Rightsizing Streets: The Seattle Experience

April 30, 2013
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Seattle Department of Transportation
Complete Streets

- 16% of households do not have a car
- Seniors
- Youth
- Transit riders
- Safety for everyone

Ultimately, we all need complete streets
Seattle’s Complete Streets Approach

- **Vision**: Streets that are safe, convenient and accessible for everyone

- **Plans**: Bicycle, Pedestrian, Transit, Freight

- **Funding**: Bridging the Gap, state, federal grants

- **Implementation**: Complete Streets checklist

- **Outreach**: Community collaboration

- **Opportunities**: Redesigning city streets
Standard Road Diets
Seattle’s Guidelines for Road Diets

Daily volume under 10,000

Yes

Daily volume 10,000 – 16,000

< 700 vehicles per hour per direction

Yes

> 700 vehicles per hour per direction

Synchro model

LOS & Critical Approaches E or better

Yes

 Applies to 4-lane or 5-lane to 3-lane conversion
Seattle’s Guidelines for Road Diets

Daily volume 16,000 – 25,000

Synchro model

- < 30% Increase in travel time
- Corridor LOS D or better
- LOS E or better at critical approaches

Yes

Daily volume more than 25,000

No

Every street is different, these are just guidelines
Economic Benefits

 Ballard
  - Drove alone: 38%
  - Carpoled/Dropped off: 26%
  - Bus: 13%
  - Light Rail: 5%
  - Walk: 8%
  - Bike: 9%

 Columbia City
  - Drove alone: 38%
  - Carpoled/Dropped off: 22%
  - Bus: 12%
  - Light Rail: 5%
  - Walk: 6%
  - Bike: 4%
  - DK/No answer: 13%

 Admiral
  - Drove alone: 48%
  - Carpoled/Dropped off: 6%
  - Bus: 16%
  - Light Rail: 15%
  - Walk: 15%

 Fremont
  - Drove alone: 23%
  - Carpoled/Dropped off: 23%
  - Bus: 24%
  - Light Rail: 4%
  - Walk: 7%
  - Bike: 19%

 Capitol Hill
  - Drove alone: 25%
  - Carpoled/Dropped off: 17%
  - Bus: 28%
  - Light Rail: 15%
  - Walk: 3%
  - Bike: 13%

 Othello
  - Drove alone: 29%
  - Carpoled/Dropped off: 7%
  - Bus: 9%
  - Light Rail: 34%
  - Walk: 9%
  - Bike: 12%

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Why Road Diets? Fewer Collisions

US Federal Highway Administration Proven Safety Measure to reduce all collisions by 29%
Why Road Diets? Pedestrian Safety

A modest decrease in vehicle speed makes the street safer for pedestrians.

- Hit by a vehicle traveling at 20 MPH: 9 out of 10 pedestrians survive.
- Hit by a vehicle traveling at 30 MPH: 5 out of 10 pedestrians survive.
- Hit by a vehicle traveling at 40 MPH: only 1 out of 10 pedestrians survives.

Top-end speeders increase the severity of pedestrian injuries.
Seattle Road Diet History

- 34 road diets have been installed in Seattle since 1972
- 1972 – 2006: 21 Projects
- 2007 – 2012: 13 Projects
How are Corridors Identified?

- Complete Streets for capital projects
- Bicycle Master Plan
- Pedestrian Master Plan
- Community requests for neighborhood plan implementation

S Columbian Way
What Factors are Considered?

Tier 1: Traffic Operations

Before  

After  

N 130th St (2010)
What Factors are Considered?

Tier 2: Safety/Collisions

Before

After

Nickerson St (2010)

Seattle Department of Transportation
What Factors are Considered?

Tier 3: Livability

Before 7th Ave (2010)

After 7th Ave (2010)

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Design Details: Freight

- Lane width
- Turning movements
Design Details: Transit

- Lane width
- Turning movements
- Stop consolidation
- Trolley lines

Before

After
Design Details: Parking

- Peak hour
- Utilization
Design Details: Pedestrian Crossings

- Refuge islands
- Marked crosswalks
Design Details: Signals

- Detection
- Optimize corridor
Design Details: Pavement Condition

Spot repair
Outreach: Common Concerns

• **There will be gridlock!**
  – Maintain capacity at signalized intersections
  – Gain efficiency by removing left turns from travel lanes

• **People will cut though the neighborhood!**
  – Monitor pre and post project implementation
  – Implement traffic calming measures if problems occur

• **I’ll be trapped in my driveway by all the traffic!**
  – Sight distance is improved for left turns
  – Access from side streets and driveways improved by crossing only one travel lane to the two-way left turn lane.
## Outreach: Common Concerns

<table>
<thead>
<tr>
<th>Street</th>
<th>Before Comments</th>
<th>After Comments</th>
<th>Requests to remove</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE 125&lt;sup&gt;th&lt;/sup&gt; St</td>
<td>394</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Nickerson St</td>
<td>66</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

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*Build a Safer Nickerson Street*

Complete streets are safer for everyone!

[Find out more at cascade.org](http://cascade.org)
## Before & After Studies

<table>
<thead>
<tr>
<th>Data needs</th>
<th>Before Study</th>
<th>After Study (&gt;1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADT</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Bike and Ped Counts</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Injury collisions</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>10+ over the speed limit</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>85&lt;sup&gt;th&lt;/sup&gt; percentile speed</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Transit operations</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Turning vehicle counts</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Parking use</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Side street diversion</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Vehicle classification</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Resident satisfaction</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Business satisfaction</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>
Case Study: Stone Way N

- 1.2 miles
- ADT – 13,000
- Burke-Gilman Trail Access
- Woodland Park Access
- Within 5 blocks – 8 schools, 2 libraries and 5 parks
Stone Way N: Marked Crosswalks

- Uncontrolled, marked crosswalks at 4 intersections.
- Crosswalk guidelines changed in 2004.
- Marked crosswalks would be non-compliant with four-lane cross section.
• Adopted in 2007.
• Stone one of the first projects completed under the plan.
• Recommended climbing lane and sharrow.
Stone Way N: 85th Percentile Speed

- Speed limit 30
- 85th percentile was 37 mph prior to rechannelization
- Dropped to 36 mph northbound
- Dropped to 34 mph southbound
Stone Way N: Aggressive Speeders

- 75% reduction in percent driver 10+ mph over the speed limit

![Graph showing the percentage of motorists driving 40 mph+ at N 38th]

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Stone Way N: Bicycle Volume

- Increased 35%
- Represents almost 15% of the peak hour traffic volume!
Stone Way N: Motor Vehicle Volume

- ADT declined 6%
- Consistent with citywide trends
- Peak volume dropped 5%
- Off-peak volume increased south of 45th Street
Stone Way N: Neighborhood Traffic

- Streets mentioned as alternatives to Stone
- Volume decreased
- Traffic did not divert
Stone Way N: Collisions

- Total declined 14%
- Injury declined 33%
- Angle declined 56%
- Pedestrian collisions declined 80%
Stone Way N: Conclusions

- Aggressive speeding reduced
- Collisions have declined
- Pedestrian crossings are safer
- Bicycle volume has increased
- Traffic has not diverted to neighborhood streets
Nickerson St:

Before

After
Nickerson Case Study

Improving Safety on Nickerson Street

- Average Speed of Vehicles was 42 MPH, now 33 MPH
  - Westbound: DOWN 18%
  - Eastbound: DOWN 24%

- Speeders (Percent driving over the speed limit)
  - Westbound: DOWN 64%
  - Eastbound: DOWN 63%

- Top End Speeders (Percent driving 10 mph or more over the speed limit)
  - Westbound: DOWN 92%
  - Eastbound: DOWN 96%
Nickerson Case Study

Improving Safety on Nickerson Street

Change in Number of Collisions on Nickerson
(One-year after rechannelization)

DOWN 23%

Long-term citywide goal:
a city with zero traffic fatalities and serious injuries

Average Weekday Traffic Volumes

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Volumes</td>
<td>18,563</td>
<td>18,364</td>
</tr>
</tbody>
</table>

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NE 125th St Case Study

- ADT 16,200
- 4 lanes to 2 lanes with TWLTL and bike lanes
- Business district
- High bus usage
- High percent of injury collisions
- High speeds
NE 125th Street Case Study

Before

After
### NE 125th St Case Study

<table>
<thead>
<tr>
<th>SPEED</th>
<th>BEFORE</th>
<th>AFTER</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>85th Percentile</td>
<td>40.0</td>
<td>36.9</td>
<td>-8%</td>
</tr>
<tr>
<td>Driving Faster Than 30</td>
<td>87%</td>
<td>77%</td>
<td>-11%</td>
</tr>
<tr>
<td>Driving Faster Than 35</td>
<td>51.6%</td>
<td>29%</td>
<td>-44%</td>
</tr>
<tr>
<td>Driving Faster Than 40</td>
<td>16%</td>
<td>4.9%</td>
<td>-69%</td>
</tr>
</tbody>
</table>
### NE 125th St Case Study

#### Collision Rate

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collisions per million vehicles</td>
<td>5.83</td>
<td>5.24</td>
<td>-10%</td>
</tr>
<tr>
<td>Injury collisions per million vehicles</td>
<td>2.41</td>
<td>1.99</td>
<td>-17%</td>
</tr>
</tbody>
</table>

#### Bicycle and Pedestrian Volume

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-hour Count (7-9AM; 1-2PM; 4-6PM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Temp 56 Precipitation 0.14”</td>
<td></td>
<td>High Temp 49 Precipitation 0.03”</td>
<td></td>
</tr>
<tr>
<td>Bicycles along NE 125th Street</td>
<td>7</td>
<td>15</td>
<td>+114%</td>
</tr>
<tr>
<td>Pedestrians in the crosswalks</td>
<td>330</td>
<td>676</td>
<td>+105%</td>
</tr>
</tbody>
</table>
## Recent Results

<table>
<thead>
<tr>
<th>Street</th>
<th>ADT Before</th>
<th>ADT Change</th>
<th>Injury Collisions</th>
<th>85th %</th>
<th>Aggressive Speeding (40+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone Way N</td>
<td>13,900</td>
<td>-6%</td>
<td>-33%</td>
<td>-5%</td>
<td>-75%</td>
</tr>
<tr>
<td>Fauntleroy Way SW</td>
<td>17,599</td>
<td>+0.3%</td>
<td>-72%</td>
<td>-1%</td>
<td>-13%</td>
</tr>
<tr>
<td>S Columbian Way</td>
<td>12,300</td>
<td>+15%</td>
<td>-19%</td>
<td>-6%</td>
<td>-46%</td>
</tr>
<tr>
<td>Nickerson Street</td>
<td>18,500</td>
<td>-1%</td>
<td>-20%</td>
<td>-21%</td>
<td>-93%</td>
</tr>
<tr>
<td>NE 125th Street</td>
<td>13,600</td>
<td>+11%</td>
<td>-8%</td>
<td>-8%</td>
<td>-69%</td>
</tr>
<tr>
<td>N 130th Street</td>
<td>13,298</td>
<td>+0.5%</td>
<td>-75%</td>
<td>-15%</td>
<td>-87%</td>
</tr>
<tr>
<td>Ellis Avenue S</td>
<td>9,855</td>
<td>-39%</td>
<td>-24%</td>
<td>-4%</td>
<td>-30%</td>
</tr>
</tbody>
</table>
Road Diet 2.0: Dexter Ave N

Before

After
Additional Resources

• Nickerson Street Before and After Study
  – http://www.seattle.gov/transportation/nickerson.htm

• Stone Way Before and After Study
  – http://www.seattle.gov/transportation/docs/StoneWaybeforeafterFINAL.pdf

• FHWA: Proven Safety Countermeasures

• NACTO Guides
  – http://nacto.org/

• National Complete Streets Coalition
  – http://www.completestreets.org/