Complete Streets

March 2, 2006
SAFE and COMFORTABLE for all users

Source: www.completestreets.org, peds.org
SAFE and COMFORTABLE for all users

• About 1/3 of Americans don’t drive
  - 21% of people over 60
  - All children under 16
  - Many low income Americans cannot afford automobiles

• 9% of all trips are made by foot or bicycle

• 13% of all traffic fatalities are bicyclists or pedestrians

• Pedestrian injury is the 2nd leading cause of death for children 5-9

• More than 5,000 pedestrians and bicyclists die each year on U.S. roads

• 64 pedestrians were killed in Atlanta in 2001

Source: www.completethestreets.org, peds.org
Pedestrians and bicyclists...

1% of federal funding
9% of trips
13% of fatalities
Why aren’t bicycle and pedestrian needs given equal consideration in design?
A POLICY
on
GEOMETRIC DESIGN
of
HIGHWAYS
and
STREETS
1994

AMERICAN ASSOCIATION OF STATE
HIGHWAY AND TRANSPORTATION OFFICIALS
The Green Book is **NOT** a design manual....

It provides **guidance** on geometric dimensions of roadways.

Aspects of design not directly addressed:

- Problem definition
- Project definition
- Development of a concept
- Aesthetic treatments
- Design context

*All of these decisions are made before the Green Book is applied.*

*Source: Flexibility in Highway Design, USDOT*
Basic Design Decisions Should Derive from the Goals Defined at the Outset of the Project
Relationship Between Pavement Width and Speed

Source: City of San Antonio, TX
Maximum Volume
25-30 Miles Per Hour
Relationship Between Unimpeded Block Length and Speed

Source: City of San Antonio, TX
Network  vs  Sparse Hierarchy

Same Lane-Miles

Greater Capacity
The Effects of Designing for Cars
The Effects of Designing for Cars
1. Sidewalk Capacity

2. Quality of the Environment

3. Perception of Safety (or Comfort)
Factors that affect SAFETY

- Motor Vehicle Speeds – Especially in crosswalks
- Lateral Separation Zone from Cars
- Buffers and Barriers from Cars – Landscaping; Parked Cars, etc.
- Ample and Visible Crossing Locations
- Driveway Frequency

Factors that affect COMFORT

- Adequate width – Between 5 and 20ft. free of obstructions
- Effective lighting
- Ground level uses and activities
- Shade – Either from trees or buildings
- Surface – Smooth, dry, level
Pedestrian Safety and Comfort

Lateral Separation

Vehicle Speeds
Pedestrian Safety and Comfort

Lateral Separation

Driveway Frequency

\[ F_L N R = \frac{1}{3} - \frac{1}{3} \]

\[ N_{L,R} = \frac{1}{3} - \frac{3}{8} \]
Lateral Separation

Buffers and Barriers

Driveway Frequency
Ample & Visible
Crossing Locations

Buffers and Barriers

Driveway Frequency
Ample & Visible Crossing Locations

Buffers and Barriers
Effective Lighting

Ample & Visible Crossing Locations

Ample Width
Effective Lighting

Ground Level Uses and Activities

Ample Width
Pedestrian Safety and Comfort

Effective Lighting

Ground Level Uses and Activities

Shade
Factors that affect SAFETY

Motor Vehicle Speeds
Presence of Dedicated Facilities

Factors that affect COMFORT

Traffic volume - Higher traffic volumes / greater potential risk for bicycles

Traffic mix - Trucks, buses, etc. can increase risk

On-street parking - Additional width is needed

Sight distance - Allow motor vehicle to change lane position or slow down; primarily on rural highways

Number of intersections - Intersections may require special treatments
1. **What type of bicyclist is the route most likely to serve?**

   - **Advanced bicyclists** - Sufficient space on the roadway shoulder. Treated as vehicles. Bike lanes on arterial and collector streets.

   - **Basic bicyclists and children** - Low-speed, low-volume streets or multiuse path.

2. **What type of roadway project is involved, i.e., new construction, major reconstruction, rehabilitation?**

   Even on rehab projects, steps such as widening the pavement area 1 to 2 ft. will enhance the roadway for bicycle use.
Bicycle Facilities

Bike Paths
Bikes out of Street

Bike Lane
Part of Street Reserved for Bikes

Bike Route
Bikes Share Entire Street

Bikeway Hierarchy
**Shared lane**- a "standard-width" travel lane that both bicycles and motor vehicles share

**Wide outside lane**- an outside travel lane with a width of at least 4.2 m (14 ft) to accommodate both bicyclists and motorized vehicles

**Shoulder**- a paved portion of the roadway to the right of the traveled way designed to serve bicyclists

**Bicycle lane**- a portion of the roadway designated by striping, signing, and/or pavement markings for preferential or exclusive use by bicycles and/or other nonmotorized vehicles

**Multiuse path**- a facility that is physically separated from the roadway and intended for use by bicyclists, pedestrians, and others
It’s the Law! - SAFETEA-LU

(Safe, Accountable, Flexible & Efficient Transportation Equity Act - a Legacy for Users)

• Safe Routes to School Program
• Transportation Enhancements
• Congestion Mitigation and Air Quality (CMAQ)
Implementation

• Procedures should accommodate all users on every project
• Design manuals should encompass the safety of all users
• Planners and engineers should be trained to balance the needs of diverse users
• Create new data collection procedures to track how well the streets are serving all users
Once your street is improved, the curb will be right here.
UPGRADES? SURE IT'S GOT PLENTY. EVEN THE STREET GOT UPGRADED TO AN ARTERIAL JUST THE OTHER DAY.
SCOTT KNEW THAT THE SIGNALS WERE TIMED TO ALLOW FOR THE SMOOTH FLOW OF TRAFFIC MOVING AT 25 MPH (40 KM/h)
I TOLD YOU THAT SIX LANES WOULD IMPROVE THE LEVEL OF SERVICE.
...and they agreed that protecting the right of way next to Joe's house was a good idea.
We have had about 30,000 accidents in the county every year for the past five years.
ACCIDENT IMPROVEMENT

LEVEL OF SERVICE
TRAFFIC
TRAFFIC DEMAND
UPGRADE
EFFICIENT

COLLISION WIDENING/NARROWING
CHANGE/MODIFICATION
... FOR WHO?
MOTOR VEHICLES
AUTOMOBILE USE
REDESIGNATE
FAST
A Good Complete Streets Policy

• Specifies that ‘all users’ includes pedestrians, bicyclists, transit vehicles and users, and motorists, of all ages and abilities.
• Aims to create a comprehensive, integrated, connected network.
• Recognizes the need for flexibility: that all streets are different and user needs will be balanced.
• Is adoptable by all agencies to cover all roads.
• Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
• Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
• Directs the use of the latest and best design standards.
• Directs that complete streets solutions fit in with context of the community.
• Establishes performance standards with measurable outcomes.