$50M Railroad Safety Improvement –
Passenger Rail Corridor Studies

2024 TEAM Conference

March 14, 2024

MoDOT

CMT + HDR
Crawford, Murphy & Tilly

Today's Speakers

Jerica Holtsclaw, PE
Multimodal Operations Director

Chris Ryan, PE
Project Manager

Matt DeMoss, PE
Deputy Project Manager

History

- MoDOT Budget Request – *Fall 2022*
- Governor's Request – *Jan 2023*
- Passenger Rail Corridor Studies Began – *March 2023*
- Passed by Missouri Legislature – *May 2023*
- Passenger Rail Corridor Studies Final – *July 2023*
- Press Conference Kick-off – *Aug 2023*

# Missouri Passenger Rail Corridors

Data Driven Results

- Independent Analysis

- Multiple forms/sources of data
  - Similar data sources as highways

- CMT/HDR
  - Joint Consultant team to deliver Independent, Safety-Focused Analysis

Data Collection is Key!

- MoDOT Rail Crossing Inventory System (RCIS)
- FRA Grade Crossing inventory System (GCIS)
- FRA Accident/Incident Data
- FRA Accident Prediction Model (New ZINB Model)
- Blocked Crossing Reports
- Aerial and Street View Review
- Field Review
- StreetLight Insight Data
- Replica and HERE Routing API
- Census Data (Population Density)

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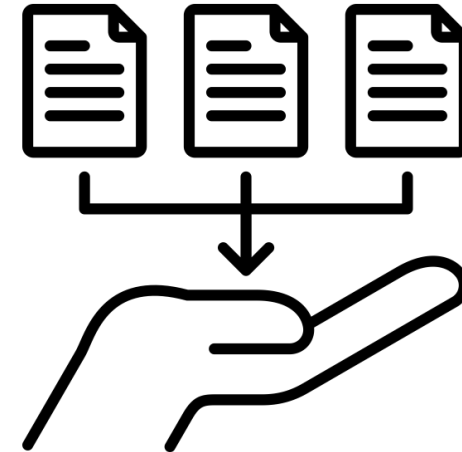
Data Collection:
StreetLight Insight

- StreetLight used to supplement crossing inventory data

- **ADT:** Used to fill in gaps for crossings with missing or old traffic volumes

- **Ped Volumes:** Used to identify high-pedestrian crossings and prioritize potential improvements

- **Trucks:** Used to prioritize vertical profile (humped crossing) improvements

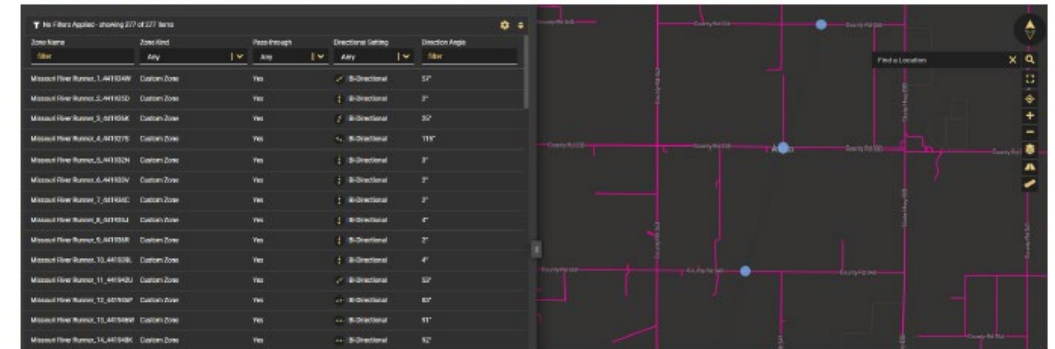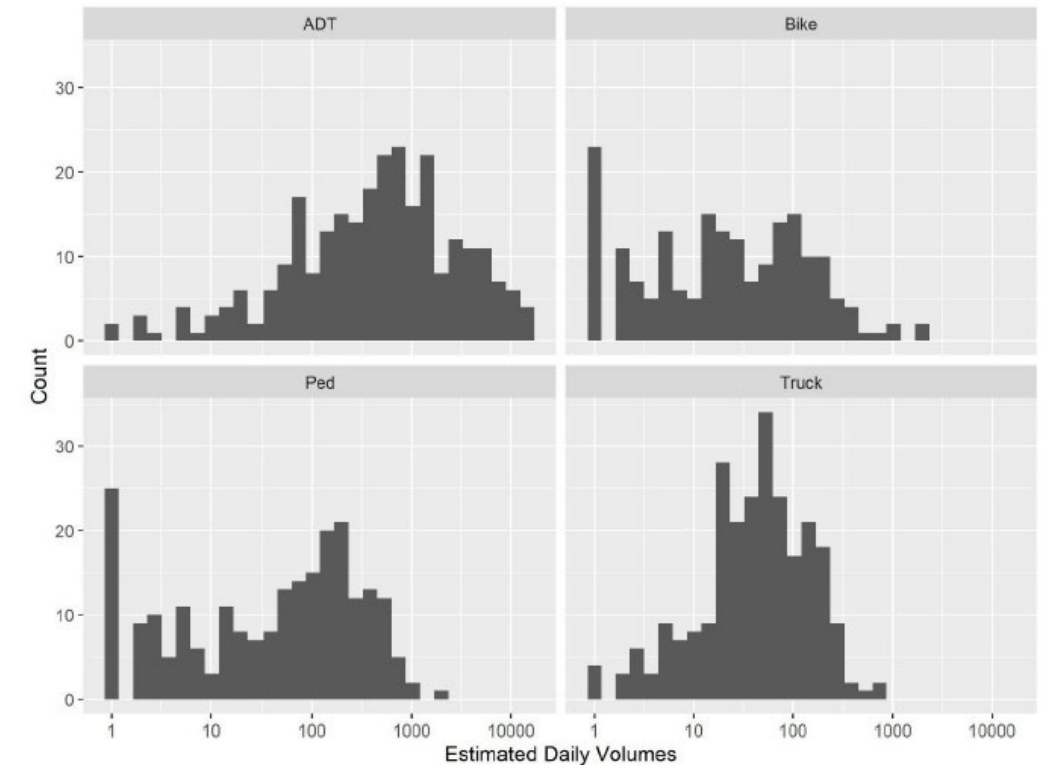Figure 10. StreetLight Insight Interface Example – Zone Definition

Figure 11. Distribution of Estimated Daily Traffic Volumes by Mode

Data Collection:
## *Replica and HERE Routing API*

- Used Replica to estimate origins and destinations of trips using the crossings
- Used HERE Routing API to generate travel path and estimated travel time for OD pairs (sampling used)
- Ran additional routing with crossing closed
- Delay/travel time impacts used to identify good closure candidates
- Delay/travel time will be used in upcoming grant applications
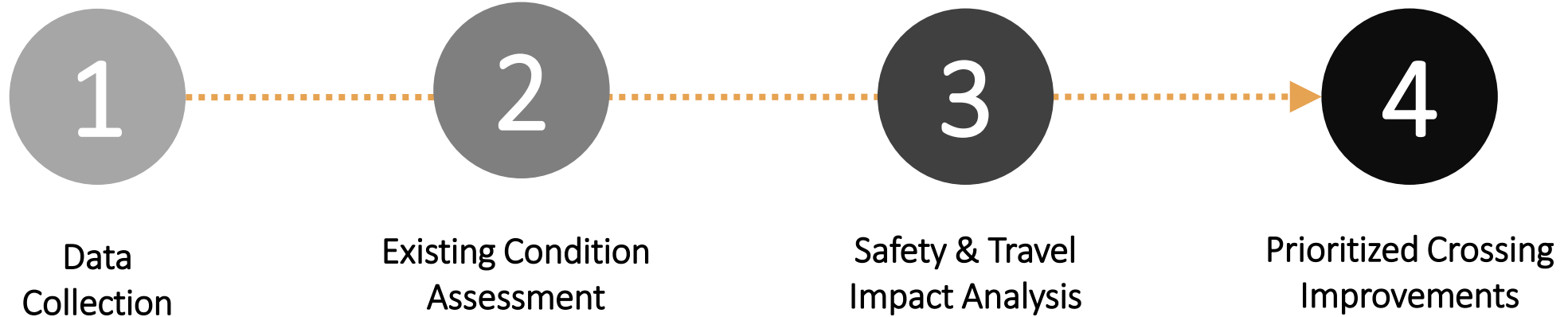
HERE Routing API Output Example

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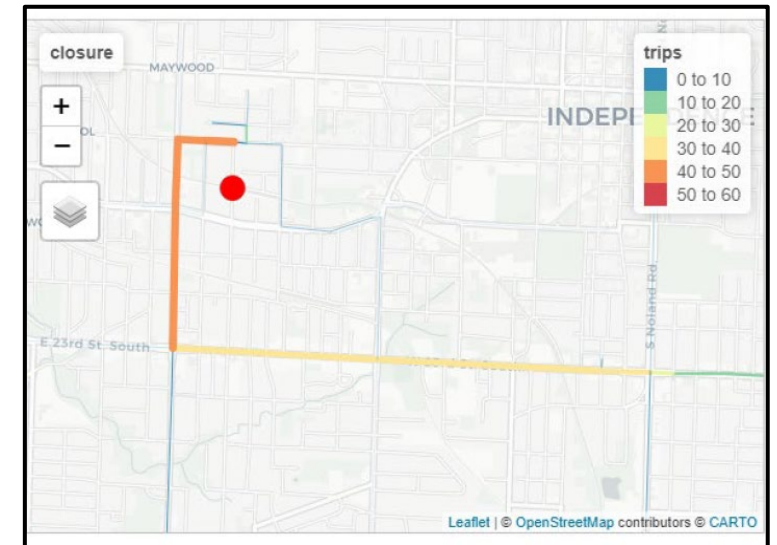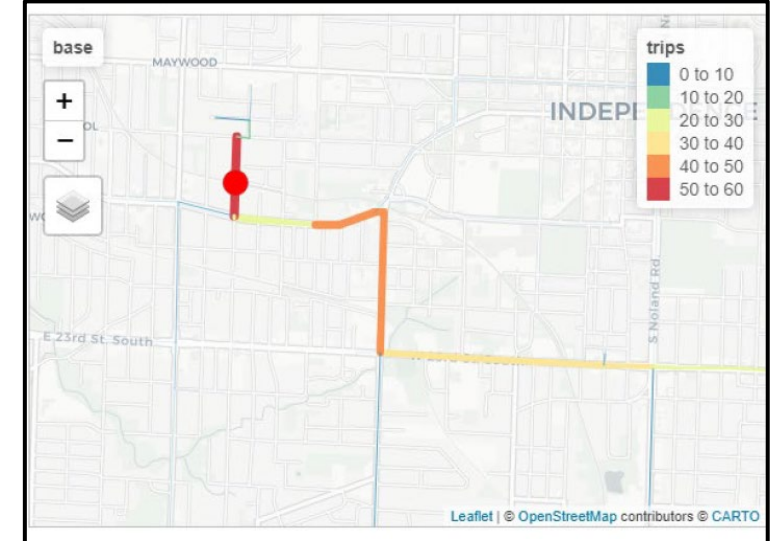
Data Collection:
Field Reviews

- Team used ArcGIS Online and Field Map mobile app to collect photos and field notes

- Allows for quick review of progress and confirmation of photos and notes later in the project
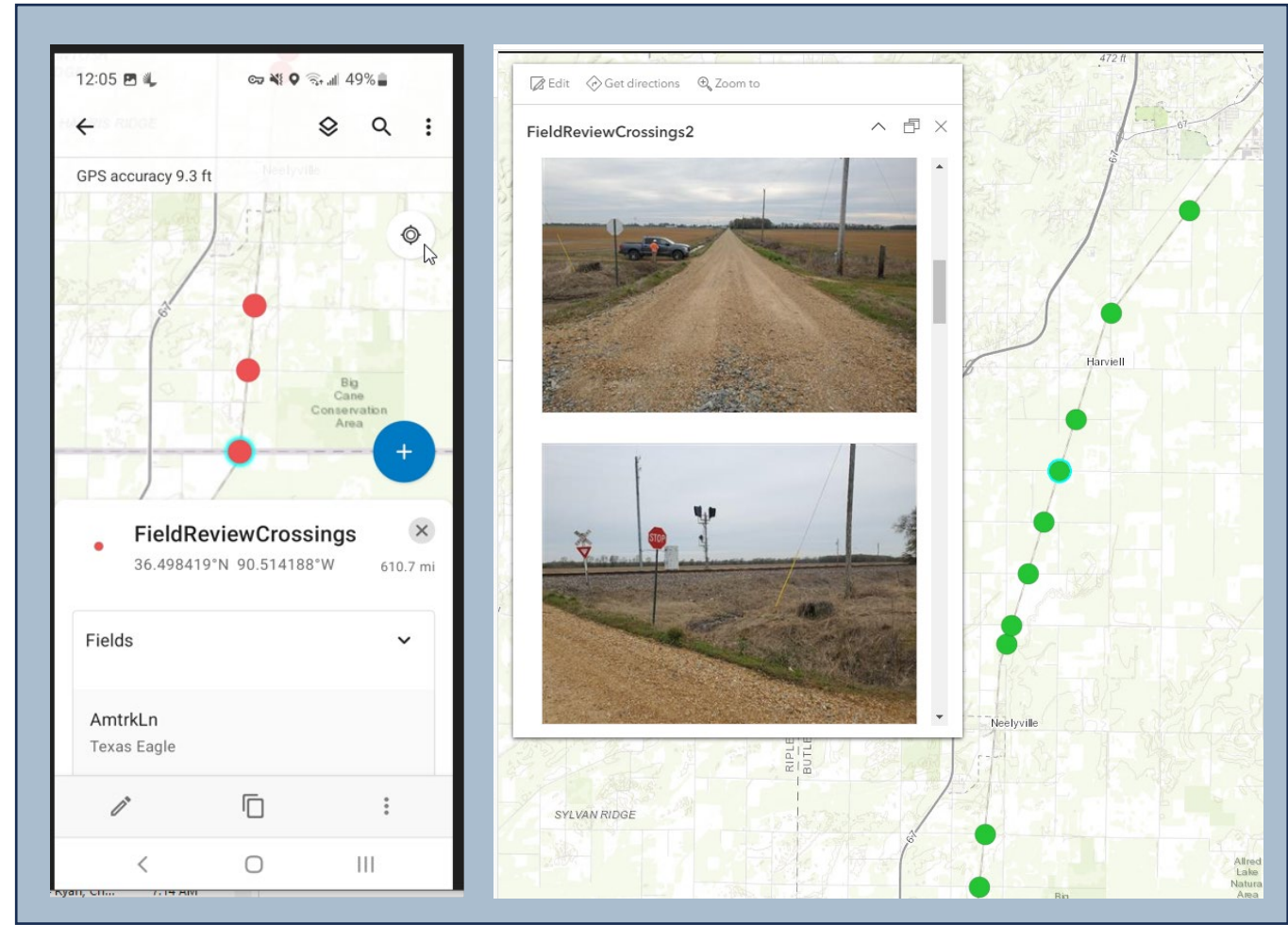
Prioritizing Rail Safety

Phased Implementation

Tier I Improvements

- 0-1 YR Implementation
- Immediate Closures
- Passive Upgrades (Lights & Gates)
- Public to Private Status Change

Tier II Improvements

- 1-1.5 YR Implementation
- Closures of Crossings (Ex. Lights of Gates)
- Signing & Pavement Marking Enhancements
- Added Sidelights/Visibility
- Profile Adjustments

Tier III Improvements

- 1.5-3 YR Implementation
- Grade-Separations
- Closure of Crossings w/ Roadway Improvements
- Cost-Share Improvements
- Crossing Geometry Realignment

Tier IV Improvements

- 3+ YR Implementation
- Grade-Separation (requires additional Feasibility Study)
- Corridor Consolidation (2+ Adjacent Crossings)
- Cost-Share Improvements
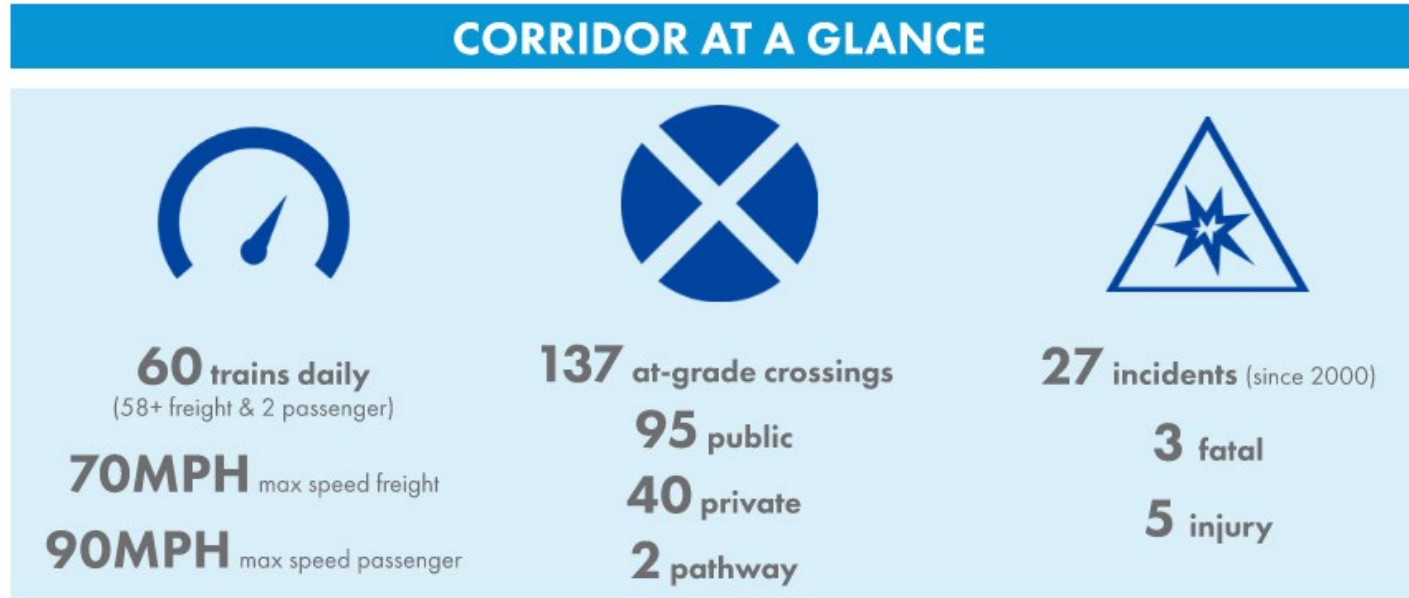- Grant Funding Opp.

NOW → **1 – 1.5 YEARS** → **3 YEARS** → **3 +YEARS**

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SW Chief: Existing Conditions

CORRIDOR AT A GLANCE

60 trains daily
(58+ freight & 2 passenger)

70MPH max speed freight

90MPH max speed passenger

137 at-grade crossings

95 public

40 private

2 pathway

27 incidents (since 2000)

3 fatal

5 injury

72% Active Warning Devices

Existing Corridor Exposure Index Rating:
160,661 → (1,728 Avg. / Crossing)

Existing Corridor Crash Prediction:
3.48 (Annually)
○ 0.51 Fatal / 1.02 Injury

BNSF MARCELINE SUBDIVISION - SW CHIEF PASSENGER LINE TOTAL INCIDENTS (2000-2022)	
TYPE	**# INCIDENTS**
FATAL	3
INJURY	5
PDO	19
TOTAL # INCIDENTS	**27**

*Incidents reported by FRA as of 12/31/2022

1.23 Average Annual Incidents

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SW Chief:
Proposed Improvements

Tier I Improvements

Tier I-IV Corridor Recommendations

Corridor Recommendations*
(Long - Term)

24 Closures

8 Upgrades (lights & gates)

3 Passive Enhancements

3 Crossing Realignments

34 Advanced Warning Enhancements

2 Added Side Flashers

4 ADA Path Improvements

7+ Miles Connector Roads

4 Grade Separations

7 Approach Grade Improvements

*inclusive of Tier I Improvements

Tier I Safety Benefits
- 80% Reduction in Exposure Index
- 12% Reduction in Annual Crash Prediction

Tier I - IV Safety Benefits
- 90% Reduction in Exposure Index
- 23% Reduction in Annual Crash Prediction

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MO River Runner: Existing Conditions

Assessing Today's Corridor
(existing conditions)

Missouri River Runner

277 mile corridor
12 local counties
39 road jurisdictions

15-34 daily freight trains
4 daily passenger trains
79 mph max speed

168 public at-grade crossings
6 passive
162 active

MO River Runner:
Proposed Improvements

15 Active Warning Device Modifications

121 Advance Warning Flashing Signs (AWFS)

25 Closure/ Consolidation

2 Grade Separation or Study

3 Public-to-Private Conversions

23 Roadway Modification

2 Security Gates

174 Signage and Pavement Markings

106 Street Lighting

14 Other

Texas Eagle: Existing Conditions

Assessing Today's Corridor
(existing conditions)

185 mile corridor

7 local counties

23 road jurisdictions

3-21 daily freight trains

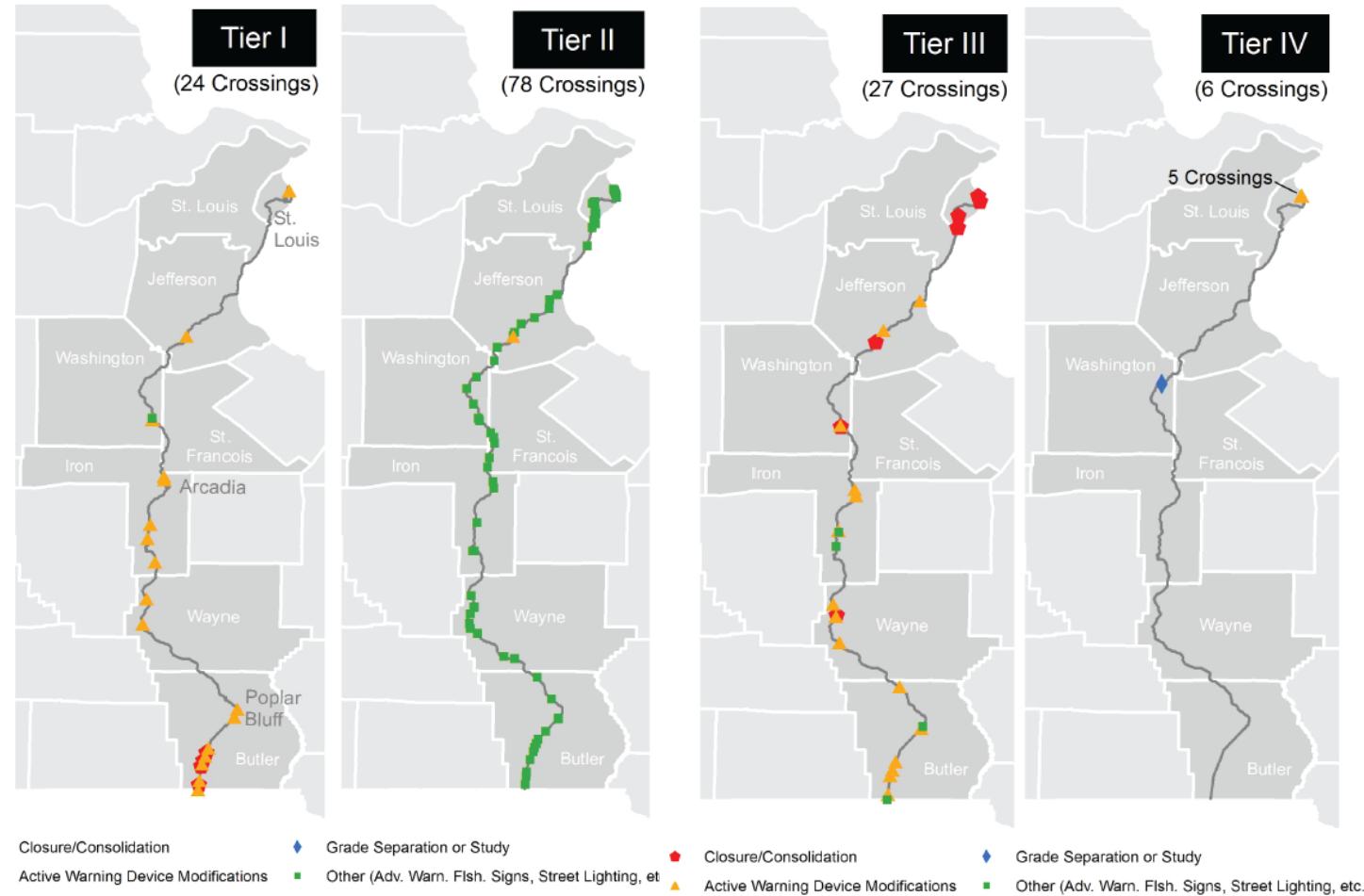**2** daily passenger trains

75 mph max speed

98 public at-grade crossings

25 passive

73 active

Texas Eagle

Texas Eagle: Proposed Improvements

Enhancing Safety on Missouri's Passenger Rail Corridors
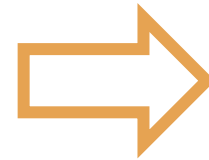
$18.5M
ESTIMATED COST
(TIER I)

Q&A

Questions?