

Physical Implications of Complete Streets Policies



Planning Michigan 2010

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Ann Arbor, Michigan

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Presentation Overview

- What Are Complete Streets?
- What Matters to Bicyclists and Pedestrians
- What Do Complete Streets Look Like?
- How Do You Implement Them?
- Additional Resources



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Complete Streets in a Nutshell

Complete streets are

- planned
- designed,
- operated and
- maintained

such that all users may

- safely
- comfortably and
- conveniently

Move

- along and
- across

streets throughout a community



All users include:

- Pedestrians
- Bicyclists
- Transit users
- Motorists
- Trucks

All users include:

- Children
- Elderly
- People of various abilities

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Importance of a Network

- Complete Streets
- An interconnected system
- Requires a range of facility types accommodate the different users



Think of a system that works for all user types at all times of the day and all times of the year

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Balancing of Transportation Modes

- Each mode of transportation impacts the level of service of the other modes
- Traditionally motorized traffic received the priority – Now looking to balance the modes
- How the balance is struck is based on street typology and context



While complete streets share many common elements the design of each street depends on its context

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A Broader Definition of Street

- A street encompasses the
 - Road
 - Landscape
 - Sidewalks
 - Architecture
- A community's streets are a defining characteristic



Streets constitute a community's single most important public space in terms of size, visibility and use.

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Looking Beyond The Physical Roadway

- Complete Streets go beyond physical design and infrastructure
- Establishing a culture and policies that provide safe and efficient transportation choices
- Like any cultural shift, this will not happen overnight



Complete Streets is a cultural change similar to the Americans with Disabilities Act. Like the ADA, it will be a long-term venture. Unlike the ADA it is voluntary, not an unfunded state or federal mandate

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A Transitional Period in Transportation

- If there is one constant in our streets over time, it is change
- Each era ushers in new modes and new sets of challenges
- There is a collective recognition that the system we have now does not fully meet our current needs



There has been a concerted move towards Complete Streets in the USA since the early 1990's

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Physical Implications of Complete Streets Policies What Matters the Most?

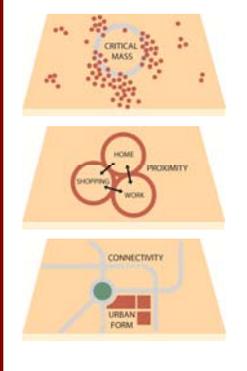


- Context
- Critical Mass
- Pedestrian Issues
- Bicyclist Issues

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Context – Urban Form Influences Nonmotorized Travel

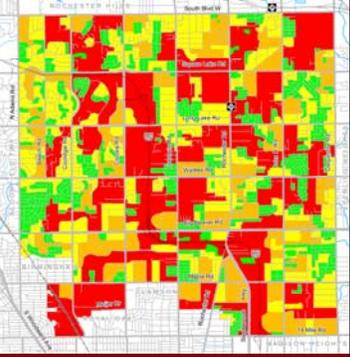
- Research Has Shown That Urban Form Influences Mode Choice and Total Miles Traveled
- The Most Important Factors Are
 - Density (Population)
 - Diversity (Land Use)
 - Design (Street Network)



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Directness of Travel

- Block Size is an Excellent Measurement of Directness of Travel
- Directness of Travel Impacts Actual Use



Block Size in Acres

- 100 to 510
- 50 to 100
- 15 to 50
- 0 to 15

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Context – Safety in Numbers

- The Most Effective Way To Increase the Safety of Pedestrians and Bicyclists is To Increase the Numbers of Pedestrians and Bicyclists
- Pedestrians and Bicyclists Become Expected Roadway Users



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

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

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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

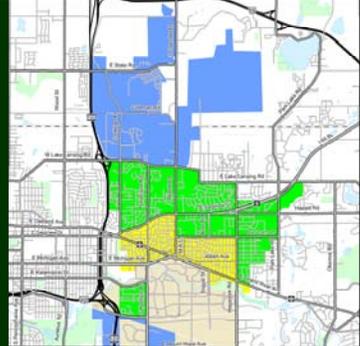


Dangerous Designs and Situations May be Off-Set By Expectations of Encountering Pedestrians.

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Context Area Analysis

- Match Proposed Improvements to Different Contexts



Zones
 Inner Ring
 Middle Ring
 Outer Ring

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Pedestrian Issues – Crossing the Road

- Average Walking Trip for Personal Business is About 1/8 Mile, A 10 Minute Walk
- A 10% Detour for An Average Walking Trip is 264' (less than a city block)
- Pedestrians Do Not Go Out of Their Way



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Crosswalk Spacing Analysis

- Where Crosswalks Are Spaced Over an 1/8 of Mile Apart and There is Demand, You Can Expect Pedestrians Crossing the Street
- Cross Check with Crash Data



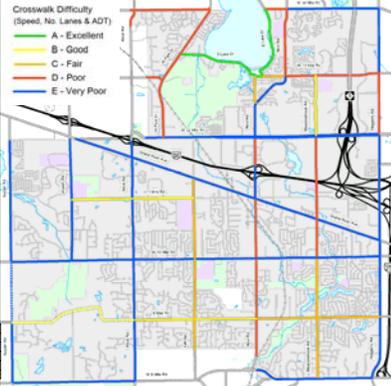
Distance Between Crosswalks
 0 to 1/8 Mile
 1/8 Mile to 1/4 Mile
 1/4 Mile to 1/2 Mile
 Over 1/2 Mile

Symbolized Crosswalk
 Signalized Crosswalk
 Unsignalized Crosswalk
 No Crossing at Signal

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Road Crossing Difficulty Analysis

- Measurement of How Difficult a Person Would Typically Find it To Cross A Road at an Unmarked Mid-Block Crosswalk
- Considers: Number of Lanes, Speed and Traffic Volumes



Crosswalk Difficulty (Speed, No. Lanes & ADT)
 A - Excellent
 B - Good
 C - Fair
 D - Poor
 E - Very Poor

Grade	Lanes	Speed	ADT
1	2	20	5,000
2	2	25	5,000-10,000
3	3	30	10,000-15,000
4	3	35	15,000-20,000
5	4	40	20,000+
6	4+	45+	20,000+

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Pedestrian Issues – Sidewalk Level of Service



A – Facility with Vertical Buffer
 B – Facility with Buffer
 C – Facility along Curb
 D – No Facility, but Passable
 E – No Facility, Not Passable



Existing Sidewalk Level of Service Analysis

- A Measurement of the Degree of Separation from the Roadway
- Can Be Used to Track Progress Over Time

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Bicycle Issues – Four Types of Bicyclists

- Strong & Fearless**
 - <1%
 - Always Biking
 - Any Road Regardless of Condition
- Enthusied & Confident**
 - 7%
 - Frequently Bike
 - Like Designated Facilities Such As Bike Lanes
- Interested but Concerned**
 - 60%
 - Occasional Rider
 - Local Roads and Trails
- No Way, No How**
 - 33%

Not Really This Clear Cut. There Is Movement Between the Groups.

Developed by Roger Geller, Bicycle Coordinator, Portland Office of Transportation

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In-Road Cycling Quality Analysis

- Measurement of Bicyclist Comfort Within The Roadway
- Considers: Traffic Volumes, Speed and Presence of Bike Lane

Grade	Lanes	Speed	ADT
A	2	<30	<5,000
B	2	30-35	5,000-10,000
C	4	35	10,000-15,000
D	5	40	15,000-20,000
E	5	45+	>20,000

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Roadside Pathway Suitability Analysis

- How Many Driveway and Road Crossing Are There?

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Sidewalks/Roadside Pathways vs. Bike Lanes

- Motorists Are Not Looking for Bicyclists on Sidewalks or Sidepaths Especially When They Are Bicycling Opposite the Flow of Traffic
- Bicycling on the Sidewalk is Generally Slower and More Inconvenient than Bicycling on the Roadway.
 - the presence of pedestrians
 - motorists that block the sidewalk or crosswalk.

There is a reason experienced bicyclists travel on the road.

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Local Road Connectors

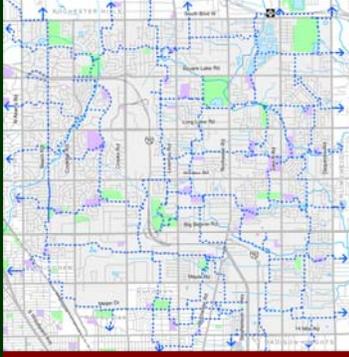
- Most Local Residential Roads Can Provide Key Links Without Special Facilities
- Often Local Roads Are a Key Part of Many Bicyclists and Pedestrians Commuting Routes
- But Many of the Routes are Unknown to the General Public

Even Experienced Bicyclists Who Are Comfortable Bicycling in Traffic Often Choose Residential Roads as Part of the Routes

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Potential Local Road Connector Identification

- "Shadow" System That Uses Local Roads and Short Trails
- Routes That Links Parks, Schools, Natural Features and Major Destinations
- Not As Direct, But Much Less Traffic Than Primary Roads



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Physical Implications of Complete Streets Policies What Do Complete Streets Look Like?



- ❖ Primary Links
- ❖ Neighborhood Connectors
- ❖ Off-Road Trails

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A Spectrum of Non-Motorized Routes

- A non-motorized network may be seen as having three main components

Primary Links	
Neighborhood Connectors	
Off-Road Trails	

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Primary Links – Urban Arterial Example

- Bike Lanes
- Frequent Mid-block Crossings
- Some Vertical Sidewalk Buffers

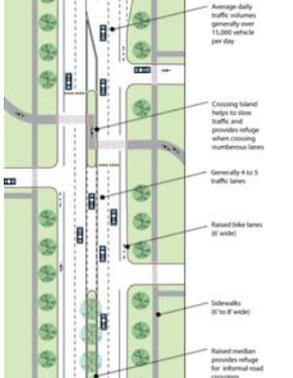


Often Faced with Situations Where ROW is Limited

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Primary Links – Suburban Arterial Example





- Average daily traffic volumes, generally over 13,000 vehicles per day
- Crossing island helps to slow traffic and provides refuge when crossing roundabout lanes
- Generally 4 to 5 traffic lanes
- Raised bike lanes (8' wide)
- Sidewalks (8' to 9' wide)
- Raised median provides refuge for informal road crossings

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Primary Links – Urban Collector Example

- In Downtown Areas May Use Shared Use Arrow
- Used Where A Bike Lane is Not Feasible and/or Desirable
- Indicated To Motorists To Expect Bicycles
- Indicates to Bicyclists To:
 - Ride With Traffic
 - Ride A Safe Distance Away From Car Doors



On-Street Parking Helps Pedestrian Level of Service

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Neighborhood Connector

• Traffic Calming
 • When sidewalks are unavailable a marked shared space on the roadway provides a place for bicycle and pedestrians
 • Bike lanes
 • Stop or yield signs favor through movement
 • Short pathways that connect separated roadways provide non-motorized shortcuts to other routes and neighborhoods

Geir Community Center 1.5
 Lansing River Trail 3.5

NORTH
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Off-Road Pathways

- A Shared Use Path Outside of a Road ROW
- Suitable for Bicyclists and Pedestrians
- Complement, But Do Not Replace On-road Facilities
- Wonderful Recreation Resource
- Great Place for Inexperienced Bicyclists to Build Skills

Provide Transportation and Recreation Links with Minimal Exposure to Motorized Vehicles

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Physical Implications of Complete Streets Policies How Do You Implement Them?

❖ A Spectrum of Non-motorized Lines

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Bike Lane Potential Through 4 to 3 Lane Conversion

- Suitability of the Conversion Depends on Traffic Volume and the Nature of the Signalized Intersections

Potential 4 to 3 Lane Conversion To Add Bike Lanes
 High Potential
 Moderate Potential
 Marginal Potential
 Low Potential
 Existing Bike Lane and Paved Shoulder

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Bike Lane Potential Through Lane Narrowing

- We Often Find Cases Where We Can Safely Narrow the Lane Width

Lane Narrowing
 High Potential
 Moderate Potential
 Marginal Potential
 Low Potential
 Existing Bike Lane and Paved Shoulder

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Potential Roadway Conversions

- Not Unusual to Find that 50 to 60% of All Primary Roads May be Converted to Add Bike Lanes

High Potential
 Moderate Potential
 Marginal Potential
 Existing Paved Shoulders/Bike Lanes

Potential for an additional 9.9 Miles of Bike Lanes in the Near Future

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As Part of Road Reconstruction Project

- Some Roads Will Need to Be Reconstructed in Order To Add Bike Lanes

Legend:

- Short Term Bike Lanes
- Long Term Bike Lanes
- Road Reconstruction Project

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Non-motorized Network Diagram

- Principal Links
 - Auto Focus
 - Bike/Ped Focus
- Neighborhood Connectors
 - Neighborhood Greenways
 - Bike Routes
 - Crossing Improvements
- Off-Road Trails

Legend:

- Signalized Intersection
- School
- Crossing Improvement
- Park & Recreation Area
- School Property
- Water
- Local Road
- Primary Road
- Complete Street
- Off-Road Trail
- Neighborhood Connector
- Neighborhood Greenway

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Non-Motorized Network Example

- Construct in Phases
- Fill Small Gaps
- Implement Road Conversions When Restriping or Resurfacing Roads
- Identify and Establish Key Cross Community Corridors
 - Continuous Routes
 - Proof of Concept

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Physical Implications of Complete Streets Policies

Additional Resources

❖ Complete Streets Institute

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Towards Complete Streets in Michigan

Project Partners

- Michigan Department of Community Health
- Michigan Association of Planning
- Michigan Trails & Greenways Alliance
- Healthy Kids Healthy Michigan
- American Recovery and Reinvestment Act

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Module 1: An Overview

Complete Streets Institute Training Curriculum

- 1. An Overview**
- Influencing Policy
- Stakeholder Engagement
- Planning & Regulations
- Design & Applications



Understanding what complete streets are and what they means to your community

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Module 2: Influencing Policy

Complete Streets Institute Training Plan

- An Overview
- 2. Influencing Policy**
- Stakeholder Engagement
- Planning & Regulations
- Design & Applications



How to implement an appropriate complete streets policy in your community

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Module 3: Stakeholder Engagement

Complete Streets Institute Training Plan

- An Overview
- Influencing Policy
- 3. Stakeholder Engagement**
- Planning & Regulations
- Design & Applications



How to develop the community support necessary to implement complete streets in your community

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Module 4: Planning & Regulations

Complete Streets Institute Training Plan

- An Overview
- Influencing Policy
- Stakeholder Engagement
- 4. Planning & Regulations**
- Design & Applications



Updating community plans and regulations to support complete streets policy implementation

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Module 5: Design & Applications

Complete Streets Institute Training Plan

- An Overview
- Influencing Policy
- Stakeholder Engagement
- Planning & Regulations
- 5. Design & Applications**



Best practices in complete street design

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Questions or Comments



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