Practical Interface Opportunities Between Safety & Asset Management Systems

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A simple, philosophical summary:

Assets in poor condition can result in increased safety risk
Catastrophic Examples

- Feb 2007 Virgin Trains Grayrigg Derailment (Faulty Switch)
  - 1 fatality
  - 88 injuries

- Jun 2009 WMATA Red Line Collision (Faulty Track Circuit)
  - 9 fatalities
  - 80 injuries

- Jul 2013 SNCF Brétigny-sur-Orge Derailment (Faulty Tracks)
  - 7 fatalities
  - 192 injuries
The Need for a Broader Focus on All Modes of Public Transit

While rail incidents grab headlines, Bus modes experience higher overall incident rates:

<table>
<thead>
<tr>
<th></th>
<th>Events*</th>
<th>Fatalities*</th>
<th>Injuries*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td>21.9</td>
<td>1.4</td>
<td>14.4</td>
</tr>
<tr>
<td>Bus</td>
<td>85.0</td>
<td>1.9</td>
<td>148.6</td>
</tr>
</tbody>
</table>

* Per 100 million Unlinked Passenger Trips, 2009 - 2013

Source: National Public Transportation Safety Plan, v. 1.0

The nexus goes beyond just asset condition...
A Simplified View of These Data-Driven Management Systems

Safety Management

- Annual Safety Targets
- Hazards
- Hazard Risks & Performance
- Needs to Deliver Safety Targets

Asset Management

- Annual Asset Targets
- Assets
- Asset Risks & Performance
- Needs to Deliver Asset Targets

Prioritization

Analysis

Inventory

Targets

Policies, Plans, and Capital and Operating Projects
A Foundation for the Nexus

• Ongoing dialogue between the agency’s safety & asset management leaders on each of the following nexus opportunities

• How do we define “Safety Critical Asset”?

A working definition:

A Transit Asset, sub-system, or component whose failure may cause serious injury or death to human beings, loss or severe damage to property, or environmental harm. Criticality will be relatively designated by asset type, on a 1-5 scale, with “1” representing the smallest consequences of asset failure, and “5” representing the largest consequences of asset failure. An asset given a criticality score of “4” or above will be categorically considered Safety Critical.
Practical Interface Opportunity #1: Asset Inventory

How should inventories be modified to maximize utility in the SMS?

- *Designate criticality score by asset type?*
- *Indicate any associated safety risk assessments that have been completed?*
- *Indicate obsolete equipment and/or parts?*
Practical Interface Opportunity #2: Condition Assessment

• How should condition of safety critical assets ("4" and above) be assessed?
  – Age-based? Performance-based? Physical Inspection?
  – How frequently?
  – By whom?

• What kind of change in condition that should trigger a formal safety risk assessment?
How should a formal safety risk assessment inform investment prioritization?

− How can decision support tools like TERM Lite reflect the weight of formally-assessed safety risks?

− How can safety risk mitigations be “bundled” with other related capital projects for time and cost efficiency?
Practical Interface Opportunity #4: Lifecycle Management

Given resource constraints, what synergistic safety and asset management activities should take place at each lifecycle phase?

− In the asset acquisition phase (planning, design, procurement, and construction)?
− In the O&M phase?
− In the Overhaul/Rehab phase?
− In the asset disposal phase?
Practical Interface Opportunity #5: Competencies and Training

• How are competencies determined and managed with respect to the nexus?
  – How to we modify job descriptions?
  – Do we hire new or train existing employees on these competencies?

• How should training programs be structured to reflect the nexus of safety and asset management?
  – Which existing training programs can be modified?
  – Which new training programs need to be developed for both initial and refresher purposes?
  – How do we prioritize the modification/creation of training programs?
Practical Interface Opportunity #6: Technology

- What technologies are currently used for safety and asset management?

- What technology enhancements or acquisitions are needed in the future?

- How can these enhancements and acquisitions reflect the interface opportunities identified through previous meetings?
Thank you

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