On A Collision Course?
Smart Growth and Traffic Safety
Speakers

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Speakers

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INTRODUCTION:
1. Basic facts about traffic safety
2. General policy implications
Traffic Safety in the U.S.
Classification of Accidents

- Fatal Crashes ..............................................30,707
- Injury Crashes .............................................1,517,000
- Property Damage Only Crashes ........3,957,000
  TOTAL .......................................................5,505,000
Your Probability...

... of dying in a traffic accident: 0.001%

... of being injured in a traffic accident: 0.722%
US Traffic Fatality Rate/HMVM

SEAT BELT LAWS
- Required: Federal – Jan 1, 1968
- Use – New York – 1984
- Use – 2009 – all but Vermont

Source: NHTSA, FHWA
US Traffic Fatality Rate/HMVM

AIR BAGS
Ford – 1971
Chevy – 1973
Federal Req/Driver – 1989
Federal Req/Pass - 1998

Source: NHTSA, FHWA
“Changes in highway infrastructure between 1984 and 1997 have not reduced traffic fatalities and injuries, and have even had the effect of increasing total fatalities and injuries.

Other factors, primarily changes in the demographic age mix of the population, increased seat belt usage, and improvements in medical technology are responsible for the downward trend in fatal accidents.”

Noland, R. B. 2001, Transportation Research Board
Traffic Safety Factors: 1960 - 2010

SAFER:
- Seatbelts
- Airbags
- Emergency Services
- Drunk Driving Laws
- Child Restraints

LESS SAFE
- Wider lanes
- More lanes
- Right turns on red
- Two-way left-turn lanes
- Higher speeds

The net improvement in safety is due to factors other than roadway design.
Traffic accidents are the leading cause of unintentional injury death in children age 1 - 4

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor vehicle accidents</td>
<td>31%</td>
</tr>
<tr>
<td>Drowning</td>
<td>27%</td>
</tr>
<tr>
<td>Fires &amp; burns</td>
<td>14%</td>
</tr>
<tr>
<td>Falls</td>
<td>2%</td>
</tr>
<tr>
<td>Suffocation</td>
<td>8%</td>
</tr>
<tr>
<td>Poisoning</td>
<td>2%</td>
</tr>
<tr>
<td>Other injuries</td>
<td>15%</td>
</tr>
</tbody>
</table>

Source: CDC National Vital Statistics System, 2000 - 2005
Traffic accidents are the leading cause of unintentional injury death in children age 5 – 9

- Motor vehicle accidents: 53%
- Drowning: 13%
- Fires & burns: 13%
- Falls: 1%
- Suffocation: 4%
- Poisoning: 1%
- Other injuries: 15%

Source: CDC National Vital Statistics System, 2000 - 2005
Traffic accidents are the leading cause of unintentional injury death in children age 10 – 14

- Motor vehicle accidents: 58%
- Drowning: 10%
- Fires & burns: 6%
- Falls: 2%
- Suffocation: 4%
- Poisoning: 2%
- Other injuries: 18%

Source: CDC National Vital Statistics System, 2000 - 2005
Traffic accidents are the leading cause of unintentional injury death in children age 15 – 19

- **Motor vehicle accidents**: 76%
- **Drowning**: 5%
- **Fires & burns**: 1%
- **Falls**: 1%
- **Suffocation**: 4%
- **Poisoning**: 7%
- **Other injuries**: 9%

*Source: CDC National Vital Statistics System, 2000 - 2005*
Five things that worry parents the most:

- Kidnapping
- School snipers
- Terrorists
- Dangerous strangers
- Drugs

Five things most likely to cause injury or death (children < 18):

- Car accidents
- Homicide*
- Child abuse
- Suicide
- Drowning

* someone they know
The most dangerous thing your child does, statistically, is get into a car with you.
2009 Fatalities

- Vehicle Occupants: 72%
- Motorcyclists: 13%
- Pedestrians: 12%
- Bicyclists: 2%
- Other: 1%
US Injury Rate: Pedestrians Hit by Motor Vehicles

(rate/100,000 population)

Age Group

- < 5
- 5 - 9
- 10 - 15
- 16 - 20
- 21 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 - 74
- 75 - 85
- 85+

Source: NHTSA, 2008
US Fatality Rate: Pedestrians Hit by Motor Vehicles
(rate/100,000 population)

Age Group

- < 5: 0.45
- 5 - 9: 0.39
- 10 - 15: 0.59
- 16 - 20: 1.33
- 21 - 24: 1.61
- 25 - 34: 1.42
- 35 - 44: 1.58
- 45 - 54: 1.97
- 55 - 64: 1.62
- 65 - 74: 1.79
- 75 - 85: 2.28
- 85+: 2.55

Source: NHTSA, 2008
pedestrian survival rates & vehicle speed

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>% Survive</th>
<th>% Die</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>95%</td>
<td>5%</td>
</tr>
<tr>
<td>30</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>40</td>
<td>15%</td>
<td>85%</td>
</tr>
</tbody>
</table>
75% of Pedestrian Fatalities Occur Away From Intersections
Rural Places Have High Fatality Rates

Fatality Rate per 100,000 Population

**Highest**

<table>
<thead>
<tr>
<th>State</th>
<th>Fatality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wyoming</td>
<td>24.6</td>
</tr>
<tr>
<td>Mississippi</td>
<td>23.7</td>
</tr>
<tr>
<td>Montana</td>
<td>22.7</td>
</tr>
<tr>
<td>North Dakota</td>
<td>21.6</td>
</tr>
</tbody>
</table>

**Lowest**

<table>
<thead>
<tr>
<th>State</th>
<th>Fatality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington DC</td>
<td>4.8</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>5.1</td>
</tr>
<tr>
<td>New York</td>
<td>5.9</td>
</tr>
<tr>
<td>Connecticut</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>US Average</strong></td>
<td><strong>11.1</strong></td>
</tr>
</tbody>
</table>

NHTSA, 2009
Most Fatalities Occur In Single Vehicle Crashes

Multiple Vehicle Accidents

- 12,052
- 39%

Single Vehicle Accidents

- 18,745
- 61%

NHTSA, 2009
Less Than ¼ of Fatal Crashes Occur At Intersections

- Not At Intersections: 72%
- Intersections: 22%
- Other: 6%
Pre-1950 Traffic Safety Model

Based on and Revised from Ewing and Dumbaugh, Journal of Planning Literature, Vol. 23, No. 4
The “Foolproof Highway”

Wider + Straighter + Faster = Better
The “Foolproof Highway”

Wider + Straighter + Faster = Better
Pre-1950 Traffic Safety Model

Based on and Revised from Ewing and Dumbaugh, Journal of Planning Literature, Vol. 23, No. 4
Traditional Traffic Safety Model

Based on and Revised from Ewing and Dumbaugh, Journal of Planning Literature, Vol. 23, No. 4
Wider + Straighter + Faster = Better
Context-Based Traffic Safety Model

- Development Patterns
- Traffic Volume
- Roadway Design
- Traffic Conflicts
- Driver Behavior
- Traffic Speed
- Crash Frequency
- Crash Severity

Based on and Revised from Ewing and Dumbaugh, Journal of Planning Literature, Vol. 23, No. 4
Speed
The U-Shaped Curve

Crash Involvement Rate

Average Speed in Traffic Stream

Source: FHWA-RD-98-154
Changing Speed Limits

Source: FHWA-RD-98-154
Cross Section Tradeoffs?
Access Management

<table>
<thead>
<tr>
<th>Intersections/Corridor Mile</th>
<th>Undivided</th>
<th>TWLTL</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20</td>
<td>3.8</td>
<td>3.4</td>
<td>2.9</td>
</tr>
<tr>
<td>20 – 40</td>
<td>7.3</td>
<td>5.9</td>
<td>5.1</td>
</tr>
<tr>
<td>40 – 60</td>
<td>9.4</td>
<td>7.9</td>
<td>6.8</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>10.6</td>
<td>9.2</td>
<td>8.2</td>
</tr>
</tbody>
</table>

Source: Hummer and Lewis, FHWA/NC/2000-003, NCSU
Safety Tradeoffs – Cross Section

Collision Rates – Medium Density – Controlling for ADT

270

210

260

2 lane

3 lane TWLTL

4 lane undivided

Commercial Land Uses

Source: Hummer and Lewis, FHWA/NC/2000-003, NCSU
Policy Implications
“Main Street”
“Main Street”
Local Streets
US Health Care
% of GDP

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>5.1</td>
<td>7.0</td>
<td>8.8</td>
<td>12.1</td>
<td>14.1</td>
<td>16.3</td>
<td>19.5</td>
<td>&gt; 20</td>
</tr>
</tbody>
</table>

transportation 2008 9.5
Annual Health Care Costs/Capita

- Germany: $2,983
- Australia: $2,886
- Denmark: $2,743
- France: $3,048
- Ireland: $2,455
- Japan: $2,249
- Sweden: $2,745
- Switzerland: $3,847
- United Kingdom: $2,317
- Canada: $2,998
- United States: $5,711

Source: Kaiser Family Foundation, Visual Economics, 2010
Average Life Expectancy

- Japan: 82.1
- Germany: 79.0
- Switzerland: 81.3
- United Kingdom: 79.0
- United States: 77.0

Source: Kaiser Family Foundation, Visual Economics, 2010
Increased Exposure to Health Care Costs

Figure 1B. Percent distribution of the total population, by age: United States, 1980, 2007, 2050

1980
- Under 18 years (28%)
- 18–44 years (41%)
- 45–64 years (20%)
- 65–74 years (7%)
- 75 years and over (4%)

2007
- Under 18 years (25%)
- 18–44 years (38%)
- 45–64 years (25%)
- 65–74 years (6%)
- 75 years and over (6%)

2050 Projected
- Under 18 years (23%)
- 18–44 years (34%)
- 45–64 years (22%)
- 65–74 years (9%)
- 75 years and over (11%)

US Dept of Health and Human Services, 2009 Annual Report
Scale – United States Economy

($ Billions/Year)

Public Health Costs...

- Traffic accidents: $180
- Traffic air pollution: $80
- Obesity: $147
Scale – United States Economy

($ Billions/Year)

- Transportation’s negative impact on public health: $260
- Public sector transportation expenditures: $199
Single Purpose Spending

Transportation

Housing

Public Health

Environment

Energy
Integrated, Strategic Investment

Public Health

Housing

Energy

Transportation

Environment

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Wrap Up
Some Resources

The Built Environment and Traffic Safety: A Review of Empirical Evidence (Reid Ewing, Eric Dumbaugh)

Speakers

Jim Charlier, Charlier Associates (Boulder)

Norm Garrick, University of Connecticut

Eric Dumbaugh, Texas A & M University
Wider travel lanes:

- SAFER?
- LESS SAFE?
More lanes:

- SAFER?
- LESS SAFE?
Connected street networks:

- SAFER?
- LESS SAFE?
Bigger intersections:
(more turn lanes)

- SAFER?
- LESS SAFE?