CLARKSVILLE TRANSPORTATION STUDY

FINAL

Prepared for

Kentuckiana Regional Planning and Development Agency

Prepared by

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OCTOBER 30, 2001

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Preparation of this report has been financed through KIPDA, the Federal Highway Administration, the Kentucky Transportation Cabinet, and the Indiana Department of Transportation. This financial assistance notwithstanding, the contents of this report do not necessarily reflect the official views or policies of the funding agencies. Accuracy of the information presented herein is the responsibility of the "Contractor".

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1.0 INTRODUCTION

1.1 Study Purpose and Project Description

The Clarksville Transportation Study addresses traffic, access, and circulation issues in the vicinity of State Route 131 (SR 131), I-65, and Applegate Lane in Clarksville, Indiana. Refer to Figure 1 for the location map. The study purpose was to identify and develop solutions to critical transportation deficiencies in the study area. The specific study objectives included: (1) identifying and analyzing the access and mobility problems in the study area; (2) developing alternative solutions; and (3) assessing the effectiveness and feasibility of implementing the solutions.

1.2 Study Scope

To achieve the stated objectives, the study included the following specific elements:

1. Existing Conditions Analysis;
2. Future No-Build Conditions Analysis;
3. Alternatives Development;
4. Future Build Conditions Analysis;
5. Alternatives Evaluation; and
6. Conclusions and Next Steps

The existing conditions assessment included an inventory of the study area roadways, base year (2003) traffic volumes, levels of service at study intersections, identification of major trip generators, existing land use patterns, and other relevant current conditions information.

The future no-build conditions assessment employed the available traffic and land use data to estimate future design year traffic volumes and levels of service. Special attention was given to the I-65 improvements now under construction through Clark County. The analysis also included other currently programmed roadway improvements in the Kentuckiana Regional Planning and Development Agency (KIPDA) Transportation Improvement Program.

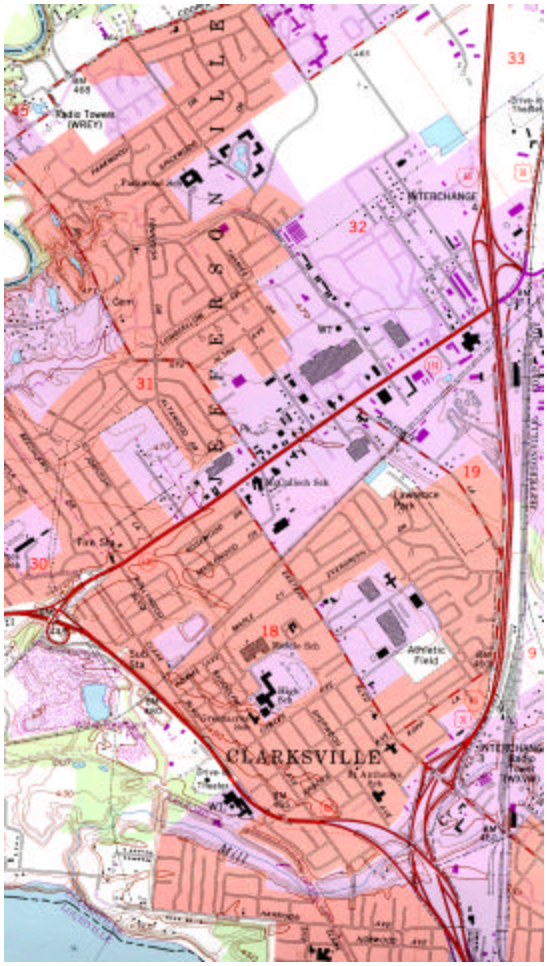


Figure 1: Location Map

The alternatives development step included developing physical and operations alternatives that would address the deficiencies (i.e. project need) defined in the first

two phases of the study. Based on initial discussions with KIPDA and Town of Clarksville staff, at least two specific physical improvement alternatives were assessed as part of this study: (1) the extension of Green Tree Boulevard south to the new I-65 Southbound Frontage Road and (2) upgrading Applegate Lane from SR 131 to Kopp Lane with a connection to the new Southbound Frontage Road. In addition, the study considered physical and operational improvements to SR 131 in the vicinity of Applegate Lane and Greentree Boulevard.

The alternatives assessment process compared the future no-build scenario to the proposed alternative build scenarios. In this evaluation traffic flows, access, levels of service, design, cost, environmental factors, land use, and institutional issues were all considered. Based on the alternatives analysis next steps were recommended.

2.0 EXISTING TRANSPORTATION SYSTEM

In order to effectively consider transportation system improvements to serve the highly developed area of SR 131 in Clarksville, Indiana, the current conditions including transportation deficiencies within the study area were investigated. This provided the baseline condition for the study.

For analysis purposes, 2003 was used as the base year. KIPDA traffic data projections for SR 131 were available for 2003. The I-65 project should also be complete (or nearly complete) by the end of 2003. This project will have a significant effect on traffic flows and operations within the study area. A study of conditions prior to 2003 is therefore not as useful from a planning perspective as an analysis of conditions once the project is complete.

Data for this effort was collected from previous studies, secondary sources, field-views, and limited primary data collection. The previous studies are listed in the bibliography. Traffic data was provided by KIPDA. Limited supplemental traffic counts and signal operation observations were conducted during May and June 2001.

2.1 Study Area

The project study area extends from the Greentree Mall and River Falls Mall in the north to the intersection of Applegate Lane and Kopp Lane in the south. The eastern and western study borders are Applegate Lane and I-65 respectively. State Route 131 runs east-west through the study area. The project study area is illustrated in Figure 2.

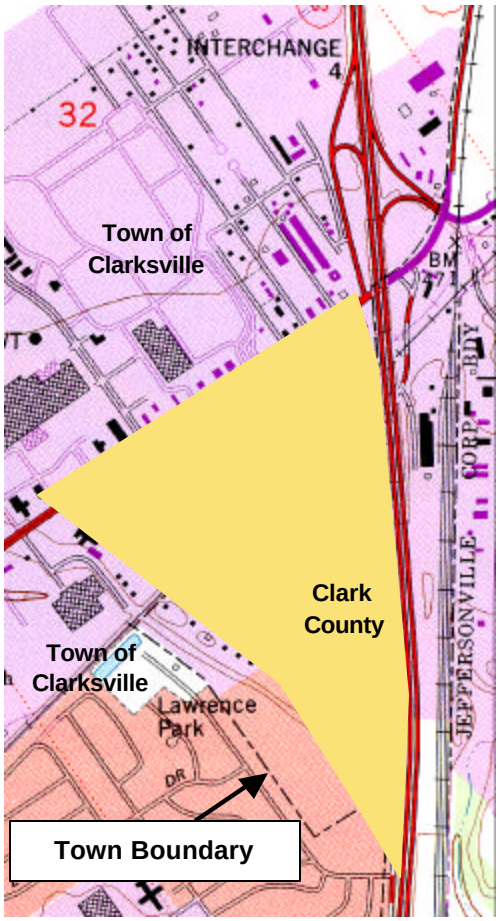


Figure 2: Project Study Area

2.2 Study Area Roadways

The project study area includes four major roadways. Each of the four roadways is discussed below. Design features, traffic volumes, proposed improvements (i.e. I-65) and other relevant data are presented.

Interstate 65 – Interstate 65 is the major north-south regional freeway serving the study area. I-65 is currently a four lane divided interstate highway. Improvements currently under construction will widen the highway to four through lanes in each direction with an additional two-lane frontage road on each side. The northbound I-65 improvements are currently under construction. Construction of

the southbound improvements through the study area will begin in 2002. The entire project is scheduled to be complete by Fall 2003[1].

As part of the I-65 project, the I-65 / SR 131 Interchange will be reconstructed from its current configuration to a tight-diamond with the frontage roads serving as the ramps, providing access to the mainline. The proposed frontage roads were classified as local roadways in the I-65 planning and design process to accommodate at-grade railroad crossings. Refer to Figure 3 for an illustration of the proposed I-65 improvements. A new interchange will also be constructed at the Intercity Highway north of the SR 131 Interchange. Average daily traffic on I-65 in the vicinity of SR 131 is expected to exceed 70,000 in 2003.

Figure 3: Proposed New I-65 / SR 131 Interchange (source: www.revive65.com)

State Route 131 – SR 131 is a four-lane major arterial with intermittent right and left turn lanes and a median. Within the study area, portions of the median have barrier curbs, while other sections have mountable curbs. There are frequent curb cuts along both sides of SR 131. The posted speed limit is 35 mph. There is little appreciable grade on the roadway. There are no sidewalks along SR 131 through the study area. There are no pedestrian crosswalks or pedestrian signals on SR 131 in the study area either. Stormwater from the roadway is carried in channels along the roadside. There are three signalized intersections on SR 131 within the study area and two additional signalized intersections at the SR 131 / I-65 Interchange. The right-of-way along SR 131 is approximately 150 feet, narrowing to approximately 100 feet near I-65. Average daily traffic on SR 131 ranges from approximately 30,000 at the western end of the study area to over 40,000 in the eastern end of the study area.

[1] Source: www.revive 65.com

Applegate Lane – Applegate Lane is a two-lane collector running north-south along the western edge of the study area. The posted speed limit is 30 mph. Lane widths on Applegate Lane are approximately 9-feet with no shoulders. There are also very limited clear zones for most of the roadway, as shown in Figure 4. The roadway does not have sidewalks. A vertical crest located just over 1,000 feet north of Kopp Lane limits sight distances. A small reverse curve (i.e. double bend) in the roadway at this same location (i.e. on the grade) further worsens the condition.

Figure 4: Applegate Lane (view toward SR 131)

The right-of-way (ROW) along Applegate Lane ranges from approximately 33 feet to 50 feet. Specifically, the ROW is 33 feet from SR 131 to the CSX railroad line[2]. From the CSX line south to the curve (1,125 feet) the ROW is 40 feet[3]. South from that point, the ROW is 50 feet[4]. Near the north and south ends of the roadway, it appears that buildings, landscaping, large trees, and other objects encroach on the public right-of-way. Toward the center of the roadway, the buildings are set back further from the roadway; however, fences, trees, and landscaping are still built up to the roadway edge. There is one at grade railroad crossing with posted STOP signs on both roadway approaches.

Average daily traffic on Applegate Lane ranges from 6,700 to over 8,000 vehicles per day. (Before Kopp Lane was closed average daily traffic on Applegate Lane is estimated to have been approximately 1,000 vehicles less per day.) Heavy vehicles and buses use Applegate Lane to access SR 131, I-65, and the major developments in the study area. These vehicles are 8.5 feet wide (compared to lane widths as low as 8.75 feet).

[2] Town and County Engineering Department sources
[3] Survey for the Applegate Heights subdivision dated October 1946. (Note that the County Assessors Book 40, Page 52, Drawing 115 shows the right-of-way as 50 feet.)
[4] Survey for the Plainview subdivision dated January 1901.

Kopp Lane (Old US 31) – Kopp Lane is a two-lane collector roadway with 12-foot lanes, no shoulders, and a posted speed limit of 30 mph. There are no sidewalks on Kopp Lane. Kopp Lane was previously a State roadway, but was subsequently relinquished to the local government entities. The ROW along Kopp Lane is 50 feet according to the Plainview subdivision survey. There is one vertical curve on Kopp Lane approximately 700 feet north of Applegate Lane. Recently Kopp Lane was terminated at I-65 as part of the I-65 improvement project. Previously the roadway continued to the north, under I-65 to SR 131 as shown in Figure 2. In 2003, the southbound movement from SR 131 to Kopp Lane will be reopened via a connection to the I-65 Southbound Frontage Road. The northbound through movement however, has been permanently closed. Traffic on Kopp Lane was approximately 4,000 ADT but with the closure, the volume of traffic has decreased significantly. Through traffic now uses Applegate Lane or I-65 and local traffic has decreased.

2.3 Transit, Bicycle and Pedestrian Facilities

The Transit Authority of River City (TARC) provides bus service to the study area. The three routes serving the area are Route 2 (Second Street), Route 282 (New Albany Shuttle) and Route 70 (Clarksville Express). Route 2 (Second Street) provides service from Preston Highway near I-65 in Jefferson County (KY) north through downtown Louisville to Jeffersonville and Clarksville, terminating at the River Falls Mall. Through the study area, the route travels on Kopp Lane (south of Applegate Lane), Applegate Lane, SR 131, Greentree Boulevard, and other local mall roadways. On weekdays, service starts at approximately 5:30 AM and ends at 11:00 PM, with headways of 30 minutes during the morning and afternoon peak periods and one hour headways for the remainder of the day. On weekends and holidays the route runs from about 8:00 AM to 10:00 or 11:00 PM with hourly headways. Most of the buses serving this route are bike rack equipped. TARC Route 70 is a weekday express bus route with one inbound run to downtown Louisville in the morning and one outbound run in the afternoon. Route 282 is a shuttle service running between the Stone Ridge Apartments in New Albany and the River Falls Mall. On weekdays, Route 282 runs between 6:00 AM and 10:00 PM with hourly headways over most of the day.

Pedestrian and bicycle facilities within the study area are limited. There are no sidewalks on SR 131, Applegate Lane, or Kopp Lane. There are no crosswalks or pedestrian signals for pedestrians crossing SR 131. There are also no bicycle lanes or routes within the study area. There are benches at certain bus stops within the study area. Overall, current pedestrian activity within the study area is minimal.

2.4 2003 Traffic Operations

Currently, there are three signalized intersections within the study area: SR 131 / Applegate Lane; SR 131 / Greentree Boulevard; and SR 131 River Falls Mall Drive. The signals operate on a time based coordination system. These intersections experience high through and turning volumes especially during peak hours. There is one critical unsignalized intersection at Applegate Lane and Kopp Lane. For this study,

the PM peak hour was selected for the peak hour traffic analysis. While both AM and PM peak hour counts were available, the PM peak had higher overall volumes than the AM peak. However, it should be recognized that due to the high retail commercial nature of the SR 131 corridor, Saturday and traditional off-peak hours often experience traffic volumes as high or higher than the PM peak hour.

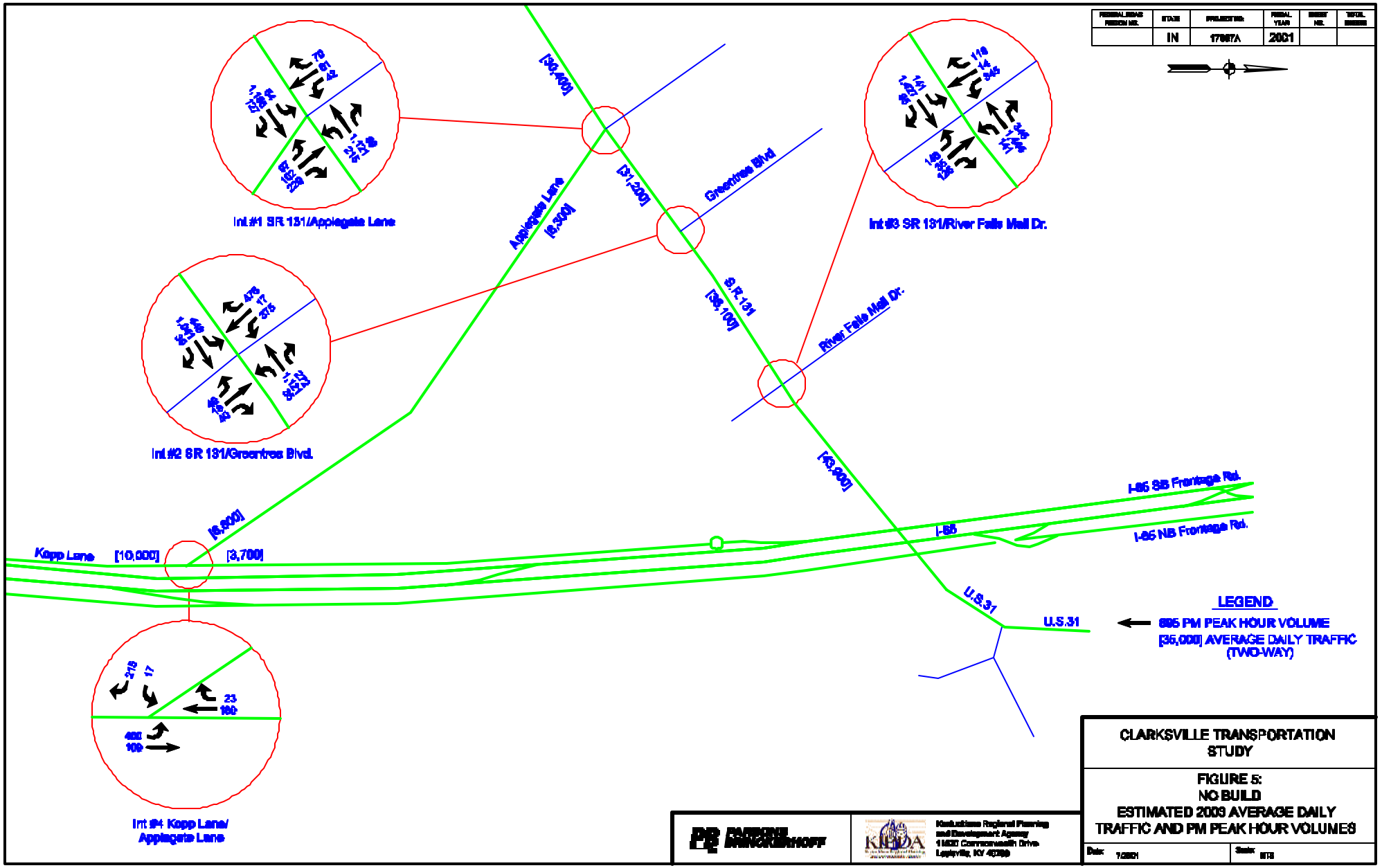
The estimated 2003 PM peak hour traffic volumes for the study intersections are given in Figure 5. The 2003 turning movement volumes are based on 1997 traffic counts provided by KIPDA. The 1997 volumes were adjusted based on average daily traffic estimates for 1998 and 2003 developed by KIPDA.

Based on the estimated 2003 traffic volumes, the study intersections will operate at Levels of Service (LOS) B through D during the weekday PM peak hour as shown in Table 1[5]. In urban areas, LOS D is the threshold for acceptable traffic operations. Therefore, the four study intersections will operate at acceptable levels of service during the PM peak hour in 2003.[6]

Table 1
Study Intersections
Estimated 2003 Levels of Service

Intersection	Peak Hour	LOS
1. SR 131 / Applegate Lane	PM	B
2. SR 131 / Greentree Boulevard	PM	D
3. SR 131 / Home Depot Entrance	PM	D
4. Applegate Lane / Kopp Lane (3-way STOP control)	PM	C

[5] Level of Service (LOS) is a qualitative measure of traffic operational conditions ranging from LOS A (free flow, minimal or no delay) to LOS F (stop and go conditions, very long delays). For intersections LOS D is the acceptable threshold in urban areas. This corresponds to 55 seconds of delay per vehicle at a signalized intersection and 35 seconds of delay at an unsignalized intersection. Refer to the 1998 Highway Capacity Manual published by the Transportation Research Board for more specific information.
[6] As discussed previously, this does not indicate that the intersections will operate acceptably during Saturdays, Holidays, and other "off-peak" hours.


Int #1 SR 131/Applegate Lane
Int #2 SR 131/Greentree Blvd.
Int #3 SR 131/River Falls Mall Dr.
Int #4 Kopp Lane/ Applegate Lane
[30,400]
[31,200]
[36,100]
[43,900]
Applegate Lane [8,300]
Greentree Blvd
S.R.131
River Falls Mall Dr.
Kopp Lane [10,000]
[8,900]
[3,700]
I-65
I-65 SB Frontage Rd.
I-65 NB Frontage Rd.
U.S.31
U.S.31
LEGEND
695 PM PEAK HOUR VOLUME
[35,000] AVERAGE DAILY TRAFFIC (TWO-WAY)
IN
17087A
2001
CLARKSVILLE TRANSPORTATION STUDY
FIGURE 5:
NO BUILD
ESTIMATED 2009 AVERAGE DAILY TRAFFIC AND PM PEAK HOUR VOLUMES
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Kentuckiana Regional Planning and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299
Date: 7/2001
State: IN3

3.0 ENVIRONMENTAL OVERVIEW

Based on available secondary data and previous studies, an environmental overview has been prepared for the study area. While it was not part of the scope to produce a comprehensive environmental review, this overview level of analysis was necessary for the development and assessment of feasible improvement alternatives.

3.1 Topography

The study area is relatively level with a small rise to the south between Applegate Land and Kopp Lane. In addition to the major roadways discussed previously, a CSX railroad line runs northeast-southwest through the study area. The rail line is currently anticipated to be abandoned by CSX. The Town of Clarksville and the Indiana Department of Transportation (INDOT) are in discussions with CSX regarding the transfer of the right-of-way to the State Rail Bank. The ROW is approximately 60 feet wide according to the Applegate Subdivision survey.

The portion of the study area near SR 131 is urban in nature with essentially all parcels developed. In the southern portions of the study area, the development is less intense with numerous undeveloped parcels and open areas. There are no major water bodies. Small forested pockets exist.

3.2 Municipal Boundaries

The study area includes portions of the Town of Clarksville and unincorporated Clark County. The Town of Clarksville border runs east-west along the CSX railroad line, then south behind the properties west of Applegate lane (as shown in Figure 2). When the line reaches the Olde Town Village apartment complex west of the Kopp Lane / Applegate Lane intersection, it runs east to Applegate Lane to include the apartment complex. The triangular area between the Town border and I-65 is unincorporated Clark County. The Town has responsibility for the roadways, zoning, subdivisions, and municipal utilities outside of this triangular area. The County has responsibility for the unincorporated area, which includes the large Sportsdrome Speedway, Concrete Lady, Goodwill, and Cristiani properties. This unincorporated area is a potential future annexation area for the Town of Clarksville. The northern portion of the study area is part of a large tax increment financing (TIF) district in the Town of Clarksville. The TIF funds have been used for infrastructure improvements to serve the district.

3.3 Land Use and Zoning

The predominant land use in the study area is commercial, with two of the largest retail malls in the Louisville Metropolitan Statistical Area (MSA) located just north of SR 131. Numerous other large and small retail developments are located in the SR 131 corridor. To the south of the CSX tracks, the land use pattern changes significantly with a much broader mix of commercial, residential, industrial, and entertainment development, as

well as vacant property. On Applegate Lane, there are both residential and commercial developments (Goodwill, an office building, and converted residential properties – two automotive shops and office space). At the Kopp Lane / Applegate Lane intersection there is an apartment complex (Olde Town Village), a motel (Star Motel), and a now closed grocery store. Along Kopp Lane the properties are primarily commercial or industrial, including retail businesses, landscaping and construction related businesses, the Sportsdrome Speedway, and a few homes. The Sportsdrome and Concrete Lady developments have access to both Applegate Lane and Kopp Lane. The zoning in the area generally follows the land uses previously described and includes R2 (residential), B1-3 (commercial), and M1-2 (industrial) in the County, and R3 (residential), B1-2 commercial) within the Town.

3.4 Natural Environment

Wetlands

According to the National Wetlands Inventory Map: New Albany Quadrangle (1989), there are no known wetlands present within the study area. While this finding should be further documented through more detailed environmental studies, the apparent absence of wetlands will certainly facilitate implementation of transportation improvements in the area.

Water Resources and Floodplains

There are no streams or standing bodies of water in the study area. According to a review of the Federal Emergency Management Agency, Flood Insurance Rate Maps there are no floodplains within the study area.

Threatened and Endangered Species

Based on available documentation from the I-65 Environmental Impact Study (EIS), the potential for impacts to threatened and endangered species appears minimal. Three Federally endangered species were identified in the I-65 EIS: the Indiana Bat (Myotis sodalis), the gray bat (Myotis grisescens), and the pink mucket pearly mussel (Lampsilis orbiculata). The EIS states that no impacts to these species are expected if trees are not removed during the Indiana bat reproductive season and if tree clearing is restricted to the minimum necessary.

3.5 Cultural Resources

According to the Indiana Historic Sites and Structures Inventory for Clark County (Interim Report, 1988) there are no historic resources within the study area. According to documentation from the I-65 Environmental Impact Study, there are no known archeological resources within the study area as well. There are also no parks or recreation areas in the study area.

3.6 Hazardous Materials

According to data from the I-65 EIS and from field observations there are a number of sites within the study area that may have hazardous materials present. These sites include the CSX railroad line, the Cristiani property (formerly a truck stop), the Home Depot development parcel (previously the Occidental Chemical Company site – a dry ice plant), a previous gas station site on Kopp Lane, the two automotive shops on Applegate Lane, the two auto dealerships on SR 131, the Goodwill property (previously a Wicks Lumber Yard), and the Sportsdrome Speedway site. Many of these sites hold the potential for contaminated soils due to gasoline and oil spills (i.e. the automotive shops). However, some of the sites may have significant contamination. The Occidental Chemical and Cristiani properties in particular have the potential for more extensive industrial contamination. The railroad and speedway may also have significant contamination due to long periods of use. Underground storage tanks could be present on one of more of the sites (including the old service station site and the Cristiani property). Above ground storage tanks were observed on at least two of the sites. All of these sites would require study and/or testing to assess the potential contamination.

3.7 Major Utilities

Electric and telephone lines are located above ground in the study area with poles along the south side of SR 131, along the east side of Applegate Lane south to the bend in the road, along the west side of Applegate Lane from there to Kopp Lane, and along the west side of Kopp Lane. There are also overhead power lines along the north side of the CSX railroad tracks. There is a major gas line running east-west through the study area along the same ROW as the CSX railroad line. There are no Town water or sewer lines in the unincorporated portion of the study area.

3.8 Air Quality and Noise

The study area is located within the Louisville MSA, which is currently going through the process of being re-designated as an attainment area for ozone under the current 8-hour standards. However, ozone will continue to be an important environmental issue in future transportation planning efforts, as the standards are likely to change in the future.

Regarding the potential for noise impacts, there are a number of sensitive receptor sites within the study. These sites are limited to apartments, single-family homes, and businesses as there are no churches, schools, hospitals, parks, or community facilities in the immediate study area.

4.0 FUTURE NO-BUILD CONDITIONS

The future no-build scenario provides the baseline for the evaluation of the improvement alternatives. It also provides additional information relative to the purpose and need for the project.

4.1 Roadway and Traffic

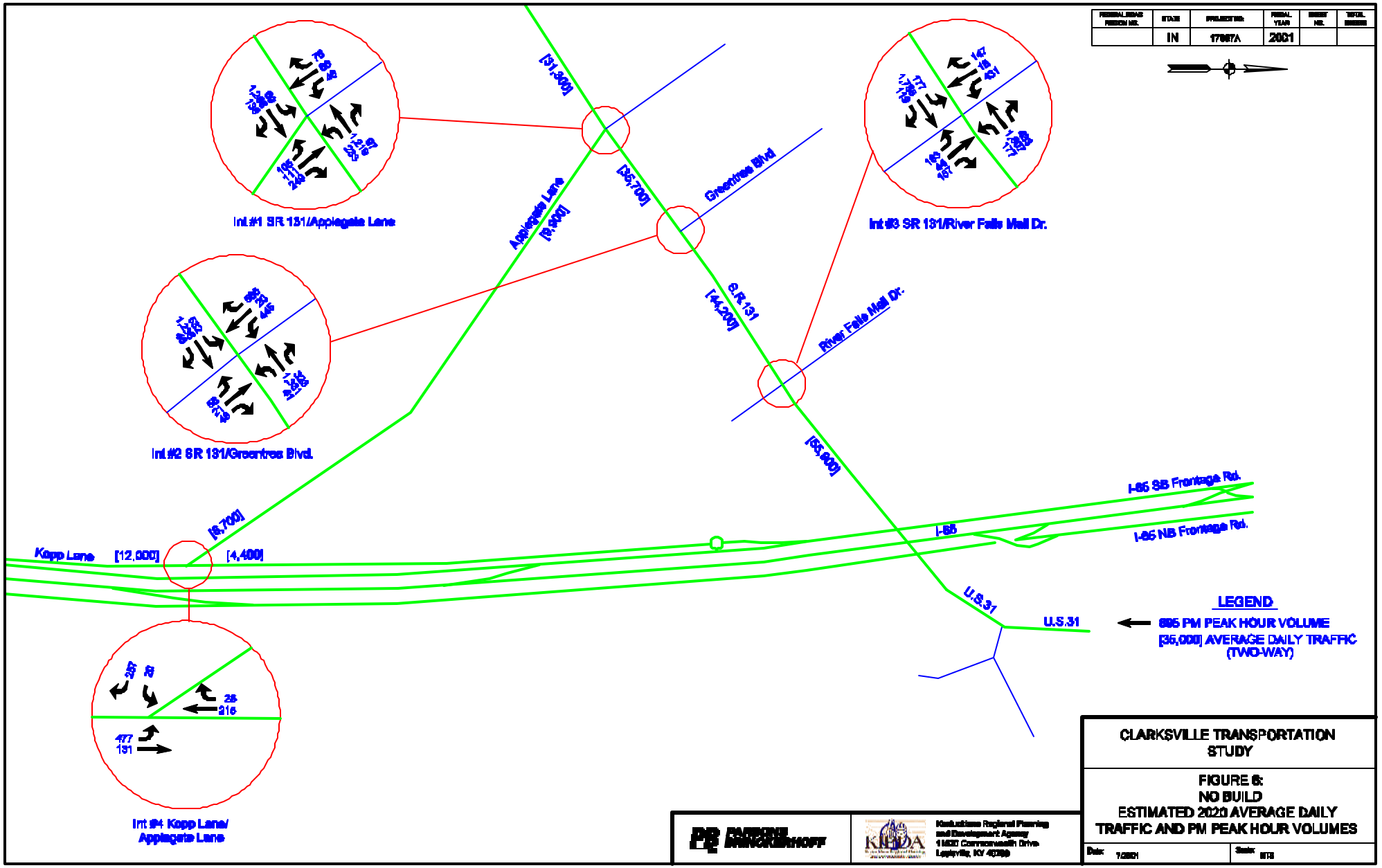
The future no-build scenario in this analysis uses 2020 as the design year. KIPDA traffic projection data was available for this period. It assumes that the currently programmed transportation improvement projects, including the I-65 improvements at SR 131 and the new Frontage Road, are in place. Part of the I-65 project is to construct the new Intercity Highway interchange. This will divert a portion of the traffic now using the SR 131 interchange to the new interchange. This adjustment has been included in the future no-build analysis.

The 2020 turning movement volumes at the three SR 131 study intersections were estimated based on the projected growth of traffic on SR 131. (Based on discussions with KIPDA staff, a constant growth rate of just over 1 percent was used for the Kopp Lane / Applegate Lane intersection.) Based on these assumptions, traffic volumes in the study area will increase significantly over the next 20 years. The resulting peak hour volumes are shown in Figure 6.

The 2020 levels of service have been estimated for the four study intersections as shown in Table 2. Based on this analysis, two of the currently signalized intersections on SR 131 will degrade to unacceptable operating conditions by 2020 (falling from LOS D to LOS E). In addition the 3-way STOP intersection at Applegate Lane and Kopp Lane will degrade to LOS E.

Table 2
Study Intersections
Estimated 2020 Levels of Service

Intersection	Peak Hour	LOS
1. SR 131 / Applegate Lane	PM	C
2. SR 131 / Greentree Boulevard	PM	E
3. SR 131 / Home Depot Entrance	PM	E
4. Applegate Lane / Kopp Lane (3-way STOP control)	PM	E



CLARKSVILLE TRANSPORTATION STUDY

FIGURE 6:
NO BUILD
ESTIMATED 2020 AVERAGE DAILY TRAFFIC AND PM PEAK HOUR VOLUMES

Date: 7/2001

Kentuckiana Regional Planning and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299

4.2 Socioeconomic, Institutional, and Land Use

A large triangular portion of the study area is located in unincorporated Clark County. The current zoning for this area is a mix of residential, commercial, and industrial. Due to development pressures, the residential and industrial land uses in the area have begun to shift to commercial land uses. However, due to the relatively poor access to much of the area, and the closure of Kopp Lane northbound, the transition is expected to occur slowly in the no-build scenario.

4.3 Summary of Current and Future Design Year Deficiencies

Based on a review of the current and projected transportation conditions in the study area, a number of deficiencies have been highlighted. Some of the deficiencies relate to the entire study area, while others are specific to Applegate Lane, Kopp Lane or SR 131. They are summarized below:

Roadway Design and Safety

- Applegate Lane has deficient lane widths, shoulders, and clear zones;
- Applegate Lane does not provide appropriate stormwater controls;
- The right-of-way on Applegate Lane north of the CSX tracks is too narrow;
- Right-of-way encroachment may be an issue on Applegate Lane;
- The horizontal and vertical roadway geometry on Applegate Lane are deficient south of the Applegate Lane entrance to the Concrete Lady property (i.e. poor line of sight);
- The Kopp Lane / Applegate Lane intersection geometry is substandard (skew)
- The roadway, shoulders, and median on SR 131 are in poor condition and should be reconstructed;
- There are excessive curb cuts on SR 131; and
- Pedestrian and bicycle facilities are lacking.

Traffic

- Closure of Kopp Lane has shifted traffic, including truck traffic, to Applegate Lane;
- The peak hour and average daily traffic on Applegate Lane exceeds that recommended for a low type two-lane highway;
- Closure of Kopp Lane has restricted access to numerous commercial properties as well as to developable land in the study area;
- A lack of parallel or reliever facilities for SR 131 causes SR 131 to become a traffic “bottleneck” during peak periods;
- Access to commercial developments and cross streets on SR 131 is hindered due to poor traffic operating conditions on SR 131 during peak periods; and
- Levels of Service at key intersections on SR 131 will fall below the acceptable threshold by 2020.

Land Use and Development

- Poor access to and circulation within the southern portion of the study area limits development in this area. This includes the Kopp Lane closure, which is temporary in the southbound direction but permanent in the northbound direction.
- The poor access has impacted existing businesses on Kopp Lane.

4.4 Project Purpose and Need

Based on the documented deficiencies in the transportation system within the study area, the following elements are recommended for inclusion in the statement of the project's purpose and need. The alternative improvement strategies will be developed to address these specific items.

- Improve roadway safety on Applegate Lane and Kopp Lane;
- Enhance local access and circulation in the southern portion of the study area;
- Improve traffic operating conditions and safety on SR 131; and
- Provide necessary transportation infrastructure for the orderly development of property in the study area.

5.0 ALTERNATIVES DEVELOPMENT

Alternative improvement strategies were developed in response to the access, circulation, safety, and traffic flow deficiencies on Applegate Lane, Kopp Lane, and SR 131. They also address the economic development and land use implications of poor access to the southern portion of the study area. The improvements range from signal timing improvements to new roadway construction. Each of the alternatives is presented below. The build condition evaluation, including the potential benefits and impacts for each alternative, is given in the following chapter.

The improvement alternatives have been divided into four primary groups:

Group 1: Alternatives 1A and B address improvements to Applegate Lane directly by proposing alternatives for widening and reconstructing the road on its current alignment. They also address the traffic flow, circulation, and operations issues by including a slip ramp from Kopp Lane to the Southbound Frontage Road.

Group 2: Alternatives 2A, B, C, and D propose new roadways in the southern portion of the study area to improve safety, circulation, traffic flow, and development opportunities. These alternatives also include slip ramps to the Southbound Frontage Road.

Group 3: Alternatives 3A, B, and C deal directly with SR 131 and the issues associated with that major arterial. They include roadway widening, reconstruction, and signal timing.

Group 4: This group includes other transportation improvements that are related to or could provide enhancements to the previous alternatives such as re-use of the railroad right-of-way as a new roadway. These alternatives are presented for discussion only and were examined in less detail than the primary improvement alternatives.

5.1 Group 1 – Improvements to Applegate Lane

The Group 1 Alternatives propose improving the existing Applegate Lane from a substandard 2-lane rural type road to a three-lane urban collector roadway from SR 131 to Kopp Lane. A slip ramp would be constructed from Kopp Lane to the I-65 Southbound Frontage Road to serve southbound I-65 traffic. To accommodate the slip ramp, Kopp Lane would be shifted west from its current location.

The purpose of the Group 1 Alternatives is to address the design and safety deficiencies on Applegate Lane. The new roadway would improve access to the southern portion of the study area. It would also shift some traffic headed to southbound I-65 away from the I-65 / SR 131 interchange, potentially improving traffic operations on SR 131.

Design Standards

The following design standards were employed in developing these alternatives:

Table 3
Group 1 - Design Standards Summary

Design Classification	Urban Collector (Suburban)
Design Speed	35 mph
Lane Width	12 ft
Shoulder Width	8 ft (right)
Median Width	4ft (Min)
Foreslope / Backslope	4:1 / 4:1 for 4 ft (3:1 max to top)
Ditch Width	4 ft
Minimum Radius	394 ft
Maximum Grade	9%

Notes:
Design standards based on INDOT Design Manual, AASHTO, and ITE
Design Variances may be required to accommodate drainage within existing ROW.

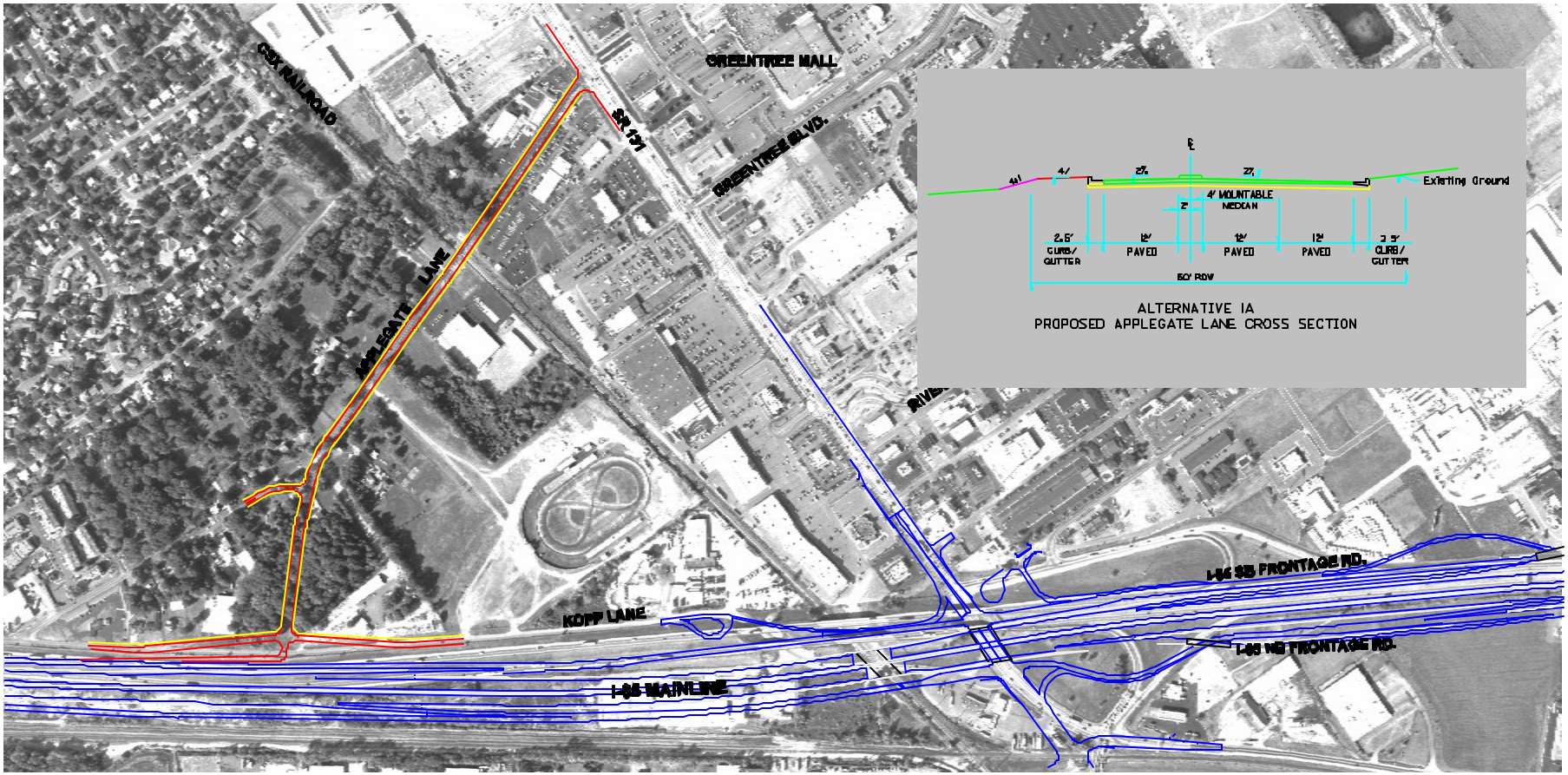
5.1.1 Alternative 1A – Improve Applegate Lane Using Partial New Alignment

Alignment and Typical Section

Alternative 1A follows the same alignment as the existing Applegate Lane from SR 131 south to the horizontal curve near the back entrance to the Concrete Lady property. From that point, the roadway continues east on a new alignment toward Kopp Lane. It connects with the relocated Kopp Lane south of the Concrete Lady property. The slip ramp runs from the relocated Applegate Lane / Kopp Lane intersection to the Southbound Frontage Road and is located south of the ramp from the Frontage Road to the I-65 mainline. This minimizes merging and weaving conflicts. The slip ramp intersection radii have been designed to accommodate truck turning movements from all three approaches. Alternative 1A is presented in Figure 7.

The southern section of Applegate Lane remains in place with new connections at either end. The CSX railroad line abandonment eliminates the need to address railroad-crossing issues as part of the roadway planning process. Existing property access points would be accommodated in the design to the extent possible. However, new full access curb cuts along the roadway would be restricted to approximately 400 to 600 feet from any other existing full access point. Right turn only driveways could be allowed approximately every 200 to 400 feet. As part of new development projects, property owners would be encouraged to consolidate access points and / or eliminate certain existing access points with the goal of ultimately achieving the 400 to 600 foot spacing. The Applegate Lane / SR 131 intersection would be improved with expanded turn lanes. The Applegate Lane / Kopp Lane intersection controls would be modified to two-way STOP control on Kopp Lane (i.e. southbound Applegate Lane would have the right-of-way.)

	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IN	17997A	2001		



CLARKSVILLE TRANSPORTATION STUDY

FIGURE 7: ALTERNATIVE 1A WIDEN APPLEGATE LANE

Date: 7/2001

Scale: 1" = 600'

PARSONS BRINCKERHOFF

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The proposed typical section for the roadway consists of two 12-foot through lanes, a 12-foot left turn lane, a 4-foot median, and a 2.5-foot curb and gutter at either edge (45 feet curb to curb). In locations where there is no left turn lane, the median width expands to 16-feet. At major intersections, right turn lanes would be added to the cross section. Sidewalks have not been included in the typical section due to the current low volume of pedestrian traffic and to reduce the required right-of-way for this alternative. However, it is noted that a sidewalk on at least one side would be beneficial and could be included during design if the added right-of-way could be obtained. Figure 7 illustrates the proposed typical section.

Right-of-Way

The right-of-way along Applegate Lane ranges from 33 feet in the north to 40 feet in the center, to 50 feet in the south. The proposed improvements would require this right-of-way to be expanded to approximately 60 feet to accommodate the paved section, utilities, and drainage. New right-of-way would also be required for the new sections of Applegate Lane and Kopp Lane. These improvements would require the acquisition of a number of partial and whole parcels including but not limited to: the commercial property on the southeast corner of Applegate Lane and SR 131; a strip of the Toyota dealership property; portions of residential and commercial properties fronting on Applegate Lane; and two complete properties on Applegate Lane (where the new roadway begins). The relocation of Kopp Lane will require the acquisition three homes and one business, partial acquisitions of both the motel and the Concrete Lady properties (buildings on both parcels will have to be moved or replaced), as well as other property only acquisitions.

Drainage, Utilities, and Signals

Stormwater runoff would be handled in pipes under the roadway edge. New stormwater detention facilities could be constructed near the CSX line and near the relocated Kopp Lane. The existing above ground utilities would be relocated in the new expanded right-of-way. Existing traffic signals and signage would also be relocated as necessary.

Cost Estimate

The concept level cost estimate for this alternative is approximately $7.4 million (2001 dollars). The construction cost estimate is $4.1 million including planning, design, construction management, inspection, and a 30 percent construction contingency. The right-of-way cost is estimated at $3.3 million based on property assessment data and information from other similar projects.

5.1.2 Alternative 1B – Improve Applegate Lane Using Existing Alignment

Alternative 1B is very similar to Alternative 1A. The major differences between the two alternatives revolve around the location of the connection to Kopp Lane and the typical section and resulting right-of-way requirements.

Alignment and Typical Section

As shown in Figure 8, Alternative 1B follows the same alignment as the existing Applegate Lane until just north of Kopp Lane. As in Alternative 1A, Kopp Lane has been relocated to the west to provide sufficient space for a new southbound slip ramp to the Southbound Frontage Road. The Applegate Lane approach to Kopp Lane has been realigned to improve the intersection alignment. The slip ramp runs from the relocated Applegate Lane / Kopp Lane intersection to the I-65 Southbound Frontage Road. Proposed access controls in Alternative 1B would be the same as for Alternative 1A with the ultimate goal of limiting full access curb cuts to every 400 to 600 feet and right-turn only curb cuts to every 200 to 400 feet. The Applegate Lane / SR 131 intersection would be improved with expanded turn lanes. The Applegate Lane / Kopp Lane intersection controls would be modified to two-way STOP control on Kopp Lane (i.e. southbound Applegate Lane would have the right-of-way.)

The proposed typical section for Alternative 1B consists of two 12-foot through lanes, a 12-foot left turn lane (intermittent), a 4-foot median, and 8-foot shoulders (56 feet edge to edge). In locations where there is no left turn lane the roadway could be narrowed by 12 feet to 44 feet. In the north, near SR 131 a curbed section would be used to minimize the required right-of-way. At major intersections, right turn lanes would be added to the cross section. Again, sidewalks have not been included in the conceptual cross section due to low demand and right-of-way requirements, but they could be added during design if right-of-way could be obtained. Figure 8 illustrates the proposed typical section.

Right-of-Way

The right-of-way along Applegate Lane ranges from 33 feet in the north to 40 feet in the center, to 50 feet in the south. The proposed improvements would require this right-of-way to be expanded to between 60 and 80 feet to accommodate the paved section, utilities, and drainage. Improving the substandard vertical curve on Applegate Lane would require additional ROW acquisition in this section to realign and re-grade the roadway and match existing grade on either side. New right-of-way would also be required for the relocated sections of Applegate Lane and Kopp Lane. Due to the required right-of-way and the number of parcels that must be acquired, it is recommended that the alignment be shifted slightly to the northeast. This will result in the acquisition of parcels on only one side of the roadway and should minimize impacts on the opposite side of the roadway. Acquisitions for this alignment will again include the commercial property on the southeast corner of the Applegate Lane / SR 131 intersection; a portion of the Toyota Dealership; as well as all or portions of the properties fronting Applegate Lane south to Kopp Lane. As many as ten residences / businesses on Applegate Lane will be displaced. The Star Motel property will also have to be acquired. The Kopp Lane relocation will also affect four other properties on Kopp Lane including the homes north of the motel and the party supply store.

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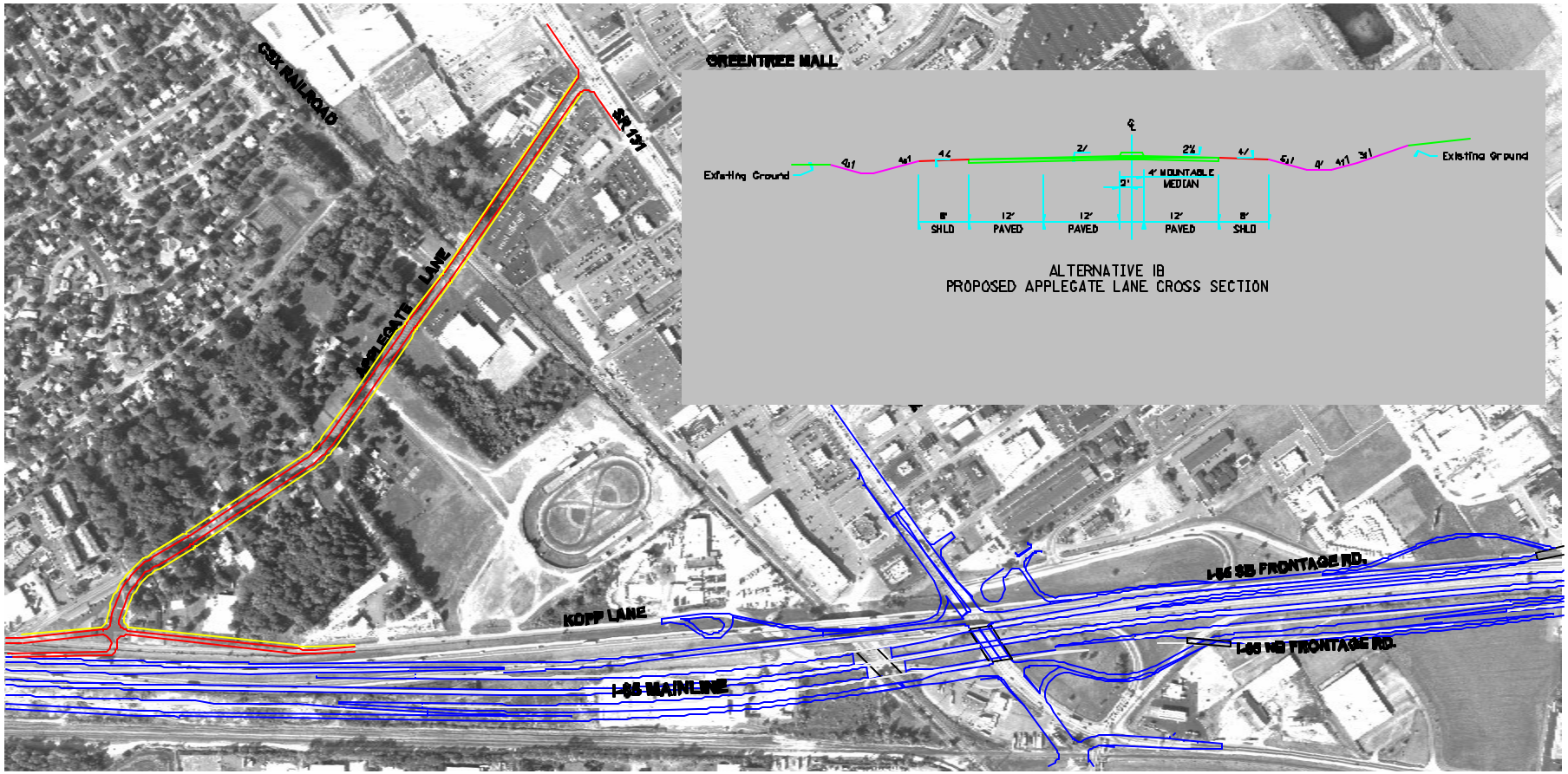

CLARKSVILLE TRANSPORTATION STUDY

FIGURE 8: ALTERNATIVE 1B
WIDEN APPLEGATE LANE

Date: 7/2001 Scale: 1" = 800'

PARSONS BRINCKERHOFF

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Louisville, KY 40299

Drainage, Utilities, and Signals

Stormwater runoff would be handled in drainage channels on either side of the roadway. Stormwater detention facilities could be constructed near the CSX line and near the relocated Kopp Lane. The existing above ground utilities would be relocated in the new expanded right-of-way. Existing traffic signals and signage would also be relocated as necessary.

Cost Estimate

The concept level cost estimate for this alternative is approximately $7.8 million (2001 dollars). The construction cost estimate is $4.6 million including planning, design, construction management, inspection, and a 30 percent construction contingency. The right-of-way cost is estimated at $3.2 million based on property assessment data and information from other similar projects.

5.2 Group 2 – Greentree Boulevard Extension Options

The Group 2 Alternatives propose constructing an extension of Greentree Boulevard from SR 131 to Kopp Lane with a slip ramp from Kopp Lane to the Southbound Frontage Road. The roadway would generally run south from the current SR 131 / Greentree Boulevard intersection, across the CSX railroad right-of-way, passing between the Sportsdrome and Goodwill Industries sites to connect with Kopp Lane in the vicinity of the Concrete Lady property. A slip ramp would connect Kopp Lane to the Southbound Frontage Road. In two of the alternatives, Kopp Lane must be shifted to the west to accommodate the slip ramp. In all of the alternatives, the proposed slip ramp connects to the Frontage Road south of the ramp from the Frontage Road to the I-65 mainline. This minimizes merging and weaving conflicts on the proposed Frontage Road. (Traffic flows on the Southbound Frontage Road where the ramp connects are light with a projected ADT of just over 500 vehicles in 2015 according to the I-65 Traffic Study data.)

The purpose of the Group 2 Alternatives is to address the design and safety deficiencies on Applegate Lane by providing an alternate route. The new roadway would improve access to the southern portion of the study area. It would also shift traffic headed to southbound I-65 away from the I-65 / SR 131 interchange, potentially improving traffic operations on SR 131.

Design Standards

The following design standards were employed in developing the Group 2 Alternatives:

Table 4
Group 2 - Design Standards Summary

Design Classification	Urban Collector (Suburban)
Design Speed	35 mph
Lane Width	12 ft
Shoulder Width	8 ft (right)
Median Width	4ft (Min)
Foreslope / Backslope	4:1 / 4:1 for 4 ft (3:1 max to top)
Ditch Width	4 ft
Minimum Radius	394 ft
Maximum Grade	9%

Notes:
Design standards based on INDOT Design Manual, AASHTO, and ITE

5.2.1 Alternative 2A – Greentree Boulevard Extension (South)

Alignment and Typical Section

Alternative 2A follows an entirely new alignment. From the SR 131 / Greentree Boulevard intersection it runs south between the Wendy's and Ford dealership properties. After crossing the CSX rail line, it cuts across the back of the Goodwill Industries property (an approximately 60-foot setback was provided from the roadway right-of-way to the back of the Goodwill building). The alignment then runs south, crossing the Applegate Lane entrance to the Sportsdrome, cutting across the backs of a number of residential / commercial properties fronting on Applegate Lane. (When possible, an approximately 40-foot setback was provided from the right-of-way line to the backs of the primary structures on these properties.) The roadway then turns east to connect with a relocated Kopp Lane just south of the Concrete Lady property. A slip ramp runs from the new Greentree Boulevard / Kopp Lane intersection to the Southbound Frontage Road. The slip ramp intersection radii were designed to accommodate truck turning movements from all three approaches. Alternative 2A is illustrated in Figure 9.

The Greentree Boulevard / SR 131 intersection would be improved with expanded turn lanes. Traffic controls at the Greentree Boulevard / Kopp Lane intersection would consist of two-way STOP control on Kopp Lane (i.e. southbound Greentree Boulevard would have the right-of-way.) Ultimately, this intersection may require traffic signal control to maintain the cross street flows on Kopp Lane. This is especially true if the area begins to develop with more intense commercial uses.

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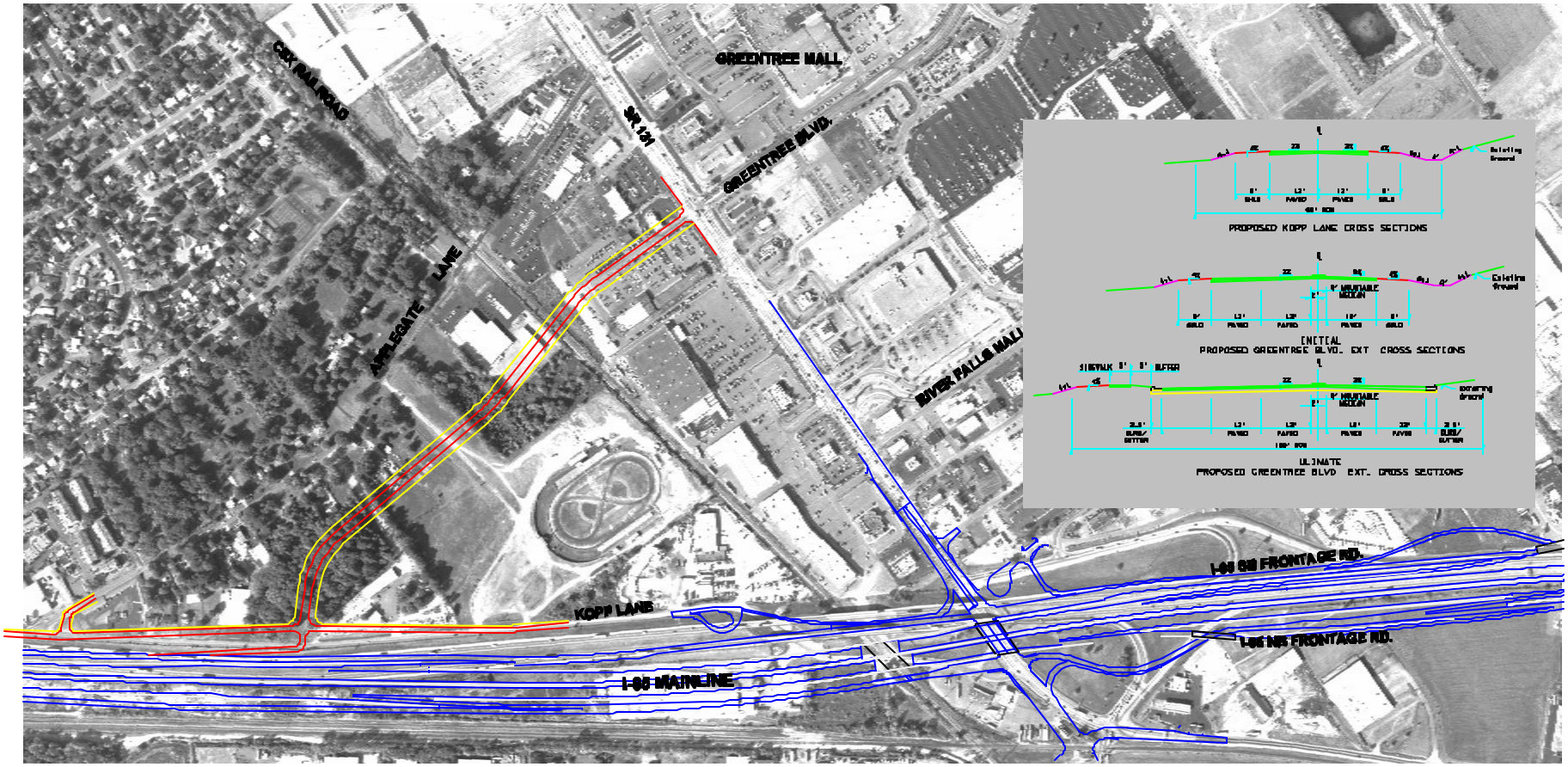
	IN	17887A	2001		



CLARKSVILLE TRANSPORTATION STUDY

FIGURE 9: ALTERNATIVE 2A GREENTREE BOULEVARD EXTENSION

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Louisville, KY 40299

Date: 7/9/01

Scale: 1" = 500'

Access controls would be instituted for the new roadway to maintain safe and efficient traffic flows. New full access curb cuts along the roadway would be restricted to approximately 400 to 600 feet from any other existing full access point. Right turn only driveways would be allowed approximately every 200 to 400 feet. As part of new development projects, property owners would be encouraged to design consolidated access points, able to serve multiple properties.

The CSX railroad line abandonment eliminates the need to address railroad-crossing issues as part of the roadway planning process. The only improvement to Applegate Lane is the realignment of the Applegate Lane / Kopp Lane intersection as part of the realignment of Kopp Lane.

The proposed initial typical section for the roadway consists of two 12-foot through lanes, a 12-foot continuous left turn lane, a 4-foot median, and 8-foot shoulders (56 feet edge to edge). At major intersections, right turn lanes would be added to the cross section. Figure 9 illustrates the proposed initial typical cross section. Figure 9 also shows the proposed ultimate typical section, which improves the roadway by adding two additional travel lanes, eliminating the shoulders, and curbing both sides of the roadway. A sidewalk has been proposed for one side of the ultimate typical section to provide for improved pedestrian access in the area. (The cost estimate for this alternative assumes the initial typical section.)

Right-of-Way

The proposed right-of-way for the extension of Greentree Boulevard is 100 feet wide. This provides sufficient ROW for both the initial proposed cross section as well as the proposed ultimate cross section. It also corresponds with the proposed right-of-way in the current Town of Clarksville Comprehensive Plan. New right-of-way would also be required for the new section of Kopp Lane. These improvements would require the acquisition of a number of partial and whole parcels.

For the Greentree Boulevard Extension, the entire Wendy's property and a portion of the Ford dealership would have to be purchased. The roadway will divide the Ford Dealership property. A substantial portion of the back of the Goodwill Industries property would also have to be acquired. The Kopp Lane relocation would require the complete acquisition of a number of properties along that corridor, including a party supply store, as well as the partial acquisition of the Concrete Lady and motel properties (buildings on both parcels would have to be relocated).

Drainage, Utilities, and Signals

With the initial cross section, stormwater runoff would be handled in ditches along the roadway edge. New stormwater detention facilities could be constructed near the CSX line and near the relocated Kopp Lane. Telephone and electric utilities could be above ground, while water and sewer would be underground along the edge of the right-of-way (to provide for future maintenance and to avoid relocation when the roadway is

expanded). The existing traffic signals at SR 131 and Greentree Boulevard would be relocated as necessary.

Cost Estimate

The concept level cost estimate for this alternative is approximately $9.2 million (2001 dollars). The construction cost estimate is $3.6 million including planning, design, construction management, inspection, and a 30 percent construction contingency. The right-of-way cost is estimated at $5.6 million based on property assessment data and information from other similar projects. The majority of this cost is for property north of the CSX railroad tracks.

5.2.2 Alternative 2B – Greentree Boulevard Extension (Center)

Alignment and Typical Section

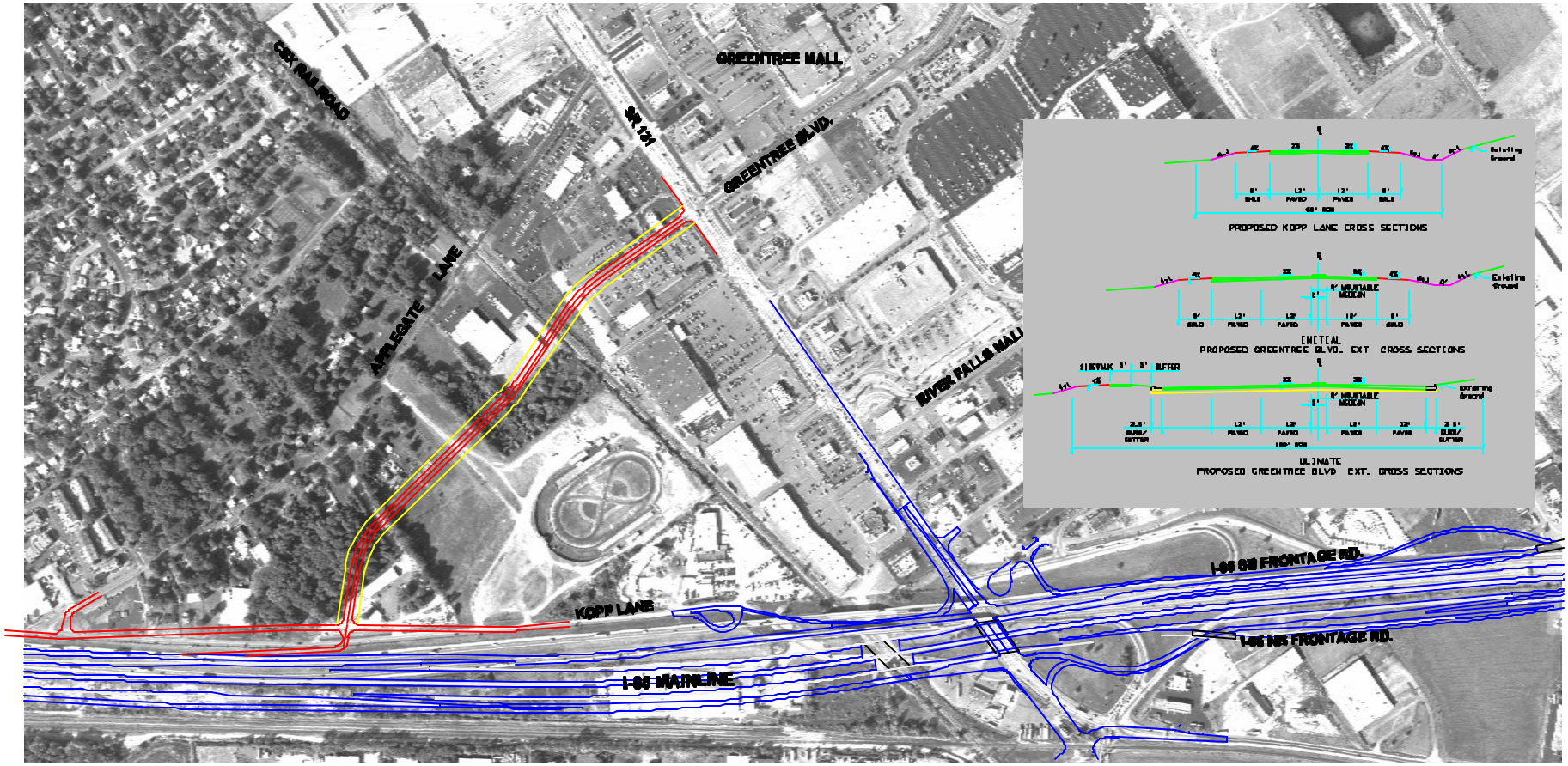
Alternative 2B is similar to Alternative 2A north of the CSX railroad tracks. South of the tracks, Alternative 2B cuts across the back of the Goodwill Industries property as illustrated in Figure 10. However, for this alternative the setback from the roadway right-of-way to the back of the Goodwill building was increased to 80 feet. The alignment then runs south, crossing the Applegate Lane entrance to the Sportsdrome and cutting across the backs of a number of residential / commercial properties fronting on Applegate Lane. Again, the setback from the right-of-way line to the backs of the primary structures on these properties was increased to 60 feet or more. The roadway then turns east to connect with a relocated Kopp Lane on the Concrete Lady property (approximately 200 feet north of Alternative 2A). A slip ramp runs from the new Greentree Boulevard / Kopp Lane intersection to the Southbound Frontage Road. Other improvements, traffic controls, and access control provisions are the same as with Alternative 2A. The initial and ultimate typical sections would be the same as for Alternative 2A.

Right-of-Way

The proposed right-of-way width for Alternative 2B is the same as for Alternative 2A. Again, new right-of-way would also be required for the new section of Kopp Lane. The improvements would require the acquisition of a number of partial and whole parcels.

For the Greentree Boulevard Extension, the entire Wendy's property and a portion of the Ford dealership would have to be purchased. A portion of the back of the Goodwill Industries property, as well as others along Applegate Lane would have to be acquired. The Kopp Lane relocation would require the acquisition of properties along that corridor including the Party Central property (a party supply store) and the Concrete Lady property. A portion of the motel property would again be required.

FEDERAL ROAD PROJECT NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IN	17887A	2001		



CLARKSVILLE TRANSPORTATION STUDY

FIGURE 10: ALTERNATIVE 2B GREENTREE BOULEVARD EXTENSION

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11520 Commonwealth Drive
Louisville, KY 40299

Date: 7/9/01

Scale: 1" = 667'

Drainage, Utilities, and Signals

These items would be the same as for Alternative 2A.

Cost Estimate

The concept level cost estimate for this alternative is approximately $9.5 million (2001 dollars). The construction cost estimate is $4.0 million including planning, design, construction management, inspection, and a 30 percent construction contingency. The right-of-way cost is estimated at $5.5 million based on property assessment data and information from other similar projects. Again, the majority of the cost is for property on SR 131 north of the CSX railroad line.

5.2.3 Alternative 2C – Greentree Boulevard Extension (Alternative 2A Modified)

Alternative 2C is the same as Alternative 2A with the exception that a Connector Roadway is proposed between Applegate Lane and Kopp Lane. This second roadway provides access to the Kopp Lane slip ramp to the Southbound Frontage Road. The Connector Roadway eliminates the need for relocating Kopp Lane because there is sufficient space to construct the slip ramp where the Connector Roadway intersects with Kopp Lane. Alternative 2C is presented in Figure 11.

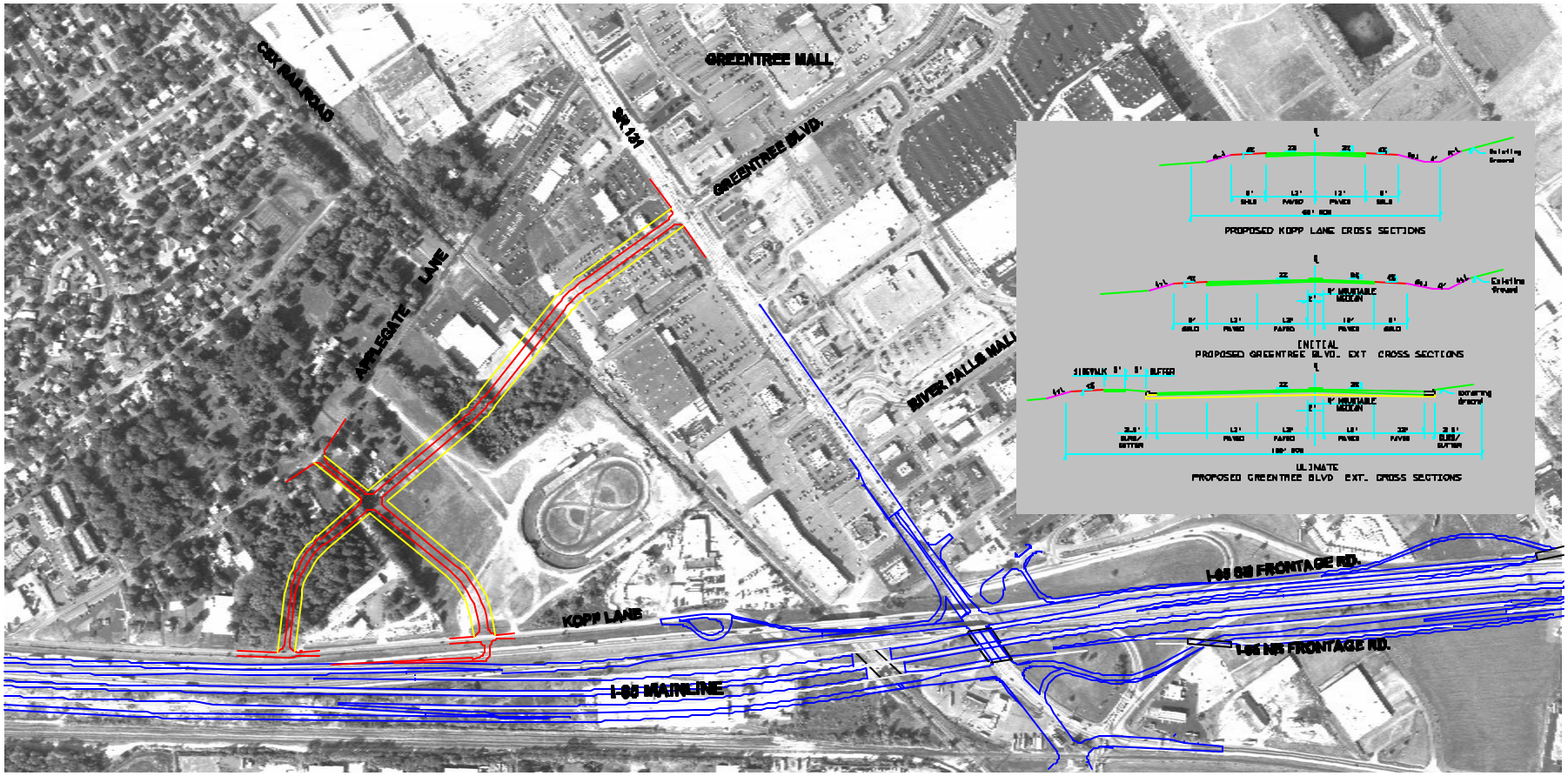
Alignment and Typical Section

The Greentree Boulevard Extension portion of Alternative 2C is essentially the same as for Alternative 2A. The new Connector Roadway runs from the bend in Applegate Lane (at the Applegate entrance to the Concrete Lady property) northeast to between the two Kopp Lane driveways to the Sportsdrome. The two roadways intersect west of the Concrete Lady property.

Improvements to the Greentree Boulevard / SR 131 intersection would be the same as with Alternative 2A. Traffic controls at the Greentree Boulevard / Kopp Lane intersection would consist of a three-way STOP control. Traffic controls at the Connector Road / Kopp Lane intersection would consist of two-way STOP control on Kopp Lane. Ultimately, this intersection may require traffic signal control to maintain the cross street flows on Kopp Lane. This is especially true if the area begins to develop with more intense commercial uses.

Access controls would be instituted for all of the new roadways to maintain safe and efficient traffic flows. New full access curb cuts along the roadway would be restricted to approximately 400 to 600 feet from any other existing full access point. Right turn only driveways would be allowed approximately every 200 to 400 feet. As part of new development projects, property owners would be encouraged to design consolidated access points, able to serve multiple properties.

FEDERAL ROAD PROJECT NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IN	17887A	2001		



CLARKSVILLE TRANSPORTATION STUDY

FIGURE 11: ALTERNATIVE 2C GREENTREE BOULEVARD EXTENSION

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11520 Commonwealth Drive
Louisville, KY 40299

Date: 7/9/01

Scale: 1" = 667'

The Greentree Boulevard Extension initial and ultimate typical cross sections would be the same as for Alternative 2A. (However, a narrower cross section could be used south of the Connector Roadway if desired.) The Connector Roadway cross section would consist of a two lane connection to Applegate Lane and a three lane connection northeast to Kopp Lane.

Right-of-Way

The proposed right-of-way for the extension of Greentree Boulevard is the same as with Alternative 2A. The Connector Roadway right-of-way would be 60 feet west of the Greentree Boulevard Extension and 100 feet east of the Greentree Boulevard Extension. The Connector would require property on Applegate Lane and on the Sportsdrome property. No additional right-of-way would be required on Kopp Lane, as Kopp Lane would not need to be relocated.

Drainage, Utilities, and Signals

Stormwater and utilities would be handled in the same manner as with Alternative 2A.

Cost Estimate

The concept level cost estimate for this alternative is approximately $8.7 million (2001 dollars). The construction cost estimate is $4.0 million including planning, design, construction management, inspection, and a 30 percent construction contingency. The right-of-way cost is estimated at $4.7 million based on property assessment data and information from other similar projects. The estimated property cost for 2C is lower than for 2A and 2B because Kopp Lane remains in its current location.

5.2.4 Alternative 2D – Greentree Boulevard Extension (North)

Alignment and Typical Section

In Alternative 2D, the proposed Greentree Boulevard Extension curves to the east closer to the Sportsdrome to connect with Kopp Lane further north. A slip ramp would connect Kopp Lane to the Southbound Frontage Road at this location. Locating the Greentree Boulevard Extension / Kopp Lane intersection further north eliminates the need for relocating Kopp Lane because the proposed Southbound Frontage Road is over 100 feet east of Kopp Lane at this location. The Alternative 2D alignment also provides a larger setback from the Goodwill Industries property and substantially avoids the properties fronting on Applegate Lane. Alternative 2D is presented in Figure 12.

Other improvements, proposed traffic controls, and access control provisions are the same as with Alternative 2A. The initial and ultimate typical sections used for Alternative 2D are the same as for Alternative 2A.

FEDERAL ROAD PROJECT NO.	STATE	PROJECT NO.	PROPOSED YEAR	SHEET NO.	TOTAL SHEETS
	IN	17887A	2001		

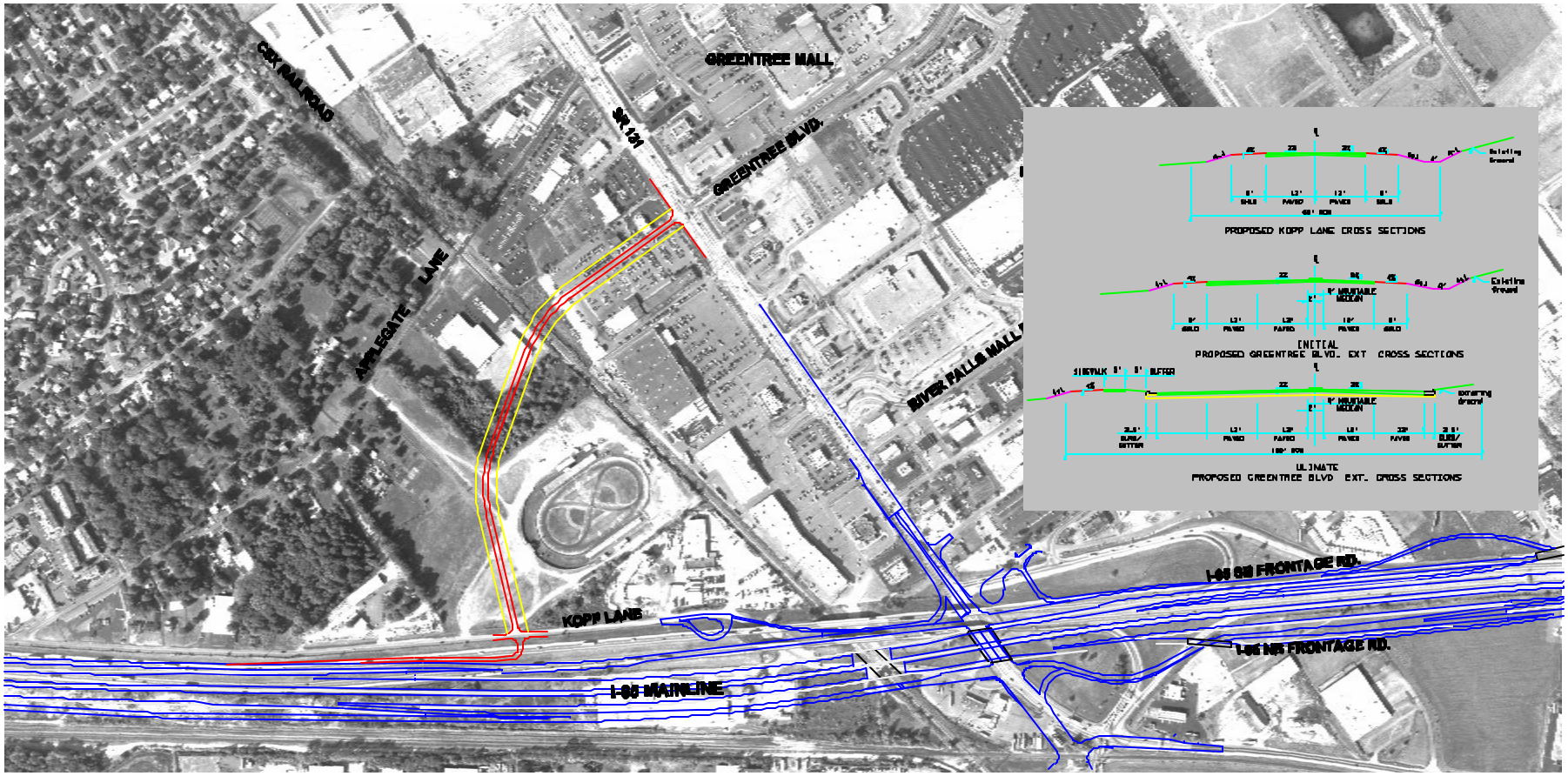

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FIGURE 12: ALTERNATIVE 2D GREENTREE BOULEVARD EXTENSION

Date: 7/6/01	Scale: 1" = 500'

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Right-of-Way

The proposed right-of-way width for Alternative 2D is the same as for Alternative 2A, however no new right-of-way would be required along Kopp Lane. The improvements would require the acquisition of a number parcels including the entire Wendy's property, a portion of the Ford dealership, a portion of the back of the Goodwill Industries property, and a corridor through the Sportsdrome property.

Drainage, Utilities, and Signals

These items would be similar to those for Alternative 2A.

Cost Estimate

The concept level cost estimate for this alternative is approximately $6.9 million (2001 dollars). The construction cost estimate is $2.8 million including planning, design, construction management, inspection, and a 30 percent construction contingency. This is the lowest of the Group 2 Alternatives in part because it does not require a relocation of Kopp Lane or a new Connector Road. The right-of-way cost is estimated at $4.1 million based on property assessment data and information from other similar projects. The estimated property cost for 2C is lower than for the other Group 2 Alternatives, again because Kopp Lane remains in place, and the overall length of new right-of-way is shorter than for the other alternatives.

5.3 Group 3 – SR 131 Improvements

The Group 3 Alternatives propose improvements to SR 131 from 500 feet west of Applegate Lane east to the I-65 project limits of work (a distance of approximately 3,100 feet). The improvements would connect to the proposed I-65 / SR 131 Interchange project. The corridor includes three signalized intersections. The improvements do not address the new SR 131 / I-65 Frontage Road interchange intersections. The I-65 improvements are assumed to be constructed as currently planned.

The objectives of the Group 3 Alternatives are to: add capacity to SR 131; improve operations at the major intersections; and enhance safety along the roadway. The improvements do not address the deficiencies on Applegate Lane and Kopp Lane or the lack of access and circulation in the southern portion of the study area. They also do not create parallel facilities for dispersing the current traffic flows.

Design Standards

The following design standards were employed in developing the Group 3 Alternatives:

Table 5
Group 3 - Design Standards Summary

Design Classification	Multilane Urban Arterial (Intermediate)
Design Speed	50 mph
Lane Width	12 ft
Shoulder Width	8 ft (right)
Median Width	4ft (Min)
Foreslope / Backslope	6:1 / 4:1 for 20 ft (3:1 max to top)
Ditch Width	4 ft

Notes:
Design standards based on INDOT Design Manual, AASHTO, and ITE
Design Variances may be required to accommodate drainage within existing ROW.

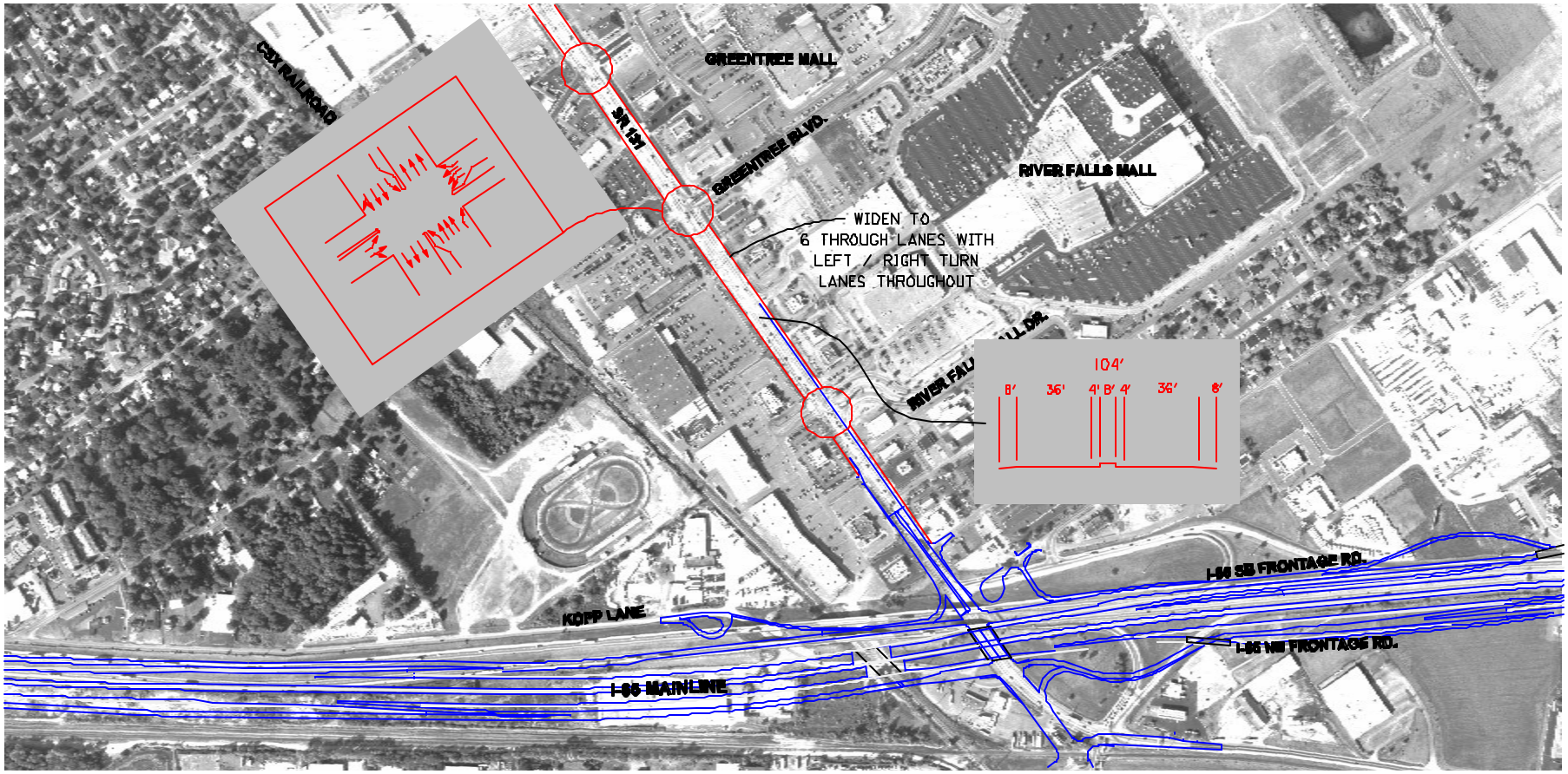
5.3.1 Alternative 3A – SR 131 Widening and Improvements

Alignment and Typical Section

Alternative 3A includes reconstructing and widening SR 131 as a seven-lane highway from approximately 500 feet west of Applegate Lane east to the new I-65 improvement project limits (a distance of approximately 3,100 feet). The improvements will tie to the proposed I-65 improvements near the Southbound Frontage Road. As part of this alternative the existing pavement, which is in poor condition, would be replaced. The three existing signalized study intersections would be improved / reconstructed with additional turn lanes as necessary to facilitate adequate vehicular flow. (Improvements are not proposed as part of this alternative for the two new I-65 Frontage Road intersections. The I-65 improvements are assumed to be in place as currently planned.) Figure 13 shows the proposed improvement corridor.

The proposed reconstructed typical section for the roadway consists of six 12-foot through lanes, a 12-foot left turn lane, a 4-foot median, and either 8-foot shoulders or a 2.5-foot curb and gutter. (In locations where there is no left turn lane the median width expands to 16-feet.) At major intersections, right turn lanes would be added to the cross section as needed. For example a westbound right-turn lane would be included at SR 131 / Greentree Boulevard. Sidewalks are not currently present and have not been included in the conceptual design, however they could be added during the design phase. Crosswalks and pedestrian signals have been assumed in the conceptual design. Figure 13 illustrates the proposed typical cross section.

	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IN	17857A	2001		



CLARKSVILLE TRANSPORTATION STUDY

FIGURE 13: ALTERNATIVE 3A
SR 131 WIDENING

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11520 Commonwealth Drive
Louisville, KY 40299

Date: 2/2001 Scale: 1" = 800'

Right-of-Way

The approximate ROW width along SR 131 is 150 feet through much of the corridor, narrowing to 100 feet near I-65. The proposed improvements would be constructed within the existing ROW except at major intersections where additional ROW for turn lanes, drainage, and utilities may be required and near I-65 where additional ROW may be required to match the proposed I-65 improvements. The section of the roadway nearest I-65 would be curbed on both sides to reduce the required ROW width.

Drainage, Utilities, and Signals

Over the majority of the corridor, the drainage would remain in roadside channels. At intersections and near I-65 where the right-of-way is limited, a curbed section would be used and the stormwater facilities would be placed underground. (Where the necessary ditch depth prevents the required front and back slopes without additional right-of-way the shoulders may be retained with the drainage placed under cover.) The existing above ground utilities would be relocated as necessary (within the ROW) to accommodate the proposed new roadway and drainage facilities. Existing traffic signals and signage would also be relocated as necessary.

Cost Estimate

The concept level cost estimate for this alternative is approximately $7.8 million (2001 dollars). The construction cost estimate is $6.3 million including planning, design, construction management, inspection, and a 30 percent construction contingency. The right-of-way cost is estimated at $1.5 million (derived as a percent of the hard construction costs) and assumes only limited new right-of-way would be required, predominantly near the intersections.

5.3.2 Alternative 3B – SR 131 Intersection Improvements

Alignment and Typical Section

Alternative 3B includes reconstructing / improving the three signalized study intersections on SR 131 from Applegate Lane to the River Falls Mall Driveway. The intersections would be reconstructed with additional turn lanes to facilitate adequate vehicular flow. (Again, the I-65 improvements are assumed to be in place as currently planned.) The traffic signal timing, phasing, system cycle lengths and offsets would also be adjusted to facilitate the best intersection operating conditions. New crosswalks and pedestrian signals are assumed in the conceptual design (at least on one leg of SR 131 at each intersection). Figure 14 illustrates the proposed intersection improvement locations.

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	IN	1783?A	2001		

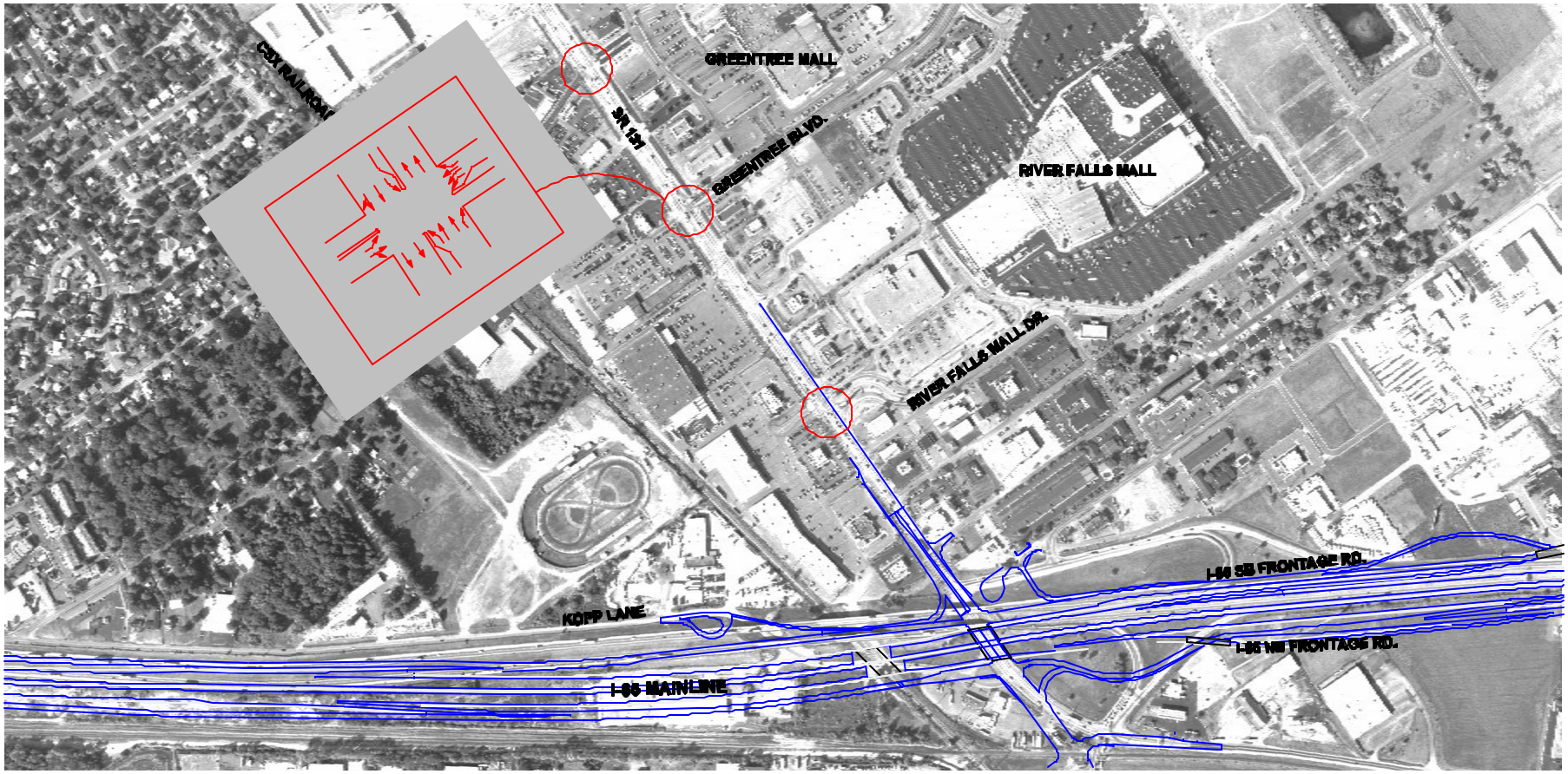

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FIGURE 14: ALTERNATIVE 3B
SR 131 INTERSECTION IMPROVEMENTS

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11520 Commonwealth Drive
Louisville, KY 40299

Date: 2/2/01

Scale: 1" = 250'

Right-of-Way

The proposed improvements would be constructed primarily within the existing ROW. Additional ROW may be required in certain locations for turn lanes, drainage, and utility relocations.

Drainage, Utilities, and Signals

Whenever possible, the drainage would remain in roadside channels. However, it is anticipated that curbed sections would be used and the stormwater facilities would be placed underground at most of the intersections. The existing above ground utilities would be relocated as necessary (within the ROW) to accommodate the proposed new roadway and drainage facilities. Existing traffic signals and signage would also be relocated as necessary.

Cost Estimate

The concept level cost estimate for this alternative is approximately $3.5 million (2001 dollars). The construction cost estimate is $2.8 million including planning, design, construction management, inspection, and a 30 percent construction contingency. The right-of-way cost is estimated at $0.7 million (derived as a percent of the hard construction costs) and assumes only limited new right-of-way would be required at the three intersections.

5.3.3 Alternative 3C – SR 131 Traffic Signal Timing Improvements

Alternative 3C improves the traffic signal timing at the three signalized study intersections on SR 131 from Applegate Lane to the River Falls Mall Driveway. (The three study intersections would be coordinated with the improved I-65 intersections.) This would include optimizing the system cycle length, intersection offsets, signal phasing, and individual signal timing (i.e. splits). The system itself would also be upgraded in terms of hardware and software. The current time based coordination system would be replaced with the latest interconnected, traffic responsive system. The interconnection could be hardwired (via the overhead utility poles) or some form of wireless technology. Either existing or new detectors would be used to provide input to the system. The system would allow remote monitoring and adjustments. However, no significant physical improvements (i.e. paving) would be made.

Cost Estimate

The preliminary concept level cost estimate for this alternative is approximately $0.75 million.

5.4 Other Considered Transportation Improvements

A number of other transportation improvements were considered as part of this study. They are presented here for reference.

Roadway on the CSX Railroad ROW

The proposed abandonment of the CSX railroad right-of-way opens the opportunity for a new local roadway along the back of the Home Depot development. This new roadway could provide access to both the back of the Home Depot development as well as the Goodwill, Sportsdrome, and Cristiani properties.

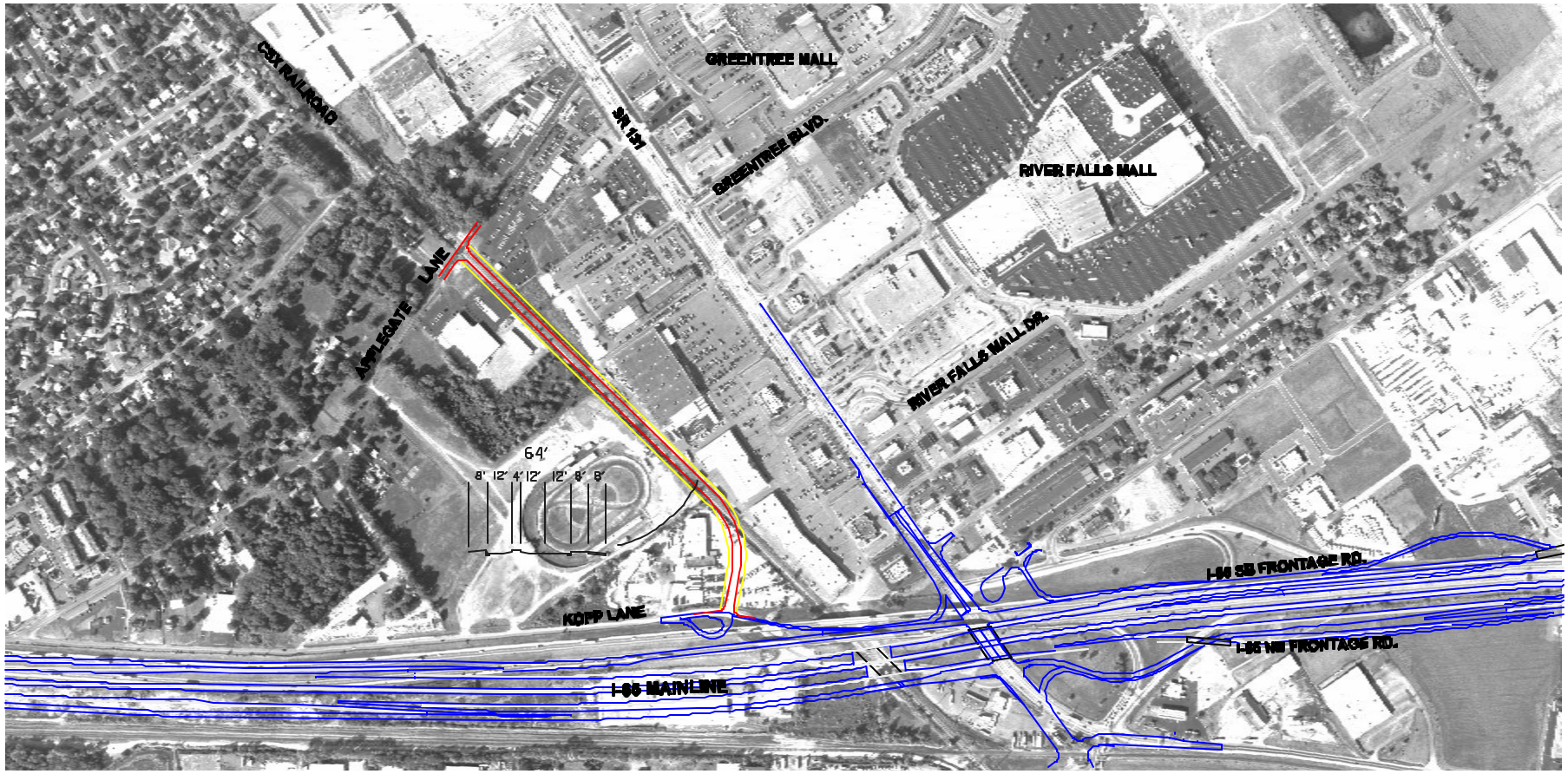
The current railroad right-of-way is approximately 60 feet according to the survey of Applegate Heights dated October 1946. A proposed 3-lane curbed section could be constructed within this right-of-way; however, the presence of both underground (gas) and overhead (electric) utilities on the north edge of the right-of-way indicates that slightly more right-of-way would be beneficial. Additionally, it would be beneficial to provide a trail or sidewalk connection from this section of the CSX line to the remainder of the line, which has been proposed for trail construction. Therefore, it has been assumed that the right-of-way would be extended 20 feet to the south for an 80-foot right-of-way. The roadway would tie to the proposed turnaround at the end of Kopp Lane in a jug handle configuration. The proposed roadway alignment is given in Figure 15.

The concept level construction cost estimate for this project is approximately $2.6 million (2001 dollars) including planning, design, construction management, inspection, and a 30 percent construction contingency. Right-of-way costs have been estimated at $1.0 million (derived as a percent of the hard construction costs) for a total project cost of 3.6 $million. However, the actual right-of-way cost (and therefore total project cost) will depend in great measure on the actual width of the railroad right-of-way, the legal status of the right-of-way, and the ability to acquire a corridor through the Cristiani property. Environmental mitigation issues could also increase the project cost above that given here.

New Interchange

Ultimately, a new interchange could be constructed at the location of the connection between the Greentree Boulevard Extension (or Applegate Lane) and the Southbound Frontage Road. This option was presented in the Town of Clarksville Comprehensive Plan; however, a new interchange would be very expensive, requiring a bridge structure over the widened I-65 (i.e. 12 lanes).

FEDERAL ROAD DESIGN NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IN	17857A	2001		



CLARKSVILLE TRANSPORTATION STUDY

FIGURE 15: USE OF CSX RAILROAD RIGHT-OF-WAY FOR NEW ROADWAY

PB PARSONS BRINCKERHOFF

KIPDA Kentuckiana Regional Planning and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299

Date: 2/2/01

Scale: 1" = 500'

6.0 BUILD SCENARIO BENEFIT / IMPACT ASSESSMENT

Future build scenario analyses were completed for each of the three groups of improvement alternatives. These analyses used the future no-build roadway network, land-use patterns, and traffic conditions as a baseline. Then the potential benefits and impacts associated with implementing each alternative were assessed. The benefit / impact assessment focused on three key areas:

- Traffic Safety, Operations, and Circulation
- Land Use and Development
- Environment and Community

Traffic Safety, Operations, and Circulation

The traffic analysis used the no-build roadway network and traffic volumes as a baseline. Then the specific alternative was added to the roadway network and the study area traffic flows were modified to reflect the network changes. Table 6 shows the future year levels of service for all of the proposed alternatives compared to the baseline (i.e. no-build) levels of service. Figures 16 through 21 show the traffic volumes associated with each of the groups of alternatives for both 2003 and 2020. The future development implications and associated traffic impacts of improved local access were examined separately as part of the land use and development assessment.

Land Use and Development

The land use and development analysis assessed the potential opportunities and impacts associated with implementation of each of the proposed alternatives. It addressed site access, parcel size, traffic generation, and zoning.

Environment and Community

The environment and community impact assessment addressed issues such as the natural environment, displacements, and hazardous materials sites.

6.1 Group 1 Alternatives

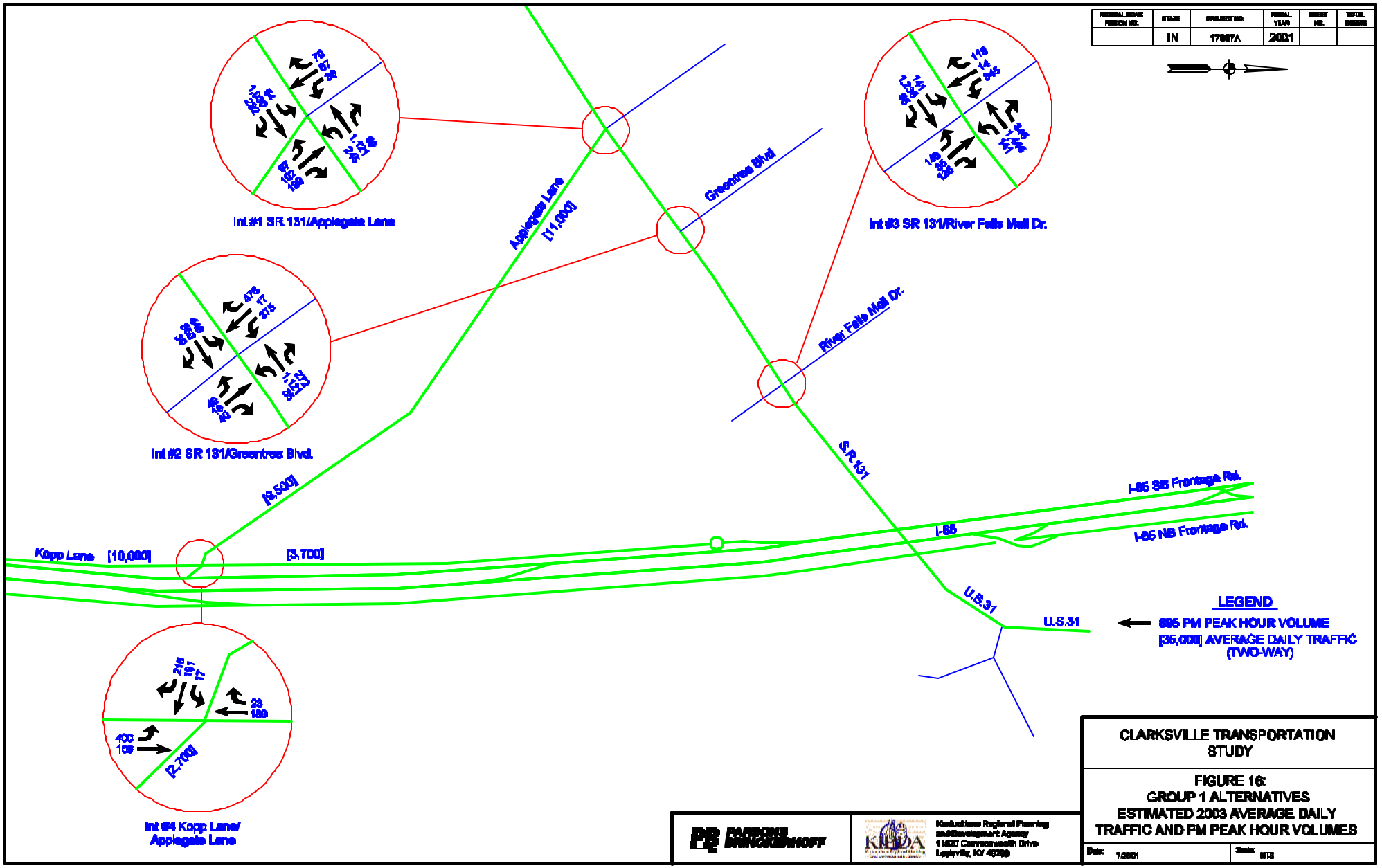
6.1.1 Traffic Safety, Operations, and Circulation

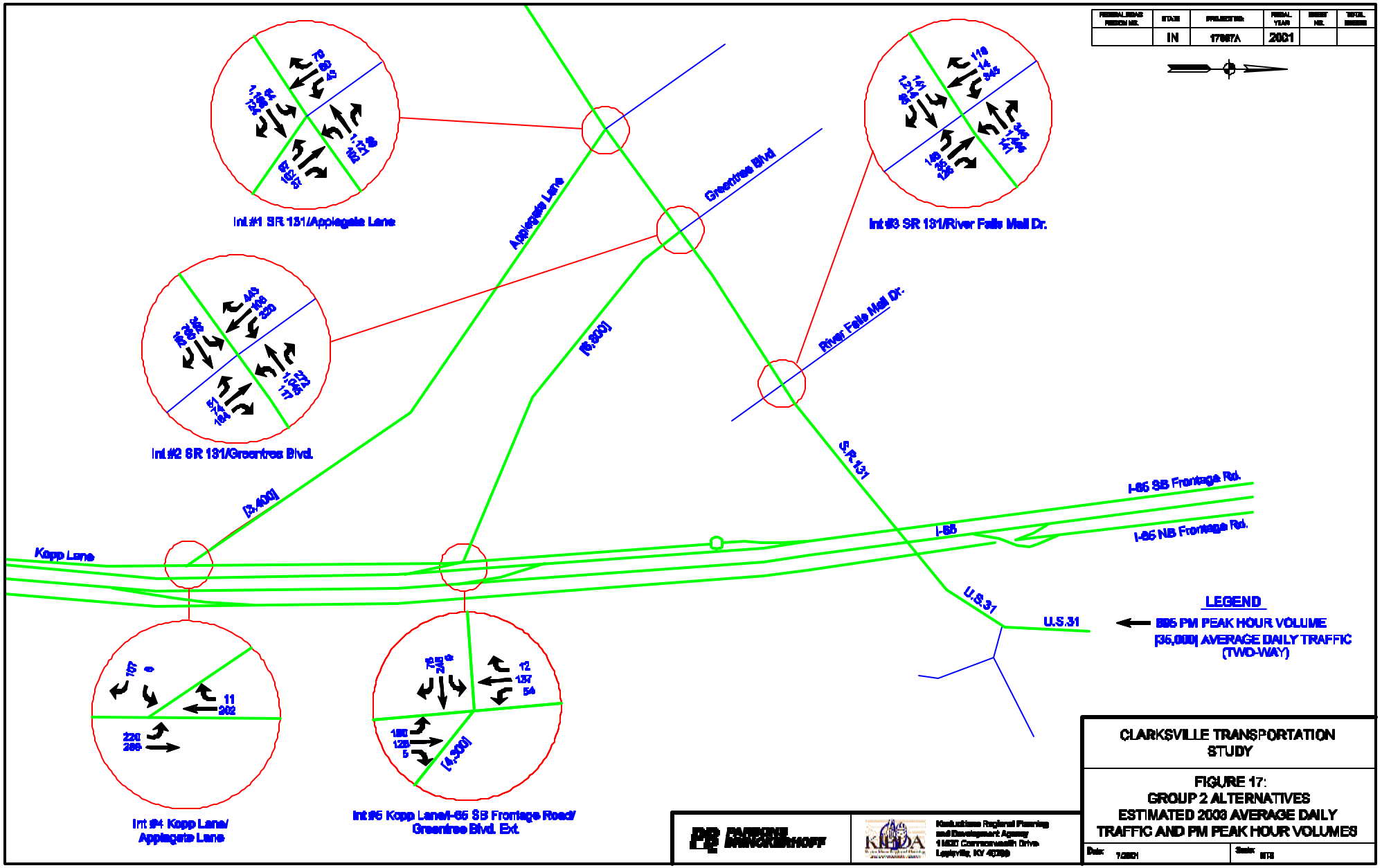
The Group 1 Alternatives (1A and 1B) improve traffic flow and safety on Applegate Lane and on a portion of Kopp Lane by providing full width lanes, curbs, and improved clear zones. They also provide a slight improvement to traffic operations on SR 131 by redirecting some traffic from the SR 131 / Southbound Frontage Road intersection to the new ramp (i.e. headed to southbound I-65). The projected levels of service on SR 131 however, do not change. In 2020, approximately 3,400 vehicles per day are estimated to use the new ramp to the Southbound Frontage Road.

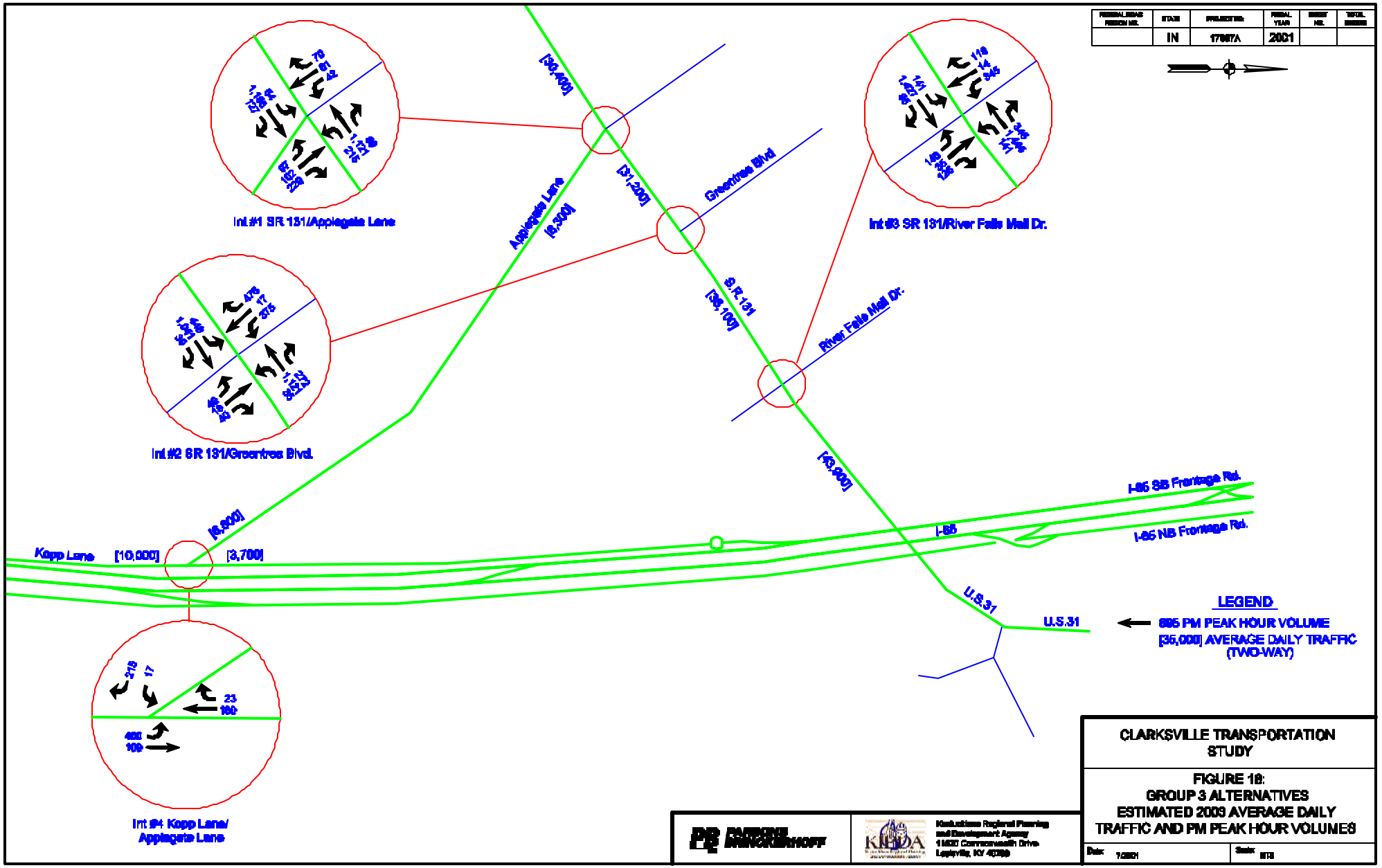
Table 6
Study Intersections
Estimated PM Peak Hour No-Build and Build Levels of Service

Intersection	Year	Peak Hour	No-Build	Alt 1A-B	Alt 2A-D	Alt 3A	Alt 3B	Alt 3C
1. SR 131 / Applegate Lane	2003	PM	B	B	B	B	B	B
	2020	PM	C	C	B	C	C	C
2. SR 131 / Greentree Boulevard	2003	PM	D	D	C	C	C	D
	2020	PM	E	E	D	C	E	E
3. SR 131 / River Falls Mall Drive	2003	PM	D	D	D	C	D	D
	2020	PM	E	E	E	D	E	E
4. Applegate Lane / Kopp Lane (unsignalized)	2003	PM	C	B	C	C	C	C
	2020	PM	E	C	D	E	E	E
5. Greentree Extension / Kopp Lane (unsignalized)	2003	PM	-	-	B	-	-	-
	2020	PM	-	-	B	-	-	-

Notes: Shaded boxes indicate a 2020 level of service below the acceptable threshold in that scenario.


STATE
IN
17087A
2001
Int #1 SR 131/Applegate Lane
Int #2 SR 131/Greentree Blvd.
Int #3 SR 131/River Falls Mall Dr.
Int #4 Kopp Lane/
Applegate Lane
Applegate Lane
[11,000]
Greentree Blvd
River Falls Mall Dr.
S.R.131
[9,500]
Kopp Lane [10,000]
[5,700]
I-65
I-65 SB Frontage Rd.
I-65 NB Frontage Rd.
U.S.31
U.S.31
[2,700]
LEGEND
695 PM PEAK HOUR VOLUME
[35,000] AVERAGE DAILY TRAFFIC
(TWO-WAY)
CLARKSVILLE TRANSPORTATION
STUDY
FIGURE 16:
GROUP 1 ALTERNATIVES
ESTIMATED 2003 AVERAGE DAILY
TRAFFIC AND PM PEAK HOUR VOLUMES
Date: 7/2001
Scale: NTS
PARSONS BRINCKERHOFF
Kentuckiana Regional Planning
and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299


IN
17067A
2001
Int #1 SR 131/Applegate Lane
Int #2 SR 131/Greentree Blvd.
Int #3 SR 131/River Falls Mall Dr.
Int #4 Kopp Lane/
Applegate Lane
Int #5 Kopp Lane/I-65 SB Frontage Road/
Greentree Blvd. Ext.
Applegate Lane
Greentree Blvd
River Falls Mall Dr.
S.R.131
U.S.31
U.S.31
I-65
I-65 SB Frontage Rd.
I-65 NB Frontage Rd.
Kopp Lane
[8,800]
[2,400]
[4,300]
LEGEND
885 PM PEAK HOUR VOLUME
[35,000] AVERAGE DAILY TRAFFIC
(TWO-WAY)
CLARKSVILLE TRANSPORTATION
STUDY
FIGURE 17:
GROUP 2 ALTERNATIVES
ESTIMATED 2003 AVERAGE DAILY
TRAFFIC AND PM PEAK HOUR VOLUMES
PARSONS BRINCKERHOFF
Kentuckiana Regional Planning
and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299
Date: 7/2001
Scale: NTS


STATE
IN
PROJECT NO.
17087A
FISCAL YEAR
2001
Int #1 SR 131/Applegate Lane
Int #2 SR 131/Greentree Blvd.
Int #3 SR 131/River Falls Mall Dr.
Int #4 Kopp Lane/
Applegate Lane
[30,400]
[31,200]
[38,100]
[43,900]
Applegate Lane
[6,300]
Greentree Blvd
S.R.131
River Falls Mall Dr.
Kopp Lane
[10,000]
[3,700]
[6,900]
I-65
I-65 SB Frontage Rd.
I-65 NB Frontage Rd.
U.S.31
U.S.31
LEGEND
695 PM PEAK HOUR VOLUME
[35,000] AVERAGE DAILY TRAFFIC
(TWO-WAY)
CLARKSVILLE TRANSPORTATION
STUDY
FIGURE 18:
GROUP 3 ALTERNATIVES
ESTIMATED 2009 AVERAGE DAILY
TRAFFIC AND PM PEAK HOUR VOLUMES
Date: 7/2001
Scale: NTS
PARSONS BRINCKERHOFF
KIPDA
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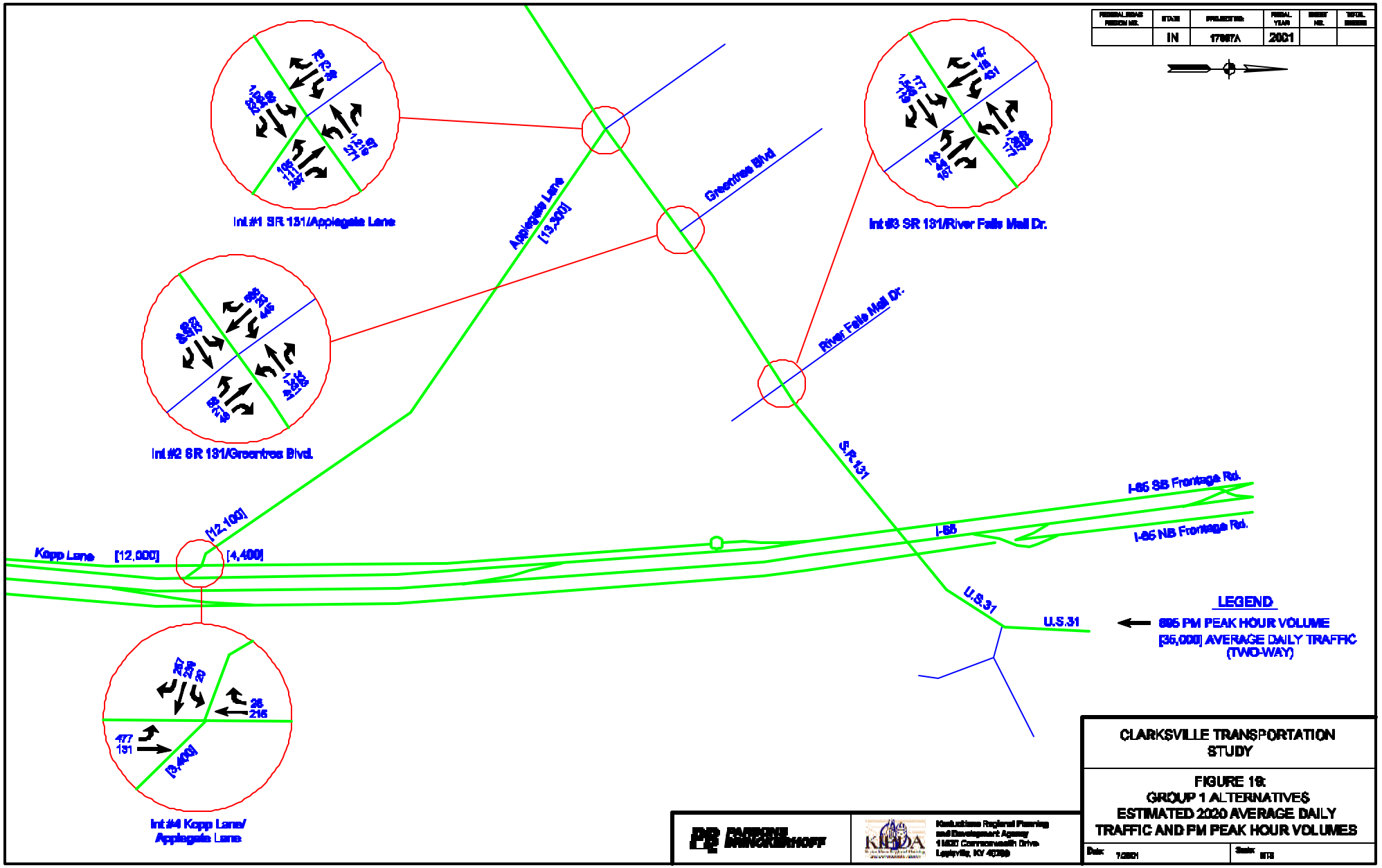
and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299



	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IN	17987A	2001		

CLARKSVILLE TRANSPORTATION STUDY

FIGURE 19:
GROUP 1 ALTERNATIVES
ESTIMATED 2020 AVERAGE DAILY TRAFFIC AND PM PEAK HOUR VOLUMES

Date: 7/2001 | State: IN

PARSONS BRINCKERHOFF

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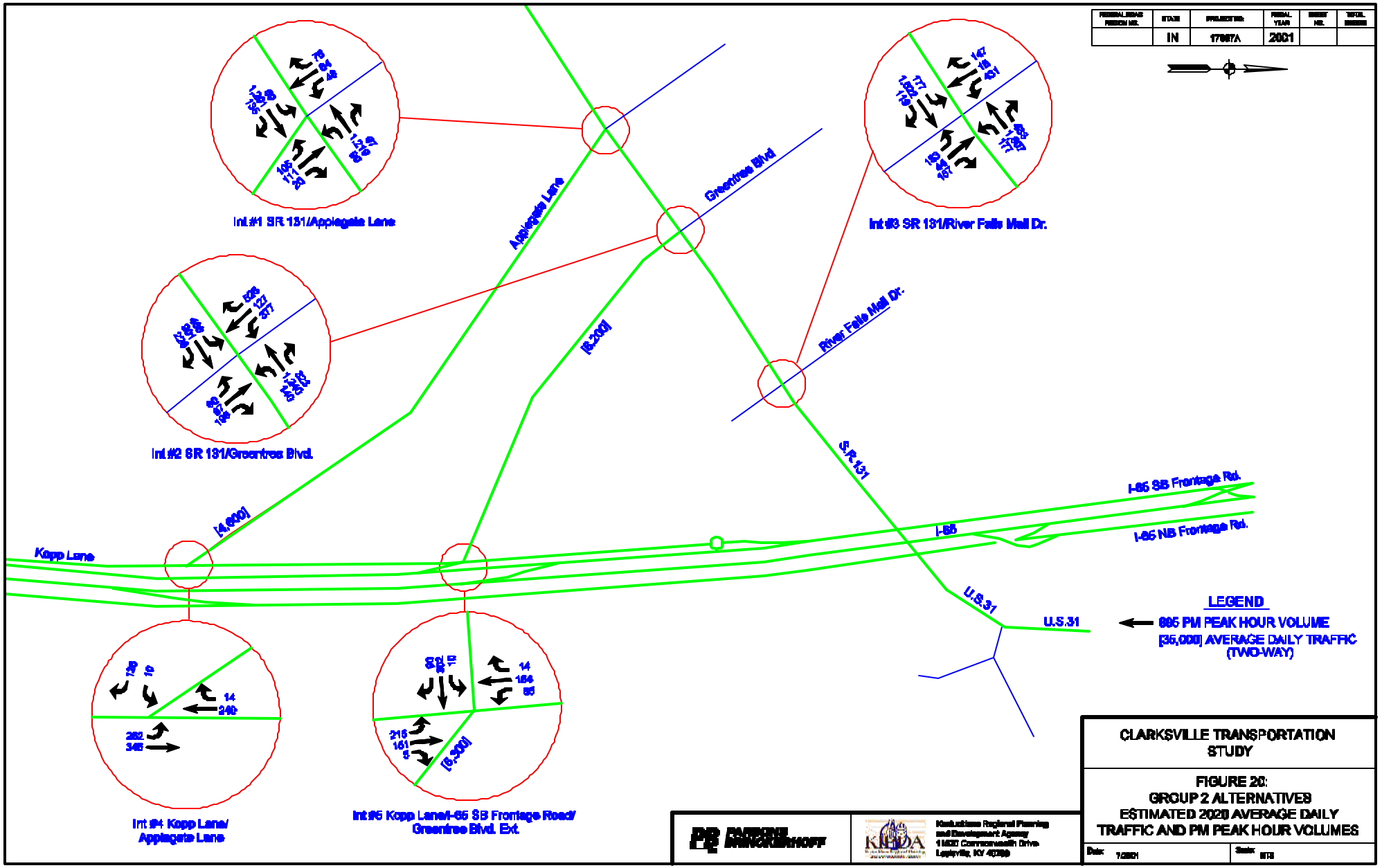
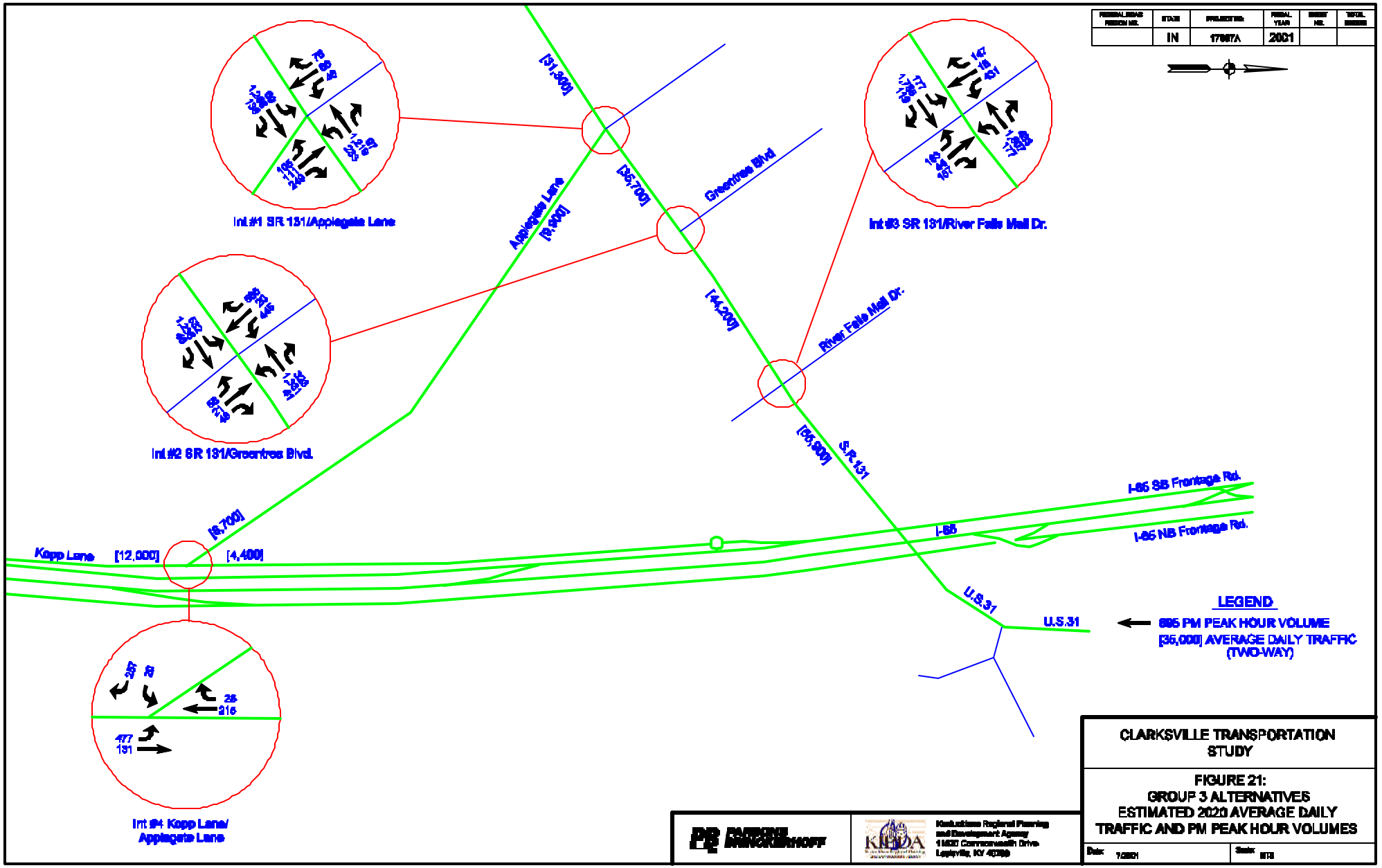
Louisville, KY 40299


Int #1 SR 131/Applegate Lane
Int #2 SR 131/Greentree Blvd.
Int #3 SR 131/River Falls Mall Dr.
Int #4 Kopp Lane/ Applegate Lane
Int #5 Kopp Lane/I-65 SB Frontage Road/ Greentree Blvd. Ext.
Applegate Lane
Greentree Blvd
River Falls Mall Dr.
S.R.131
I-65 SB Frontage Rd.
I-65
I-65 NB Frontage Rd.
Kopp Lane
U.S.31
U.S.31
[6,200]
[4,600]
[6,300]
LEGEND
695 PM PEAK HOUR VOLUME
[35,000] AVERAGE DAILY TRAFFIC (TWO-WAY)
IN
17067A
2001
CLARKSVILLE TRANSPORTATION STUDY
FIGURE 20:
GROUP 2 ALTERNATIVES
ESTIMATED 2020 AVERAGE DAILY TRAFFIC AND PM PEAK HOUR VOLUMES
Parsons Brinckerhoff
Kentuckiana Regional Planning and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299


Int #1 SR 131/Applegate Lane
Int #2 SR 131/Greentree Blvd.
Int #3 SR 131/River Falls Mall Dr.
Int #4 Kopp Lane/ Applegate Lane
[31,900]
[36,700]
[44,200]
[55,900]
Applegate Lane [9,400]
Greentree Blvd
River Falls Mall Dr.
S.R.131
Kopp Lane [12,000]
[6,700]
[4,400]
I-65
I-65 SB Frontage Rd.
I-65 NB Frontage Rd.
U.S.31
U.S.31
LEGEND
695 PM PEAK HOUR VOLUME
[35,000] AVERAGE DAILY TRAFFIC (TWO-WAY)
IN
17087A
2001
CLARKSVILLE TRANSPORTATION STUDY
FIGURE 21:
GROUP 3 ALTERNATIVES
ESTIMATED 2020 AVERAGE DAILY TRAFFIC AND PM PEAK HOUR VOLUMES
Kentuckiana Regional Planning and Development Agency
11520 Commonwealth Drive
Louisville, KY 40299

The Applegate Lane / Kopp Lane / Slip Ramp intersection will operate acceptably at level of service C in 2020. The ramp connection to the Southbound Frontage Lane will also operate acceptably in 2020 given the moderate volume of traffic on the ramp (approximately 3,400 ADT and 240 peak hour) and the low volume of traffic on the Frontage Road at that location. According to the I-65 Traffic Study, 2015 traffic on the Frontage Road at this location is just over 500 vehicles per day with 46 vehicles in the peak hour.

The Group 1 Alternatives improve access and circulation for the southern portion of the study area by upgrading the existing roads. However, with Alternative 1B access is still limited to the existing corridors and access from the northern portion of Kopp Lane to SR 131 remains circuitous. Alternative 1A offers the benefit of a partial new and overall shorter alignment, making the route more attractive than Alternative 1B for drivers accessing Kopp Lane and the new slip ramp. Given the limited right-of-way, Alternatives 1A and 1B doe not provide significant improvements for pedestrian circulation and safety.

6.1.2 Land Use and Development

The Group 1 Alternatives improve access to the Applegate corridor and would facilitate development in that corridor. They leave the large parcels east of Applegate Lane whole, and provide good new access points. However, they provide only moderately better access to the Kopp Lane corridor and the connection to SR 131 remains distant.

Alternative 1B conflicts with the residential nature of the southern and western portion of the study area by increasing traffic in a primarily residentially zoned area. Traffic on Applegate Lane with the Group 1 Alternatives is projected to exceed 12,000 vehicles per day in 2020, compared to 8,700 to 9,900 in the no-build scenario. Alternative 1B also requires the acquisition of 10 residential / commercial parcels on the northeast side of the roadway, eliminating nearly half of the residences on that portion of the roadway. It also requires acquisition of the motel, party supply store and three other structures on Kopp Lane (in addition to the commercial property on SR 131 and other partial acquisitions). Overall, it will cause significant changes to the land use patterns on Applegate Lane. It is important to note however, that some of the residential parcels on Applegate Lane have been rezoned to commercial, leading to the two automotive shops on Applegate Lane.

Alternative 1A diminishes the land use conflict issue by avoiding the residences on the southern portion of Applegate Lane through the use of a new alignment at the southern end of the roadway. It will require taking only two residential properties. Other property acquisitions on Kopp Lane and near SR 131 are similar except that the motel remains, and a portion of the Concrete Lady must be acquired (and at least one building must be relocated). The cost of Alternative 1A is also lower than for Alternative 1B due to a shorter roadway length.

6.1.3 Environment and Community

Alternatives 1A and 1B do not cross any known environmentally sensitive sites. They do however, cross of come near a number of potentially contaminated parcels including the old service station site on Kopp Lane and the railroad tracks. These sites would require further study and possibly remediation prior to implementation of either alternative.

The more significant impacts are community impacts. Alternative 1A will displace approximately five homes and two businesses and will cause disruption or partial acquisition of three other major businesses. Alternative 1B will displace approximately 13 residential (or residential/ commercial) properties and two businesses. And will cause disruption or partial acquisition of one other major business.

6.2 Group 2 Alternatives

6.2.1 Traffic Safety, Operations, and Circulation

The Group 2 Alternatives (i.e. Greentree Boulevard Extension) improve safety and traffic operations in the study area by drawing traffic to a new arterial roadway running parallel to Applegate Lane. Applegate Lane reverts to a lower volume local roadway. Trucks, buses, and through traffic would have a safe through route to SR 131. With the Greentree Boulevard Extension, traffic volumes on Applegate Lane are projected to drop to 4,600 vehicles per day in 2020 (compared to 8,700 to 9,900 in the no-build scenario), with 8,200 vehicles per day on the new roadway. Alternative 2D, however, is likely to draw less traffic from Applegate Lane than the other three alternatives, because it connects to Kopp Lane further to the north.

The Group 2 Alternatives can be upgraded as they have sufficient ROW for a five lane ultimate cross section. The Group 2 Alternatives also improve pedestrian access and safety in their ultimate cross section configuration.

The Group 2 Alternatives shift traffic not only from Applegate Lane, but also from the SR 131 / Southbound Frontage Road intersection, as demonstrated by the projected 5,300 vehicles per day on the new slip ramp to the Southbound Frontage Road. These shifts result in modest improvements in the 2020 levels of service at both the Applegate Lane / SR 131 and Greentree Boulevard / SR 131 intersections.

The proposed new slip ramp to the Southbound Frontage Road connects south of the ramp from the Frontage Road to the I-65 mainline. The slip ramp will function well in 2020 given the modest ramp volume (5,300 ADT, 372 peak hour) and the low volume of traffic on the Frontage Road at that location. According to the I-65 Traffic Study, the 2015 traffic on that segment of the Frontage Road is just over 500 vehicles per day with 46 vehicles in the peak hour. The intersection providing access to the ramp is projected to operate at LOS B in 2020 as an unsignalized intersection.

The Group 2 Alternatives provide significant improvements to local access and circulation in the southern portion of the study area. Each of the four Group 2 Alternatives provides different levels of access to different portions of the study area. Alternatives 2A and 2B provide direct access from SR 131 to Kopp Lane and the Frontage Road. Alternative 2C provides a network of roadways, but does not offer a direct connection to the Frontage Road; instead a southbound left turn is required. Finally, Alternative 2D provides a link to the northern portion of Kopp Lane, but divides the major developable parcels as discussed below.

6.2.2 Land Use and Development

By improving access to the study area, the Group 2 Alternatives would facilitate future development, especially in the large parcels between Alternative 2A and Kopp Lane.

Alternatives 2A and 2B provide simple, direct alignments, leaving large unified tracts for future development. Conversely, these two alignments have the greatest impacts of the four on existing development due to the need for a relocation of Kopp Lane.

Alternative 2C divides potential development parcels in the vicinity of the Concrete Lady property. However, it reduces impacts on existing businesses by eliminating the need for relocating Kopp Lane and creates a network by which traffic can be dispersed. It also creates a left turn conflict at the intersection of the Greentree Boulevard Extension and the Connector Roadway that could limit future traffic flows.

Alternative 2D runs through the center of the study area. It reduces impacts on existing businesses by eliminating the need for relocating Kopp Lane, but this is overshadowed by the alignment bisecting the major development area. The alignments horizontal curvature could also hinder future roadway connections should the area begin to develop more intensely.

It is important to note that if the roughly 50 plus acre study area were to all develop as retail commercial property it could result in nearly a million square feet of new retail space. This in turn would generate tens of thousands of new trips to the study area each day. The current road system could not handle this increase in traffic. Associated transportation system improvements, such as a new access point to the study area should be pursued in conjunction with proposed development on this scale.

6.2.3 Environment and Community

Alternatives 2A, 2B, and 2C do not cross any known environmentally sensitive sites. They do however, cross or come near, a number of potentially contaminated parcels including the old service station site on Kopp Lane, the railroad tracks, an automotive repair firm (Applegate Subdivision Parcel 2), and the Goodwill property (previously a lumber yard). These sites would require further study and possibly remediation prior to implementation of either alternative. Alternative 2D crosses the railroad tracks, the

Goodwill property both of which would require further study and possibly remediation prior to implementation of either alternative.

Regarding community impacts, Alternative 2A will displace approximately five residential or residential/commercial properties and two businesses and will cause the disruption or partial acquisition of four other major businesses. Alternative 2B will displace approximately three residential or residential/commercial properties and three businesses and will cause the disruption or partial acquisition of three other major businesses. Most of these impacts are either due to the Kopp Lane relocation or are located near SR 131 north of the CSX line.

Alternative 2C will displace approximately two residential or residential/commercial properties and one business and will cause the partial acquisition of two other major businesses. Alternative 2D will displace one business and will cause the partial acquisition of two other major businesses.

6.3 Group 3 Alternatives

6.3.1 Traffic Safety, Operations, and Circulation

The Group 3 Alternatives provide the most direct benefits to traffic operations on SR 131. Alternative 3A especially, improves traffic flow by adding both through lanes and critical turn lanes to SR 131. The results of these additions are demonstrated by the improved 2003 and 2020 levels of service at the SR 131 / Greentree Boulevard and SR 131 River Falls Mall Drive intersections. The improvements raise the levels of service for both intersections to above the minimum threshold in 2020.

Alternative 3B offers moderate improvements, but cannot address the need for additional through capacity on SR 131, which is provided by Alternative 3A. Implementation of Alternative 3B results in a minor level of service improvement at the Greentree Boulevard / SR 131 intersection in 2003, but the 2020 levels of service are essentially the same as the 2020 no-build scenario.

Alternative 3C offers little appreciable improvement over the PM peak period no-build scenario in 2020. However, this dynamic timing alternative may offer benefits during "off-peak" times such as weekends, holidays, and midday periods when travel patterns may not match the signal timing programs currently in operation. Therefore, it could be considered as part of other improvement efforts.

The Group 3 Alternatives do not enhance local access and circulation in the southern portion of the study area. They do not decrease traffic volumes on Applegate Lane or address the safety concerns on that roadway. (In fact the Applegate Lane / Kopp Lane intersection falls to LOS E, as it does in the no-build scenario, and will require some form of improvements in 2020 simply due to the increase in the background traffic.)

6.3.2 Land Use and Development

The Group 3 Alternatives (especially Alternative 3A) provide improved regional access into the area but do not directly promote circulation within the southern portion of the study area for future development. They are therefore part of the larger access picture but do not meet the local access needs. The Group 3 Alternatives do affect local land uses in that they support the commercial nature of the northern portion of the study area and potentially the expansion of that development to the south.

6.3.3 Environment and Community

The Group 3 Alternatives are intended to remain as far as possible within the existing SR 131 right-of-way. It is not expected that they will impact any currently known environmentally sensitive sites. They may however, cross or come near potentially contaminated parcels. If such sites were discovered, they would require further study and possibly remediation.

Regarding community impacts, all of the alternatives would be designed to minimize impacts to commercial properties in the corridor. Property acquisition would be limited to partial or sliver acquisitions as much as possible.

7.0 ALTERNATIVES EVALUATION

7.1 Evaluation Criteria

The proposed alternatives have been compared and evaluated using seven evaluation criteria. The first four criteria relate to the need for the project, while the remaining three address project implementation, impacts, and cost. The seven criteria are:

- Safety
- Traffic Operations (Applegate and Kopp Lanes)
- Traffic Operations (SR 131)
- Development Opportunities
- Environmental and Community Impacts
- Project Cost

7.2 Comparison of the Alternatives

Safety

All nine of the improvement alternatives offer safety benefits, however, they improve safety in different ways and locations. Alternatives 1A and 1B directly address safety on Applegate Lane and on a portion of Kopp Lane by widening those roadways. Alternative 1B leaves a short segment of Applegate Lane unimproved, but converts it to a low volume residential street.

Alternatives 2A, 2B, and 2C improve safety by providing a new parallel arterial to draw traffic, especially truck and bus traffic from Applegate Lane. Alternatives 2A and 2B also improve a segment of Kopp Lane. Alternative 2C provides two connections to Kopp Lane and another to Applegate Lane to draw traffic. Alternative 2D provides a new parallel facility as well but it would likely draw fewer vehicles from Applegate Lane because it connects further north on Kopp Lane. With a wider right-of-way, all of these alternatives offer a greater potential for continuous sidewalks. None of the Group 1 or 2 Alternatives addresses safety on SR 131.

Alternative 3A improves safety on SR 131 by widening and reconstructing the roadway. The shoulders, medians, and travel lanes would all be restored to a good condition. Alternative 3B would make these improvements at the major intersections only. Alternative 3C is less likely to have a significant affect on roadway safety. None of the Group 3 Alternatives affect safety on Applegate Lane or Kopp Lane.

Traffic Operations (Applegate Lane, Kopp Lane and SR 131)

The Group 1 Alternatives improve traffic operations on Applegate Lane and Kopp Lane. They also making minor improvements to operations in the SR 131 corridor by drawing some traffic from SR 131 to use the new slip ramp.

Alternatives 2A, 2B, and 2C also improve operations on Applegate Lane and Kopp Lane. However, they shift additional traffic from SR 131 in comparison to the Group 1 Alternatives, further improving operations in the SR 131 corridor. Alternative 2D does not offer the same level of improvement to traffic operations on Applegate Lane, but it does draw some traffic from SR 131.

The Group 3 Alternatives address traffic operations on SR 131 only. Alternative 3A offers the most benefit and Alternative 3C the least.

Development Opportunities

Alternatives 2A, 2B, and 2C offer the best opportunities for future development in the southern portion of study area. They provide good access, do not divide the large development parcels, and provide sufficient right-of-way for future expansion. Alternative 3C requires a Connecting Roadway to give access to the slip ramp. The Connecting Roadway does divide a small portion of the future development area.

Alternative 1A also offers good opportunities for future development. However, it does not provide a direct new connection to SR 131 away from all residential development. Alternative 1B is limited in terms of future development because it continues to serve existing residential development and does not provide direct access to the major development area. Alternative 2D divides the major development area.

The Group 3 Alternatives do not provide the necessary local access for new development in the southern portion of the study area. Alternative 3A (and potentially 3B) would however improve general access to the northern edge of the study area.

Environmental and Community Impacts

None of the alternatives considered in this study are expected to have significant environmental impacts.

Of the Group 1 and 2 Alternatives, Alternatives 2C and 2D will have the least affect upon existing development because they will not require relocating Kopp Lane. Alternative 1B will have substantial impacts upon the residential development in the area, as well as business impacts. Alternative 1A will have less impact upon the residential development than 1B. Alternatives 2A and 2B require business property acquisitions, relocations, and disruptions of a magnitude similar to 1A.

Of the Group 3 Alternatives, 3A will have the most impact (including maintenance of traffic issues) and 3C the least.

Project Cost

The order of magnitude project construction and right-of-way costs for each alternative have been estimated. Based on the total cost estimates, Alternatives 1A, 1B, and 2D are all in the same cost range, $6.9 million to $7.8 million and Alternatives 2A, 2B, and 2C are between $8.6 million and $9.2 million. However, it is important to note that the construction cost estimates for all of the Group 2 Alternatives (excluding right-of-way) are less than the construction cost estimates for the Group 1 Alternatives. In fact, Alternative 2D is the least expansive to construct at $2.8 million, followed by Alternative 2A at $3.6 million. The remaining Group 1 and 2 Alternatives range from $4.0 to $4.6 million.

7.3 Comparison Results

To facilitate the comparison and ranking of the alternatives a score has been assigned to each alternative for each evaluation criteria (1-poor, 2-good and 3-excellent). Table 7 shows the scores given to each alternative for each criterion. The scores are directly related to the discussion above. The scoring process was used to quantify the evaluation and comparison process.

A simple 1 to 3 weighting was also given to each criteria to capture the fact that some of the criteria are more critical than others (1 - less important, 2 – important, 3 - more important). Consistent with the study purpose and the project need, Safety, Traffic Operations on Applegate Lane, and Development Opportunities in the southern portion of the study area were all weighted as “more important”. Traffic Operations on SR 131, and Environmental and Community Impacts were weighted as important. Costs were weighted as less important, due in part to uncertainty regarding how right-of-way acquisition will be handled.

It is important to note that while a weighted matrix was used for reference in the analysis this evaluation method is only a tool. The results are intended to “screen out” projects that do not meet the project purpose and need or have significant feasibility concerns. The final conclusions are based on a review of the data and analysis results, backed by planning and engineering judgment.

The weighted scores are summed for each alternative in Table 7, giving an approximate rank order listing of the improvements. Alternatives 2A and 2B have the highest overall score (38), followed by Alternative 2C (37). Alternatives 2A and 2B are very similar and address the same project needs. Alternatives 2A and 2B score higher in the Development Opportunities category than 2C, but lower in Environmental and Community Impacts. Alternative 1A was ranked fourth (34), scoring lower in Development Opportunities and SR 131 Traffic Operations than the top two alternatives. Alternatives 1B and 2D score low in key areas and therefore are ranked lower than the other Group 1 and 2 Alternatives.

Table 7
Alternatives Comparison Summary

Alternative	Safety	Traffic Operations (Applegate / Kopp)	Traffic Operations (SR 131)	Development Opportunities	Environment / Community Impacts	Cost	**Total Score (Weighted)**
Weighting	*3*	*3*	*2*	*3*	*2*	*1*	
1A	3	3	2	2	2	2	**34**
1B	3	3	2	1	1	2	**29**
2A	3	3	3	3	2	1	**38**
2B	3	3	3	3	2	1	**38**
2C	3	3	3	2	3	1	**37**
2D	1	1	2	1	3	2	**21**
3A	3	1	3	2	1	2	**28**
3B	2	1	2	1	2	2	**22**
3C	1	1	1	1	3	3	**20**

The Group 3 Alternatives are directed to issues on SR 131 and therefore do not score as high as the Group 1 and 2 Alternatives in key categories. Of the Group 3 Alternatives, Alternative 3A has the highest ranking (28). Alternative 3B ranked much lower (22) due to the fact that it does not improve the future levels of service at the study intersections or increase through capacity on SR 131. This increase in through capacity will become more of an issue as traffic in the corridor continues to grow.

Therefore, based on this comparative analysis, Alternatives 2A and 2B are recommended for further study. They both adequately address the project purpose and need. Alternative 2C could also be considered further as it ranked close to 2A and 2B and also meet the project purpose and need. Alternative 1A was ranked highest of the Group 1 Alternatives. It generally met the project purpose and need, and could also be studied further if an Applegate Lane alternative was to be evaluated in more detail.

In addition, Alternative 3A is recommended for further study relative to issues on SR 131. While Alternative 3A does not meet the specific project needs in the southern portion of the study area as well as the recommended alternatives, it does address critical needs on SR 131. The traffic analysis reveals that traffic capacity and levels of service on SR 131 will continue to be major issues. Alternative 3A addresses these issues directly.

8.0 CONCLUSIONS

Based on this analysis, a number of transportation deficiencies have been identified including:

- Safety and design deficiencies on Applegate Lane
- Safety and design deficiencies on Kopp Lane
- Poor access and circulation in the southern portion of the study area
- Poor traffic operating conditions on SR 131

Based on the comparison of the proposed alternatives, Alternatives 2A and 2B are recommended for further study as they best meet the stated project purpose and need. They are both simple alignments, providing safety, traffic, and future development benefits. Alternative 2C could also be considered for further more detailed evaluation as it offers the advantage of fewer impacts to existing properties, but is not quite as effective in supporting future development as 2A and 2B. Alternative 1A, as the most promising of the Group 1 Alternatives, could also be studied further if an Applegate Lane alternative was to be evaluated in more detail.

Alternative 3A is also recommended for further study in relation to the specific traffic flow issues on SR 131. As shown by the projected future levels of service, traffic operations and capacity on SR 131 will play an increasingly important role in access to both existing and future development throughout the SR 131 corridor.

It is important to note that the various alternatives included in this study are not mutually exclusive. In fact, it would be possible to combine aspects of the proposed alternatives, as well as aspects of the alternatives considered but not studied in detail, to meet the stated purpose and need.

The next steps in pursuing implementation of one of these alternatives are to identify potential funding sources and complete more detailed planning, engineering, and environmental analyses for the recommended alternatives. Another very important step in the process is to determine how right-of-way acquisition will be handled. Right-of-way has the potential to be the largest cost of the project and could be a fatal flaw if sufficient funds are not available for obtaining the right-of-way. INDOT concurrence with the proposed project is another critical step in the process.

9.0 BIBLIOGRAPY

Clark County Zoning Ordinance, Clark County, Indiana, www.co.clark.in.us/zoningord.html, June 14, 2001

Comprehensive Plan for Clarksville, Indiana "A Plan for Guided Growth and Redevelopment", August 1992.

I-65 from the Ohio River to SR 311 Clark County, Indiana, Final Environmental Impact Statement, U.S. Department of Transportation Federal Highway Administration and Indiana Department of Transportation, September 14, 1995.

I-65 Study Final Report, Ohio River to SR 311 Project #STI-65-1 (L), Indiana Department of Transportation, The Corradino Group, August 1995.

I-65 Study, From Ohio River to SR 311, Traffic Volume Supplement – 2015, The Corradino Group, October 1995.

Indiana Department of Transportation, Design Manual, July 1994.

Indiana Historic Sites and Structures Inventory, Clark County Interim Report, Historic Landmarks Foundation of Indiana, October 1988.

Zoning Ordinance, Town of Clarksville, Indiana, February 8, 1993 (and as amended).