Transforming Traffic Signals to Support Sustainability: Applications, Ideas, & Research

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Presented by:

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Overview

- Ideas about Policy Directives in Portland
- Example Applications
- Research
Who Do I Work For?

Mayor Sam Adams, Leader of PDX
Our intentions are to be as sustainable a city as possible. That means socially, that means environmentally and that means economically. The bike is great on all three of those factors. You just can’t get a better transportation return on your investment than you get with promoting bicycling.

– Mayor Sam Adams
Policy Directives

- Regional Transportation Plan, Metro
- Climate Action Plan
- City Transportation System Plan
  - Bicycle Master Plan
  - Freight Master Plan
- Transit Investment Plan, TriMet
CITY OF PORTLAND AND MULTNOMAH COUNTY

CLIMATE ACTION PLAN 2009

2008 MULTNOMAH COUNTY GREENHOUSE GAS EMISSIONS BY SECTOR

- Waste Disposal: 1%
- Residential: 21%
- Transportation: 38%
- Commercial: 25%
- Industrial: 15%

City of Portland Bureau of Planning and Sustainability
Sam Adams, Mayor  Susan Anderson, Director
MULTNOMAH COUNTY Sustainability Program
Jeff Cogen, County Commissioner
Emissions Reduction Goals

Bottom Line
Signals Street Lighting Budget

• $14 Million
  – Nearly half is power bill for street lighting

• Opportunity
  – LEDs & other efficient fixtures
  – Adaptive Lighting (dimming)
Transportation Hierarchy
Where are we going?

**Current Commute Mode for Portland**
- Walk: 4%
- Bike: 8%
- Carpool: 8%
- Transit (including park-and-ride): 15%
- Drive Alone: 60%

**2030 Target Commute Mode Share for Portland**
- Bike: 25%
- Drive Alone: 30%
- Additional Telecommuting: 2.5%
- Transit (including park-and-ride): 25%

Source: City of Portland Auditors
Portland Climate Action Plan

• Urban Form and Mobility
  – Create vibrant 20-minute neighborhoods (90%)
  – Reduce VMT by 30% from 2008 levels
  – Improve efficiency of freight movement
  – Other non-transportation operations objectives
Today’s Intersection
Tomorrow’s Intersection
Federal Requirements

• Manual of Uniform Traffic Control Devices
  – Adequate Roadway Capacity should be provided at a signalized intersection
  – Non-standard treatments must use Experimentation process
Case in Point: City & FHWA Pedestrian Crossing Signals

• Guide for Design of Ped/Bicycle Facilities
• Traffic Control Devices focused on improving crossing opportunities for pedestrians
  – Half Signals
  – Pedestrian Hybrid Signals (HAWK)
Current USDOT Policy Directive

- Treat walking and bicycling as equals with other transportation modes
- Go beyond minimum design standards
- Improve nonmotorized facilities during maintenance projects
Half Signals

- FHWA determined unsafe
  - Should be removed

- What research is this based on?
- How does the federal government provide us with flexibility to meet local policies?
- What are the safety benefits for future mode split targets?
HAWK Signal

- Shouldn’t be used at intersections
- Designed to reduce vehicle delay

➢ Is this better?
Pedestrian/Bicycle Prioritization

- Leading pedestrian intervals (LPIs) seek to elevate pedestrians to the top of the triangle

- Where do we apply them?
- What are the safety benefits?
Passive Pedestrian Detection

• Vehicles aren’t forced to push a button
• Extension of green for pedestrians that need a little more time
Downtown Signal Timing

- One way, regular grid street system
- Signal Cycle Lengths are as short as possible
- Quarter Cycle Offsets result in:
  - Progressions speeds 12-16 mph (vehicles/bikes)
  - “Reverse” progression 4 mph (pedestrians)
Downtown Signal Coordination

- Short blocks = 280 feet, 15 second difference
- In automobile direction – 12.7 mph
Downtown Signal Coordination (Pedestrians)

- Same situation, different direction
  - 280 feet, 45 seconds – 4.2 miles per hour
Innovations in Ped/Bike Control

- Improved information for peds at signals
- Innovative facility design
Bike Box

• Increase visibility for cyclists at intersections
• Increase efficiency for heavily trafficked locations
How to Use the New Bicycle Signal

1. TO GET A GREEN LIGHT
Place your bicycle on the marking on the sidewalk, with your wheels directly on the lines.

2. When the bicycle signal here is green...

3. ...cyclists can cross the intersection as shown here.

Questions? Comments?
Call City of Portland Bicycle Programs at (503)823-CYCL or submit a comment via the City of Portland’s bicycle transportation website at www.pdxtrans.org
- Traditional design for bicycle lanes were similar to pedestrian design (accommodate)
- Make bicyclists equal to vehicles at sign
N Broadway St & N Williams Ave Improvements

- Thru green arrows
- PTR
- Bike signal sign
- Overhead sensor
- Bike signal on recall
- 12" yellow heads on bike signal
- Future Loops
European examples of intersection design are helpful and contributed to the meeting their goals for mode split.
Concluding Thoughts

• Transportation design must evolve to meet our goals
  – Flexibility in design standards
  – Embracing Innovation
• Vehicular traffic needs must be balanced in concert with transportation needs and community interests
• Research is vital to effort
Thank you for your Time

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