Pedestrian Safety

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for the
Nevada Transportation
Conference 2009

Presentation Overview

Background
- Benefits
- Influencing Factors
- Barriers

Pedestrian Safety Planning
- Policies Supporting Safety
- Key Areas
- What's Being Done

Street Design Issues
- Areas of Concern
- Inventory
- Specific Strategies

Examples

Why not just leave the streets to cars?

- Past 30 years VMT has been growing much faster than population; not sustainable!
- Not possible to build our way out of congestion
- Vehicular travel accounts for about 35% of all pollution
- Successful transportation strategies emphasize moving people; not just cars

Why Accommodate Walking?

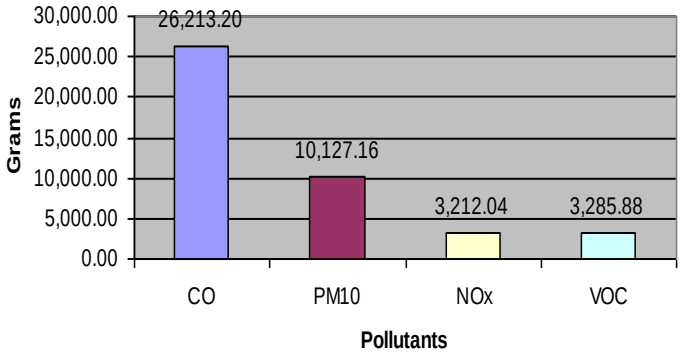
- **Because it shows such great promise**
  50% of all trips are less than 3 miles
  25% of all trips are less than 1 mile
  (Source: Pedestrian Safety Guide and Countermeasure Selection)

- **Legitimate and viable mode of transportation….SAFETEA-LU**

- **Helps to reduce congestion and eliminate SOV trips**

- **Helps to reduce of tailpipe emissions – each year 70,000 deaths can be linked to poor air quality (CDC)**

Total Annual Pollutants for One SOV



Why Accommodate Walking?

..continued

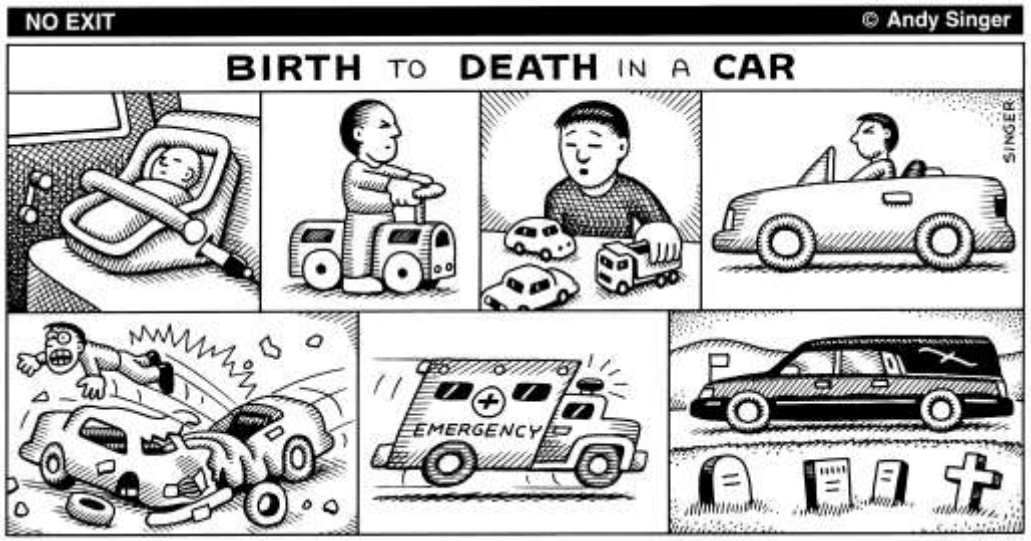
- **It's an inexpensive form of transportation**
  Annual cost of car ownership/journey to work about $3,500

- **Walking improves health!**
  The U.S. Center of Disease Control (CDC) estimates that:
  - One third of all children today will become diabetics
  - Their life span may be shortened by some 15 years
  - 1st generation in history who may not live as long as their parents

- **It can be done! Other nations experience high levels of participation**

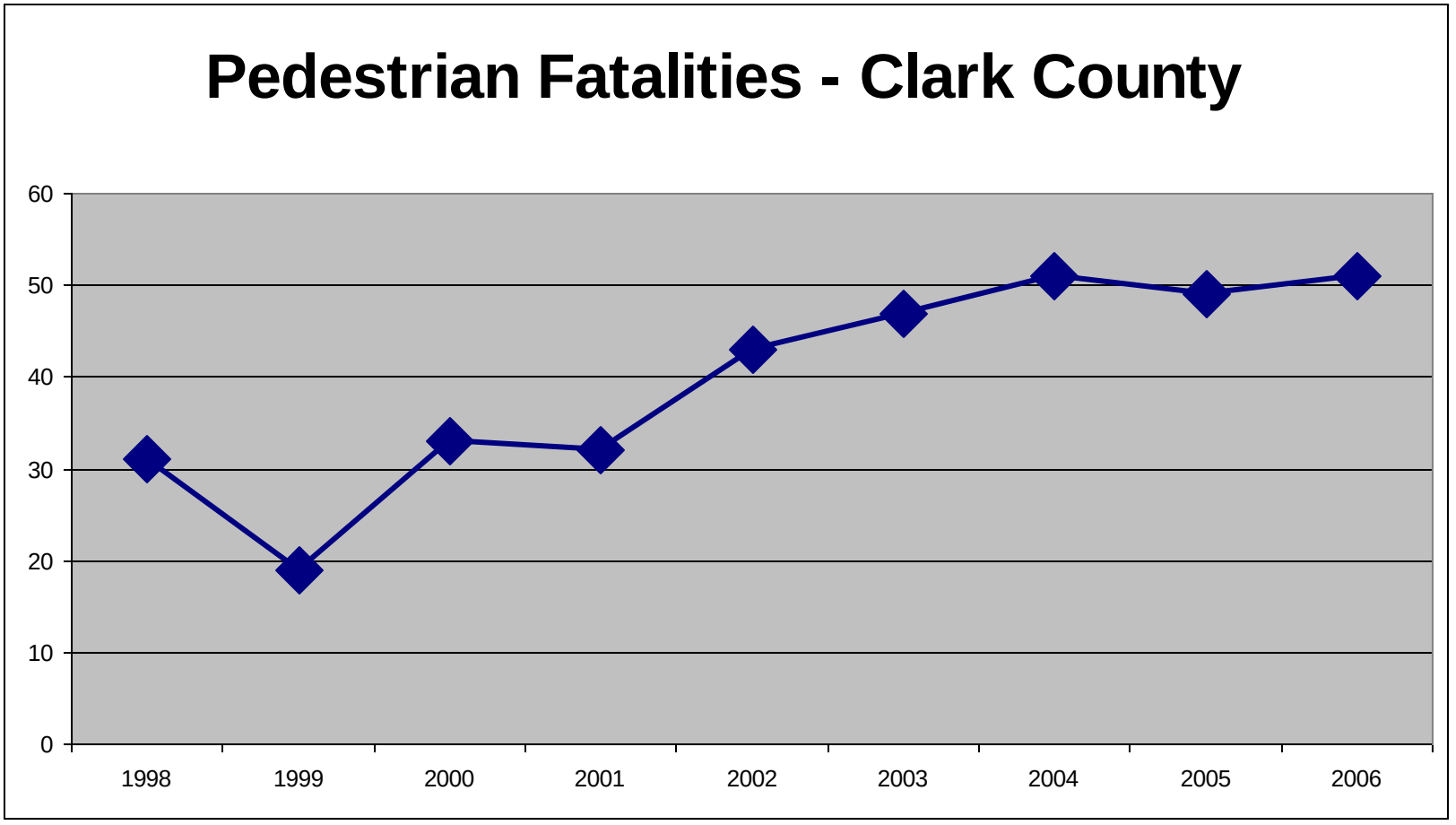
Key Barriers to Walking

- Weather
- Lack of Facilities and Amenities
- Land Development Patterns



Key Barriers to Walking
..continued

- **Walking can be dangerous**



Pedestrian Safety Planning

Policies Supporting Safety

Key Areas

Responsibility and opportunity to protect the interaction between drivers and pedestrians within five key areas:

- **Streets and Highways**
- **Bicycle and Pedestrian Activities**
- **Transit Operations**
- **Traffic Signal Optimization and Operational Improvements**
- **Subdivision design**

What is being done?

Streets and Highways RTC's Policies and Procedures:

- **Follows AASHTO standards**
- **Provide Guidelines for raised medians**
- **Define speed limit warrants**
- **Establish a prioritization system for traffic signal construction**
- **Define left-turn phase traffic signal warrants**

What is being done?
…continued

- **Define warrants for uniform crossing guards**
- **Establish Traffic Impact Analysis Guidelines**
- **Define policies for school zones, crossings, and speed limit sign beacons**
- **Define policy for audible pedestrian signals**
- **Provide policy on sidewalks or pedestrian accessible facilities on all RTC projects**
- **Provide guidelines for bus turnouts and passenger loading zones**

What is being done?
..continued

Transit Operations

- **Bus Turn Outs**
- **Far Side Bus Stops whenever possible**
- **Timepoints in breakdown lanes only**
- **More visible bus stop signs**

What is being done?
..continued

Transit Operations, con't.

- **Strobe break lights**
- **Audible "beeper" with hazard lights and right turn signal**
- **Reflective tape on curbside mirrors**
- **Coaches use "breakdown" lane for stops**
- **No unprotected left turn signal**
- **Routes realigned for safety and security**
- **Security measures improved at new MAX stations**

What is being done?
..continued

Pedestrian Activities

- **New Standards that increase pedestrian sidewalk space**
- **Planning and fiscal participation in "Pedestrian Safety Countermeasure Deployment and Evaluation"**
- **Guidelines for retrofit of streets for bicycles and pedestrians**
- **Regional standards for Shared-Use Trails**

What is being done?
..continued

- **Bicycle and Pedestrian Plan**

Routes: 390 adopted center-lane miles, defined as at least 14 foot wide curb lane and Share the Road Signs installed approximately every 500 feet (82 miles implemented)

Lanes: 690 adopted center-lane miles, defined as a minimum 4 foot wide space with 8 inch solid tape or paint line, plus MUTCD approved symbols (194 miles implemented)

Shared Use Paths: 760 adopted linear miles, defined as at least a 12 foot wide paved surface, including 2 foot shoulders (107 miles implemented)

What is being done?
..continued

Bicycle and Pedestrian Plan

Funding –

Question 10 Passed in 2002

- $ 50 Million for On-Street Implementation
- $ 67 Million for Off-Street Maintenance

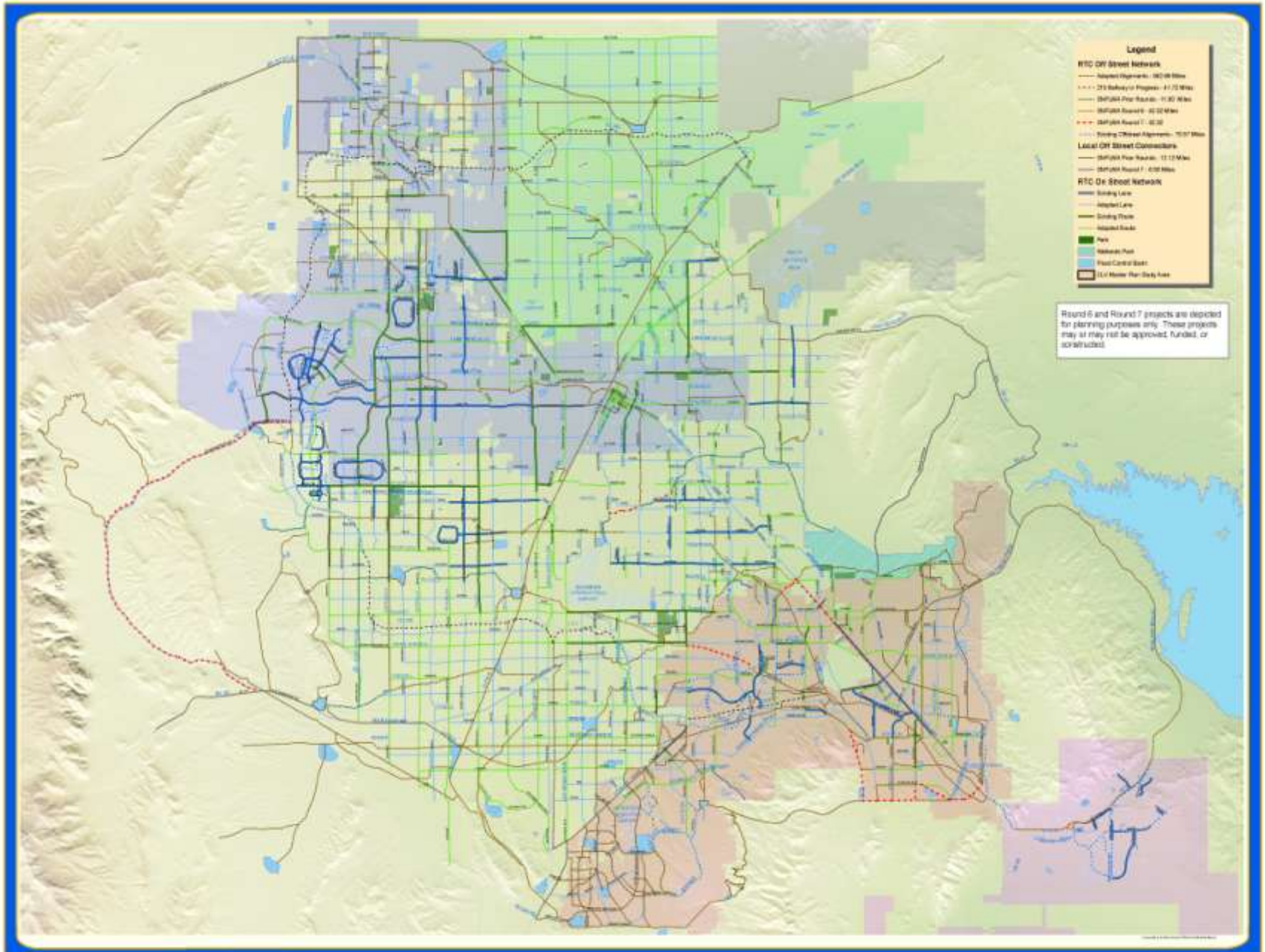
Inclusion of Lanes and Routes in roadway improvement projects Countywide.

Trails funding from SNPLMA

What is being done?
..continued

Bicycle and Pedestrian Plan

- The BPE principal goal is to accelerates bicycle facilities implementation and integration process with existing and future road surface network
- The BPE implementation program goal facilitates mode integration from road surface/bicycle facilities to transit and future mass transit
- The BPE contributes to building a more complete transportation system through modal options and links



Regional Transportation Commission
IT Department
GIS Division
March 30, 2016

Alternative Transportation Mode Network

What is being done?
..continued

Bicycle and Pedestrian Plan

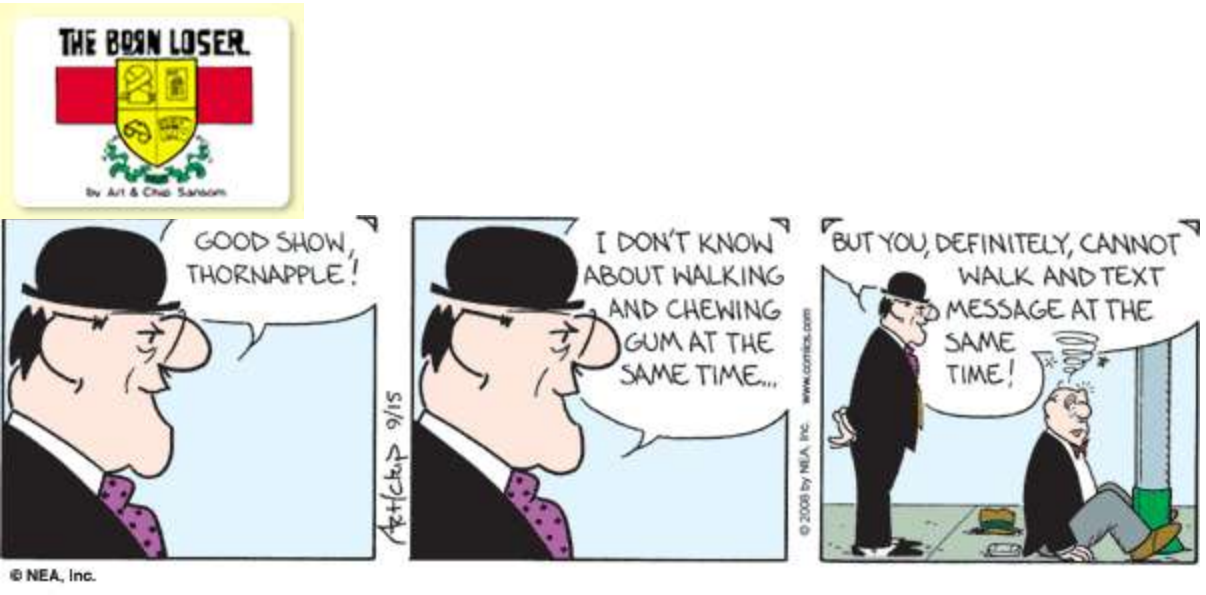
RTC has 39 fixed routes the Deuce and a Max Route

RTC transit routes carry 50,000 to 60,000 bicycles a month.

What is being done?

..continued

- **Pedestrian Safety Action Plan**
- **Targeted safety campaigns**



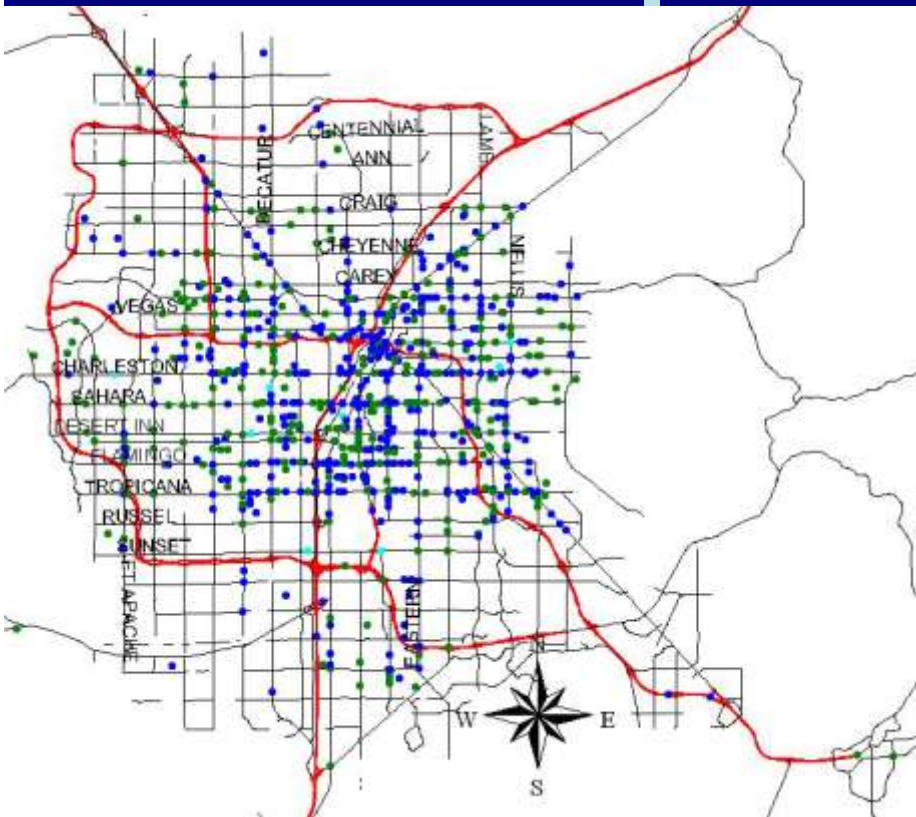
Street Design Issues

Geometrics, Infrastructure, Operational & Policy

Roadway Design Matters

- **Majority of crashes occur on arterials where the speeds are higher and the roadways are wide**

  (City of Henderson not included on figure.)



Areas of Concern

- **Width of travel lanes**
- **Driveway frequency**
- **Travel speeds**
- **Median applications**
- **Lateral separation/buffers**
- **Pedestrian signal timing**
  At 3’ per second it takes 30 seconds to cross a 90’ street

Areas of Concern …continued

- **Land Use/Development Patterns**
  - Spatial orientation
  - Ample access to roadways for residential areas
  - Access policies

- **If the link isn't there, people will make one.**

- **The trick is that it might not always be the safest way to make the link.**

Areas of Concern …continued

- **Intersection geometrics**

Know What Is Out There!

- **Inventory of facilities is essential!**
  - Geometry
  - Physical conditions
  - Challenges/barriers

- **Minimum elements of inventory:**
  - Sidewalk widths and types
  - Curb lanes widths
  - Curb cuts/frequency
  - Median/type
  - Location/condition of crosswalks
  - Posted travel speeds
  - Visual impairments

Inventory Techniques

- **Manual Data Collection**
  Time consuming and costly

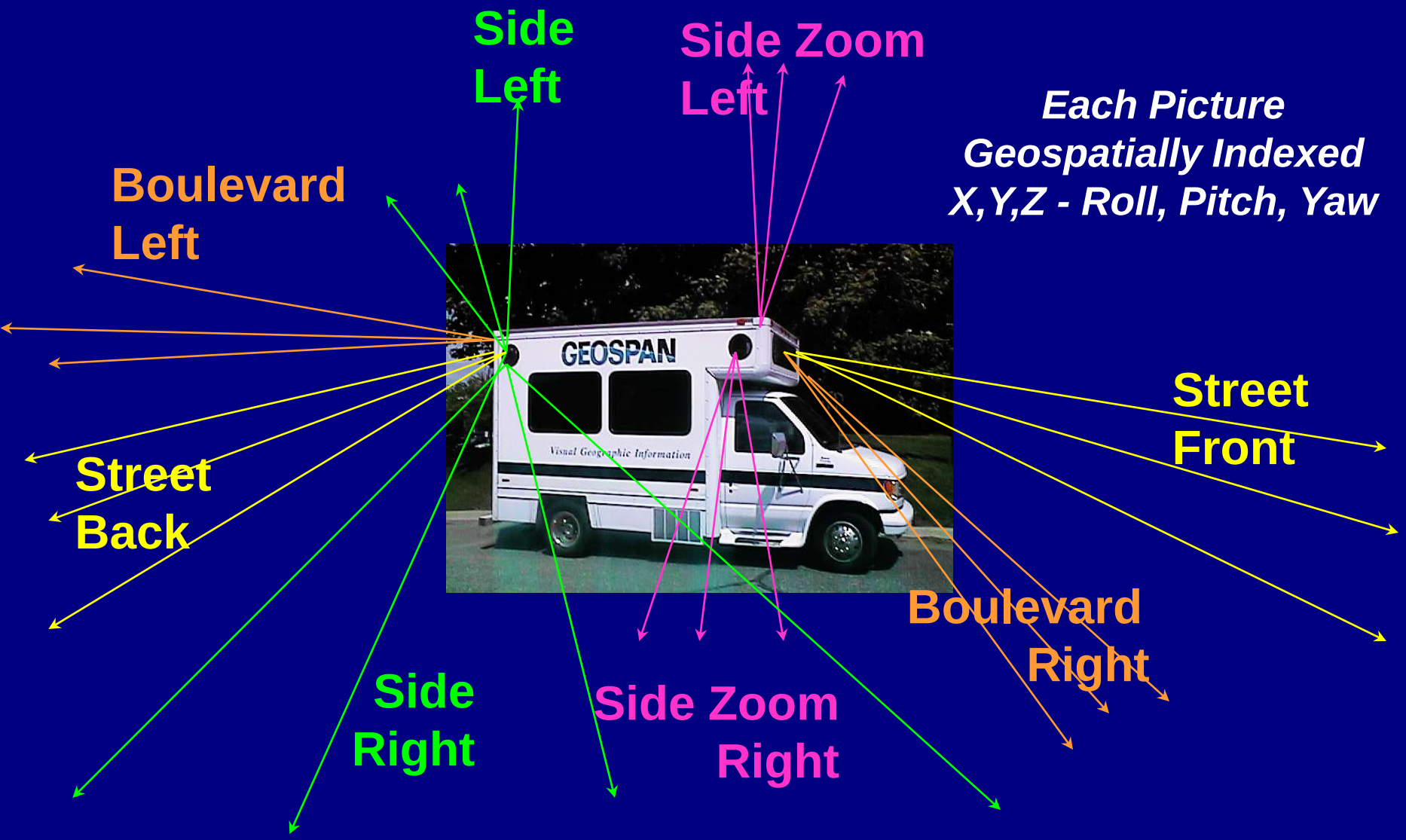
- **Aerial Photos**
  Good sketch planning tool;
  no accurate data collection

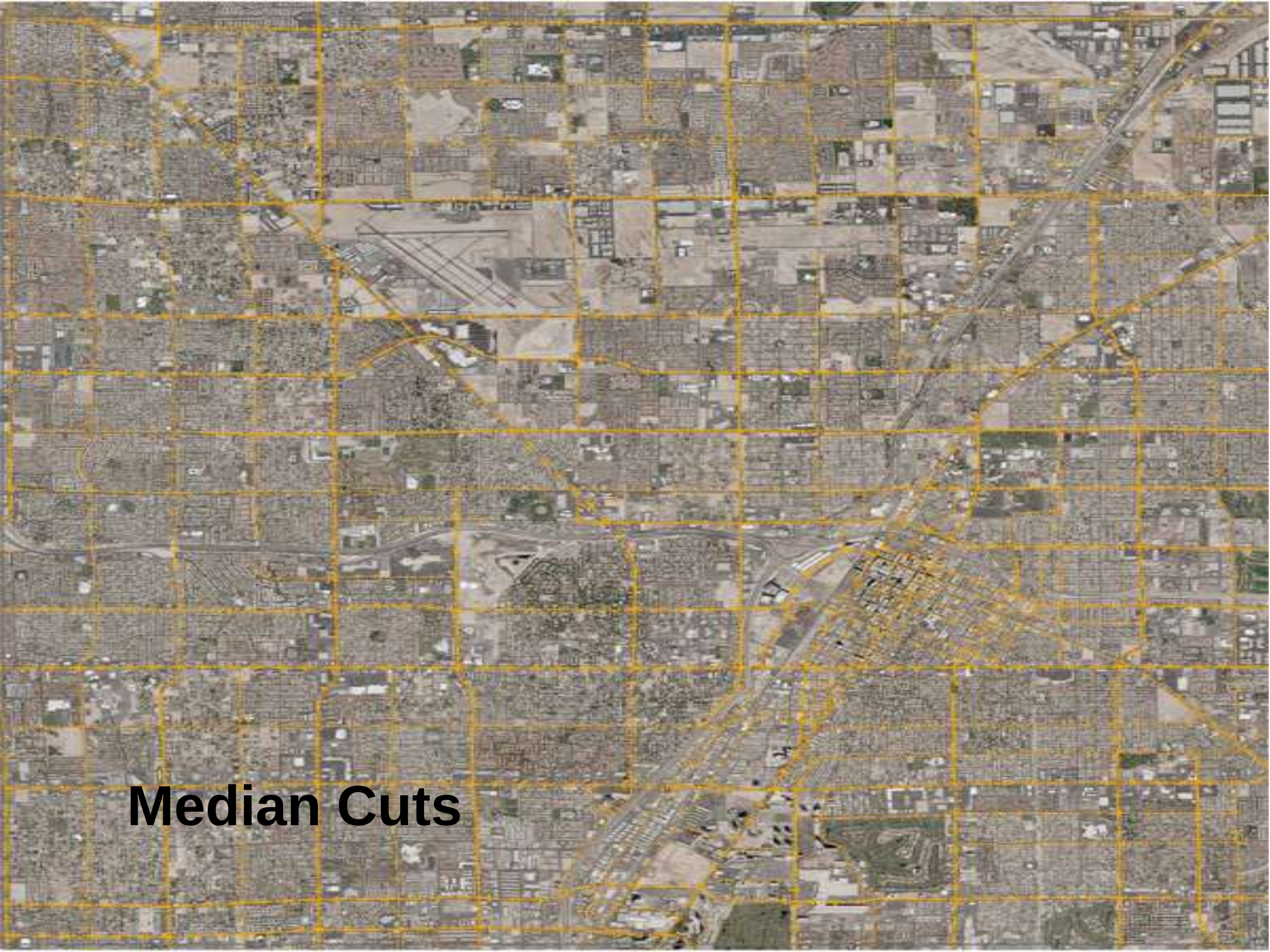
- **Camera/Automated**
  Efficient, cost effective - lends itself to a variety of applications

Digital Imaging Overview

- Data Collection Method
- Las Vegas Area Coverage
- GIS Driveway location file

Camera Power




Median Cuts


Driveways

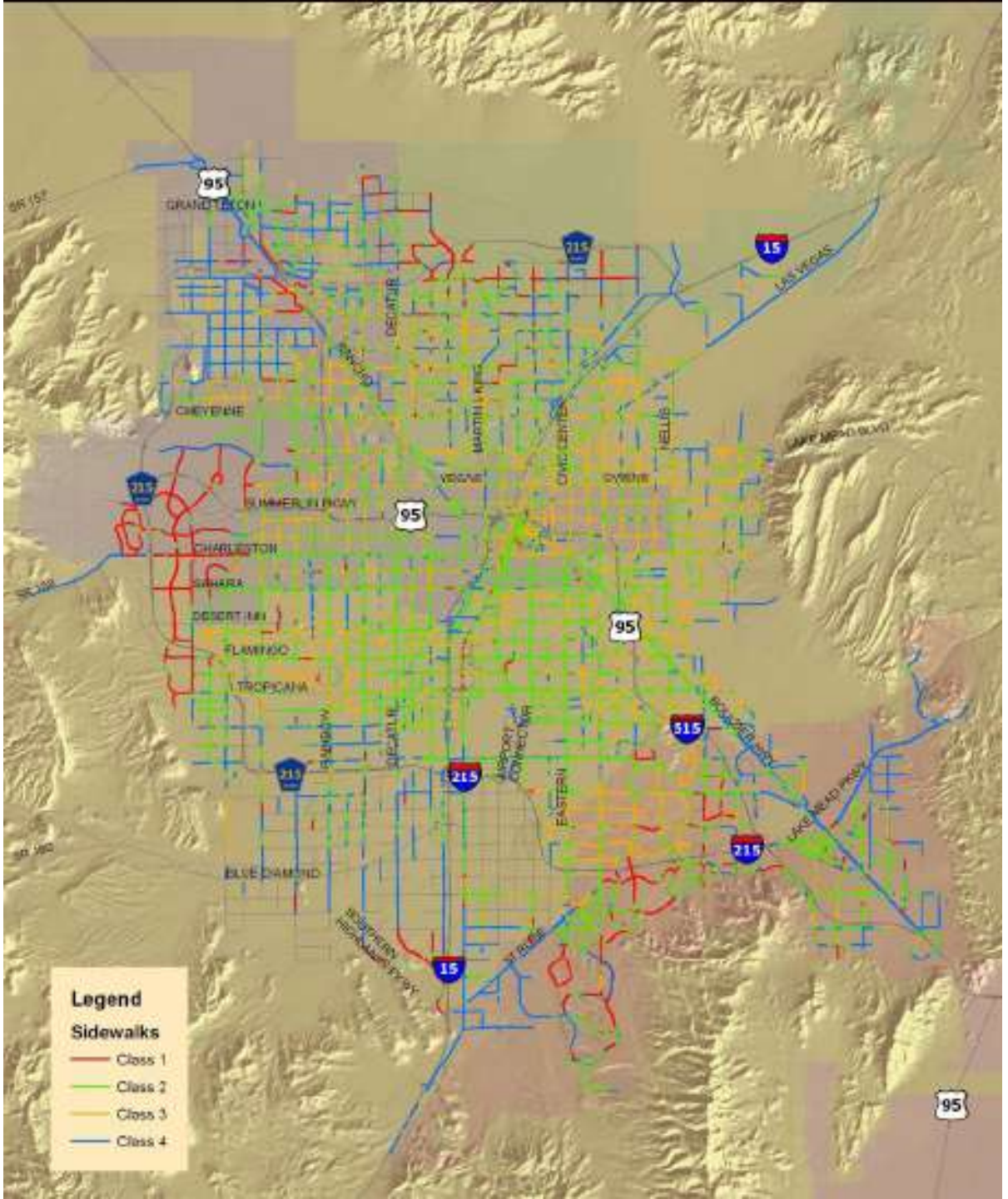

Viewer1 12/7/2005
Tools
Survey Modes
Measure Road Width
Drive
GoTo
F
L
R
B
Master
100%
+1
v0806039:9524|C1-C1
Hold
2.5 Feet
Measurement Tool
Start
\\P14\e\bin\bike path
GEOVISTA GCASigns ...
Viewer1 12/7/2005
18.bmp - Paint
10:11 AM

Map Sidewalks:

- Class One
- Class Two
- Class Three
- Class Four

Sidewalk Map:

Class 1: 172 miles
Class 2: 861 miles
Class 3: 515 miles
Class 4: 591 miles



Specific Retrofitting Strategies

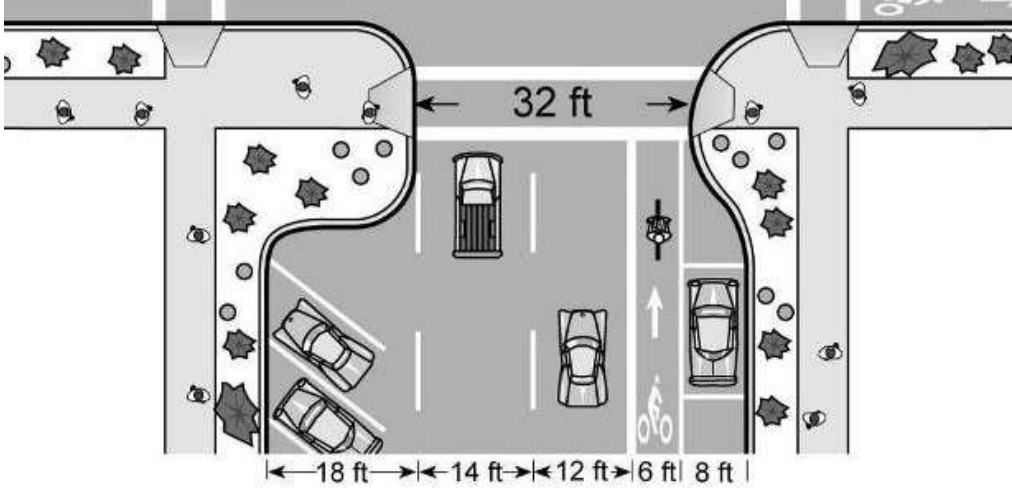
Choose Facilities That Have:

- Low posted travel speeds
- Low or no truck travel
- Lower overall crash rates
- Adequate ROW to accommodate retrofit

Focus on Intersections

- **Provide crossing refuges at all intersections**
- **Reduce crossing widths where possible!**

  Bulb outs are effective on minor arterial and collectors.
- **Eliminate free flow right turns**
- **Ensure that the signal's green 'walk' time is adequate for the width of the facility**
- **Separate bike though movements from right turning vehicles**

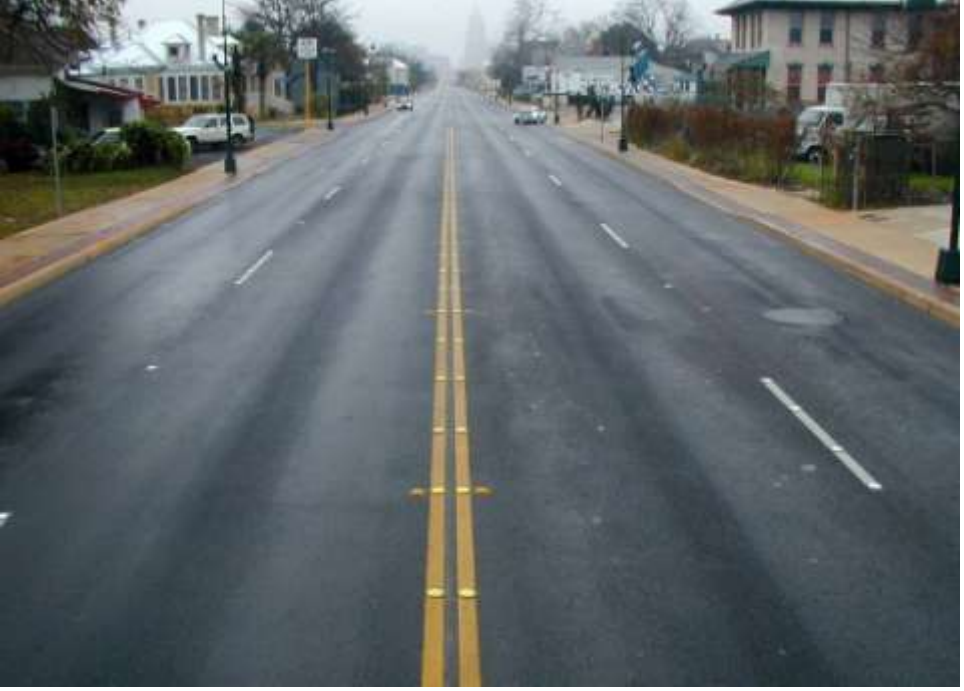


Reduce or Mitigate Conflicts on the Roadway

- Reduce the frequency of driveways!
- Install medians to reduce conflicts; double as refuges
- Provide lateral separation/buffer for pedestrians
- Take advantage of eliminating travel obstructions on sidewalks when retrofitting

Reduce Widths of Travel Lanes

- Research has demonstrated that 10.5 wide lanes are adequate for almost all facilities except freeways
- Narrow lanes aid in speed reduction
- Reduces pedestrian crossing distances; is safer and creates space for wider sidewalks and bike facilities



- **Which road carries more traffic?**
- **Which road produces the lower speed?**
  - ✓ **With a 4-lane road a fast driver can pass others**
  - ✓ **With a 2-lane road the slower driver sets the speed**
- **Which road experiences the lower crash rate?**
- **Which is better for bicyclists, pedestrians, businesses?**

Develop a Prioritization Plan

- **Include input from multi-agencies, jurisdictions, law enforcement and the public**
- **Give priority to facilities that may be used for Safe Routes to School**
- **Focus on streets anticipated to experience high walking and cycling demand**
- **Focus on retrofitting streets that eliminate gaps in the network**
- **Retrofit streets that improve neighborhood to neighborhood/shopping linkages – promotes short trips**

Consider Improvements to the Streetscape When Retrofitting

- **Landscaping**
  - Provides a more aesthetically pleasing experience
  - Can be used as a soft buffer
  - Facility color can be very useful in improving recognition (link graphic)
- **Consider adding street amenities –**
  - They help to increase participation!
  - Advantageous within CBDs, shopping, restaurant & entertainment areas

Incorporate Transit Accessibility When Retrofitting

- Enhances/encourages multimodal trip making
- Include provisions for bikes on buses

Street Retrofit Examples

Reinventing the roadway:
Transform a 5-lane commercial strip to …

Portland OR

…a safer road for everyone

Transforming a street

Los Angeles CA

Narrow travel lanes; add bike lanes, median, trees, texture

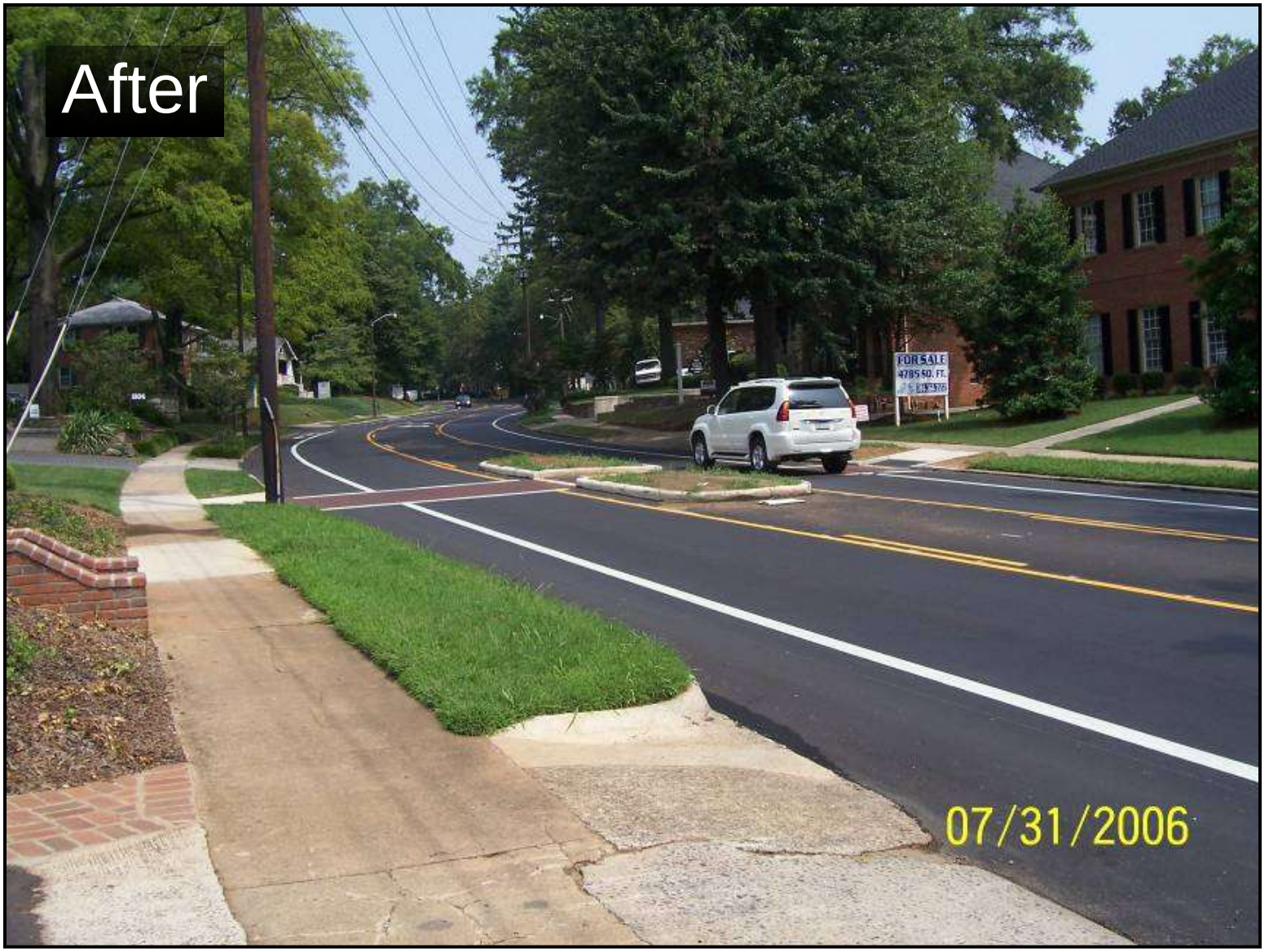
Los Angeles CA

Before

After

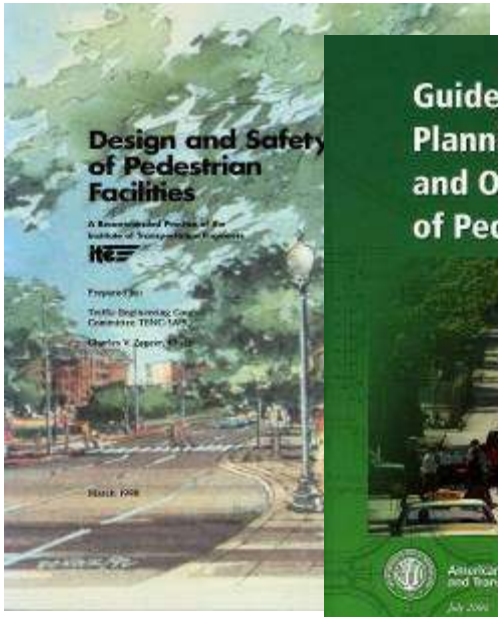
Olive Avenue in W. Palm Beach

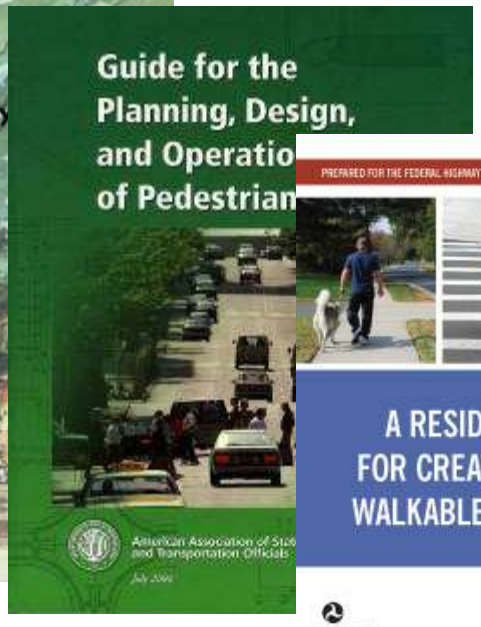

BUFORD
HEIGHTS

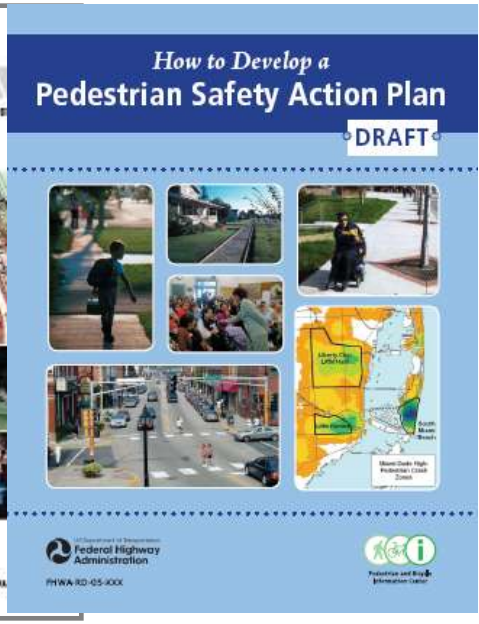


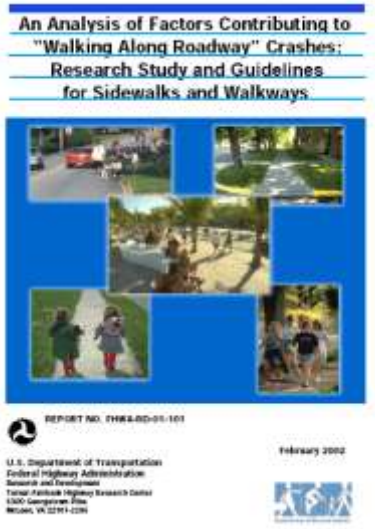
[54] East Boulevard, Charlotte NC

Most designs are available in:









ITE: www.ite.org

AASHTO:

www.safety.transportation.org
PBIC: www.walkinginfo.org

NHTSA: nhtsa.dot.gov **FHWA: safety.fhwa.dot.gov**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