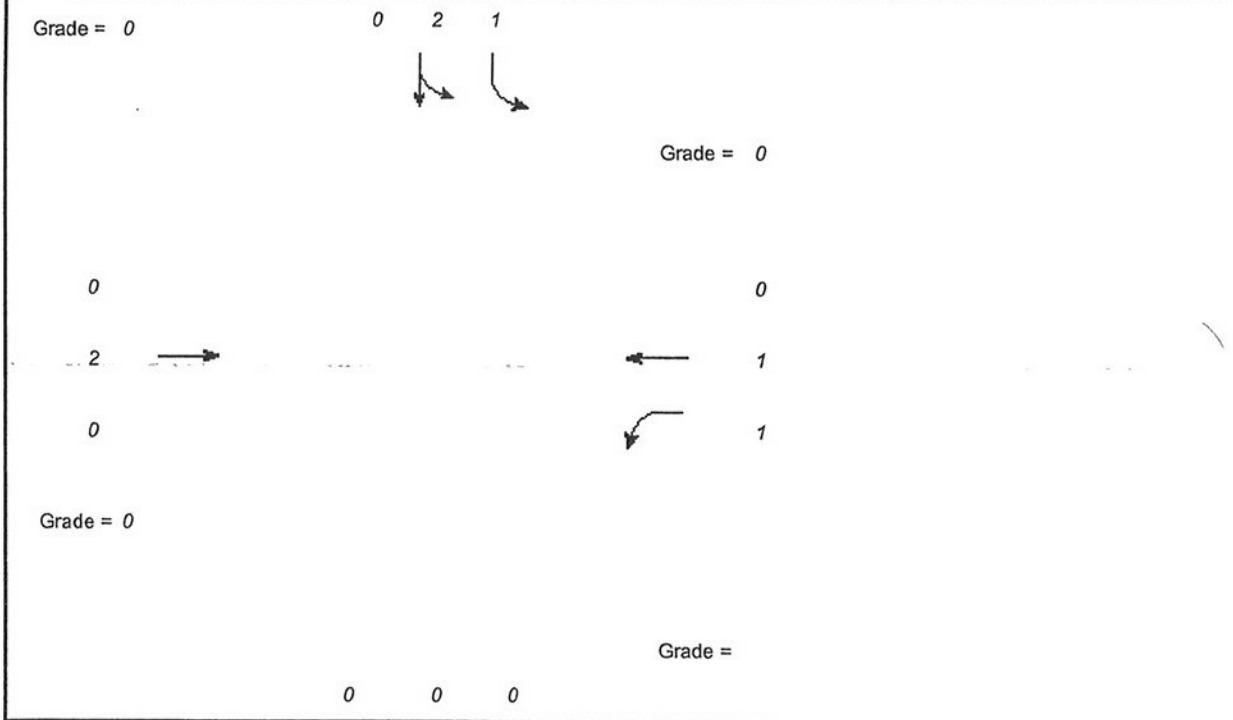
	EB			WB			NB			SB		
Lane group		*T*		*L*	*T*					*L*	*LT*	
Adj. flow rate		*378*		*487*	*206*					*39*	*591*	
Lane group cap.		*743*		*603*	*635*					*441*	*882*	
v/c ratio		*0.51*		*0.81*	*0.32*					*0.09*	*0.67*	
Green ratio		*0.23*		*0.37*	*0.37*					*0.27*	*0.27*	
Unif. delay d1		*23.6*		*19.8*	*15.7*					*19.0*	*22.7*	
Delay factor k		*0.50*		*0.50*	*0.50*					*0.50*	*0.50*	
Increm. delay d2		*2.5*		*11.1*	*1.4*					*0.4*	*4.0*	
PF factor		*1.000*		*1.000*	*1.000*					*1.000*	*1.000*	
Control delay		*26.1*		*30.9*	*17.1*					*19.4*	*26.7*	
Lane group LOS		*C*		*C*	*B*					*B*	*C*	
Apprch. delay	*26.1*			*26.8*						*26.3*		
Approach LOS	*C*			*C*						*C*		
Intersec. delay	*26.4*			Intersection LOS						*C*		

INPUT WORKSHEET

General Information		Site Information	
Analyst	*TMC*	Intersection	*PROPOSED AT-GRADE*
Agency or Co.	*T&M*	Area Type	*CBD or Similar*
Date Performed	*3/13/2002*	Jurisdiction	*MEMPHIS*
Time Period	*AM*	Analysis Year	*2025*

Project Description *ALTERNATE D*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)		*653*		*480*	*97*					*136*	*238*	
% Heavy veh		*0*		*0*	*0*					*0*	*0*	
PHF		*0.90*		*0.90*	*0.90*					*0.90*	*0.90*	
Actuated (P/A)		*P*		*P*	*P*					*P*	*P*	
Startup lost time		*2.0*		*2.0*	*2.0*					*2.0*	*2.0*	
Ext. eff. green		*2.0*		*2.0*	*2.0*					*2.0*	*2.0*	
Arrival type		*3*		*3*	*3*					*3*	*3*	
Unit Extension		*3.0*		*3.0*	*3.0*					*3.0*	*3.0*	
Ped/Bike/RTOR Volume							*0*					
Lane Width		*12.0*		*12.0*	*12.0*					*12.0*	*12.0*	
Parking (Y or N)	*N*		*N*	*N*		*N*	*N*		*N*	*N*		*N*
Parking/hr												
Bus stops/hr		*0*		*0*	*0*					*0*	*0*	

	EB Only	WB Only	03	04	SB Only	06	07	08
Timing	G = *16.0*	G = *28.0*	G =	G =	G = *17.0*	G =	G =	G =
	Y = *3*	Y = *3*	Y =	Y =	Y = *3*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*						Cycle Length C = *70.0*		

CAPACITY AND LOS WORKSHEET

General Information

Project Description *ALTERNATE D*

Capacity Analysis

	EB			WB					NB					SB				
Lane group		*T*			*L*	*T*								*L*	*LT*			
Adj. flow rate		*726*			*533*	*108*								*151*	*264*			
Satflow rate		*3249*			*1624*	*1710*								*1624*	*3249*			
Lost time		*2.0*			*2.0*	*2.0*								*2.0*	*2.0*			
Green ratio		*0.23*			*0.40*	*0.40*								*0.24*	*0.24*			
Lane group cap.		*743*			*650*	*684*								*394*	*789*			
v/c ratio		*0.98*			*0.82*	*0.16*								*0.38*	*0.33*			
Flow ratio		*0.22*			*0.33*	*0.06*								*0.09*	*0.08*			
Crit. lane group		*Y*			*Y*	*N*								*Y*	*N*			
Sum flow ratios	*0.64*																	
Lost time/cycle	*9.00*																	
Critical v/c ratio	*0.74*																	

Lane Group Capacity, Control Delay, and LOS Determination

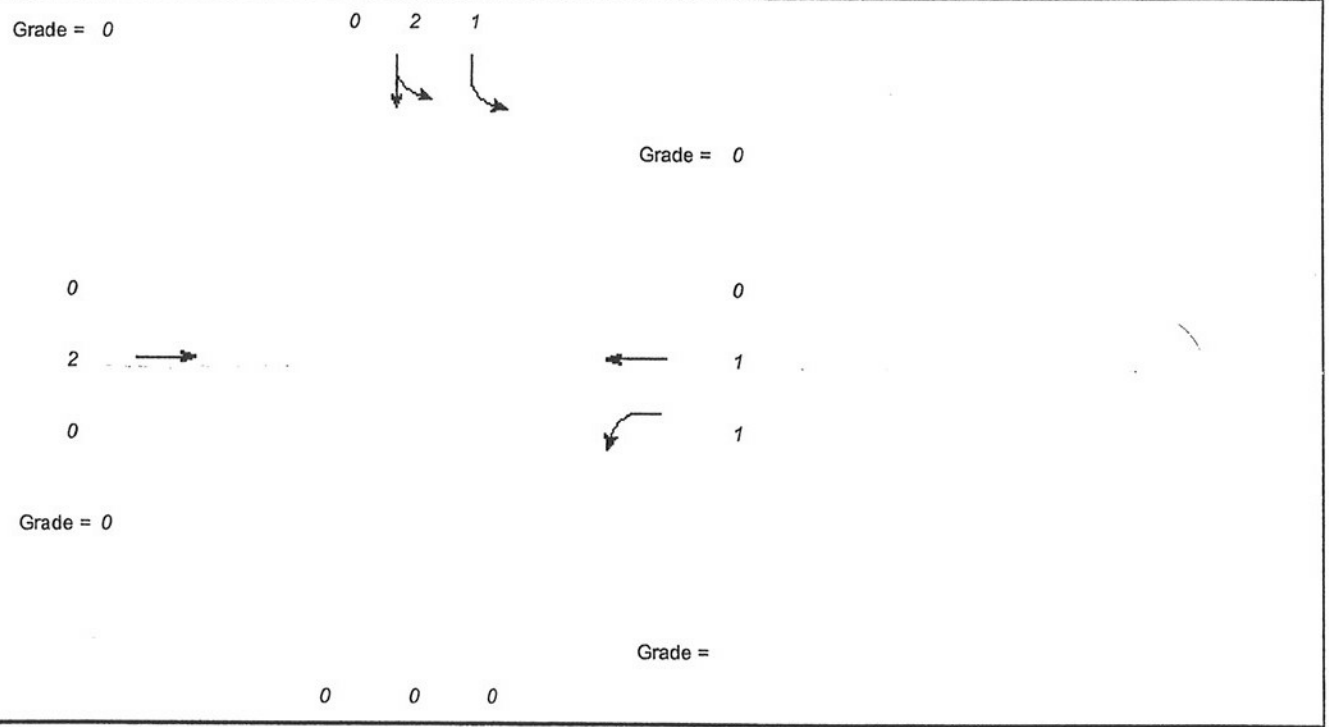
	EB			WB					NB					SB				
Lane group		*T*			*L*	*T*								*L*	*LT*			
Adj. flow rate		*726*			*533*	*108*								*151*	*264*			
Lane group cap.		*743*			*650*	*684*								*394*	*789*			
v/c ratio		*0.98*			*0.82*	*0.16*								*0.38*	*0.33*			
Green ratio		*0.23*			*0.40*	*0.40*								*0.24*	*0.24*			
Unif. delay d1		*26.8*			*18.8*	*13.4*								*22.1*	*21.8*			
Delay factor k		*0.50*			*0.50*	*0.50*								*0.50*	*0.50*			
Increm. delay d2		*27.9*			*11.1*	*0.5*								*2.8*	*1.1*			
PF factor		*1.000*			*1.000*	*1.000*								*1.000*	*1.000*			
Control delay		*54.7*			*29.8*	*13.9*								*24.9*	*23.0*			
Lane group LOS		*D*			*C*	*B*								*C*	*C*			
Apprch. delay	*54.7*			*27.2*						*23.7*								
Approach LOS	*D*			*C*						*C*								
Intersec. delay	*37.6*			Intersection LOS						*D*								

INPUT WORKSHEET

General Information		Site Information	
Analyst	TMC	Intersection	PROPOSED AT-GRADE
Agency or Co.	T&M	Area Type	CBD or Similar
Date Performed	3/13/2002	Jurisdiction	MEMPHIS
Time Period	PM	Analysis Year	2025

Project Description *ALTERNATE D*

Intersection Geometry



Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)		513		658	279					52	798	
% Heavy veh		0		0	0					0	0	
PHF		0.90		0.90	0.90					0.90	0.90	
Actuated (P/A)		P		P	P					P	P	
Startup lost time		2.0		2.0	2.0					2.0	2.0	
Ext. eff. green		2.0		2.0	2.0					2.0	2.0	
Arrival type		3		3	3					3	3	
Unit Extension		3.0		3.0	3.0					3.0	3.0	
Ped/Bike/RTOR Volume							0					
Lane Width		12.0		12.0	12.0					12.0	12.0	
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr		0		0	0					0	0	

	EB Only	WB Only	03	04	SB Only	06	07	08
Timing	G = 12.0	G = 30.0	G =	G =	G = 19.0	G =	G =	G =
	Y = 3	Y = 3	Y =	Y =	Y = 3	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

CAPACITY AND LOS WORKSHEET

General Information

Project Description *ALTERNATE D*

Capacity Analysis

	EB			WB			NB			SB		
Lane group		T		L	T					L	LT	
Adj. flow rate		570		731	310					58	887	
Satflow rate		3249		1624	1710					1624	3249	
Lost time		2.0		2.0	2.0					2.0	2.0	
Green ratio		0.17		0.43	0.43					0.27	0.27	
Lane group cap.		557		696	733					441	882	
v/c ratio		1.02		1.05	0.42					0.13	1.01	
Flow ratio		0.18		0.45	0.18					0.04	0.27	
Crit. lane group		Y		Y	N					N	Y	
Sum flow ratios	0.90											
Lost time/cycle	9.00											
Critical v/c ratio	1.03											

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Lane group		T		L	T					L	LT	
Adj. flow rate		570		731	310					58	887	
Lane group cap.		557		696	733					441	882	
v/c ratio		1.02		1.05	0.42					0.13	1.01	
Green ratio		0.17		0.43	0.43					0.27	0.27	
Unif. delay d1		29.0		20.0	14.0					19.3	25.5	
Delay factor k		0.50		0.50	0.50					0.50	0.50	
Increm. delay d2		44.2		48.1	1.8					0.6	31.7	
PF factor		1.000		1.000	1.000					1.000	1.000	
Control delay		73.2		68.1	15.7					19.9	57.2	
Lane group LOS		E		E	B					B	E	
Apprch. delay	73.2			52.5						54.9		
Approach LOS	E			D						D		
Intersec. delay	58.0			Intersection LOS						E		

APPENDIX E

CAPACITY ANALYSIS: SERVICE LIFE

SERVICE LIFE ANALYSES

HCS: Ramps and Ramp Junctions Release 3.2

DIVERGE ANALYSIS

Location:	I-55 @ Illinois (EB off)
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2013 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3142	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	449	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp	0	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	1000	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3142	449	0	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	873	125	0	v
Trucks and Buses	25	4	0	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	1.000	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3928	509	0	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v - v_F) P_{FD}$ = 3928 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3928	4500	No
v_{12}	3928	4400	No
$v_{FO} = v - v_R$	3419	4500	No
v_R	509	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 34+ pc/mi/ln
Level of Service for Ramp-Freeway Junction Areas of Influence D
Speed in Ramp Influence Area, S 49 mph

HCS: Ramps and Ramp Junctions Release 3.2

DIVERGE ANALYSIS

Location:	I-55 @ Illinois (EB off)
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2014 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Diverge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3208	vph
Off Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	459	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane	500	ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp	0	vph
Position of Adjacent Ramp	Upstream	
Type of Adjacent Ramp	On	
Distance to Adjacent Ramp	1000	ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Volume, V (vph)	3208	459	0	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	
Peak 15-min Volume, v15	891	128	0	v
Trucks and Buses	25	4	0	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.889	0.980	1.000	
Driver Population Adjustment, fP	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4010	520	0	pcph

ANALYSIS and RESULTS of DIVERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FD} = 1.000 Using Equation 6
Flow in Lanes 1 and 2, $v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4010 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4010	4500	No
v_{12}	4010	4400	No
$v_{FO} = v_F - v_R$	3490	4500	No
v_R	520	2000	No

Level of Service Operation (if not LOS F):
Density, $D = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 35+ pc/mi/ln
Level of Service for Ramp-Freeway Junction Areas of Influence E
Speed in Ramp Influence Area, S 49 mph

HCS: Ramps and Ramp Junctions Release 3.2

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp fr. Riversid
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2008 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3090	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	150	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	3090	150		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	858	42		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	3863	170		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3863 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	4033	4500	No
v_{R12}	4033	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 34+ pc/mi/ln
Level of Service for Ramp-Freeway Junction Areas of Influence D
Speed in Ramp Influence Area, S 48.3 mph

HCS: Ramps and Ramp Junctions Release 3.2

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp fr. Riversid
Analyst:	Fischbach
Analysis Time Period:	AM Peak - proposed network
Date Performed:	2009 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	3161	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	153	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	3161	153		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	878	43		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	3951	173		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3951 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	4124	4500	No
v_{R12}	4124	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_R - 0.00627\ L_A$ = 35+ pc/mi/ln
Level of Service for Ramp-Freeway Junction Areas of Influence E
Speed in Ramp Influence Area, S_R 48.1 mph

HCS: Ramps and Ramp Junctions Release 3.2

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp fr Riverside
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2008 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2901	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	387	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2901	387		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	806	108		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	3626	439		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3626 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	4065	4500	No
v_{R12}	4065	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 34+ pc/mi/ln
Level of Service for Ramp-Freeway Junction Areas of Influence D
Speed in Ramp Influence Area, S_R 48.2 mph

HCS: Ramps and Ramp Junctions Release 3.2

MERGE ANALYSIS

Location:	WB I-55 @ on-ramp fr Riverside
Analyst:	Fischbach
Analysis Time Period:	PM Peak - proposed network
Date Performed:	2009 DHVs

FREEWAY-RAMP COMPONENTS AND CHARACTERISTICS

Type of Analysis	Merge	
Freeway Data:		
Number of Lanes in Freeway	2	
Free-Flow Speed on Freeway	55.0	mph
Volume on Freeway	2968	vph
On Ramp Data:		
Side of Freeway	Right	
Number of Lanes in Ramp	1	
Free-Flow Speed on Ramp	35.0	mph
Volume on Ramp	396	vph
Length of First Accel/Decel Lane	400	ft
Length of Second Accel/Decel Lane		ft
Adjacent Ramp Data if one exists:		
Does adjacent ramp exist?	No	
Volume on Adjacent Ramp		vph
Position of Adjacent Ramp		
Type of Adjacent Ramp		
Distance to Adjacent Ramp		ft

VOLUME ADJUSTMENT

Junction Components	Freeway	Ramp	Adjacent Ramp	
Terrain Type	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Volume, V (vph)	2968	396		vph
Peak-Hour Factor, PHF	0.90	0.90		
Peak 15-min Volume, v15	824	110		v
Trucks and Buses	25	4		%
Trucks and Buses PCE, ET	1.5	1.5		
Recreational Vehicles	0	0		%
Recreational Vehicle PCE, ER	1.2	1.2		
Heavy Vehicle Adjustment, fHV	0.889	0.980		
Driver Population Adjustment, fP	1.00	1.00		
Adjusted Flow Rate, vp	3710	449		pcph

ANALYSIS and RESULTS of MERGE AREAS

Estimation of Flow entering Lanes 1 and 2:
Proportion of Freeway Vehicles
in Lanes 1 and 2, P_{FM} = 1.000 Using Equation 1
Flow in Lanes 1 and 2, $v_{12} = v_F (P_{FM})$ = 3710 pcph

Capacity Checks:

	Actual	Maximum	LOS F?
v_{FO}	4159	4500	No
v_{R12}	4159	4600	No

Level of Service Operation (if not LOS F):
Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{R12} - 0.00627\ L_A$ = 35+ pc/mi/ln
Level of Service for Ramp-Freeway Junction Areas of Influence E
Speed in Ramp Influence Area, S 47.9 mph

HCS: Weaving Areas Release 3.2

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	AM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2013 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	3366	0	409	394	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	935	0	114	109	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4207	0	474	453	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.25	0.49
Speeds, S	51.05	45.25
Type of Operation is	Unconstrained	
Number of Lanes Required	0.99	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Flow Rate, Vw	927	2000	a
Average Flow Rate (pcphpl)	1711	2150	b
Volume Ratio, VR	0.18	0.45	c
Weaving Ratio, R	0.49	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:

a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average (Speed Mean) Speed, S	49.90	mph
Density, D	34.30	pc/mi/ln
Level of Service, LOS	D	

HCS: Weaving Areas Release 3.2

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	AM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2014 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	3436	0	418	402	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	954	0	116	112	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	4295	0	485	462	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.26	0.50
Speeds, S	50.85	45.05
Type of Operation is	Unconstrained	
Number of Lanes Required	0.99	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Flow Rate, Vw	947	2000	a
Average Flow Rate (pcphpl)	1747	2150	b
Volume Ratio, VR	0.18	0.45	c
Weaving Ratio, R	0.49	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:

a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average (Speed Mean) Speed, S	49.70	mph
Density, D	35.16	pc/mi/ln
Level of Service, LOS	E	

HCS: Weaving Areas Release 3.2

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	PM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2013 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2716	0	536	727	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	754	0	149	202	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3395	0	622	836	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.34	0.57
Speeds, S	48.59	43.66
Type of Operation is	Unconstrained	
Number of Lanes Required	1.34	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Flow Rate, Vw	1458	2000	a
Average Flow Rate (pcphpl)	1617	2150	b
Volume Ratio, VR	0.30	0.45	c
Weaving Ratio, R	0.43	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:

a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average (Speed Mean) Speed, S	47.00	mph
Density, D	34.42	pc/mi/ln
Level of Service, LOS	D	

HCS: Weaving Areas Release 3.2

OPERATIONAL ANALYSIS

Location:	NB I-55 btw Mc and Crump
Analysis Time Period:	PM Peak - proposed network
Analyst:	Fischbach
Date Performed:	2014 DHVs

ROADWAY CONDITIONS

Type of Section	A	
Number of Lanes in Section	3	
Length of Weaving Section	2500	ft
Free-Flow Speed, FFS	55	mph
Terrain Type	Level	
Grade		%
Length		mi

VOLUME COMPONENTS

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V (vph)	2773	0	548	743	vph
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min Volume, v15	770	0	152	206	v
Trucks and Buses	25	7	9	7	%
Trucks and Buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational Vehicles	0	0	0	0	%
Recreational Vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy Vehicle Adjustment, fHV	0.89	0.97	0.96	0.97	
Driver Population Adjustment, fP	1.00	1.00	1.00	1.00	
Adjusted Flow Rate, vp	3466	0	636	854	pcph

ANALYSIS

Type of Weaving Section	A	Multilane or C-D
	Non-Weaving	Weaving
Intensity Factor, W	0.35	0.58
Speeds, S	48.35	43.44
Type of Operation is	Unconstrained	
Number of Lanes Required	1.35	
Maximum Number of Lanes	1.40	

	Analyzed	From HCM Table 4-5 If Max Exceeded Maximum	See Note Note
Weaving Flow Rate, Vw	1490	2000	a
Average Flow Rate (pcphpl)	1652	2150	b
Volume Ratio, VR	0.30	0.45	c
Weaving Ratio, R	0.43	0.50	d
Weaving Length (ft)	2500	2000	e

Notes:

a. Section likely to fail at higher weaving flows.
b. Section likely to fail at higher per-lane flows.
c. Section will likely operate at lower speeds than predicted if VR limit is exceeded.
d. Section will likely operate at lower speeds than predicted if R limit is exceeded.
e. When length exceeds these limits, merge and diverge are treated as isolated junctions and analyzed accordingly (HCM Chapter 5, HCS Ramps.)

Average (Speed Mean) Speed, S	46.76	mph
Density, D	35.33	pc/mi/ln
Level of Service, LOS	E	

HCS2000: Freeway Weaving Release 4.1d

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	AM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2019
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.20	
Weaving ratio, R	0.39	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	3039	179	538	349	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	844	50	149	97	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3798	205	618	401	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
(Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.63	0.29
Weaving and non-weaving speeds, Si	42.67	49.81
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	0.88
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	48.17	mph
Weaving segment density, D	34.75	pc/mi/ln
Level of service, LOS	D	
Capacity of base condition, cb	6020	pc/h
Capacity as a 15-minute flow rate, c	5351	pc/h
Capacity as a full-hour volume, ch	4816	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1019	4000	a
Average flow rate (pcphpl)	1674	2250	b
Volume ratio, VR	0.20	0.80	c
Weaving ratio, R	0.39	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	AM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2020
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.20	
Weaving ratio, R	0.39	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	3096	182	548	356	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	860	51	152	99	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3870	209	630	409	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
(Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.63	0.30
Weaving and non-weaving speeds, Si	42.53	49.65
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	0.89
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	48.02	mph
Weaving segment density, D	35.53	pc/mi/ln
Level of service, LOS	E	
Capacity of base condition, cb	6019	pc/h
Capacity as a 15-minute flow rate, c	5350	pc/h
Capacity as a full-hour volume, ch	4815	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1039	4000	a
Average flow rate (pcphpl)	1706	2250	b
Volume ratio, VR	0.20	0.80	c
Weaving ratio, R	0.39	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS2000: Freeway Weaving Release 4.1d

Phone: Fax:
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Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	PM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2015
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.30	
Weaving ratio, R	0.26	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	2486	107	320	890	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	691	30	89	247	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3107	123	367	1023	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.70	0.43
Weaving and non-weaving speeds, Si	41.45	46.45
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	1.21
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	44.82	mph
Weaving segment density, D	34.36	pc/mi/ln
Level of service, LOS	D	
Capacity of base condition, cb	5548	pc/h
Capacity as a 15-minute flow rate, c	4932	pc/h
Capacity as a full-hour volume, ch	4439	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1390	4000	a
Average flow rate (pcphpl)	1540	2250	b
Volume ratio, VR	0.30	0.80	c
Weaving ratio, R	0.26	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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Phone: Fax:
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Operational Analysis

Analyst:	Brady Griggs
Agency/Co.:	Clinard Engineering Associates
Date Performed:	4/24/2006
Analysis Time Period:	PM Peak
Freeway/Dir of Travel:	I-55 Southbound
Weaving Location:	between Crump & McLemore
Jurisdiction:	
Analysis Year:	2016
Description:	I-55 Interchange Modification Study

Inputs

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1200	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	
Volume ratio, VR	0.30	
Weaving ratio, R	0.26	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	2535	109	326	908	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	704	30	91	252	v
Trucks and buses	25	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3168	125	374	1044	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.71	0.44
Weaving and non-weaving speeds, Si	41.29	46.26
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	1.21
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	44.64	mph
Weaving segment density, D	35.18	pc/mi/ln
Level of service, LOS	E	
Capacity of base condition, cb	5548	pc/h
Capacity as a 15-minute flow rate, c	4932	pc/h
Capacity as a full-hour volume, ch	4439	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1418	4000	a
Average flow rate (pcphpl)	1570	2250	b
Volume ratio, VR	0.30	0.80	c
Weaving ratio, R	0.26	N/A	d
Weaving length (ft)	1200	2500	e

Notes:

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2008 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4155	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1154	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1731	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1731	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	31.5	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2009 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4252	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1181	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1772	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1772	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	54.4	mph
Number of Lanes, N	3	
Density, D	32.6	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2016 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4127	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1146	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1720	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1720	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	31.3	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	NB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2017 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4208	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1169	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1753	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1753	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	54.5	mph
Number of Lanes, N	3	
Density, D	32.2	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2020 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4176	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1160	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1740	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1740	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	31.6	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	AM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2021 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4252	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1181	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1772	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1772	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	54.4	mph
Number of Lanes, N	3	
Density, D	32.6	pc/mi/ln
Level of Service, LOS	E	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2013 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4192	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1164	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1747	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1747	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	3	
Density, D	31.8	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	SB I-55
From/To:	south of McLemore Avenue
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2014 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	4279	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	1189	v
Number of Lanes, N	3	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1783	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	3	
Number of Lanes Adjustment, fN	3.0	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1783	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	54.4	mph
Number of Lanes, N	3	
Density, D	32.8	pc/mi/ln
Level of Service, LOS	E	

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2005 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3474	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	965	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2171	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2171	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	51.8	mi/h
Number of lanes, N	2	
Density, D	41.9	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	Aprill 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	NB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2007 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3482	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	967	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2176	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2176	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	51.7	mi/h
Number of lanes, N	2	
Density, D	42.1	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2011 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3497	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	971	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2186	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2186	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	51.5	mi/h
Number of lanes, N	2	
Density, D	42.4	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1

Operational Analysis

Analyst:	GLF
Agency or Company:	Fischbach
Date Performed:	April 2002
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	SB I-55
From/To:	btw McLemore Av and Crump Blvd
Jurisdiction:	Memphis, TN
Analysis Year:	2011 DHVs - proposed network
Description:	

Flow Inputs and Adjustments

Volume, V	3497	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	971	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.889	
Driver population factor, vp	1.00	
Flow rate, vp	2186	pc/h

Speed Inputs and Adjustments

Lane width	12.0	m
Right-shoulder lateral clearance	6.0	m
Interchange density	1.00	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	55.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	2.5	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	55.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2186	pc/h/ln
Free-flow speed, FFS	55.0	mi/h
Average passenger-car speed, S	51.5	mi/h
Number of lanes, N	2	
Density, D	42.4	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2007 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	2749	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	764	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1718	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1718	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	55.0	mph
Number of Lanes, N	2	
Density, D	31.2	pc/mi/ln
Level of Service, LOS	D	

HCS: Basic Freeway Sections Release 3.2

OPERATIONAL ANALYSIS

Highway/Dir. Travel:	EB I-55
From/To:	west of Alston / Delaware
Agency or Company:	Fischbach
Analyst:	GLF
Analysis Time Period:	PM Peak Hour
Jurisdiction:	Memphis, TN
Analysis Year:	2008 DHVs - proposed network
Date Performed:	June 2000

VOLUME

Volume, V	2815	vph
Peak-Hour Factor, PHF	0.90	
Peak 15-min Volume, v15	782	v
Number of Lanes, N	2	
Terrain Type	Level	
Grade	0.00	%
Segment Length	0.00	mi
Trucks and Buses	25	%
Trucks and Buses PCE, ET	1.5	
Recreational Vehicles	0	%
Recreational Vehicle PCE, ER	1.2	
Heavy Vehicle Adjustment, fHV	0.89	
Driver Population Adjustment, fP	1.00	
Adjusted Flow Rate, vp	1759	pcphpl

FREE-FLOW SPEED

Free-Flow Speed:	Ideal	
FFS or FFSi	55.0	mph
Lane Width	12.0	ft
Lane Width Adjustment, fLW	0.0	mph
Right-Shoulder Lateral Clearance	6.0	ft
Lateral Clearance Adjustment, fLC	0.0	mph
Interchange Density	1.00	interchange/mi
Interchange Density Adjustment, fID	2.5	mph
Number of Lanes, N	2	
Number of Lanes Adjustment, fN	4.5	mph
Adjusted Free-Flow Speed	55.0	mph
	Urban Freeway	

Adjusted free-flow speed cannot be less than 55 mph.

RESULTS

Adjusted Flow Rate, vp	1759	pcphpl
Adjusted Free-Flow Speed, FFS	55.0	mph
Average Passenger-Car Speed, S	54.5	mph
Number of Lanes, N	2	
Density, D	32.3	pc/mi/ln
Level of Service, LOS	E	

APPENDIX F

COST ESTIMATES

COST DATA SHEET

Alternate A

PROJECT: I-55 & U.S. 64 (Crump Blvd.) Interchange Modification Study
LOCATION: Memphis, Shelby County, Tennessee
LENGTH: 0.75 Miles
CROSS SECTION: 4 Lane Interstate

RIGHT-OF-WAY				
Land, Improvements & Damages	(# Acres	6.20)	$2,679,000	
Incidentals	(# Tracts	9)	$23,000	
Relocation Payments	(Residences	7)	$70,000	
	(Businesses	2)	$200,000	
	(Non-Profits	0)		
Total Right-Of-Way Cost				**$2,972,000**
UTILITY RELOCATION				
Reimbursable			$0	
Non-Reimbursable			$331,000	
Total Utility Adjustment Cost				**$331,000**
CONSTRUCTION				
Clear and Grubbing			$27,000	
Earthwork			$970,000	
Pavement Removal			$850,000	
Drainage (Erosion Control =	$280,000)		$570,000	
Structures (Preserv'n/Demol'n =	$88,000)		$2,776,000	
Railroad Crossing			$0	
Paving			$1,455,000	
Retaining Walls			$880,000	
Maintenance of Traffic			$400,000	
Topsoil			$20,000	
Seeding			$9,000	
Sodding			$49,000	
Signing			$200,000	
Signalization			$150,000	
Fence			$45,000	
Guardrail			$216,000	
Rip-rap or Slope Protection			$75,000	
Other Construction Items (8.5%)			$503,000	
Mobilization			$398,000	
10% Engineering and Contigencies			$959,000	
Total Construction Cost				**$10,552,000**
Preliminary Engineering (10% of Constr.)				**$959,000**

TOTAL COST FOR ALTERNATE A **$14,814,000**

4/27/2006

Interstate 55 and US 64 (Crump Boulevard)
Cost Estimate
TMP Project No. 99036.04

Alternate A

April 27, 2006

I-55 & US 64

	Area (ac)	Cost/Acre	Total Cost
Clearing & Grubbing	13.35	$2,000	**$26,700**

Earthwork

Length (ft)		Total (ft^3)	Total (yd^3)	Cost / yd^3	
2,520	370	932,400			
1,260	1200	1,512,000			
630	1100	693,000			
4,400	200	880,000			
	Total:	4,017,400			
			148,793	$6.5	$967,152

Pavement Removal

Length	Width	Total (sf)	Cost/sf		
400	50	20,000			
		4,800			
500	30	15,000			
700	20	14,000			
500	50	25,000			
600	50	30,000			
400	50	20,000			
600	40	24,000			
200	86	17,200			
		170,000	$5		$850,000

Drainage

	Cost	Total Cost
Reloc. Riverside	**$135,000**	
Main Line & Ramps	**$155,000**	
		$290,000

Erosion Control $280,000

Structures

Bridges

	Width	Length	Area	Cost/sf		Total Cost
new	86	170	14,620	$85		$1,242,700
new	86	110	9,460	$85		$804,100
widen	5	120	600	$85		$51,000
new	34	200	6,800	$85		$578,000
pedestrian	0	0	0	$30		$0
Replace Rail:	120		ft	$100.00	per ft.	$12,000

Demolition

	Width	Length	Area	Cost/sf	Total Cost
Wisconson	34	200	6,800	$10	$68,000
Pedestrian	10	200	2,000	$10	$20,000
	0	0	0	$0	$0
			Total Demolition Cost:		$88,000
			Total Structure Cost:		$2,687,800

	Length	Cost	
Fence	3,000	$15	$45,000

Paving

	Cost	Length	Total Cost
I-55 4 lane w/ 14' median	$250	3,400	$850,000
Riverside	$150	1,100	$165,000
Ramps	$100	4,400	$440,000
		Total Paving Cost:	$1,455,000

Retaining Walls

Retaining Wall

Height	Length	Area	Cost/sf	
6	100	600	50	$30,000

10	900	9000	50		$450,000
20	400	8000	50		$400,000
					$880,000

Maintenance of Traffic $400,000

Topsoil

Length	Factor	x 2	Total	Cost per	
3,400	0.459	2	3,121	$5.00	
1,400	0.339	2	949	$5.00	

$20,352

Seeding

Length	Factor	x 2	Total	Cost per	
3,400	0.050	2	340	$20.00	
1,400	0.037	2	104	$20.00	
			444		

$8,872

Sodding

Length	Factor	x 2	Total	Cost per		
900	6.778	2	12,200	$4.00		$48,802
					Total Sod	$48,802

Signing $200,000

Signalization $150,000

Guardrail

		Number of Terminals		Cost	Total Cost
		30		$1,200	$36,000
Length of rail	12,000 ft			$15	$180,000
			Total Guardrail:		$216,000

Rip-Rap $75,000

Right-of-Way

								Total Cost
					Cost			
Total acreage	6.2 acres	Cost/acre	$75,000	$465,000				
2 Commercial Buildings		LS Cost		$700,000				
2 Commercial Sheds		LS Cost		$145,000				
7 Residences	7 @	$75,000		$525,000				
			Total	$1,835,000	Factor	146%		$2,679,100
No. of Tracts	9	Cost/tract	$5,000					$45,000
Relocate 2 Businesses			2	@	$100,000			$200,000
Relocate 7 Residences			7	@	$10,000			$70,000
				Total Right-of-Way Cost:				$2,994,100

Utilities

Reimbursable

	Length (ft)	Cost/ft	Total Cost
12" Steel Gas	0	$84	$0
16" Water	0	$45	$0
		Total Reimbursable	$0

Non-Reimbursable

	Length (ft)	Cost/ft	Total Cost
UG Telephone	1,400	$20	$28,000
12" Water	1,400	$40	$56,000
12" SS	1,400	$40	$56,000
Cable	800	$20	$16,000
8" Gas	1,400	$55	$77,000

			Cost/each	
Electric	16	Poles	$3,300	$52,800
Telephone	10	Poles	$3,300	$33,000
Manholes	8		$1,500	$12,000
			Total Non-Reimbursable	$330,800
			Total Utility Cost:	$330,800

COST DATA SHEET

Alternate B

PROJECT: I-55 & U.S. 64 (Crump Blvd.) Interchange Modification Study
LOCATION: Memphis, Shelby County, Tennessee
LENGTH: 0.75 Miles
CROSS SECTION: 4 Lane Interstate

RIGHT-OF-WAY

Land, Improvements & Damages	(# Acres	4.10)	$1,938,000	
Incidentals	(# Tracts	8)	$40,000	
Relocation Payments	(Residences	7)	$70,000	
	(Businesses	1)	$100,000	
	(Non-Profits	0)		
Total Right-Of-Way Cost				**$2,148,000**

UTILITY RELOCATION

Reimbursable	$0	
Non-Reimbursable	$173,000	
Total Utility Adjustment Cost		**$173,000**

CONSTRUCTION

Clear and Grubbing	$23,000	
Earthwork	$730,000	
Pavement Removal	$771,000	
Drainage (Erosion Control = $250,000)	$440,000	
Structures (Preserv'n/Demol'n = $88,000)	$3,113,000	
Railroad Crossing	$0	
Paving	$1,580,000	
Retaining Walls	$990,000	
Maintenance of Traffic	$400,000	
Topsoil	$17,000	
Seeding	$7,000	
Sodding	$41,000	
Signing	$300,000	
Signalization	$0	
Fence	$42,000	
Guardrail	$161,000	
Rip-rap or Slope Protection	$75,000	
Other Construction Items (8.5%)	$474,000	
Mobilization	$397,000	
10% Engineering and Contigencies	$956,000	
Total Construction Cost		**$10,517,000**
Preliminary Engineering (10% of Constr.)		**$956,000**

TOTAL COST FOR ALTERNATE B **$13,794,000**

4/27/2006

Interstate 55 and US 64 (Crump Boulevard)
Cost Estimate
TMP Project No. 99036.04

Alternate B

April 27, 2006

I-55 & US 64

	Area (ac)	Cost/Acre	Total Cost
Clearing & Grubbing	11.25	$2,000	**$22,500**

Earthwork

Length (ft)	Factor	Total (yd3)
650	124.4	80,860
400	54.81	21,924
1,100	6.29	6,919
1,500	2.22	3,330
	Total:	113,033

Cost / yd^3: $6.5

Total Cost: $734,715

Pavement Removal

Length	Width	Total (sf)	Cost/sf
575	35	20,125	
500	30	15,000	
500	30	15,000	
75	50	3,750	
250	20	5,000	
620	38	23,560	
500	86	43,000	
500	24	12,000	
700	24	16,800	
		154,235	$5

Total Cost: $771,175

Drainage

	Cost	Total Cost
Main Line & Ramps	**$190,000**	$190,000

Erosion Control $250,000

Structures

Bridges

	Width	Length	Area	Cost/sf	Total Cost
new	86	170	14,620	$85	$1,242,700
new	86	112	9,632	$85	$818,720
				$85	$0
new	56	200	11,200	$85	$952,000
pedestrian	0	0	0	$30	$0

Replace Rail: 120 ft $100.00 per ft. $12,000

Demolition

	Width	Length	Area	Cost/sf	Total Cost
Wisconson	34	200	6,800	$10	$68,000
Pedestrian	10	200	2,000	$10	$20,000
	0	0	0	$0	$0

Total Demolition Cost: $88,000

Total Structure Cost: $3,025,420

	Length	Cost	
Fence	2,800	$15	$42,000

Paving

	Cost	Length	Total Cost
I-55 4 lane w/ 14' median	$250	3,400	$850,000
Riverside	$150	0	$0
Ramps	$100	7,300	$730,000

Total Paving Cost: $1,580,000

Retaining Walls

Retaining Wall

Height	Length	Area	Cost/sf	
6	700	4200	50	$210,000

	10	760	7600	50		$380,000
	20	400	8000	50		$400,000
						$990,000

Maintenance of Traffic $400,000

Topsoil

Length	Factor	x 2	Total	Cost per		
2,900	0.459	2	2,662	$5.00		
1,100	0.339	2	746	$5.00		
						$17,040

Seeding

Length	Factor	x 2	Total	Cost per		
2,900	0.050	2	290	$20.00		
1,100	0.037	2	81	$20.00		
			371			
						$7,428

Sodding

Length	Factor	x 2	Total	Cost per		
750	6.778	2	10,167	$4.00		
						$40,668
					Total Sod	$40,668

Signing $300,000

Signalization $0

Guardrail

Number of Terminals	Cost	Total Cost
22	$1,200	$26,400
Length of rail 9,000 ft	$15	$135,000
	Total Guardrail:	$161,400

Rip-Rap $75,000

Right-of-Way

								Total Cost
Total acreage	4.1	acres	Cost/acre	$75,000	$307,500			
1 Commercial Bldg.			LS Cost		$350,000			
2 Commercial Sheds			LS Cost		$145,000			
7 Residences	7	@	$75,000		$525,000			
				Total	$1,327,500	Factor	146%	$1,938,150
No. of Tracts	8		Cost/tract	$5,000				$40,000
Relocate 1 Businesses				1	@	$100,000		$100,000
Relocate 7 Residences				7	@	$10,000		$70,000
					Total Right-of-Way Cost:			$2,148,150

Utilities

Reimbursable

	Length (ft)	Cost/ft	Total Cost
12" Steel Gas	0	$84	$0
16" Water	0	$45	$0
		Total Reimbursable	$0

Non-Reimbursable

	Length (ft)	Cost/ft	Total Cost
UG Telephone	600	$20	$12,000
12" Water	600	$40	$24,000
12" SS	600	$40	$24,000
Cable	600	$20	$12,000
8" Gas	600	$55	$33,000

			Cost/each	
Electric	12	Poles	$3,300	$39,600
Telephone	6	Poles	$3,300	$19,800
Manholes	6		$1,500	$9,000
			Total Non-Reimbursable	$173,400
			Total Utility Cost:	$173,400

COST DATA SHEET

Alternate C

PROJECT: I-55 & U.S. 64 (Crump Blvd.) Interchange Modification Study
LOCATION: Memphis, Shelby County, Tennessee
LENGTH: 0.75 Miles
CROSS SECTION: 4 Lane Interstate

RIGHT-OF-WAY				
Land, Improvements & Damages	(# Acres	6.00)	$2,657,000	
Incidentals	(# Tracts	9)	$23,000	
Relocation Payments	(Residences	7)	$70,000	
	(Businesses	2)	$200,000	
	(Non-Profits	0)		
Total Right-Of-Way Cost				**$2,950,000**
UTILITY RELOCATION				
Reimbursable			$0	
Non-Reimbursable			$173,000	
Total Utility Adjustment Cost				**$173,000**
CONSTRUCTION				
Clear and Grubbing			$23,000	
Earthwork			$710,000	
Pavement Removal			$687,000	
Drainage (Erosion Control =	$250,000)		$440,000	
Structures (Preserv'n/Demol'n =	$88,000)		$2,506,000	
Railroad Crossing			$0	
Paving			$1,420,000	
Retaining Walls			$760,000	
Maintenance of Traffic			$400,000	
Topsoil			$17,000	
Seeding			$7,000	
Sodding			$41,000	
Signing			$200,000	
Signalization			$0	
Fence			$42,000	
Guardrail			$161,000	
Rip-rap or Slope Protection			$75,000	
Other Construction Items (8.5%)			$424,000	
Mobilization			$347,000	
10% Engineering and Contigencies			$826,000	
Total Construction Cost				**$9,086,000**
Preliminary Engineering (10% of Constr.)				**$826,000**

TOTAL COST FOR ALTERNATE C **$13,035,000**

4/27/2006

Interstate 55 and US 64 (Crump Boulevard)
Cost Estimate
TMP Project No. 99036.04

Alternate C

April 27, 2006

I-55 & US 64

	Area (ac)	Cost/Acre	Total Cost
Clearing & Grubbing	11.25	$2,000	**$22,500**

Earthwork

Length (ft)	Factor	Total (yd3)
650	124.4	80,860
400	54.81	21,924
1,100	6.29	6,919
0	0	0
	Total:	109,703

Cost / yd^3: $6.5

Total Cost: $713,070

Pavement Removal

Length	Width	Total (sf)	Cost/sf
575	35	20,125	
500	30	15,000	
500	30	15,000	
75	50	3,750	
250	20	5,000	
620	38	23,560	
500	86	43,000	
500	24	12,000	
		0	
		137,435	$5

Total Cost: $687,175

Drainage

	Cost	Total Cost
Main Line & Ramps	**$190,000**	
		$190,000

Erosion Control $250,000

Structures

Bridges

	Width	Length	Area	Cost/sf	Total Cost
new	86	170	14,620	$85	$1,242,700
new	86	80	6,880	$85	$584,800
				$85	$0
new	34	200	6,800	$85	$578,000
pedestrian	0	0	0	$30	$0

Replace Rail: 120 ft $100.00 per ft. $12,000

Demolition

	Width	Length	Area	Cost/sf	Total Cost
Wisconson	34	200	6,800	$10	$68,000
Pedestrian	10	200	2,000	$10	$20,000
	0	0	0	$0	$0

Total Demolition Cost: $88,000

Total Structure Cost: $2,417,500

	Length	Cost	
Fence	2,800	$15	$42,000

Paving

	Cost	Length	Total Cost
I-55 4 lane w/ 14' median	$250	3,400	$850,000
Riverside	$150	0	$0
Ramps	$100	5,700	$570,000

Total Paving Cost: $1,420,000

Retaining Walls

Retaining Wall

Height	Length	Area	Cost/sf	
6	200	1200	50	$60,000

10	600	6000	50		$300,000
20	400	8000	50		$400,000
					$760,000

Maintenance of Traffic $400,000

Topsoil $17,040

Length	Factor	x 2	Total	Cost per
2,900	0.459	2	2,662	$5.00
1,100	0.339	2	746	$5.00

Seeding $7,428

Length	Factor	x 2	Total	Cost per
2,900	0.050	2	290	$20.00
1,100	0.037	2	81	$20.00
			371	

Sodding

Length	Factor	x 2	Total	Cost per		
750	6.778	2	10,167	$4.00		$40,668
					Total Sod	$40,668

Signing $200,000

Signalization $0

Guardrail

Number of Terminals	Cost	Total Cost
22	$1,200	$26,400
Length of rail 9,000 ft	$15	$135,000
	Total Guardrail:	$161,400

Rip-Rap $75,000

Right-of-Way

							Total Cost
Total acreage	6.0 acres	Cost/acre	$75,000	$450,000			
2 Commercial Bldg.		LS Cost		$700,000			
2 Commercial Sheds		LS Cost		$145,000			
7 Residences	7 @	$75,000		$525,000			
			Total	$1,820,000	Factor	146%	$2,657,200
No. of Tracts	9	Cost/tract	$5,000				$45,000
Relocate 2 Businesses			2	@	$100,000		$200,000
Relocate 7 Residences			7	@	$10,000		$70,000
				Total Right-of-Way Cost:			$2,972,200

Utilities

Reimbursable

	Length (ft)	Cost/ft	Total Cost
12" Steel Gas	0	$84	$0
16" Water	0	$45	$0
		Total Reimbursable	$0

Non-Reimbursable

	Length (ft)	Cost/ft	Total Cost
UG Telephone	600	$20	$12,000
12" Water	600	$40	$24,000
12" SS	600	$40	$24,000
Cable	600	$20	$12,000
8" Gas	600	$55	$33,000

		Cost/each	
Electric	12 Poles	$3,300	$39,600
Telephone	6 Poles	$3,300	$19,800
Manholes	6	$1,500	$9,000
		Total Non-Reimbursable	$173,400
		Total Utility Cost:	$173,400

COST DATA SHEET

Alternate D

PROJECT: I-55 & U.S. 64 (Crump Blvd.) Interchange Modification Study
LOCATION: Memphis, Shelby County, Tennessee
LENGTH: 0.75 Miles
CROSS SECTION: 4 Lane Interstate

RIGHT-OF-WAY				
Land, Improvements & Damages	(# Acres	0.30)	$126,000	
Incidentals	(# Tracts	2)	$13,000	
Relocation Payments	(Residences	0)	$0	
	(Businesses	0)	$0	
	(Non-Profits	0)		
Total Right-Of-Way Cost				**$139,000**
UTILITY RELOCATION				
Reimbursable			$0	
Non-Reimbursable			$51,000	
Total Utility Adjustment Cost				**$51,000**
CONSTRUCTION				
Clear and Grubbing			$1,000	
Earthwork			$580,000	
Pavement Removal			$198,000	
Drainage (Erosion Control =	$190,000)		$368,000	
Structures (Preserv'n/Demol'n =	$36,000)		$3,107,000	
Railroad Crossing			$0	
Paving			$1,238,000	
Retaining Walls			$978,000	
Maintenance of Traffic			$400,000	
Topsoil			$14,000	
Seeding			$6,000	
Sodding			$41,000	
Signing			$150,000	
Signalization			$0	
Fence			$13,000	
Guardrail			$97,000	
Rip-rap or Slope Protection			$75,000	
Other Construction Items (8.5%)			$354,000	
Mobilization			$335,000	
10% Engineering and Contigencies			$796,000	
Total Construction Cost				**$8,751,000**
Preliminary Engineering (10% of Constr.)				**$796,000**

TOTAL COST FOR ALTERNATE D **$9,737,000**

4/27/2006

	Area (ac)	Cost/Acre	Total Cost
Clearing & Grubbing	0.3	$2,000	**$600**

Earthwork

Length (ft)	factor	Total (cy)
500	124.4	62,200
300	54.81	16,443
1,100	6.29	6,919
1,500	2.22	3,330
	Total:	88,892

88,892 $6.5 $577,798

Pavement Removal

Length	Width	Total (sf)	Cost/sf
350	16	5,600	
180	27	15,000	
340	21	7,140	
375	20	7,500	
360	12	4,320	
0	0	0	

39,560	$5	$197,800

Drainage

	Cost	Total Cost
Main Line & Ramps	**$178,000**	
		$178,000

Erosion Control $190,000

Structures

Bridges

	Width	Length	Area	Cost/sf	Total Cost
New	86	180	15,480	$85	$1,315,800
New	86	112	9,632	$85	$818,720
New	86	215	18,490	$50	$924,500

Replace Rail: 120 ft $100.00 per ft. $12,000

Demolition

	Width	Length	Area	Cost/sf	Total Cost
					$0
Pedestrian	10	360	3,600	$10	$36,000
					$0

Total Demolition Cost: **$36,000**

Total Structure Cost: **$3,071,020**

	Length	Cost	
Fence	870	$15	**$13,050**

Paving

	Cost	Length	Total Cost
I-55 4 lane w/ 14' median	$250	2,430	$607,500
Ramps	$100	6,300	$630,000

Total Paving Cost: $1,237,500

Retaining Walls

Retaining Wall

Height	Length	Area	Cost/sf	
13	960	12480	50	$624,000

6	1,180	7080	50		$354,000
		0			$0
		0			$0
					$978,000

Maintenance of Traffic $400,000

psoil

Length	Factor	x 2	Total	Cost per	
2,400	0.459	2	2,203	$5.00	
900	0.339	2	610	$5.00	

$14,067

Seeding

Length	Factor	x 2	Total	Cost per	
2,400	0.050	2	240	$20.00	
900	0.037	2	67	$20.00	
			307		

$6,132

Sodding

Length	Factor	x 2	Total	Cost per		
750	6.778	2	10,167	$4.00		$40,668
					Total Sod	$40,668

Signing $150,000

Signalization $0

Guardrail

		Number of Terminals	Cost	Total Cost
		16	$1,200	$19,200
Length of rail	5,200 ft		$15	$78,000
			Total Guardrail:	$97,200

Rip-Rap $75,000

Right-of-Way

				Cost			Total Cost
Total acreage	0.3 acres	Cost/acre	$75,000	$22,500			
			Total	$22,500	Factor	146%	$32,850
No. of Tracts	2	Cost/tract	$5,000				$10,000
					Total Right-of-Way Cost:		$42,850

Utilities

Reimbursable

	Length (ft)	Cost/ft	Total Cost
12" Steel Gas	0	$84	$0
16" Water	0	$45	$0
		Total Reimbursable	$0

Non-Reimbursable

	Length (ft)	Cost/ft	Total Cost
UG Telephone	200	$20	$4,000
12" Water	200	$40	$8,000
12" SS	200	$40	$8,000
Cable	200	$20	$4,000
8" Gas	200	$55	$11,000

			Cost/each	
Electric	2	Poles	$3,300	$6,600
Telephone	2	Poles	$3,300	$6,600
Manholes	2		$1,500	$3,000
			Total Non-Reimbursable	$51,200
			Total Utility Cost:	$51,200

APPENDIX G

FUNCTIONAL PLANS

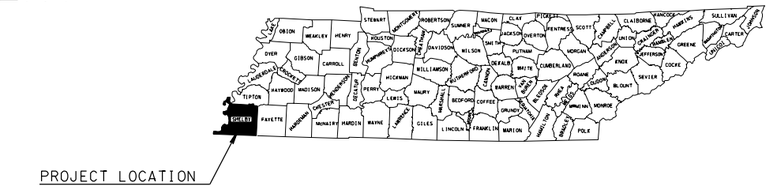
TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

Index Of Sheets

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING AND DEVELOPMENT

SHELBY COUNTY

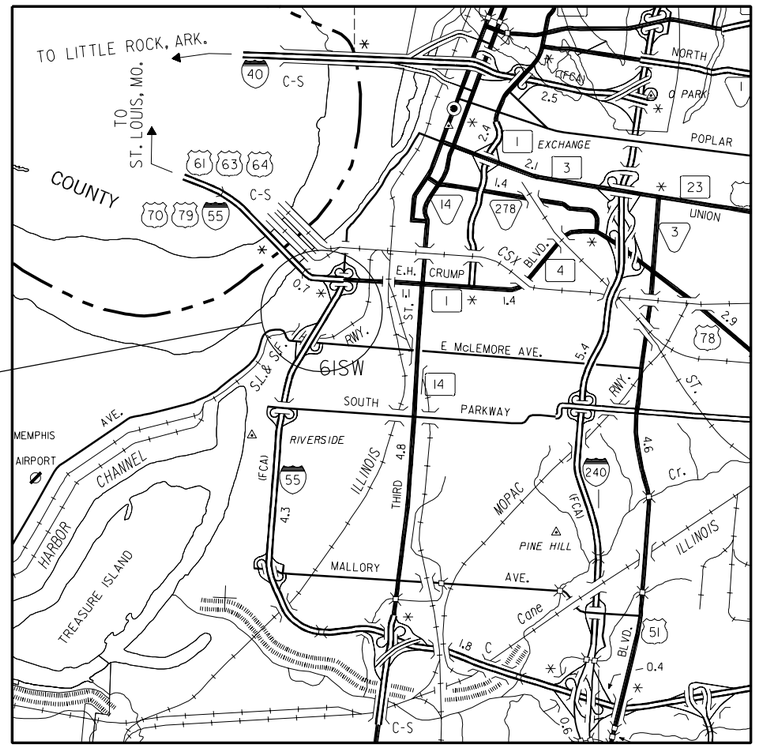
TENN.	YEAR	SHEET NO.
	2002	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		



PROJECT LOCATION

INTERSTATE 55 AT
U.S. 64 (CRUMP BOULEVARD)

STATE HIGHWAY NO. 55 F.A.H.S. NO. 55



N

SCALE: 1"= 1 MILE

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 1995 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

DESIGNED BY THOMAS & MILLER, LLC

DESIGNER THOMAS M. CLINARD, P.E. CHECKED BY

P.E. NO.

Survey & Design Section

TRAFFIC DATA	
ADT (2005)	64,650
ADT (2025)	95,680
DHV (2025)	9,568
D	55 - 45
T (ADT)	25 %
T (DHV)	17 %
V	50 MPH

APPROVED:

DIRECTOR, DESIGN DIVISION

DATE:

APPROVED:

COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

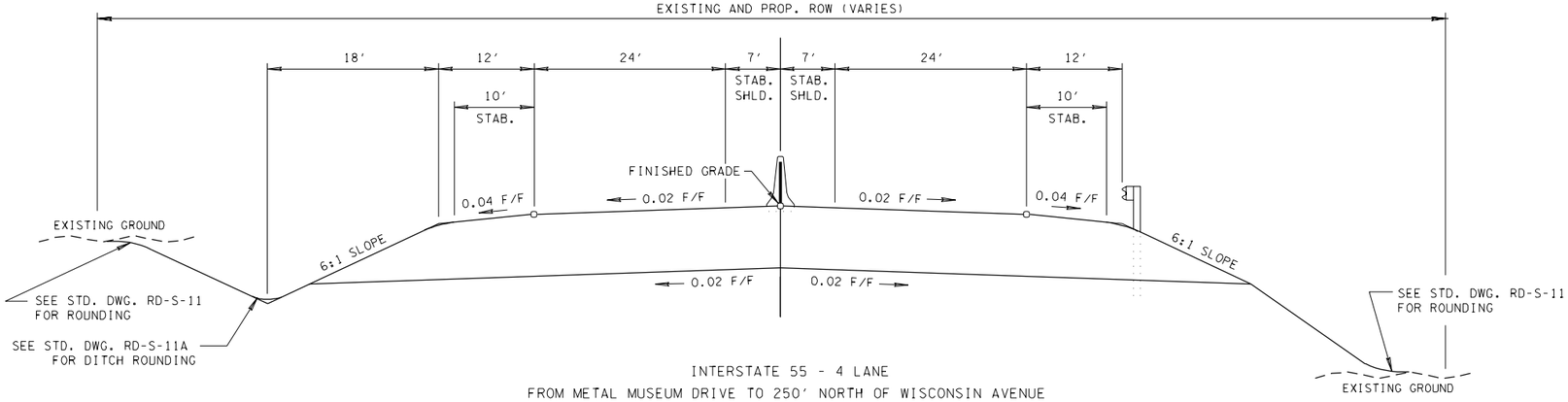
APPROVED:

DIVISION ADMINISTRATOR DATE

TENNESSEE D.O.T.
DESIGN DIVISION

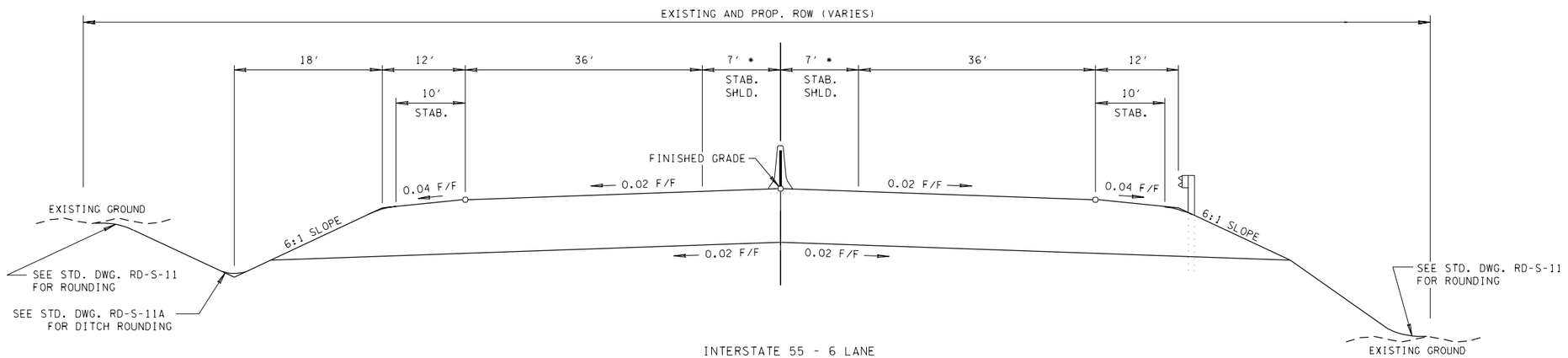
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	2



INTERSTATE 55 - 4 LANE

FROM METAL MUSEUM DRIVE TO 250' NORTH OF WISCONSIN AVENUE



INTERSTATE 55 - 6 LANE

FROM 250' N. OF WISCONSIN AVENUE TO MCLEMORE AVENUE

* MATCH EXISTING 14' MEDIAN

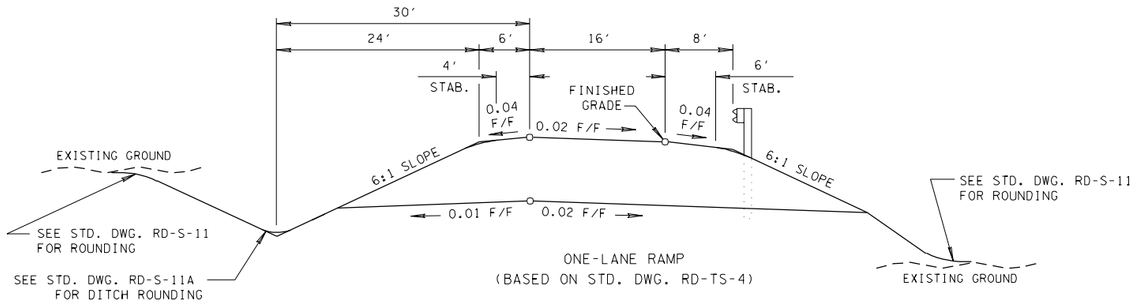
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

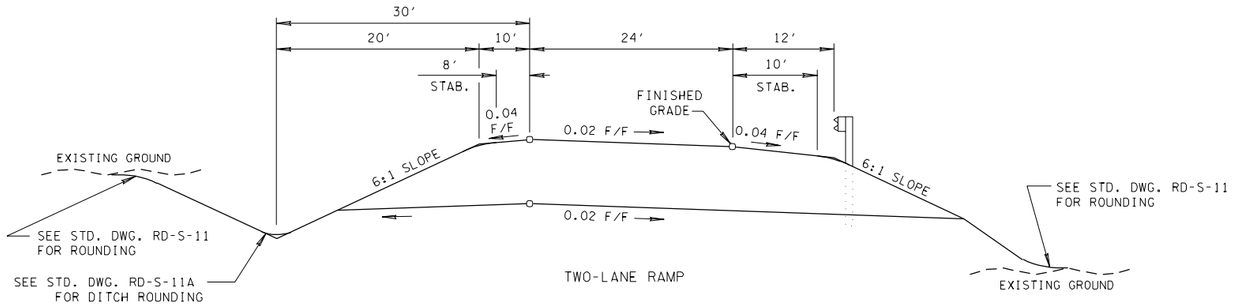
TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

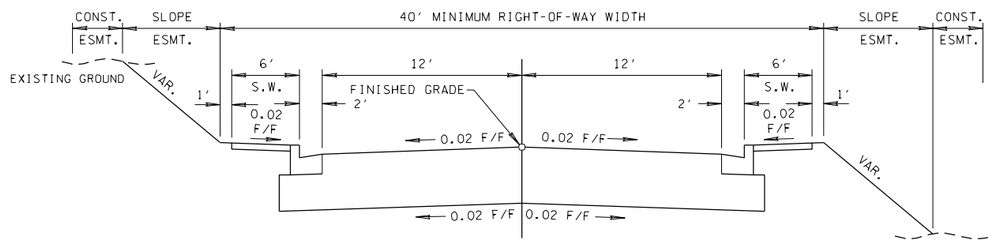
TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	2A



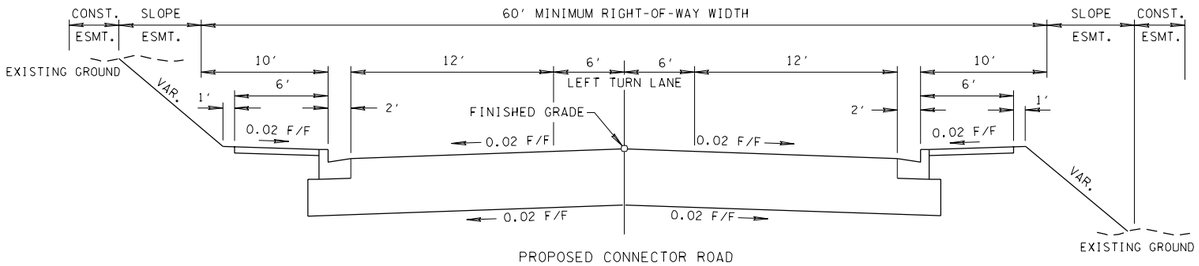
ONE-LANE RAMP
(BASED ON STD. DWG. RD-TS-4)



TWO-LANE RAMP



WISCONSIN AVENUE



PROPOSED CONNECTOR ROAD

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	3

LEGEND:

AREA TO BE SCARIFIED, TOPSOILED AND SEEDED

N

RIVERSIDE DR.
VIRGINIA AVE.
EXIST. R.O.W.
CRUMP BLVD.
PROP. C&G W/5' S.W.
EXISTING LOOP TO REMAIN
CSX RAILROAD
16'
56'
8'
36'
24'
PROP. SIGNAL
TO MEMPHIS
TO ARKANSAS
I-55
62'
14'
PROP. RETAINING WALL
BUILDING AND PARKING LOT TO BE SCARIFIED, TOPSOILED & SEEDED
PROP. R.O.W.
ALSTON
COMMERCIAL
EXIST R.O.W.
METAL MUSEUM DR.
ILLINOIS
RESIDENTIAL
PROP. CONNECTOR ROAD
RES.
ILLINOIS AVE.
INDUSTRIAL
TENNESSEE ST.
DE SOTO AVE.

MATCH LINE

SEE SHEET NO. 4

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE A
MEMPHIS, TN

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	4

N

WISCONSIN AVENUE

24'

EXIST. R.O.W.

36'

PROP. RETAINING WALL

PROP. R.O.W.

I-55

86'

36'

14'

PROP. C&G W/S. S.W.

PROP. C&G W/S. S.W.

RES.

ES.

SEE SHEET NO. 3

MATCH LINE

McLEMORE AVENUE

RIVERSIDE DRIVE

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE A
MEMPHIS, TN

TENNESSEE D.O.T.	FILE NO.
DESIGN DIVISION	

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	5

LEGEND:

AREA TO BE SCARIFIED, TOPSOILED AND SEEDED

N

RIVERSIDE DR.
VIRGINIA AVE.
EXIST. R.O.W.
CRUMP BLVD.
EXISTING LOOP TO REMAIN
CSX RAILROAD
EXIST. R.O.W.
PROP. R.O.W.
I-55
PROP. RETAINING WALL
ALSTON
TO MEMPHIS
TO ARKANSAS
METAL MUSEUM DR.
COMMERCIAL
ILLINOIS
RESIDENTIAL
RES.
INDUSTRIAL
TENNESSEE ST.
DE SOTO AVE.
ILLINOIS AVE.

MATCH LINE

SEE SHEET NO. 6

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE B
MEMPHIS, TN

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	6

N

WISCONSIN AVENUE

24'

EXIST. R.O.W.

16'

36'

PROP. RETAINING WALL

PROP. R.O.W.

I-55

86'

36'

14'

4

2

SEE SHEET NO. 5

MATCH LINE

PROP. C&G W/S S.W.

PROP. C&G W/S S.W.

PROP. RETAINING WALL

RES.

McLEMORE AVENUE

RIVERSIDE DRIVE

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE B
MEMPHIS, TN

TENNESSEE D.O.T. | DESIGN DIVISION | FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	7

LEGEND:

AREA TO BE SCARIFIED, TOPSOILED AND SEEDED

N

RIVERSIDE DR.

VIRGINIA AVE.

EXIST. R.O.W.

CRUMP BLVD.

EXISTING LOOP TO REMAIN

CSX RAILROAD

EXIST. R.O.W.

PROP. R.O.W.

EXIST. R.O.W.

TO MEMPHIS

TO ARKANSAS

I-55

PROP. RETAINING WALL

BUILDING AND PARKING LOT TO BE SCARIFIED, TOPSOILED & SEEDED

EXIST. R.O.W.

ALSTON

METAL MUSEUM DR.

COMMERCIAL

ILLINOIS

RESIDENTIAL

RES.

INDUSTRIAL

TENNESSEE ST.

DE SOTO AVE.

MATCH LINE

SEE SHEET NO. 8

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE C

MEMPHIS, TN

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	8

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE C
MEMPHIS, TN

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	9

LEGEND:

AREA TO BE SCARIFIED, TOPSOILED AND SEEDED

N

RIVERSIDE DR.
VIRGINIA AVE.
EXIST. R.O.W.
CRUMP BLVD.
EXISTING LOOP TO REMAIN
CSX RAILROAD
EXIST. R.O.W.
PROP. R.O.W.
TO MEMPHIS
TO ARKANSAS
PROP. RETAINING WALL
ALSTON
METAL MUSEUM DR.
COMMERCIAL
ILLINOIS
RESIDENTIAL
RES.
I-55
INDUSTRIAL
TENNESSEE ST.
DE SOTO AVE.
ILLINOIS AVE.
16'
24'
8'

MATCH LINE

SEE SHEET NO. 10

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE D
MEMPHIS, TN

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	10

N

WISCONSIN AVE.

PROP. RETAINING WALL

PROP. R.O.W.

EXIST. R.O.W.

SEE SHEET NO. 9

MATCH LINE

PROP. RETAINING WALL

RES.

McLEMORE AVENUE

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64 INTERCHANGE MODIFICATION STUDY

ALTERNATE D
MEMPHIS, TN

APPENDIX H

SINGLE LINE SKETCHES

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	

N

RAILROAD BRIDGE

RIVERSIDE DR.

VIRGINIA AVE.

CSX RAILROAD

EXISTING RAILROAD

RAILROAD CROSSING

VIRGINIA AVE.

CRUMP BLVD.

ILLINOIS AVE.

TO MEMPHIS

TO ARKANSAS

I-55

ALSTON

ILLNOIS

I-55

TENNESSEE ST.

DE SOTO AVE.

E.H. CRUMP PARK

METAL MUSEUM DR.

COMMERCIAL DEVELOPMENT

RESIDENTIAL DEVELOPMENT

INDUSTRIAL DEVELOPMENT

RIVERSIDE DR.

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

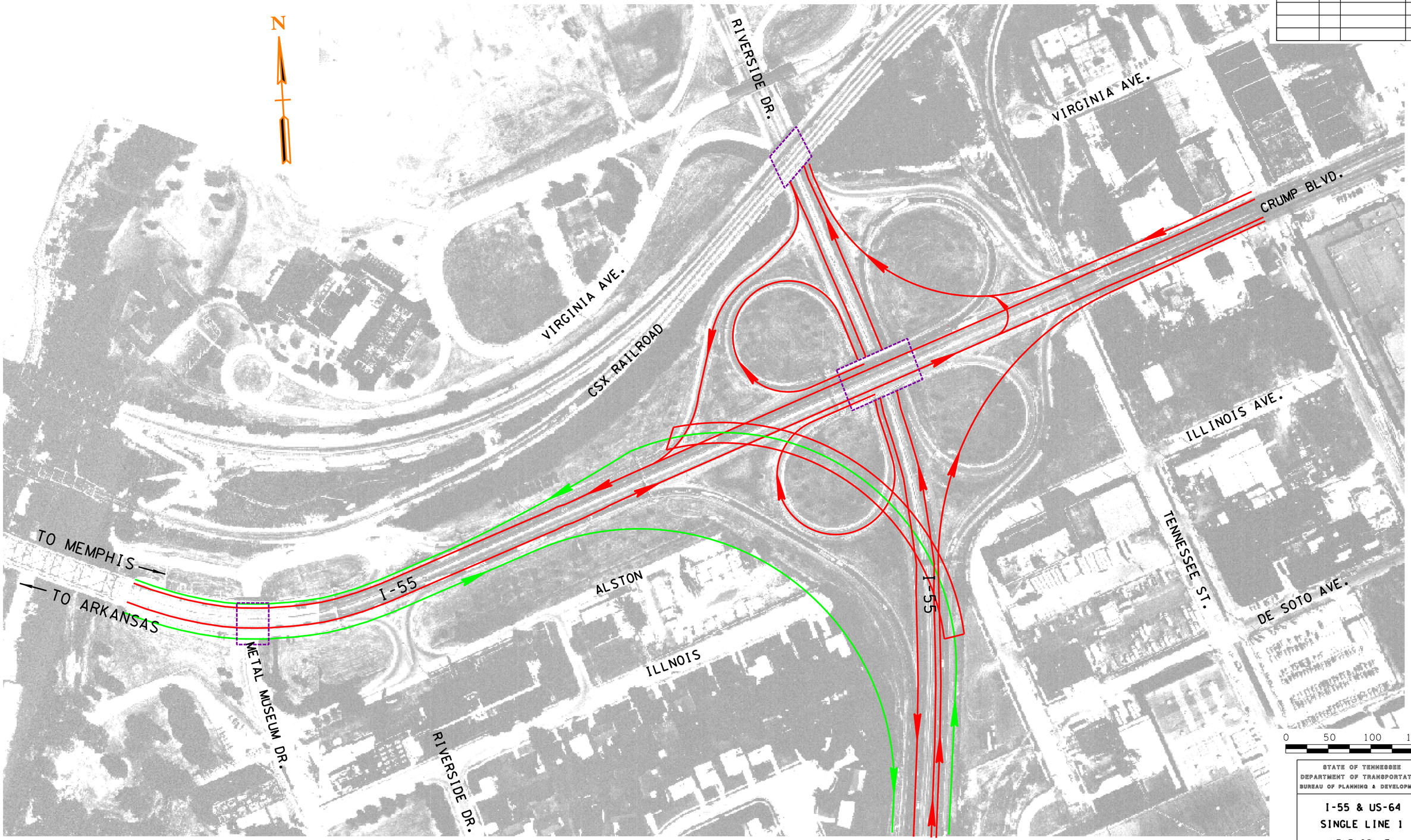
I-55 & US-64 CONSTRAINTS

MEMPHIS, TN
SHELBY CO.

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

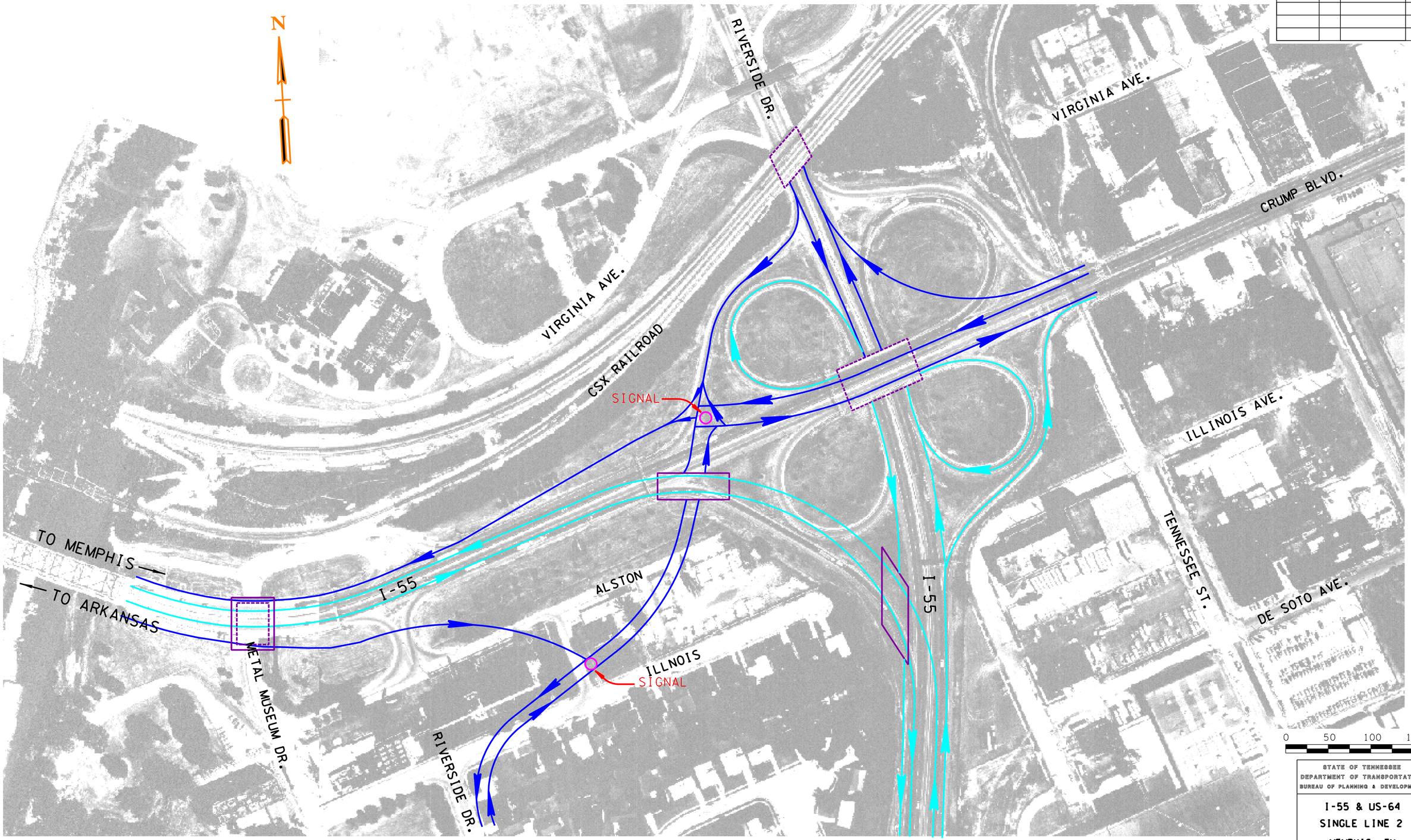
I-55 & US-64
SINGLE LINE 1

MEMPHIS, TN
SHELBY CO.

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

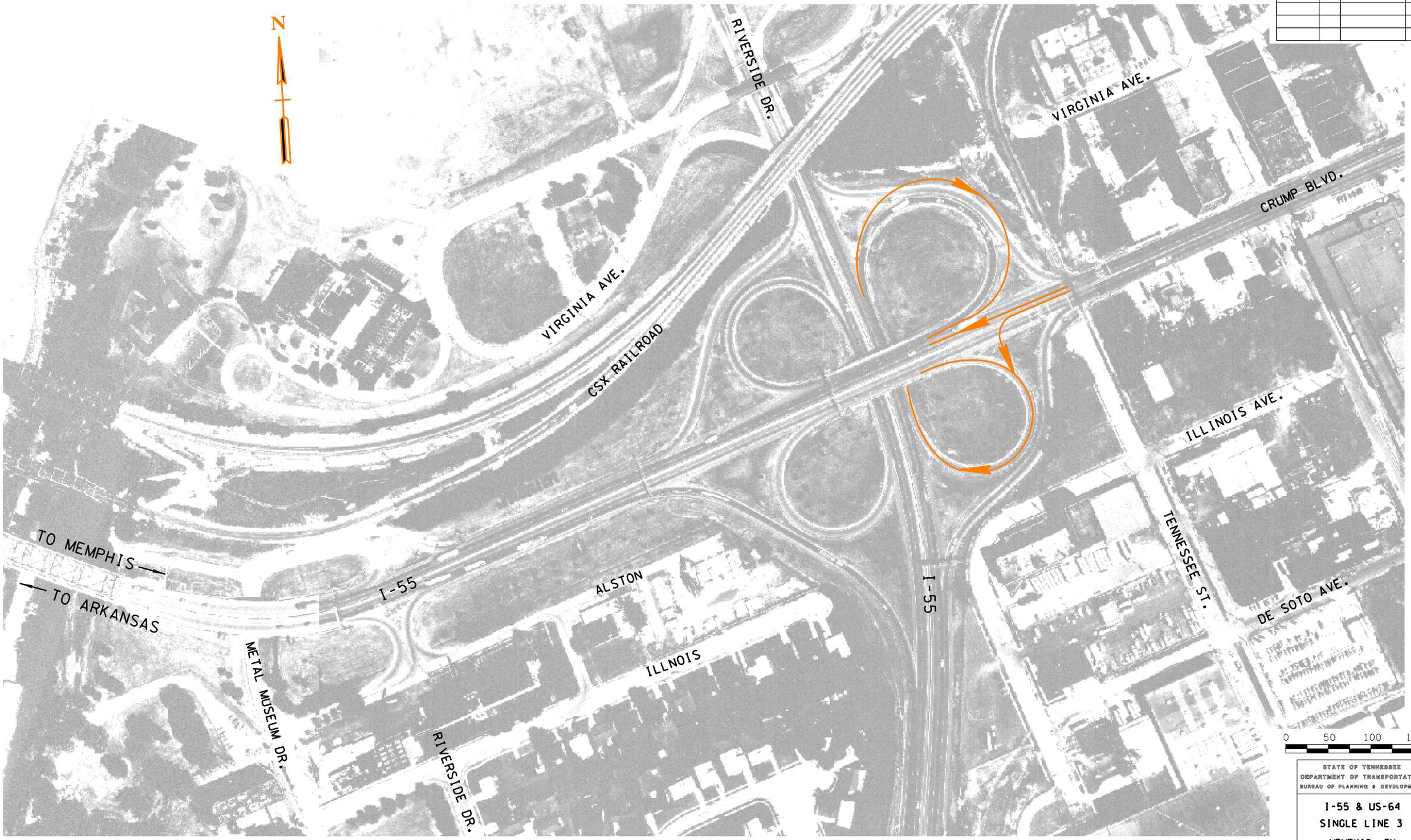
I-55 & US-64
SINGLE LINE 2

MEMPHIS, TN
SHELBY CO.

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64
SINGLE LINE 3

MEMPHIS, TN
SHELBY CO.

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	

N

RIVERSIDE DR.

VIRGINIA AVE.

VIRGINIA AVE.

CRUMP BLVD.

CSX RAILROAD

ILLINOIS AVE.

TO MEMPHIS

TO ARKANSAS

I-55

ALSTON

ILLNOIS

I-55

TENNESSEE ST.

DE SOTO AVE.

METAL MUSEUM DR.

RIVERSIDE DR.

v = 40 mph

v = 50 mph

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64
SINGLE LINE 4

MEMPHIS, TN
SHELBY CO.

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
A.P.R.	2002	I-55	

N

TO ARKANSAS
TO MEMPHIS
METAL MUSEUM DR.
SIGNAL
SIGNAL
RIVERSIDE DR.
V = 60 mph
ALSTON
ILLINOIS
CSX RAILROAD
VIRGINIA AVE.
RIVERSIDE DR.
I-55
MCLEMORE AVE.
WISCONSIN AVE.
TENNESSEE ST.
DE SOTO AVE.
ILLINOIS AVE.
CRUMP BLVD.
VIRGINIA AVE.

0 150 300 450

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

I-55 & US-64
SINGLE LINE 5

MEMPHIS, TN
SHELBY CO.

APPENDIX I

ACCIDENT DATA

TDOT TRAFFIC ACCIDENT DATA REQUEST T&SP 1/02

REQUESTED BY: (NAME) MATT ASHBY DATE: 4-9-2002

(DIVISION) Transportation Planning Office

(ADDRESS) 9th Floor J.K. Polk TEL. NO.: 741-6743

PROJECT NO.: ———

LOCATION: REG. 4 COUNTY Shelby, CITY Memphis,
ROUTE I55/SR1/Riverside LOG MILE ———,
LOG MILE (END) ———, LOCATION ON ROUTE ———
Sections in area Ramp Interchanges

MAP SHOWING LOCATION MUST BE ATTACHED:

TYPE OF ACCIDENT DATA REQUESTED

	CHECK YES	CHECK NO	TIME PERIOD OR YEARS REQUESTED (3 YEARS OR SPECIFY)			
ACCIDENT LISTING:	✓		97	98	99	2000
COLLISION DIAGRAM:						
ACCIDENT RATES:	✓					
HIGH HAZARD RANK:						
UPDATE PREVIOUS REQUEST:						

SPECIAL REQUEST: ——— ——— DESCRIBE SPECIFICS: ———

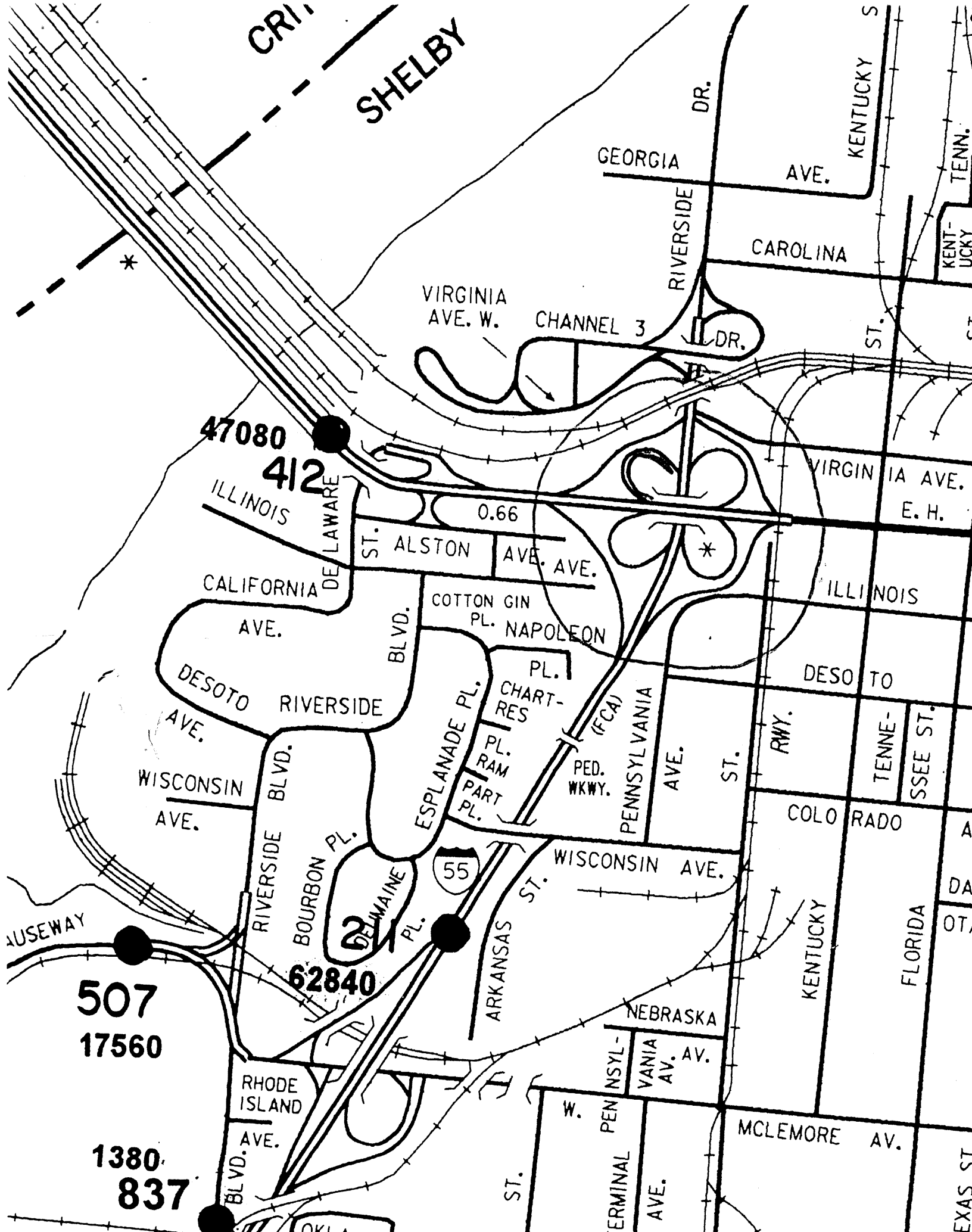
REQUEST ANALYZED BY: M. Nelson / D. Hay DATE: April 9, 02

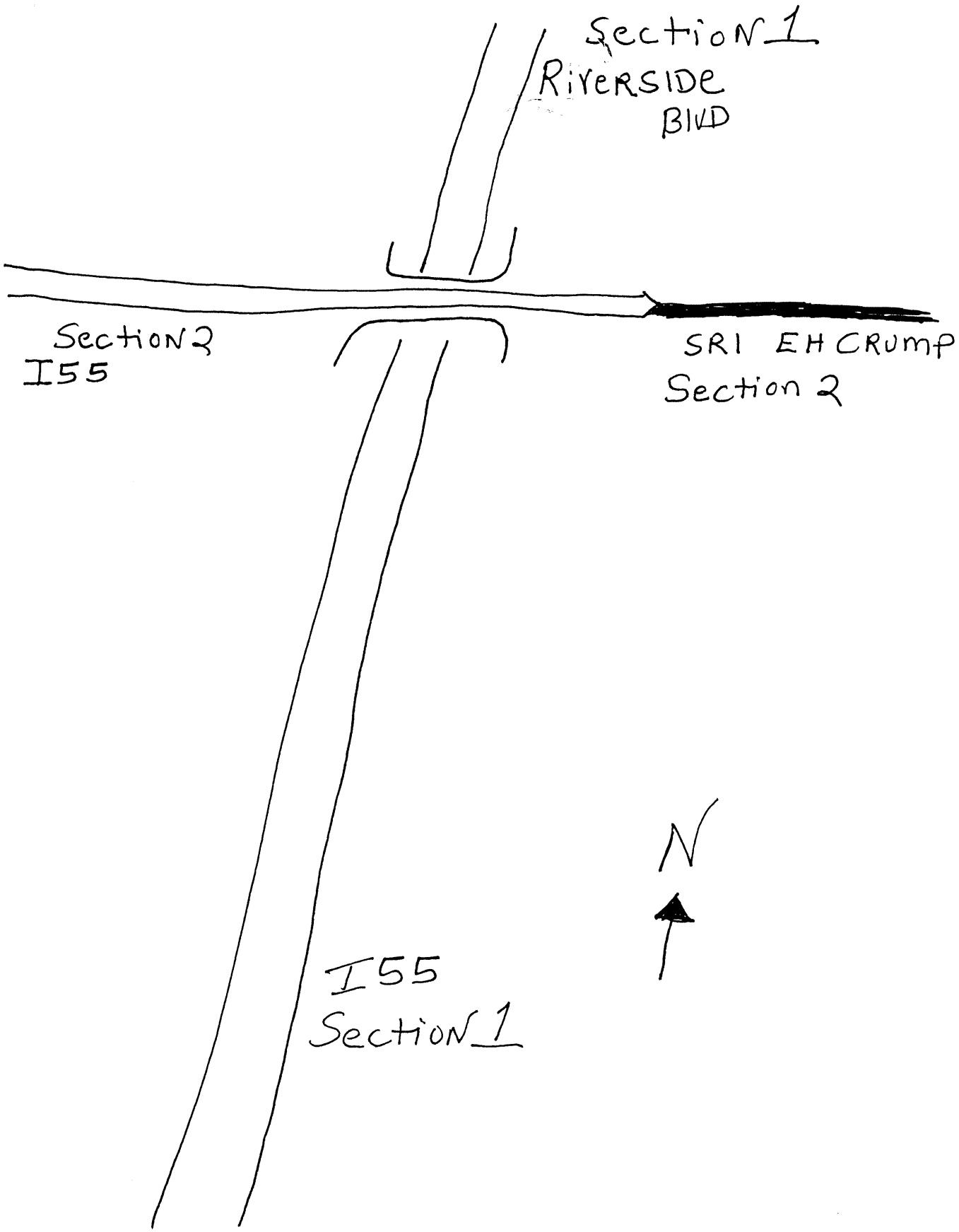
REVIEWED BY: David Lollar DATE: 4/9/02
David Lollar Trns. Spec. 1

Harold Dilmore DATE: 4/9/02
Harold Dilmore Trns. Mgr. 1

Steve Allen DATE: 4-11-02
Steve Allen Trns. Mgr. 2

COMMENTS: There are No Interchange State Wide Avg. Rates to do Comparisons with. These Locations were done as Specified by Requestee. This is Not a Typical Practice without Doing a Full Study By Pulling out the Crashes and Verifying all Ramps and Mainline Data.


SHELBY
GEORGIA AVE.
KENTUCKY DR.
RIVERSIDE DR.
CAROLINA
VIRGINIA AVE. W.
CHANNEL 3
47080
412
ILLINOIS
DELAWARE
ST. ALSTON
AVE. AVE.
0.66
VIRGINIA AVE.
E. H.
CALIFORNIA AVE.
BLVD.
COTTON GIN PL. NAPOLEON
ILLINOIS
DESOTO RIVERSIDE AVE.
ESPLANADE PL.
CHART-RES PL.
PART PL.
RAM
PED. WKWY.
(FCA)
PENNSYLVANIA AVE.
ST.
RWY.
TENNESSEE ST.
DESOTO
WISCONSIN AVE.
RIVERSIDE BLVD.
BOURBON PL.
DELMAINE PL.
55
COLORADO
WISCONSIN AVE.
ARKANSAS ST.
KENTUCKY
FLORIDA
NEBRASKA
PENNSYLVANIA AV.
RHODE ISLAND AVE.
MCLEMORE AV.
W. PEN
ST.
TERMINAL AVE.
BLVD.
507
17560
62840
1380
837


Section 1
Riverside
Blvd
Section 2
I55
SR1 EH Crump
Section 2
N
I55
Section 1

County SHELBY Date: 04/09/02
Route I 55 / 04233 (RIVERSIDE BLVD)
Location FROM I 55 RAMPS SOUTH OF SR 1 TO RIVERSIDE RAMPS NORTH OF SR 1
Highway Type FREEWAY
SECTION 1

SECTION or SPOT

BLM	ELM	Length	AVERAGE ADT	VMT	
11.47	11.63	0.16	62,840	10,054	(I 55)
0.00	0.10	0.10	18,830	1,883	(RIVERSIDE)
0.00		0.00		0	
0.00		0.00		0	
		0.00		0	
		0.26	45,913	11,937	

	Total		Fatal	Injury
No. of Accidents	81		0	16
No. of Years	3	(97 - 99)		
SW avg. rate	1.10		Section - FREEWAY	

Exposure	13.0715
Rate (A)	6.20
Critical Rate (C)	1.81
Severity Index	0.1975
A/C	3.42

County SHELBY Date: 04/09/02
Route I 55 / 04233 (RIVERSIDE BLVD)
Location FROM I 55 RAMPS SOUTH OF SR 1 TO RIVERSIDE RAMPS NORTH OF SR 1
Highway Type FREEWAY
SECTION 1

SECTION or SPOT

BLM	ELM	Length	AVERAGE ADT	VMT	
11.47	11.63	0.16	62,840	10,054	(I 55)
0.00	0.10	0.10	18,830	1,883	(RIVERSIDE)
0.00		0.00		0	
0.00		0.00		0	
		0.00		0	
		0.26	45,913	11,937	

	Total		Fatal	Injury
No. of Accidents	83		0	19
No. of Years	3	(98 - 00)		
SW avg. rate	1.10		Section - FREEWAY	

Exposure	13.0715
Rate (A)	6.35
Critical Rate (C)	1.81
Severity Index	0.2289
A/C	3.50

County SHELBY Date: 04/09/02
Route I 55/ SR 1
Location RAMP INTERCHANGES ON SR 1 CRUMP & I 55 GOING EAST TO WEST
Highway Type FREEWAY

SECTION 2

SECTION or SPOT

BLM	ELM	Length	AVERAGE ADT	VMT	
11.64	11.8	0.16	47,080	7,533	(I 55)
0.00	0.09	0.09	12,970	1,167	(SR 1)
		0.00		0	
		0.25	34,800	8,700	

	Total	Fatal	Injury
No. of Accidents	51	0	9
No. of Years	3	(97-99}	
SW avg. rate	1.10	Section - FREEWAY	

Exposure	9.5266
Rate (A)	5.35
Critical Rate (C)	1.94
Severity Index	0.1765
A/C	2.75

County SHELBY Date: 04/09/02
Route I 55/ SR 1
Location RAMP INTERCHANGES ON SR 1 CRUMP & I 55 GOING EAST TO WEST
Highway Type FREEWAY

SECTION 2

SECTION or SPOT

BLM	ELM	Length	AVERAGE ADT	VMT	
11.64	11.8	0.16	47,080	7,533	(I 55)
0.00	0.09	0.09	12,970	1,167	(SR 1)
		0.00		0	
		0.25	34,800	8,700	

	Total	Fatal	Injury
No. of Accidents	58	0	9
No. of Years	3	(98-00)	
SW avg. rate	1.10	Section - FREEWAY	

Exposure	9.5266
Rate (A)	6.09
Critical Rate (C)	1.94
Severity Index	0.1552
A/C	3.13

S ↕ N

ACCIDENT CHARACTERISTIC SUMMARY SHEET

LOCATION: Section 1
I55 To SR1 Bridge
Riverside Blvd
Ramp Interchange

PERIOD COVERED: 4 years FROM: 1/1/97 TO: 12/31/00

CITY: Memphis DATA PREPARED: April 9, 02

COUNTY: Shelby PREPARED BY: DHuang

TYPE

YEAR	RIGHT ANGLE	REAR END	OUT OF CONTROL	SIDE SWIPE	LEFT TURN	LANE CHANGE	PASSING	HEAD ON	MERGE	PEDES-TRIAN	BACKING VEH.	PKD VEH.	TOTAL ACC.	INJ.	FATAL	PROP. DAM.	
19													81	16	0	65	From 97-99
19													83	19	0	64	From 98-00
19																	
19																	
19																	
TOTAL																	

UNKNOWN FOR _____

CONTRIBUTING FACTORS

YEAR	STOPPED OR SLOWED VEH.	SNOW & ICE	MECHANICAL FAILURE	OBJECT IN ROADWAY	PREVIOUS ACCIDENT	D.U.I.	FELL ASLEEP	WET PAVEMENT	OUT OF COUNTY	NIGHT	A.M. PEAK	P.M. PEAK
19												
19												
19												
19												
19												
TOTAL												

YEAR	SPEEDING OR RECKLESS DRIVING	DISREGARDING TRAFFIC SIGNS OR SIGNALS	WRONG SIDE OF ROADWAY	PHYSICAL DEFECTS SICK OR ILL	DRIVERS ERROR OR NON ATTENTION	UNK-NOWN
19						
19						
19						
19						
19						

ACTUAL ACCIDENT RATE _____

STATEWIDE AVERAGE ACCIDENT RATE _____

CRITICAL ACCIDENT RATE _____

ACCIDENT CHARACTERISTIC SUMMARY SHEET

LOCATION: Section 2 PERIOD COVERED: 4 years FROM: 1-1-97 TO: 12-31-00

W↔E I-55 From ctr. of Bridge CITY: Memphis DATA PREPARED: 04/09/02

/SR-1 From ctr. of Bridge COUNTY: Shelby PREPARED BY: M Nelson

Ramps Interchanges

TYPE

YEAR	RIGHT ANGLE	REAR END	OUT OF CONTROL	SIDE SWIPE	LEFT TURN	LANE CHANGE	PASSING	HEAD ON	MERGE	PEDES-TRIAN	BACKING VEH.	PKD VEH.	TOTAL ACC.	INJ.	FATAL	PROP. DAM.
From 97-99 19	—	—	—	—	—	—	—	—	—	—	—	—	51	9	0	42
From 98-00 19	—	—	—	—	—	—	—	—	—	—	—	—	58	9	0	49
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL																

UNKNOWN FOR ____

CONTRIBUTING FACTORS

YEAR	STOPPED OR SLOWED VEH.	SNOW & ICE	MECHANICAL FAILURE	OBJECT IN ROADWAY	PREVIOUS ACCIDENT	D.U.I.	FELL ASLEEP	WET PAVEMENT	OUT OF COUNTY	NIGHT	A.M. PEAK	P.M. PEAK
19	—	—	—	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL												

YEAR	SPEEDING OR WRECKLESS DRIVING	DISREGARDING TRAFFIC SIGNS OR SIGNALS	WRONG SIDE OF ROADWAY	PHYSICAL DEFECTS SICK OR ILL	DRIVER'S ERROR OR NON ATTENTION	UNK-NOWN
19	—	—	—	—	—	—
19	—	—	—	—	—	—
19	—	—	—	—	—	—
19	—	—	—	—	—	—
19	—	—	—	—	—	—

ACTUAL ACCIDENT RATE ____

STATEWIDE AVERAGE ACCIDENT RATE ____

CRITICAL ACCIDENT RATE ____

ROUTE FEATURE DESCRIPTION LISTING

SHELBY County - I0055

COUNTY: SHELBY **COUNTY NO.** 79

ROUTE: I0055 **SPECIAL CASE:** None **CTY SEQ:** 1

LOG MILE	ITEM CODE	ROUTE FEATURE
11.140	7	RAMP TO FCU-2841 (W. MCLEMORE AV.) LT.
11.270	2	UNDERPASS [79I00550093]: E691 (WISCONSIN AV.)
11.380	2	UNDERPASS [79I00550095]: PEDESTRIAN WALKWAY
11.470	7	RAMP FROM I-55 SB. LNS. LT. START Section 1
11.520	0	EXIT 12A: US-64, US-70, US-79 / EAST / CRUMP BLVD.
11.520	7	RAMP TO SR-1 (E.H. CRUMP BLVD.) RT.
11.620	7	RAMP FROM SR-1 (E.H. CRUMP BLVD.) RT. S ↓ N
11.620	2	UNDERPASS [79I00550097]: SR-1 (E.H. CRUMP BLVD.) RT. & I-55 LT.
11.630	3	SR-1 (E.H. CRUMP BLVD.) RT. & I-55 LT. / {CENTER OF UNDERPASS} TURN Section 2
11.630	4	FCU-4233 (RIVERSIDE DR.) RT. / {CENTER OF OVERHEAD / BEGIN US-61/64/70/79}
11.650	0	EXIT 12B: I-55 SOUTH / JACKSON, MISS. E ↑ W
11.650	7	RAMP TO FCU-4233 (RIVERSIDE DR.) RT. & RAMP FROM I-55 LT.
11.770	7	RAMP FROM FCU-4233 (RIVERSIDE DR.) RT.
11.780	7	RAMP TO I-55 LT. END 11.80
11.820	0	EXIT 12C: DELAWARE ST.
11.820	7	RAMP TO E716 (DELAWARE AV.) RT.
11.850	7	RAMP FROM E716 (DELAWARE AV.) LT.
11.890	7	RAMP FROM E716 (DELAWARE AV.) RT.
11.930	2	OVERHEAD [79I00550099]: E716 (DELAWARE AV.)
12.000	2	BRIDGE [79I00550101]: MISSISSIPPI RIVER / {MEMPHIS-ARKANSAS MEMORIAL BRIDGE}
12.280	1	MEMPHIS CITY LIMITS & URBAN BOUNDARY
12.280	1	TENNESSEE-ARKANSAS STATE LINE
12.280	9	CENTER OF MISSISSIPPI RIVER BRIDGE

ROUTE FEATURE DESCRIPTION LISTING

SHELBY County - SR001

COUNTY: SHELBY **COUNTY NO.** 79

ROUTE: SR001 **SPECIAL CASE:** None **CTY SEQ:** 1

LOG MILE	ITEM CODE	ROUTE FEATURE
0.000	3	I-55 RT. & BACK / {CENTER OF OVERHEAD / RT. LNS. ONLY} / BEGIN E.H. CRUMP BLVD. IN MEMPHIS / {US-61/64/70/79}
0.000	4	FCU-4233 (RIVERSIDE DR.) LT. / {CENTER OF OVERHEAD / LT. LNS. ONLY}
0.000	2	OVERHEAD [79I00550097]: I-55 RT. & FCU-4233 (RIVERSIDE DR.) LT
0.020	7	RAMP TO I-55 RT. & RAMP FROM FCU-4233 (RIVERSIDE DR.) LT.
0.090	7	RAMP FROM I-55 RT. & RAMP TO FCU-4233 (RIVERSIDE DR.) LT.
0.100	6	GRADE CROSSING [663461P]: BURLINGTON-NORTHERN RAILROAD
0.190	5	E681 (KENTUCKY ST.) RT. & LT.
0.290	4	FCU-2842 (FLORIDA ST.) RT. & LT.
0.380	2	UNDERPASS [79SR0010001]: ILLINOIS CENTRAL RAILROAD [297544U]
0.390	2	UNDERPASS [79SR0010003]: CSX RAILROAD [_____]
0.450	4	FCU-2816 (S. MAIN ST.) LT.
0.480	5	E700 (MICHIGAN ST.) LT.

Section 2 W ↓ E

ROUTE FEATURE DESCRIPTION LISTING

SHELBY County - 04233

COUNTY: SHELBY COUNTY NO. 79

ROUTE: 04233 SPECIAL CASE: None CTY SEQ: 1

LOG MILE	ITEM CODE	ROUTE FEATURE
0.000	2	CENTER OF UNDERPASS SR-1 E.H. CRUMP BLVD. RT. & I-55 LT. BEGIN RIVERSIDE BLVD.
0.000	9	BEGIN ILLUM. & 45 MPH.
0.010	7	RAMP FROM SR-1 E.H. CRUMP BLVD. LT.
0.030	7	RAMP TO NB LANES OF I-55 RT.
0.090	7	RAMP TO NB LANES OF I-55 LT.
0.100	7	RAMP FROM SR-1 E.H. CRUMP BLVD. RT.
0.100	5	E683 VIRGINIA AVE. RT.
0.110	2	(79042330003) UNDERPASS UNDER [663383K] BURLINGTON-NORTHERN RR. & CSX RR.
0.120	7	RAMP FROM E682 CHANNEL 3 DR. LT.
0.150	2	(790B5900001) UNDERPASS UNDER E682 CHANNEL 3 DR.
0.180	5	E682 CHANNEL 3 DR. RT.
0.220	7	RAMP TO E682 CHANNEL 3 DR. LT.
0.250	5	E669 CAROLINA AVE. RT.
0.320	5	E637 GEORGIA AVE. RT. & LT.
0.350	2	UNDERPASS [79042330001]: PEDESTRAIN WALKWAY
0.370	9	BEGIN 40 MPH.
1.300	9	TRAFFIC SIGNAL
1.300	4	5284 BEALE ST. RT.
1.510	9	TRAFFIC SIGNAL
1.510	4	4441 UNION AVE. RT.
1.580	5	E623 MONROE AVE. RT.
1.700	5	E622 COURT AVE. RT.
1.800	9	TRAFFIC SIGNAL
1.800	5	K564 JEFFERSON AVE. RT.
1.880	9	TRAFFIC SIGNAL
1.880	4	2856 ADAMS AVE. RT.
1.880	2	(79042330005) UNDERPASS UNDER MUD ISLAND PEDESTRAIN WALKWAY & PASSENGER TROLLEY

Section 1 S ↓ N

END

Section 1
I-55 Beginning of Ramp Interchange South of SR-1 to the Overhead of SR-1 Crump

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: I0055 SC: 0 CO SEQ: 01
FROM LOG MILE: 1147 TO LOG MILE 1163 FOR YEARS 1997 TO 1999

		WEATHER		LIGHTING		COLLISION INVOLVEMENT	
FATAL ACCIDENTS	0						
PERSONS KILLED	0	CLEAR	40	DAWN	2	VEH/VEH	61
		CLOUDY	13	DAYLIGHT	49	VEH/TRAIN	0
INJURY ACC	15	FOGGY	0	DUSK	2	VEH/FARM IMP	0
		RAINING	18	DARK/NO LGT	1	VEH/ANM DR VEH	0
PERSONS INJURED	21	SNOWING	0	DARK/LGT ON	16	VEH/BICYCLE	0
		OTHER	4	DARK/LGT OFF	1	VEH/OT PEDCYC	0
PROP DAMAGE ACC	60					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	75					VEH/MISC ACT	1
		HEADON	0	DRY	49	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	42	WET	19	VEH RAN OFF RD &	
		ANGLE	5	SNOW	0	OVERTURNED	1
PEDESTRIANS	0	SIDESWIPE/SD	12	ICE	0	STRUCK FIX OBJ	12
HAZARDOUS CARGO	1	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	0	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	10	OTHER	14				

NEXT SCREEN 85 ACTION I

Section 1
Riverside Blvd. From Overhead of SR-1 Crump/ I-55 to end of Ramp interchange

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: 04233 SC: 0 CO SEQ: 01
FROM LOG MILE: 0000 TO LOG MILE 0010 FOR YEARS 1997 TO 1999

		WEATHER		LIGHTING		COLLISION INVOLVEMENT	
FATAL ACCIDENTS	0						
PERSONS KILLED	0	CLEAR	3	DAWN	0	VEH/VEH	5
		CLOUDY	0	DAYLIGHT	5	VEH/TRAIN	0
INJURY ACC	1	FOGGY	0	DUSK	0	VEH/FARM IMP	0
		RAINING	3	DARK/NO LGT	0	VEH/ANM DR VEH	0
PERSONS INJURED	1	SNOWING	0	DARK/LGT ON	1	VEH/BICYCLE	0
		OTHER	0	DARK/LGT OFF	0	VEH/OT PEDCYC	0
PROP DAMAGE ACC	5					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	6					VEH/MISC ACT	1
		HEADON	0	DRY	3	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	2	WET	3	VEH RAN OFF RD &	
		ANGLE	1	SNOW	0	OVERTURNED	0
PEDESTRIANS	0	SIDESWIPE/SD	2	ICE	0	STRUCK FIX OBJ	0
HAZARDOUS CARGO	0	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	0	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	0	OTHER	1				

NEXT SCREEN 85 ACTION I

Section 1
I-55 Beginning of Ramp Interchange South of SR-1 to the Overhead of SR-1 Crump

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: I0055 SC: 0 CO SEQ: 01
FROM LOG MILE: 1147 TO LOG MILE 1163 FOR YEARS 1998 TO 2000

FATAL ACCIDENTS	0	WEATHER		LIGHTING		COLLISION INVOLVEMENT	
PERSONS KILLED	0	CLEAR	50	DAWN	2	VEH/VEH	64
		CLOUDY	9	DAYLIGHT	55	VEH/TRAIN	0
INJURY ACC	19	FOGGY	0	DUSK	3	VEH/FARM IMP	0
		RAINING	16	DARK/NO LGT	1	VEH/ANM DR VEH	0
PERSONS INJURED	26	SNOWING	0	DARK/LGT ON	12	VEH/BICYCLE	0
		OTHER	4	DARK/LGT OFF	2	VEH/OT PEDCYC	0
PROP DAMAGE ACC	60					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	79					VEH/MISC ACT	2
		HEADON	0	DRY	55	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	47	WET	17	VEH RAN OFF RD &	
		ANGLE	5	SNOW	0	OVERTURNED	1
PEDESTRIANS	0	SIDESWIPE/SD	11	ICE	0	STRUCK FIX OBJ	12
HAZARDOUS CARGO	1	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	0	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	11	OTHER	15				

NEXT SCREEN 85 ACTION I

Section 1
Riverside Blvd. From Overhead of SR-1 Crump/ I-55 to end of Ramp interchange

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: 04233 SC: 0 CO SEQ: 01
FROM LOG MILE: 0000 TO LOG MILE 0010 FOR YEARS 1998 TO 2000

FATAL ACCIDENTS	0	WEATHER		LIGHTING		COLLISION INVOLVEMENT	
PERSONS KILLED	0	CLEAR	1	DAWN	0	VEH/VEH	4
		CLOUDY	0	DAYLIGHT	2	VEH/TRAIN	0
INJURY ACC	0	FOGGY	0	DUSK	0	VEH/FARM IMP	0
		RAINING	3	DARK/NO LGT	0	VEH/ANM DR VEH	0
PERSONS INJURED	0	SNOWING	0	DARK/LGT ON	2	VEH/BICYCLE	0
		OTHER	0	DARK/LGT OFF	0	VEH/OT PEDCYC	0
PROP DAMAGE ACC	4					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	4					VEH/MISC ACT	0
		HEADON	0	DRY	1	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	2	WET	3	VEH RAN OFF RD &	
		ANGLE	1	SNOW	0	OVERTURNED	0
PEDESTRIANS	0	SIDESWIPE/SD	1	ICE	0	STRUCK FIX OBJ	0
HAZARDOUS CARGO	0	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	0	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	0	OTHER	0				

NEXT SCREEN 85 ACTION I

Section 2
I-55 From the center of SR-1 Crump overhead going west toward Mississippi to the end of ramp interchange I-55/SR-1

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: I0055 SC: 0 CO SEQ: 01
FROM LOG MILE: 1164 TO LOG MILE 1180 FOR YEARS 1997 TO 1999

FATAL ACCIDENTS	0	WEATHER		LIGHTING		COLLISION INVOLVEMENT	
PERSONS KILLED	0	CLEAR	20	DAWN	0	VEH/VEH	20
		CLOUDY	3	DAYLIGHT	22	VEH/TRAIN	0
INJURY ACC	4	FOGGY	0	DUSK	0	VEH/FARM IMP	0
		RAINING	1	DARK/NO LGT	0	VEH/ANM DR VEH	0
PERSONS INJURED	5	SNOWING	0	DARK/LGT ON	2	VEH/BICYCLE	0
		OTHER	0	DARK/LGT OFF	0	VEH/OT PEDCYC	0
PROP DAMAGE ACC	20					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	24					VEH/MISC ACT	1
		HEADON	1	DRY	22	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	12	WET	2	VEH RAN OFF RD &	
		ANGLE	4	SNOW	0	OVERTURNED	0
PEDESTRIANS	0	SIDESWIPE/SD	2	ICE	0	STRUCK FIX OBJ	3
HAZARDOUS CARGO	0	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	0	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	2	OTHER	5				

NEXT SCREEN 85 ACTION I

Section 2
SR-1 Crump from over I-55 to end of I-55/Riverside Blvd. Interchange

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: SR001 SC: 0 CO SEQ: 01
FROM LOG MILE: 0000 TO LOG MILE 0009 FOR YEARS 1997 TO 1999

FATAL ACCIDENTS	0	WEATHER		LIGHTING		COLLISION INVOLVEMENT	
PERSONS KILLED	0	CLEAR	19	DAWN	1	VEH/VEH	23
		CLOUDY	4	DAYLIGHT	22	VEH/TRAIN	0
INJURY ACC	5	FOGGY	0	DUSK	0	VEH/FARM IMP	0
		RAINING	3	DARK/NO LGT	0	VEH/ANM DR VEH	0
PERSONS INJURED	5	SNOWING	0	DARK/LGT ON	3	VEH/BICYCLE	0
		OTHER	1	DARK/LGT OFF	0	VEH/OT PEDCYC	0
PROP DAMAGE ACC	22					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	27					VEH/MISC ACT	1
		HEADON	1	DRY	23	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	9	WET	3	VEH RAN OFF RD &	
		ANGLE	5	SNOW	0	OVERTURNED	0
PEDESTRIANS	0	SIDESWIPE/SD	9	ICE	0	STRUCK FIX OBJ	3
HAZARDOUS CARGO	1	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	0	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	2	OTHER	3				

NEXT SCREEN 85 ACTION I

Section 2
I-55 From the center of SR-1 Crump overhead going west toward Mississippi to the end of ramp interchange I-55/SR-1

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: I0055 SC: 0 CO SEQ: 01
FROM LOG MILE: 1164 TO LOG MILE 1180 FOR YEARS 1998 TO 2000

FATAL ACCIDENTS	0	WEATHER		LIGHTING		COLLISION INVOLVEMENT	
PERSONS KILLED	0	CLEAR	25	DAWN	0	VEH/VEH	26
		CLOUDY	3	DAYLIGHT	24	VEH/TRAIN	0
INJURY ACC	5	FOGGY	0	DUSK	0	VEH/FARM IMP	0
		RAINING	1	DARK/NO LGT	0	VEH/ANM DR VEH	0
PERSONS INJURED	6	SNOWING	0	DARK/LGT ON	5	VEH/BICYCLE	0
		OTHER	0	DARK/LGT OFF	0	VEH/OT PEDCYC	0
PROP DAMAGE ACC	24					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	29					VEH/MISC ACT	0
		HEADON	1	DRY	26	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	17	WET	2	VEH RAN OFF RD &	
		ANGLE	1	SNOW	0	OVERTURNED	1
PEDESTRIANS	0	SIDESWIPE/SD	4	ICE	0	STRUCK FIX OBJ	2
HAZARDOUS CARGO	0	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	1	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	3	OTHER	6				

NEXT SCREEN 85 ACTION I

Section 2
SR-1 Crump from over I-55 to end of I-55/Riverside Blvd. Interchange

DOT ACCIDENT SUMMARY REPORT
INQUIRY SECTION: CO: 79 ROUTE: SR001 SC: 0 CO SEQ: 01
FROM LOG MILE: 0000 TO LOG MILE 0009 FOR YEARS 1998 TO 2000

FATAL ACCIDENTS	0	WEATHER		LIGHTING		COLLISION INVOLVEMENT	
PERSONS KILLED	0	CLEAR	22	DAWN	1	VEH/VEH	27
		CLOUDY	4	DAYLIGHT	24	VEH/TRAIN	0
INJURY ACC	4	FOGGY	0	DUSK	1	VEH/FARM IMP	0
		RAINING	2	DARK/NO LGT	0	VEH/ANM DR VEH	0
PERSONS INJURED	4	SNOWING	0	DARK/LGT ON	2	VEH/BICYCLE	0
		OTHER	1	DARK/LGT OFF	0	VEH/OT PEDCYC	0
PROP DAMAGE ACC	25					VEH/ANIMAL	0
		COLLISION		ROAD COND		VEH/PEDEST	0
TOTAL ACCIDENTS	29					VEH/MISC ACT	1
		HEADON	0	DRY	26	VEH/OVTRN I/RD	0
ACCIDENTS INVOLVING		REAREND	11	WET	2	VEH RAN OFF RD &	
		ANGLE	5	SNOW	0	OVERTURNED	0
PEDESTRIANS	0	SIDESWIPE/SD	11	ICE	0	STRUCK FIX OBJ	1
HAZARDOUS CARGO	0	SIDESWIPE/OD	0	MUD	0	OTHER	0
CONSTRUCTION ZONE	0	TOP OF VEH	0	OTH	0		
FIXED OBJECTS	1	OTHER	2				

NEXT SCREEN 85 ACTION I

County	Route Nbr	Sp. Case	Co. Seq.	Beg LM	End LM	Year	AADT
SHELBY	I0055	0-NONE	1	8.920	10.360	2001	67930
SHELBY	I0055	0-NONE	1	10.360	10.970	2001	64250
SHELBY	I0055	0-NONE	1	10.970	11.630	2001	62840
SHELBY	I0055	0-NONE	1	11.630	12.280	2001	47080

County	Route Nbr	Sp. Case	Co. Seq.	Beg LM	End LM	Year	AADT
SHELBY	SR001	0-NONE	1	0.000	0.690	2001	12970
SHELBY	SR001	0-NONE	1	0.690	1.140	2001	17000

County	Route Nbr	Sp. Case	Co. Seq.	Beg LM	End LM	Year	AADT
SHELBY	04233	0-NONE	1	0.000	1.880	2001	18830

APPENDIX J

DESIGN EXCEPTION DATA

DESIGN EXCEPTION DATA SUMMARY

ROUTE:	I-55	ALTERNATE:	D
REGION:	IV	COUNTY:	Shelby
LOCATION	I-55 and US 64 (Crump Boulevard) Interchange		

PRESENT ADT (2005)	64,650
FUTURE ADT (2025)	95,680
PERCENT TRUCKS (ADT)	25%
DHV (2025)	9,568
DIRECTIONAL DISTRIBUTION	55 - 45
EXISTING POSTED SPEED	50 mph
PROPOSED DESIGN SPEED	45 mph
TYPE OF TERRAIN	Flat
RURAL OR URBAN AREA	Urban
MINIMUM RADIUS FOR PROPOSED DESIGN SPEED*	600 ft

REMARKS:

* Due to the constraints outlined in this study as it relates to Alternate D, a minimum degree of curve for a design speed of 45 miles per hour would be required. It is for this reason a design exception would be needed.