Integrating Safety Into Transportation Planning

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Steps in Transportation Planning

Understanding the Problem

Vision

Economic Development

Mobility and Accessibility

Environmental Quality

Goals and Objectives

System Operations

Performance Measures

Other Sources for Project Ideas

Alternative Improvement Strategies

Data

Analysis Methods

Evaluation

Implementation of Strategies

Short- (3-5 year) Range Program

Long-Range Plan

Policies
Operations strategies
Infrastructure projects
Studies
Regulations
Education and awareness
Enforcement
Financing strategies
Partnerships
Collaborative undertakings
Where do safety considerations fit into transportation planning and decision-making?
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- Safety Part of Criteria Set

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- Safety Strategies Included

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Steps in Transportation Planning

1. Vision
   - Economic Development
   - Mobility and Accessibility
   - Environmental Quality

2. Goals and Objectives
   - System Operations
   - Performance Measures
   - Alternative Improvement Strategies
   - Evaluation
   - Data
   - Analysis Methods

3. Other Sources for Project Ideas
   - Policies
   - Operations strategies
   - Infrastructure projects
   - Studies
   - Regulations
   - Education and awareness
   - Enforcement
   - Financing strategies
   - Partnerships
   - Collaborative undertakings

4. Implementation of Strategies
   - Safety Explicitly Part of Project Implementation
   - Safety Projects Programmed

5. Short- (3-5 year) Range Program

6. Long-Range Plan
   - Safety Integrated within Plan
Steps in Transportation Planning

Continuous Monitoring of Safety in Operations

System Operations

Goals and Objectives

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Steps in Transportation Planning

Goals and Objectives
- Continuous Monitoring of Safety in Operations
- Safety Performance Measures
- Safety Stated in Goals
- Safety Included in Vision

Performance Measures
- System Operations
- Safety Strategies Considered
- Safety Stated in Goals
- Safety Included in Analysis
- Safety Data Continuously Collected

Alternative Improvement Strategies
- Other Sources for Project Ideas
- Safety Part of Criteria set
- Safety Data Continuously Collected
- Safety Included in Analysis

Evaluation
- Short- (3-5 year) Range Program
- Long-Range Plan
- Policies
  - Operations strategies
  - Infrastructure projects
  - Studies
- Regulations
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- Financing strategies
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Implementation of Strategies
- Safety Explicitly Part of Project Implementation
- Safety Integrated within Plan
- Safety Strategies Included

Collaboration with safety stakeholders and the public
Understanding the Problem
# SEMCOG: High-risk Populations

<table>
<thead>
<tr>
<th>Population</th>
<th>Region</th>
<th>U.S.*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teenagers</strong></td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>(9% of driving age population/ 5% nationally)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(17% in fatal crashes /14% nationally)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(19% in incapacitating injury crashes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Elderly (65+)</strong></td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>(9% of driving age population/ 13% nationally)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11% in fatal crashes/13% nationally)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9% in incapacitating injury crashes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Male drivers</strong></td>
<td>79%</td>
<td>60%</td>
</tr>
<tr>
<td><em>(Compared to 58% for females 1.7 times more likely to be in fatal crash/ 1.4 nationally)</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Safety Costs versus Congestion Costs, Atlanta Region, 2001

Congestion Cost: $2.021 billion
Safety Cost: $3.314 billion

For Kansas City, 2002.....

Congestion Cost: $215 million
Safety Cost: $1.305 billion
Most Frequent Crash Locations: 1998 to 2000
Central View

Frequency of crashes
- Less than 25
- 25 - 49
- 50 - 74
- 75 - 99
- 100 or more

Freeway
Arterial
Water
Counties
Metropolitan Houston Safety
Crashes and VMT: 1999-2001
N=15,251 Road Segments

Number of crashes vs. Daily vehicle miles Traveled
# Jurisdictional Comparisons

## Serious Crash Risk

(Serious Crashes per 100 Million VMT)

<table>
<thead>
<tr>
<th>City</th>
<th>Serious Crash Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearland</td>
<td>378</td>
</tr>
<tr>
<td>Galveston</td>
<td>337</td>
</tr>
<tr>
<td>Baytown</td>
<td>334</td>
</tr>
<tr>
<td>Rosenberg</td>
<td>320</td>
</tr>
<tr>
<td>Pasadena</td>
<td>290</td>
</tr>
<tr>
<td>Conroe</td>
<td>247</td>
</tr>
<tr>
<td>Houston</td>
<td>231</td>
</tr>
<tr>
<td>Texas City</td>
<td>211</td>
</tr>
<tr>
<td>Sugar Land</td>
<td>192</td>
</tr>
<tr>
<td>Region</td>
<td>204</td>
</tr>
<tr>
<td>State of Texas</td>
<td>149</td>
</tr>
</tbody>
</table>
Safety on Kirby Drive: 1998 to 2000
Location of Crashes

Crash location
Freeways
Kirby Dr
Arterials
Street

0 3 Miles
HOV Multiple Crash Locations 1999-2001
Number of Crashes

Number of crashes
1 2 3 4

Hov facility: 2000
Freeways: 2000
Water
Region
Major Crash Hot Spots in Central Houston: 1998-2000
Location of Hot Spots with 78 or More Crashes
Major Crash Hot Spots: 1999-2001
Mid-Town Houston

Legend
- Crashes 1999 to 2001
- Freeway
- Street
- Major crash hot spots

0 1 Mile
East End Safety:
Crash Locations and Hot Spots with 10 or More Crashes: 1998-2000
High Risk Locations on Kirby Drive: 1998 to 2000
Crashes Per 100 Million Vehicle Miles Traveled
The Southeast Michigan Council of Governments
It Just Makes Sense

- High cost of crashes
- Liability to state and local governments
- Changing trends
- Complements traditional transportation planning
- Low-cost/high-benefit improvements
SEMCOG LRP Safety Goals and Objectives

- Promote a safe and secure transportation system
- Reduce traffic crashes
- Increase safety for transit riders
- Address roadway incidents
- Develop pedestrian friendly communities
- Assist local communities in defining safety needs
Crash Data Analysis

• Start with state police crash data
• Identify high-crash locations
  – Frequency
  – Rate
  – Equivalent Property Damage Only (EPDO)
  – Relative Severity Index (RSI)
  – Crash Probability Index (CPI)
• Examine crash types
• Identify solutions/options
• Perform cost/benefit analysis
Crash Data Analysis, *continued*

- Use GIS (combining crash with other transportation planning data)
  - Road geometrics (width, configuration)
  - Traffic volumes
  - Congestion
  - Land use
  - Pavement conditions
  - Census
Elderly Crashes and Population

- Fatal
- Injury
- Property Damage Only
SEMCOG Safety Tools used by Local Governments

- SEMCOG Traffic Safety Manual
- SEMCOG Data Management Tool
Seven Mile at Ryan in Detroit
Seven Mile at Ryan in Detroit
## Before and After Collision Data
### Seven Mile at Ryan in Detroit

<table>
<thead>
<tr>
<th>Type</th>
<th>Before</th>
<th>After</th>
<th>% Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear End</td>
<td>14</td>
<td>9</td>
<td>36%</td>
</tr>
<tr>
<td>Angle</td>
<td>20</td>
<td>5</td>
<td>75%</td>
</tr>
<tr>
<td>Sideswipe</td>
<td>13</td>
<td>3</td>
<td>77%</td>
</tr>
<tr>
<td>LTHO</td>
<td>22</td>
<td>8</td>
<td>64%</td>
</tr>
<tr>
<td>Other</td>
<td>39</td>
<td>9</td>
<td>77%</td>
</tr>
<tr>
<td><strong>Total Crashes</strong></td>
<td><strong>71</strong></td>
<td><strong>34</strong></td>
<td><strong>52%</strong></td>
</tr>
<tr>
<td><strong>Total Injuries</strong></td>
<td><strong>19</strong></td>
<td><strong>5</strong></td>
<td><strong>74%</strong></td>
</tr>
</tbody>
</table>
Pedestrian Safety Countermeasures
Warren at Cass in Detroit
SEMCOG Crash Map (Note: 1 Chip = 5 Crashes)

Map Type:
3 Dimensional

Chip to Crash Ratio:
1 Chip = 5 Crashes

From:
1997

To:
2002

Radius:
150

Redraw Crash Map

Crash Severity
2D
3D
- Fatal
- A-Level
- B-Level
- C-Level
- PDO

One symbol may represent more than one actual crash
Addressing Local Needs

• Special studies
  – Toward Walkable Communities in Southeast Michigan
  – Elderly Mobility and Safety Task Force
  – OHSP Engineering Assistance Grants

• Red-Light-Running Task Force
  – Michigan “Stop on Red” Coalition

• Michigan Deer Crash Coalition

• AAA Michigan Road Improvement Demonstration Program
Red-Light-Running Crashes
continued
2002 Southeast Michigan Crash Clock

- Crash every 3 minutes
- Someone injured in crash every 9.6 minutes
- Someone killed every 19.7 hours
- Alcohol-involved crash every 1.4 hours
  - Someone killed in alcohol-involved crash every 2.5 days
- Vehicle-deer crash every 1.4 hours
SEMCOG Safety Results

- Integrated safety into overall transportation program
- Programmed and implemented safety projects using STP funds
- Increased sensitivity of the public and media to safety issues
- Increased use of traffic and safety partners
Incident Management Task Forces in the Delaware Valley

Safety Conscious Planning Peer Exchange

May 2005
Task Forces in DVRPC’s Region

- I-295/I-76/NJ 42 in New Jersey
- I-76/I-476 in Pennsylvania
- I-95 in Philadelphia
IM Task Force Purpose

- Improve Coordinated IM Response
- Foster Interaction Among IM Stakeholders
- Identify and Address Critical IM Needs
- Give Other Organizational Perspectives
I-295/I-76/NJ 42 Stakeholders

**Police Departments**
- Barrington Borough
- Bellmawr Borough
- Brooklawn Borough
- Camden City
- Delaware River Port Authority
- Deptford Township
- Gloucester City
- Haddon Heights Borough
- Mount Ephraim
- NJ State Police – Bellmawr Barracks
- NJ State Police – Incident Management Unit
- NJ Transit Police
- Runnemede Borough
- Westville

**Other Agencies**
- Camden County Communications
- Cross County Connection TMA
- DRPA Traffic Management Center
- Delaware Valley Regional Planning Commission
- Federal Highway Administration
- Garden State Towman’s Association
- Gloucester County Communications
- NJDOT – Traffic Operations and Maintenance Divisions

**Fire, Ambulance & EMS Departments**
- Barrington Borough
- Bellmawr Borough
- Bellmawr Park
- Blackwood
- Blenheim
- Brooklawn Borough
- Camden
- Cherry Hill
- Chews Landing
- Deptford Township
- Gloucester City
- Gloucester Township
- Haddon Heights Borough
- Haddonfield
- Mount Ephraim
- Lambs Terrace
- Runnemede Borough
- University of Medicine & Dentistry of NJ - EMS
- Westville
Task Force Activities

• Quarterly Meetings

• Elected Chairperson

• Rotating Venue

• Develop Action Plan
  – Ramp Designation Signs
  – Response Boxes
  – Policy and Procedures Manual
  – Training
DVRPC Support Services

- Mapping
- Training
- Contact List
- Website
- Meeting Coordination
- Nextel Phones
DVRPC IM Training

• 8 IM Courses in Last 4 Years
  – NHI Incident Management (3)
  – I-95 Incident Management (2)
  – NJDOT/NJSP Incident Management Workshop
  – Highway Safety for Emergency Services

• Regional Incident Management Conference
In sum….

• There are many safety-related participants (each having their own processes and procedures) that can play a critical role in safety conscious planning

• Transportation planning is one of these processes that, because of its focus and who is involved, can have a significant impact in both the short- and long-term

• MPO’s have a critical role to play in enhancing safety of the transportation system
In sum....

- This role is found throughout the planning process, and can involve infrastructure, operations, enforcement, education, etc.
- Collaboration with others is the key to success