

Systematic Safety: The Principles Behind Europe's Vision Zero

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Recreation, and Transportation

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We Have a Huge Traffic Safety Problem

Boston

2-3 EMS responses per day
to pedestrian or bike crash
15 deaths per year

US

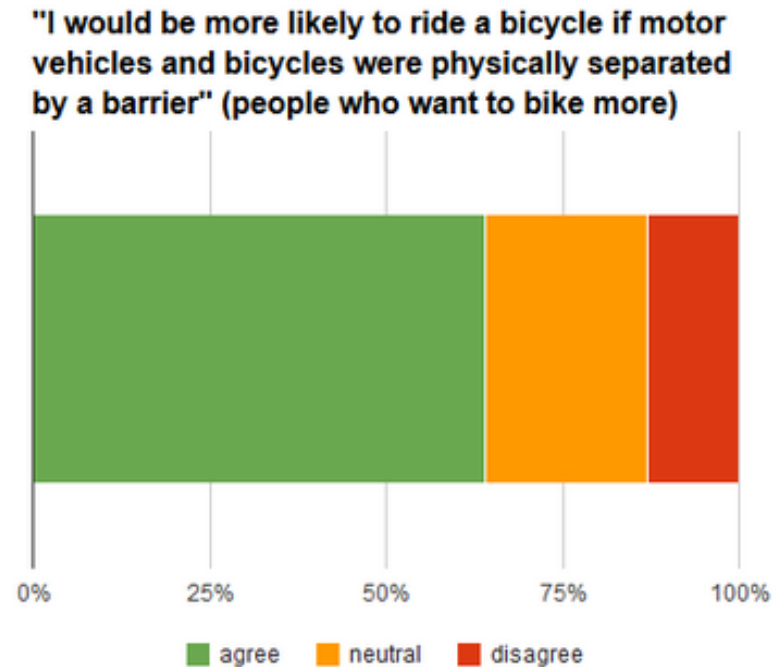
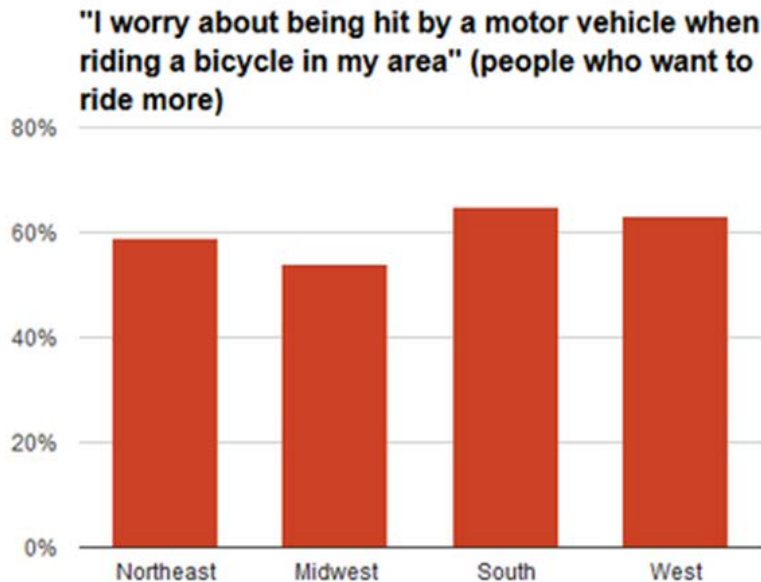
35,000 deaths per year



Deaths and Injuries Aren't the Only Measure of Unsafety

Vulnerable users are shut out

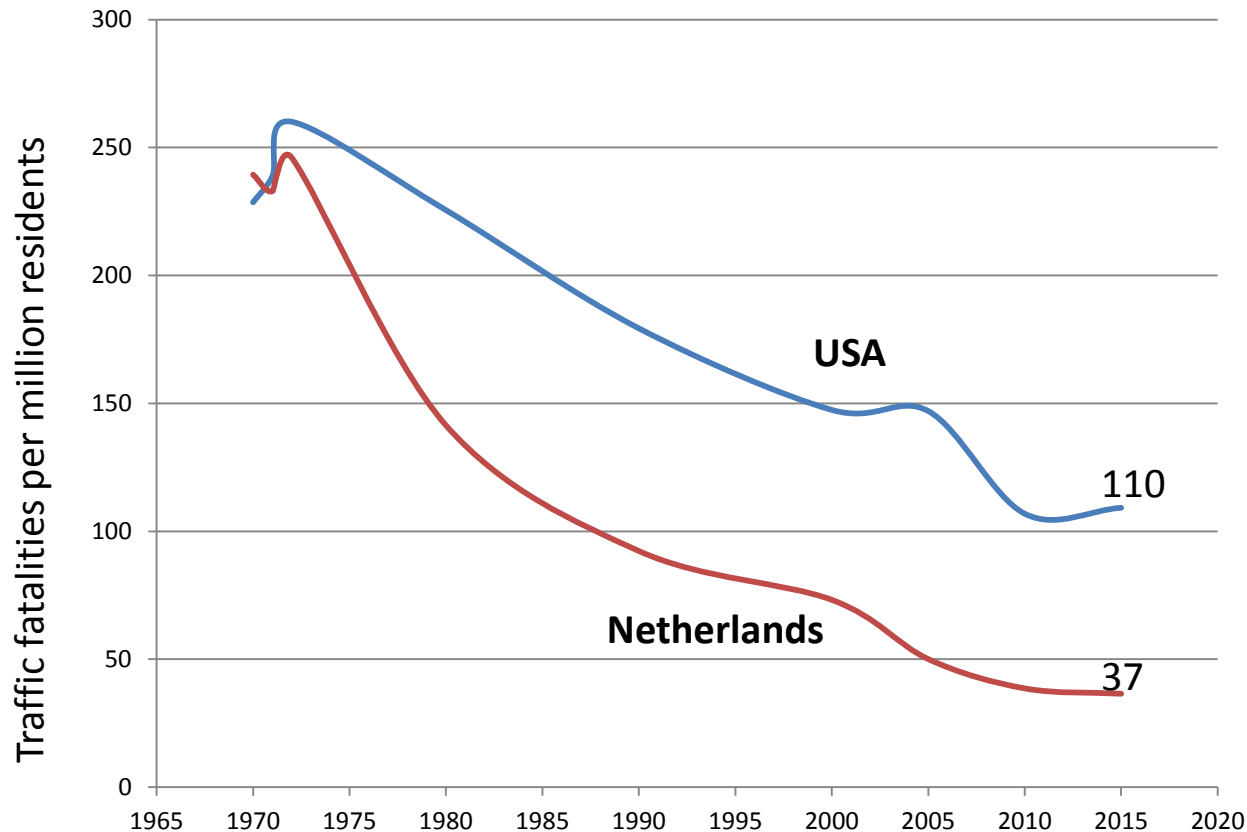
- Children walking to school has fallen from 50% (1960) to 10%
- Bicycling is limited to a hardy few



Where it's safe, people will ride

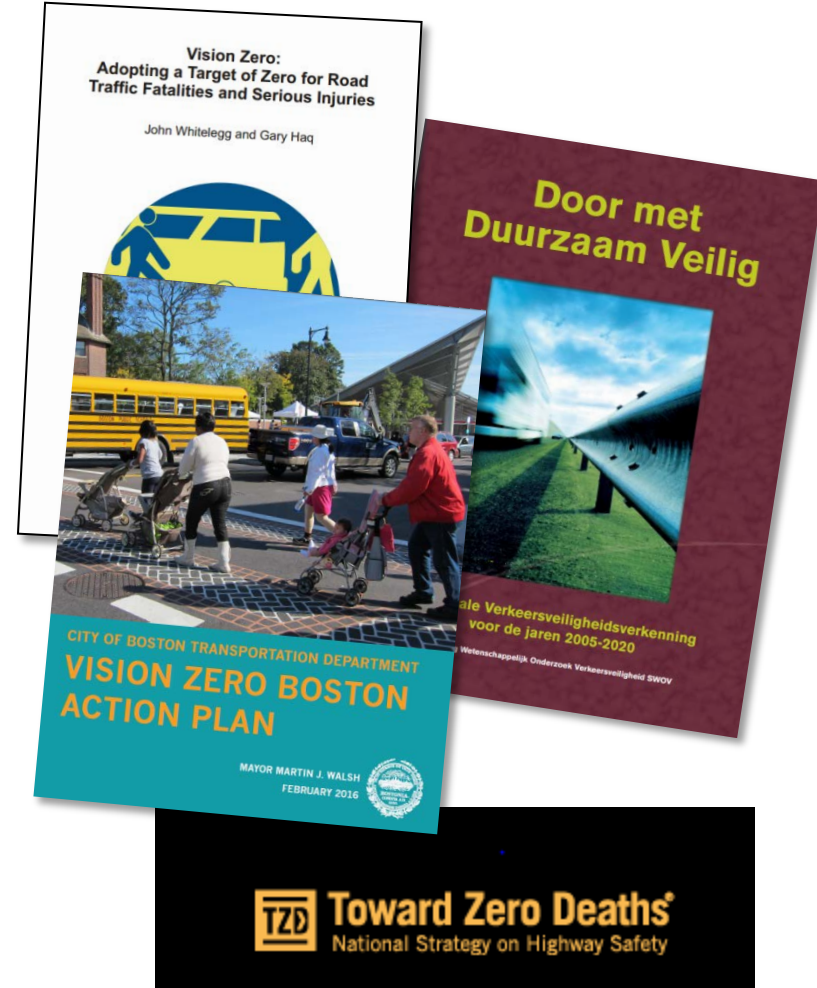


If we'd improved as Netherlands did,
we'd be saving 20,000 lives per year



Traffic Safety Programs

- Sweden: Vision Zero (1997)
- Netherlands: Sustainable Safety (1997)
- US: Toward Zero Deaths (2009 / 2015)
- US Cities: Vision Zero



Europe's Vision Zero: What Are the Values?

Value # 1: **Safe Mobility is a Civil Right**

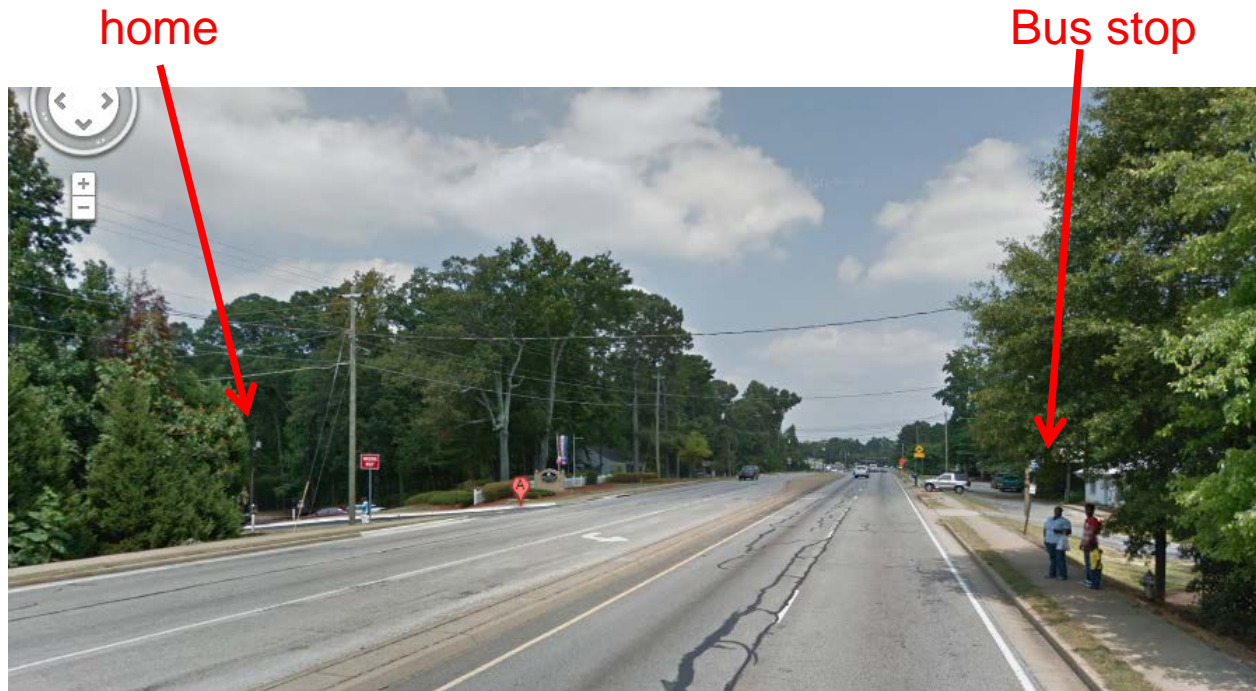
Meanwhile, the nearest crossing
is 0.3 miles away!

8 ft wide platform makes this bus
stop "accessible", per ADA



Value # 2: The road system owner is responsible for ensuring road safety

If our road system were treated like any other industry, it would be shut down immediately for gross safety violations



2011: Mother found guilty of *vehicular homicide* for crossing this street with her son.

1788 Austell Road, Marietta, Georgia (Google Maps)

Value # 3: Traffic safety programs must be proactive, eliminating safety risks before they cause serious injury or death.

*Reacting to historic crashes:
necessary, but not sufficient*

*Data collection and analysis:
valuable, but no excuse to
delay action*



A Tremont Street intersection treated after a pedestrian was injured. What about the other intersections just like it?

Why Do Traffic Injuries Happen?

- Humans are vulnerable
 - Clear implications for *speed* and for *separation*
- Humans make mistakes
 - A system that is safe only as long as people don't make mistakes isn't a safe system
 - Implications for roadway design
- This leads to 5 principles of Systematic Safety that underlie Vision Zero in Netherlands

Principles of Systematic Safety

1. Speed control and separation
2. Functional harmony
3. Predictability and Simplicity
4. Forgivingness and Restrictiveness
5. State awareness

A Policy / Action Plan for Boston for implementing Systematic Safety

1. Speed control
2. Road diets
3. Separation and recognizability for bikes
4. Safe crossings
5. Long term policies for reducing auto use

Action Plan #1: Speed Control

a. Target speed policy

Road type	Target Speed
Local streets	20 mph
Other streets with closely pedestrian crossings	25 mph
...	



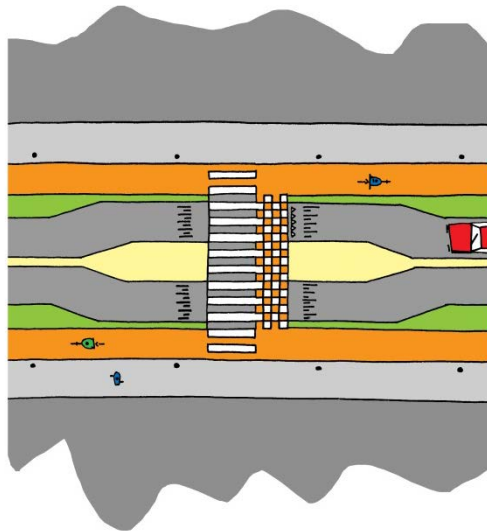
Different from a speed limit

b. Treatments to achieve speed targets

Road type	Target Speed	Treatments
Local streets	20 mph	Speed humps, STOP signs, chicanes*, neighborhood traffic circles
1+1 lane streets	25 mph	Crossing islands with a chicane* effect
Multi-lane streets	25 or 30 mph	Traffic signal timing that limits speeding opportunities

*Chicane = obstructions that force drivers to turn / slalom

Speed control treatment for 1+1 lane roads: crossing islands with a chicane effect



Speed control for 1+1 lane roads

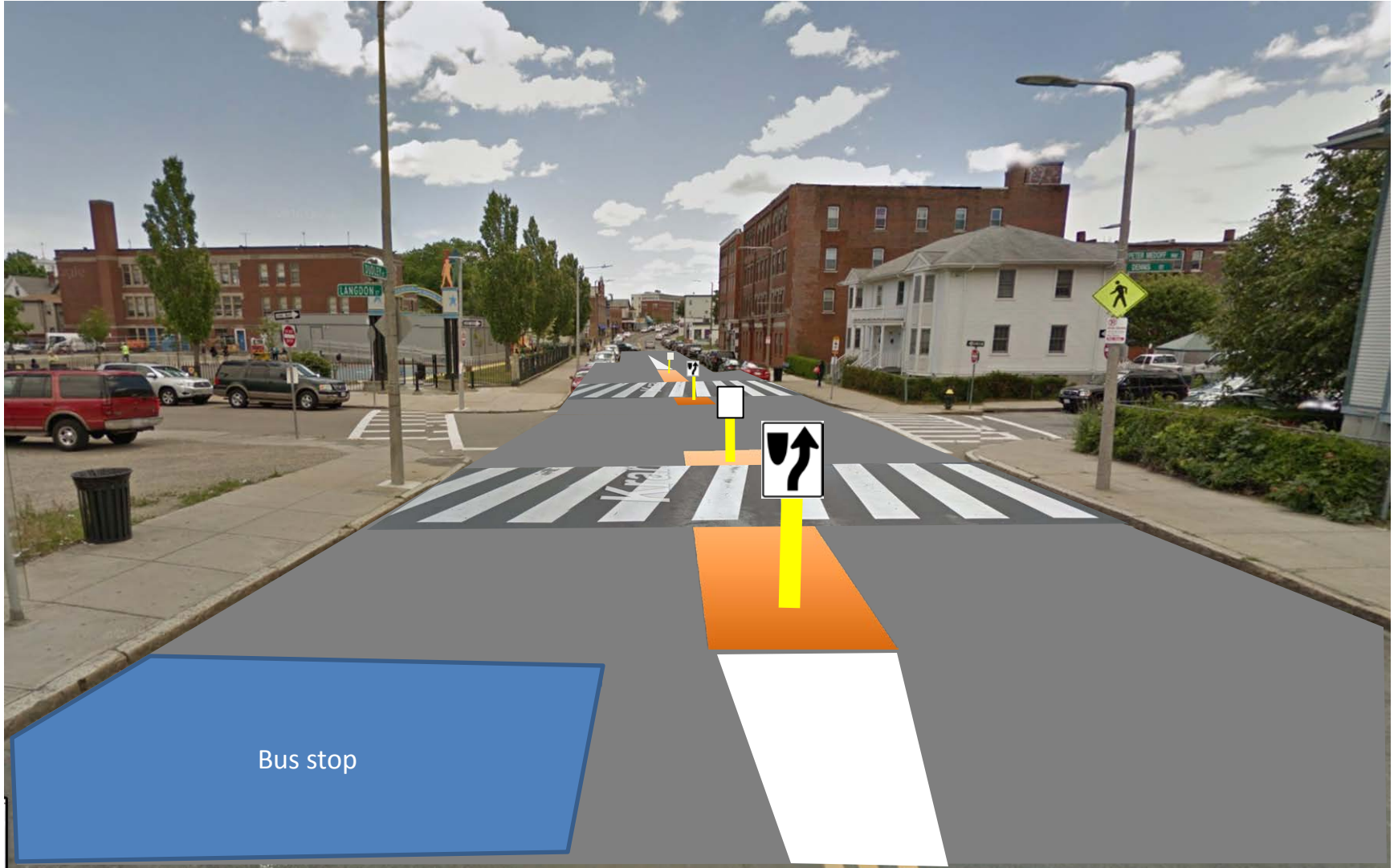


Dudley Street, Roxbury (Google Maps)



Kraneweg, Groningen, Netherlands





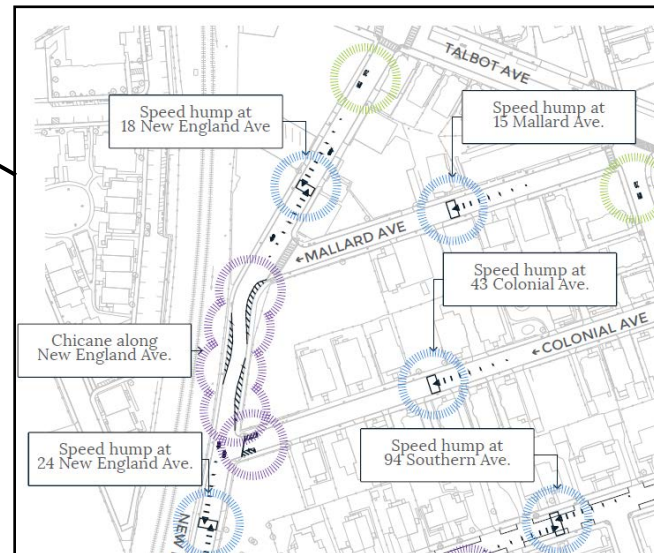
Treating Dudley Street with crossing island chicanes

- Safer street
- Safer crossings
- Lose a few parking spaces



c. Implementation – Budget & Staffing

“Neighborhood Slow Streets,” a pilot program, was budgeted for 2 small neighborhoods in 2016



What pace of implementation will the City support?

Action Plan #2: Road Diets

- Convert 2+2 lanes to 1+1 lanes, with turn pockets so that turning vehicles don't block a lane
- Smaller *is* better
 - Speed control
 - Safer crossings
 - Create space for bike lanes
- Promoted nationwide by FHWA

Road Diet: candidate streets

1. **Tremont St, South End**
2. Beacon St, Back Bay
3. **Mass. Ave., Newmarket (Melnea Cass to Columbia Rd)**
4. **Southampton Street, Newmarket (Melnea Cass to I-93 ramps)**
5. Cambridge Street, Beacon Hill
6. Cummins Highway
7. Washington Street, West Roxbury
8. Morton Street south of Gallivan Blvd
9. Centre Street, West Roxbury
10. **Martin Luther King Blvd**
11. **Malcomb X Blvd**
12. Day Blvd (DCR)
13. Truman Parkway / Brush Hill Rd (partly in Milton) (DCR)



Truck unloading on Cambridge St (Beacon Hill) during the a.m. peak



Tremont St, South End

Action Plan #3: Separation and Recognizability for Bikes

a. A policy on preferred form of separation

Road type	Preferred separation
Multilane roads and greenway routes	Separate bike path
1 + 1 lane roads	bike lane OK except in commercial areas where parking pressure is strong, where a separate bike path is preferred
Unlaned roads with ADT < 3000	Mixed traffic
Unlaned roads with ADT > 3000	Advisory lanes

b. Engineering innovation

- Advisory bike lanes for minor collectors
 - Walworth St (Roslindale)
 - Perkins St (JP)
 - Parker St (near Wentworth)



Hannover, NH

b. Engineering innovation

- Contraflow
 - With a marked contraflow lane
 - Without



Brookline, MA

c. Recognizability: Colored bike lanes



Signing & Marking
Colored Bike Lanes - Color along Bikeway Bikeway Corridor

Action Plan #4: Safe Crossings

a. Policy on unsignalized crossings

- Never cross more than 2 through lanes at a time
- Prefer crossing 1 lane at a time
- Zebra striping
- Treatments to improve compliance
 - Beacons
 - Raised crossings
 - In-street yield signs

- b. Raised crossings for cycle tracks at unsignalized intersections (Western Ave., Cambridge)
- c. Signal timing policies for improving pedestrian and bicycle safety
 - No permitted lefts on multilane roads
 - Preference to short cycles (less priority to coordination)
 - Avoid forcing peds to make multi-stage crossings

Action Plan #5: Long term policies for reducing vehicle dependence

- Rational parking pricing
 - current pilot program in Back Bay and Seaport
- Better transit
 - Transit priority treatments
- Transit-oriented development

Changing the Culture

- In the Netherlands, “Sustainable Safety” has taken over transportation planning and engineering
- It’s worth it!

