Oregon Rail Crossing Action Plan

Stakeholder Meeting 2

September 25, 2018
Wifi Password

Network: odot-guest
Password: Swallowtail
Welcome!

- Project Management Team
- Purpose of Today’s Meeting
- Agenda
- Introductions
- Parking Lot
Charter
Charter Overview

- Treat each other, staff and guests (if any) with respect
- Listen carefully, seek to understand each other
- Everyone participates
- Focus on the purpose and help stick to the agenda
- Discuss constructively
- Seek to find unity and common ground
- Minimize distractions during the meeting
The Role of the State Action Plan

Currently

- ODOT selects appropriate devices (Rail unit) and provides crash analysis (Transportation Data)
- Examines licensing, training, education programs and coordinates enforcement (DMV, Safety Division) in separate programs

- This plan seeks to bring these together
- Stakeholders play an important role in crossing safety improvements
- Your input is important for this plan
Schedule & Key Milestones
Oregon Department of Transportation
Rail Crossing Action Plan

Project Schedule

Jan – Apr 2018
- Develop Plan purpose & need
- Data Assessment
- Obtain supplemental data

Apr – Jun 2018
- Data analysis
- Assess incident factors
- Stakeholder input
- Finalize Plan goals

Jul – Aug 2018
- Develop crossing selection criteria
- Testing
- QA/QC
- Revisions

Sept 2018
- Evaluate improvement options
- Stakeholder input
- Begin Plan document

Oct – Dec 2018
- Finalize Plan document
- Submit to FRA for approval
Last Meeting Highlights

• Data Discussion
• Contributing Factors
• Plan Objectives
Last Meeting Highlights - Data

• Data Analysis – Incidents 2008-2017
  – Physical
  – Temporal
  – Environment
  – Behavioral
Last Meeting Highlights - Data

- Data Analysis – Incidents 2008-2017
  - Physical
  - Temporal
  - Environment
  - Behavioral
    - Where
    - Railroad
    - Incident Rate
Last Meeting Highlights - Data

• Data Analysis – Incidents 2008-2017
  – Physical
  – Temporal
    o Time of day
    o Day of the week
  – Environment
  – Behavioral
    o Time of year
Last Meeting Highlights - Data

• Data Analysis – Incidents 2008-2017
  – Physical
  – Temporal
  – Environment
  – Behavioral
    o Weather
    o Other factors
Last Meeting Highlights - Data

• Data Analysis – Incidents 2008-2017
  – Physical
  – Temporal
  – Environment
  – Behavioral
    o Driver characteristics
    o Driver behavior
    o Situation
Last Meeting Highlights - Factors

• Contributing Factors
  – Risky behavior (15)
  – Population /Demographics: (4)
  – Distraction (12)
  – Inactive Rail—Expectations (6)
  – Changes in Traffic Volumes (11)
  – Lack of education/outreach (12)
  – Rail Operational Context (2)

• Contributing Factors
  – Lack of Transportation investment (0)
  – Time of Day/Seasonal (1)
  – Crossing Configuration (# of tracks, geometry) (12)
  – Connectivity: (2)
  – Land Use/Development: (9)
  – Vehicle Type (4)
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Plan Objectives
Plan Objectives - Revised

• Balance safety with quality of life
• Apply engineering solutions for improvements
• Coordinate and collaborate with railroads, road authorities and other stakeholders to improve rail crossing safety
• Strengthen education and outreach about rail crossing safety
• Leverage opportunities for rail crossing improvements
• Reduce number of rail crossings
• Strengthen enforcement of illegal and dangerous behavior near rail crossings
Overview Rail Crossing Incidents (follow-up)
A Word About This Data

- Sources include FRA, ODOT Rail Division, ODOT Transportation Data Section, Oregon State Rail Plan
- TriMet incidents not included
- Suicides excluded
- Some information is missing
Additional Steps

- Removed confirmed suicide incidents
- Analyzed multi-incident crossings
- Other miscellaneous data cleanup
Oregon Annual Incidents

Annual Crossing Incidents

0 2 4 6 8 10 12 14 16 18 20

129 total incidents
Oregon Annual Incidents

Rail Crossing Incidents

Number of Incidents


Total, Injury, Fatality
Oregon Incidents - More Info

- 2 crossings since closed
- 4 crossings have seen improvements
- 11 crossings are under study or programmed for funds
- 9 suicides removed from data going forward
  - 8 categorized at “pedestrians”
  - 1 categorized as “pickup” or PV
  - 2 of our multi-incident locations
Oregon Incidents - Updated

Oregon Incidents Severity

- Fatality: 26 (20%)
- Injury only: 22 (17%)
- Property or no damage: 81 (63%)

Incident Severity (suicide excluded)

- Fatality: 17 (14%)
- Injury only: 22 (18%)
- Property or no damage: 81 (68%)
Oregon Incidents - Updated

Number of Fatalities

16 (52%)
13 (42%)
2 (6%)

Number of Fatalities (suicide excluded)

8 (36%)
12 (55%)
2 (9%)
Follow-up Info

- Crossing intersection angle
- AADT
- Road speed
- Train speed
- Number of tracks
- Number of lanes
- Sidewalk or bike lane present
Crossing Incidents

- Years analyzed 2008-2017
- No TriMet Max (6 incidents excluded)
- Public crossings only
- Reported incidents only
- “Near Misses” not included
Intersection Angle
Crossing Intersection Angle

Crossing Angle at Crossings with Incidents

- 10, 10%: 10
- 37, 35%: 37
- 38, 36%: 38
- 17, 16%: 17
- 3, 3%: 3

Crossing Angle at Oregon Crossings

- 139, 8%: 139
- 887, 48%: 887
- 436, 23%: 436
- 342, 18%: 342
- 63, 3%: 63
- 96-135
- 46-84
- <=45
- 136-160
- 85-95
Crossing Intersection Angle - Example
Annual Average Daily Traffic
ADDT - Incident Locations

AADT at Crossings with Incidents

- <500: 38 incidents
- 501-1000: 11 incidents
- 1001-5000: 36 incidents
- 5001-10000: 26 incidents
- 10001-20000: 6 incidents
- >20000: 8 incidents
ADDTC - All Crossings

AADT at Oregon Crossings

Number of Crossings

Number of crossings:
- <500
- 501-1000
- 1001-5000
- 5001-10000
- 10001-20000
- >20000

Number of Crossings

0 100 200 300 400 500 600 700 800
ADDT - All Crossings

AADT Incident Locations

- 5, 4% (87, 5%)
- 24, 21% (37, 32%)
- 24, 21% (37, 32%)
- 11, 9% (179, 28%)
- 31, 27% (484, 28%)
- 8, 7% (742, 42%)

AADT All Crossings

- <500: 742, 42%
- 501-1000: 87, 5%
- 1001-5000: 31, 2%
- 5001-10000: 226, 13%
- 10001-2000: 484, 28%
- >20000: 179, 10%

Additional note: The AADT (Average Annual Daily Traffic) data is categorized based on traffic volume, with each category representing a certain percentage of the total incidents. The pie charts illustrate the distribution of incidents across different traffic volume ranges, highlighting the most prevalent traffic volumes associated with rail crossing incidents.
Train Speed
Train Speed

Train Speed at Crossings with Incidents

- >70
- 61-70
- 51-60
- 41-50
- 31-40
- 21-30
- 11-20
- <10

Number of incidents

Oregon Department of Transportation
Rail Crossing Action Plan
Roadway Speed
Posted Travel Speed

Road Speed at Crossings with Incidents (MPH)

- 0, 0%
- 13, 11%
- 20, 17%
- 19, 16%
- 52, 45%

- 20 or less
- 21-30
- 31-40
- 41-50
- 51-60
- 61-70
Safe Stopping Distance - Incident Crossing

Safe Stopping Distance (ft) - Incident Locations

- 0, 0% (4 ft, 4%)
- 5, 4%
- 8, 7%
- 23, 20%
- 62, 54%
- 13, 11%
- <100
- 101-200
- 201-300
- 301-400
- 401-500
- 501-600
- >600

Oregon Department of Transportation
Rail Crossing Action Plan
Travel Lanes

Number of Travel lanes at Crossings with Incidents

Number of travel lanes

Number of incidents
Tracks
Number of Tracks

Number of Tracks at Crossings with Incident

- Number of tracks: 1
- Number of incidents: 90
Number of Tracks at Crossings in Oregon

Number of Tracks

Number of crossings

- 0 tracks: 1 crossing
- 1 track: 1400 crossings
- 2 tracks: 0 crossings
- 3 tracks: 0 crossings
- 4 tracks: 0 crossings
- 5 tracks: 0 crossings
- 6 tracks: 0 crossings

Number of tracks
Multiple Incident Locations
Multiple Incident Locations

Incident Occurrence at Crossings (number of incidents)

- 80, 67% (One Time)
- 40, 33% (Repeat)
Multiple Incident Locations

Incident Occurrence at Crossings – number of crossings

- 101, 84% (One Time)
- 19, 16% (Repeat)
Multiple Incident Locations

Incident Severity at Repeat Locations

- 22, 48%
- 13, 28%
- 11, 24%

Fatal
Injury
Property/None
Multiple Incident Locations

Intersection Angle at Repeat Locations

- <=45: 2 incidents
- 46-84: 10 incidents
- 85-95: 4 incidents
- 96-135: 1 incident
- 136-160: 1 incident
Multiple Incident Locations

Number of Lanes at Repeat Locations

- Number of Incidents
- Number of Lanes

Graph shows the number of incidents at different numbers of lanes at repeat locations.
Multiple Incident Locations

Number of Tracks at Repeat Locations

- Number of incidents
- Number of Lanes

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7+

Graph showing the number of tracks at repeat locations with the highest number having one track.
Multiple Incident Locations

Traveler Mode

Number of incidents

Explore the data graphically to understand the distribution of incidents by traveler mode. The chart highlights Car and Ped as the modes with the highest number of incidents.
Multiple Incident Locations

- 20 locations had 2 or more incidents
  - 2 had 3 reported incidents: Pendleton and Umatilla
  - 1 has been closed; 4 have been upgraded
  - 3 had “severe” angles
  - 1 is documented with 9 travel lanes (Beaverton)
Oregon Rail Crossing Incidents - Conclusions about Multi-incident Locations

• Activity – 2 suicides, 2 stalled vehicles, went around gates
• Conditions – 2 weather related
• Locations
• Upgrades / closures since
  – 1 Closure
  – 4 crossing upgraded (Donald, Woodburn, Pendleton, Umatilla)
Oregon Rail Crossing Incidents - Conclusions from Additional Data

- Correlation between angle and incidents
- Pedestrian fatalities large portion
- Posted speed – lower speeds stronger correlation
- AADT – correlation with higher AADT
Oregon Rail Crossing Incidents - Overall Conclusions

• What are the key issues in Oregon impacting crossing safety
Putting the Pieces Together

• Report Outline
  – Current system
  – Rail Incidents – history and last 10 year
  – Key Trends and Analysis
  – Objectives
  – Strategies
  – Examples and Tools
Break
Strategy Development
Defining the Key Terms

- **Vision** – The future we want to arrive at (defined in the OTP, Rail Plan and TSAP)
- **Goal** – Refines the vision, provides more description of the future
- **Objectives** – Describe how we can arrive at the goal (we did this last time)
- **Strategy** – Specific things to do to implement the objectives
- **Action** – Sub-level of strategies - provide the most explicit detail of what to do to achieve the objectives – not likely to be in this Plan
Defining the Key Terms

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Plan Strategies Development
Strategies - Highlights from Other States

- Utah –
  - Risk based assessment
  - Developed pedestrian crossing guidance

- Minnesota –
  - Crude oil routes prioritization
  - Established an expert panel for funding process
  - Used a factor that coupled AADT and devices (a vs p) and established thresholds
Strategies - Highlights from Other States

• Nevada -
  – Factor for truck volumes due to the nature of crashes

• California
  – Improved funding prioritization with near miss info

• Georgia
  – Coordinates with school district for crossing usage reporting and prioritization
Strategy Development Process

Data Collection and Analysis
- Assessed Data for Key Factors and Trends

Identified key areas of concern, gaps and issues

Developed Our Plan Objectives
- Looked to our TSAP for Emphasis Areas

Categorized into Topic Areas

Develop Plan Strategies
<table>
<thead>
<tr>
<th>Focus Area</th>
<th>Plan Objective</th>
<th>TSAP FA</th>
<th>Issue</th>
<th>Strategies</th>
<th>Notes/Actions</th>
<th>RS Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Behavior</td>
<td>Apply engineering solutions for improvements</td>
<td>Roadway Design</td>
<td>Difficulty in designing safe and cost-effective solutions</td>
<td>Develop a toolkit of countermeasures and design options such as extended gate arms, additional guardrails, etc.</td>
<td></td>
<td>9/26/18 Focus on Training and Outreach</td>
</tr>
<tr>
<td>Driver Behavior</td>
<td>Apply engineering solutions for improvements</td>
<td>Improved System</td>
<td>Difficult to access and maintain</td>
<td>Evaluate current signage and visibility for high-risk crossings with multiple tracks</td>
<td>Explore options beyond number of tracks</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Increase number of safety barriers and signage</td>
<td>Private crossings with related incidents at intersections for improvement updating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Increase safety barriers and signage</td>
<td>Explore options for improvement</td>
<td>Options may include improving existing materials on signage, adding additional warning signs, etc.</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Increase safety barriers and signage</td>
<td>Work with local road authorities to install additional warning signs at intersections</td>
<td>Determine criteria to identify impacted crossings</td>
<td>Need to discuss this one more.</td>
</tr>
<tr>
<td>Engineering</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Signal/ day/night at the adequate on the lateral edge</td>
<td>Explore options for improved illumination</td>
<td>Consider LED upgrades and other options</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Increased number of severe and minor crashes</td>
<td>Establish crossing condition criteria that is then used for further investigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering (Change to Funding?)</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Increase in number of severe and minor crashes</td>
<td>Develop an identification process for rough crossings and prioritize for improvement</td>
<td>Identify changes with high crossing-related incidents</td>
<td>Need to first develop a funding source for crossing surface projects. Our current funding is not available for surface projects.</td>
</tr>
<tr>
<td>Funding Allocation</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Climate impacts on safety</td>
<td>Establish an Interagency/Intermodal Planning Committee to match priority funds for grade separation projects</td>
<td>Work with FRA to evaluate system needs and prioritize projects</td>
<td></td>
</tr>
<tr>
<td>Multimodal Users</td>
<td>Apply engineering solutions for improvements</td>
<td>Infrastructure</td>
<td>Increase safety barriers and signage</td>
<td>Review and prioritize multimodal surfaces for improvement techniques</td>
<td>Investigate best practices for options</td>
<td>Need to first develop a funding source for</td>
</tr>
</tbody>
</table>
Strategies - Oregon

Influencing Driver Behavior
Decisions
Physical design
Safety crossing

ODOT Process and Sharing
Training
Data Sharing
Coordination with jurisdictions
Strategies - Oregon

Influencing Driver Behavior
Decisions
Physical design
Safety crossing

ODOT Process and Sharing
Training
Data Sharing
Coordination with jurisdictions
Strategies - Influencing Driver Behavior

• Topic Areas
  – Multimodal Users
  – Driver Behavior
  – Physical Characteristics
Strategies - Oregon

Influencing Driver Behavior
Decisions
Physical design
Safety crossing

ODOT Process and Sharing
Training
Data Sharing
Coordination with jurisdictions
Strategies - Process and Sharing

- Topic Areas
  - Coordination and Collaboration
  - Funding
  - Training and Outreach
**Strategies - Oregon**

- Handout discussion – Questions to Consider
  - Do the strategies mirror the themes we’ve discussed?
  - Are there any broad themes missing?
  - Goal – make sure strategies capture important needs and ideas
Strategy Review and Discussion

For Consideration and Discussion

• Do the draft strategies adequately set the stage for addressing crossing safety issues?
• Are you aware of successful or unsuccessful strategy efforts?

•
•
•
•
Crossing Improvement Prioritization
Funding

• ODOT Rail Crossing Funding
  – 3 Primary Categories
    • Dedicated Funding for Crossing Upgrades
      – State Highway Funds - $300,000 annually
      – Section 130 funds - $3,000,000 annually
        » 50% required to be used for warning devices
        » 10% non-fed match required
    – Grant Opportunity
      » FHWA/FRA
      » requires ODOT state match
Funding Prioritization - Dedicated Funds

• Current Process
  – JACQUE – creates a 200% list
  – Regional staff input and local jurisdiction coordination
  – 150% list established
  – On-site diagnostics with stakeholders
  – Consideration of other factors
    • Region / local request
  – Final Decision: Rail Crossing Safety Manager
Funding Prioritization - Draft Recommendations

Identifying critical crossings for improvements

HI (AADT, angle, multimodal crossing, crash history & severity etc)
+
RP (population, bus, hazmat, freight, etc)
+
MI (leverage, prior upgrades, etc)
Funding Prioritization

• JAQUE – which considerations should supplement the formula?

• RI- which route types are important?

• MI – other factors to consider?
Next Steps

• Parking Lot

• Synthesize what we heard today

• Final Plan Early 2019
For More Information

- FHWA Rail Crossing Program Overview
  https://safety.fhwa.dot.gov/hsip/xings/

- FRA Highway-Rail Grade Crossings Overview
  https://www.fra.dot.gov/Page/P0156

- ODOT Rail and Public Transit Division
  https://www.oregon.gov/ODOT/RPTD

- ODOT Planning Unit
  https://www.oregon.gov/ODOT/Planning/Pages/SPR.aspx
Thank you!

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