Bicycle and Pedestrian Traffic At The Tipping Point

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Bicycle and Pedestrian Traffic at the Tipping Point

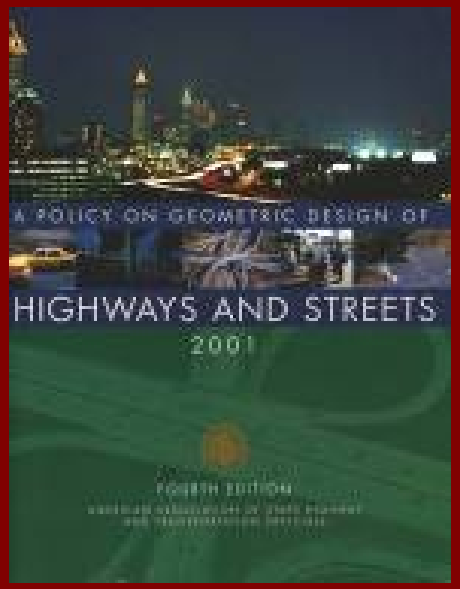
What Has Changed

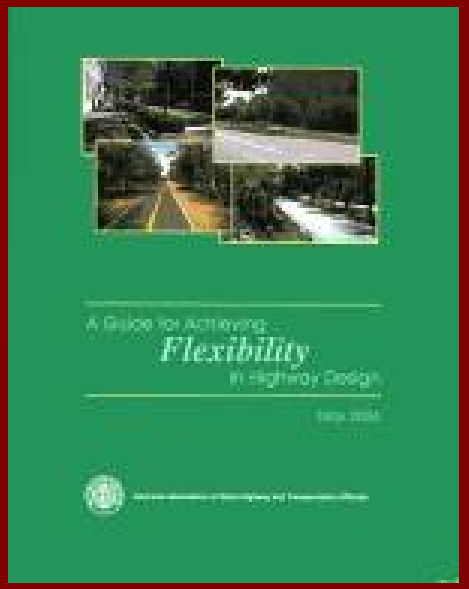
- Gradual “Mainstreaming” Bicycle and Pedestrian As a Transportation Mode
- Major Urban Design Initiatives
- Economic Pressures
- Social Norms

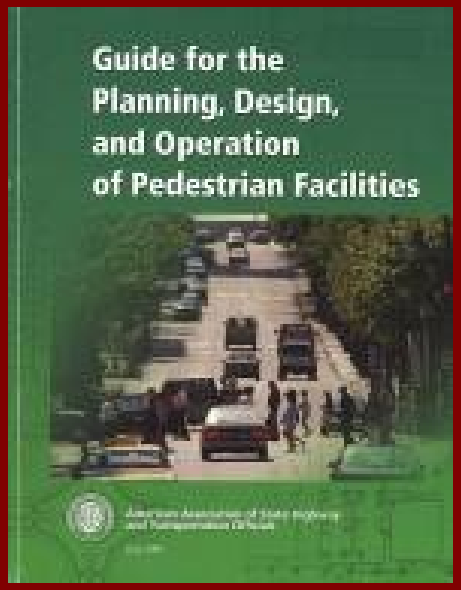
AASHTO Guidelines

- American Association of State Highway Transportation Official's (AASHTO) "Green Book" Calls for Accommodating Bicycles and Pedestrians

- AASHTO Bike and Ped. Guides Are Incorporated by Reference in the "Green Book"
  - No Conflicts with the Michigan Design Manual or Local Agency Guidelines

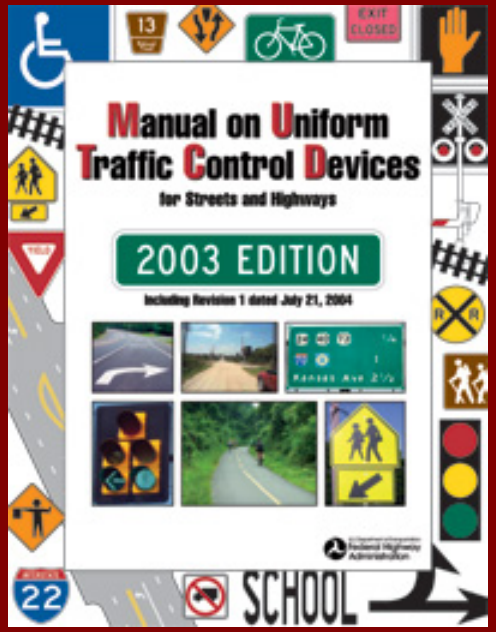


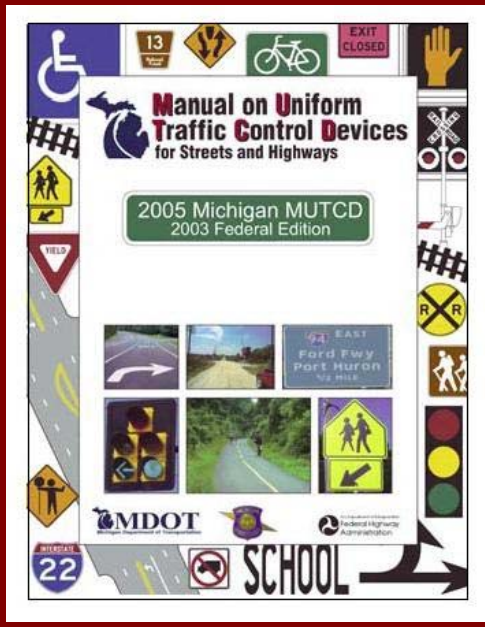




Manual of Uniform Traffic Control Devices (MUTCD)

- Entire Section on Bicycle Facilities
- Next Version Has Many New Items for Bicycles and Pedestrians
  - Streamlined Bicycle Route and Bicycle Route Guide Signs
  - Shared Use Arrow
- Lots of Experimentation Currently Occurring with Bicycle and Pedestrian Traffic Control Devices





FHWA Nonmotorized Accommodation Policy

Federal Highway Administration Model:

- Include Bike and Ped. Facilities in New and Reconstruction Projects in Urban Areas – Few Exceptions
- Pave Shoulders in Rural Areas
- Anticipate Future Demand
- Address Crossing the Road
- Get Exceptions at Senior Level
- Use Best Currently Available Guidelines

Bottom Line – Incorporate Bicycles and Pedestrians in All Non-freeway Projects as a Matter of Course.

Need to Make the Case for Why Not Rather than Why.

Bicycling and Walking Are in Vogue

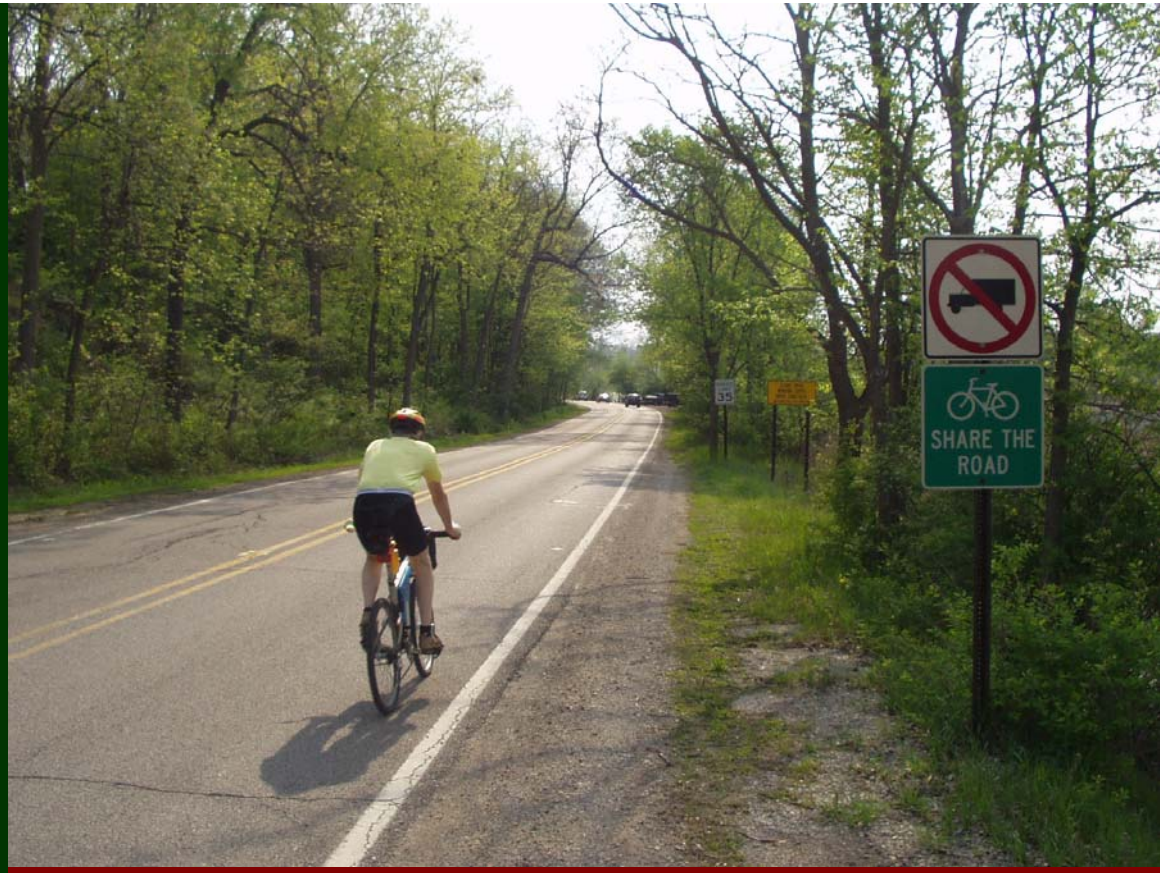
- Healthy Livable Communities
- New Urbanism
- Smart Growth
- Livable Communities
- Active Transportation
- Transit Oriented Development
- Complete Streets
- Safe Routes to School
- Form Based Codes
- Walkable Communities

Bicycling and Walking Are Central to The Most Important Urban Design and Health Initiatives in the Country!

And There Is That “Global Warming” Thing

The $4.00 a Gallon Gas Experiment of 2008

- $4 Gas in 2008 Changed Travel Patterns
  - Less Miles Driven
  - More Miles Biked and Walked
- Bicycles and Pedestrians Were Newsworthy and Visible
- People Were Bicycling and Walking More in Suburban Environments
- Other Economic Forces Continue to Impact Travel Choices



We Went From A Situation Where We Where Trying to Build an Environment to Encourage Bicycling and Walking for Health and Environmental Reasons to Reacting to Increased Bicycling and Walking Due to Economic Reasons

“Normal” People Started to Walk and Bicycle

- We Have Seen A Significant Increase in The Number of People Bicycling Around the State and Country
- Not Just Students
- Many Bicycling Year-round
- Now Seen As Being A Good Citizen vs. In the Past There Was The Stigma of Too Poor To Own a Car or a Lycra Clad Weirdo
- Less Us vs. Them

You Probably Now Know Someone Who Walks, Bicycles or Takes a Bus To Work (If You Don’t Do So Yourself).

Big Increase in “Commuter” Bicycle Sales

Bicycle and Pedestrian Traffic at the Tipping Point

Design and Engineering Challenges

- Fear and Ignorance
- Different Evaluation Techniques
- Institutional Barriers
- Realities of Mid-block Crossings
- Sidewalk Bicycling

Fear and Ignorance

- Of The Approximately 40,000 People Who Die Each Year on US Roadways About:
  - 5,000 Are Pedestrians
  - 800 Are Bicyclists
- No One Wants to Hit A Pedestrian or Bicyclist
- Fear Introducing Pedestrians and Bicycles Into the Roadway
- May Not Have the Educational Background to Make Informed Decisions

There is a Perception That Liability Is Limited By Doing Nothing - Liability is Not an Issue

Result Is Too Often Doing Nothing or Overkill

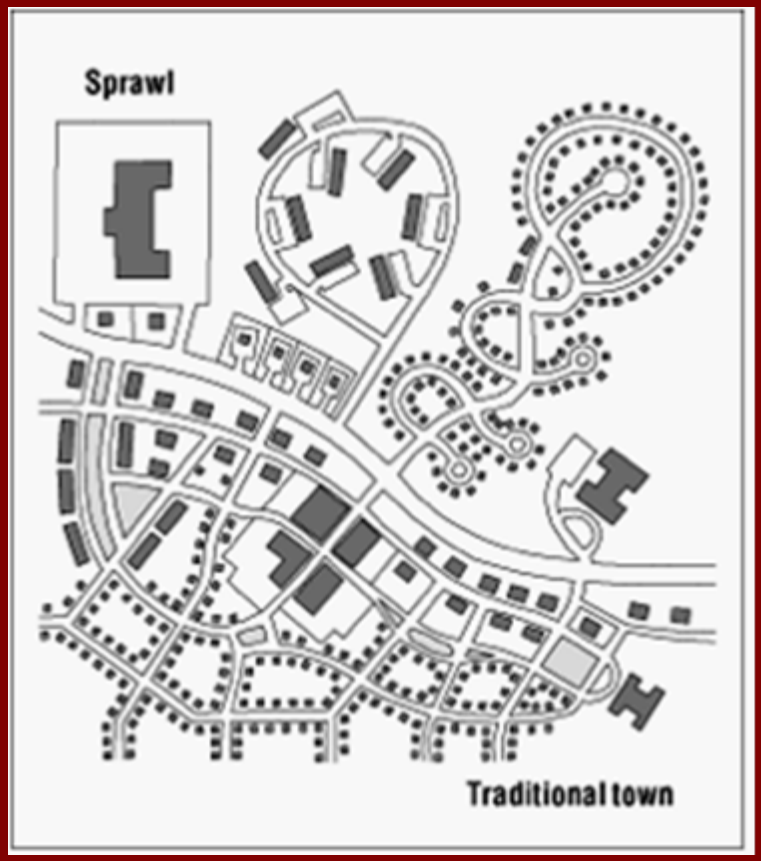
Institutional & Professional Barriers

- Institutional Focus
- Measurements of Success
- Lack of Education on Bike and Ped. Issues
- Professional Boundaries
  - Engineering
  - Planning
  - Landscape Architecture
  - Enforcement
  - Health Care

There is Plenty of Blame to Go Around. But the Solutions are Where the Planning, Design, Engineering, Enforcement and Educational Fields Overlap.

Street Networks Influence on Safety

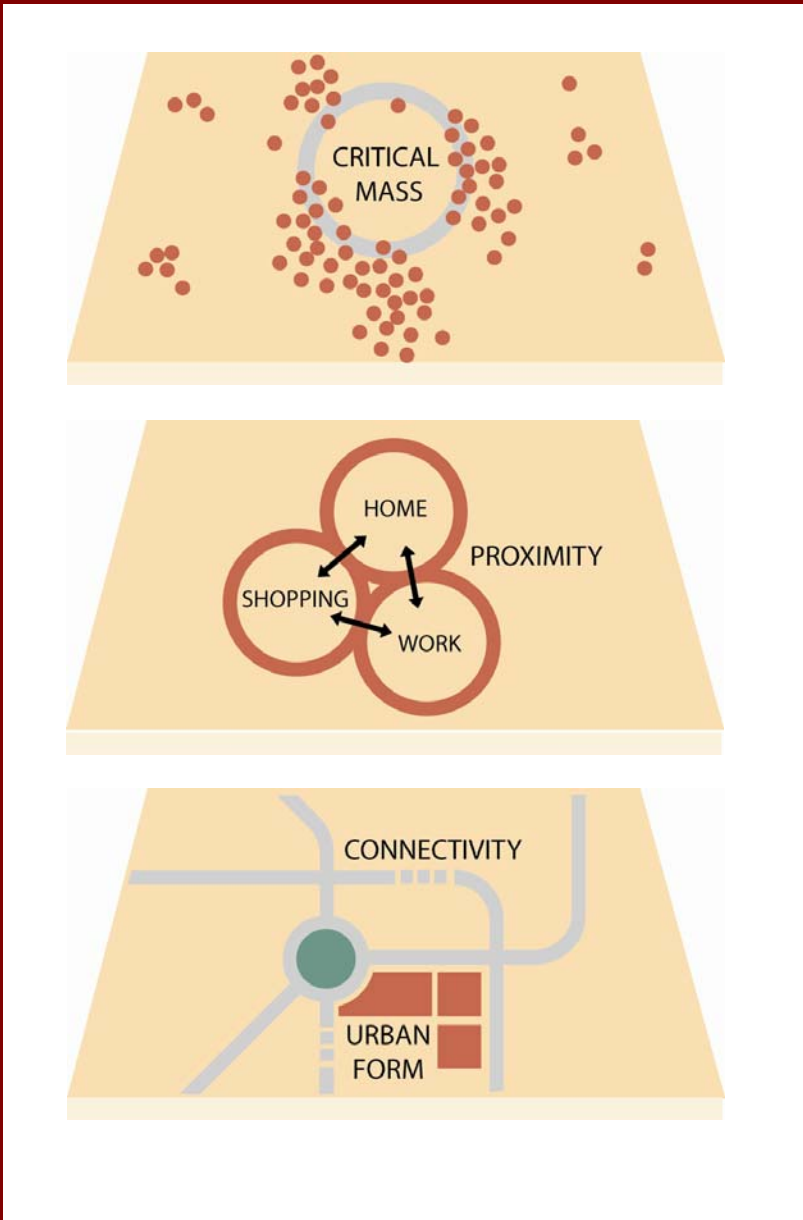
- Review of 24 Cities and 130,000 Crashes Shows that Safety Grows as Street Networks Grow Denser
- Newer Cities, Primarily Developed Since 1950 Are the Most Unsafe
- Newer Cities Tend to Concentrate Traffic on a Few Main Roads
- Newer Cities Tend to Have Fewer Busier Intersections
- Older Cities Tend to Have Grid Road System



Speed Is a Key Safety Factor – When Vehicle Speeds Drop 5%, Injuries Drop 10%, Fatalities Decrease by 20%. Grid Road Systems Tend to Be Slower Road Networks.

Urban Form Influences Nonmotorized Travel

- Research Has Shown That Urban Form Influences Mode Choice and Total Miles Traveled
- The Most Important Factors Are
  - Density (Population)
  - Diversity (Land Use)
  - Design (Street Network)
- People Moving From One Area to Another Will Change Their Behavior

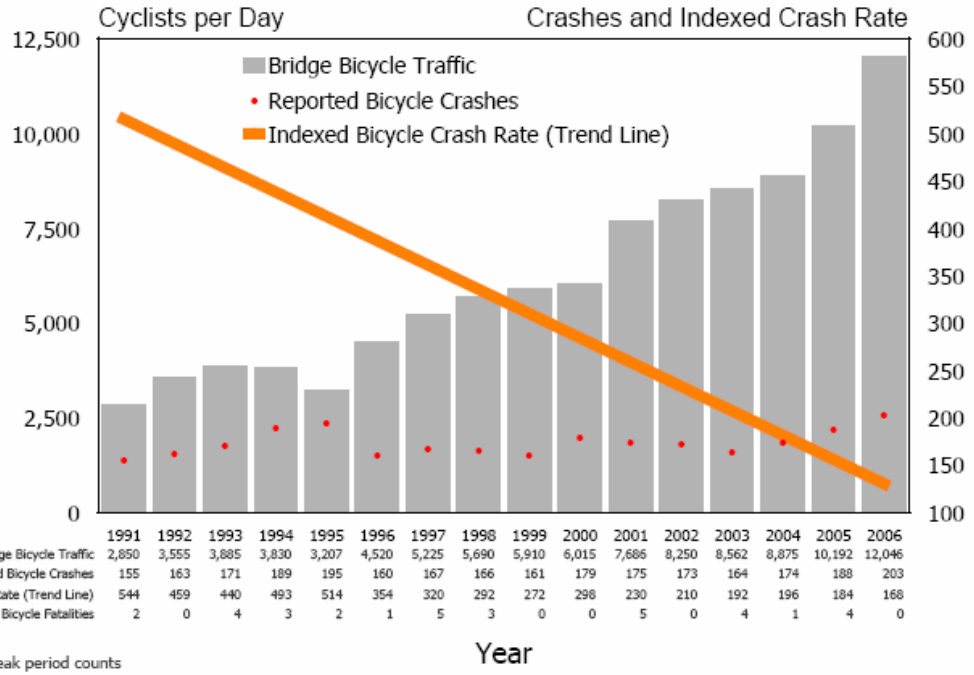


Safety in Numbers

- The Most Effective Way To Increase the Safety of Pedestrians and Bicyclists is To Increase the Numbers of Pedestrians and Bicyclists

- Pedestrian and Bicycle Safety is A Biggest Concern Where There Are the Fewest Bicycles and Pedestrians

Combined Bicycle Traffic over Four Main Portland Bicycle Bridges Juxtaposed with Bicycle Crashes



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bridge Bicycle Traffic	2,850	3,555	3,885	3,830	3,207	4,520	5,225	5,690	5,910	6,015	7,686	8,250	8,562	8,875	10,192	12,046
Reported Bicycle Crashes	155	163	171	189	195	160	167	166	161	179	175	173	164	174	188	203
Indexed Bicycle Crash Rate (Trend Line)	544	459	440	493	514	354	320	292	272	298	230	210	192	196	184	168
Bicycle Fatalities	2	0	4	3	2	1	5	3	0	0	5	0	4	1	4	0

Extrapolated from peak period counts

"Crash Rate" represents an indexing of annual reported crashes to daily bicycle trips across the four main bicycle bridges.

In Portland The Number of Crashes Held Almost Steady While the Number of Cyclists Dramatically Increased

Safety in Numbers

- Two Types of Safety Concerns:
  - Personal Safety From Crime
  - Threat of Being Hit by a Motor Vehicles
- More Pedestrians =
  - More Eyes on the Street and a Safer Environment
  - Increased Driver Expectations of Encountering a Pedestrian

The More Pedestrians There Are the More Likely a Motorist May Know or Even Be Related to A Pedestrian on The Street.

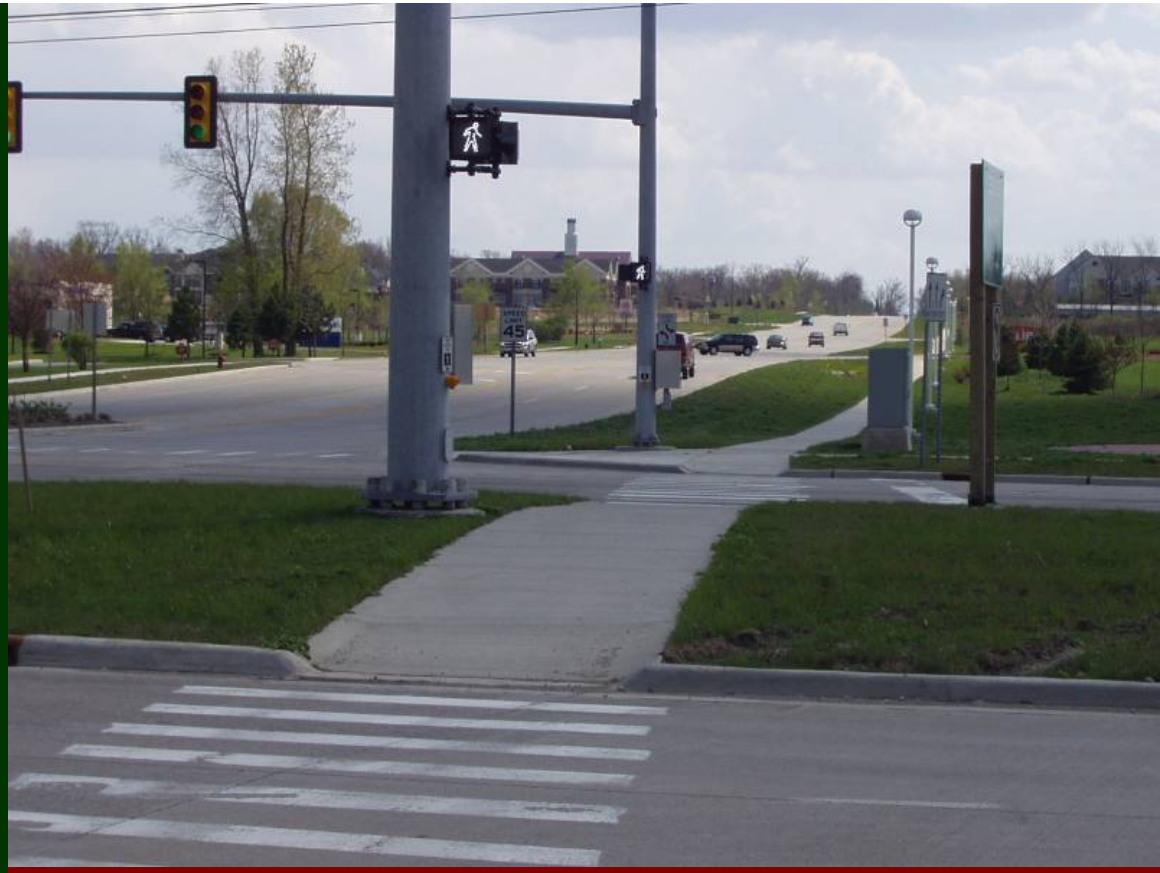
Safety in Numbers

- The Concept Applies Community Wide and To Specific Locations and Times
- Less Frequent Use Needs More Visible Facilities to Increase Motorists Awareness
- This is The Opposite of How Motorized Facilities Are Dealt With

Dangerous Designs and Situations May be Off-Set By Expectations of Encountering Pedestrians.

The Suburban “Perfect Storm”

- If You Look At The Suburban Context It Typically Consists of:
  - Four + Lanes of Traffic
  - 35 to 50 MPH Speeds
  - Highest Traffic Volumes Per Lane
  - ½ to 1 Mile Between Signals
  - Limited or Non-Existent Transit Service
  - Deep Building Setbacks
  - Few Pedestrians and Bicycles



The Conditions of a Suburban Context Warrant Significant Pedestrian and Bicycle Facilities for Relatively Few Bicyclists and Pedestrians

Evaluating Bicycle and Pedestrian Crashes

- A Typical Crash Analysis Periods is 3 Years – This Works Fine for Automobiles
- To Get A Similar Sample for Pedestrians You Would Have to Have A 20 to 60 Year Time Frame
- Pedestrian/Motor Vehicle Crashes Typically Result in Server Injury or Death
- This is Why It Often Takes A Severe Injury or Fatality to Get a Crosswalk
- Pedestrian and Bicycle Safety Issues Are Often Best Handled By Road Safety Audits – Looking For Near Misses

Too Often Bicycle and Pedestrian Safety Issues Are Not Given The Same Attention as Motorized Safety Issues Because They Do Not Have the Same Concentration of Crashes.

Lack of Bicycle and Pedestrian Counts is an Issue In Identifying Problem Areas.

Pedestrians Will Not Go Out of Their Way

- Average Walking Trip for Personal Business is About ½ Mile. This Equals A 10 Minute Walk
- Think of Out of Direction Travel as a Percentage of the Total Trip Distance and Walking Time
- Thus A10% Detour for An Average Walking Trip is 264’ (less than a city block)

Direct Behind You Is A Large Married Student Housing Complex.

So How Effective Do You Think This Sign Was?

Pedestrians Will Not Go Out of Their Way

Pedestrians Will Not Go Out of Their Way

- In 10 Minutes, 8 of 9 Pedestrian Crossed Mid-block
- Accommodate Mid-Block Crossings If Signalized Crossings are Spaced Greater Than 660’ (1/8 Mile) Or Less If There Is A Direct Connection
- Where Demand Exists The Typical City Block (330’) Is About the Right Spacing For Crosswalks

Does the 85% Rule Apply to Pedestrians?

Locating Crosswalk – Determining Demand

- Existing Crossing Activity
  - May Be Time Sensitive
- Map Out Mixed Land Use On Opposite Sides of Road
  - Housing and Retail
  - Office and Restaurants
- Major Transit Stops – Look for Shelters
- School Routes
- Bike Routes
- Local Road Connectors
- Trail Crossings

Don't Only Rely on Existing Activity. Some Traffic Is So Intimidating That It Inhibits Trips. Evaluate the Latent Demand.

Look at a Road As It Were a River and Locate the Crosswalk as You Would Locate a Bridge.

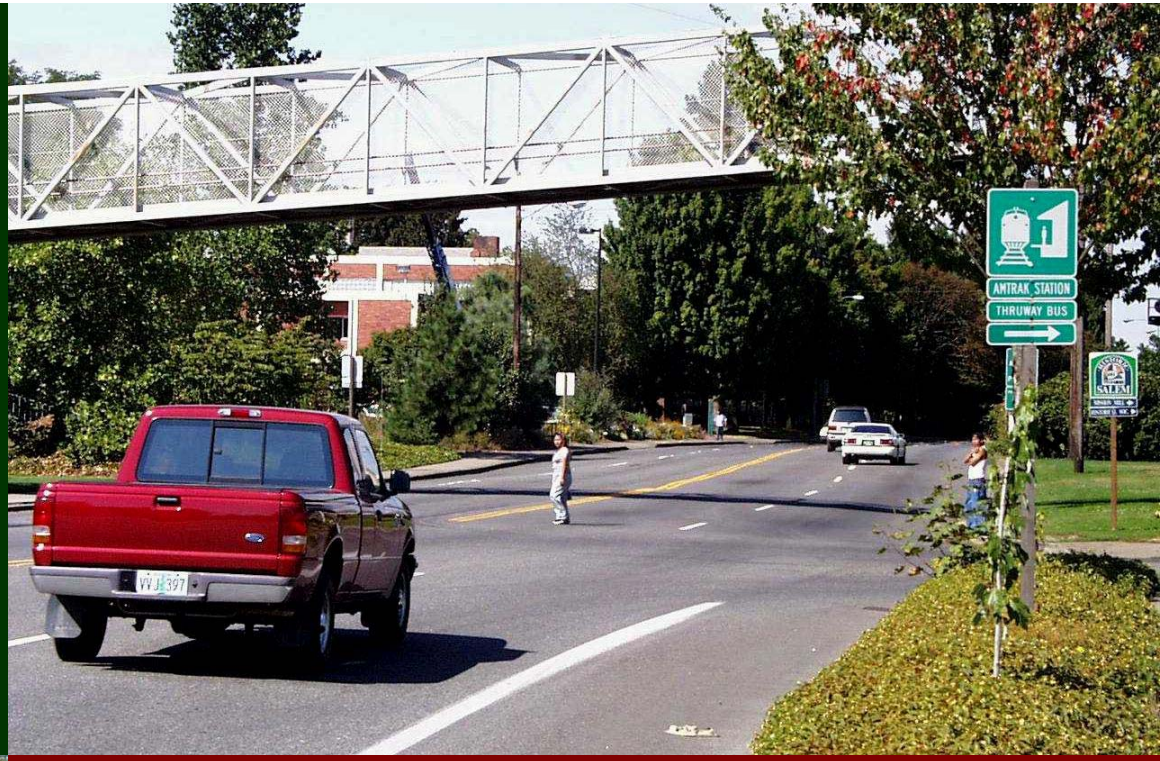
Redirect Mid-block Crossings to a Signal?

- Too Often the Default Choice Without Analysis
- Is The Signalized Intersection Really A Safer Option?
  - Generally More Lanes
  - Turning Movements
  - Many Things Vying for the Driver Attention
- Is The Route To The Intersection Safe?
- Will Pedestrians Really Go That Far Out of Their Way?

In Many Cases A Unsignalized Mid-Block Crossing May Be the Safer Alternative

Redirect Mid-block Crossing Overhead?

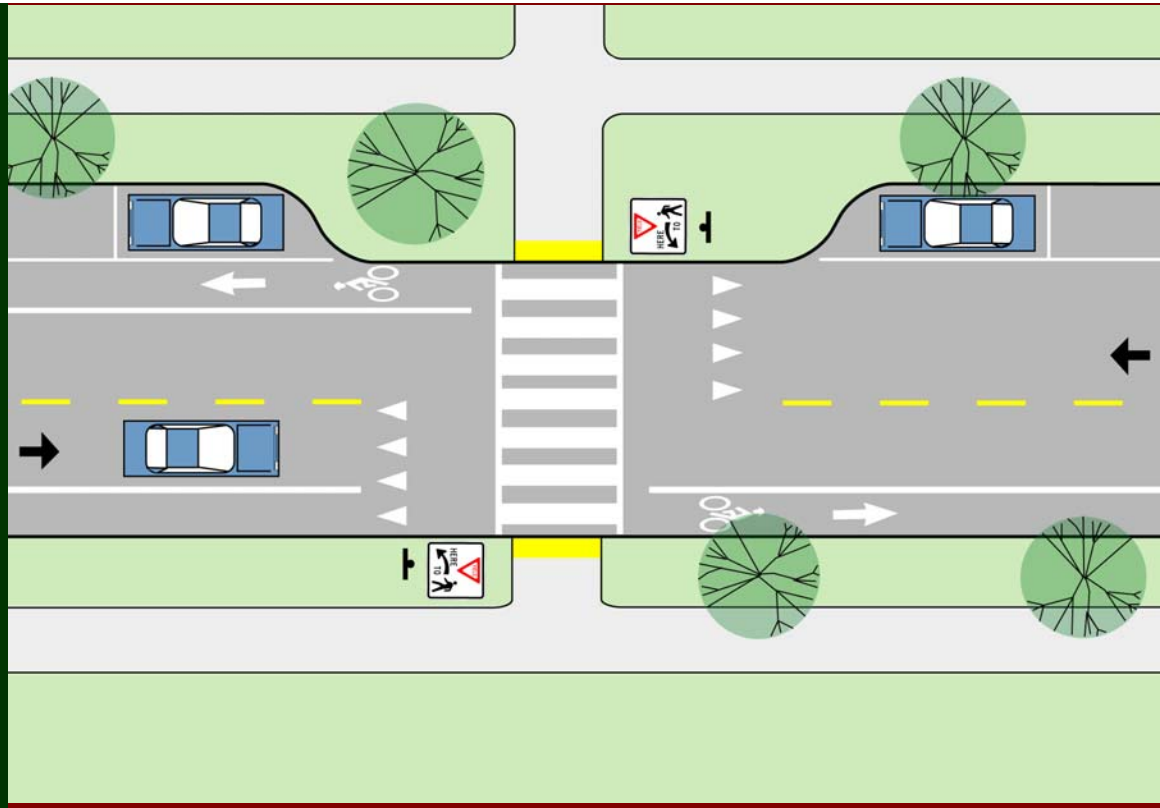
- Overpasses Are Often A Poor Allocation of Limited Resources
- Ramps Add A Lot Of Distance To Trips
- Many People Are Afraid To Use Them



You Can Put in About 30 Crossing Islands for the Cost of One Overpass

Making Mid-Block Crossings Safe

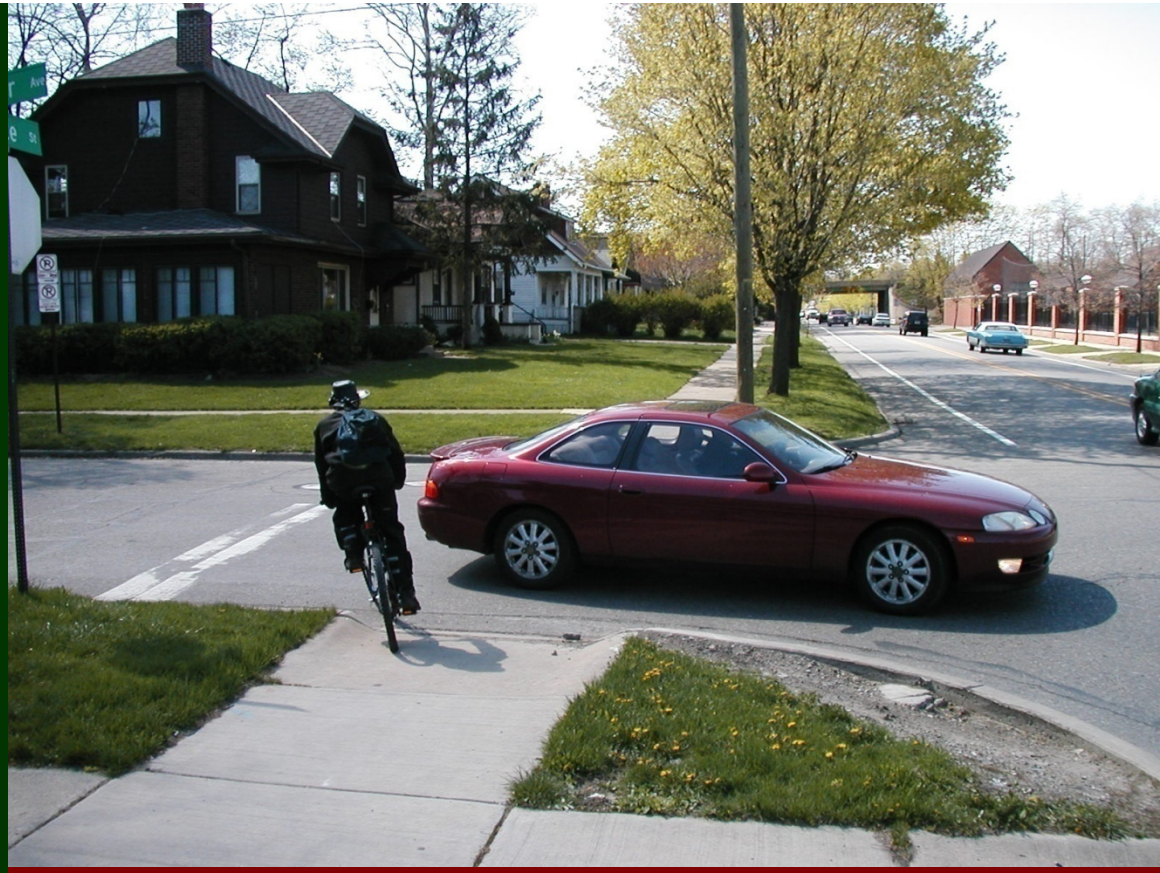
- Do Not Ignore the Problem As People Will Cross Anyway
- Make the Crosswalk Obvious
  - Use High Visibility Markings and Signs
- Make Sure Pedestrians and Motorists See Each Other:
  - Use Curb Extensions to Improve Visibility Where On-Street Parking Exists
  - Use Crossing Islands Where Gaps in Traffic Are Infrequent or Too Short



Crosswalks Do Not Increase Liability for Road Agencies

Sidewalks vs. Bike Lanes

- Motorists Are Not Looking for Bicyclists on Sidewalks.
- Pedestrian safety and comfort is compromised by bicyclists using the sidewalk.
- Bicycling on the sidewalk is generally slower than bicycling on the roadway. This is due to:
  - the presence of pedestrians, and
  - motorists that block the sidewalk or crosswalk.

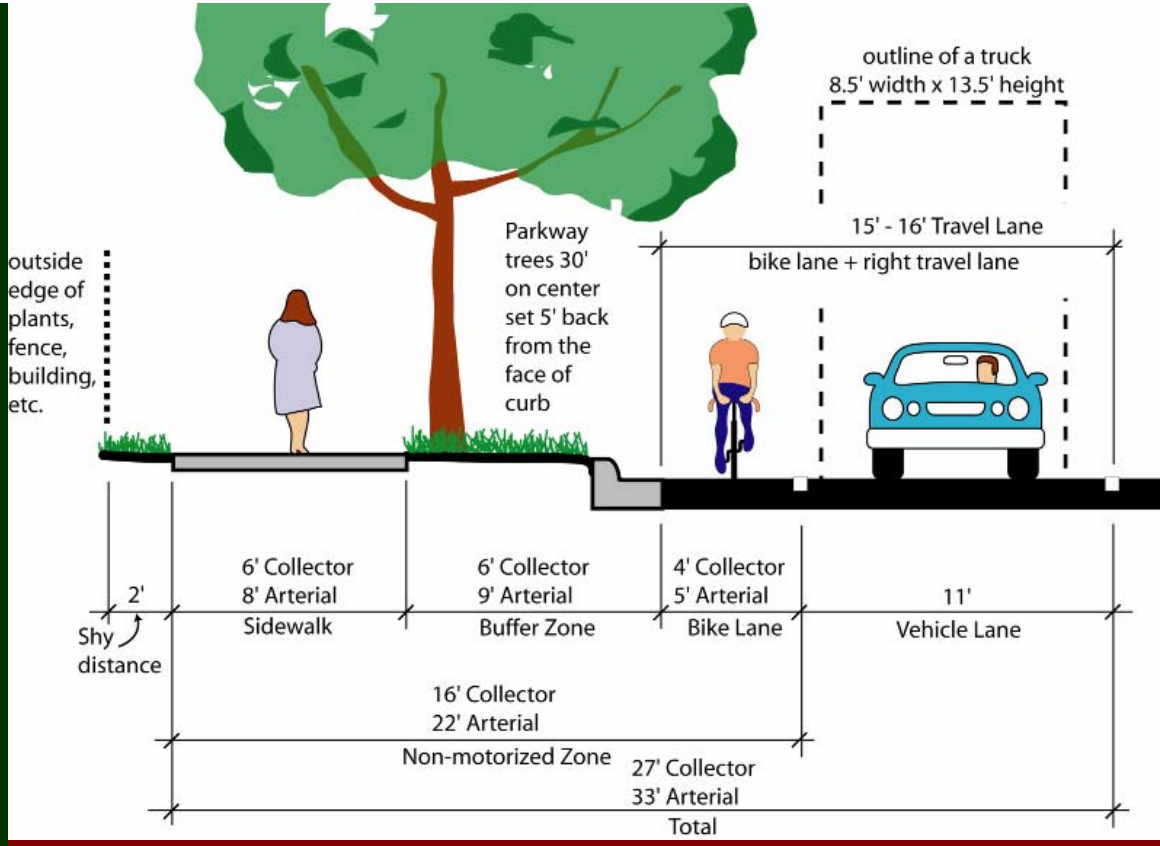


Bike lanes are the current best practice for almost all scenarios to reduce the number of crashes involving motorists and bicyclists.

Establishing a “Non-Motorized Zone”

Suburban Context

- A Typical 66’ ROW is Capable of Supporting A Multi-Modal Roadway
- Adding Lanes To The Roadway Should Not Come At The Expense of The Non-motorized Zone
- The Additional ROW Is Really To Accommodate Additional Lanes NOT the Non-motorized Facilities



Just Because Pedestrian and Bicycle Facilities Are Located on the Outside of the ROW Does Not Make Them Expendable

Bicycle and Pedestrian Traffic at the Tipping Point

Education Challenges

- Relative Risk of Bicycling and Walking
- Effective and Safe Bicycling
- Purpose of A Street

Communicating the Relative Risk

- Child Abduction vs. TV
- Health Risk of Inactivity vs. Exposure to Motorized Traffic
- Compare Risk By Time Exposure Vs. Miles Traveled
- Sidewalk Bicycling vs. Riding With Traffic
- Avoid Over Simplifying And Misinterpreting Crash Statistics

Bicycling and Walking Are Not Dangerous Activities!

Communicating What Really Matters for Safety

- Visibility
- Predictability
- Bicycles Following the Rules of the Road
  - Riding With Traffic
  - Turning Correctly
  - Obeying Traffic Control Devices
- Seemingly Insignificant Infractions May Result In Serious Safety Issues
  - Use Stops As An Education Opportunity
  - Option to Clear Ticket By Taking a Class

Cast the Discussion As Doing What Is In The Bicyclists or Pedestrians Best Interest

Show Support for Bicycles and Pedestrians Through Sting Operations

Integrate Bike and Pedestrian Safety Programs Into Elementary and Junior High School Curriculum

Communicating the Benefits

- Personal Economic
  - Vehicle Costs
  - Parking Costs
- Community Economic
  - Health Costs
  - Facility Costs
- Environmental
- Personal Benefits
  - Physical
  - Mental
  - Fun
  - Challenge
  - Social

Driving Has Become the “Automatic” Choice For All Trips No Mater What the Purpose or Distance.

This Will Take A Concerted Effort To Change.

Communication a New Perspective on Streets

- People Have Come to View Most Streets as Having a Single Purpose – to Move Cars and Trucks
- Lost is the Historical Context of Streets as a Public Forum
- Streets Define A Community's Character
- People Spend More Recreation Time in Streets Than in Parks
- Streets Are Pervasive Throughout A Community

Streets Constitute A Community's Single Most Important Public Space

A Street Encompasses the Road, the Landscape, the Sidewalks, the Architecture and the People, You Cannot Address the Different Elements In Isolation

Professional Challenge

- Make Your Commute Part of Your Professional Training
  - Walk 1 Mile to Work
  - Bike 2 Miles to Work
  - Take a Bus at Least 5 Miles to Work
- Do This For A Week During <u>All Four Seasons</u>
- Park Your Car Short of Your Destination if Need Be
- Try Being a Multi-Modal Commuter!

First Hand Experience is Invaluable – Hands On Training Is Ideal

You Would Not Expect a Highway Engineer to Have Never Driven a Car!

Questions or Comments

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