Nuts & Bolts of Complete Streets Design

Matthew Vail – Principal Engineer – Highway Design
Craig Babowicz – TSP – Project Coordination Unit
Mike Cherpak – TSE – Highway Design
Sal Aresco – TSE – Highway Design
Scott Bushee – TSE – Highway Design
Agenda

Introductions
Design Guidance
Bike/Ped Reviews
Complete Streets – In Practice
State of CTDOT’s Design Guidance

Where does CTDOT look for Design Guidance?
Source Materials & CTDOT

- CT DOT Highway Design Manual
- AASHTO Guide for Development of Bicycle Facilities
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities
- FHWA Planning, Design, and Maintenance of Pedestrian Facilities
- FHWA Manual on Uniform Traffic Control Devices
- CT DOT The Connecticut Strategic Highway Safety Plan
- NACTO Urban Bikeway Design Guide
Complete Streets Project Reviews
Complete Streets Project Reviews

Bicycle & Pedestrian Travel Needs Assessment form
Complete Streets Project Reviews

Project Design Milestone Reviews
  30% - Preliminary Design
  60% - Semi-Final Design
  90% - Final Design

Study Phase for Larger Projects
Complete Streets Project Reviews

Other Opportunities
Provide Design Support and Guidance for those “Tricky” situations
See projects from a high level and in relation to others

Adoption of Complete Streets Over Time
Increased level of awareness by designers
Less need to provide comments regarding Complete Streets
Constraints and Complexity

Burnside Avenue Cross-Section

Existing

Proposed

Michael Cherpak
Transportation Supervising Engineer – CTDOT Highway Design
Constraints and Complexity

Michael Cherpak
Transportation Supervising Engineer – CTDOT Highway Design

https://www.google.com/maps/@41.670437,-72.9364974,3a,90y,99h,57.54t/data=!3m6!1e1!3m4!1s9ti5JlsAo4R3DwzIL_80ig!2e0!7i16384!8i8192
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Complete Streets – In Practice

How CTDOT is applying Complete Streets fundamentals

Sal Aresco, P.E.
Transportation Supervising Engineer – CTDOT Highway Design

Scott Bushee, P.E.
Transportation Supervising Engineer – CTDOT Highway Design
State Project No. 117-159

Sal Aresco, P.E. – CTDOT
State Project No. 117-159
Main Street Improvements
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COMPLETE STREETS – IN PRACTICE

SAFETY FOR ALL USERS

- Trail Crossings
- Arterial Roadways
- Roundabouts

PRESENTER: SCOTT BUSHEE, P.E.
CT DOT – HIGHWAY DESIGN
TRAILS - LOCAL STREET CROSSINGS

- Signing
- Speed Tables - elevated pavement markings
TRAILS - LOCAL STREET CROSSINGS

- Signing
- Visual Cues
- Textural Cues
TRAILS - LOCAL STREET CROSSINGS

- Success:
  - Maintenance of Sight lines
  - Signs
  - Pavement Markings
  - User Responsibility / Public Education
TRAILS - LOCAL STREET CROSSINGS

• Success!!
• Signing
• Traffic Calming
• Pedestrian Signals or Beacons
• Dual Crosswalk Signing
TRAILS – ARTERIAL ROADWAY CROSSINGS

• Trail signing
TRAILS – ARTERIAL ROADWAY CROSSINGS

- Traffic Calming
- Visually Narrowing the Roadway

WB – 62 Truck Accommodations - w/ all users
Traffic Calming

- Narrowing the Roadway
- Visually Narrowing the Roadway
TRAILS – ARTERIAL ROADWAY CROSSINGS

From the Trail Users Perspective

• Success:
• Maintenance of Sight lines
• Signs
• Pavement Markings
• User Responsibility / Public Education
TRAILS – ARTERIAL ROADWAY CROSSINGS

From the Trail Users Perspective
- Visual Cues
- Textured Cues
- 2 stage crossing if needed
- Pedestrian Signal
High-intensity activated crosswalk (hawk) signal
TRAILS – ARTERIAL ROADWAY CROSSINGS

From the Trail Users Perspective

High-intensity activated crosswalk (hawk) signal
Motorists Perspective

High-intensity activated crosswalk (hawk) signal
1. Dark Until Activated
   Action Required
   Proceed If No Users In Crosswalk

2. Flashing Yellow Upon Activation
   Prepare To Stop

3. Steady Yellow
   Stop if Possible

4. Steady Red
   Stop; Do Not Proceed

5. Flashing Red
   Stop; Then Proceed If Clear

Pedestrian Hybrid Beacon

“HAWK Signal”
Pedestrian Hybrid Beacon

“HAWK Signal”
TRAILS – ARTERIAL ROADWAY CROSSINGS

Motorist Compliance - Excellent

High-intensity activated crosswalk (hawk) signal
TRAILS – ARTERIAL ROADWAY CROSSINGS

- Using of the Device???
- Love it !!!!!
TRAILS – ARTERIAL ROADWAY CROSSINGS

• Use of the Device???

High-intensity activated crosswalk (hawk) signal
TRAILS – ARTERIAL ROADWAY CROSSINGS

- Use of the Device???

High-intensity activated crosswalk (hawk) signal
TRAILS – ARTERIAL ROADWAY CROSSINGS
Not wanting to activate the **HAWK**

**HAWK non-Users:**
- not wanting to wait for the walk phase
- not wanting to delay traffic

- **HAWK vs RRFB - ?**
• Further Safety Considerations
• Further Safety Considerations
COMPLETE STREETS
ARTERIAL ROADWAYS AND DOWNTOWN

• Cars
• Buses
• Bicycles
• Pedestrians
• Neighborhoods
• Businesses
• Community
• Defining the pedestrian corridor
Defining the pedestrian corridor:
• Roadway / Pedestrians / Parking
• Traffic Calming
ARTERIAL ROADWAYS AND DOWNTOWN

- Protecting the Pedestrian Corridor
- Street Trees Provide Traffic Calming
ARTERIAL ROADWAYS AND DOWNTOWN

- Bus Pull Outs / Pads / Shelters
- Personal Responsibility and Public Education
ARTERIAL ROADWAYS AND DOWNTOWN

• Safety Achieved?
ARTERIAL ROADWAYS AND DOWNTOWN

Cross walks & Pavement Markings

Night Visibility?

8’
• Sharrows remind motorists of cyclists
ARTERIAL ROADWAYS AND DOWNTOWN

• Bump outs improve safety
arterial roadways and downtown

• Bump outs improve safety

Better sight lines for all users
ARTERIAL ROADWAYS AND DOWNTOWN

• Bump outs improve safety

Shorter Crossing Distances – 25% reduction
• Pedestrian Corridor During Construction
COMPLETE STREETS
ARTERIAL ROADWAYS AND DOWNTOWN

- **Learn the Community**

- Cars
- Buses
- Bicycles
- Pedestrians
- Neighborhoods
- Businesses

- **Community = Customer**
COMPLETE STREETS
ROUNDABOUTS

Roundabouts Are Safer
Roundabouts Are Safer

- Low speed (15 - 25 mph)
- No Left Turns / Fewer Decisions
- *Drivers Don’t Run Roundabouts*
ROUNDABOUTS

Roundabouts Are Safer

Deflection limits speeds to 15-25 MPH
We’d better slow down!!

Roundabouts Are Safer
Roundabouts Are Safer

- 75% Reduction in Conflict Points
- 40-50% Reduction in speed
Roundabouts Are Safer

Gateway Opportunities

Roundabouts Are Safer

- Visual Strength
- Safety
Roundabouts are Safer
Traffic Signal to Roundabout - 2012

Traffic Signal
- 22.3 crashes w/ 8.7 injuries / yr.

Roundabout
- 10.0 crashes w/ 0.7 injuries / yr.

50% ↓
90% ↓

Roundabouts Are Safer
Lives Saved !!

Routes 82 & 85
Salem, CT
Bicyclists stay on roadway
Bicyclists move to sidewalk
Pedestrians travel on sidewalk

* If no bicycle ramp is present (common in CT), bicyclists may choose to dismount and use pedestrian ramp
ROUNDABOUTS
Safety for all users

Roundabouts Are Safer
ROUNDABOUTS

Safety for all users

Roundabouts Are Safer
ROUNDABOUTS
Safety for all users

Roundabouts Are Safer
ROUNDABOUTS
Safety for all users

Two Staged Xing – with Refuge

Roundabouts Are Safer
ROUNDABOUTS
Safety for all users

Cross behind vehicle entering intersection

Roundabouts Are Safer
ROUNDABOUTS

Safety for all users

Roundabouts Are Safer
ROUNDABOUTS

Look at Zack go!!

Roundabouts Are Safer
ROUNDABOUTS

Sidewalks?

Roundabouts don’t have shoulders

Roundabouts Are Safer

What about Zack?

Routes 80 & 81
Killingworth, CT
2007
Trucks use entire circular roadway

Roundabouts Are Safer
Truck Aprons are not for Pedestrians

Roundabouts Are Safer
**Always Consider Sidewalks at Roundabouts**

Roundabouts Are Safer
**Always Consider Sidewalks at Roundabouts**

Roundabouts Are Safer
ROUNDABOUTS

Killingworth Before

35-45mph

Killingworth After

20-25mph

Routes 80 & 81
Killingworth, CT

Roundabouts Are Safer
ROUNDABOUTS

Rotary to Roundabout - 2007

Rotary
- 6.3 crashes w/ 8.7 injuries / yr.

Roundabout
- 2.1 crashes w/ 0.8 injuries / yr.

70% ↓

65% ↓

Routes 80 & 81 Killingworth, CT

Will Britnell

National Roadway Standard Award

Roundabouts Are Safer
**Always Consider Sidewalks at Roundabouts**

**Routes 110 & 111**
Monroe, CT
COMPLETE STREETS – IN PRACTICE

Roundabouts Are Safer

THANK YOU 😊

Roundabouts Are Safer