

Traffic Safety & City Trees: Finding a Livable Balance

Partners in Community Forestry

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Why Street Trees?

- Transportation Perception: Primary Benefit of Landscaping is to Enhance Beauty
- Evolving Understanding: Street Trees offer Environmental, Economic, and Social Benefits

Recommendation: Do not compromise Safety, but Engineering & Landscape professionals need to work together to Identify Strategies to Safely Incorporate Street Trees

Presentation Format

- Trees, Livability & Value
- City Trees and Safety
- Design Solutions

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

Economic Incentives

- Improved consumer environments in business districts: + 9-12% product spending
- Residential real estate values:
 - + 3-7% with trees in yard
 - + 5-20% proximity to natural open space
 - + 9% when adjacent to street tree plantings
- Commercial property rental rates: + 7%
- Air pollution mitigation
- Heating and cooling cost reductions

Tree Values & Benefits

- Ecosystem / Environmental Services
- Public Goods & Valuation
- Human Dimensions & Benefits



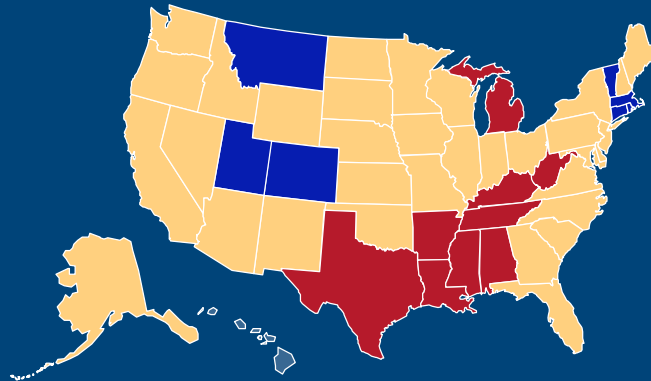
Physical Activity & Obesity

- Majority of Americans Not Active Enough
- Goal: 30 minutes per day of Moderate Activity
- Risk Factor for Chronic Diseases
(Heart, Stroke, Cancer, Diabetes)
- Significant Costs to National Health Services

310-580,000 deaths per year
\$100 annual billion medical costs (1995)
9.4% of all U.S. medical costs

Obesity Trends* Among U.S. Adults 2004

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)



**Doubling of
adult obesity
rate since 1980.**



CANINE CONSTITUTIONAL



A brisk walk in the park keeps Marcy II in shape between dog shows. His owner, Columbus resident Cathy Sandoz, got up early to give her 5-year-old Doberman his regular workout. They typically log 10 miles in Barlowe Park.





parks, open spaces & trails

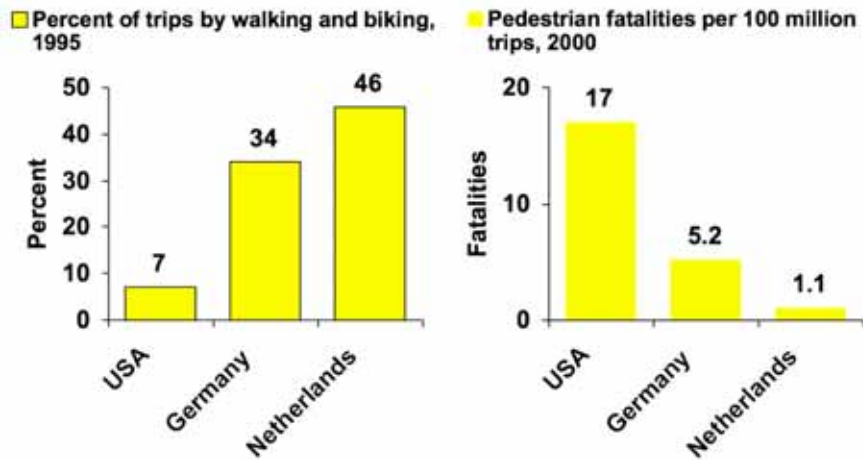


Provide Continuous Pedestrian Facilities

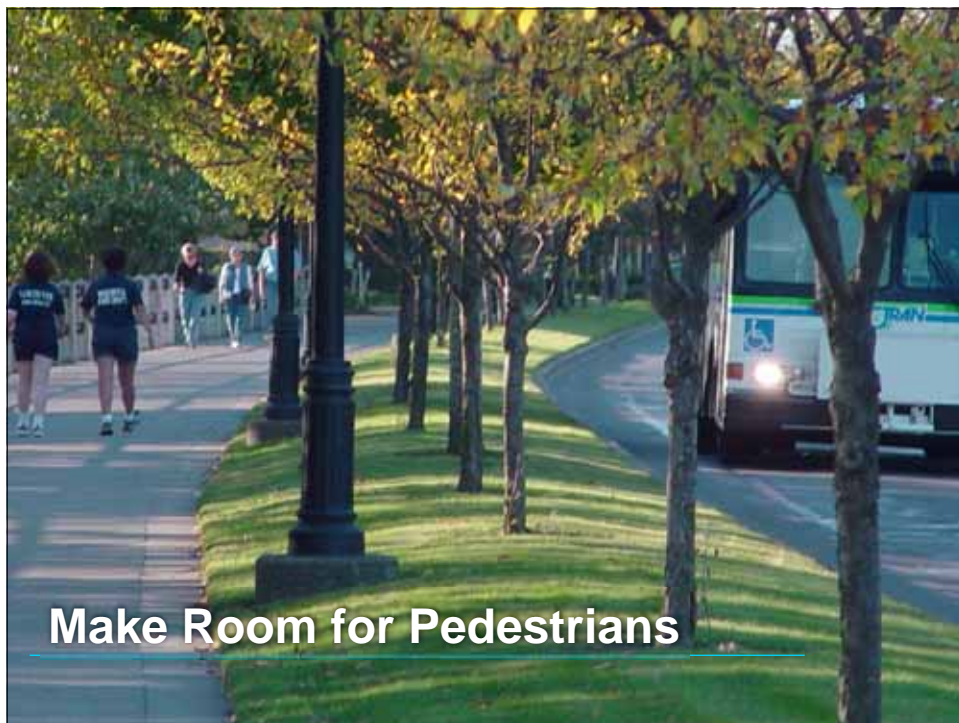
Durham, NC



Walking and Bicycling: International Comparisons



Pucher, AJPH 93:1509,2003



Presentation Format

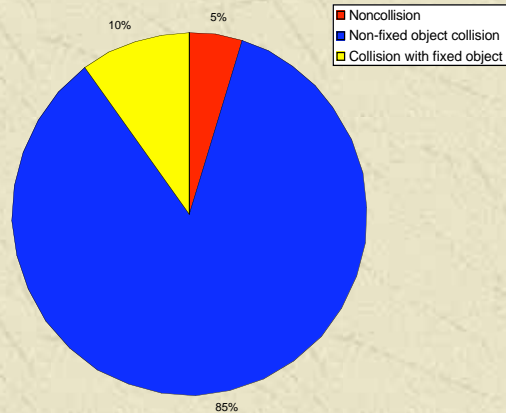
- Trees, Livability & Values
- **City Trees and Safety**
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Problem!

- ✦ Drivers run off the road
and crash into trees



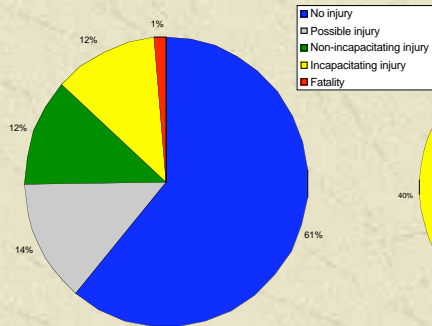
Distribution of Crashes



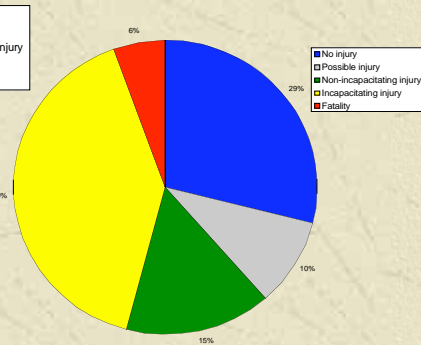
Total 2002 motor vehicle crashes: 6,316,000
 collisions with trees - 1.9% (120,000 per year)

Injury Comparison

☀ All accidents



☀ Trees only



Roadside Trees & Safety

✦ U.S. traffic accident rates in 2002

	U.S. Total	Tree Accidents	Urban Accidents	Urban Tree Accidents
All Accidents	*6,316,000 (100%)	1.9% *141,000 (2.2%)	37%	0.7%
Incapacitating Injury and Fatality	13%	0.9%	4.1%	0.04%
Fatality	1.2% *43,005 (0.6%)	0.1% *3,258 (< 0.001%)	0.4%	< 0.001%

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

Bratton and Wolf, Trans Research Board, 2005

Wolf & Bratton, Arb & Urban Forests, 2006

Annual Fatality Risks:

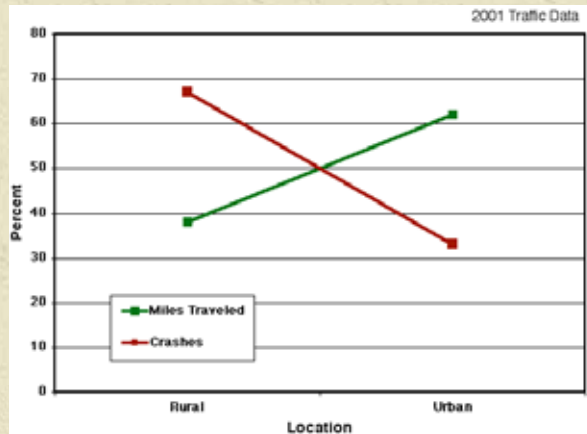
M. Norris, Australia ISA, 2005

Table 2 Every Day Risks
Source ANSTO (Higson 1989)

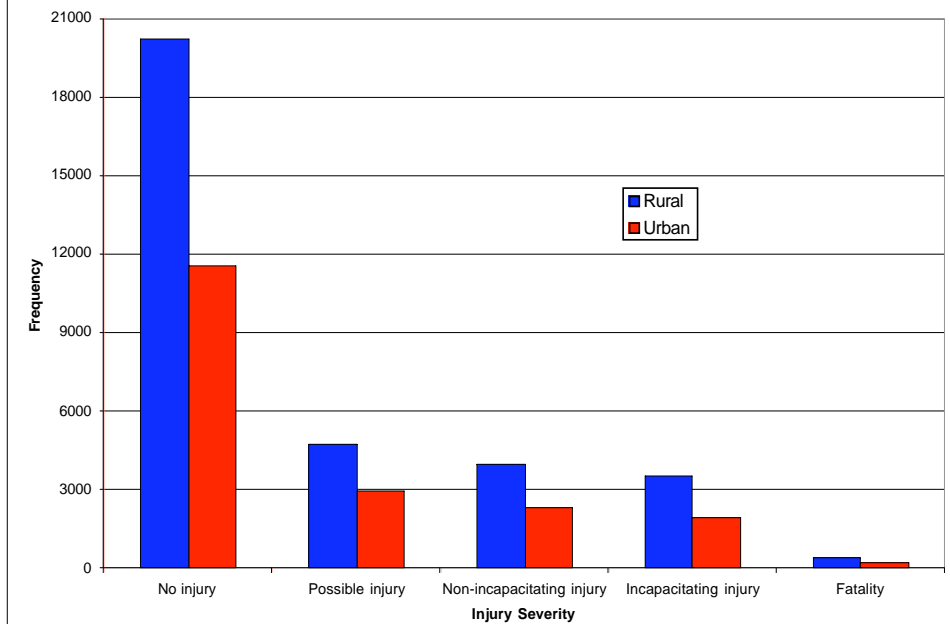
Risk	Individual risk per person per year
Smoking (20 cigarettes a day)	1:200
Cancers from all causes	1:500
Drinking alcohol	1:2,500
Travelling by Motor vehicle	1:7,000
Travelling by Train	1:33,000
Travelling by Aeroplane	1:100,000
Fires and accidental burns	1:100,000
Cataclysmic storms and storm flood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

fatal
urban
tree
crash
1: 100,000

Urban/Rural Crash Rates



Injury, Urban and Rural Differences





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

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Is this so bad?

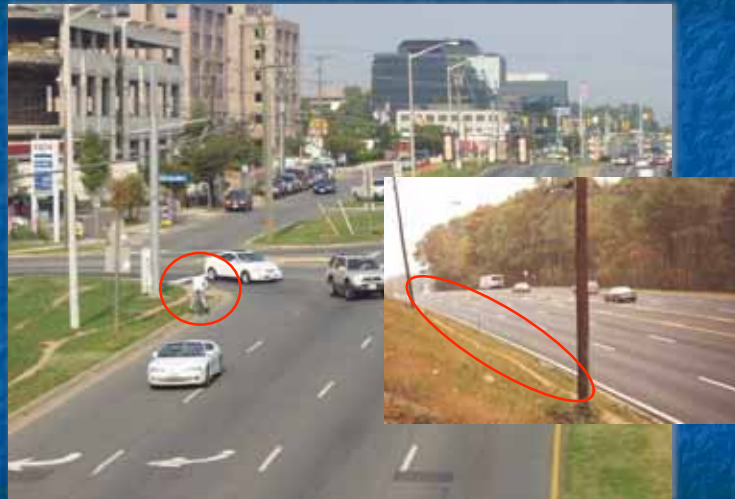


Streets Focus on High-Speed



Poor Livability Factor

Streets Focused on Vehicles



No room for people – Utility Encroachments

Complete the Streets! cars/pedestrians/bikes



Home Zones (Dutch “woonerf”) Integrating the Street into Everyday Life



Home Zones

Traffic Calming
Green Streets
Festival Planning
Play Spaces
Multi-modal
Transport



Psychological Traffic Calming

"body language of the street"
"mental speedbumps" D. Engwicht

- complete streets
- home zones

Closing Thoughts

- Community Benefits of Vegetation are Extensive and Well Documented
- Safety on Urban Streets is Very Important
- If Safe Methods are not Developed, then Unsafe Applications will Continue to Occur

Closing Thoughts


- Design Engineers Understand the Safety Concerns of Street Trees
- Urban Forestry Professionals Understand Tree Form and Function
- Urban Forestry Community willing and waiting to collaborate for Safe Solutions

www.cfr.washington.edu/research.envmind

Center for Urban Horticulture, College of Forest Resources, University of Washington

Human Dimensions of Urban Forestry and Urban Greening

featuring research on peoples' perceptions and behaviors regarding nature in cities



- Nature and Consumer Environments**
Research about how the urban forest influences business district visitors.
- Trees and Transportation**
Studies on the value of having quality landscapes in urban roadsides.
- Civic Ecology**
Studies of human behaviors and benefits when people are active in the environment.
- International Urban Greening**
Scientific explorations of people and urban nature in other nations.
- Urban Forestry and Human Benefits**
More resources, studies and links ...

Research Director
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