CHAPTER I
Purpose and Need Statement

A. Proposed Action

1. Project Background

The Missouri Department of Transportation (MoDOT) is conducting a location study to address the transportation problems associated with U.S. Route 65 (Route 65), in Benton County, Missouri. **Figure I-1** depicts the general vicinity of the study area. The northern terminus is located just south of the Route 52 interchange, where Route 65 transitions from a four-lane divided highway with a 60-foot-wide grassed median to a two-lane facility with narrow shoulders, at-grade intersections and limited access control[1]. Route 65 passes through the City of Lincoln and the City of Warsaw. The southern terminus is immediately south of the Route 7 interchange. The study area incorporates the interchanges at Truman Dam Access Road and Route 7. Overall, the study area extends approximately 15 miles.

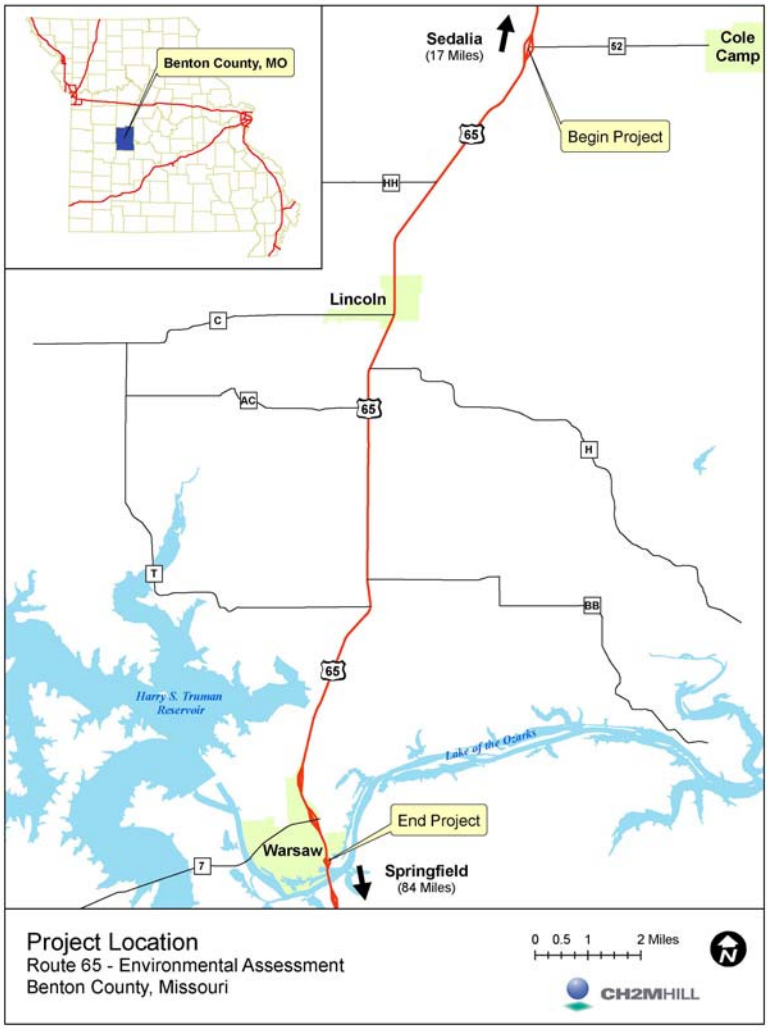

Figure I-1: Route 65 Project Location Map

On April 20, 1994, a Notice of Intent (NOI) to prepare an environmental impact statement (EIS) for the proposed 17.5-mile, four-lane relocation of Route 65 in Benton County, Missouri, was published in the Federal Register. This NOI was later rescinded due to the project being revised to consist of simply widening approximately 15 miles of Route 65 from two lanes to four lanes, with the only consideration of relocation to being in the vicinity of Lincoln. The Route 65 project was developed in accordance with the goals of MoDOT's Long-Range Transportation Plan. It is also included in the State Transportation Improvement

[1] Within the study area, the traveled way is composed of two 12-foot lanes, with shoulders varying between two and 10 feet (four-foot shoulders are typical).

Program: 2006–2010 (STIP). This project is being funded by Amendment 3 monies and has a projected award date of 2010.

The purpose and need are the transportation-related problems that this project is intended to address. The generation and evaluation of alternatives are conducted to develop the most appropriate solution to the identified problems. Ultimately, the identification of a selected alternative will be based on how well it satisfies the project's purpose and need and its associated impacts.

The Route 65 purpose and need statement is the result of extensive coordination and input from the public agencies (MDNR, COE, MDC) and local municipal leaders (City of Lincoln, City of Warsaw, Kaysinger Basin Regional Planning Commission, Benton County Transportation Corporation). Coordination and input have helped clarify the scope of the project and facilitated the project-related discussions that have occurred as the project proceeded through the preliminary development process. Because of this coordination, the purpose and need of the Route 65 improvement project have been refined to allow for the best possible decision-making to occur.

Typical view of Route 65 north of study area

2. Logical Termini/Independent Utility

The logical termini for the Route 65 project are:

- The end of the four-lane divided highway just south of the Route 52 interchange (northern terminus) and
- The Route 7 interchange (southern terminus).

This project's northern terminus will match the four-lane divided highway that characterizes Route 65 to the north. The four-lane divided configuration extends until Marshall, Missouri, except through Sedalia where a five-lane, center-turn lane, cross-section is used.

The project's southern terminus is located immediately south of the Route 7 interchange. At the southern end of the Route 65 study area, there are three closely spaced interchanges located in the vicinity of Warsaw. The Route 65 project includes the northern two interchanges of this trio - the interchange at Truman Dam Access Road and the interchange at Route 7. The Route 65 project excludes the third interchange – the Main Street interchange. The Route 65 project excludes the Main Street interchange based on the change in traffic volumes that occur at this point. The Truman Reservoir is the major destination within the Route 65 project area. Vehicles destined for the

View of the merge/diverge area between the Truman Dam and Route 7 interchanges. The primary operational issue is to better coordinate the movements between the interchanges.

Northward view from the Main Street interchange. The connecter road to the Route 7 interchange is visible in the right of this view.

Southward view from the Main Street interchange. The Osage River crossing and the Route 83 interchange are visible in the background.

reservoir utilize the Truman Dam Access Road interchange and the Route 7 interchange.

Relative to the project's independent utility, it can be seen as a logical expansion of service. North of the project area, Route 65 is a four-lane divided highway extending northward through Sedalia to Marshall, Missouri. Within Benton County, Route 65 is the primary north/south roadway. Extending the four-lane portion of Route 65 to Warsaw will improve access and operations for all of Benton County. These improvements will occur without the need for any other transportation project.

3. Study Area Description

Route 65 is a north/south U.S. highway stretching 998 miles between Albert Lea, Minnesota, and Natchez, Mississippi. Created in 1926, Route 65 runs through Minnesota, Iowa, Missouri, Arkansas, Louisiana and Mississippi. In Missouri, Route 65 runs north/south across the western part of the state through the cities of Marshall, Sedalia, Springfield and Branson. Route 65 is the most heavily traveled highway in Benton County. It roughly divides the county into eastern and western halves. The county's major population centers, Cole Camp, Lincoln, Warsaw and Fristoe, rely on Route 65 for access. Within the 15 mile-long corridor, Route 65 is a two-lane highway that follows the area's rolling terrain. This terrain creates a narrow and curvy roadway with numerous blind spots and difficult curves.

Typical view of narrow roadways and blind spots along Route 65

All intersections within the study area (even at the interchanges) are unsignalized. Stop signs (on the cross-streets) control access at the major intersections. **Table I-1** identifies the cross-roads

located within the study area. In addition to these intersections, there are numerous driveways and farm access points throughout the study area. **Exhibits I-1A–D** depict the elements of the Route 65 study area discussed in this text[2].

Table I-1: Summary of All Intersections within Route 65 Study Area

Cross-road		Through?	Perpendicular?	Notes
1	Mt. Olivet Road	No	No	—
2	Dulaban Road/Route HH	Yes	No	—
3	Frisch Road	No	Yes	Lincoln
4	Jenny Lane	No	Yes	Jenny & Airport closely offset
5	Airport Road	No	Yes	
6	Timberline Drive	No	Yes	Lincoln
7	Oak Street	Yes	Yes	Lincoln
8	Locust Street	No	Yes	Lincoln
9	Route C (Fordney Road)	Yes	Yes	Lincoln
10	Osage Street	No	No	Lincoln
11	McCain Street	No	No	Lincoln
12	Morgan Street	No	No	Lincoln
13	Zion Church/Gerken Road	Yes	No	—
14	Rotermund Avenue/Route H	Yes	No	—
15	Route AC	No	Yes	—
16	Carpet Barn Road	No	Yes	—
17	McDaniel Road	No	Yes	—
18	Drenon Road	No	Yes	—
19	Meyer Road	No	Yes	—
20	Route BB	No	Yes	BB, T and Poplar Church closely offset
21	Route T	No	Yes	
22	Poplar Church Road	No	No	
23	Sterett Creek Marina Road	No	No	—
24	Cedar Gate Road	No	No	—
25	Truman Dam Access Road	Yes	Yes	Interchange
26	Route 7	Yes	Yes	Interchange

The largest population centers within the Route 65 study area are Warsaw and Lincoln. Warsaw, with a population of approximately 2,100, is the Benton County seat. Warsaw lies adjacent to Route 65 at the project's southern terminus. Route 65 is the major north/south road

[2] All exhibits are located at the end of the referenced chapter.

through the City of Lincoln. The population of Lincoln is approximately 1,500. Two other Benton County communities, Cole Camp and Fristoe, are located along Route 65 outside of the study area. Cole Camp is located approximately two miles north of the study area, and Fristoe is located approximately 10 miles south of the study area.

The portion of the study area north of Lincoln is relatively short. It is approximately five miles between the Route 52 interchange and Lincoln. The four-lane divided portion of Route 65 ends near the Mt. Olivet Road intersection. The only other roadway intersection north of Lincoln is at Route HH/Dulaban Road. In addition to numerous existing driveways, this portion of the study area displays substantial amounts of new/pending residential development along Route 65, especially along the western side of Route 65. This will increase the total number of access points along this portion of Route 65.

View of difficult curve on Route 65

The portion of Route 65 north of Lincoln lies within the Cole Camp Creek watershed. There are four stream crossings, including one of the Carman Creek. Existing roadside development is primarily residential and concentrated on the west side of the road. Wooded areas are interspersed with pasture. The posted speed limit in this portion of the study area is 60 miles per hour (mph).

The portion of Route 65 within Lincoln is short (less than one mile), but it accounts for nearly one-third of the study area's intersections. Within Lincoln, the speed limit is 45 mph. Typical roadside commercial uses (restaurants, service stations, automotive, general retail) line Route 65 in Lincoln. Relatively wide parking areas flank Route 65. Drainage is via open roadside ditches that eventually discharge to the nearby Timber Line Lake. Route 65 is Lincoln's major north/south roadway. Route C is Lincoln's primary east/west roadway. Route C is also known as Fordney Road, east of Route 65 and Main Street, west of Route 65. A flashing warning light is located at this intersection, which is controlled by a stop sign on Route C. All of the other intersections within Lincoln are local roadways. Route 65 is considered a vital component of the Lincoln economy. Servicing traffic destined for the Truman Reservoir seems to be the dominant revenue source. Other important land uses along Route 65 in Lincoln include a U.S. Department of Agriculture (USDA) field office, the local bank and a retirement home. One of the two airports in the vicinity of the Route 65 project lies within sight of

Typical view of Route 65 through Lincoln

Route 65 in Lincoln. The Lincoln Airport is a grass-strip facility, just northwest of Lincoln. The second airport is the Warsaw Airport, located south of Lincoln in the northwestern quadrant of the Route 65/Drenon Road intersection.

South of Lincoln, the speed limit returns to 60 mph. This portion of the study area is approximately 10 miles long. Pasture is punctuated with several important land uses. Among these are the Warsaw Airport, the Rock Hill Prairie, the Lost Valley Fish Hatchery and the Truman Reservoir. Rolling terrain and the narrow roadway cross-section continues through this area. In addition to numerous minor crossings, this portion of the project includes two interchanges, a major access point to the Sterett Creek Marina[3] and the closely spaced intersections of Routes BB, T and Poplar Church Road. Each of these presents unique challenges. The two grade-separated interchanges are located near the project's southern terminus. The interchange at Truman Dam Access Road has a narrow diamond configuration and principally provides access to and from Truman Lake. The other interchange is located at Route 7, approximately 4,400 feet

Property associated with the Lost Valley Fish Hatchery (left) and the Truman Reservoir (right), which lie opposite each other along Route 65.

south of the Truman Dam Access Road interchange. This diamond interchange provides the primary highway access to the City of Warsaw. The Rock Hill Prairie is a privately held nature preserve administered by The Nature Conservancy. The Truman Reservoir is administered by the U.S. Army Corps of Engineers (ACOE), and the Lost Valley Fish Hatchery is administered by the Missouri Department of Conservation (MDC).

In addition to MoDOT Project J5P0892, there are several other STIP projects within the Benton County portion of Route 65. Project J5P0871 would improve the geometrics of Route 65 at the curve 2.1 miles south of the Route T intersection. Project J5S0846 would replace the box culvert at Byler Branch along Route C in Lincoln. This crossing is approximately 3,000 feet from

[3] Part of the Harry S. Truman Reservoir.

Route 65. These projects would be incorporated into all planning associated with MoDOT Project J5P0892.

B. Elements of Purpose and Need

Purpose and need are the transportation-related problems that a project is intended to address. The generation and evaluation of alternatives are conducted to develop the most appropriate solution to the identified problems. The selected alternative would be identified on the basis of how well it satisfies the project's purpose and need[4].

The elements that define the purpose and need associated with the Route 65 project are the following:

1. Improve Safety on Route 65
   - How well will alternatives address known traffic crash hot spots?
   - How well will the alternatives address access management issues?
   - How well will the alternatives improve safety-related design issues?

2. Enhance Corridor Operations
   - How well will alternatives address the issue of limited passing?
   - How well will the alternatives address the need for adequate capacity?
   - How well will the alternatives address the operation of intersections?

3. Achieve Regional/Local Continuity Goals
   - How well will alternatives provide access to important local destinations and maintain locally important pathways?

The remainder of this section addresses these elements. Together, the purpose and need will shape the range of alternatives generated and evaluated for this project.

1. Improve Safety on Route 65

The configuration of Route 65, along with the characteristics of its users, creates conditions where unsafe operations flourish[5]. This portion of Route 65 is a narrow two-lane roadway with poor sight lines, following a rolling-type terrain. Many of the users of Route 65 are trucks and trailers destined for Truman Reservoir. These vehicles slow the overall pace of traffic on the narrow roadway. The hills and curves of the existing roadway make passing difficult. Head-on and rear-end crashes on this portion of Route 65 are frequent. Consequently, the first goal of the Route 65 project is to improve safety along Route 65.

A review of the crash statistics for the years 2000 through 2004 found that total crash rates within the Route 65 study area were somewhat higher than statewide rates. Overall, the project crash rate was 172.49, compared to a statewide rate of 169.11. On this 15.4-mile portion of highway, there were eight fatalities between 2000 and 2004. The Missouri State Highway Patrol reports traffic deaths using a rate based on deaths per 100 million vehicle miles traveled.

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[4] The identification of the selected alternative will also incorporate the magnitude of project impacts, relative to the other alternatives that satisfy the project's purpose and need.

[5] Accident statistics and safety data summarized or presented in this document are protected under federal law. See **Appendix I-A**.

Between 2000 and 2004, the death rate in Missouri varied between 1.6 and 1.8[6]. The average death rate for this portion of Route 65 is 47 percent higher (2.5) than the statewide average. The combination of high numbers of slower vehicles[7], a narrow winding road and limited passing opportunities[8] seem to be factors that result in the death and crash rates. **Table I-2** summarizes crash rate analysis for the portion of Route 65 within the project area.

Table I-2: Summary of Crash Data

Section		Project-Wide Crash Rate	Statewide Crash Rate	Fatal Crashes	Crashes Resulting in Disabilities	Head-on Crashes	Total Crashes
1	Route 52 to Lincoln	110.58	169.11	3	5	7	58
2	Lincoln	219.45	169.11	2	4	3	64
3	Lincoln to Route T	174.14	169.11	1	17	7	133
4	Route T to Route 7	119.52	169.11	2	7	4	99
	Totals	172.49*	169.11	**8**	**33**	**21**	**354**

Note:
*This total is an average for five years.

To evaluate how well alternatives would address the issue of safety, the project team focused on three critical elements. These critical elements will form one of the criteria by which alternatives will be developed and evaluated. Regarding safety along the Route 65 corridor, these are the critical elements:

1. How well will alternatives address known traffic crash hot spots within the corridor?
2. How well will the alternatives address access management issues within the corridor?
3. How well will the alternatives implement safety-related design specifications within the corridor?

By adequately addressing these issues, the corridor's safety will be improved. All other things being equal, alternatives that address these critical elements best should be considered superior. The balance of this section will examine these safety-related critical elements.

6 Death rates have been steadily declining for the past the last 20 years. In 1986, the death rate was in excess of 2.5.

7 The project's Design Traffic assumes that 13 percent of the Route 65 traffic stream is composed of trucks. This number is supplemented by an unknown number of cars towing boat trailers to and from the Truman Lake. The operational characteristics of trucks and cars with boat trailers are similar.

8 North of Lincoln, 56 percent of Route 65 consists of no-passing zones. Within Lincoln, approximately 66 percent of Route 65 consists of no-passing zones. South of Lincoln, approximately 60 percent of Route 65 consists of no-passing zones.

a. Crash Trends

The analysis of crash records revealed several areas where crashes were prevalent. The crash distribution map shown in **Figure I-2** depicts the location of each crash on record between year 2000 and year 2004. From this map, it is possible to observe general crash trends and patterns in the project area. These observations assisted the team in developing solutions to improve the existing conditions.

One trend is that seven of the eight fatalities recorded were the result of head-on collisions. The existing two-lane road forces opposing traffic to pass by each other in very close proximity. This constraint combined with vehicles traveling too fast for the existing geometry seems to be the primary contributor to the head-on collisions occurring in the corridor.

A second crash trend that exists in the project corridor is the concentration of crashes occurring at or around some of the cross-road intersections along the corridor. Several intersections along the existing corridor are either skewed or connect to Route 65 at locations where there is not sufficient sight distance for drivers to judge gap distance. These intersections include Zion Church Road/Gerken Road, Route H/Rotermund and Route T/Poplar Church Road. In addition to the challenges posed by the intersection configuration, having only one lane in each direction on existing Route 65 limits the ability of through traffic to avoid slow-moving vehicles entering Route 65 from the respective cross-roads, increasing the risk of rear-end and/or right-angle collisions at cross-road intersections.

Lastly, there is a significant number of rear-end crashes that occur along Route 65 in the City of Lincoln. This trend is largely attributable to the large number of access points along both sides of Route 65. Here again, the presence of only one lane in each direction on Route 65 limits the ability of through traffic to avoid slow-moving vehicles that are either entering the Route 65 traffic stream or slowing down to turn off of Route 65 into one of the abutting parcels.

b. Access Management

Access management seeks to limit and consolidate access along major roadways, while promoting an adequately functioning local street system. The result of appropriately applying access management techniques is a roadway that functions safely and efficiently. Access management also tends to create a more attractive corridor from the local perspective. Especially within Lincoln, there are very few access management techniques in use along Route 65. The Missouri Department of Transportation Access Management Guidelines (May 1, 2005) are a comprehensive assemblage of access management techniques. While there are many access management techniques, not all techniques are appropriate in all instances. This requires the judicious establishment of techniques that will advance the goals of any individual project. The use of the following standards will improve highway travel and local access, which is expected to minimize accidents/improve safety.

At-Grade Intersection and Traffic Signal Spacing

The minimum spacing between public roadway intersections should ideally be 1.0 mile in rural areas and 0.5 mile in urban areas. This standard is not met currently, and it is not the intent of this project to force this condition into being.

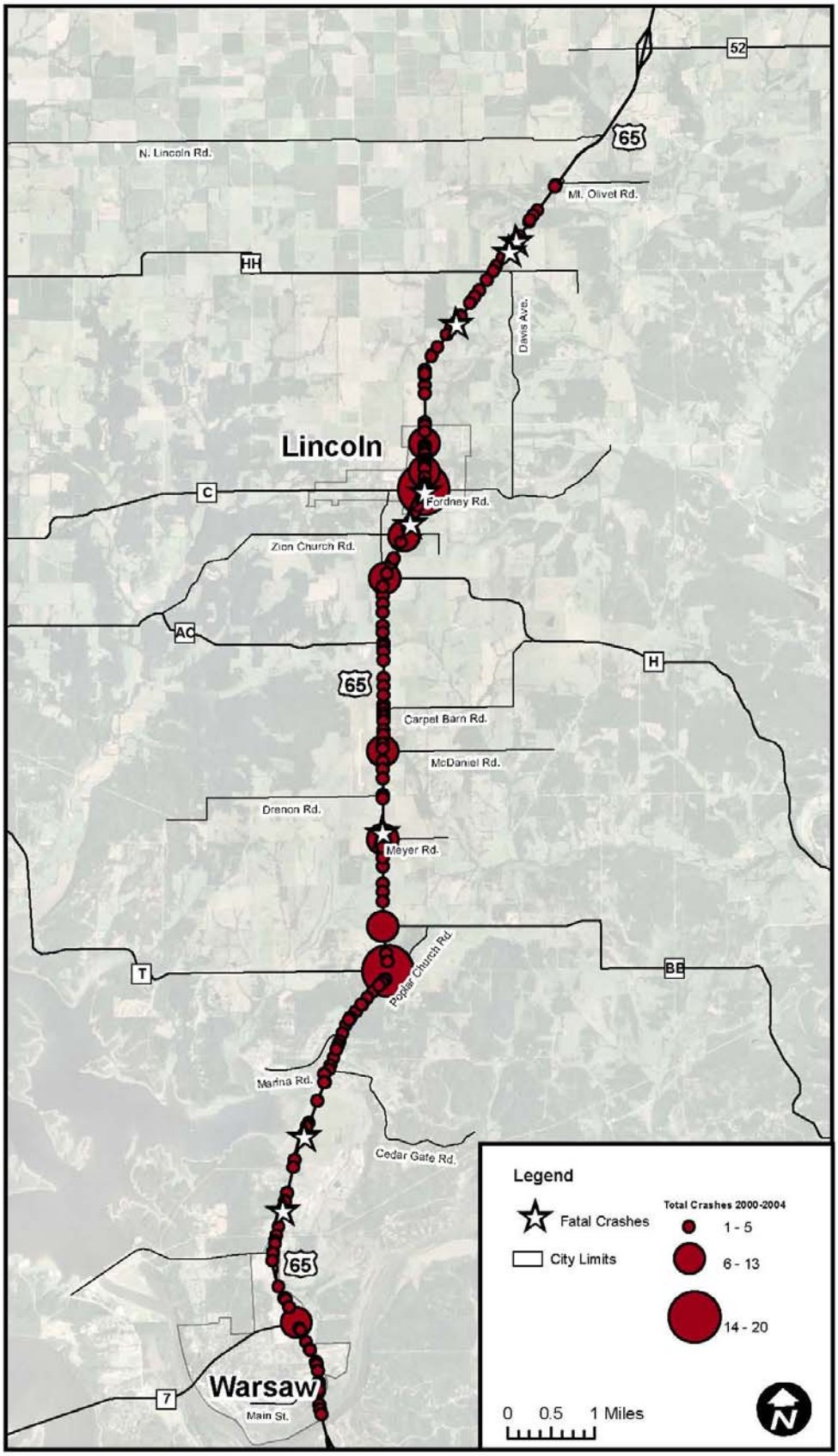

Figure I-2: Crash Hot Spots

Median Opening Spacing

Openings in raised medians should only be provided to accommodate turning traffic to locations where this can be done safely. Two types of openings can be utilized. A full opening accommodates turns in both directions, while a directional opening allows turns in only one direction. Median openings shall not be used within the functional area of an intersection between two public roads, at locations with high accident rates and where the opening does not allow for an adequate sight distance. Storage lengths should be a minimum of 40 feet (two guideline car lengths) in rural areas and 60 feet (three guideline car lengths) in urban areas.

Table I-3 summarizes the recommended minimum distances for median openings.

Table I-3: Median Opening Spacing

Roadway Classification	In Current and Projected Urban Areas	In Rural Areas
Principal Arterial	- 1,320 to 2,640 feet	- 2,640 feet (full) when posted speed is over 45 mph
	- 660 to 1,320 feet (directional)	- 1,320 feet (full) when posted is under 45 mph

Raised Medians

Raised medians are an effective access management strategy on high-volume urban routes. Use of raised medians is recommended where current and projected traffic volume is greater than 28,000 average annual daily traffic (AADT). Raised medians are recommended when strategies, such as driveway consolidation and corner clearance, are not practical. Raised medians should be used on arterial facilities with three or more through traffic lanes in each direction.

Two-Way, Left-Turn Lanes

Two-way, left-turn lanes (TWLTL) work best in situations where traffic volume and the density of driveways are relatively low and the proportion of left-turning vehicles is relatively high. It is recommended that they only be considered in places where commercial driveways make up a substantial portion of total driveways and where the percentage of vehicles turning left at peak hour is at least 20 percent.

The Missouri Department of Transportation does not recommend use of TWLTL when commercial driveway density is over 24 per mile (12 per mile in each direction). This equates to an average driveway spacing of 440 feet. When high driveway densities are present, crash rates increase significantly. Use of TWLTL is only recommended where current and projected traffic volumes are less than 28,000 in average daily traffic (ADT).

Driveway Spacing

Minimum spacing between private driveways is needed to ensure adequate safety and traffic flow. In urban areas, typical MoDOT guidelines suggest about one driveway per city block. Direct access should be moved to local streets, wherever possible. Driveways should also be

lined up across the public roadway from each other whenever possible. Driveways should only be allowed where the proper sight distance is available. In rural areas, the minimum driveway spacing guideline is 660 to 1,320 feet.

The section of Route 65 through Lincoln can be characterized by its complete lack of driveway spacing limits. The numerous driveways present conflicts for traffic operations on Route 65, and as noted above, they are contributing to a high frequency of rear-end crashes in this area. This project is not recommending a minimum spacing standard for driveways; rather, it is recommending a case-specific analysis of the Lincoln area to determine the most effective driveway configurations and spacing. Driveways should also be lined up across the public roadway from each other, whenever possible. Driveways should only be allowed where the proper sight distance is available. In rural areas, the minimum driveway spacing guideline is 660 to 1,320 feet. **Chapter II.C.1.h** provides additional information in this regard.

Parking

No parking should be allowed on Route 65. Any parking along the corridor will need to be from adjacent parking lots. Access between parking lots and Route 65 will occur via driveways.

c. Safety-Related Design Specifications

Safety is also affected by the design characteristics of a roadway. In order to ensure that alternatives are designed such that appropriate safety measures are used, design criteria for the Route 65 project were established. Another important objective of the design criteria is to ensure fulfillment of federal and state regulations. These criteria focus on highway geometry and its relationship to traffic operations and safety. They reflect the desire for a practical and safe facility and are based on the current (2006) MoDOT Practical Design Guidance, the American Association of State Highway Transportation Officials (AASHTO) Roadside Design Guide (2001) and the 2004 AASHTO publication of “A Policy on Geometric Design of Highways and Streets.” Among the key safety-related design specifications include the following:

Facility Selection: Selecting the most appropriate facility type is an important decision for any project. The facility must be able to address the purpose and need for the project, and it must be appropriate for the context. Key factors that will aid in the selection of the Route 65 facility type include system capacity requirements, system continuity, access management and safety.

Horizontal and Vertical Geometry: These design parameters will be controlled by the design speed. Per MoDOT practical design guidance, the design speed will be equal to the posted speed (45 mph in Lincoln, 60 mph outside of Lincoln).

Cross-Sectional Elements: The proposed Route 65 improvements in the rural areas of the corridor will consist of constructing 12-foot lanes with a 10-foot outside shoulder and a four-foot inside shoulder. To improve safety, rumble strips will be provided on all newly constructed shoulders. Auxiliary lanes at interchanges should be constructed to be 12 feet wide. Newly constructed lanes should be separated from existing lanes by a depressed median in all rural areas of the corridor. In most sections of the rural corridor, a 60-foot median is the goal. In areas where the existing roadway’s vertical profile differs greatly from the proposed profile, it will be necessary to provide a wider median to allow for the construction of stable slopes. Through the City of Lincoln, 12-foot lanes should be constructed. Turn lanes should be 14 feet wide. Outside of the travel lanes, either a curb-and-gutter section or four-foot shoulders should be provided.

The complete design criteria technical memo for the Route 65 project is available in the project's technical file. The development of alternatives will attempt to comply with all design criteria. The ability to satisfy design criteria will be a focus of alternative evaluation.

2. Enhance Corridor Operations

Within the study area, Route 65 is a narrow two-lane roadway with poor sight lines, following a rolling-type terrain. Many of the users of Route 65 are trucks and trailers destined for Truman Reservoir. These vehicles slow the overall pace of traffic on the narrow roadway. The hills and curves of the existing roadway make passing difficult. Roughly two-thirds of the study area consists of no-passing zones. In addition to its safety implications, these conditions result in a poorly operating corridor. Typical conditions include vehicles getting stacked behind slower-moving vehicles and being unable to progress in a timely manner. As overall volumes increase, this problem will become more pronounced. Consequently, the second goal of the Route 65 project is to enhance corridor operations along Route 65.

An analysis of conditions along Route 65 concluded that if nothing is done on Route 65, traffic volumes will steadily increase and operational conditions along the corridor will decline to the point of failure (**Table I-4**). Average Daily Traffic along Route 65 is estimated to be:

- 2006 ADT – 10,740
- 2010 ADT – 11,590
- 2020 ADT – 14,060
- 2030 ADT – 17,010
- Percentage of Trucks – 13

North of the project area, traffic volumes are roughly 40 percent higher than those within the project corridor. South of the project area, traffic volumes are roughly 30 percent lower than those within the project corridor.

In order to evaluate how well alternatives address the issue of corridor enhancement, the project team focused on three critical elements. These critical elements will form one of the criteria by which alternatives will be developed and evaluated. Regarding corridor enhancement within the Route 65 corridor, these are the critical elements:

1. How well will alternatives address the issue of limited passing within the corridor?
2. How well will the alternatives address the need for adequate capacity within the corridor?
3. How well will the alternatives address the operation of intersections within the corridor?

By adequately addressing these issues, corridor operation will be improved. All other things being equal, alternatives that address these critical elements should be considered superior. The balance of this section will examine these operation-related critical elements.

a. Passing within the Corridor

Under existing conditions, the ability to pass slower vehicles is difficult. The corridor's rolling terrain and passing prohibitions are the primary causes for this. It was determined that the northern segment of Route 65 consists of 56 percent no-passing zones. The Lincoln segment is 66 percent no-passing zones, and the southern segment is 60 percent no-passing zones.

Improving the passing characteristics within the Route 65 corridor can be accomplished in several ways. The alternative development and evaluation process will be required to balance capacity-enhancing solutions with non-capacity-enhancing solutions. Converting the existing two-lane roadway to four-lane highway will add capacity and improve passing. Other improvements to passing conditions can be accomplished with little or no enhancement to the carrying capacity of Route 65. A 2 plus 1 configuration or modified two-lane configuration could also, perhaps, improve the ability for vehicles to pass safely. The decision-making process will need to account for how alternatives address all purpose and need elements.

b. Capacity within the Corridor

Level of service (LOS) is a measure of a highway's ability to handle traffic demand. Traffic parameters and roadway design factors, such as ADT volumes, percentage of daily volume occurring in the peak-hour, truck percentages, number of driving lanes, lane widths, vertical grades, presence or absence of traffic signals and type of access and spacing allowed all affect LOS. Guidelines for calculating LOS on various types of highways have been established by the Transportation Research Board. The LOS ranges from A to F in order of decreasing operational quality. The LOS categories used to describe freeway operations are summarized as follows:

- LOS A Uninterrupted traffic flow, lower volumes and higher travel speeds.
- LOS B Stable traffic flow, increasing traffic and reduced travel speed due to congestion.
- LOS C Stable flow, increasing traffic, travel speeds and maneuverability are restricted by higher volumes.
- LOS D Approaching unstable flow, tolerable travel speeds but considerably affected by changes in operating conditions.
- LOS E Unstable flow, with possible stopped conditions, lower operating speeds and volume approaching capacity of the roadway.
- LOS F Unstable flow, with speeds at low or stopped condition for varying times caused by congestion when downstream traffic volumes are at or over the roadway capacity.

By the year 2030, the LOS along an unimproved Route 65 is predicted to be LOS E. The Lincoln portions of Route 65 degrade to LOS E much earlier. Based on the MoDOT "Practical Design Guidelines," LOS D is the poorest acceptable LOS in the peak hour of the design year for a facility in a rural setting[9]. **Table I-4** summarizes the LOS within the Route 65 corridor.

Table I-4: Level of Service on Route 65 Under No-Build Conditions

		2006	2010	2020	2030
1	North of Lincoln	D	D	D	E
2	Lincoln	E	E	E	E
3	South of Lincoln	D	D	D	E

The alternative development and evaluation process will need to address whether alternatives will produce a minimum LOS D within the study area.

c. Intersection Operation

All of the intersections within the Route 65 study area are unsignalized (stop signs on the minor cross-road). By the year 2030, conditions at some of these intersections are predicted to degrade to unacceptable levels[10]. **Table I-5** summarizes 2030 level of service at the Route 65 intersections.

[9] The mainline analyses were performed using the Highway Capacity Software (HCS). The mainline operations for the Build Alternative were evaluated with the multilane highway module, while the mainline operations for the No-Build Alternative were evaluated with the two-lane highway module.

[10] The intersection analyses for both alternatives were performed using a combination of the HCS unsignalized module and Synchro.

Table I-5: 2030 No-Build Intersection Operation Level of Service

Cross-Road	2030 Approach/Movement LOS			
	NB	SB	EB	WB
Mt. Olivet Road	—	A	—	C
Dulaban Road/Route HH	A	A	F	F
Frisch Road	—	A	—	C
Airport Road	A	—	C	—
Jenny Lane	—	A	—	C
Timberline Drive	—	A	—	C
Oak Street	A	A	D	C
Locust Street	A	—	C	—
Route C	A	A	F	F
Osage Street	A	—	C	—
McCain Street	A	—	C	—
Zion Church Road/Gerken Road	A	A	C	C
Rotermund Avenue/Rte. H	A	A	C	C
Route AC	A	—	C	—
Carpet Barn Road	—	A	—	C
McDaniel Road	—	A	—	C
Drenon Road	A	—	C	—
Meyer Road	—	A	—	C
Route BB	—	A	—	D
Route T	A	—	C	—
Poplar Church Road	—	A	—	D
Marina Road	A	—	C	—
Cedar Gate Road	—	A	—	D
Truman Dam Access Road (east)	E	—	A	—
Truman Dam Access Road (west)	—	B	—	A
Route 7 (east)	F	—	A	—
Route 7 (west)	—	C	—	A

The alternative development and evaluation process will need to address whether alternatives will produce a minimum LOS D within the corridor's intersections.

3. Achieve Regional/Local Continuity Goals

Because of the important role that Route 65 plays for local communities, the third element of the Route 65 project is to advance the access and continuity goals of the people who depend most heavily on Route 65.

To evaluate how well alternatives address the issue of achieving regional/local continuity within the Route 65 corridor, the critical element is how well alternatives will provide access to important local destinations and maintain locally important pathways.

The "gate" to the City of Lincoln is on Route 65

Route 65 provides access to numerous important destinations within Benton County. The alternative development and evaluation process will need to address whether alternatives will provide adequate access to important destinations, such as:

- The Lincoln and Warsaw airports,
- Truman Lake and the Sterett Creek Marina,
- The Lost Valley Fish Hatchery,
- The Lincoln and Warsaw business districts and
- The community resources, employers and emergency service providers of Benton County.

In addition to providing access, this element is intended to investigate the maintenance of fundamental roadway continuity, in such a way as to prevent disruption to local planning efforts. Among the fundamentally important pathways potentially impacted by the improvement of Route 65 are the following:

- Truman Dam Access Road as the pathway between Route 65 and Truman Lake,
- Route 7 as the pathway to the Warsaw business district and
- Route 65 as the focal point of the Lincoln Civic Redevelopment Corporation.

Measuring the ability of alternatives to accomplish this element will require the qualitative interpretation of whether the access to important destinations or the maintenance of fundamentally important pathways is provided in a manner consistent with local planning goals. Because most of the communities in Benton County do not have formal comprehensive plans guiding development, this element will also need to consider the informal, unwritten or pending policies of the destination stakeholders. **Chapter III.B** outlines the scope of local planning and identifies many of the area's important community resources. Interpreting these informal goals required an extensive outreach program. **Chapter V.B** provides details of the coordination conducted with local stakeholders.

Because of the qualitative and collaborative nature of determining whether local goals are being met, the analysis of alternative will utilize three broad categories:

1. Achieved: Access to all or nearly all important destinations is provided and all fundamentally important pathways are maintained;
2. Minimally Achieved: Access to most important destinations is provided and all fundamentally important pathways are maintained and
3. Not Achieved: Access to all important destinations is not provided or at least one fundamentally important pathway is not maintained.