Ohio Rail Grade Crossing Pilot Study

August 2020 Update
Develop a methodology to evaluate rail-road grade crossings in Ohio and produce an adaptive capacity tool (and resulting score) that assesses at-grade crossing importance, redundancy, and overall adaptability.
Study Overview

Phase 1 Inputs

7. Identify Pilot Areas

8. Develop/Test Adaptive Capacity Assessment Tool

9. Test and Validate Methodology in Pilot Areas

10. Final Report
### Adaptive Capacity Score Methodology

#### Adaptive Capacity Score

<table>
<thead>
<tr>
<th>Public Importance</th>
<th>Redundancy</th>
<th>Delay to Road Users</th>
<th>Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Motorized Road users</td>
<td>Proximity to Grade-Separated Facility</td>
<td>Rail Traffic Volume (Day Trains)</td>
<td>PUCO/ODOT Grade Crossing Hazard Index</td>
</tr>
<tr>
<td>Road Type (Functional Class)</td>
<td>Road Demand (AADT)</td>
<td>Proximity to Signals, Sidings and Yards</td>
<td></td>
</tr>
<tr>
<td>Facility Proximity to Crossing</td>
<td>Community Cohesion</td>
<td>Road Demand (AADT)</td>
<td></td>
</tr>
<tr>
<td>For Community</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road Demand (AADT)</td>
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</tbody>
</table>

For EMS/Fire Services

For Community
## Adaptive Capacity Score Output

**Identifiers**

<table>
<thead>
<tr>
<th>CROSSING</th>
<th>COUNTY</th>
<th>CITY</th>
<th>ROUTE</th>
<th>STREET</th>
<th>OPERATOR</th>
<th>MOTORIZED ACS</th>
<th>PUBLIC IMPORTANCE</th>
<th>REDUNDANCY</th>
<th>DELAY TO ROAD USERS</th>
<th>SAFETY</th>
<th>NON-MOTORIZED ACS</th>
<th>TRUCK ACS</th>
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What’s Next

• Final Stakeholder Workshop
• Final Report
• Final Evaluation Tool & User Manual
• Develop metrics to compare ACS outputs across a set of crossings (city/county/rail corridor/statewide)
• Incorporate ACS output into evaluation of potential projects
Contact Information

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Megan.McClory@dot.ohio.gov
(614) 644-0289
Annex: Adaptive Capacity Score Methodology

### Adaptive Capacity Score

#### Public Importance
- For Motorized Road users
  - Road Type (Functional Class)
  - Road Demand (AADT)
- For EMS/Fire Services
  - Facility Proximity to Crossing
- For Community
  - Community Cohesion

#### Redundancy
- Proximity to Grade-Separated Facility
- Proximity to Grade-Separated Facility
- Rail Traffic Volume (Day Trains)
- Road Demand (AADT)

#### Delay to Road Users
- Road Demand (AADT)
- Road Demand (AADT)

#### Safety
- Proximity to Signals, Sidings and Yards
- PUCO/ODOT Grade Crossing Hazard Index
Annex: Adaptive Capacity Score Methodology

Public Importance

For Motorized Road Users
\[ \times w_{M}^{+} \]
- Road Type
  - Functional Class of a road
- Road Demand
  - Average Annual Daily Traffic (AADT)

For EMS/Fire Services
\[ \times w_{E}^{+} \]
- Facility Proximity to Crossing
  - Inverse of the Distance to Hospitals / Fire Stations

For Community
\[ \times w_{C} \]
- Community Cohesion
  - Percentage of population split by rail line

Legend:
- Component
- Sub-Component
- Performance Category
- Performance Measure

Adaptive Capacity Score

- Public Importance
- Redundancy
- Delay to Road Users
- Safety
- Proximity to Grade Separated Facility
- Road Demand (AADT)
- For Motorized Road Users
- For EMS/Fire Services
- For Community

Motorized Road Users
To be included in the calculation of the Adaptive Capacity Score for Motorized Road Users only
## Annex: Adaptive Capacity Score Methodology

### Redundancy

<table>
<thead>
<tr>
<th>Proximity to Grade-Sep. Facility</th>
<th>Road Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to Closest Grade-Sep. Crossing</td>
<td>Average Annual Daily Traffic (AADT)</td>
</tr>
</tbody>
</table>

\[
\text{Adaptive Capacity Score} = \text{Proximity to Grade-Sep. Facility} \times \text{Road Demand} \times \text{Distance to Closest Grade-Sep. Crossing} \times \text{Average Annual Daily Traffic (AADT)}
\]

### Legend:

- **Component**
- **Sub-Component**
- **Performance Category**
- **Performance Measure**

### Adaptive Capacity Score

- **Public Importance**
  - For Motorized Road Users
  - For EMS/Fire Services
  - For Community
  - Road Type (Functional Class)
  - Facility Proximity to Crossing
  - Community Cohesion
- **Redundancy**
  - Proximity to Grade-Sep. Facility
- **Delay to Road Users**
  - Rail Traffic, Including Train
  - Road Demand (AADT)
- **Safety**
  - Road Demand (AADT)
Annex: Adaptive Capacity Score Methodology

Delay to Road Users

Rail Traffic Volume
- Number of Day Trains

Proximity to Signals, Sidings and Yards
- Inverse distance to closest rail signal, yard or siding

Road Demand
- Average Annual Daily Traffic (AADT)

Legend:

Component
- Public Importance
- Redundancy
- Delay to Road Users
- Safety

Sub-Component
- For Motorized Road users
- For EMS/Fire Services
- For Community
- Proximity to Grade Separated Facility
- Rail Traffic Volume (Day Trains)
- Proximity to Signals, Sidings and Yards

Performance Category
- Rail Type (Functional Class)
- Facility Proximity to Crossing
- Community Cohesion
- Road Demand (AADT)
- Proximity to Signals, Sidings and Yards

Performance Measure
- Road Demand (AADT)
Annex: Adaptive Capacity Score Methodology

Safety

PUCO/ODOT Grade Crossing Hazard Index

PUCO/ODOT Hazard Index

Legend:

Component
Sub-Component
Performance Category
Performance Measure

Adaptive Capacity Score

Public Importance

Refundancy
Delay to Road Users
Safety

Road Type (Functional Class)
Facility Proximity to Crossing
Community Cohesion
Property to Grade Separated Facility
Rail Traffic Volume (Day Trains)
Proximity to Signals, Sidings and Yards
Rail Demand (AADT)

PUCO/ODOT Grade Crossing Hazard Index