



Bicycle and Pedestrian Connectivity Study

Old Colony Planning Council



BICYCLE INSPECTION BY CHIEF OF POLICE WILLIAM H. BROWN



Enthusiasm for bicycles ran high in 1897, as evidenced by this race through town the day after Independence Day.

Outline

- Why consider bike/peds in road designs?
Why are measures needed?
- Connecting Land Use with Transportation
- Evaluation Tools: Bicycle Level of Service, Pedestrian Level of Service and Pedestrian Infrastructure Index overviews, uses
- Policy possibilities
- Resources – including easy-to-use online calculator

Why should road designs accommodate bikes and peds?

- It's what people want:
 - According to the 2011 Regional Transportation Plan survey, 50% want more fed \$ on bike and ped facilities
 - 70% support requiring roads to have bike lanes or paths, even if it means less space for cars and trucks
 - 43% would like to see more recreational trails and parks

Why should road designs accommodate bikes and peds?

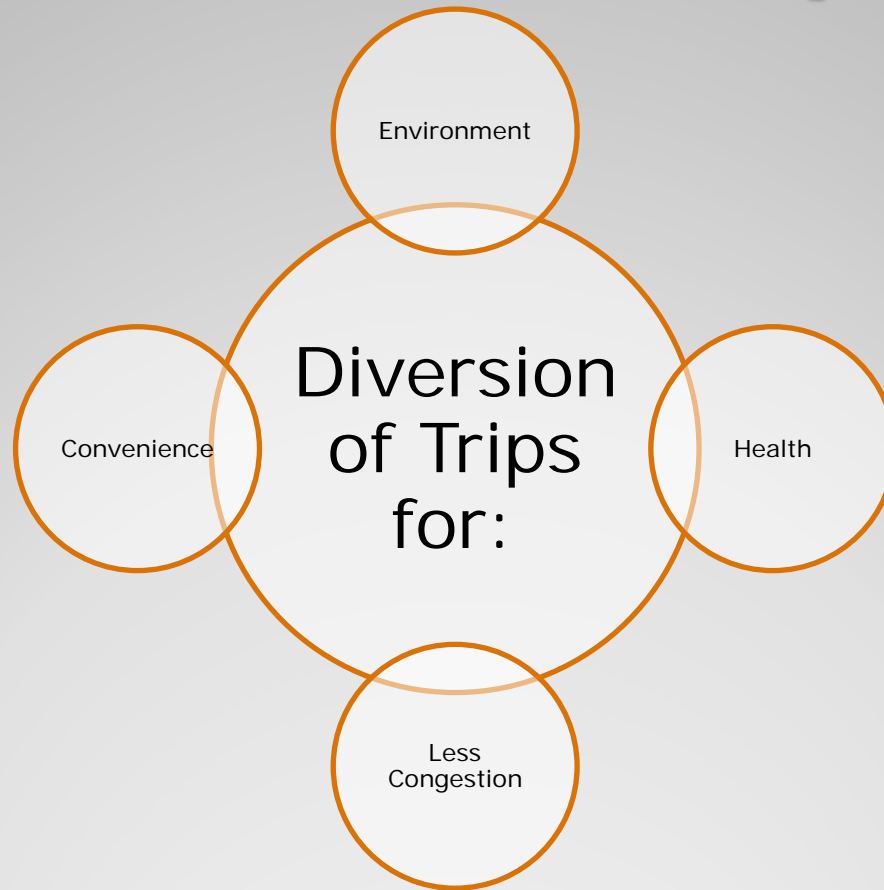
- Arterials and collectors provide the only access to goods, services, and employment



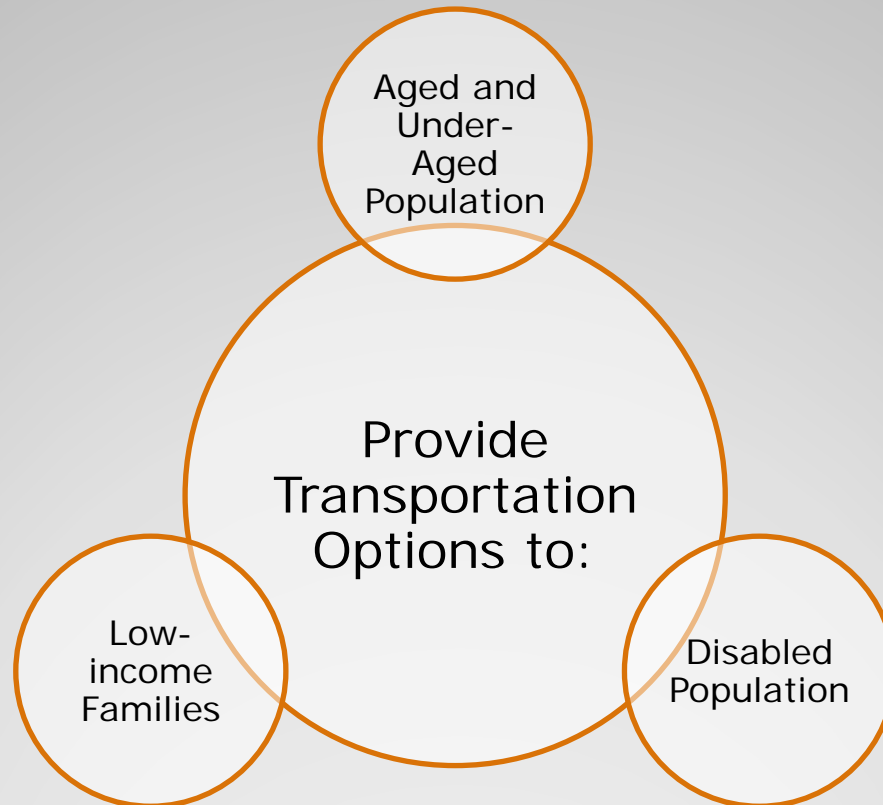


Importance of Connecting Land Use with Bike and Ped Infrastructure

Why should road designs accommodate bikes and peds?



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Why should road designs accommodate bikes and peds?

- Cyclists and walkers will be there to some extent anyway, so better to design for them



Evaluation Tools

- Bicycle and Pedestrian Level of Services (BLOS and PLOS) models developed by Sprinkle Consulting Inc., used throughout USA
- Pedestrian Infrastructure Index model developed by FHWA to evaluate the conditions of the intersection

Bicycle Level of Service



- Measures on-road bicycling conditions, NOT separate trails
- For mid-block cross-sections, not for intersections
- Applicable for teens and adult cyclists

BLOS input variables

- Motorized Traffic: Volume, Speed, % Trucks, % Occupied Parking
- Roadway: # of lanes, pavement conditions, width of outside lane and extra pavement (shoulder/street parking/bike lane)

BLOS Score = 4.64 (E)
PLOS Score = 4.31 (D)



- ADT = 34,000 vehicles/day
- Five 12' lanes (One TWLT Lane)
- No paved shoulders, bike lanes, parking
- 40 mph speed limit
- Roadway pavement conditions = 4 (1 poor and 5 excellent)

- ADT = 16,600 vehicles/day
- Two 11' lanes
- 8 feet street parking
- 2 feet shoulders
- 25 mph speed limit
- Roadway pavement conditions = 3 (1 poor and 5 excellent)

BLOS Score = 3.00 (C)
PLOS Score = 2.33 (B)



BLOS/PLOS Sample Street

Lane Width and Striping

Outside Lane Width		With Striping	
10	4.36 (D)		
12	4.14 (D)		
14	3.88 (D)	12 – 2	3.58 (D)
16	3.58 (D)	12 – 4	2.86 (C)
18	3.24 (C)	12 - 6	1.98 (B)

- ✓ Extra space benefits cyclists
- ✓ Striping particular helpful





Local Example of Lane Width and Striping Improvement



Local Example of Lane Width and Striping Improvement

What happens when the street gets narrow?

- Sharrows markings is a great solution
- Finding off-street multi-use trails or alternative routes



Sharrows indicate that motorists and cyclists share the travel lane

Pedestrian Level of Service

- Walkers' perception of comfort and safety
- Mid-block cross-sections, including any sidewalks and buffers



PLOS input variables

- Motorized traffic: Volume, Speed, % Occupied Parking
- Roadway: # of lanes, width of outside lane, width of extra pavement (shoulder/parking/bike lanes)
- Sidewalk: Width; buffer width and type (e.g., tree spacing)

Sample cases

General characteristics of the road:

- ADT = 12,000 vehicles/day; speed = 40 mph
- Two 12' lanes; no paved shoulders, bike lanes, parking

Scores:

- No sidewalk: **PLOS = (E)**
- 5' sidewalk, 6" buffer, no trees: **PLOS = (D+)**
- 5' sidewalk, 20" buffer, no trees: **PLOS = (C)**
- 5' sidewalk, 6" buffer, trees every 40': **PLOS = (C)**

Sample cases

- ADT = 16,700 vehicles/day
- Two 14' lanes
- 1' paved shoulder
- 30 mph speed limit
- 4' sidewalk width
- 0 sidewalk buffer
- 0 Average tree spacing

BLOS Score = 3.80 (D)
PLOS Score = 3.04 (C)



BLOS Score = 3.72 (C)
PLOS Score = 1.41 (A)



- ADT = 14,500 vehicles/day
- Two 12' lanes
- 2' paved shoulders
- 30 mph speed limit
- 5' sidewalk width
- 5' sidewalk buffer
- 6' average tree spacing

Pedestrian Infrastructure Index



- The index is only based on the physical characteristics of the intersection and pedestrian amenities
- Other factors such as vehicular volume, pedestrian volume and approach speed are not included in the formula

Pedestrian index input variables

- Long crossing distances
- Allowance for right turn on red
- Long intersection radii
- Number of sidewalks present at approach
- Lack of active pedestrian signal indicators
- Intersection street lighting
- ADA compliance curb cuts
- Left turn lanes and right channels
- Crosswalks painting

Pedestrian Infrastructure Index

Good Example

Total # of Lanes at the Intersection	12
Greatest # of Lanes Across Any Road	3
Left Turn Lanes	1
Right Turn Channel	2
Right on Red Prohibited	2
Signal Phasing	multiple
Crosswalks Present	4
Crosswalk Type	4
Crosswalk Condition	good
Pedestrian Buttons	4
Accessible Pedestrian Buttons	4
Pedestrian Signals	4
Sidewalks Present at intersection	8
Approach Grade	3
Blocked Views	0
ADA Compliant Curb Cuts	4
ADA Compliant Refuge Islands	0
Turn Radius	4
Skewed/Offset Intersection	no
Street Lighting	4
Special Features	8



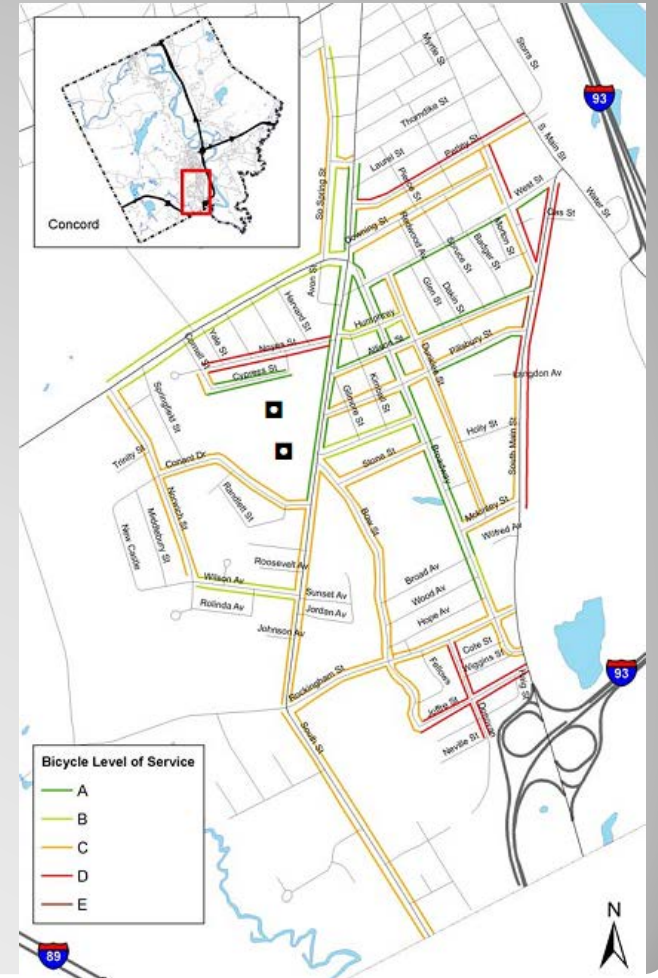
Commercial and Centre Streets Brockton, MA

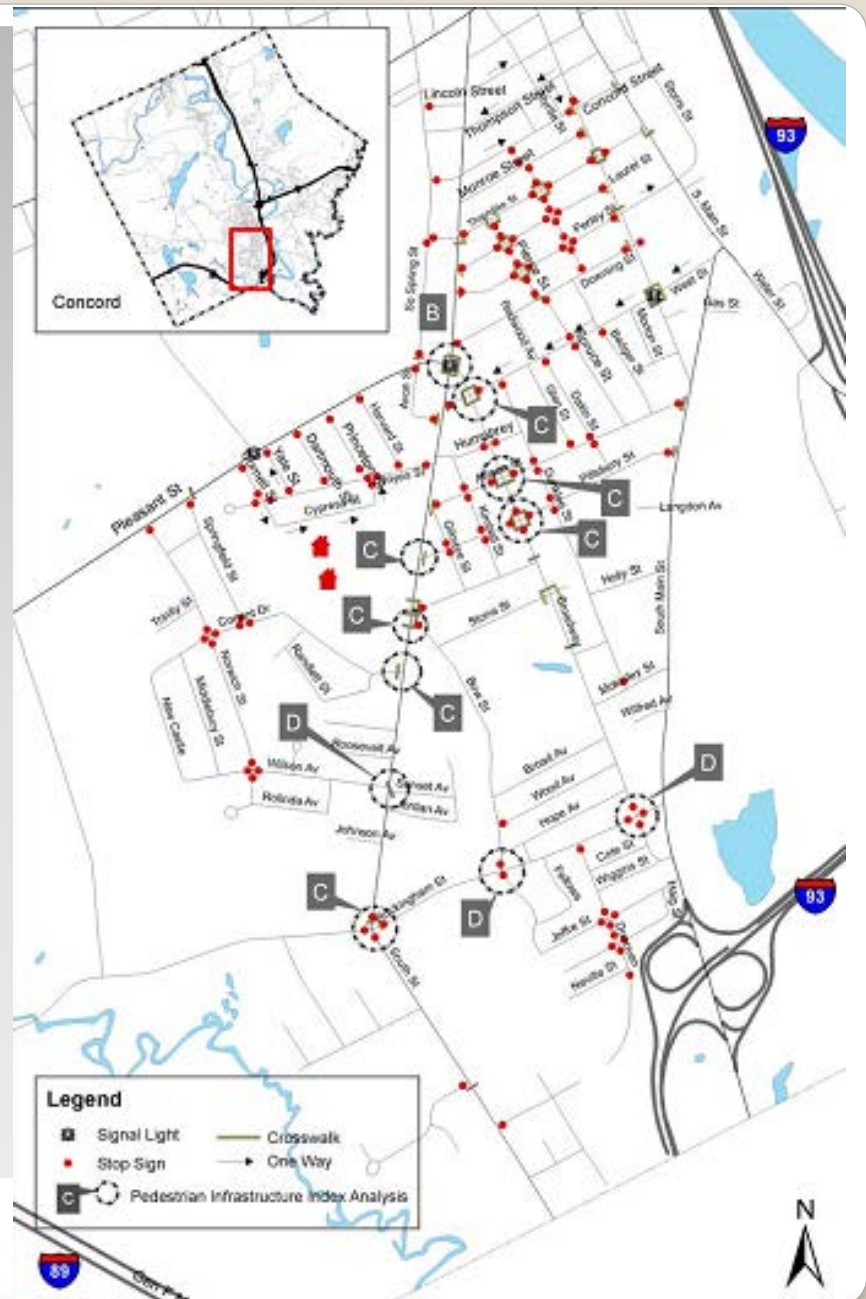
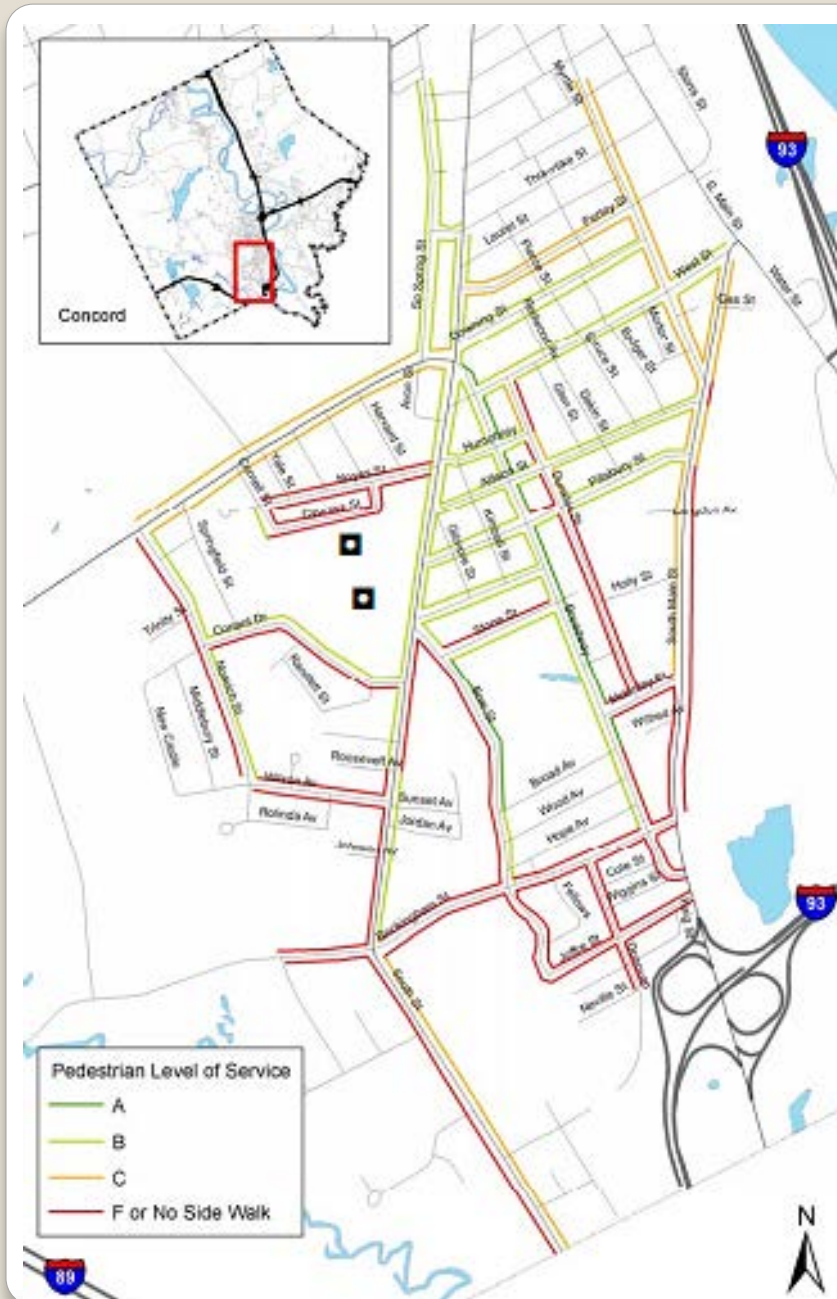
Score = 52

Grade = A

How can we apply the study findings in our communities?

- Pick routes for community bike network
- Identify “weak links” in bike or ped network
- Prioritize sites needing improvement
- Evaluate alternate treatments during design





BLOS and PLOS as policy tools

- Performance measures can be tied to goals and policies for all road projects
- Policies can range from simply reporting bike/ped impact up to target LOS levels

Policy requirement examples

- New roads & roads requiring ROW acq: BLOS of "C" or better in areas of higher demand. PLOS similar.
- All projects: maintain or improve scores – DO NOT worsen conditions!

Bike/Ped Performance Measures

- By 2035, OCPC has the goals to increase the use of non-motorized transportation modes by 20% compared to 1990 census
- By 2020, Massachusetts Department of Transportation has the goal to reduce greenhouse gas emissions by 7.3 percent below 1990 levels

Transportation Federal Budget Updates

Transportation Programs	FY10	FY11	FY12
	Enacted	Request	President's Request
Highways	\$41.4 Billion	\$42.8 Billion	\$70.5 Billion
Livable Communities	-	\$200 Million	*\$4.1 Billion
Transit	\$10.7 Billion	\$10.8 Billion	\$22.7 Billion
High Speed Rail	-	-	\$4 Billion

*It is part of a plan for \$28 Billion in investment over 6 years

Source: American Planning Association

Questions?

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