roadside trees = bad trees?
Presentation Outline

- City Trees & DOTs – traditions/standards
- Trees, Livability & Value
- City Trees and Safety
- Design Opportunities
Clear Zone (U.S. policy):
Class 1- Least Risk

Solution to run-off-the-road crashes auto damage & driver injury

forgiving roadside
Class 3 Risk

Class 5 Risk
Class 7: Highest Risk
Thanks to Mark Wilkes, Savannah GA Metro Planning Commission
Big Road

Drive Fast
Presentation Outline

- City Trees & DOTs – traditions/standards
- Trees, Livability & Value
- City Trees and Safety
- Design Solutions
trees make cities pretty . . . .

More than beauty . . .
environment, economics, social benefits
Ecosystem / Environmental Services

- Stormwater Absorption & Quality
- Air pollutants reduction
- Nitrogen, phosphorus and sediment interception
- Carbon emission reduction, storage and sequestration
- Urban heat-island cooling
- Reduced “bad” ozone
- Wildlife habitat creation
Human Well-Being Benefits

- Stress reduction in urban lifestyles
- Higher job satisfaction and reduced absenteeism
- Reduced violence and more constructive conflict resolution in domestic conflict
- Improved surgery and illness recovery
- Greater creativity and modeling behavior in children’s play
- Reduced ADHD symptoms
Physical Inactivity & Obesity

- Majority of Americans not active enough
- 30-minute per day of moderate activity
- To reduce risk factors for chronic diseases
  (heart, stroke, cancer, diabetes)
- Significant costs to national health services

310-580,000 deaths per year
$100 billion medical costs (1995)
9.4% of all U.S. medical costs
Obesity Rates By Nation (2002)

* There are now more overweight than malnourished people in the world!
parks, open spaces & trails
need access & facilities
Streets Focused on Vehicles need people space, and multi-modal mobility
Make Room for Pedestrians
Walkable Neighborhoods
Tree Values & Benefits

- Ecosystem / Environmental Services
- Community Economic Development
- Human Dimensions & Social Benefits

so much more than aesthetics!
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Problem!

Drivers run off the road and crash into trees

national crash data analysis for 2002
research funding: USDA Forest Service; NUCFAC
Distribution of Crashes

Total 2002 motor vehicle crashes: 6,316,000 collisions with trees - 1.9% (120,000 per year)
Injury Comparison

All accidents

Trees only

- No injury
- Possible injury
- Non-incapacitating injury
- Incapacitating injury
- Fatality
Speed Comparison

💥 All crashes 🌳 Trees only
Urban/Rural Crash Rates
## Roadside Trees & Safety

U.S. traffic accident rates in 2002

<table>
<thead>
<tr>
<th></th>
<th>U.S. Total</th>
<th>Tree Accidents</th>
<th>Urban Accidents</th>
<th>Urban Tree Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Accidents</td>
<td>*6,316,000</td>
<td>1.9%</td>
<td>37%</td>
<td>0.7%</td>
</tr>
<tr>
<td></td>
<td>(100%)</td>
<td>*141,000 (2.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incapacitating</td>
<td>13%</td>
<td>0.9%</td>
<td>4.1%</td>
<td>0.04%</td>
</tr>
<tr>
<td>Injury and Fatality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatality</td>
<td>1.2%</td>
<td>0.1%</td>
<td>0.4%</td>
<td>&lt; 0.001%</td>
</tr>
<tr>
<td></td>
<td>*43,005 (0.6%)</td>
<td>*3,258 (&lt; 0.001%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* NHTSA (2004) - %s may differ due to sampling and analysis procedures

Bratton and Wolf, Trans Research Board, 2005
## Annual Fatality Risks:

M. Norris, Australia ISA, 2005

### Table 2 Every Day Risks

Source ANSTO (Higson 1989)

<table>
<thead>
<tr>
<th>Risk</th>
<th>Individual risk per person per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking (20 cigarettes a day)</td>
<td>1:200</td>
</tr>
<tr>
<td>Cancers from all causes</td>
<td>1:500</td>
</tr>
<tr>
<td>Drinking alcohol</td>
<td>1:2,500</td>
</tr>
<tr>
<td>Travelling by Motor vehicle</td>
<td>1:7,000</td>
</tr>
<tr>
<td>Travelling by Train</td>
<td>1:33,000</td>
</tr>
<tr>
<td>Travelling by Aeroplane</td>
<td>1:100,000</td>
</tr>
<tr>
<td>Fires and accidental burns</td>
<td>1:100,000</td>
</tr>
<tr>
<td>Cataclysmic storms and storm flood</td>
<td>1:5,000,000</td>
</tr>
<tr>
<td>Lightning strike</td>
<td>1:10,000,000</td>
</tr>
<tr>
<td>Meteorite</td>
<td>1:1,000,000,000</td>
</tr>
</tbody>
</table>

- fatal
- urban tree
- crash
- 1: 100,000
research on risk management
perceived versus actual risk

city trees crashes risk?
No sir, I was not talking on my cell phone.... I was watching a TV show on my iPod....
Behavior & Safe Driving!

- Crashes occur on weekends, late evening hours
- Winding rural roads, vehicle leaves road on outside of curves
- Male traffic fatalities outnumber female 2 to 1
- Drunk driving - about 50% of all traffic fatalities
- Seat belt use reduces risk of death by 42%
- Travel speed exceeds posted speed - about 30% of fatalities

Psychology division in transportation agencies?
Presentation Outline

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- Design Opportunities
the "green book"

AASHTO: policy vs standards

professional interpretation
Streets Focus on High-Speed

poor livability
Why Urban Street Trees Aren’t the Hazard the Traffic Engineer Thinks They Are.

Eric Dumbaugh, Ph.D.
Assistant Professor
Program Coordinator, Graduate Certificate in Transportation Planning
Texas A&M University
Safe Streets

- “traffic calming”
- driving behavior at too high speed

Eric Dumbaugh
Transportation Planning
Texas A&M
Traffic Calming?

- pilot study . . . .
- increased safety perception: urban and suburban
- slower travel speed: suburban

Naderi, Kweon, Maghelal, ITE 2008
Alternative!

Psychological Traffic Calming

“body language of the street”
“mental speedbumps” D. Engwicht

- complete streets
- home zones
Home Zones (Dutch “woonerf”)
Integrating the Street into Everyday Life
Home Zones
Traffic Calming
Green Streets
Festival Planning
Play Spaces
Multi-modal Transport
www.completestreets.org/

Let’s Complete America’s Streets!

THE LATEST
Congress shows support for complete streets
The energy bill that was recently signed by President Bush includes a “Sense of Congress” supporting “complete streets,” basically representing a statement of support for the concept. Read more on Smart Growth America’s blog.

Praise for the Coalition
Read what syndicated columnist Neal Peirce has to say about the National Complete Streets Coalition.

Complete Streets Bill passed in Illinois!
The Complete Streets law requires that bicycle and pedestrian ways be established in the planning and construction of all state transportation projects.

Get the latest Complete Streets News!
Overview article from On Common Ground Magazine
Elements of Complete Streets Policies
Frequently Asked Questions
Thunderhead Alliance’s Complete Streets Page
Groups Working for Complete Streets
Complete Streets brochure pdf or html
Join the Coalition!
Donate!

Click here to view a short slide show on why we need complete streets.

COMPLETE STREETS are designed and equipped to enable safe access for all.
Complete the Streets!
cars/pedestrians/bikes

multi-modal systems
Walking and Bicycling: International Comparisons

Percent of trips by walking and biking, 1995

- USA: 7%
- Germany: 34%
- Netherlands: 46%

Pedestrian fatalities per 100 million trips, 2000

- USA: 17 fatalities
- Germany: 5.2 fatalities
- Netherlands: 1.1 fatalities

Pucher, AJPH 93:1509, 2003
Context Sensitive Solutions
national & state policy – U.S.

Barracks Row

8th Street Barracks Row, a 3/4 mile, 6 block stretch between Pennsylvania Avenue and M Street SE, is one of the District’s oldest commercial corridors. 8th Street’s turn of the century buildings give the street charm and character, but over the years the commercial strip had experienced economic decline. Vacant storefronts and littering added to the perception that 8th Street was an unsafe place to be and shop after dark. Merchants complained that there was inadequate public parking. And time

Context Sensitive Solutions

case study: Barracks Row, WA DC
Context Sensitive Solutions

case study: Barracks Row, WA DC
Goals for Roadside Trees?

- Common Transportation Perception: trees & landscape enhance beauty
- Evolving Understanding: green streets offer environmental, economic, and social benefits
- Do not compromise Safety! Reasonable Risk?
- Engineering, landscape, and tree professionals working together
Urban Streets Guidelines - 2008 –

Crash stats best practices (what is, not what could be)

Still has a “clear zone” bias
Context Sensitive Solutions
U.S. national & state policy
e.g. 2006, Institute of Transportation Engineers

- Acknowledge & integrate community values
- Documentation of public process limits liability
Human Dimensions of Urban Forestry and Urban Greening

Trees and Transportation

Transportation systems have traditionally been designed for traffic mobility and driver safety. Road systems and roadways are now being designed to address a variety of other functions, including aesthetic, environmental, and community interests.

Context Sensitive Design is a new approach in transportation planning that recognizes community values. Roads, vegetation, and green spaces are often valued features of transportation corridors. The studies below are inviting the public for values regarding trees and vegetation in vehicular use areas.

Studies

Urban Trees and Traffic Safety
Across our nation, transportation policy and practices regarding urban livability of cities and towns. Professions' reasons for driver safety and perceptions of tree collisions in urban trees can be designed into streetscapes more safely. (See bottom of page.)

www.naturewithin.info