



**Beatline Road
Planning and Environmental Linkage (PEL) Study
Final Report**



Prepared For:

Mississippi Department of Transportation

January 2019



This page intentionally left blank

Contents

1.0	Introduction	1
2.0	Study Area	1
3.0	Purpose and Need and Study Goals	3
4.0	Environmental Constraints.....	4
5.0	Proposed Concepts	4
6.0	Screening Process	6
7.0	Level 1 Screening Criteria and Results.....	7
8.0	Level 2 Screening Criteria and Measures	7
9.0	Level 2 Screening Results	8
10.0	PEL Recommended Concept	10
11.0	Phased Improvements.....	10
12.0	PEL Questionnaire	10

List of Figures

Figure 1:	Study Area	2
Figure 2:	West Concept	5
Figure 3:	East Concept	6

List of Tables

Table 1:	Level 1 Screening Matrix	7
Table 2:	Level 2 Screening Matrix – Raw Scores	9
Table 3:	Level 2 Screening Matrix - Scaled Scores	9

Attachments

Attachment A – Traffic and Safety Report

Attachment B – Purpose and Need

Attachment C – Environmental Constraints Report

Attachment D – Relocation Impact Report

Attachment E – Concepts Analysis Report

Attachment F – PEL Questionnaire

1.0 Introduction

In February 2018, the Mississippi Department of Transportation (MDOT) began the Beatline Road Planning and Environmental Linkage (PEL) Study to identify the purpose and need for improvements within the Beatline Road study area, determine possible viable concepts for long-term solutions, and recommend concepts that may be advanced seamlessly into a National Environmental Policy Act (NEPA) study.

Beatline Road is a minor arterial that serves as a main connecting route between I-10 and the City of Long Beach on the Mississippi Gulf Coast. Future traffic growth and a lack of connectivity are expected to cause mobility and safety issues to deteriorate to unacceptable levels prior to the design year, 2040.

This document presents an overview of the Beatline Road PEL Study, supplemented by the following attachments documenting the detailed analyses completed throughout the PEL process.

Attachment A provides detailed information on the traffic and safety analyses conducted for existing and future scenarios that provide support for the project's purpose and need.

Attachment B includes the purpose and need statement and provides supporting information for the development of the PEL concepts.

Attachment C supplies detailed information regarding environmental constraints in the study area.

Attachment D provides information on the business and residential property relocations that would result from construction of the proposed concepts.

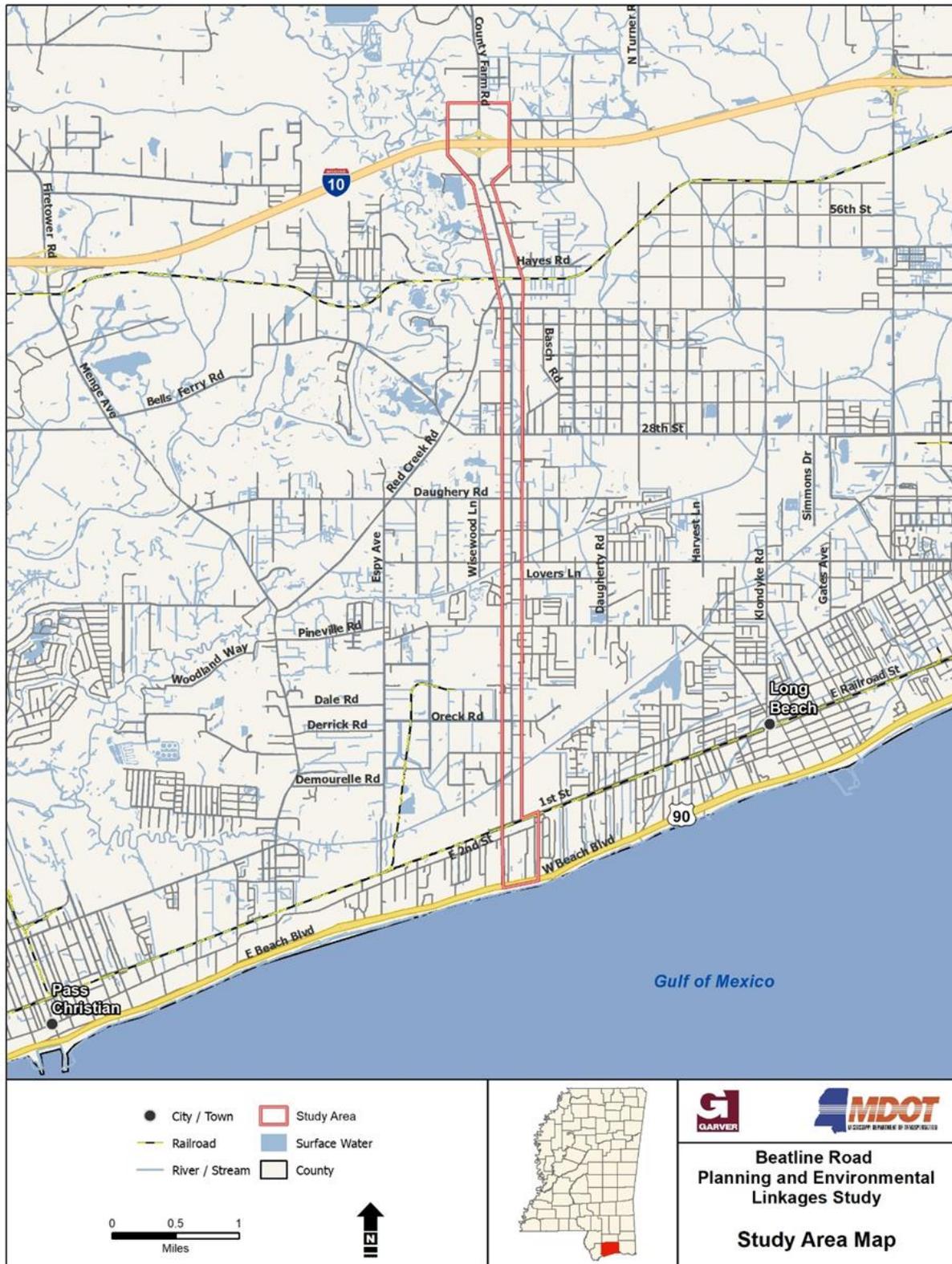
Attachment E describes the development and screening of the proposed concepts, which led to the selection of the PEL recommended concept.

Attachment F is the Beatline Road PEL Questionnaire, which will be utilized by the Federal Highway Administration (FHWA) to determine if an effective PEL process has been followed and if the Beatline Road PEL Study can be used as a resource for future NEPA documentation during future project development.

2.0 Study Area

The proposed Beatline Road PEL study area stretches approximately six miles along existing County Farm Road and Beatline Road between I-10 and US 90 in Long Beach, Mississippi. The study area is shown in **Figure 1**.

Figure 1: Study Area



3.0 Purpose and Need and Study Goals

The Beatline Road PEL Study was conducted in order to identify the issues that exist or are anticipated to develop within the project corridor and to propose a solution that is in line with the project goals and local development plans. Issues were identified based on an evaluation of the infrastructure conditions, existing and future traffic operations, and historical crashes within the study area. Traffic projections through the study design year, 2040, were developed to assist in defining the key traffic issues, as described in **Attachment A – Beatline Road PEL Traffic and Safety Report**.

Based on analysis of the project, the following needs were identified.

The first need identified is the capacity and operations of the corridor. The existing traffic conditions demonstrate a lack of capacity for future growth and traffic operations are anticipated to deteriorate in the future, with heavily congested traffic expected along Beatline Road/County Farm Road and at multiple intersections along this project corridor. The second need identified in the project corridor is the lack sidewalks and/or bike lanes/multi-use lanes needed to improve bicyclist and pedestrian connectivity and safety. The third need found is in reference to the safety of the corridor. A majority of crashes along Beatline/County Farm Road occur at major intersections within the study area due to functional deficiencies of the facility, congestion and lengthy queues. The fourth need identified is in reference to connectivity in the area. Beatline Road/County Farm Road currently terminates at Railroad Street north of US 90. A consistent and improved connection between I-10 and US 90 is needed to serve as a hurricane evacuation route to ensure that the roadway can remain open and traffic can move smoothly during and after an evacuation. It is also needed to facilitate connectivity between the city and waterfront and to better handle heavy trucks traveling along Beatline Road to/from I-10 and US 90. Each of these needs also supports the recommendations and strategies outlined in the Gulf Regional Planning Commission (GRPC) Metropolitan Transportation Plan (MTP) and the City of Long Beach Comprehensive Plan.

Based on these needs, the project purpose is to reduce congestion and improve mobility along the project corridor, provide bicycle and pedestrian facilities along the project corridor, enhance driver safety along the project corridor, and provide a consistent north/south connection of Beatline Road/County Farm Road between I-10 and US 90.

In addition to the purpose and need, other project elements were established to balance transportation and environmental objectives. These goals and objectives provide guidance for the concept development process in that they sharpen the decision framework when two or more concepts meet the purpose and need and other criteria need to be employed for more detailed evaluation.

Goals/Objectives for the proposed project are listed below:

- Enhance mobility through the study area;
- Optimize opportunities for economic development;

- Avoid and/or minimize impacts to the human and natural environment, including historic and archeological resources;
- Minimize conflicts with the CSX Railroad; and
- Enhance freight mobility.

Attachment B - *Beatline Road PEL Purpose and Need Report* includes detailed information on the development of the purpose and need and study goals.

4.0 Environmental Constraints

Environmental resources were examined as part of the Beatline Road PEL Study to establish a baseline context and generally describe the existing conditions within the study area. The environmental constraints were provided to the design engineers for their use in developing alignments for the proposed concepts. The resource information was also utilized during the screening process to broadly assess the potential impacts associated with the build concepts. The existing conditions for the following social, economic and environmental resources located within the study area were analyzed and documented in **Attachment C - *Beatline Road PEL Constraints Report***.

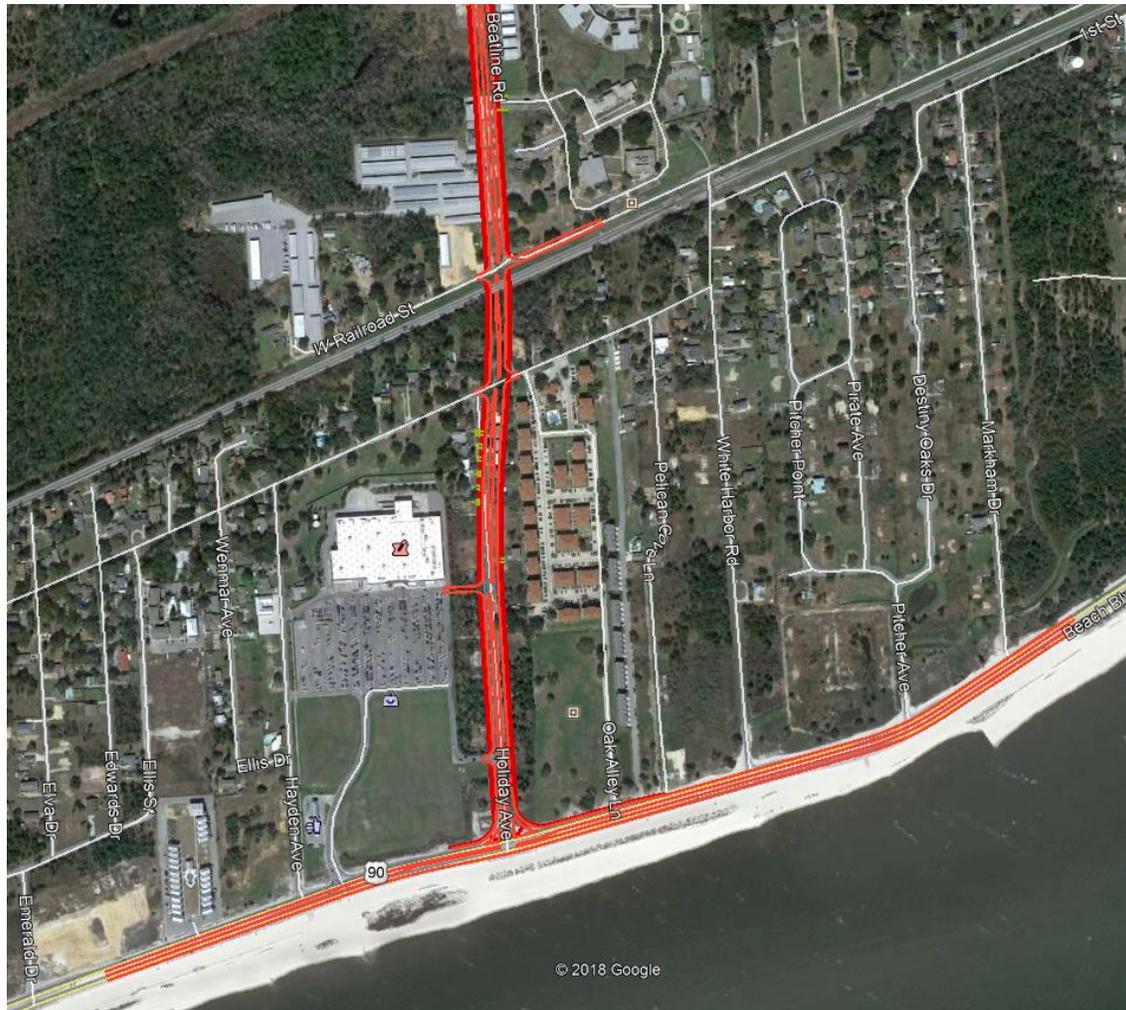
- Businesses
- Residences/Non Business Entities
- Superfund Sites
- Minority and Low Income Populations
- Archeological Sites
- Historic Resources
- Park Land
- Wetlands
- Coastal Management Zones
- Threatened and Endangered Species
- Floodplains/Floodways
- Biological Resources
- Hazardous Materials

5.0 Proposed Concepts

Two build concepts, called the **West** and **East Concepts**, were proposed to address the mobility and safety issues along the corridor. Both build concepts would include the widening of County Farm Road/Beatline Road from a two-lane road to a four-lane divided boulevard with raised medians and bicycle and pedestrian accommodations. The limits for both build concepts are US 90 to the south and I-10 to the north. The differences between the West and East Concepts include intersection concepts along the project corridor and how the proposed improvements extend Beatline Road southward beyond its current terminus at Railroad Street to US 90. Both concepts are described in more detail below.

West Concept: This concept would extend Beatline Road to US 90 using a western alignment along Holiday Avenue. The West Concept would include signalized intersections at the major cross streets along County Farm Road/Beatline Road. The West Concept is located in Long Beach, MS, except for the proposed extension of Beatline Road along Holiday Avenue, which would be located in Pass Christian, MS. The southern portion of the West Concept, where its alignment differs from the East Concept, is shown in **Figure 2**.

Figure 2: West Concept



East Concept: This concept would extend Beatline Road to US 90 using an eastern alignment that ties into US 90 along Pelican Cove Lane (just west of White Harbor Road). The East Concept includes roundabouts at the intersections along Beatline Road where right-of-way and traffic operations allow for this type of intersection control. Roundabouts are proposed where Beatline Road intersects (from south to north) Johnson Road, Pineville Road, Daugherty Road, 28th Street, and Jones Mill Road/Red Creek Road. Other major intersections along the County Farm Road/Beatline Road project corridor are proposed to be signalized as part of the East Concept. The entirety of the East Concept alignment would be located in Long Beach, MS. The southern

- **Level 1, Fatal Flaw Screening** - Fatal flaw criteria were utilized to evaluate and screen the concepts against the purpose and need. In the Level 1 Screening, concepts were given a *pass* or *fail* rating for each of the screening criteria. The concepts that met the purpose and need of the project were advanced to the Level 2 Screening.
- **Level 2, Detailed Evaluation** – The Level 2 Screening employed qualitative and quantitative analyses to compare the concepts against measures associated with the study goals. The Level 2 Screening process identified the concept(s) that best addressed the transportation needs in the Beatline Road study area while minimizing the negative impacts to the surrounding area.

7.0 Level 1 Screening Criteria and Results

Concepts were given a “Pass” or “Fail” rating for each of the criteria, as shown in **Table 1**.

Table 1: Level 1 Screening Matrix

Concept	Criteria				Overall Pass / Fail
	Reduce Congestion / Improve Mobility	Provide Bicycle / Pedestrian	Enhance Driver Safety	Consistent Connection between I-10 and US 90	
No-Build	Fail	Fail	Fail	Fail	Pass
West	Pass	Pass	Pass	Pass	Pass
East	Pass	Pass	Pass	Pass	Pass

The West and East Concepts met the requirements of the purpose and need, and were advanced to the Level 2 Screening. The No-Build Concept did not meet any of the purpose and need criteria, but was advanced to Level 2 as the baseline for concept comparisons in the design year, 2040.

8.0 Level 2 Screening Criteria and Measures

Measure – Planning-Level Cost Estimates

The total cost was estimated by totaling the MDOT planning-level construction cost estimates, right-of-way estimates and utility relocation estimates for each concept, and then adding 20 percent to cover engineering fees and contingencies. A growth rate of 3.2 percent was used to project the cost estimates from the current year to the construction year, 2022.

Measure – Overall Level of Service

Highway Capacity Software and SimTraffic were used to assess overall level of service (LOS) provided by each concept along the entire Beatline Road/County Farm Road corridor in the design year.

Measure – PM Peak Delay per Vehicle

SimTraffic software was used to estimate the average delay for each vehicle traveling from I-10 to US 90 during the PM peak period.

Measure – Anticipated Economic Development

The Level 2 Screening included a qualitative assessment of the ability of each concept to improve economic development along the corridor and in the City of Long Beach.

Measure – Natural and Physical Environmental Impacts

The concepts were evaluated on their potential impact to the surrounding natural and physical environments.

Measure – Displacements (# of Properties Impacted)

The concepts were evaluated according to the total number of businesses, public facilities and residences displaced.

Measure – Displacements (Severity of Impacts)

This measure qualitatively evaluated the severity of the relocations resulting from the construction of each concept. Impacts to the South Mississippi Regional Center, a state-run facility that provides services to citizens with intellectual and other developmental disabilities, were considered more severe than impacts to other businesses. Full details of the property impacts resulting from the construction of the proposed concepts are included in **Attachment D – Beatline Road PEL Relocation Report**.

Measure – Railroad Crossing

The study team qualitatively assessed the geometry and resulting safety of the CSX Railroad crossing.

Measure – Freight Mobility

The study team qualitatively assessed the ability of each concept to accommodate heavy vehicles through the corridor.

9.0 Level 2 Screening Results

The concepts were evaluated against each of the measures listed above, and the evaluation results are shown in **Table 2**.

The scores for each measure were then converted to a scale of 1-5 (with the lower score being better), and then summed to produce the final score for each concept, as shown in **Table 3**.

Table 2: Level 2 Screening Matrix – Raw Scores

Concept	Total Cost (Millions)	Mobility		Optimize Economic Development	Environmental Impacts			Railroad Crossing	Freight Mobility
		2040 Traffic Operations (LOS)	PM Peak Delay per Vehicle (Seconds)		Natural and Physical Environmental Impacts	Displacements			
						Properties Impacted	Severity		
No-Build	\$0	F	225	Very Poor	None	0	None	Very Poor	Very Poor
East	\$127.0	B	61	Excellent	Moderate	81	High	Good	Excellent
West	\$131.4	B	81	Excellent	Moderate	78	Moderate	Good	Excellent

Table 3: Level 2 Screening Matrix - Scaled Scores

Concept	Total Cost (Millions)	Mobility		Optimize Economic Development	Environmental Impacts			Railroad Crossing	Freight Mobility	Score
		2040 Traffic Operations (LOS)	PM Peak Delay per Vehicle (Seconds)		Natural and Physical Environmental Impacts	Displacements				
						Properties Impacted	Severity			
No-Build	1.00	5	5.00	5	1	1.00	1	5	5	29.00
East	4.87	1	2.08	1	3	5.00	4	2	1	23.95
West	5.00	1	2.44	1	3	4.85	3	2	1	23.29

Color Codes: Very Poor Poor Average Good Excellent

The West Concept scored slightly better than the East Concept due to less severe right-of-way impacts and a slightly lower cost. Both Build Concepts scored better than the No-Build. Full details of the development, scoring and screening of concepts is included in **Attachment E – Beatline Road PEL Concept Analysis Report**.

10.0 PEL Recommended Concept

Each Build Concept included specific features that would be beneficial to the area.

- The alignment of the West Concept had less severe right-of-way impacts, which resulted in fewer displacements and completely avoided the South Mississippi Regional Center.
- The roundabout intersections that were evaluated as part of the East Concept delivered better traffic performance resulting in less vehicle delay than the signalized intersections.

A combination of the favorable components of each concept would result in a superior concept moving forward. Therefore, a western alignment with roundabout intersections should be advanced to NEPA as the PEL Recommended Concept. By combining the better features of each concept, the total cost for the preferred concept is slightly lower than either of the original concepts, at \$126,800,000.

11.0 Phased Improvements

The project can be divided into three logical segments of independent utility (SIU), as shown below, to allow for construction in phases as funding becomes available.

- **US 90 to north of Railroad Street** – this segment is crucial to improve heavy vehicle/freight access and connectivity between I-10 and US 90, and is listed in Stage 2 (2021-2030) of the GRPC MTP. The estimated cost is \$15,200,000 for the West Concept.
- **I-10 to Red Creek Road/Jones Mill Road** – This segment will experience increased congestion prior to the design year and is listed in Stage 3 (2031-2040) of the GRPC MTP. The study team recommends that the intersection at Red Creek Road be closed, with traffic re-routed to the improved intersection with Jones Mill Road to provide more spacing between the intersection and the KCS Railroad. The estimated cost is \$22,800,000.
- **Railroad Street to Jones Mill Road** – This segment is the lowest priority and the most expensive, but would complete the needed connectivity between I-10 and US 90. The estimated cost is \$88,800,000.

12.0 PEL Questionnaire

Attachment F – Beatline Road PEL Questionnaire, provides a summary in the format of questions and answers describing the methodology utilized to complete the PEL Study, environmental resources evaluated, and process/issues related to advancing the findings of the PEL Study to the NEPA process.

