Republic Summary

1.0 – Introduction

On January 26, 2017 the Missouri Department of Transportation Multi-Modal Division commissioned CMT to perform a safety study of the BNSF Cherokee Subdivision line from M.P. 251 to M.P. 258 in Greene, Christian, and Lawrence counties. **Figure 1-1** illustrates the overview of the study along the Route 60 corridor from Republic, MO to Aurora, MO. The study was divided up into three different sections as illustrated below. This summary will focus on Section 1 that included the City of Republic, MO.

Figure 1-1
Overall Study Map

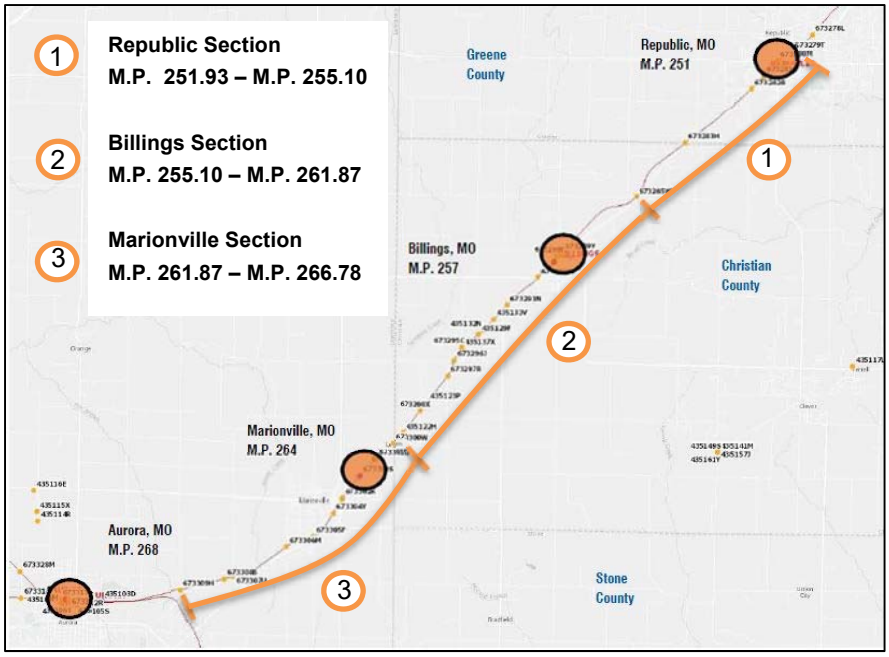


Figure 1-2 Republic Section Crossing Map

All at-grade railroad crossings within the City of Republic, including the surrounding areas were included in this section of the safety study as shown above. In all, ten (10) at-grade railroad crossings were included as part of the Republic section of the study as shown in **Figure 1-2** below.

Additionally, a table with the railroad at-grade crossing existing condition and accident statistics can be seen below in **Figure 1-3**.

MoDOT - BNFS RAILROAD (CHEROKEE SUB-DIVISION FROM M.P. 251 TO M.P. 268)
AT-GRADE RAILROAD CROSSING SUMMARY

	STREET	US DOT #	RR M.P.	WARNING DEVICES	RR SPEED	ROADWAY CLASSIFICATION	ROADWAY SPEED LIMIT	# OF TRAFFIC LANES	CMT ADT	ACCIDENTS	INJURY STATUS	DATE
REPUBLIC	Route MM	673274J	248.09	FL/GATES	50	PRIMARY ARTERIAL	55	2		2	Killed	7/28/1986
											Injured	7/20/1998
	County Road 170	673275R	248.9	FL/GATES	50	MAJOR COLLECTOR	25	2		4	Uninjured	7/21/1979
											Uninjured	7/14/1997
											Uninjured	12/13/1997
											Uninjured	12/4/1996
	County Road 93	673276X	249.52	FL/GATES	45	SECONDARY ARTERIAL	25	2		4	Injured	12/8/1980
											Uninjured	8/21/1986
											Injured	5/12/1990
											Injured	6/8/1990
	MO 174	673277E	250.44	FL/GATES	45	PRIMARY ARTERIAL	45	2		0	-	-
	Hines Street	673278L	250.75	FL/GATES	45	SECONDARY ARTERIAL	20	2		1	Uninjured	1/21/1997
	Hampton Avenue	673279T	251.25	FL/GATES	45	MAJOR COLLECTOR	20	2		1	Uninjured	10/11/1982
	Main Street	673280M	251.63	FL/GATES	40	PRIMARY ARTERIAL	30	2		3	Uninjured	6/25/1977
											Injured	3/22/1979
											Uninjured	9/19/2003
	West Avenue	673281U	251.93	FL/GATES	50	MAJOR COLLECTOR	30	2	1314	1	Injured	9/30/1978
	ONeal Road / Miller Road	673282B	252.24	FL/GATES	50	MAJOR COLLECTOR	30	2	1164	2	Killed	1/30/2003
											Uninjured	2/3/1983
	County Line Road 194	673283H	253.88	FL/GATES	50	LOCAL	45	2	208	4	Uninjured	11/17/1997
											Uninjured	2/27/1994
											Uninjured	2/26/1994
											Uninjured	8/26/1978

Figure 1-3
At-Grade Crossing Summary

2.0 – Jurisdictional Contacts and Limits

The Republic section of the Rail Crossing Safety Study includes crossings within the city limits of Republic, including a few crossings that are outside the city limits. Due to this, multiple different agencies have jurisdictional control of the various crossings in this study area. The Jurisdictional contact information can be found below in **Figure 2-1**. Additionally, **Figure 2-2** shows the crossings throughout the Republic section and the agency with jurisdictional control over them.

Figure 2-1
Jurisdictional Contact Information

Contact Information				
Name	**Agency**	**Title**	**Phone Number**	**Email Address**
David Cameron	City of Republic	City Administrator	417-732-3110	dcameron@republicmo.com
Andrew Nelson	City of Republic	Public Works Director	417-732-3401	anelson@republicmo.com
Connie Moller	City of Republic	Assistant to the City Administrator	417-732-3110	Cmoller@republicmo.com
Rick Artman	Greene County	Highway Department Administrator	417-829-6505	Rartman@greenecountymo.gov
Adam Humphrey	Greene County	Highway Department Assistant Administrator	417-829-6536	ahumphrey@greenecountymo.gov
Andrew Mueller	MoDOT – SW District	Area Engineer	417-895-7685	Andrew.Mueller@modot.mo.gov
Kristi Bachman	MoDOT – SW District	Transportation Project Manager	417-829-8040	Kristi.bachman@modot.mo.gov

Figure 2-2
Jurisdictional Control

At-Grade Crossing Jurisdictional Control			
Crossing	**M.P.**	**DOT#**	**Jurisdiction**
Route MM	248.09	673274J	Missouri Department of Transportation
County Road 170	248.90	673275R	Greene County
County Road 93	249.52	673276X	Greene County
MO 174	250.44	673277E	Missouri Department of Transportation
Hines Street	250.75	673278L	City of Republic
Hampton Avenue	251.25	673279T	City of Republic
Main Street	251.63	673280M	City of Republic
West Avenue	251.93	673281U	City of Republic
O'Neal/Miller Road	252.24	673282B	City of Republic
County Line Road 194	253.88	673283H	Greene County

3.0 – Alternate Analysis

Multiple alternatives were developed as part of the study, many of which were generated by participants during the public work sessions. Feedback from the public engagement process was evaluated and reflected in the development of five (5) different alternatives for analysis. During the study, these alternatives were continually modified based on feedback from the public, stakeholders, and city staff. Additional documentation on the public engagment process can be found in Section 2 of the report. All the alternates were technically evaluated based on geometrics, safety, traffic, and public support. Below is a summary of the different alternatives and the supporting documentation that was performed as part of the alternative analysis. (See **Figure 3-1**)

Figure 3-1
Consolidation
Alternatives

REPUBLIC SECTION AT-GRADE RAILROAD SAFETY STUDY CONSOLIDATION ALTERNATIVES														
Alternative Number	**Route MM**	**County Road 170**	**County Road 93**	**MO 174 (Grade Sep.)**	**Hines St.**	**Hampton Ave.**	**Main St.**	**West Ave.**	**O'Neal/Miller Rd.**	**New Overpass Location**	**County Line Rd. 174**	**Closure Summary**	**Overpass Summary**	**Cost**
1	X (Overpass)	OP	OP	OP	OP	OP	OP	X	OP	N/A	X	3 Total Closures	1 Total Overpass	$6,912,284
2	X (Overpass)	OP	X	OP	OP	OP	OP	OP	OP	N/A	OP	2 Total Closure	1 Total Overpass	$7,565,237
2A	OP	OP	X	OP	OP	OP	OP	OP	OP	N/A	OP	1 Total Closure	0 Total Overpass	$1,309,015
3	OP	OP	OP	OP	OP	OP	OP	OP	OP	N/A	OP	0 Total Closures	0 Total Overpass	$0.00
4	X (Overpass)	OP	X	OP	OP	OP	OP	X	X	Overpass	X	5 Total Closures	2 Total Overpass	$18,548,833

3.1 Alternate Selection

During the Alternate selection process the public voted on their preferred alternate with additional input on the alternates. In Republic, the citizens overwhelmingly supported Alternate #4 as their preferred alternate. Although the public input played a major

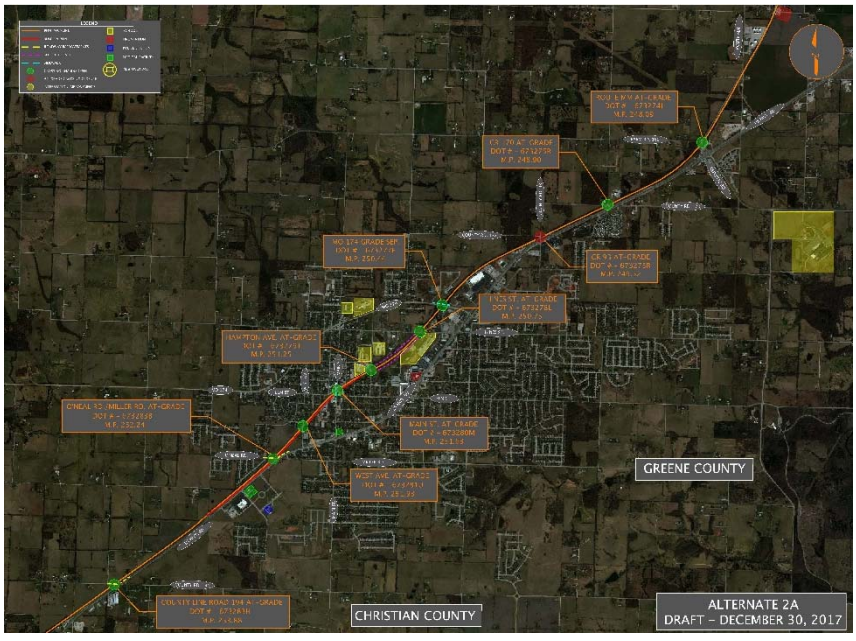
role in determining the final recommendation, each alternative was independenty analyzed to determine which alternatives would provide the largest safety benefit and maintain a positive benefit cost ratio. In order to determine which alternatives provided the largest safety benefit and cost benefit ratio, the existing condition and accident history were both evaluated to determine an existing crash probability.

A proposed crash probability was then developed for each crossing by taking into account the proposed improvements for each alternate. This quantitative approach provided the department with evaluation tools to compare the theoretical safety benefits to the anticipated costs of the improvements. More can be found regarding the cost benefit ratio in **Section 6** of this summary.

In conclusion, Alternate 2A was chosen for a final recommendation to provide safety benefits along the corridor. It is important to note that Alternate 2A was a hybrid of Alternate 2. Alternate 2 called for an overpass at Route MM due to its undesirable geometrics and heavy traffic. The costs associated with this overpass and additional roadway connections reduced the cost benefit ratio enough that it was not ultimately chosen as the recommended alternate. However, it is recommended that the overpass at Route MM be a priority in the future for MoDOT, The City of Republic, and OTO (Ozarks Transportation Organization) to address the poor geometrics and increasing traffic at this crossing.

3.1.1 Alternate for Final Recommendation

Figure 3-2
Alternate 2A



Route MM	County Road 170	County Road 93	MO 174 (Grade Sep.)	Hines St.	Hampton Ave.	Main St.	West Ave.	O'Neal/ Miller Rd.	County Line Rd. 194
OP	OP	X	OP	OP	OP	OP	OP	OP	OP

Alternate 2A provides a significant safety benefit along the BNSF Railroad in the Republic Section.

The preferred alternative recommendation was Alternate 2A since it provides a significant safety benefit due to the closure of County Road 93 as shown in **Figure 3-2.** Other alternatives provided more at-grade closures with additional costs, but the other crossings had such a low crash probability and crash history that the additional costs resulted in lower cost benefit ratios. Additionally, Alternate 2A provides additional safety improvements in the form of security fencing near the schools and additional sidewalk under the MO 174 underpass based on feedback from the public. These additional measures add safety benefit but this additional safety benefit can not be quantified. Additional details for this recommended alternative can be found in Section 4 of the Report.

4.0 - Summary of Improvements – Alternate 2A

Below is a summary of the improvements included in the recommended Alternative 2A. Additional narrative on existing conditions and determining factors that resulted in each of the proposed improvements can be found in Section 1 and Section 4 of the Report.

4.1 **DOT #673274J –** Route MM At-Grade crossing located at M.P. 248.09. No proposed improvements at this crossing or to surrounding roadway system.

4.2 **DOT #673275R –** County Road 170 crossing located at M.P. 248.90. No proposed improvements at this crossing or to surrounding roadway system.

4.3 **DOT #673276X** – County Road 93 At-Grade crossing located at M.P. 249.52. Proposed improvements at this crossing are: Permanent closure of at-grade crossing that include removal of existing crossing.

4.4 **DOT #673277E –** MO 174 Grade Seperated crossing located at M.P. 250.44. Proposed improvements at this crossing are: Sidewalk addition between Christian Health Care of Republic and Lindsey Ave. on the east side of MO 174.

4.5 **DOT #673278L –** Hines St. At-Grade crossing located at M.P. 250.75. Proposed improvements at this crossing are: Security fencing to be placed between Hines & Hampton Ave. crossing on both sides of tracks.

4.6 **DOT #673279T –** Hampton Ave. At-Grade crossing located at M.P. 251.25. Proposed improvements at this crossing are: Security fencing to be placed between Hampton & Hines St. crossing on both sides of tracks.

4.7 **DOT #673280M –** Main St. At-Grade crossing located at M.P. 251.63. Proposed improvements at this crossing are: Sidewalk addition between West & East Elm St. on the west side of Main St across the tracks.

4.8 **DOT #673281U –** West Ave. At-Grade crossing located at M.P. 251.93. No proposed improvements at this crossing or to surrounding roadway system.

4.9 **DOT #673283B** – O'Neal Rd./Miller Rd. At-Grade crossing located at M.P. 252.24. Proposed improvements at this crossing are: Dedicated right turn lane on US Hwy. 60 and a profile adjustment of O'Neal/Miller Rd.

4.10 **DOT #673283H** – County Line Road 194 At-Grade crossing located at M.P 253.88. Proposed improvements at this crossing are: Dedicated right turn lane on US Hwy. 60 and widening of County Line Road 194.

5.0 - Estimated Costs – Alternate 2A

A breakdown of estimated costs for the proposed improvements described in **Section 4.0** above can be seen in **Figure 5-1** below. A detailed breakdown of the costs associated with Alternate 2A is attached in **Appendix A**.

Figure 5-1
Estimated Cost

Alternate 2A Estimated Improvement Costs						
Location	**Railroad**	**Roadway**	**Right of Way**	**Utilities**	**Engineering**	**Total Cost**
Route MM	No Improvements					
County Road 170	No Improvements					
County Road 93	$40,704.00	$0.00	$0.00	$0.00	$0.00	$40,704.00
MO 174 (Grade Sep.)	$0.00	$112,572.00	$0.00	$0.00	$9,000.00	$121,572.00
Hines St. / Hampton Ave.	$0.00	$168,540.00	$0.00	$0.00	$14,000.00	$182,540.00
Main St.	$0.00	$38,160.00	$0.00	$0.00	$3,500	$41,660.00
West Ave.	No Improvements					
O'Neal/Miller Rd.	$0.00	$363,156.00	$0.00	$10,000.00	$29,000.00	$402,156.00
County Line Road 194	$0.00	$276,660.00	$0.00	$10,000.00	$22,500.00	$309,160.00
					Total Improvement Cost	$1,097,792

6.0 – Cost Benefit Analysis

As part of the Railroad Study a cost-benefit analysis was performed to determine which alternative would provide the most benefit. In order to perform a cost benefit analysis, each crossing's safety benefits were determined by comparing the existing crash prediction model versus the proposed crash prediction model. The proposed crash prediction formula considered the proposed improvements (described in Section 4) for each at-grade crossing. The comparison of these two models resulted in a theoretical safety benefit for each at-grade crossing. Based on this information the proposed costs for the improvements were valued against the theortical safety benefit. The cost benefit for each alternative can be seen below in **Figure 6-1**. As shown in the table, the selected Alternate 2A, provided the best benefit-cost ratio of all alternatives evaluated for this section and thus was recommended as the preferred alternate despite being below the preferred value of 1.

Figure 6-1
Cost Benefit Analysis

MoDOT - BNSF RAILROAD (CHEROKEE SUB-DIVISION FROM M.P. 251 TO M.P. 268)																
BENEFIT-COST CROSSING ALTERNATE SUMMARY																
REPUBLIC, MO - GREENE COUNTY																
	IMPROVEMENT COSTS	# CROSSING CLOSURES	# CROSSING UPGRADES		ROUTE MM B/C	CR 170 B/C	CR 93 B/C	MO 174 B/C	HINES ST. B/C	HAMPTON AVE. B/C	MAIN ST.B/C	WEST AVE. B/C	O'NEAL/ MILLER RD. B/C	NEW OVERPASS B/C	COUNTY LINE 194 B/C	TOTAL ALTERNATE COST-BENEFIT
ALT #1	$ 5,577,601.00	2	0		0.10483651	N/A	N/A	N/A	N/A	N/A	N/A	22.1075353	N/A	N/A	6.22853523	**0.233298841**
ALT #2	$ 6,077,560.00	1	1		0.10483651	N/A	0.633616	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0.201617183**
ALT #2A	$ 1,097,792.00	1	0		-	N/A	0.633616	M/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0.633615838**
ALT #3	$ -	0	0		-	-	-	-	-	-	-	-		-	-	-
ALT #4	$ 14,907,921.00	5	0		0.10483651	N/A	0.633616	N/A	N/A	N/A	N/A	N/A	N/A	0.150678639	N/A	**0.148494198**

7.0 – Implemenation Strategy

7.1 Section Priorities

The Republic Section of the Railroad Study contains four (4) separate locations where the proposed improvements are recommended. These areas are listed above in Section 4 and are listed below from North to South:

Project Location No. 1 – County Road 93
Project Location No. 2 – MO 174, Hines, Hampton, & Main St.
Project Location No. 3 – O'Neal/Miller Rd.
Project Location No. 4 – County Line Road 194

It is recommended that all project locations be performed under one contract to minimize disruption to local vehicle and rail traffic. Depending on available funding, if all project locations can not be completed under one construction contract, it is recommended that the incident history be used to determine priorities within this section. Based on this information, the suggested implementation plan is shown in order of theoretical safety benefit:

Project Location No. 1 – County Road 93
Project Location No. 4 – County Line Road 194
Project Location No. 3 – O'Neal/Miller Rd.
Project Location No. 2 - MO 174, Hines, Hampton, & Main St.

It should be mentioned that the Section through Republic is only one of three sections within the overall study limits and additional priorities for implementation will be outlined in the context of the entire study limits in Section 5 of the Report.

7.2 MOU & Agreements

The department has met with all public agencies and the BNSF Railway on the final recommendations for this section of the study and have obtained verbal approval in moving forward with finalizing a memorandum of understanding (MOU) or construction agreement to implement the improvements as presented. There is anticipated to be 1 agreement for the four different project locations that will involve the different parties based on juridictional authorities of adjacent roadways:

MOU / Construction Agreement No. 1 – Project Location 1, 2, 3, and 4

- MoDOT
- BNSF Railway
- Greene County
- City of Republic

MoDOT will serve as the sponsor and the lead agency for the development and coordination of the MOU and Construction Agreements with the Railway and Local Public Agencies.

7.3 Funding Sources & Schedule

Although there are no funds committed for the project implementation at this time, MoDOT is pursuing many different funding sources to complete the recommended improvements along the corridor. Additionally, it is recommended that OTO, MoDOT, and the City of Republic pursure additional funding to implement the Route MM overpass. Opportunities

and partnerships to obtain funding for the project include, but are not limited to the following:

- FRA Grant Dollars
- MoDOT Multi-Modal Department – Rail Safety Funding
- MoDOT SW District
- BNSF Railway

It is not anticipated that any of the local public agencies will contribute funding towards the recommended improvements. However, once funding for the projects have been programmed, detailed design for the recommended improvements will need to be completed and a design and construction schedule should be developed and communicated with all parties for implementation.

7.4 Communication Plan

Communication with the public and receiving local input was vital to the success of the Railroad Safety Study. It is recommended that MoDOT, in partnership with the local public agencies continue to update the public and participating partners on the progress towards implementing the project. A master contact list is located in Section 2 of the report and should be used when final plans and funding are obtained for the improvements.

APPENDIX A
MODOT MULTI-MODAL RAIL CROSSING SAFETY STUDY
REPUBLIC SECTION
Thursday, April 5, 2018
ALTERNATE 2A

	TOTAL
DEMOLITION	**$ 20,500**
Existing Pavement Removal	$ 20,500
STRUCTURAL	**$ -**
Underpass Construction	N/A
ROADWAY	**$ 649,000**
Excavation	$ 28,500
Embankment	$ 85,000
Aggregate Base (4")	$ 30,000
Full Depth Pavement (8")	$ 195,000
Drainage	$ 70,000
Pavement Marking	$ 2,000
Erosion Control	$ 10,000
Sidewalk	$ 40,000
Signing	$ 3,500
Retaining Wall	$ 60,000
Security Fence	$ 125,000
ENVIRONMENTAL MITIGATION	**$ -**
Hazardous Waste Disposal	N/A
RAILROAD CROSSINGS	**$ 30,000**
BNSF RR At-Grade Removal	$ 30,000
Railroad Crossing Gates	N/A
MOBILIZATION	**$ 46,500**
Assume 6% for Mobilization	$ 46,500
MAINTENANCE OF TRAFFIC	**$ 40,000**
Assume Staged Constuction	$ 40,000
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2017 DOLLARS)	**$ 786,000**
PRELIMINARY DESIGN LEVEL CONTINGENCY (20%)	**$ 157,200**
SUB-TOTAL	**$ 943,200**
INFLATION (3% PER YEAR) ASSUMING CONSTRUCTION IN 2019	**$ 56,592**
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2019 DOLLARS)	**$ 999,792**
UTILITIES	**$ 20,000**
Overhead High-Voltage Electrical Relocation	N/A
Potential Underground Gas Relocation	N/A
Potential Underground FO Relocation	$ 20,000
Potential Sanitary Sewer Relocate	N/A
Potential Water Main Relocate	N/A
LAND ACQUISITION	**$ -**
	N/A
ENGINEERING	**$ 78,000**
Phase 2 Design Phase Engineering	$ 78,000
SUB-TOTAL	**$ 98,000**
TOTAL PROGRAM BUDGET (2019 DOLLARS)	**$ 1,097,792**

NOTES:

1. The Opinion of Probable Cost Assumes a Reasonable Schedule for Construction with No Additional Contingencies Estimated for Acceleration.
2. The Opinion of Probable Cost Does not Include any Additional Contingencies for Escalation of Steel and Fuel Costs.

APPENDIX A
MODOT MULTI-MODAL RAIL CROSSING SAFETY STUDY
REPUBLIC SECTION
Thursday, April 5, 2018
COUNTY ROAD 93

	TOTAL
DEMOLITION	**$ -**
Existing Pavement Removal	N/A
STRUCTURAL	**$ -**
Underpass Construction	N/A
ROADWAY	**$ -**
Excavation	N/A
Embankment	N/A
Aggregate Base (4")	N/A
Full Depth Pavement (8")	N/A
Drainage	N/A
Pavement Marking	N/A
Erosion Control	N/A
Signing	N/A
ENVIRONMENTAL MITIGATION	**$ -**
Hazardous Waste Disposal	N/A
RAILROAD CROSSINGS	**$ 30,000**
BNSF RR At-Grade Removal	$ 30,000
Railroad Crossing Gates	N/A
MOBILIZATION	**$ 2,000**
Assume 6% for Mobilization	$ 2,000
MAINTENANCE OF TRAFFIC	**$ -**
Assume Staged Constuction	N/A
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2017 DOLLARS)	**$ 32,000**
PRELIMINARY DESIGN LEVEL CONTINGENCY (20%)	**$ 6,400**
SUB-TOTAL	**$ 38,400**
INFLATION (3% PER YEAR) ASSUMING CONSTRUCTION IN 2019	**$ 2,304**
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2019 DOLLARS)	**$ 40,704**
UTILITIES	**$ -**
Overhead High-Voltage Electrical Relocation	N/A
Potential Underground Gas Relocation	N/A
Potential Underground FO Relocation	N/A
Potential Sanitary Sewer Relocate	N/A
Potential Water Main Relocate	N/A
LAND ACQUISITION	**$ -**
	N/A
ENGINEERING	**$ -**
Phase 2 Design Phase Engineering	N/A
SUB-TOTAL	**$ -**
TOTAL PROGRAM BUDGET (2019 DOLLARS)	**$ 40,704**

NOTES:

1. The Opinion of Probable Cost Assumes a Reasonable Schedule for Construction with No Additional Contingencies Estimated for Acceleration.
2. The Opinion of Probable Cost Does not Include any Additional Contingencies for Escalation of Steel and Fuel Costs.

APPENDIX A
MODOT MULTI-MODAL RAIL CROSSING SAFETY STUDY
REPUBLIC SECTION
Thursday, April 5, 2018
MO 174

	TOTAL
DEMOLITION	**$ -**
Existing Pavement Removal	N/A
STRUCTURAL	**$ -**
Underpass Construction	N/A
ROADWAY	**$ 83,500**
Excavation	$ 3,500
Embankment	N/A
Aggregate Base (4")	N/A
Full Depth Pavement (8")	N/A
Drainage	N/A
Pavement Marking	N/A
Sidewalk	$ 20,000
Retaining Wall	$ 60,000
ENVIRONMENTAL MITIGATION	**$ -**
Hazardous Waste Disposal	N/A
RAILROAD CROSSINGS	**$ -**
BNSF RR At-Grade Removal	N/A
Railroad Crossing Gates	N/A
MOBILIZATION	**$ 5,000**
Assume 6% for Mobilization	$ 5,000
MAINTENANCE OF TRAFFIC	**$ -**
Assume Staged Constuction	N/A
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2017 DOLLARS)	**$ 88,500**
PRELIMINARY DESIGN LEVEL CONTINGENCY (20%)	**$ 17,700**
SUB-TOTAL	**$ 106,200**
INFLATION (3% PER YEAR) ASSUMING CONSTRUCTION IN 2019	**$ 6,372**
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2019 DOLLARS)	**$ 112,572**
UTILITIES	**$ -**
Overhead High-Voltage Electrical Relocation	N/A
Potential Underground Gas Relocation	N/A
Potential Underground FO Relocation	N/A
Potential Sanitary Sewer Relocate	N/A
Potential Water Main Relocate	N/A
LAND ACQUISITION	**$ -**
	N/A
ENGINEERING	**$ 9,000**
Phase 2 Design Phase Engineering	$ 9,000
SUB-TOTAL	**$ 9,000**
TOTAL PROGRAM BUDGET (2019 DOLLARS)	**$ 121,572**

NOTES:

1. The Opinion of Probable Cost Assumes a Reasonable Schedule for Construction with No Additional Contingencies Estimated for Acceleration.
2. The Opinion of Probable Cost Does not Include any Additional Contingencies for Escalation of Steel and Fuel Costs.

APPENDIX A
MODOT MULTI-MODAL RAIL CROSSING SAFETY STUDY
REPUBLIC SECTION
Thursday, April 5, 2018
HINES & HAMPTON

	TOTAL
DEMOLITION	**$ -**
Existing Pavement Removal	N/A
STRUCTURAL	**$ -**
Underpass Construction	N/A
ROADWAY	**$ 125,000**
Excavation	N/A
Embankment	N/A
Aggregate Base (4")	N/A
Full Depth Pavement (8")	N/A
Drainage	N/A
Pavement Marking	N/A
Sidewalk	N/A
Security Fence	$ 125,000
ENVIRONMENTAL MITIGATION	**$ -**
Hazardous Waste Disposal	N/A
RAILROAD CROSSINGS	**$ -**
BNSF RR At-Grade Removal	N/A
Railroad Crossing Gates	N/A
MOBILIZATION	**$ 7,500**
Assume 6% for Mobilization	$ 7,500
MAINTENANCE OF TRAFFIC	**$ -**
Assume Staged Constuction	N/A
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2017 DOLLARS)	**$ 132,500**
PRELIMINARY DESIGN LEVEL CONTINGENCY (20%)	**$ 26,500**
SUB-TOTAL	**$ 159,000**
INFLATION (3% PER YEAR) ASSUMING CONSTRUCTION IN 2019	**$ 9,540**
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2019 DOLLARS)	**$ 168,540**
UTILITIES	**$ -**
Overhead High-Voltage Electrical Relocation	N/A
Potential Underground Gas Relocation	N/A
Potential Underground FO Relocation	N/A
Potential Sanitary Sewer Relocate	N/A
Potential Water Main Relocate	N/A
LAND ACQUISITION	**$ -**
	N/A
ENGINEERING	**$ 14,000**
Phase 2 Design Phase Engineering	$ 14,000
SUB-TOTAL	**$ 14,000**
TOTAL PROGRAM BUDGET (2019 DOLLARS)	**$ 182,540**

NOTES:

1. The Opinion of Probable Cost Assumes a Reasonable Schedule for Construction with No Additional Contingencies Estimated for Acceleration.
2. The Opinion of Probable Cost Does not Include any Additional Contingencies for Escalation of Steel and Fuel Costs.

APPENDIX A
MODOT MULTI-MODAL RAIL CROSSING SAFETY STUDY
REPUBLIC SECTION
Thursday, April 5, 2018
MAIN ST.

	TOTAL
DEMOLITION	**$ 5,000**
Existing Pavement Removal	$ 5,000
STRUCTURAL	**$ -**
Underpass Construction	N/A
ROADWAY	**$ 23,000**
Excavation	$ 2,500
Embankment	N/A
Aggregate Base (4")	N/A
Full Depth Pavement (8")	N/A
Drainage	N/A
Pavement Marking	N/A
Sidewalk	$ 20,000
Signing	$ 500
ENVIRONMENTAL MITIGATION	**$ -**
Hazardous Waste Disposal	N/A
RAILROAD CROSSINGS	**$ -**
BNSF RR At-Grade Removal	N/A
Railroad Crossing Gates	N/A
MOBILIZATION	**$ 2,000**
Assume 6% for Mobilization	$ 2,000
MAINTENANCE OF TRAFFIC	**$ -**
Assume Staged Constuction	N/A
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2017 DOLLARS)	**$ 30,000**
PRELIMINARY DESIGN LEVEL CONTINGENCY (20%)	**$ 6,000**
SUB-TOTAL	**$ 36,000**
INFLATION (3% PER YEAR) ASSUMING CONSTRUCTION IN 2019	**$ 2,160**
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2019 DOLLARS)	**$ 38,160**
UTILITIES	**$ -**
Overhead High-Voltage Electrical Relocation	N/A
Potential Underground Gas Relocation	N/A
Potential Underground FO Relocation	N/A
Potential Sanitary Sewer Relocate	N/A
Potential Water Main Relocate	N/A
LAND ACQUISITION	**$ -**
	N/A
ENGINEERING	**$ 3,500**
Phase 2 Design Phase Engineering	$ 3,500
SUB-TOTAL	**$ 3,500**
TOTAL PROGRAM BUDGET (2019 DOLLARS)	**$ 41,660**

NOTES:

1. The Opinion of Probable Cost Assumes a Reasonable Schedule for Construction with No Additional Contingencies Estimated for Acceleration.
2. The Opinion of Probable Cost Does not Include any Additional Contingencies for Escalation of Steel and Fuel Costs.

APPENDIX A

MODOT MULTI-MODAL RAIL CROSSING SAFETY STUDY
REPUBLIC SECTION
Thursday, April 5, 2018
O'NEAL/MILLER RD.

	TOTAL
DEMOLITION	**$ 5,500**
Existing Pavement Removal	$ 5,500
STRUCTURAL	**$ -**
Underpass Construction	N/A
ROADWAY	**$ 242,500**
Excavation	$ 15,000
Embankment	$ 50,000
Aggregate Base (4")	$ 15,000
Full Depth Pavement (8")	$ 105,000
Drainage	$ 50,000
Pavement Marking	$ 1,000
Erosion Control	$ 5,000
Signing	$ 1,500
ENVIRONMENTAL MITIGATION	**$ -**
Hazardous Waste Disposal	N/A
RAILROAD CROSSINGS	**$ -**
BNSF RR At-Grade Removal	N/A
Railroad Crossing Gates	N/A
MOBILIZATION	**$ 17,500**
Assume 6% for Mobilization	$ 17,500
MAINTENANCE OF TRAFFIC	**$ 20,000**
Assume Staged Constuction	$ 20,000
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2017 DOLLARS)	**$ 285,500**
PRELIMINARY DESIGN LEVEL CONTINGENCY (20%)	**$ 57,100**
SUB-TOTAL	**$ 342,600**
INFLATION (3% PER YEAR) ASSUMING CONSTRUCTION IN 2019	**$ 20,556**
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2019 DOLLARS)	**$ 363,156**
UTILITIES	**$ 10,000**
Overhead High-Voltage Electrical Relocation	N/A
Potential Underground Gas Relocation	N/A
Potential Underground FO Relocation	$ 10,000
Potential Sanitary Sewer Relocate	N/A
Potential Water Main Relocate	N/A
LAND ACQUISITION	**$ -**
	N/A
ENGINEERING	**$ 29,000**
Phase 2 Design Phase Engineering	$ 29,000
SUB-TOTAL	**$ 39,000**
TOTAL PROGRAM BUDGET (2019 DOLLARS)	**$ 402,156**
NOTES:	
1. The Opinion of Probable Cost Assumes a Reasonable Schedule for Construction with No Additional Contingencies Estimated for Acceleration.	
2. The Opinion of Probable Cost Does not Include any Additional Contingencies for Escalation of Steel and Fuel Costs.	

APPENDIX A
MODOT MULTI-MODAL RAIL CROSSING SAFETY STUDY
REPUBLIC SECTION
Thursday, April 5, 2018
COUNTY LINE ROAD 194

	TOTAL
DEMOLITION	**$ 10,000**
Existing Pavement Removal	$ 10,000
STRUCTURAL	**$ -**
Underpass Construction	N/A
ROADWAY	**$ 175,000**
Excavation	$ 7,500
Embankment	$ 35,000
Aggregate Base (4")	$ 15,000
Full Depth Pavement (8")	$ 90,000
Drainage	$ 20,000
Pavement Marking	$ 1,000
Erosion Control	$ 5,000
Signing	$ 1,500
ENVIRONMENTAL MITIGATION	**$ -**
Hazardous Waste Disposal	N/A
RAILROAD CROSSINGS	**$ -**
BNSF RR At-Grade Removal	N/A
Railroad Crossing Gates	N/A
MOBILIZATION	**$ 12,500**
Assume 6% for Mobilization	$ 12,500
MAINTENANCE OF TRAFFIC	**$ 20,000**
Assume Staged Constuction	$ 20,000
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2017 DOLLARS)	**$ 217,500**
PRELIMINARY DESIGN LEVEL CONTINGENCY (20%)	**$ 43,500**
SUB-TOTAL	**$ 261,000**
INFLATION (3% PER YEAR) ASSUMING CONSTRUCTION IN 2019	**$ 15,660**
TOTAL CONSTRUCTION OPINION OF PROBABLE COST (2019 DOLLARS)	**$ 276,660**
UTILITIES	**$ 10,000**
Overhead High-Voltage Electrical Relocation	N/A
Potential Underground Gas Relocation	N/A
Potential Underground FO Relocation	$ 10,000
Potential Sanitary Sewer Relocate	N/A
Potential Water Main Relocate	N/A
LAND ACQUISITION	**$ -**
	N/A
ENGINEERING	**$ 22,500**
Phase 2 Design Phase Engineering	$ 22,500
SUB-TOTAL	**$ 32,500**
TOTAL PROGRAM BUDGET (2019 DOLLARS)	**$ 309,160**
NOTES:	
1. The Opinion of Probable Cost Assumes a Reasonable Schedule for Construction with No Additional Contingencies Estimated for Acceleration.	
2. The Opinion of Probable Cost Does not Include any Additional Contingencies for Escalation of Steel and Fuel Costs.	