

# ***Messages That Matter!***

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## **Science, Information & Policy Change in Cities**

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Science has told us . . . .

# Urban Trees & Forests

## Environmental Services

- Air pollutants reduction
- Nitrogen, phosphorus and sediment interception
- Carbon emissions reduction & sequestration
- Urban heat-island cooling
- Reduced “bad” ozone
- Stormwater runoff reduction
- Wildlife habitat

## Urban Nature

# Human Functioning Benefits

- Improved surgery and illness recovery
- Higher job satisfaction and reduced absenteeism
- Lower crime rates in well landscape areas
- Stress reduction in urban lifestyles
- Reduced violence and more constructive conflict resolution in domestic conflict
- Reduced ADHD symptoms

## Urban Nature

# Community Economics

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- Improved consumer environments in business districts - 9-12% product spending
- Residential real estate values - 3-7% with trees in yard
- Residential real estate values - 5-20%, proximity to natural open space
- Commercial property rental rates - 7%
- Air pollution mitigation
- Heating and cooling costs reductions
- Less frequent pavement replacement

Science has told us about . . . .  
urban trees and crash risk . . . .

# **Trees and Traffic Safety**

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## **analysis of urban crash data**

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**Wolf & Bratton, July 2006, Arb and Urban Forestry**

**research funded by USDA Forest Service &  
National Urban & Community Forestry Advisory Council**

# Problem!

- ✦ Drivers run off the road and crash into trees





# Clear Zone Policy

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## Class 1: Least Risk



**Run-off-the-  
road  
accidents**

**auto damage  
& driver  
injury**



**Class 3 Risk**

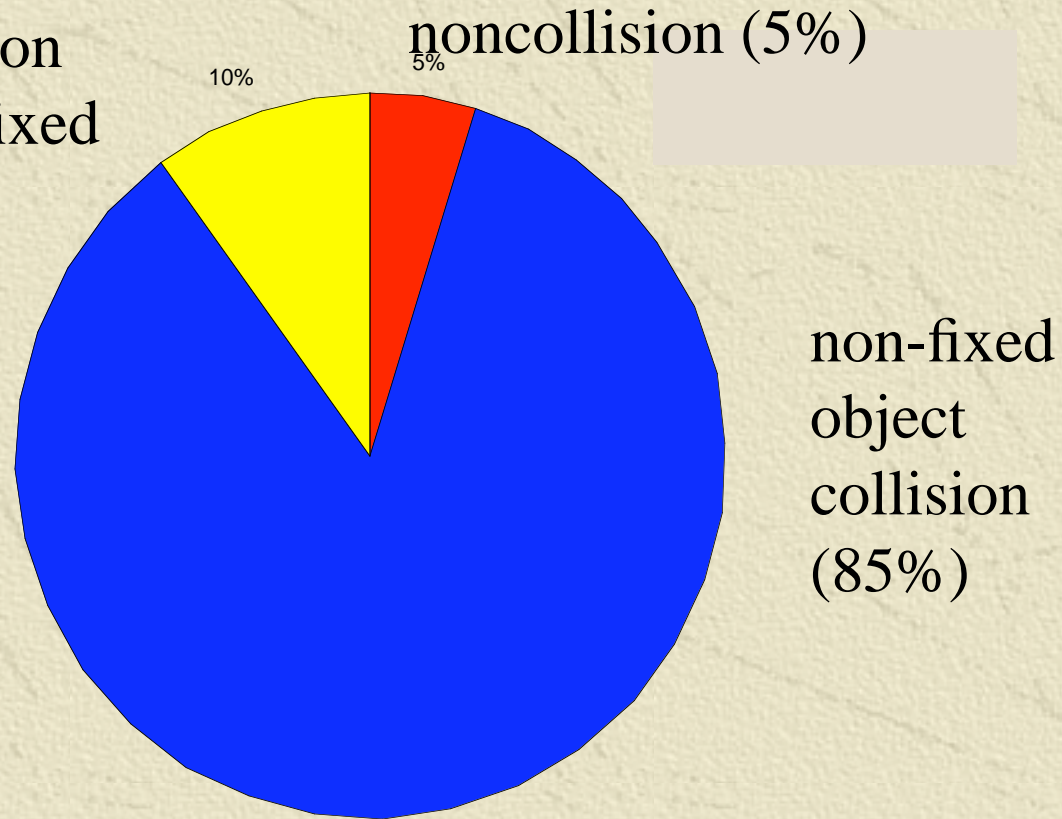


**Class 5 Risk**

# Distribution of Crashes

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collision  
with fixed  
object  
(10%)



non-fixed  
object  
collision  
(85%)

Total 2002 motor vehicle crashes: 6,316,000

# Overall Accident Stats

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- ✦ car vs. car collisions - 78.6%
- ✦ rollovers - 4%
- ✦ collisions with poles or signs - 2.1%
- ✦ collisions with trees - 1.9% (120,000 per year)

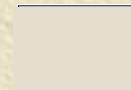
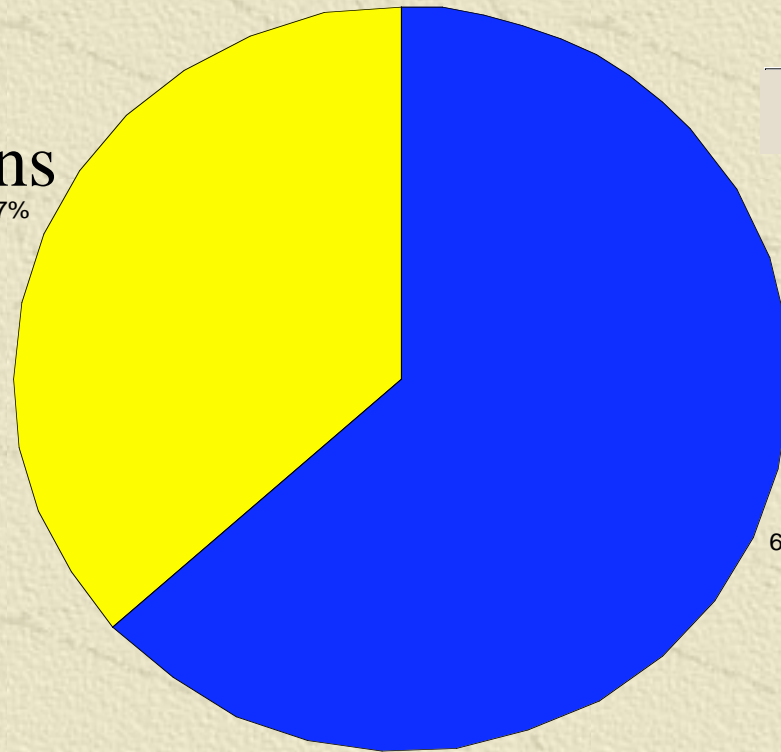
U.S. annual total vehicle trips: 233 billion or  
about (6 trips per day per household)  
= tree crash in 1 per 1.9 million trips

# Spatial Distribution - all crashes

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urban  
locations  
(37%)

37%



rural  
locations  
(63%)

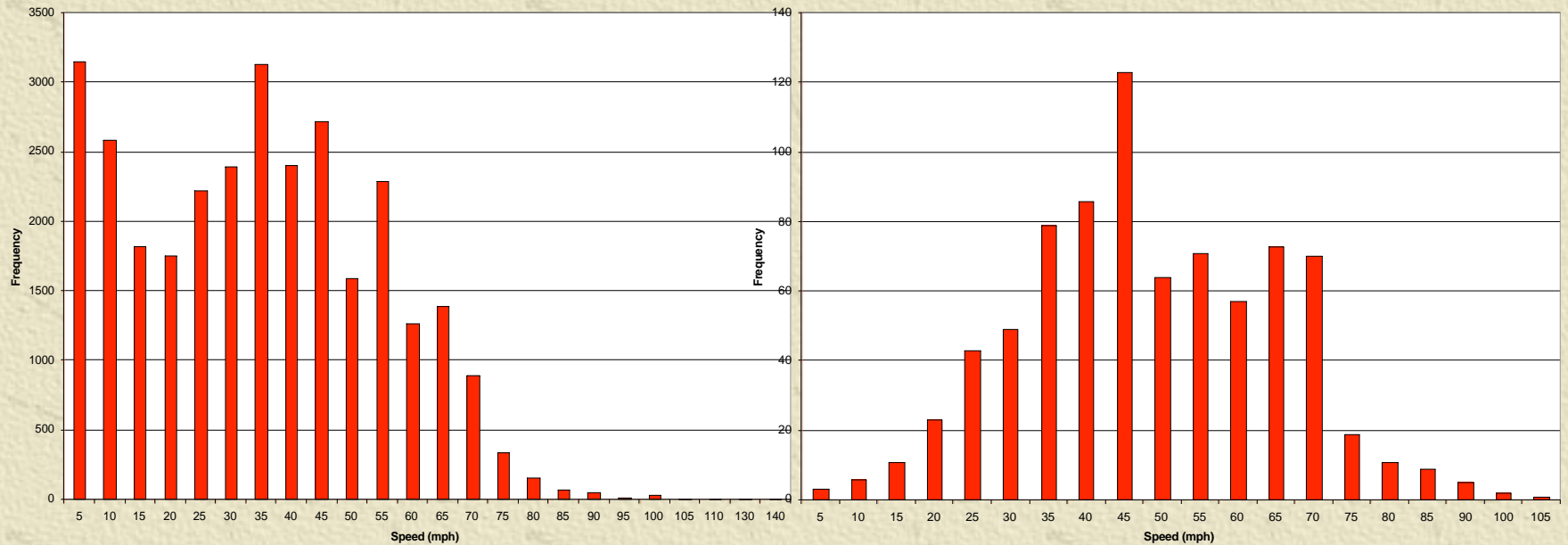
63%

\* stats similar for tree crashes\*

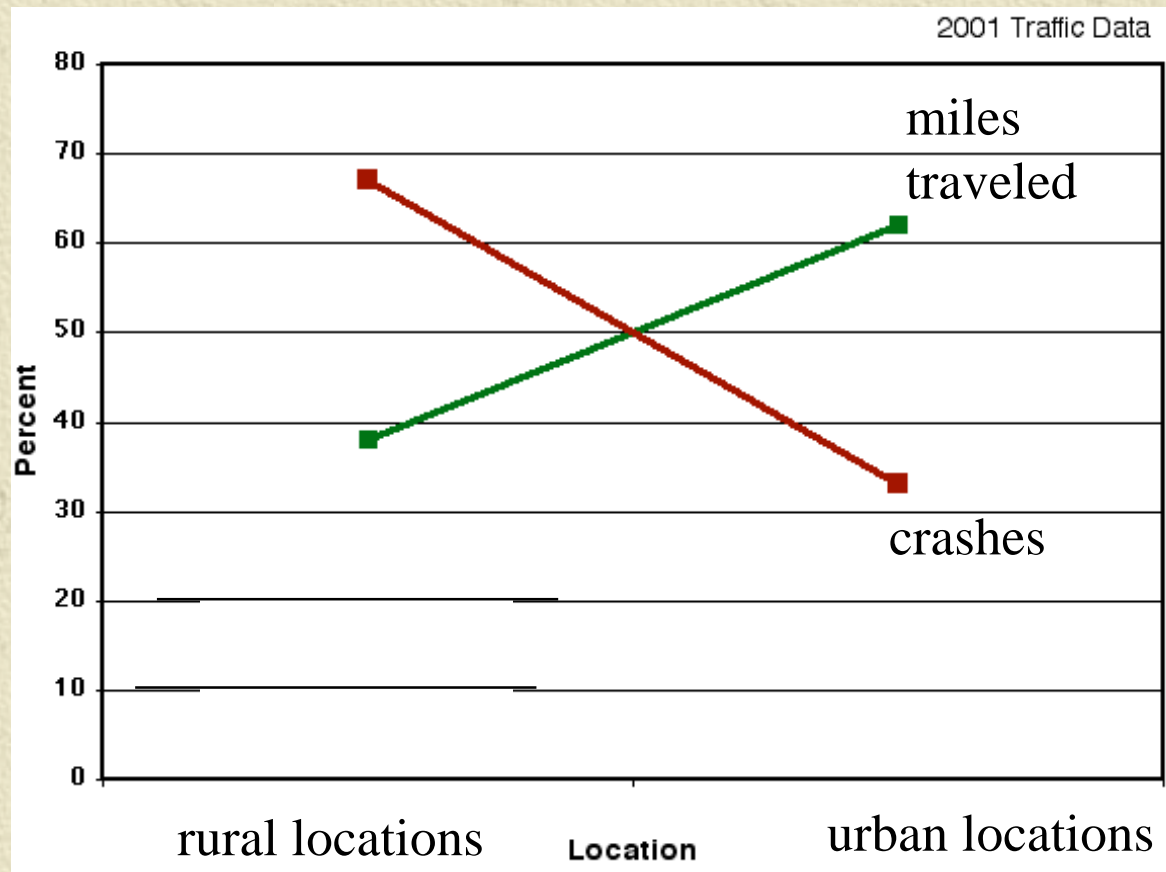
# Speed Comparison

✦ All crashes  
average 34 mph

✦ Tree crashes  
average 52 mph



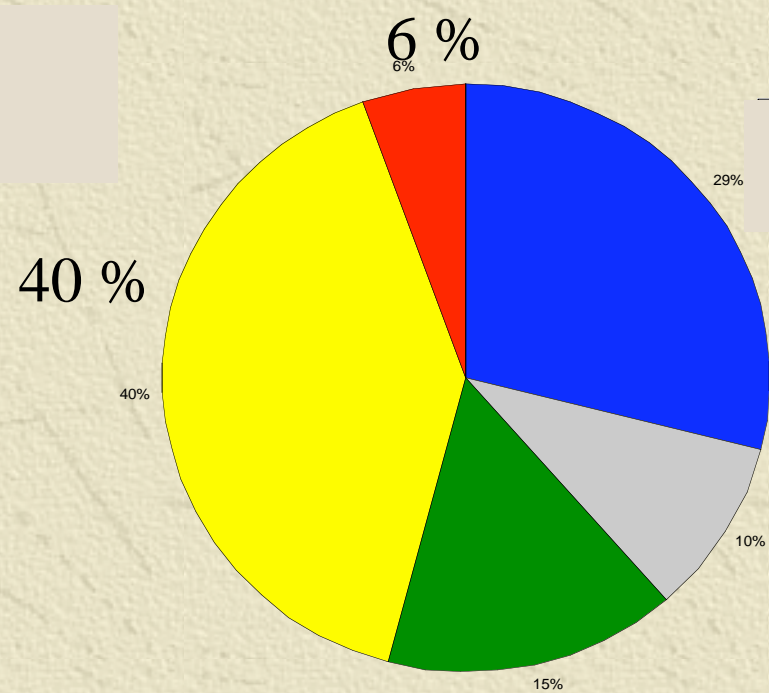
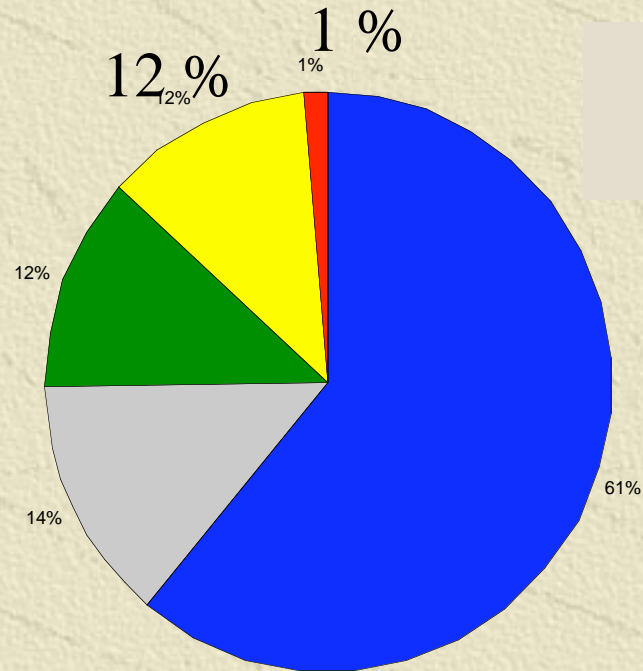
# Urban/Rural Distribution



# Injury Comparison

☼ All accidents

☼ Tree accidents



incapacitating injury  
fatality

# Roadside Trees & Safety

## ✦ U.S. traffic accident rates in 2002

	U.S. Total	Tree Accidents	Urban Accidents	Urban Tree Accidents
<b>All Accidents</b>	*6,316,000 (100%)	1.9% *141,000 (2.2%)	37%	0.7%
<b>Incapacitating Injury and Fatality</b>	13%	0.9%	4.1%	0.04%
<b>Fatality</b>	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

Urban tree  
crash  
1: 100,000

# 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



[www.cfr.washington.edu/research.envmind](http://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  
**Kathleen L. Wolf, Ph.D.**

Sponsors



# ***Messages That Matter!***

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**Research funded by:  
USDA Forest Service  
National Urban & Community Forestry Advisory Council**

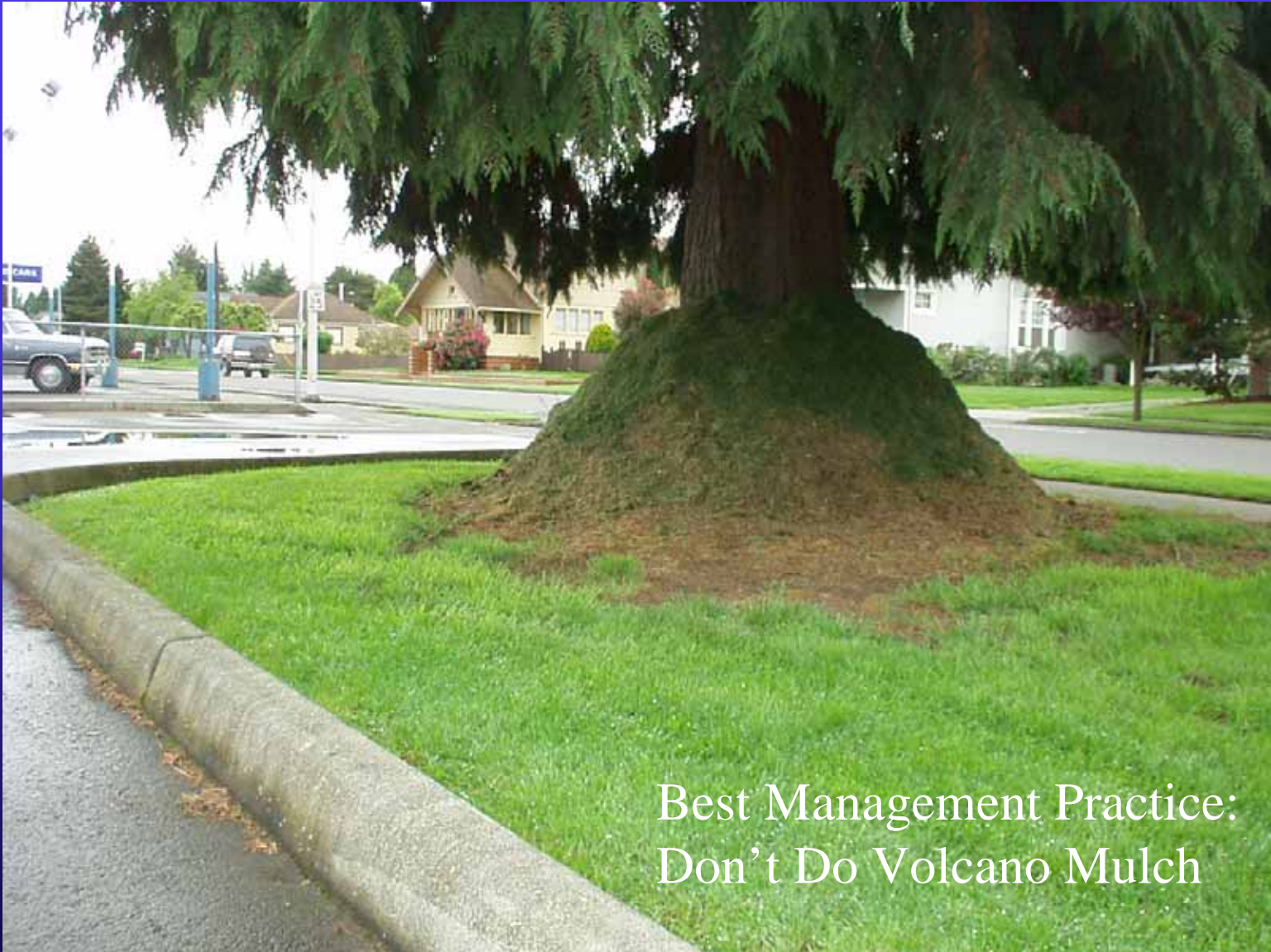
Science has told us . . . .

and municipal practices are changing (?)



Best  
Management  
Practice:

Don't  
Top  
Trees



Best Management Practice:  
Don't Do Volcano Mulch

Comprehensive planning & management  
Do local leaders get the message?



University of Washington

College of Forest Resources



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HUMAN DIMENSIONS OF THE URBAN FOREST

FACT SHEET #19

## Managing the Forests Where We Live: An Assessment of Washington State Cities



It's hard to know where you are going if you don't know where you are! The Washington State Department of Natural Resources provides technical and financial assistance to communities of all sizes throughout the state to help build their urban forestry programs. What has been achieved?

An assessment of our cities' urban forestry programs was done by the University of Washington in three phases from 2001 to 2004. Here are the results .....

science &  
best  
practices  
becomes  
policy?

10% up-to-date inventories

12% management plans

20% routine tree care

47% ordinance, but enforcement needed!

61% Arbor Day

municipal urban & community forestry  
= policy innovation

Diffusion of Innovations  
Everett Rogers

urban & community forestry

= voluntary policy = innovation

wetlands

critical areas/resources

shorelines

riparian zones

= regulated policy

**Communications Campaigns**

Rogers & Storey article

**Individual Social Factors**

McKenzie-Mohr, Sustainable Behavior

**Group Social Factors**

Rogers, Innovation Diffusion

**Perceived Attributes of Programs**

Rogers, Innovation Diffusion

# Communications Campaigns

Rogers & Storey, 1987, Handbook of  
Communication Science

*definition: communications with a purpose & desired outcome, aimed at a specific audience,  
includes an organized set of activities*

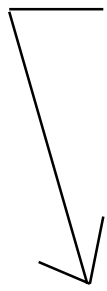
1. widespread exposure to messages necessary
2. mass media creates knowledge-awareness, helps recruit people
3. communication source perceived as credible
4. formative evaluation - test messages and revise based on response
5. use audience segmentation & target messages
6. appeal must not be socially distant
7. message of prevention less effective than immediate positive consequences
8. timeliness & accessibility is important

# Desired Programs/Behaviors?

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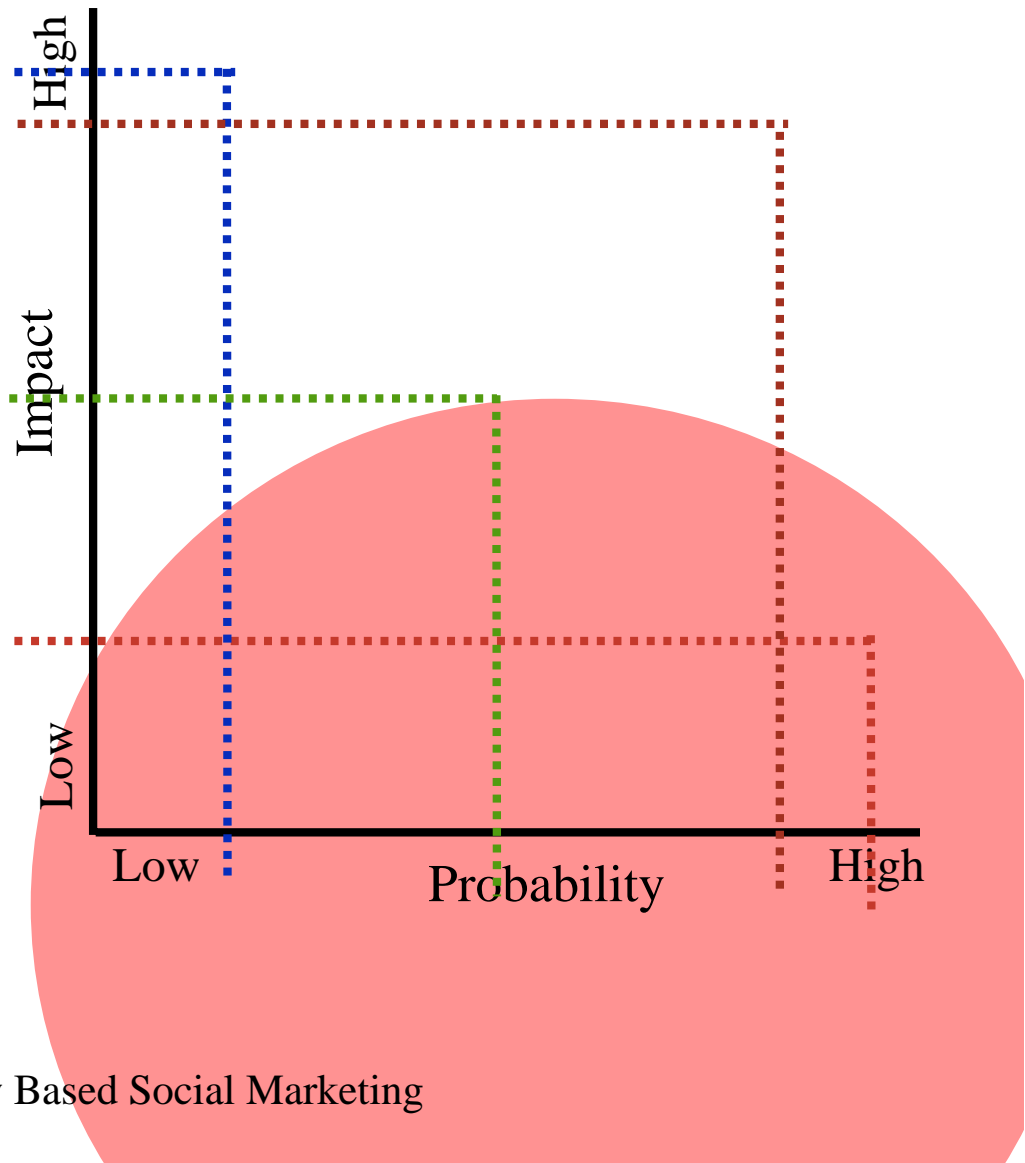
Specify Programs/Activities

1. **tree protection-construction**
2. \_\_\_\_\_
3. \_\_\_\_\_



Impacts

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



Doug McKenzie-Mohr & Wm. Smith, 1999,  
Fostering Sustainable Behavior: Community Based Social Marketing

# Benefits & Barriers

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Specific Program/ Activity	Perceived Benefits	Perceived Barriers
<b>tree protection-during construction</b>	1. _____ 2. _____ 3. _____ 4. _____	1. _____ 2. _____ 3. _____ 4. _____

Doug McKenzie-Mohr & Wm. Smith, 1999,  
Fostering Sustainable Behavior: Community Based Social Marketing

# Perceived Attributes of Programs

Rogers, 2003, Diffusion of Innovations

*definition: characteristics of the proposed change that determine an innovation's rate of adoption*

1. relative advantage  
(image)
2. compatibility  
(ease of use)
3. complexity
4. trialability
5. observability  
(result demonstrability, visibility)