Centre Street Safety Improvements

June 20, 2019

Mayor Martin J. Walsh

Centre Street Safety Improvements

Agenda/Schedule

Tonight

- Review background, safety issues
- Discuss design concept raised at February meeting (road diet) and other safety measures

This Summer

- Smaller group and stakeholder meetings to gather input and feedback

This Fall

- The City will host another community meeting to summarize feedback and present updated design

Late Fall 2019 or Spring 2020

- Implement changes

Fall 2020 or spring 2021: Project evaluation

Centre Street - Ongoing Improvements

Centre Street at Hastings

- Added “tactical” medians, daylighting, high visibility crosswalk markings

Speed Feedback Signs

- Procurement of additional signs recently completed
- Will add on Centre Street in July

Bluebike Stations

- 3 new locations planned in West Roxbury
- Meeting held June 13 to identify locations
- One proposed near YMCA; one near Post Office
- Online survey still open

Other safety projects completed and underway not on Centre Street:

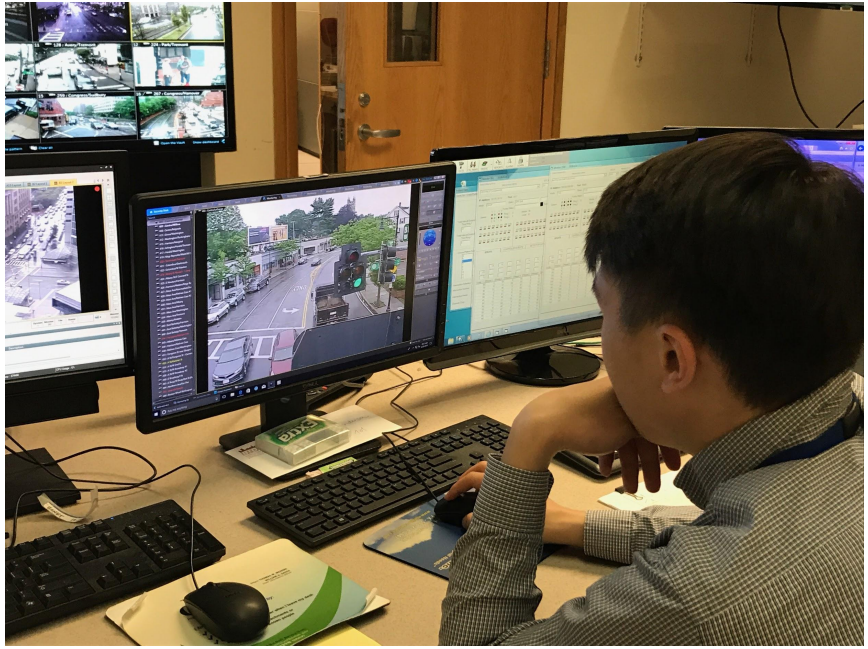
- Lagrange and Sturges (completed)
- Washington and DeSoto (Beethoven School)
- Stimson Street at Draper Playground
- Hackensack Road, Sanborn Road

Centre Street - Ongoing Improvements

Traffic Management

- BTD Signal Group adding cameras* and connecting signals on Centre Street to Traffic Management Center (TMC)
- Cameras currently at:
  - Centre and Spring
  - Centre and Lagrange
  - Centre and Willow
  - Centre and Belgrade
- Plans to add more cameras and connect all signals from Spring Street to Belgrade to the TMC by next summer to better manage traffic flow on Centre Street

* Note that cameras cannot be used to issue speeding tickets. State legislation to enable that would be required.



Centre Street West Roxbury: Why here, why now

2/5: Marilyn Wentworth struck while crossing Centre St. near Hastings St.
Two others killed in traffic crashes in West Roxbury in a three month period.

2/27: Public meeting at Elks Club with ~200 attendees

- Concerns about pedestrian safety and speeding, especially on Centre Street
- Centre St "Road Diet" discussed
- City committed to study and return in June

6/11: West Roxbury Main Streets hosts ULI Boston/New England Technical Assistance Panel (TAP)

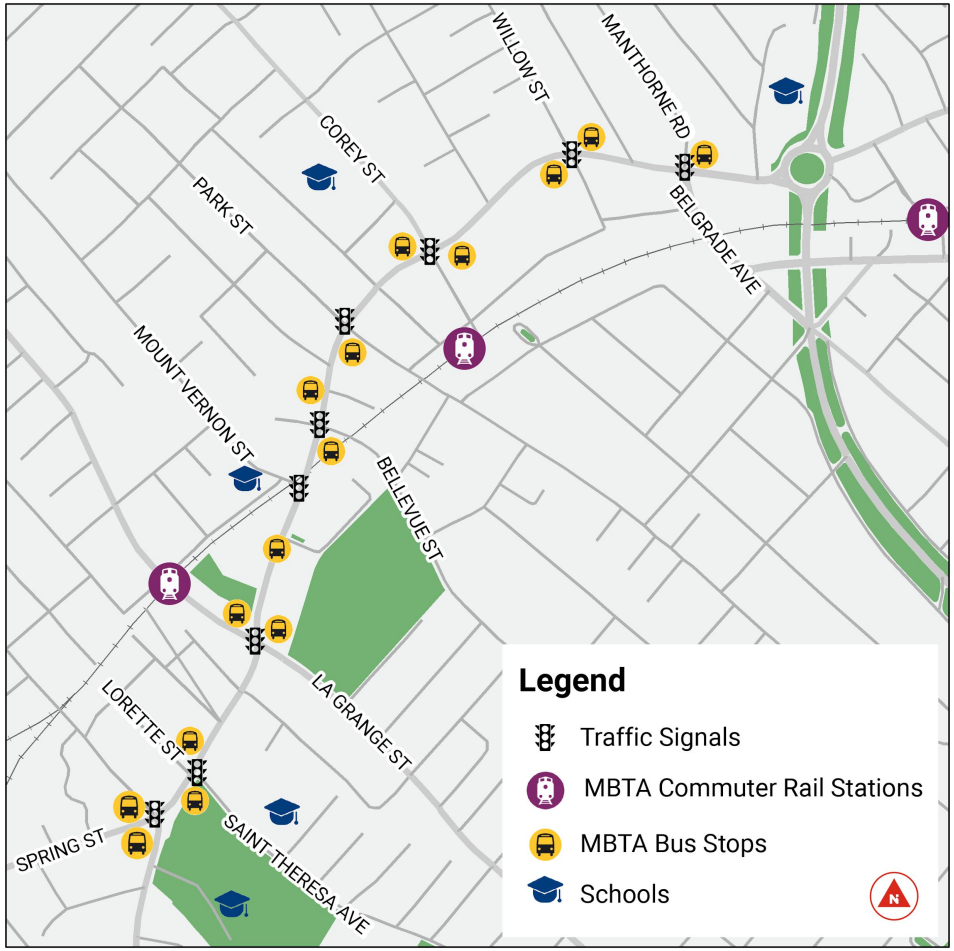
General observations by West Roxbury Main Streets and ULI

- Centre Street is the “center of West Roxbury”, surrounded by residential neighborhoods
- Daytime destinations used by youth, seniors, families (YMCA, schools, library, shops, cafes)
- Street is wide (60’) with no crossing islands or bike facilities
- Multiple transit options: Buses, commuter rail
- Underutilized parking lots (public, private and MBTA)

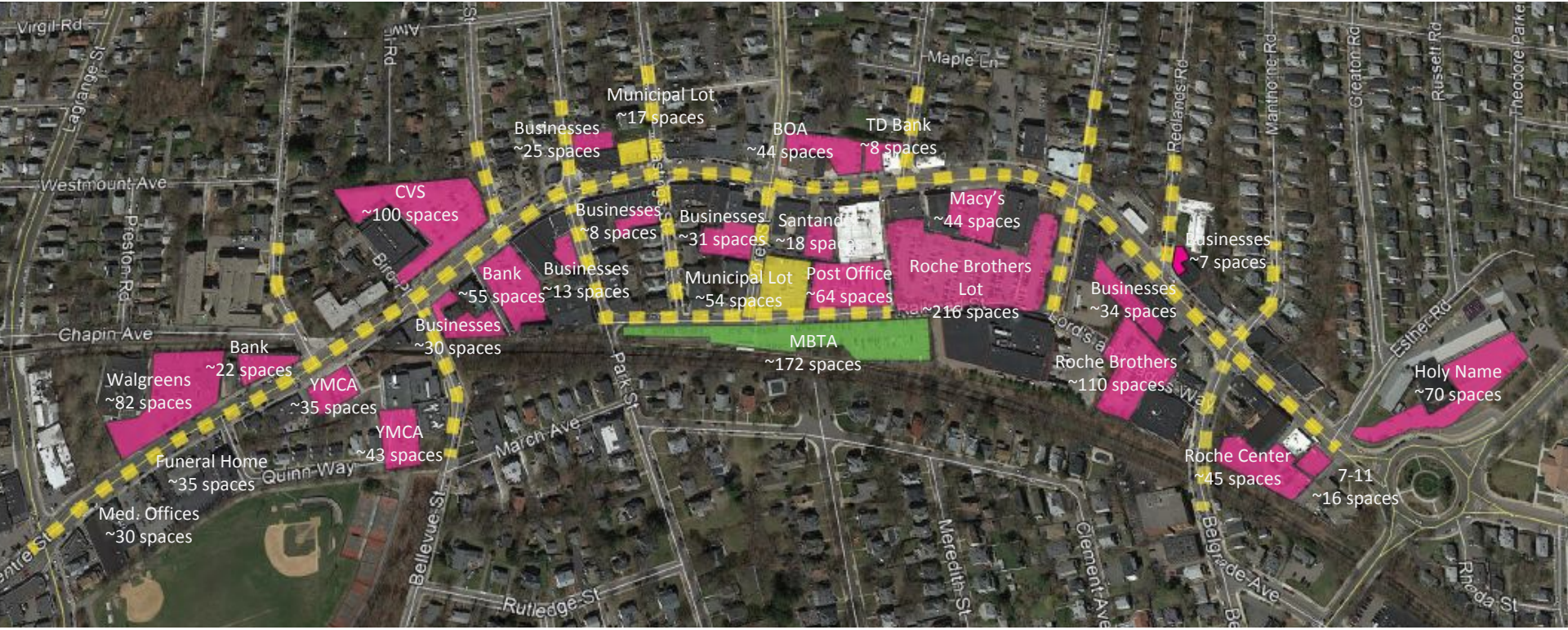
Centre Street Study Area

- 1 mile segment* from Spring Street to West Roxbury Pkwy
- ~16,200 vehicles per day, 51% northbound
- 18 intersections, 9 signalized
- 3 bus routes (35, 36, 37); ~7 pairs of stops
- 3 commuter rail stations (Needham Line)
- 221 on-street parking spaces
- No bike facilities
- No pedestrian islands

* Segment from West Roxbury Parkway to Weld Street is being evaluated separately



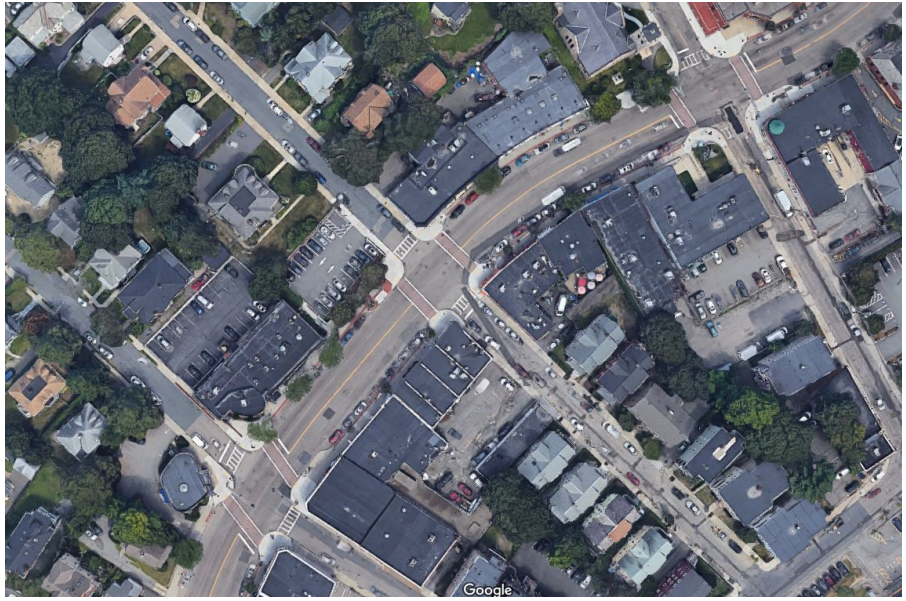
Parking: >1,100 private, ~172 MBTA, ~70 municipal, 221 on-street

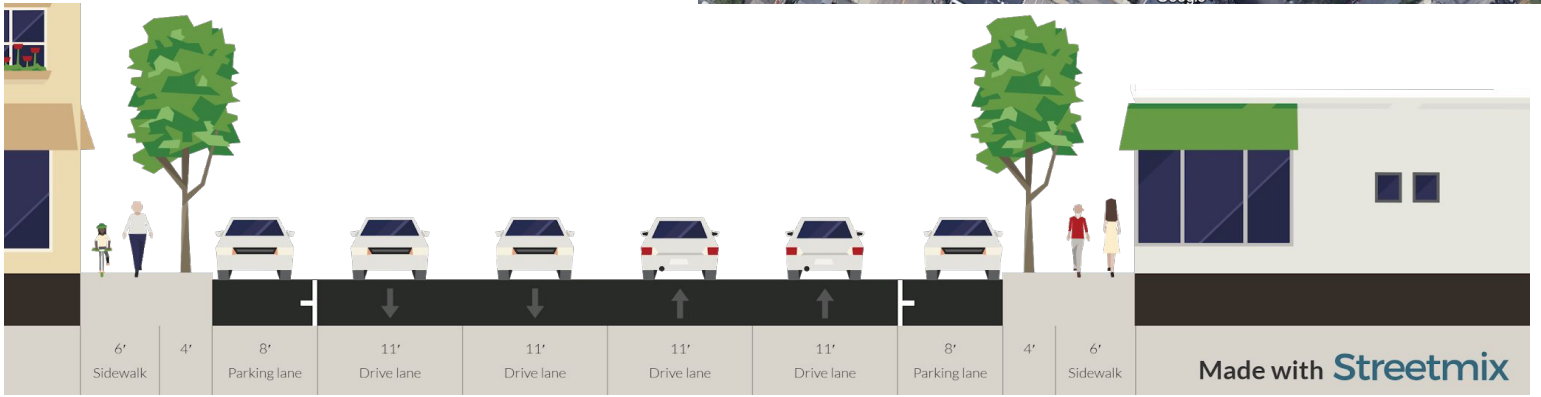


Source: MAPC as part of ULI TAP

Typical Cross Section

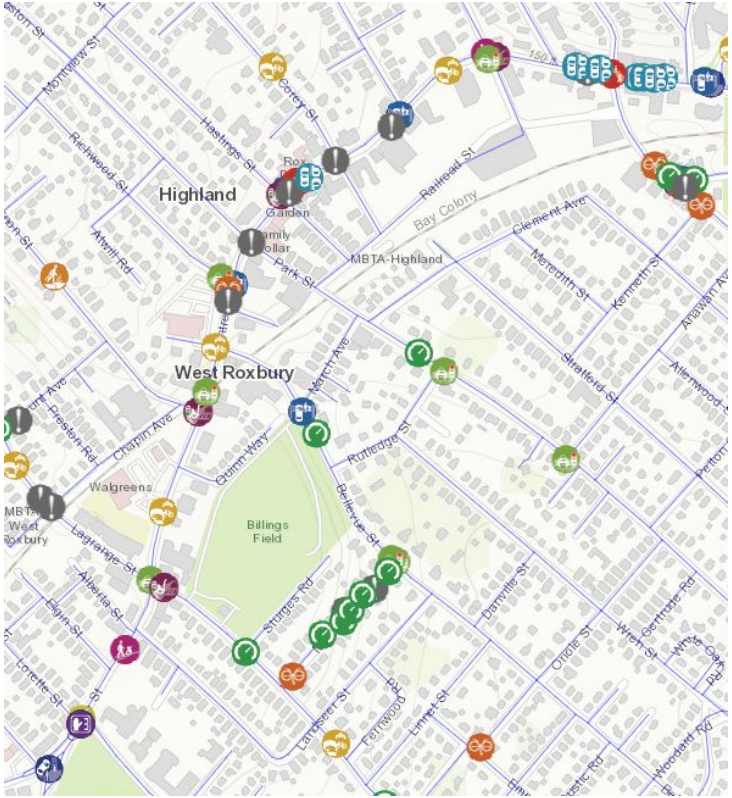
- 60’ wide curb to curb
- 4 travel lanes: 2 each direction plus parking
- 4 intersections have turn lanes:
    - Spring, Lagrange, Willow, Belgrade





Centre Street West Roxbury - Safety Concerns

- Double parking
- Red light running
- Drivers not yielding to pedestrians
- Too many lanes to cross
- Wait too long for walk signal
- No bicycle facilities
- Speeding (in comments)



Currently No Bike Facilities

- Go Boston 2030 #1 voted project was walk and bike friendly Main Streets districts
- Centre Street within walking and biking distance for most West Roxbury residents
- Protected bike facilities (top) are associated with safer streets overall
- Opportunity to make biking a safe and attractive option for all West Roxbury residents

Driving Speeds

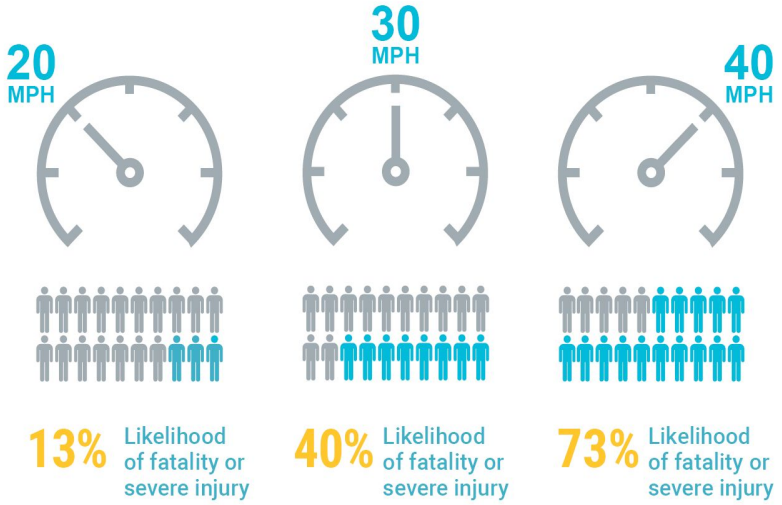
Speed Limit: 25 mph

Northbound

- Average 30 mph
- 85th percentile 36 mph
- 85% of drivers traveling 25 mph or greater
- ***58% of drivers traveling 30 mph or greater***

Southbound

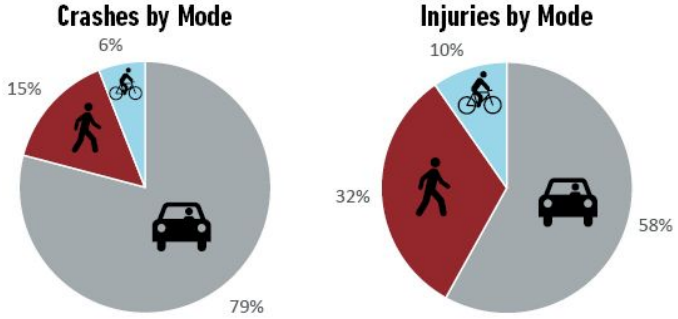
- Average 26 mph
- 85th percentile 31 mph
- 70% of drivers traveling 25 mph or greater
- ***26% of drivers traveling 30 mph or greater***



Source: Tefft, Brian C. Impact speed and a pedestrian's risk of severe inju or death. Accident Analysis & Prevention. 50. 2013

Crashes 2015-2018 (Boston Police Department)

- **Majority are angle (turning) and rear-end**
- **Half the pedestrian crashes involve drivers traveling straight**
- **Pedestrians and cyclists are disproportionately injured**



Crash type	Total	Percent	Bicyclist	Pedestrian
Angle	**26**	**39%**	**3**	**2**
Rear-end	**13**	**19%**	**1**	**0**
Traveling straight	**11**	**16%**	**0**	**5**
Fixed object	6	9%	0	0
Sideswipe-Same Direction	5	7%	0	0
Backing up	5	7%	0	2
U-turn	1	1%	0	1
Total:	**67**	**100%**	**4**	**10**

Crashes from Turning

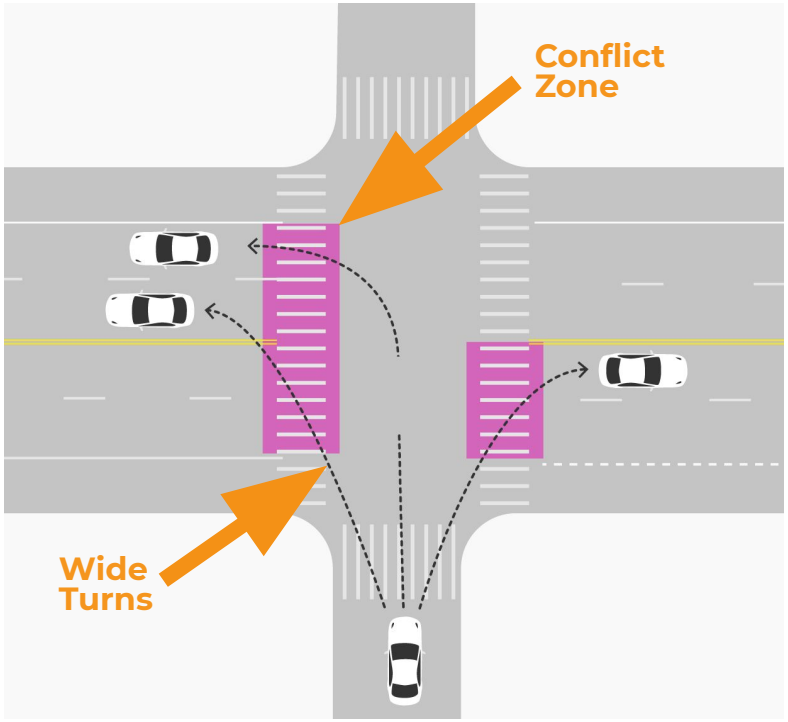
"Right Hook" and "Left Hook" crashes common for cyclists

Turning from general travel lanes associated with swerving and rear end collisions

Special Challenges of Left Turns

- **Obscured visibility from A-pillar**
- **Larger pedestrian conflict zone**
- **Wider turning radii, higher turning speeds**
- **Driver workload from back pressure and "find the gap"**
- **Harder to find a gap when crossing two opposing lanes**

Source: NYC DOT



Source: NYDOT and Quartz, No Turn Left Behind, Karen Hao & Amanda Shendruck

Pedestrian Crashes from Traveling Straight

Speeding:

- Yielding rates decrease (Bertulis, 2013)
- Cone of vision narrows
- Stopping distance increases
- Force/severity of crash increases

Distracted driving

Poor visibility/blocked sight lines:

- Sun; nighttime; weather
- Parked Cars
- "Multiple Threat"

10-15 MPH

Stopping Distance: 25'

20-25 MPH

Stopping Distance: 40'

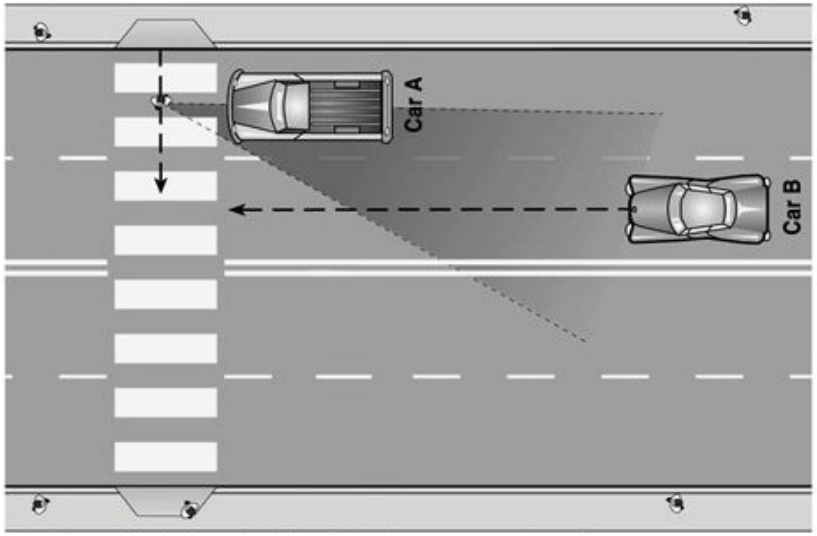
30-35 MPH

Stopping Distance: 75'

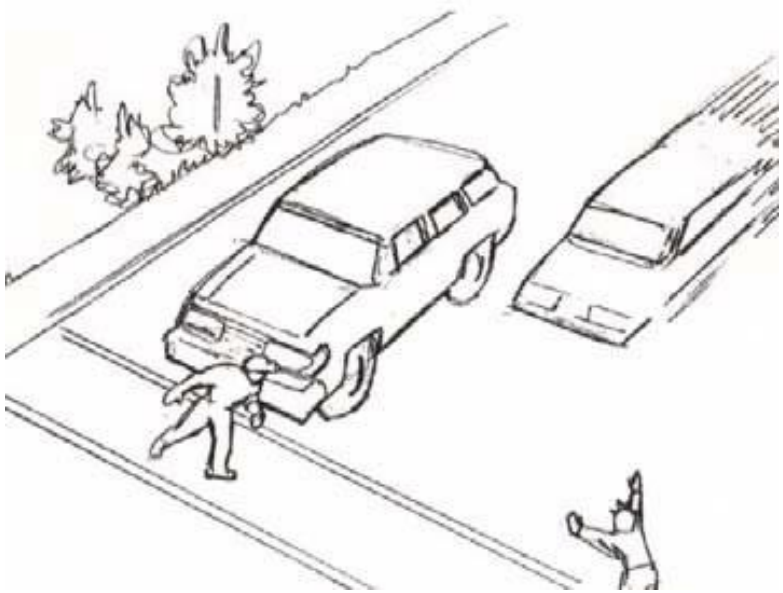
Source: NACTO Urban Street Design Guide, 2013

“Multiple Threat”

- Two or more travel lanes in same direction
- One driver yields; other driver attempts to pass
- First driver blocks line of site for second driver and pedestrian



Source: SRTS Guide, PBIC



Source: FHWA MUTCD

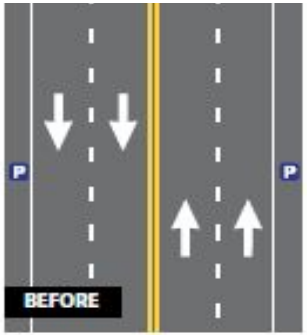
Centre Street: Primary Goal -- Improve Safety

Improve safety

1. **Reduce Conflicts**
2. **Improve Visibility**
3. **Curb Speeding**

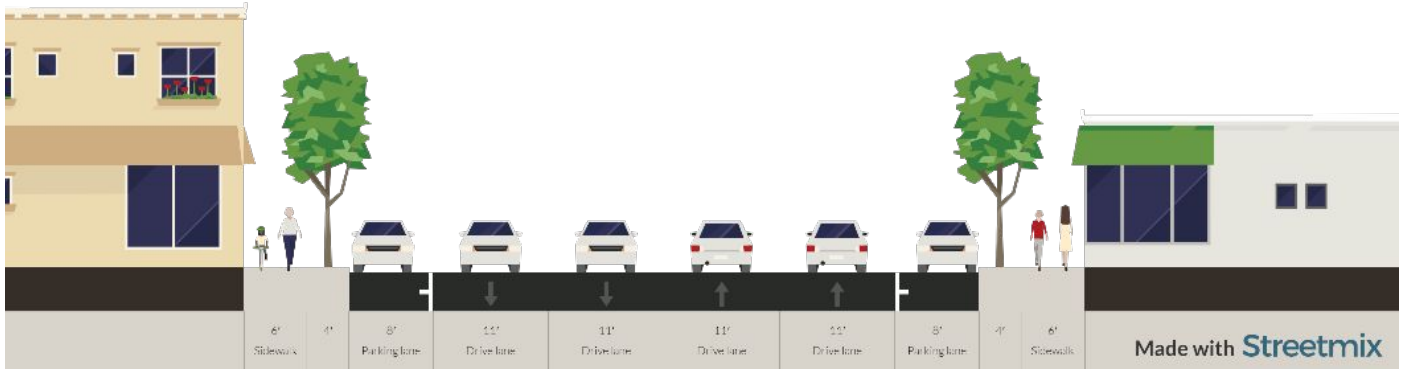
Proposal: 4 to 3 lane Road Diet

- 1 travel lane each direction plus left turn lanes
- Parking protected bike lanes
- Painted medians and pedestrian refuge islands where turn lanes not needed

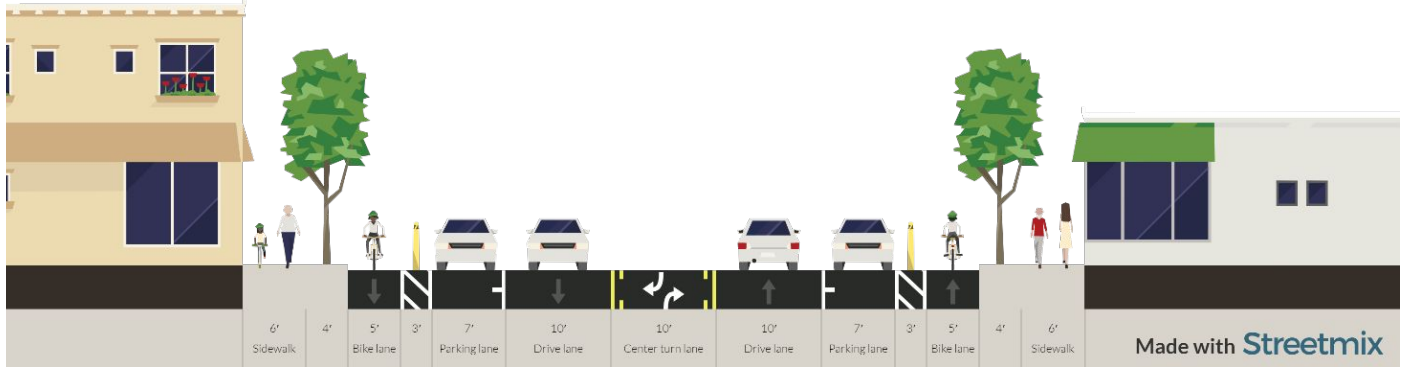


55th Street, Chicago
Source: FHWA Road Diet Case Studies

Proposal: 4 to 3 lane Road Diet



Before



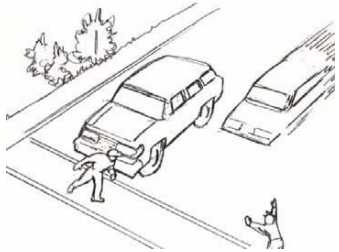
After

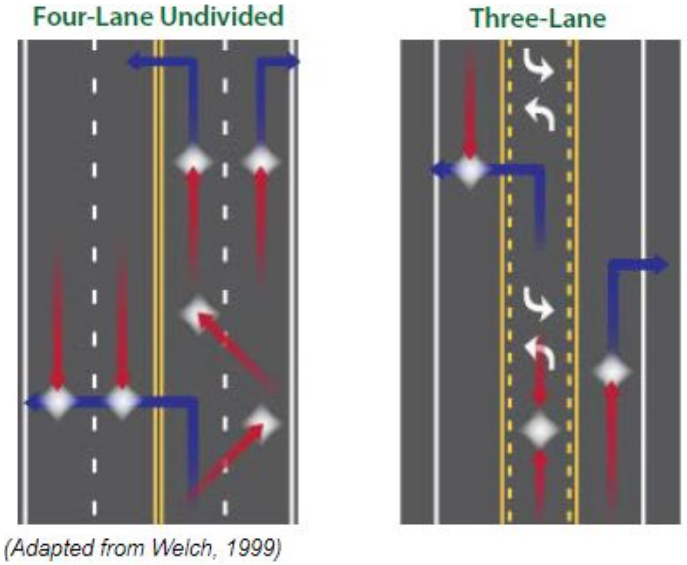
Road Diet General Guidelines

Guideline	Centre Street
< 20K vehicles per day (FHWA)	~16,200 vehicles per day
< 875 vehicles per direction during peak hour < 750 preferred (Iowa DOT cited by FHWA)	< 700 per hour during the AM, afternoon, and PM peaks (all except Centre @St. Theresa in PM peak) Centre @St. Theresa during PM peak has < 875

Road Diet Benefits

1. **Reduce Conflicts**
    - i. Fewer conflicts when turning left
    - ii. Less weaving around turning vehicles
    - iii. Space for protected bike lanes
2. **Improve Visibility**
    - i. No multiple threat
    - ii. Fewer travel lanes for pedestrians to cross
3. **Curb Speeding**
    - i. No speeding while passing





(Adapted from Welch, 1999)

Source: Federal Highway Administration
Road Diet Informational Guide

Road Diet Benefits

Source: Federal Highway Administration
Road Diet Informational Guide

Appendix A – Road Diet Safety Assessment Studies

The following table provides an overview of recent Road Diet safety analyses, including the number of treatment sit volume, and key safety results. Following that are synopses for each reference.

Reference	Treatment Sites	ADT	Key Safety Results
FHWA, 2010	45 sites in California, Iowa, and Washington	3,718 to 26,376	Iowa data: 47% reduction in total crashes California and Washington data: 19% reduction in total crashes Combined data: 29% reduction in total crashes
Noyce et al., 2006	7 treatment sites throughout Minnesota	8,900 to 17,400	Traditional before-after approach: 42- 43% reduction in crashes. Yoked/group comparison analysis: 37% reduction in total crashes and 47% reduction in crash rates. EB approach: 44% reduction in total crashes.
Pawlovich et al., 2006	15 treatment sites throughout Iowa	4,766 to 13,695	25.2% reduction in crash frequency per mile; 18.8% reduction in crash rate.
Li and Carriquiry, 2005	15 treatment sites throughout Iowa	3,007 to 15,333	29% reduction in the frequency of crashes per mile; 18% reduction in the crash rate.
Huang et al., 2003	12 treatment sites in California and Washington	10,179 to 16,070	6% reduction in total crashes relative to control; no reduction in crash rate.
Lyles et al., 2012	24 treatment sites throughout Michigan	3,510 to 17,020	9% reduction in total crashes (non- significant).
Stout, 2005; Stout et al., 2005; Stout (year unknown)	11 to 15 treatment sites in various Iowa cities	2,000 to 17,400	21 to 38 percent reduction in total crashes; similar reduction in crash rates.
Clark, 2001	One treatment site in Athens-Clarke County, GA	18,000 to 20,000	52.9% reduction in total crashes; 51.1% reduction in crash rate (first 6 months).
City of Orlando, 2002	One treatment site in Orlando, FL	18,000 to 20,000	34% reduction in crash rate; 68% reduction in injury rate (first 4 months).
Preston, 1999	Minnesota	Not Provided	27% lower crash rate on three-lane roads than on four-lane undivided roadways (cross-sectional comparison – not a before-after study)

Impacts on Traffic

Ways to mitigate:

- **Optimize signal timing and phasing to minimize delays**
- **Remove signals if not needed (analysis assumes all signals stay)**
- **Connect signals to Traffic Management Center (ongoing)**

Peak Period	Direction	Existing Travel Time (mins)	Proposed Travel Time (mins)	Change (mins)
AM Peak	Inbound	3.6	4.6	+1.0
AM Peak	Outbound	3.6	4.1	+0.5
Midday Peak	Inbound	3.5	4.7	+1.2
Midday Peak	Outbound	3.5	4.3	+0.8
PM Peak	Inbound	5.0	5.9	+1.0
PM Peak	Outbound	4.6	6.3	+1.8

Initial Traffic Model Results, subject to refinement

Impacts on Parking: Loss of ~16 of 221 on-street spaces

Ways to mitigate:

- **Update parking regulations to better manage short term parking needs**
- **Work with businesses to ensure loading needs are accommodated**
- **Work with MBTA to evaluate bus stop locations and potential for consolidation**
- **Provide better wayfinding to parking lots**

Why Protected Bike Lanes

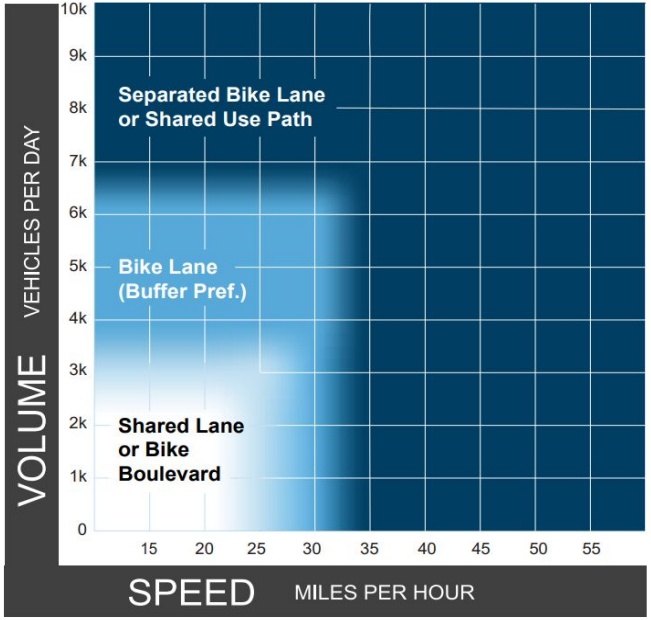
Traffic Volume:

- **Centre Street has 16,200 vehicles per day**
- **> 6,000 vehicles/day, difficult for drivers and bicyclists to share roadway**
- **At 10,000 vehicles/day, a bicyclist at 10 mph will be passed about every 4 seconds by a driver during the peak hour**

Protects bicyclists from fatal door zone crashes

Motorists feel more comfortable on streets where bicyclists are separated from motor vehicle traffic

Preferred Bikeway Type for Urban Core, Suburban, and Rural Town Contexts



Source: Federal Highway Administration Bikeway Selection Guide, 2019

Areas to Continue to Explore

- Enhance all crosswalks to be high visible
- Evaluate signal timing to reduce pedestrian and bus delays
- Consider removing signals that don't meet warrants
- Add pedestrian refuge islands where there is space
- Provide wayfinding to parking lots
- Evaluate on-street parking regulations

Centre Street Safety Improvements

Agenda/Schedule

Tonight

- Review background, safety issues
- Discuss design concept raised at February meeting (road diet) and other safety measures

This Summer

- Smaller group and stakeholder meetings to gather input and feedback

This Fall

- The City will host another community meeting to summarize feedback and present updated design

Late Fall 2019 or Spring 2020

- Implement changes

Fall 2020 or spring 2021: Project evaluation

Centre Street Safety Improvements

June 20, 2019

Mayor Martin J. Walsh