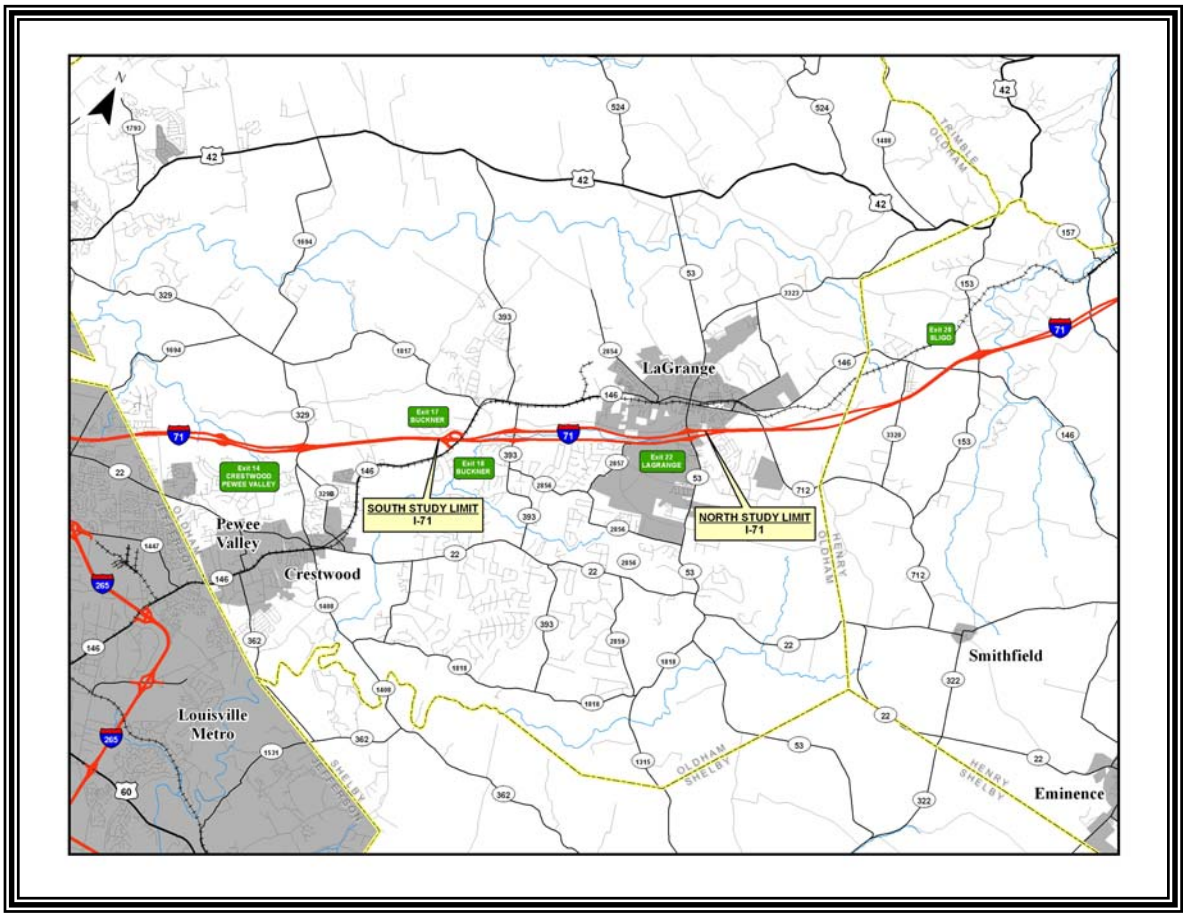
I-71 / Proposed Overpass Interchange

FEASIBILITY STUDY

I-71 between KY 393 (Exit 18) and KY 53 (Exit 22)
Oldham County, Kentucky
Item No.: 05-8201.00

Final Report

November 2008



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EXECUTIVE SUMMARY

The I-71 Interchange Feasibility Study in Oldham County was prepared to assist the Kentucky Transportation Cabinet (KYTC) in evaluating the feasibility of constructing an interchange on I-71 at a proposed overpass (MP 20.6) between KY 393 (Exit 18) and KY 53 (Exit 22). A project study team approach was used, consisting of representatives from the KYTC Central Office, KYTC District 5, the Kentuckiana Regional Planning and Development Agency (KIPDA), Oldham County Planning, Oldham County Economic Development Authority (OCEDA), and Qk4.

The project area is the I-71 corridor between KY 146 (Exit 17) and KY 53 (Exit 22) in Oldham County, Kentucky.

No improvements are included in KIPDA's Transportation Improvement Program (TIP) or Horizon 2030 Long-Range Transportation Plan, and the project is not in KYTC's current Highway Plan.

Figure 1 – Project Area

Project Purpose

The existing conditions and constraints were identified through discussions with the Project Team.

The purpose of the project is to alleviate future congestion in this area of Oldham County and provide better access to OCEDA's Oldham Reserve Development south of I-71 and west of KY 53.

Alternatives

The following alternatives for the interchange configuration were evaluated, including the combined costs for design, right-of-way acquisition, utility relocation, and construction for the build alternatives:

- Do Nothing.
- Traffic System Management (TSM) improvements and Spot Improvements.
- Alternative 1 – construct a Standard Diamond interchange at the new overpass location.
- Alternative 2 – construct a Collector – Distributor system with the KY 53 interchange.
- Alternative 3 – improve the existing roadways in the area (i.e. no interchange). The roads would be Commerce Parkway, Allen Lane and New Moody Lane.

- Alternative 4 – construct a new road between KY 393 and New Moody Lane south of I-71 (i.e. no interchange).

The following table shows the benefits to I-71 and the project area roads:

		Traffic Volumes					
Alternatives	I/C Spacing	KY 393↓	I-71↓	Allen Lane ↑	New Moody W ↑	New Moody E ↓	KY 53 ↓
Standard Diamond		✓	✓	✓	✓	✓	✓
C-D	✓	✓	✓	✓	✓	✓	✓
Existing Roads	✓	✓		✓	✓		
New Road	✓	✓		✓	✓		✓

Key: I/C Spacing – Alternative meets or exceeds current AASHTO criteria.
↓ - A decrease in traffic volume on the road would be a benefit.
↑ - An increase in traffic volume on the road would be a benefit.

Conclusion

After a careful review and consideration of the existing conditions, the cost and benefits, and constraints of the build alternatives, the Project Team acknowledges that an interchange at the proposed overpass alleviates future traffic congestion in this area of Oldham County and best serves the purpose and need. The reasons to advance an interchange are as follows:

- Improving the existing roads or adding a new road does not improve KY 53 as much as an interchange.
- The cost of constructing an interchange is less than other alternatives because of Right-of-Way costs.

Advancing an alternative will require further detailed design and analysis, including a full Interchange Justification Study (IJS); National Environmental Policy Act (NEPA) analysis and documentation; preliminary detail engineering and design; and public involvement before approval by Federal Highway Administration (FHWA).

1.0 INTRODUCTION

1.1 Purpose of the Study

The purpose of this feasibility study is to assist the Kentucky Transportation Cabinet (KYTC) in evaluating the feasibility of providing a new interchange on I-71 in Oldham County. The study examines possible alternatives, including two interchange configurations at a proposed overpass location (see Figure 1).

Figure 1 – Project Area

1.2 Project Background

The Kentucky Transportation Cabinet's Six Year Highway Plan (FY 2007 – 2012) established the overpass project:

OLDHAM COUNTY

Item No. & Parent No.		Description	Funding	Phase	Year	Amount
2006	05-8201.01	Construct new I-71 overpass with	SP	D	2007	$2,000,000
		approaches from Commerce Pky to	SP	R	2008	$1,000,000
		Peak Road. (06CCR)	SP	U	2008	$1,000,000
			SP	C	2008	$11,000,000
					Total	$15,000,000

The overpass establishes connectivity in LaGrange across I-71. The overpass will carry a four lane typical section with a raised 12 ft. median barrier and 9 ft. combined use paths on both sides.

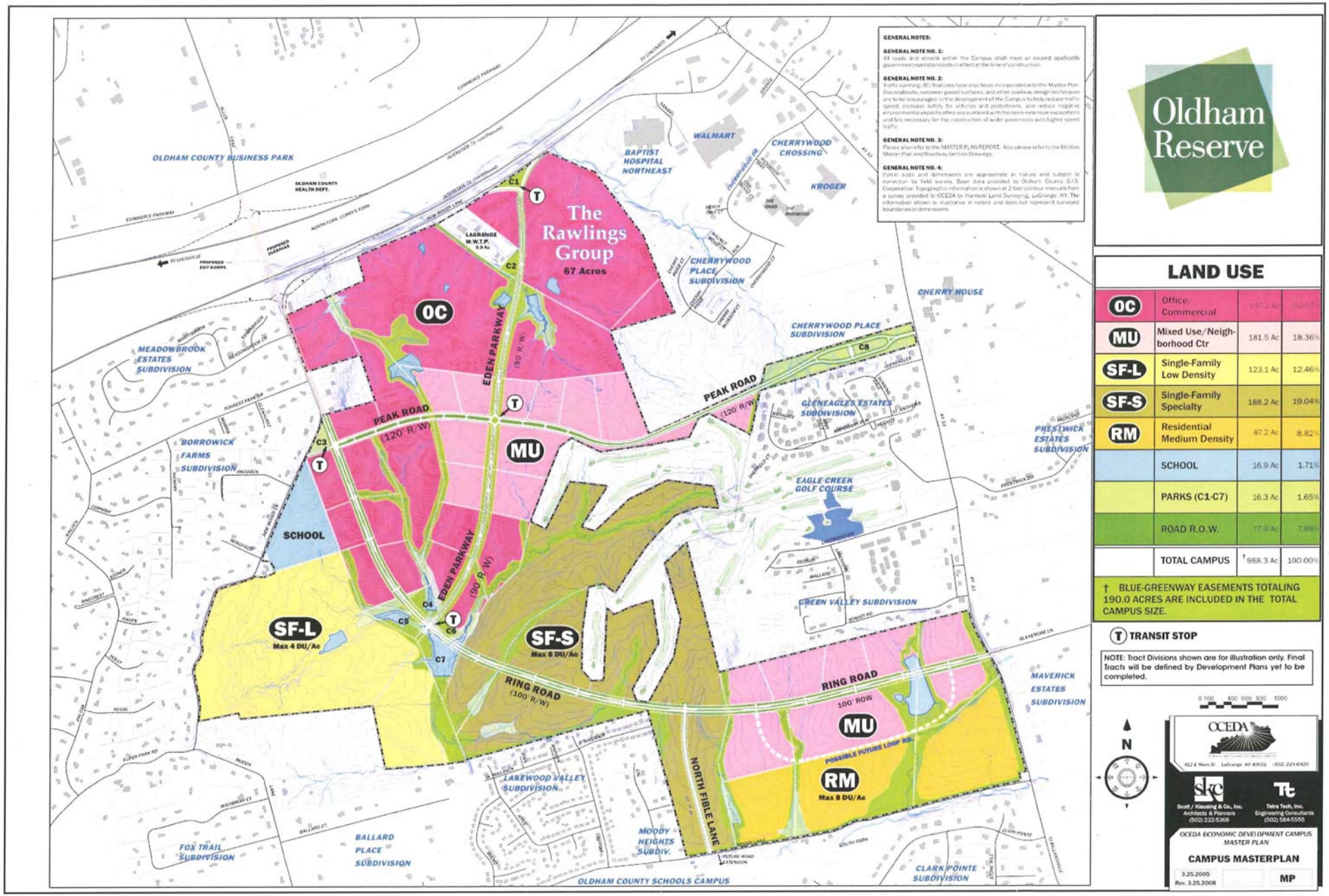
The Oldham County Economic Development Authority (OCEDA) is developing a nearly 1,000 acre mixed use campus to the south of I-71, east of the overpass and west of KY 53 (see exhibit on the next page). OCEDA has asked the KYTC to study improved access opportunities to this development.

1.3 Project Purpose and Need

The purpose of the project is to alleviate traffic congestion in the project area, specifically on KY 53.

The need for the project is supported by the following facts:

- High accident rates occur along KY 53 and I-71 in the vicinity KY 53 interchange (Exit 22) area.
- Current level of Service (LOS) in the project area is C or worse on all of the major roads in the project area. Design year LOS analysis shows a majority of the roads at unacceptable conditions (D, E, F).
- Traffic backups occur frequently on the KY 53 northbound exit ramp.
- Improved access is needed to Oldham Reserve.


GENERAL NOTES:
GENERAL NOTE NO. 1:
All roads and streets within the Campus shall meet or exceed applicable government road standards in effect at the time of construction.
GENERAL NOTE NO. 2:
Traffic calming / EC features have also been incorporated into the Master Plan. Roundabouts, narrower paved surfaces, and other roadway design techniques are to be encouraged in the development of the Campus to help reduce traffic speed, increase safety for vehicles and pedestrians, and reduce negative environmental impacts often encountered with the more extensive excavations and fills necessary for the construction of wider pavements with higher speed traffic.
GENERAL NOTE NO. 3:
Please also refer to the MASTER PLAN REPORT. Also please refer to the Utilities Master Plan and Roadway Section Drawings.
GENERAL NOTE NO. 4:
Parcel sizes and dimensions are approximate in nature and subject to correction by field survey. Base data provided by Oldham County GIS Cooperative. Topographic information is shown at 2 foot contour intervals from a survey provided to OCEDA by Harrison Land Surveying, LaGrange, KY. The information shown is illustrative in nature and does not represent surveyed boundaries or dimensions.
Oldham Reserve
LAND USE
OC Office/ Commercial 297.2 Ac 30.07
MU Mixed Use/Neighborhood Ctr 181.5 Ac 18.36%
SF-L Single-Family Low Density 123.1 Ac 12.46%
SF-S Single-Family Specialty 188.2 Ac 19.04%
RM Residential Medium Density 87.2 Ac 8.82%
SCHOOL 16.9 Ac 1.71%
PARKS (C1-C7) 16.3 Ac 1.65%
ROAD R.O.W. 77.9 Ac 7.88%
TOTAL CAMPUS †988.3 Ac 100.00%
† BLUE-GREENWAY EASEMENTS TOTALING 190.0 ACRES ARE INCLUDED IN THE TOTAL CAMPUS SIZE.
T TRANSIT STOP
NOTE: Tract Divisions shown are for illustration only. Final Tracts will be defined by Development Plans yet to be completed.
0 100 400 600 800 1000
N
OCEDA
Scott / Klausing & Co., Inc. Architects & Planners (502) 222-5366
Tetra Tech, Inc. Engineering Consultants (502) 584-5555
OCEDA ECONOMIC DEVELOPMENT CAMPUS MASTER PLAN
CAMPUS MASTERPLAN
3.25.2005
Rev. 3.25.2008
MP
The Rawlings Group
67 Acres
OC
MU
SF-L
Max 4 DU/Ac
SF-S
Max 6 DU/Ac
RM
Max 8 DU/Ac
SCHOOL
OLDHAM COUNTY BUSINESS PARK
OLDHAM COUNTY HEALTH DEPT.
COMMERCE PARKWAY
INTERSTATE 71 (northbound)
INTERSTATE 71 (southbound)
TO CINCINNATI
TO LOUISVILLE
PROPOSED OVERPASS
PROPOSED EXIT RAMPS
LAGRANGE W.W.T.P. 9.9 Ac
BAPTIST HOSPITAL NORTHEAST
WALMART
CHERRYWOOD CROSSING
KROGER
CHERRYWOOD PLACE SUBDIVISION
CHERRY HOUSE
MEADOWBROOK ESTATES SUBDIVISION
BORROWICK FARMS SUBDIVISION
EDEN PARKWAY (90' R/W)
PEAK ROAD (120' R/W)
GLENEAGLES ESTATES SUBDIVISION
PRESTWICK ESTATES SUBDIVISION
EAGLE CREEK GOLF COURSE
GREEN VALLEY SUBDIVISION
RING ROAD (100' R/W)
RING ROAD 100' ROW
POSSIBLE FUTURE LOOP RD.
MAVERICK ESTATES SUBDIVISION
NORTH FIBLE LANE
LAKEWOOD VALLEY SUBDIVISION
MOODY HEIGHTS SUBDIV.
FOX TRAIL SUBDIVISION
BALLARD PLACE SUBDIVISION
CLARK POINTE SUBDIVISION
OLDHAM COUNTY SCHOOLS CAMPUS
C1
C2
C3
C4
C5
C6
C7
C8

2.0 EXISTING CONDITIONS

2.1 Project Location

The project is located in east central Oldham County, Kentucky near the city of LaGrange. The project area centers on a proposed overpass of I-71 at mile point 20.6. The I-71 corridor has the following adjacent interchanges:

- Exit 17 (KY 146) - Buckner
- Exit 18 (KY 393) - Buckner
- Exit 22 (KY 53) – LaGrange and Ballardsville

The local roads of Commerce Parkway to the north and New Moody Lane to the south will be connected by the proposed overpass. Allen Lane is the local road between Commerce Parkway and KY 146 that connects the overpass to the north (see Figure 1, *Project Area on Page 3*).

2.2 Roadway Characteristics

The number of lanes and functional classification of the major roadways in the project area is as follows:

- I-71: Urban Interstate; four lanes throughout the project area.
- KY 146: Rural Minor Arterial; two lanes from I-71 to KY 53.
- KY 393: Rural Minor Arterial; newly constructed to three lanes south of I-71 (widening to three lanes north of I-71 is planned).
- KY 53: Urban Principle Arterial; five lanes south of I-71, and four lanes north of I-71.
- Commerce Parkway: Local two lane road north of I-71 between KY 393 and KY 53.
- New Moody Lane: Local two lane road south of I-71 from overpass location to KY 53.

2.3 Traffic Conditions

The following paragraphs provide summaries of traffic information. The traffic analysis was prepared by Qk4 for a base year of 2015 and a horizon year of 2035. Existing traffic volumes (year 2008) were obtained from the KYTC Highway Information System (HIS) database. Future year build and no-build traffic volumes were predicted using a travel demand model developed by Wilbur Smith for the Oldham County Economic Development Campus Traffic Impact Study, which included the proposed overpass.

A traffic volume/roadway capacity analysis was performed for this project, using existing and future year modeled traffic volumes.

- Interstate 71 currently has traffic volumes averaging 59,900 vehicles per day (vpd) in the project area, which are projected to increase to 88,000 vpd by the year 2035 (see *No Build Traffic Volumes and Level of Service*, in Appendix B). It should be noted that there

are currently no plans in either the KYTC's Highway Plan or KIPDA's Long Range Plan to add any additional lanes to I-71.

- KY 53 currently has traffic volumes averaging 17,300 vpd south of I-71 and 15,200 vpd north of I-71. Traffic volumes are projected to increase to 24,600 vpd south of I-71 and 42,300 vpd north of I-71 by the year 2035. Currently KIPDA lists several projects in their Long Range Plan concerning KY 53. These projects include widening both north and south of I-71 combined with an access management study to improve traffic flow and congestion.

- KY 146 currently has traffic volumes averaging 12,400 vpd. Traffic volumes are projected to increase to 25,900 vpd by the year 2035. Currently KIPDA has projects listed in their Long Range Plan to widen KY 146 to four lanes throughout most of the study area.

- KY 393 currently has traffic volumes averaging 7,720 vpd in the project area, which are projected to increase to 19,800 vpd by the year 2035. Currently KIPDA has projects listed in their Long Range Plan to widen KY 393 to three lanes throughout most of the study area.

2.4 Level of Service

"Level of service" is defined as a qualitative measure of operational conditions, and the motorists' perception of those conditions. The conditions are usually defined in terms such as speed, travel time, maneuverability, delay, and comfort and convenience. The letters "A" through "F" designate the six levels of service. LOS A represents the best operating conditions (*i.e.*, free flow conditions), while LOS F defines the worst (*i.e.*, severe congestion). According to the national standards, the lower levels of service (*i.e.*, D, E, and F) are unacceptable for safe and efficient operation. The lower levels generally involve unstable traffic flows, and drivers have little freedom to maneuver.

The LOS analysis performed on study area roadways indicates the 2008 LOS ranges from B to D (see Table 1, *Level of Service Comparison*, page 8). By the year 2035, LOS is predicted to generally decrease, resulting in a range from C to F. The increasing traffic volume combined with a decreasing level of service will eventually cause regularly occurring peak hour congestion and its associated delays in accessing businesses, along with increased driver frustration and the likelihood for higher crash rates.

Typically, LOS D is considered the minimum acceptable in urban areas. LOS E and F are, therefore highlighted yellow and orange, respectively.

Table 1 2008, 2015 and 2035 Traffic Conditions

Route	From	To	2008 Existing		2015 No-Build		2035 No-Build	
I-71	West	KY 146	59900	D	69400	E	88000	F
I-71	KY 146	KY 393	58200	D	62600	D	75800	E
I-71	KY 393	KY 53	57400	D	60500	D	69400	E
I-71	KY 53	East	38600	C	44600	C	58800	D
KY 146	West	I-71	8810	C	19200	F	25900	F
KY 146	I-71	KY1817	12100	C	16200	D	24900	F
KY 146	KY 1817	KY 393	12400	C	12400	C	21200	F
KY 146	KY 393	KY 393	11600	C	12100	C	21600	F
KY 146	KY 393	KY 2854	8130	C	6400	C	11200	C
KY 146	KY 2854	KY 53	9570	C	7200	C	10700	C
KY 146	KY 53	East	5740	C	3100	B	6300	C
KY 393	South	KY 2856	5250	C	12100	C	16100	D
KY 393	KY 2856	I-71	6710	C	14300	D	19800	F
KY 393	I-71	KY 146	7720	C	9100	C	18800	F
KY 393	KY 146	North	4060	B	5200	C	12300	C
KY 53	South	KY 2856	6350	C	7600	C	23200	F
KY 53	KY 2856	Connector	9030	C	12000	C	25200	F
KY 53	Connector	I-71	17300	C	14400	C	24600	C
KY 53	I-71	KY 146	15200	C	33000	E	42300	F
KY 53	KY 146	North	9200	C	18700	C	28000	D

2.5 Existing Interchange Geometry

The following table shows that the existing interchanges in the study area meet AASHTO criteria for acceleration and deceleration lengths in every case except the northbound entrance ramp at Exit 17 (KY 146).

Table 2 Existing Interchange Geometry

Ramps	Exit Ramp Storage Length	Deceleration Actual (Recommended)	Acceleration Actual (Recommended)
Exit 17 NB	1800 ft.	520 (340)	300 (1230)**
Exit 17 SB	2350 ft.	560 (550)	600 (580)
Exit 18 NB	2005 ft.	730 (340)	750 (580)
Exit 18 SB	1760 ft.	700 (340)	*2000 (580)
Exit 22 NB	1500 ft.	540 (340)	800 (580)
Exit 22 SB	1317 ft.	560 (340)	800 (580)
*Parallel Type			
**Substandard (3 crashes, 6800 ADT)			

2.6 Crash Analysis

Safety along the major roadways in the project study area was analyzed using accident report data in a crash analysis. A crash analysis is a mathematical tool for finding roadway sections with abnormally high crash rates and, therefore, sections with potentially correctable hazards to traffic safety. Historical

crash data from the three-year period January 2005 – December 2007 was used to identify roadway sections with abnormally high crash rates. The traffic crash analysis indicates five roadway sections in the project study area are experiencing high crash rates. Table 3, *Crash Analysis Summary*, lists the high crash locations for the project area. When the critical rate factor (CRF) is higher than 1.0, statistically the rate of crashes is higher than normal as compared to other roads with the same functional classification and traffic volumes. The complete analysis is shown in Appendix A.

Table 3 Crash Analysis Summary

Route	Begin Milepoint	End Milepoint	Location Description	CRF
KY-53	5	5.685	South of Gleneagles Way to Zhale Smith Rd	1.0-1.5
KY-53	6.296	7.055	I-71 Overpass to KY 146	1.5-2.5
KY-53	5.685	6.296	Zhale Smith Road to I-71 Overpass	2.5-3.0
KY-146	6.829	7.419	KY 1817 to KY 393 North	1.0-1.5
I-71	21.65	22.15	South and North of the KY 53 Underpass	1.0-1.5

3.0 PROJECT TEAM INPUT

3.1 Project Team Meetings

The I-71 Interchange study project team met three times: 1) prior to the initiation of this study; 2) to review alternatives and; 3) to make a recommendation. The meetings were documented with meeting minutes. A brief summary of the major topics discussed at each meeting follows:

- PTM #1 Kickoff Meeting Summary (March 10, 2008)
    - Evaluation Options
    - Existing Conditions
    - Proposed Projects
    - Crash History
    - Traffic Data
    - Constraints

- PTM #2 Summary (Review of Alternatives) (August 8, 2008)
    - Traffic analysis review of each alternative including volume, LOS, merge, diverge and weave
    - Preliminary interchange layouts
        - Standard diamond
        - Collector – Distributor
    - Interchange layouts eliminated from detailed study
        - Single Point Urban
        - Split Diamond

- Discussion
    - Show benefits of alternatives
    - Document assumptions made
    - Study I-71 widening
    - Study improvements to existing KY 53 interchange
    - Check AASHTO criteria met at existing interchanges

- PTM #3 Summary (Review Alts. / Make Recommendation) (August 29, 2008)
    - Oldham County provided the most recent plan for the Oldham Reserve
    - Determine when the interstate needs to be widened after the interchange is constructed
    - I-71 LOS's go from E & F (4 lanes) to C & D (6 lanes)
    - Identify projects (I-71 Widening) that need to be done with or without a new interchange.
    - Other improvement concepts discussed:
        - ½ Interchange – originally eliminated at the Kickoff Meeting (PTM #1)
        - Parallel route south of I-71 – construction of a new road between KY 393 and New Moody

- FHWA will review the report, make comments and decide whether to grant Engineering and Operational approval pending completed IJS.

The above meetings were documented with minutes (see Appendix I).

3.2 Constraint Identification

- Commerce Parkway – Possible Relocation
- Meadowbrook Subdivision
- New Moody Lane
- Widening of I-71 to Inside (Currys Fork)
- Spacing with LaGrange Exit
- LaGrange Treatment Plant
- Business on east side of Commerce Parkway
- Major utilities crossing the Study Area (gas, power)
- Proposed bike and pedestrian facility on north side of Commerce Parkway

4.0 STUDY ALTERNATIVES CONSIDERED

4.1 Transportation System Management

Transportation System Management (TSM) involves relatively low-cost improvements, but effective in nature, that can be quickly implemented through roadway maintenance activities. TSM improvements generally refer to such things as signing at critical locations, traffic signals at intersections, lighting, and simple roadway improvements such as pavement striping, removing vegetation to improve visibility, or improving the radius of a street corner. No TSM options are found to be sufficient to significantly improve the interstate connectivity in the study area. However, because of limited access management on KY 53 (Oldham County is striving to improve), TSM improvements, such as signal timing adjustments, should be investigated as possible short-term safety projects.

4.2 Spot Improvements

- The only spot improvement identified that could be implemented to improve traffic flow and safety is the installation of dual left turn lanes on the NB Exit Ramp from I-71 to KY 53. The construction cost is estimated to be less than $250,000.

4.3 Independent System Improvements

The following projects have been identified as recommended improvements in the area:

- I-71, Six Lanes – Current ADT's on I-71 are between 57,400 and 59,900. Assuming a 10% K Factor, a 65/35 D Factor and that interstate capacity is 2200 vph per lane, I-71 would need to be 3 lanes in 2009 south of KY 146; in 2013 between KY 146 and KY 393 and in 2015 between KY 393 and KY 53. An estimated cost for this improvement is as follows:

Construction	$31,500,000
R/W	100,000
Utility	100,000
Engineering	300,000
Total	$34,700,000

- Two Lane Exit Ramp to KY 53 (I-71 NB to KY 53) – Current ADT on the ramp is 13,400. The projected No-Build ADT's for 2015 and 2035 are 16,600 and 20,100 respectively. Assuming a 10% K Factor and that ramp capacity is 1,800 for speeds less than 20 mph (i.e. ramp backs up) the ramp would need to be two lanes in 2023. If a Standard Diamond interchange at the new overpass location is constructed, however, the traffic model shows that a one lane ramp is sufficient.

Construction	*$1,000,000
R/W	100,000
Utility	100,000
Engineering	100,000
Total	$1,300,000

*Cost includes dual left turn lanes at KY 53.

- KY 53 – widening KY 53 through the interchange to accommodate three lanes in each direction and left turn lanes would produce operation at a low LOS D (borderline LOS E). With the heavy turn movements at some of the existing intersections, it would actually

operate much worse than this, as current traffic (15,200) is less than half of the projected volume (42,300) and there are concerns now.

Construction	$3,500,000
R/W	1,000,000
Utility	1,000,000
Engineering	400,000
Total	$5,900,000

4.4 Design Alternatives

A do-nothing and four build alternatives were evaluated for this Feasibility Study. The five alternatives are described below. The cost estimates are in 2008 dollars.

Do Nothing Alternative. The Do Nothing Alternative involves only routine roadway maintenance. No action will be taken to construct an interchange or improve existing roads. This option will be referred to as appropriate for baseline comparisons throughout the decision making process (see Appendix C).

Alternative 1 – Construct a Standard Diamond interchange at the overpass location. Appendix D shows a preliminary sign layout. New Moody Lane is relocated to opposite the entrance to Meadowbrook Subdivision to meet access control requirements (>300 ft.). The ramp lengths, acceleration and deceleration lengths meet AASHTO criteria. The spacing between this location, which would be Exit 20 (overpass at MP 20.6) and the KY 53 interchange (Exit 22) is not as desirable as Alternative 2 (C-D). The desirable distance is 3 miles due to the rural character of the project area. This alternative improves emergency access to the hospital in LaGrange. The cost estimate is as follows:

Construction	$4,900,000
Right of Way	1,000,000
Utilities	350,000
Engineering	500,000
TOTAL	$6,650,000

Alternative 2 - Construct a one lane Collector-Distributor system from south of the overpass location to north of KY 53. Appendix E shows a preliminary sign layout. New Moody Lane is relocated to opposite the entrance to Meadowbrook Subdivision to meet access control requirements (>300 ft.). The ramp lengths, acceleration and deceleration lengths meet AASHTO criteria. There is not a spacing problem, since the interchanges are combined. Existing Exit 22 becomes Exit 20B. This alternative improves emergency access to the hospital in LaGrange. The cost estimate is a follows:

Construction	$22,600,000
Right of Way	3,000,000
Utilities	500,000
Engineering	2,300,000
TOTAL	$28,400,000

Alternative 3 – Improve the existing roads in the project area (i.e. no interchange at the overpass). Widening of Commerce Parkway, Allen Lane and New Moody Lane to 2 lanes in each direction between KY 393 and KY 53 is an alternative to constructing an interchange. Vehicles would use the KY 393 interchange (Exit 18) to access Oldham Reserve and downtown LaGrange. The cost estimates are as follows:

Commerce Parkway

Construction	$11,800,000
Right of Way	1,500,000
Utilities	500,000
Engineering	1,200,000
TOTAL	$15,000,000

Allen Lane

Construction	$3,500,000
Right of Way	250,000
Utilities	100,000
Engineering	250,000
TOTAL	$3,100,000

New Moody Lane

Construction	$4,900,000
Right of Way	200,000
Utilities	500,000
Engineering	500,000
TOTAL	$6,100,000

TOTAL COST = $24,200,000

Note: See Appendix F for Traffic Volumes, LOS and Merge, Diverge and Weave Analysis.

Alternative 4 – construct a new road between KY 393 and New Moody Lane on the south side of I-71 (i.e. no interchange at the overpass). This alternative would require New Moody Lane to be widened also. Appendix G shows a preliminary layout of the proposed road. The major utilities identified as constraints and three subdivisions are impacted. The cost estimate is as follows:

Construction	$8,300,000
Right of Way	30,000,000
Utilities	2,000,000
Engineering	800,000
TOTAL	$41,100,000

4.4.1 Alternatives Eliminated from Detail Study

- Half Interchange – Eliminated at kickoff meeting (further discussed at PTM #3; IJS may choose to reconsider).
- Single Point Urban – Eliminated at kickoff meeting.
- Split Diamond – KY 53 intersection capacity LOS F.
- Flopped Diamond – R/W impacts.

4.5 Alternative Comparison

The following alternative comparison is focused on the increase or decrease in traffic volumes for the road network in the area (↑ signifies an increase; ↓ signifies a decrease).

KY 393 North of I-71 (Like to see a decrease on this segment.)		
	2015	2035
Diamond	↓ 1500	↓ 3100
C-D	↓ 400	↓ 2600
Existing Roads	↑ 2200	↑ 2700
New Road	↓ 2600	↓ 6400

I-71 between overpass and KY 53 (Like to see a decrease on this segment.)		
	2015	2035
Diamond	↓ 8700	↓ 4500
C-D	↓ 36100	↓ 17900
Existing Roads	↑ 2300	↑ 1500
New Road	↑ 1700	↑ 1800

Allen Lane (Like to see an increase of traffic.)		
	2015	2035
Diamond	↑ 4500	↑ 4500
C-D	↑ 3400	↑ 3700
Existing Roads	↑ 2700	↑ 900
New Road	↑ 3000	↑ 1800

Commerce Parkway (Like to see an increase between Allen Lane and downtown.)		
	2015	2035
Diamond	↑ 600	↑ 2400
C-D	↑ 900	↑ 4500
Existing Roads	↑ 1500	↑ 3000
New Road	↑ 200	↓ 3500

New Moody Lane West of Rawlings (Like to see an increase.)		
	2015	2035
Diamond	↑ 5900	↑ 4800
C-D	↑ 6200	↑ 4500
Existing Roads	↑ 1700	↑ 2900
New Road	↑ 2300	↑ 4800

New Moody Lane east of Rawlings (Like to see a decrease.)		
	2015	2035
Diamond	↓ 3500	No change
C-D	↓ 3300	↑ 400
Existing Roads	↑ 900	↓ 2000
New Road	↑ 2200	↓ 600

KY 53 North (Like to see a decrease in traffic using KY 146 or Commerce Parkway to get to downtown.)		
	2015	2035
Diamond	↓ 4600	↓ 1700
C-D	↓ 3500	↓ 4200
Existing Roads	↓ 2300	↑ 1500
New Road	↓ 4100	↓ 1100

KY 53 South (Like to see a decrease.)		
	2015	2035
Diamond	No change	↓ 5700
C-D	No change	↓ 5400
Existing Roads	↑ 3400	↓ 6500
New Road	↑ 7300	↓ 2500

The following table compares the projected ramp volumes in 2015 of an interchange at the overpass to the projected 2015 KY 393 interchange ramp volumes.

Ramp Volumes: New interchange vs KY 393			
	New	KY 393	Δ
NB off	5400	4500	+ 900
NB on	1100	3900	-2800
SB off	1100	1900	- 800
SB on	5200	3900	+1300

The following table shows the benefits to I-71 and the project area roads.

Table 4 Benefits Matrix

		Traffic Volumes					
Alternatives	I/C Spacing	KY 393↓	I-71↓	Allen Lane ↑	New Moody W ↑	New Moody E ↓	KY 53 ↓
Standard Diamond		✓	✓	✓	✓	✓	✓
C-D	✓	✓	✓	✓	✓	✓	✓
Existing Roads	✓	✓		✓	✓		
New Road	✓	✓		✓	✓		✓

Key: I/C Spacing – Alternative meets or exceeds current AASHTO criteria.
↓ - A decrease in traffic volume on the road would be a benefit.
↑ - An increase in traffic volume on the road would be a benefit.

5.0 CONCLUSIONS

5.1 Recommendation

After a careful review and consideration of the existing conditions, the cost and benefits, and constraints of constructing either an interchange, improving existing roads or constructing a new road **the Project Team acknowledges that an interchange at the proposed overpass location alleviates future traffic congestion in this area of Oldham County, and best serves the purpose and need.** The interchange could be a C–D, Standard Diamond or another configuration (such as a partial interchange) following more detailed traffic and design analysis. The Project Team also recognizes widening of I-71 and KY 53 are needed with or without an interchange.

Draft recommendation based on:

- Existing conditions – improving the existing roads or constructing a new road did not reduce the amount of traffic on the KY 53 NB exit ramp that presently backs into I-71.
- Constraints - there are not major impacts on the identified constraints for the project except the impact to Meadowbrook Subdivision in Alternative 4
- Benefits - the C-D is the only alternative that met the project purpose in every case; the standard diamond met all but one.
- Operations - the C-D did not have spacing issues, where the standard diamond did.
- Cost - the Standard Diamond interchange alternative cost ($6.5 million) is significantly less than the other alternatives. The C-D is slightly more than improving the existing roads.

5.2 Next Steps

An I-71 interchange at the proposed overpass south of LaGrange is not in the current Long Range Plan.

Since this study shows that an interchange is feasible, KYTC or Oldham County would need to introduce it into the KIPDA Long Range Plan.

5.2.1 Interchange Justification Study Analysis

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) contains requirements for planning a proposed interchange to the existing Interstate Highway system. These requirements are implemented in FHWA policy and through Federal regulation located in 23 CFR part 450. The policy for *Additional Interchanges to the Interstate System* contains eight points that must be taken into consideration. This section provides a preliminary overview of each policy point as it relates to this project.

Policy Statement No. 1: Existing Facilities Capability

"It is demonstrated that the existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access, nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal. "

The existing interchanges in the area (I-71/KY 146; I-71/KY 393; I-71/KY 53) and the existing local roads (Allen Lane, Commerce Parkway, New Moody Lane) could be improved to handle more capacity. The planning level traffic analysis does show that an interchange added to the system takes some traffic off already congested roads. Providing a new interchange at the proposed overpass location would provide improved and more direct access to the interstate network for Oldham Reserve. Emergency access to the hospital is also improved.

Policy Statement No. 2: Transportation System Management

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

Transportation System Management (TSM) type improvements have not been discussed in detail for this location. TSM improvements, such as signal timing adjustments, should be investigated as possible short-term safety projects. Limited mass transit is provided for in the study area, and improved access to I-71 with an interchange would improve the transit service routes and options, including school bus routes. HOV lanes are not provided on any Louisville urban area interstates. An additional interchange in Oldham County would appear to not limit future TSM options if required.

Policy Statement No. 3: Operational Analysis

"The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access point."

The traffic operational analysis has been performed for the interchange alternatives, and it included the interchanges to the south (KY 146, KY 393), to the north (KY 53) and the local roads within the study area. The operational analysis illustrates that a proposed standard diamond interchange is tightly spaced with the KY 53 interchange and is not the most desirable from an operational standpoint; but, adding an interchange as a Collector-Distributor system with the KY 53 interchange provides better safety and operation compared to a standard diamond.

The operational analysis shows that the local streets would be able to effectively collect and distribute traffic to and from either interchange configuration.

Policy Statement No. 4: Access Connections and Design

"The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purposes access for transit vehicles, for HOVs or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed standards for Federal-aid projects on the Interstate system."

The proposed interchange will connect to public roads: Commerce Parkway, New Moody Lane, Allen Lane and the proposed Oldham Reserve exterior road (which connects to KY 53).

As noted in the meeting summaries provided in this report, a half interchange was discussed and eliminated from detailed study (if an interchange is concluded to be feasible at this location, a "less

than full interchange" could be considered during this phase of the project). Projected traffic volumes show that movements to and from I-71 to the south are much higher than those from and to the north. A partial interchange would provide some relief to the currently congested interchange at KY 53 as does a full interchange, but a partial interchange would not fully satisfy the purpose and need for the project.

The design of the recommended partial interchange would need to meet or exceed current design standards for Federal-aid projects on the Interstate System.

Policy Statement No. 5: Transportation and Land Use Plans

"The proposal considers and is consistent with local and regional land use and transportation plans."

The interchange is not in KIPDA's *Horizon 2030* LRTP. Current land use plans in Oldham County are consistent with a proposed interchange. Oldham County Planning Commission does have a Major Thoroughfare Plan published in December 2003. This location was not identified as a possible new interchange with I-71. Oldham County also has a comprehensive plan – Outlook 2020 – adopted in February 2002.

Policy Statement No. 6: Comprehensive Interstate Network Study

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

The only proposed new interchange with I-71 in Oldham County's Major Thoroughfare Plan is with KY 1694 (south of this project and outside the study area).

Policy Statement No. 7: Coordination with Transportation System Improvements

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

Inclusion of the Oldham County Planning Commission Director; OCEDA Director and KIPDA as part of the project team demonstrates early coordination efforts. Further documented coordination would be a part of the IJS. The proposed project would provide benefit to continued development plans for Oldham Reserve and is being coordinated with other planned transportation improvements.

Policy Statement No. 8: Status of Planning and NEPA

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

The planning process and planning objectives, herein, were implemented to advance the National Environmental Policy Act (NEPA) and Interchange Justification Study (IJS) requirements of the FHWA, should this project be advanced. The planning level analysis concludes the interchange would be beneficial to area traffic and not harmful to the interstate network. Regarding the NEPA process, no significant impacts are anticipated with an interchange; therefore, either a Categorical Exclusion or an Environmental Assessment/Finding of No Significant Impact document should be appropriate.

5.2.2 NEPA Requirements

The following environmental issues are likely to require consideration for this project.

- Historic, Archaeological, and Cultural Resources
- Aquatic Resources
- Wetlands and Ponds
- Threatened and Endangered Species
- Hazardous Materials Concerns
- Air Quality
- Traffic Noise
- Community Facilities
- Environmental Justice

5.2.3 Preliminary Engineering

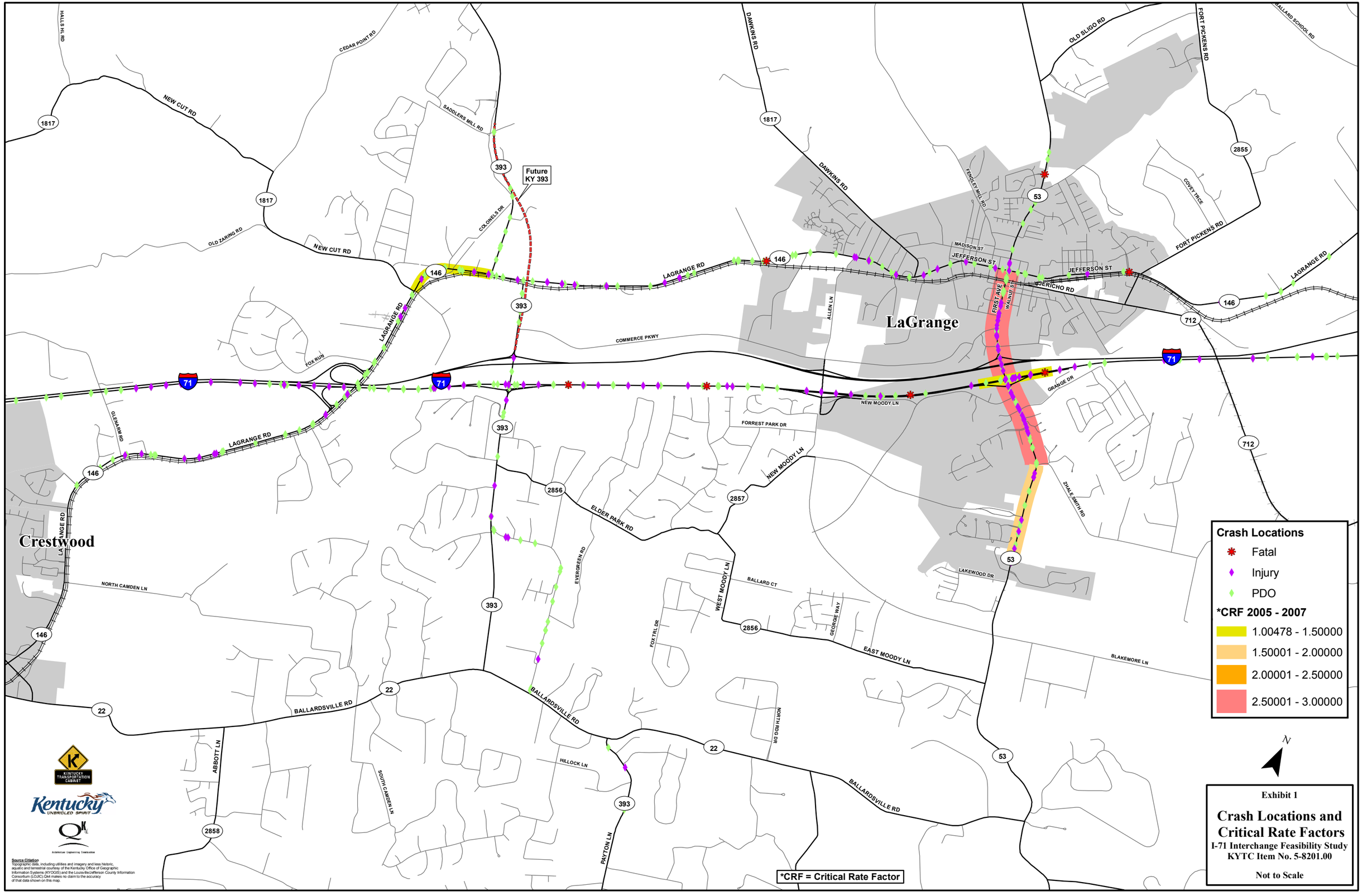
A more detailed interchange design would require the following elements:

- Update mapping with digital terrain information
- Finalize typical sections
- Finalize geometry (compatible with all recommendations)
- Study drainage
- Conceptual Traffic Management Plan
- Establish preliminary R/W
- Refine cost estimate
- Select recommended alternative/DES

5.2.4 Public Involvement

Advancement of the project would necessitate a public involvement component. Public input and comments would need to be included with the NEPA document.

Appendix A
Crash Analysis


Crash Locations
Fatal
Injury
PDO
*CRF 2005 - 2007
1.00478 - 1.50000
1.50001 - 2.00000
2.00001 - 2.50000
2.50001 - 3.00000
*CRF = Critical Rate Factor
LaGrange
Crestwood
Future KY 393
LAGRANGE RD
NEW CUT RD
OLD ZARING RD
HALLS HL RD
CEDAR POINT RD
SADDLERS MILL RD
COLONELS DR
DAWKINS RD
FENDLEY MILL RD
OLD SLIGO RD
FORT PICKENS RD
COVEY TRCE
MADISON ST
JEFFERSON ST
JERICHO RD
FIRST AVE
WALNUT ST
ALLEN LN
COMMERCE PKWY
FOX RUN
GLENARM RD
NEW MOODY LN
FORREST PARK DR
GRANGE DR
ZHALE SMITH RD
ELDER PARK RD
EVERGREEN RD
WEST MOODY LN
BALLARD CT
LAKEWOOD DR
FOX TRL DR
GEORGIE WAY
EAST MOODY LN
BLAKEMORE LN
NORTH CAMDEN LN
BALLARDSVILLE RD
ABBOTT LN
SOUTH CAMDEN LN
HILLOCK LN
NORTH RDG DR
PAYTON LN
1817
146
393
71
53
712
2855
2856
2857
22
2858
Source Citation
Topographic data, including utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Office of Geographic Information Systems (KYOGIS) and the Louisville/Jefferson County Information Consortium (LOJIC).QK4 makes no claim to the accuracy of that data shown on this map.
Exhibit 1
Crash Locations and Critical Rate Factors
I-71 Interchange Feasibility Study
KYTC Item No. 5-8201.00
Not to Scale

Critical Rate Analysis

Roadway Segment

County	Oldham		
Route	Kentucky 53		
Milepoint Range	5.685	to	6.296
Date	March 3, 2008		
Completed By	J Lukat		

Critical Rate Analysis and Crash History

Total Number of Crashes at Location			148
Total Number of Nighttime Crashes at Location			20
Traffic Volume at Location			17,900
Date Range of CRASH Query	January 1, 2005	to	December 31, 2007
Roadway Typical Section			4-Lane, Undivided
Roadway Classification			Urban

Critical Rate Analysis

Statewide Average Crash Rate	4.320
Critical Rate	6.279
Critical Rate Factor	**2.956**
Is the Critical Rate Factor greater than or equal to 1.0?	**Yes**

Nighttime Critical Rate Analysis

Nighttime Statewide Average Crash Rate	5.350
Critical Rate	10.837
Nighttime Critical Rate Factor	**1.362**
Is the Nighttime Critical Rate Factor greater than or equal to 2.0?	**No**

Critical Rate Analysis

Roadway Segment

County	Oldham		
Route	Kentucky 146		
Milepoint Range	6.829	to	7.419
Date	March 3, 2008		
Completed By	J Lukat		

Critical Rate Analysis and Crash History

Total Number of Crashes at Location			30
Total Number of Nighttime Crashes at Location			2
Traffic Volume at Location			12,100
Date Range of CRASH Query	January 1, 2005	to	December 31, 2007
Roadway Typical Section			Two Lane
Roadway Classification			Rural

Critical Rate Analysis

Statewide Average Crash Rate	2.220
Critical Rate	3.657
Critical Rate Factor	**1.050**
Is the Critical Rate Factor greater than or equal to 1.0?	**Yes**

Nighttime Critical Rate Analysis

Nighttime Statewide Average Crash Rate	3.790
Critical Rate	8.660
Nighttime Critical Rate Factor	**0.184**
Is the Nighttime Critical Rate Factor greater than or equal to 2.0?	**No**

Critical Rate Analysis

Roadway Segment

County	Oldham		
Route	Kentucky 53		
Milepoint Range	6.296	to	7.055
Date	March 3, 2008		
Completed By	J Lukat		

Critical Rate Analysis and Crash History

Total Number of Crashes at Location			138
Total Number of Nighttime Crashes at Location			23
Traffic Volume at Location			16,000
Date Range of CRASH Query	January 1, 2005	to	December 31, 2007
Roadway Typical Section			4-Lane, Undivided
Roadway Classification			Urban

Critical Rate Analysis

Statewide Average Crash Rate	4.320
Critical Rate	6.176
Critical Rate Factor	**2.524**
Is the Critical Rate Factor greater than or equal to 1.0?	**Yes**

Nighttime Critical Rate Analysis

Nighttime Statewide Average Crash Rate	5.350
Critical Rate	10.539
Nighttime Critical Rate Factor	**1.450**
Is the Nighttime Critical Rate Factor greater than or equal to 2.0?	**No**

Critical Rate Analysis

Roadway Segment

County	Oldham		
Route	Interstate 71		
Milepoint Range	21.65	to	22.15
Date	March 3, 2008		
Completed By	J Lukat		

Critical Rate Analysis and Crash History

Total Number of Crashes at Location			52
Total Number of Nighttime Crashes at Location			11
Traffic Volume at Location			46,000
Date Range of CRASH Query	January 1, 2005	to	December 31, 2007
Roadway Typical Section			Interstate
Roadway Classification			Urban

Critical Rate Analysis

Statewide Average Crash Rate	0.960
Critical Rate	1.483
Critical Rate Factor	**1.393**
Is the Critical Rate Factor greater than or equal to 1.0?	**Yes**

Nighttime Critical Rate Analysis

Nighttime Statewide Average Crash Rate	1.180
Critical Rate	2.584
Nighttime Critical Rate Factor	**0.914**
Is the Nighttime Critical Rate Factor greater than or equal to 2.0?	**No**

Critical Rate Analysis

Roadway Segment

County	Oldham		
Route	Kentucky 53		
Milepoint Range	5	to	5.685
Date	March 3, 2008		
Completed By	J Lukat		

Critical Rate Analysis and Crash History

Total Number of Crashes at Location			32
Total Number of Nighttime Crashes at Location			6
Traffic Volume at Location			8,600
Date Range of CRASH Query	January 1, 2005	to	December 31, 2007
Roadway Typical Section			Two Lane
Roadway Classification			Urban

Critical Rate Analysis

Statewide Average Crash Rate	2.610
Critical Rate	4.735
Critical Rate Factor	**1.574**
Is the Critical Rate Factor greater than or equal to 1.0?	**Yes**

Nighttime Critical Rate Analysis

Nighttime Statewide Average Crash Rate	3.130
Critical Rate	9.149
Nighttime Critical Rate Factor	**0.898**
Is the Nighttime Critical Rate Factor greater than or equal to 2.0?	**No**

Appendix B

Traffic Volumes & LOS Summary

TRAFFIC VOLUMES LOS SUMMARY
EXHIBIT 1 - APPENDIX B

Route	From / To	2008 Existing		2015 No-Build		2015 Diamond		2015 CD		2015 Widening		2015 New Road		2035 No-Build		2035 Diamond		2035 CD		2035 Widening		2035 New Road	
I-71 (**1**)	West of KY 146	59900	D	69400	E	69400	E	69400	E	69400	E	69400	E	88000	F	88000	F	88000	F	88000	F	88000	F
I-71 (**3**)	between KY 146 and KY 393	58200	D	62600	D	64500	D	61500	D	63400	D	63200	D	75800	E	76300	E	77900	F	76600	F	76400	E
I-71 (**5**)	between KY 393 and Proposed Interchange	57400	D	60500	D	61200	D	60800	D	59500	D	63500	D	69400	E	71500	E	72300	E	63300	D	67600	E
I-71 ML (**8**)	between Proposed Interchange and KY 53	57400	D	61800	D	53100	D	25700	B	59500	D	63500	D	69400	E	64900	D	51500	C	63300	D	67600	E
I-71 CD	between Proposed Interchange and KY 53	n/a	n/a	n/a	n/a	n/a	n/a	9400		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21600		n/a	n/a	n/a	n/a
I-71 (**11**)	East of KY 53	38600	C	44600	C	44600	C	44600	C	44600	C	44600	C	58800	D	58800	D	58800	D	58800	D	58800	D
KY 146	West of I-71	8810	C	19200	F	19600	F	19400	F	19000	F	19300	F	25900	F	24400	F	24000	F	24900	F	25200	F
KY 146 (**2**)	between I-71 and KY 1817	12100	C	16200	D	15500	D	15600	D	15900	D	15900	D	24900	F	24000	F	24400	F	24000	F	24000	F
KY 146	between KY 1817 and KY 393	12400	C	12400	C	12100	C	13700	C	12500	C	12300	C	21200	F	20400	F	20600	F	20900	F	20500	F
KY 146	between KY 393 and KY 393	11600	C	12100	C	12100	C	14300	D	12600	C	12400	C	21600	F	21900	F	21400	F	22500	F	22100	F
KY 146 (**12**)	between KY 393 and KY 2854	8130	C	6400	C	6700	C	8300	C	7200	C	13200	C	11200	C	10600	C	10200	C	9900	C	18100	F
KY 146 (**13**)	between KY 2854 and KY 53	9570	C	7200	C	5400	C	7400	C	6700	C	10000	C	10700	C	12100	C	11500	C	11500	C	17200	F
KY 146	East of KY 53	5740	C	3100	B	4700	C	3100	B	3000	B	3300	B	6300	C	5400	C	6000	C	5700	C	6200	C
KY 393	South of KY 2856	5250	C	12100	C	12000	C	12300	C	11500	C	14800	D	16100	D	15600	D	15800	D	14100	D	16400	D
KY 393	between KY 2856 and I-71	6710	C	14300	D	13400	C	13600	C	13000	C	14200	D	19800	F	16900	E	17300	F	15100	D	16500	E
KY 393 (**4**)	between I-71 and KY 146	7720	C	9100	C	7600	C	8700	C	11300	C	6500	C	18800	F	15700	D	16200	D	21500	F	12400	C
KY 393	North of KY 146	4060	B	5200	C	5000	C	5000	C	5100	C	4800	C	12300	C	10200	C	10000	C	10800	C	10200	C
KY 53	South of KY 2856	6350	C	7600	C	6200	C	6300	C	6100	C	4800	C	23200	F	25000	F	25500	F	25800	F	17500	F
KY 53 (**20**)	between KY 2856 and connector	9030	C	12000	C	7000	C	6900	C	6900	C	6800	C	25200	F	19200	F	19400	F	18400	F	18100	F
KY 53 (**10**)	between and I-71	17300	C	14400	C	14400	C	14400	C	17800	C	21700	C	24600	C	18900	C	19200	C	18100	C	22100	C
KY 53 (**9**)	between I-71 and KY 146	15200	C	33000	E	28400	D	29500	D	30700	D	28900	D	42300	F	40600	F	40800	F	43800	F	41200	F
KY 53	North of KY 146	9200	C	18700	C	18700	C	18300	C	18500	C	18100	C	28000	D	27900	D	28100	D	27100	D	26500	D
Allen Ln (**6**)	between I-71 and Commerce	n/a	n/a	4500	C	7800	C	8200	C	5800	C	5700	C	21000	F	26000	F	26900	F	29200	F	28500	F
Allen Ln (**15**)	North of Commerce Pkwy	800	B	10900	C	5700	C	4600	C	3900	B	4200	B	12800	C	17300	F	16500	E	13700	C	14600	D
Commerce (**14**)	between KY 393 and Proposed Interchange	1200	B	1500	B	1300	B	1200	B	2400	B	2400	B	11500	C	11600	C	10900	C	17600	F	9000	C
Commerce (**16**)	between Proposed Interchange and KY 53	800	B	900	B	1900	B	1800	B	1900	B	1100	B	12800	C	10400	C	9600	C	15800	D	9300	C
Moody (**17**)	East of Proposed Overpass	1800	B	2100	B	8000	C	8300	C	3800	B	4400	C	4900	C	9700	C	9400	C	8400	C	9700	C
Moody (**18**)	West of Proposed Overpass	8900	C	10300	C	6800	C	7000	C	11200	C	12500	C	13900	D	13900	D	14300	D	11900	C	13300	C
Connector (**7**)	East of Proposed Overpass	n/a	n/a	2500	B	2700	B	2700	B	1100	B	1000	B	13700	C	10000	C	9500	C	14300	D	13100	C
Connector (**19**)	West of KY 53	n/a	n/a	1200	B	300	B	300	B	300	B	300	B	3300	B	1200	B	1300	B	2000	B	2200	B
KY 146 Ramp	from I-71 EB to KY 146	7200	E	8600	F	8400	F	9200	F	8700	F	8800	F	14100	F	11700	F	13200	F	13300	F	13500	F
KY 146 Ramp	from KY 146 to I-71 EB	6800	E	7800	F	8800	F	7900	F	8100	F	7900	F	11600	F	10000	F	12000	F	11800	F	11500	F
KY 146 Ramp	from K-71 WB to KY 146	10000	E	10500	F	11400	F	8800	F	10900	F	11200	F	12800	F	14500	F	14000	F	12800	F	13100	F
KY 146 Ramp	from KY 146 to I-71 WB	7900	E	9200	F	8500	F	7800	F	8900	F	8700	F	14400	F	15100	F	13200	F	13200	F	12900	F
KY 393 Ramp	from I-71 EB to KY 393	3300	E	4600	F	4500	F	5700	F	5200	F	6200	F	12200	F	12200	F	10500	F	13100	F	15600	F
KY 393 Ramp	from KY 393 to I-71 EB	2600	E	3100	F	3900	E	2600	E	1500	F	5100	F	5000	F	4700	F	3600	F	1800	F	6200	F
KY 393 Ramp	from K-71 WB to KY 393	2500	E	2900	F	1900	E	1200	E	1300	F	4900	F	4700	F	2100	F	1300	F	1500	F	5700	F
KY 393 Ramp	from KY 393 to I-71 WB	3100	E	4500	F	3900	F	4500	F	5200	F	6300	F	13700	F	11100	F	10500	F	13200	F	16100	F
New Ramp	from I-71 EB to connector					5400	F	4800	A							6700	F	5600	A				
New Ramp	from connector to I-71 EB					1100	D	700	A							3800	E	3500	A				
New Ramp	from K-71 WB to connector					1100	D	1100	A							4400	E	5600	A				
New Ramp	from connector to I-71 WB					5200	E	5500	A							6000	F	6200	A				
KY 53 Ramp	from I-71 EB to KY 53	13400	D	16600	F	11000	D	4200	D	14800	E	14600	E	20100	F	12200	E	18500	E	17000	F	16800	F
KY 53 Ramp	from KY 53 to I-71 EB	7200	C	9500	D	8600	D	8700	D	9700	D	9500	D	21000	E	17100	E	17100	E	20900	E	20500	E
KY 53 Ramp	from K-71 WB to KY 53	7200	C	9700	D	8700	D	8400	D	10000	D	8900	D	22900	E	18000	E	15500	E	23800	E	21200	E
KY 53 Ramp	from KY 53 to I-71 WB	12200	D	14200	E	10200	D	5300	E	16200	E	12500	E	21900	F	13200	E	13600	E	17600	F	17100	F

Appendix C

No Build

- Traffic and LOS
- Merge, Diverge, Weave 2008, 2015 and 2035

	*ADT	*LOS
2008 Existing =	4,060	B
2015 No-Build =	5,200	C
2035 No-Build =	12,300	C

	*ADT	*LOS
2008 Existing =	12,400	C
2015 No-Build =	12,400	C
2035 No-Build =	21,200	F

	*ADT	*LOS
2008 Existing =	11,600	C
2015 No-Build =	12,100	C
2035 No-Build =	21,600	F

	*ADT	*LOS
2008 Existing =	8,130	C
2015 No-Build =	6,400	C
2035 No-Build =	11,200	C

	*ADT	*LOS
2008 Existing =	9,570	C
2015 No-Build =	7,200	C
2035 No-Build =	10,700	C

	*ADT	*LOS
2008 Existing =	9,200	C
2015 No-Build =	18,700	C
2035 No-Build =	28,000	D

	*ADT	*LOS
2008 Existing =	5,740	C
2015 No-Build =	3,100	B
2035 No-Build =	6,300	C

	*ADT	*LOS
2008 Existing =	12,100	C
2015 No-Build =	16,200	D
2035 No-Build =	24,900	F

	*ADT	*LOS
2008 Existing =	59,900	D
2015 No-Build =	69,400	E
2035 No-Build =	88,000	F

	*ADT	*LOS
2008 Existing =	7,720	C
2015 No-Build =	9,100	C
2035 No-Build =	18,800	F

	*ADT	*LOS
2008 Existing =	1,200	C
2015 No-Build =	1,500	C
2035 No-Build =	11,500	D

	*ADT	*LOS
2008 Existing =	800	C
2015 No-Build =	10,900	C
2035 No-Build =	12,800	C

	*ADT	*LOS
2008 Existing =	800	C
2015 No-Build =	900	C
2035 No-Build =	12,800	D

	*ADT	*LOS
2008 Existing =	15,200	C
2015 No-Build =	33,000	E
2035 No-Build =	42,300	F

	*ADT	*LOS
2008 Existing =	57,400	D
2015 No-Build =	61,800	D
2035 No-Build =	69,400	E

	*ADT	*LOS
2008 Existing =	58,200	D
2015 No-Build =	62,600	D
2035 No-Build =	75,800	E

	*ADT	*LOS
2008 Existing =	6,710	C
2015 No-Build =	14,300	D
2035 No-Build =	19,800	F

	*ADT	*LOS
2008 Existing =	N/A	D
2015 No-Build =	4,500	D
2035 No-Build =	21,000	E

	*ADT	*LOS
2008 Existing =	1,800	C
2015 No-Build =	2,100	C
2035 No-Build =	4,900	C

	*ADT	*LOS
2008 Existing =	8,900	C
2015 No-Build =	10,300	D
2035 No-Build =	13,900	D

	*ADT	*LOS
2008 Existing =	38,600	C
2015 No-Build =	44,600	C
2035 No-Build =	58,800	D

	*ADT	*LOS
2008 Existing =	17,300	C
2015 No-Build =	14,400	C
2035 No-Build =	24,600	C

	*ADT	*LOS
2008 Existing =	N/A	N/A
2015 No-Build =	2,500	C
2035 No-Build =	13,700	C

	*ADT	*LOS
2008 Existing =	N/A	N/A
2015 No-Build =	1,200	C
2035 No-Build =	3,300	C

	*ADT	*LOS
2008 Existing =	9,030	C
2015 No-Build =	12,000	C
2035 No-Build =	25,200	F

	*ADT	*LOS
2008 Existing =	8,810	C
2015 No-Build =	19,200	F
2035 No-Build =	25,900	F

	*ADT	*LOS
2008 Existing =	5,250	C
2015 No-Build =	12,100	C
2035 No-Build =	16,100	D

	*ADT	*LOS
2008 Existing =	6,350	C
2015 No-Build =	7,600	C
2035 No-Build =	23,200	F

Future KY 393

HALLS HL RD
CEDAR POINT RD
NEW CUT RD
SADDLERS MILL RD
OLD ZARING RD
COLONELS DR
LAGRANGE RD
FOX RUN
GLENARM RD
NORTH CAMDEN LN
DAWKINS RD
FENDLEY MILL RD
OLD SLIGO RD
FORT PICKENS RD
BALLARD SCHOOL RD
COVEY TRCE
MADISON ST
JEFFERSON ST
KENTUCKY AVE
FIRST AVE
WALNUT ST
JERICHO RD
CRYSTAL DR E
ALLEN LN
COMMERCE PKWY
NEW MOODY LN
GRANGE DR
MAPLE LEAF DR
PIN OAK DR
SYCAMORE RD
ELDER PARK RD
EVERGREEN RD
ZYALE SMITH RD
MAPLE DR
MASSIE SCHOOL RD
LAKEWOOD DR
WEST MOODY LN
BALLARD CT
GEORGE WAY
FOX TRL DR
EAST MOODY LN
BLAKEMORE LN
NORTH RDG DR
BALLARDSVILLE RD
ABBOTT LN
SOUTH CAMDEN LN
HILLOCK LN
PAYTON LN

1817 · 146 · 393 · 71 · 53 · 2855 · 712 · 2856 · 2857 · 22 · 2858

KENTUCKY TRANSPORTATION CABINET
Kentucky UNBRIDLED SPIRIT
QK4 Architecture Engineering Construction

Source Citation
Topographic data, including utilities and imagery and less historic, aquatic and terrestrial courtesy of the Kentucky Office of Geographic Information Systems (KYOGIS) and the Louisville/Jefferson County Information Consortium (LOJIC). Qk4 makes no claim to the accuracy of that data shown on this map.

*ADT = Average Daily Traffic
*LOS = Level of Service

N

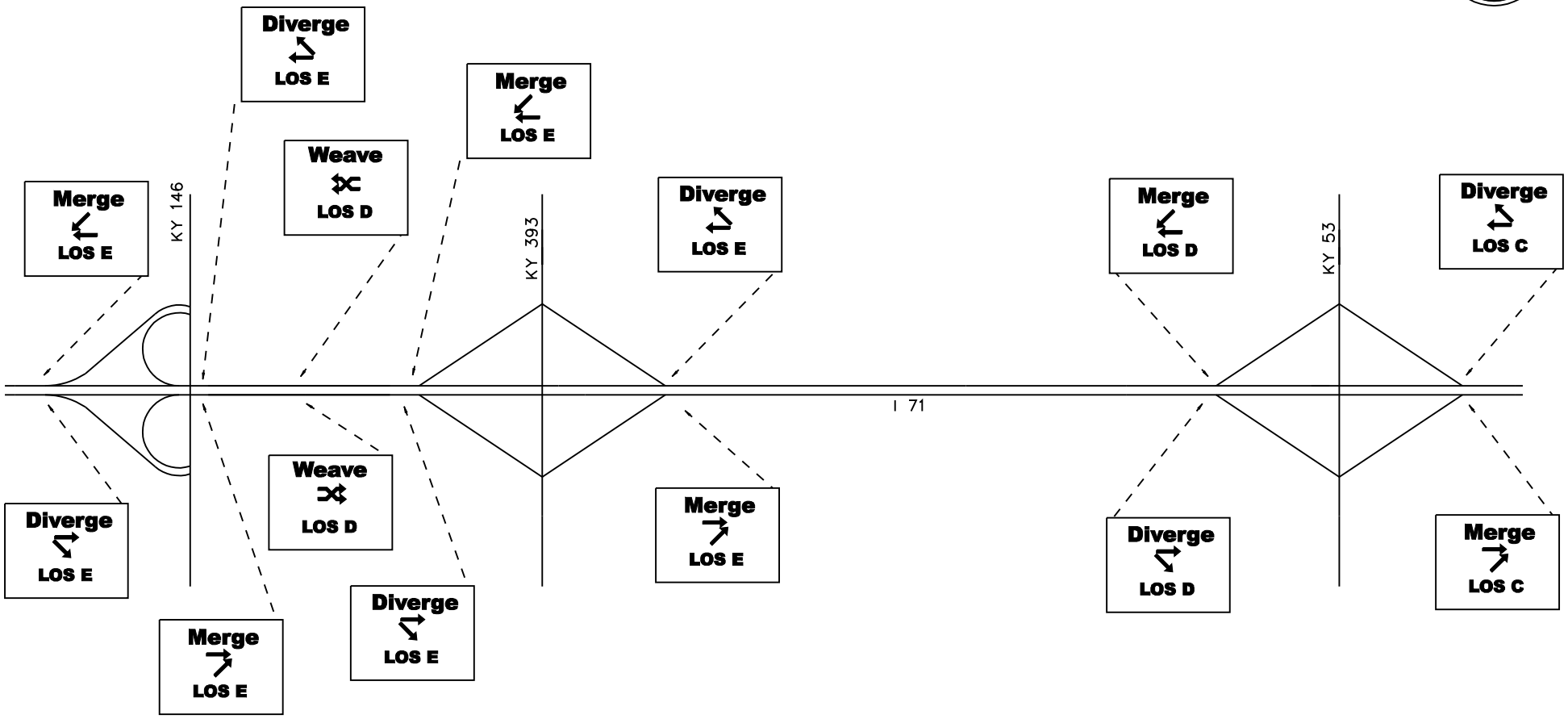
Exhibit 1

Existing/No-Build Traffic and LOS

I-71 Interchange Feasibility Study
KYTC Item No. 5-8201.00

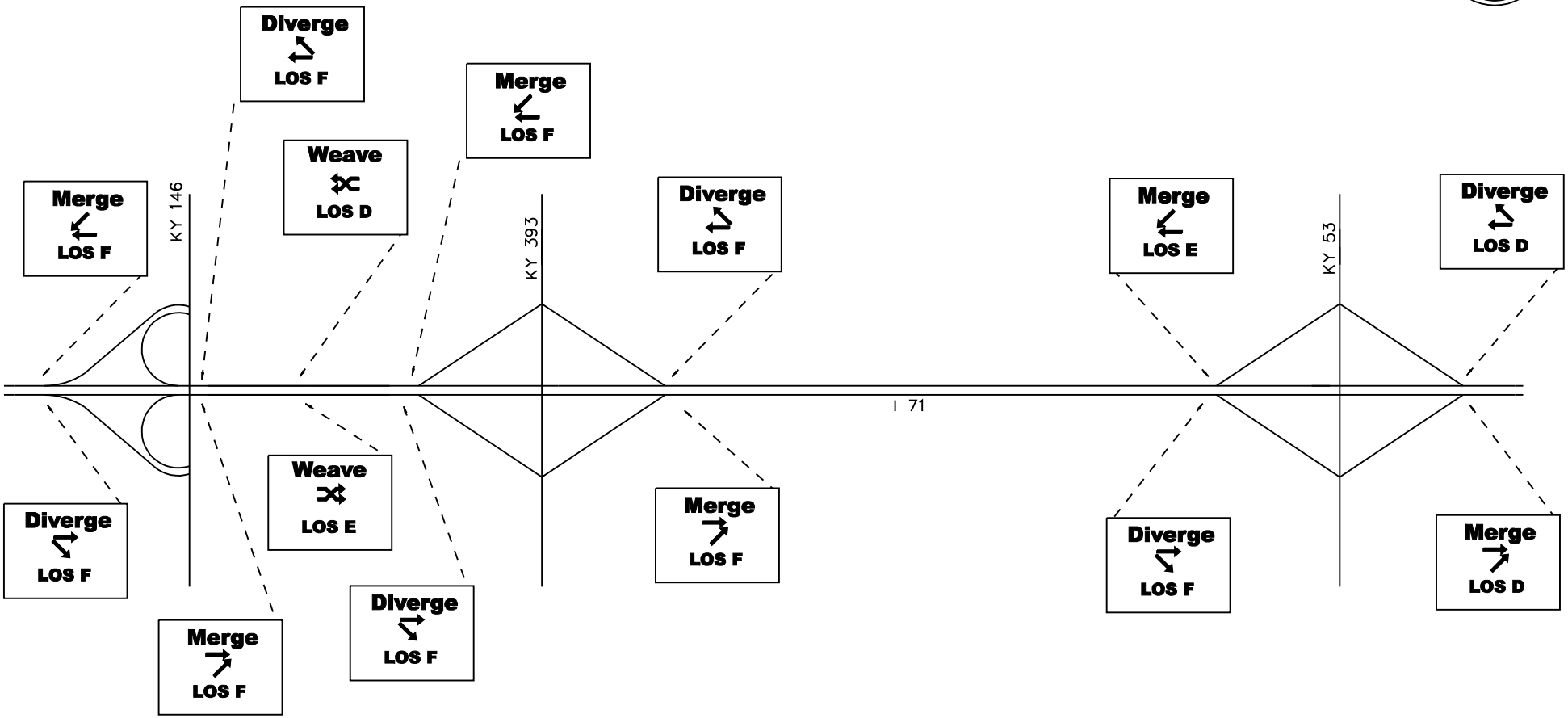
Not to Scale

2008 EXISTING DETAILED ANALYSIS



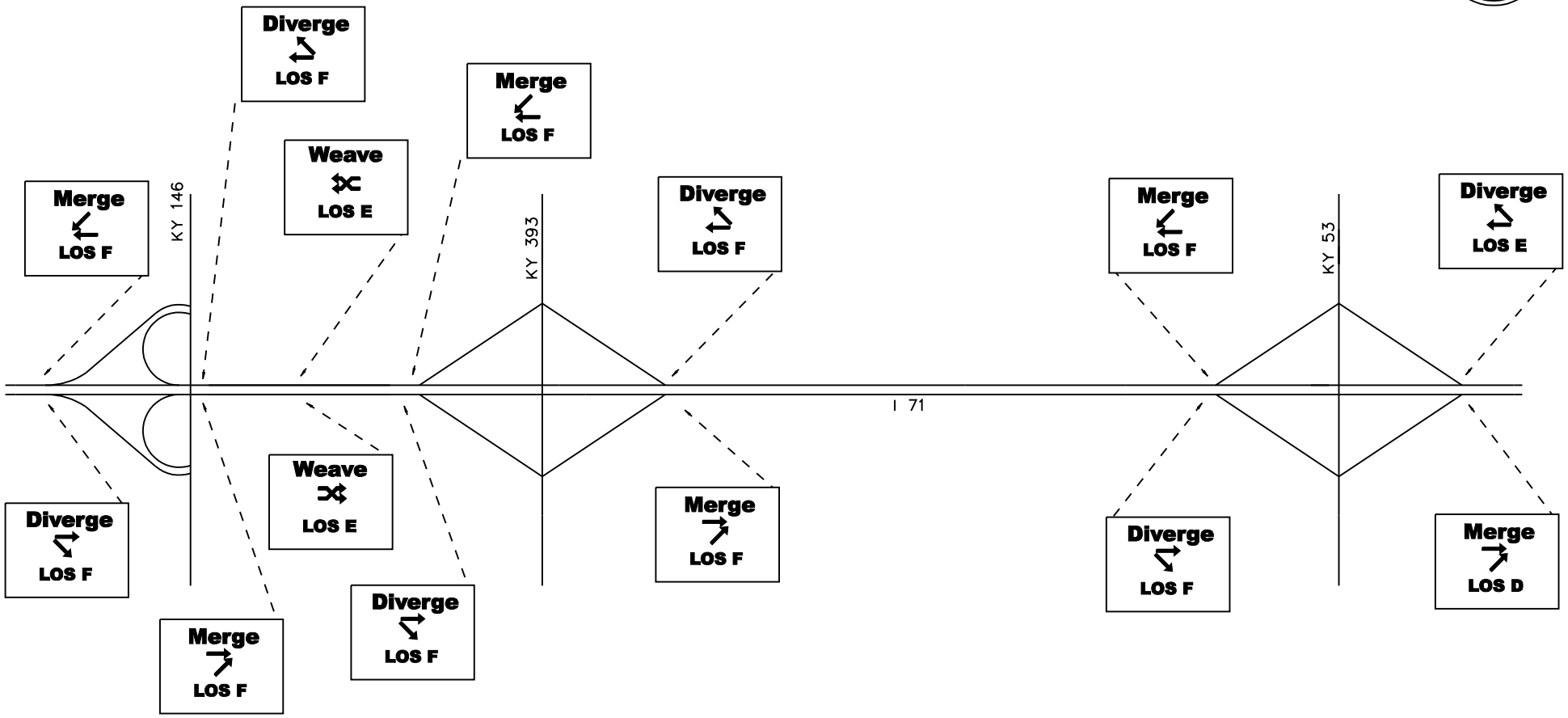
NOT TO SCALE

2015 NO-BUILD DETAILED ANALYSIS



NOT TO SCALE

2035 NO-BUILD DETAILED ANALYSIS



NOT TO SCALE

Appendix D

Alternative 1 – Standard Diamond

- Traffic and LOS
- Preliminary Geometry
- Preliminary Sign Layout
- Merge, Diverge, Weave 2015 and 2035

	*ADT	*LOS
2008 Existing =	4,060	B
2015 Diamond =	5,000	C
2035 Diamond =	10,200	C

	*ADT	*LOS
2008 Existing =	12,400	C
2015 Diamond =	12,100	C
2035 Diamond =	20,400	F

	*ADT	*LOS
2008 Existing =	11,600	C
2015 Diamond =	12,100	C
2035 Diamond =	21,900	F

	*ADT	*LOS
2008 Existing =	8,130	C
2015 Diamond =	6,700	C
2035 Diamond =	10,600	C

	*ADT	*LOS
2008 Existing =	9,570	C
2015 Diamond =	5,400	C
2035 Diamond =	12,100	C

	*ADT	*LOS
2008 Existing =	9,200	C
2015 Diamond =	18,700	C
2035 Diamond =	27,900	D

	*ADT	*LOS
2008 Existing =	5,740	C
2015 Diamond =	4,700	C
2035 Diamond =	5,400	C

	*ADT	*LOS
2008 Existing =	12,100	C
2015 Diamond =	15,500	D
2035 Diamond =	24,000	F

	*ADT	*LOS
2008 Existing =	59,900	D
2015 Diamond =	69,400	E
2035 Diamond =	88,000	F

	*ADT	*LOS
2008 Existing =	7,720	C
2015 Diamond =	7,600	C
2035 Diamond =	15,700	D

	*ADT	*LOS
2008 Existing =	1,200	C
2015 Diamond =	1,300	B
2035 Diamond =	11,600	C

	*ADT	*LOS
2008 Existing =	800	C
2015 Diamond =	5,700	C
2035 Diamond =	17,300	B

	*ADT	*LOS
2008 Existing =	800	C
2015 Diamond =	1,900	B
2035 Diamond =	10,400	C

	*ADT	*LOS
2008 Existing =	57,400	C
2015 Diamond =	53,100	C
2035 Diamond =	64,900	D

	*ADT	*LOS
2008 Existing =	15,200	C
2015 Diamond =	28,400	D
2035 Diamond =	40,600	F

	*ADT	*LOS
2008 Existing =	N/A	N/A
2015 Diamond =	7,800	D
2035 Diamond =	26,000	E

	*ADT	*LOS
2008 Existing =	58,200	D
2015 Diamond =	64,500	D
2035 Diamond =	76,300	E

	*ADT	*LOS
2008 Existing =	57,400	D
2015 Diamond =	61,200	D
2035 Diamond =	71,500	E

	*ADT	*LOS
2008 Existing =	38,600	C
2015 Diamond =	44,600	C
2035 Diamond =	58,800	D

	*ADT	*LOS
2008 Existing =	17,300	C
2015 Diamond =	14,400	C
2035 Diamond =	18,900	C

	*ADT	*LOS
2008 Existing =	6,710	C
2015 Diamond =	13,400	C
2035 Diamond =	16,900	E

	*ADT	*LOS
2008 Existing =	N/A	N/A
2015 Diamond =	2,700	B
2035 Diamond =	10,000	C

	*ADT	*LOS
2008 Existing =	6,900	C
2015 Diamond =	6,800	D
2035 Diamond =	13,900	D

	*ADT	*LOS
2008 Existing =	1,800	C
2015 Diamond =	8,000	C
2035 Diamond =	9,700	D

	*ADT	*LOS
2008 Existing =	8,810	C
2015 Diamond =	19,600	F
2035 Diamond =	24,000	F

	*ADT	*LOS
2008 Existing =	5,250	C
2015 Diamond =	12,000	C
2035 Diamond =	15,000	D

	*ADT	*LOS
2008 Existing =	N/A	N/A
2015 Diamond =	300	B
2035 Diamond =	1,200	B

	*ADT	*LOS
2008 Existing =	9,030	C
2015 Diamond =	7,000	C
2035 Diamond =	19,200	F

	*ADT	*LOS
2008 Existing =	6,350	C
2015 Diamond =	6,200	C
2035 Diamond =	25,000	F

Future KY 393

*ADT = Average Daily Traffic
*LOS = Level of Service

N

Exhibit 1

Diamond Interchange Traffic and LOS

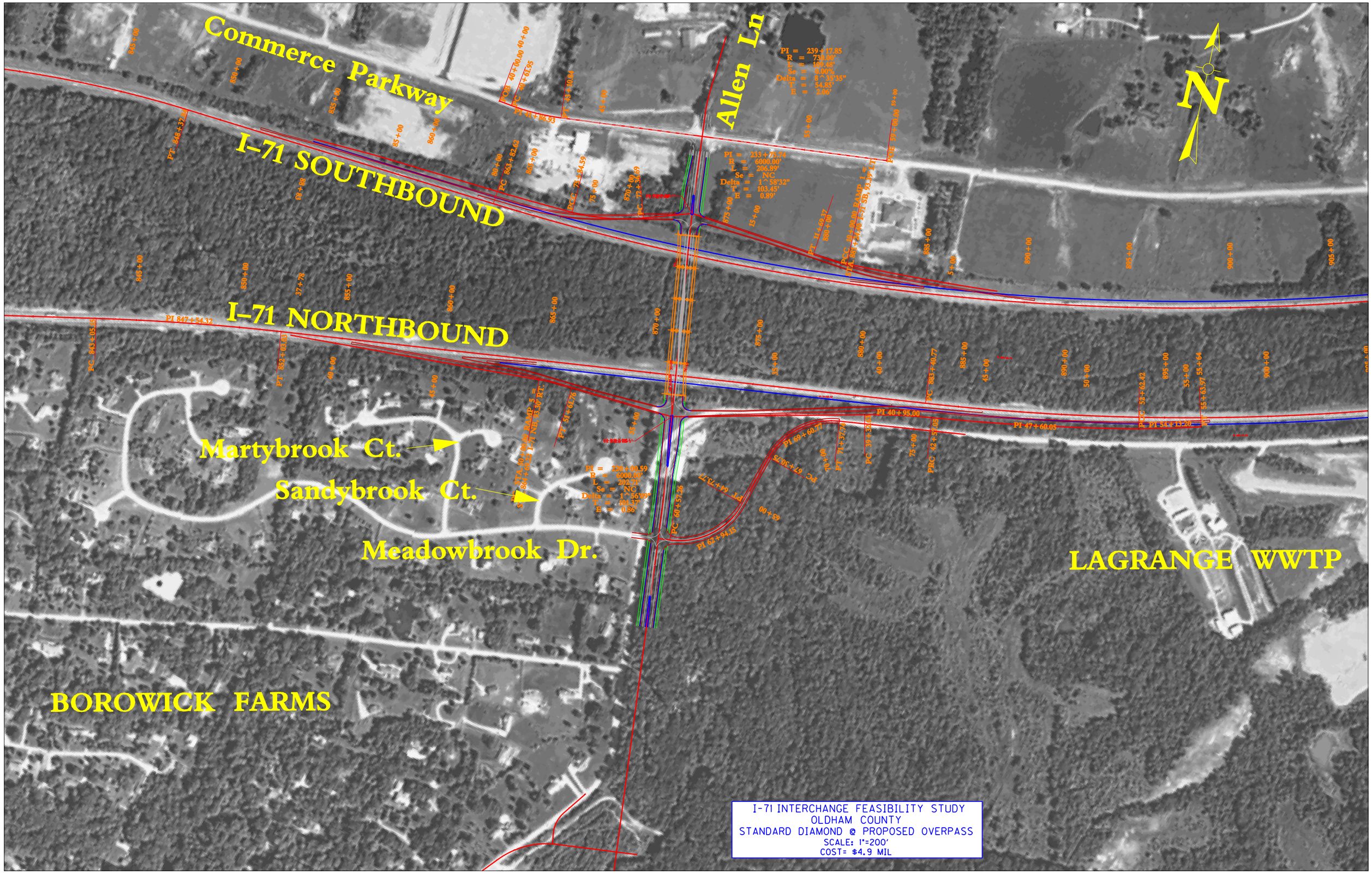
I-71 Interchange Feasibility Study
KYTC Item No. 5-8201.00

Not to Scale

KENTUCKY TRANSPORTATION CABINET

Kentucky UNBRIDLED SPIRIT

QK4 Architecture Engineering Construction


Commerce Parkway
I-71 SOUTHBOUND
I-71 NORTHBOUND
Allen Ln
Martybrook Ct.
Sandybrook Ct.
Meadowbrook Dr.
BOROWICK FARMS
LAGRANGE WWTP
N
I-71 INTERCHANGE FEASIBILITY STUDY
OLDHAM COUNTY
STANDARD DIAMOND @ PROPOSED OVERPASS
SCALE: 1"=200'
COST= $4.9 MIL

LAGRANGE COMMERCE PARK

COMMERCE PARKWAY

ALLEN LN

I-71 SOUTHBOUND

I-71 NORTHBOUND

NEW MOODY LN

BOROWICK FARMS

RELOCATE

Existing Sign

EXIT 22

53

La Grange

Ballardsville

1 MILE

EXIT 20

285 TO 146

LaGrange

Commerce Parkway

1 Mile

DOWNTOWN LAGRANGE

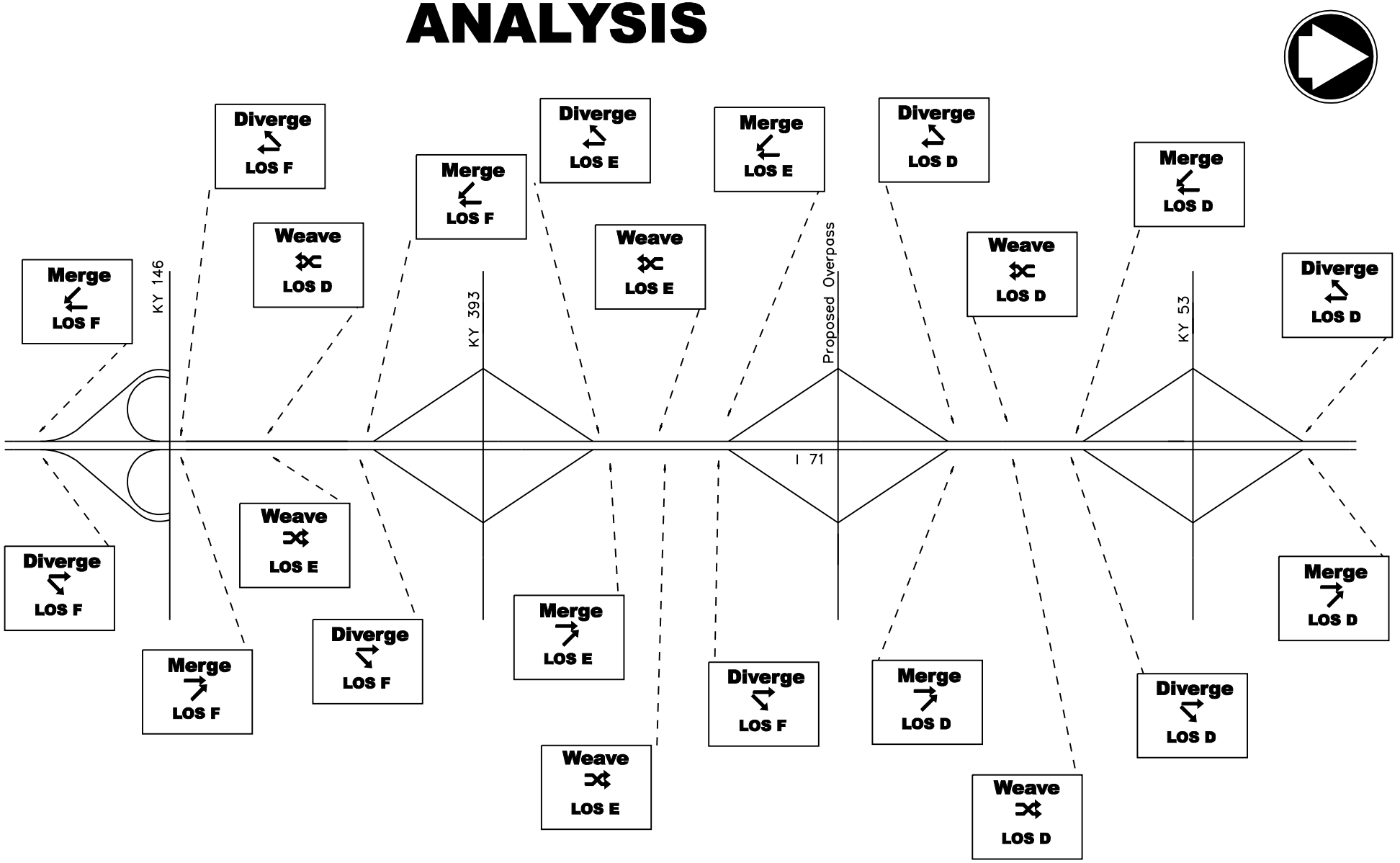
1ST AVE

TO BALLARDSVILLE

N

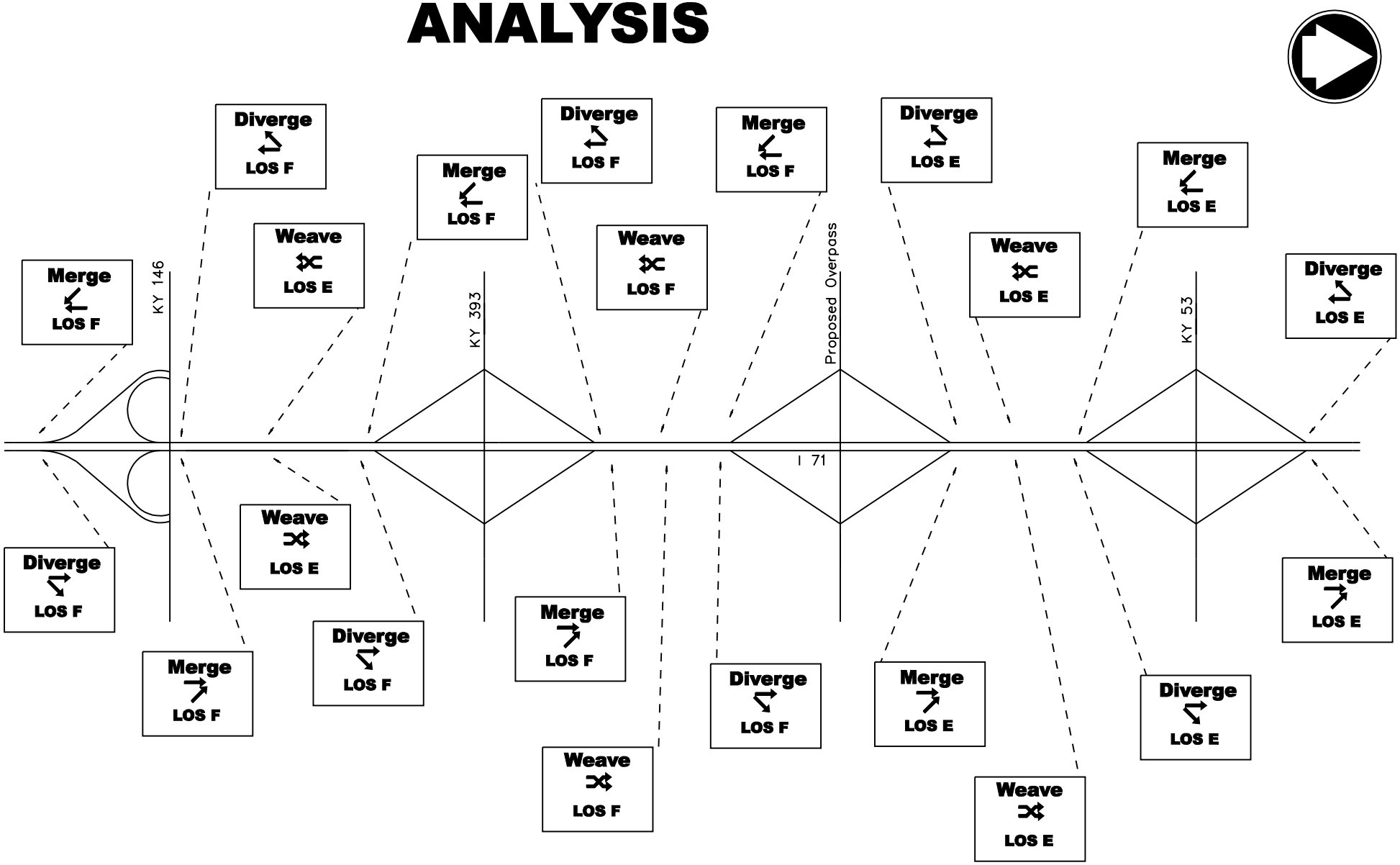
PRELIMINARY SIGN LAYOUT
STANDARD DIAMOND

2015 BUILD DIAMOND DETAILED ANALYSIS



NOT TO SCALE

2035 BUILD DIAMOND DETAILED ANALYSIS



NOT TO SCALE