

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

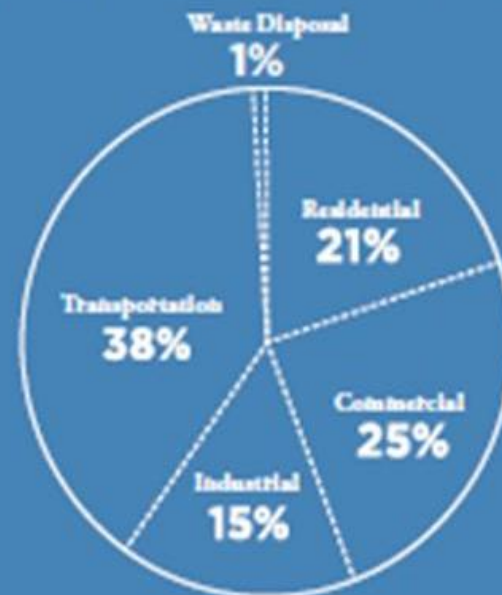


City of Portland Bureau of
Planning and Sustainability
Sam Adams, Mayor | Susan Anderson, Director



Sustainability Program
Jeff Cogen, County Commissioner

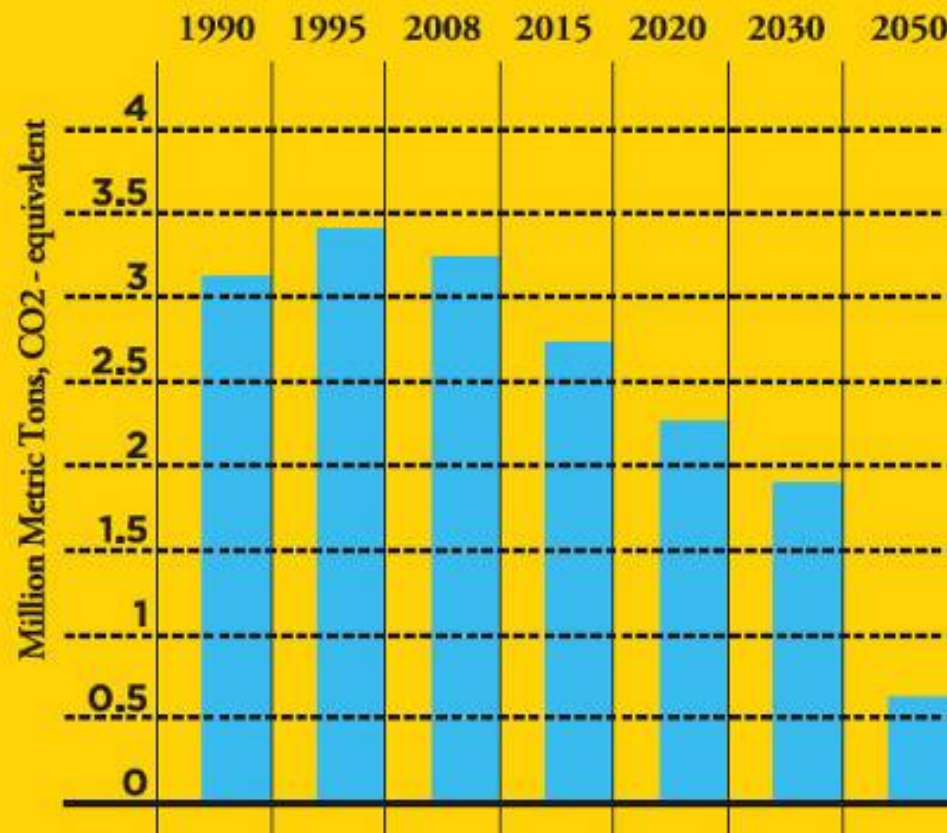
2008 MULTNOMAH COUNTY GREENHOUSE GAS EMISSIONS BY SECTOR



City of Portland Bureau of Planning and Sustainability

Emissions Reduction Goals

TRANSPORTATION-RELATED CARBON EMISSIONS REDUCTION GOALS



Source: Climate Action Plan, City of Portland,
<http://www.portlandonline.com/bps/index.cfm?c=49989&a=268612>



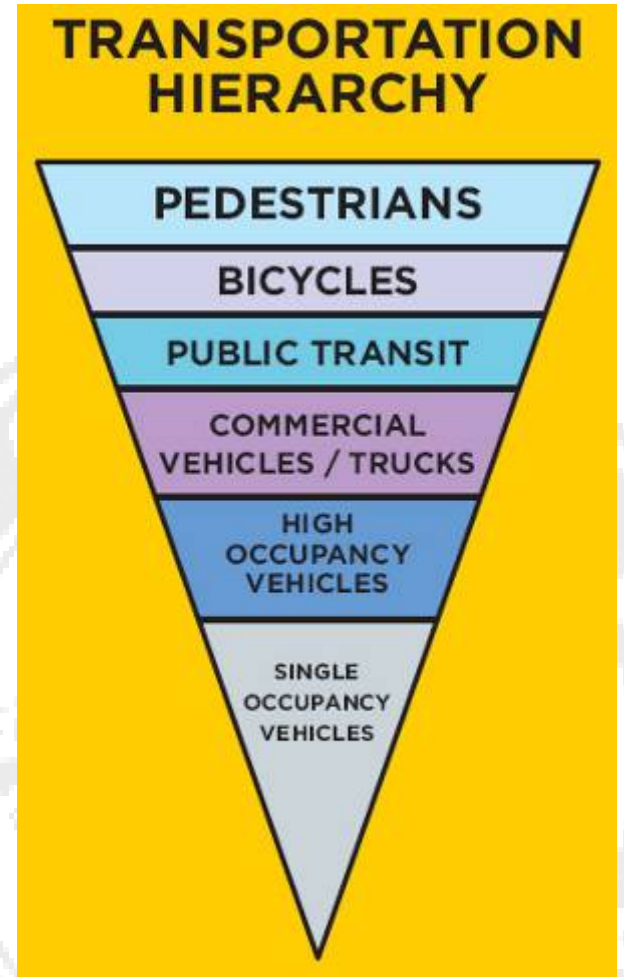
Bottom Line

Signals Street Lighting Budget

- \$14 Million
 - Nearly half is power bill for street lighting
- Opportunity
 - LEDs & other efficient fixtures
 - Adaptive Lighting (dimming)

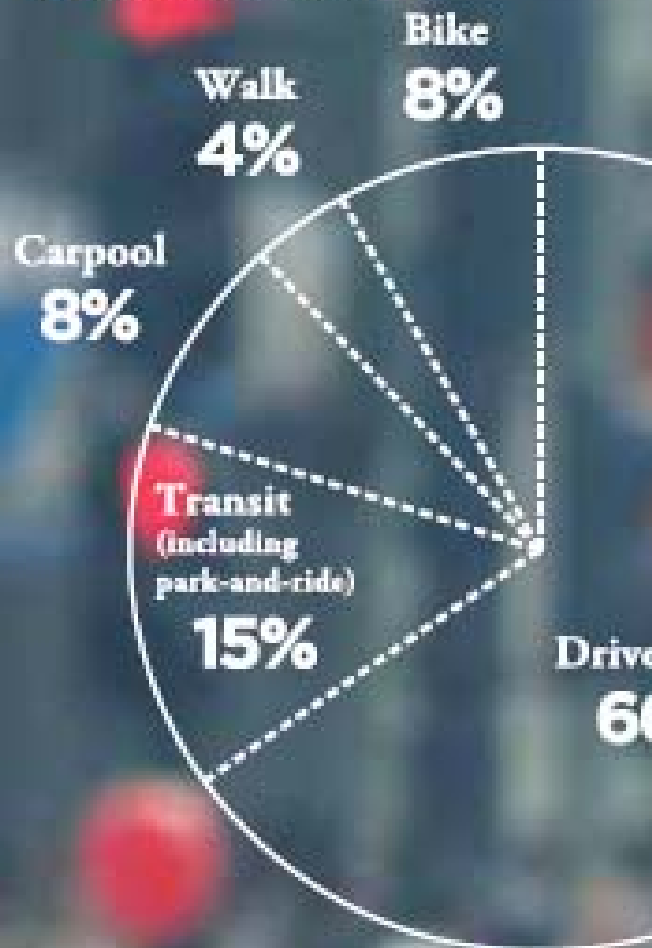


Transportation Hierarchy



Where are we going?

**CURRENT COMMUTE MODE
FOR PORTLAND**



**2030 TARGET COMMUTE MODE SHARE
FOR PORTLAND**





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



Intersection of 2030





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

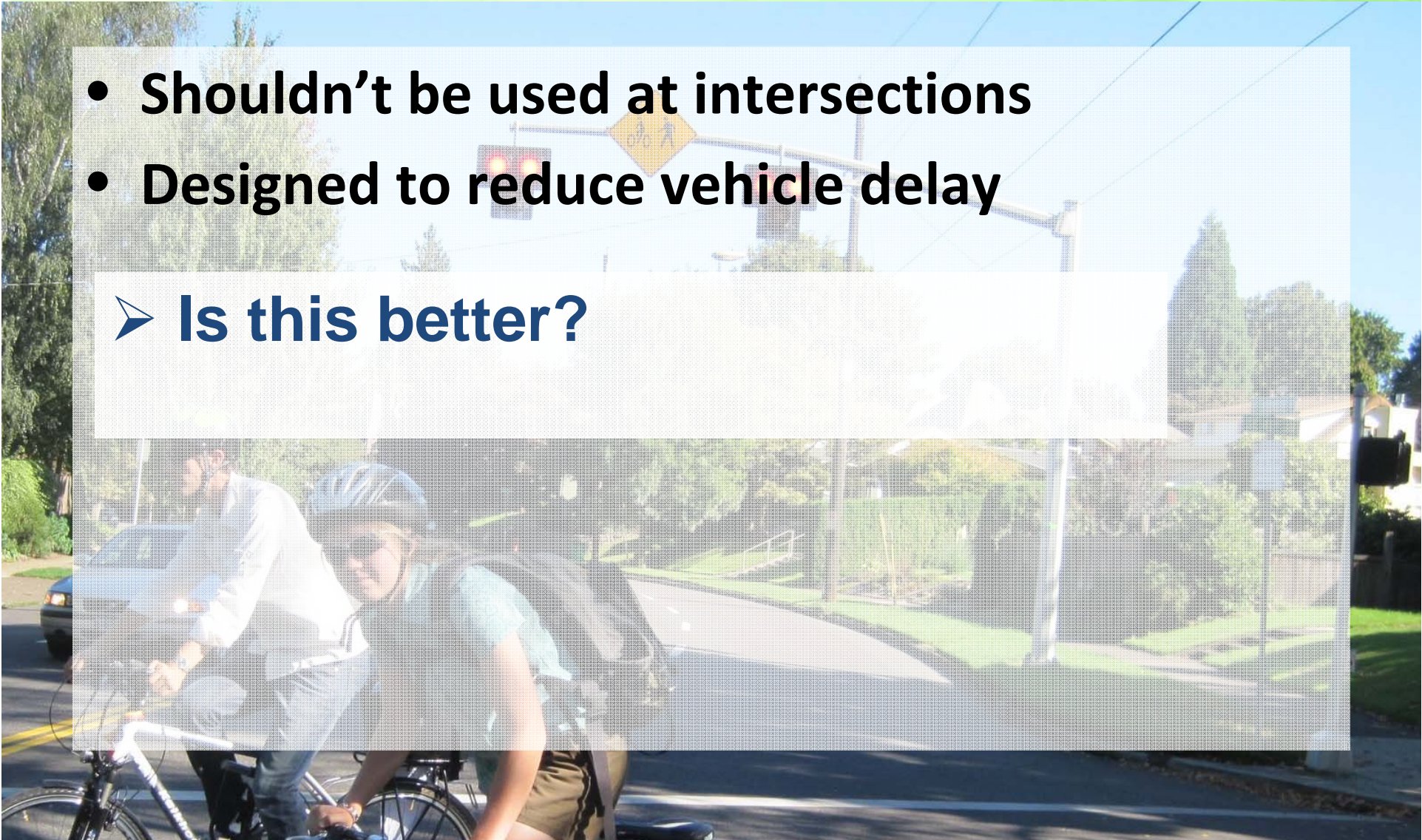
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- **FHWA determined unsafe**
 - Should be removed
 - **What research is this based on?**
 - **How does the federal government provide us with flexibility to meet local policies?**
 - **What are the safety benefits for future mode split targets?**



HAWK Signal

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

➤ Is this better?



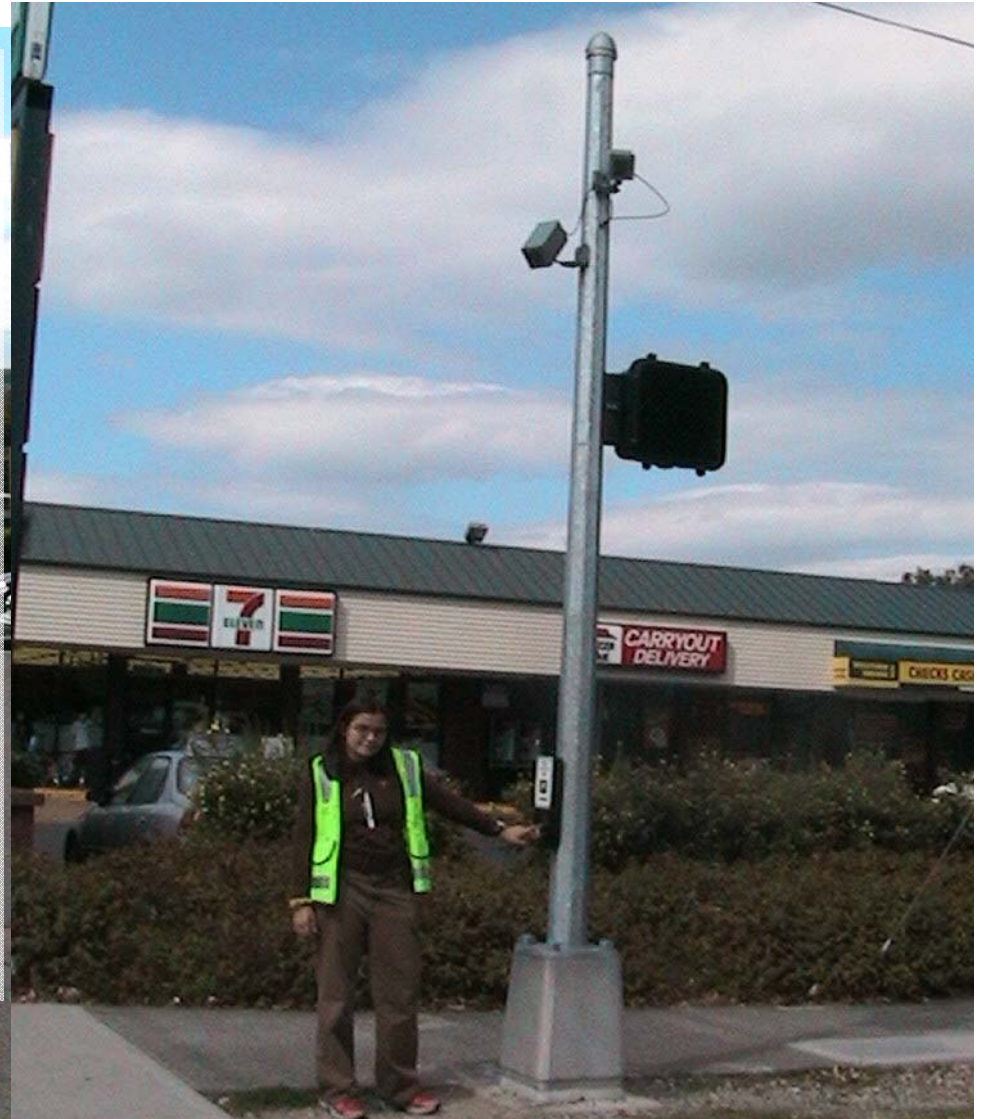


Pedestrian/Bicycle Prioritization

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- **Leading pedestrian intervals (LPIs) seek to elevate pedestrians to the top of the triangle**
 - **Where do we apply them?**
 - **What are the safety benefits?**

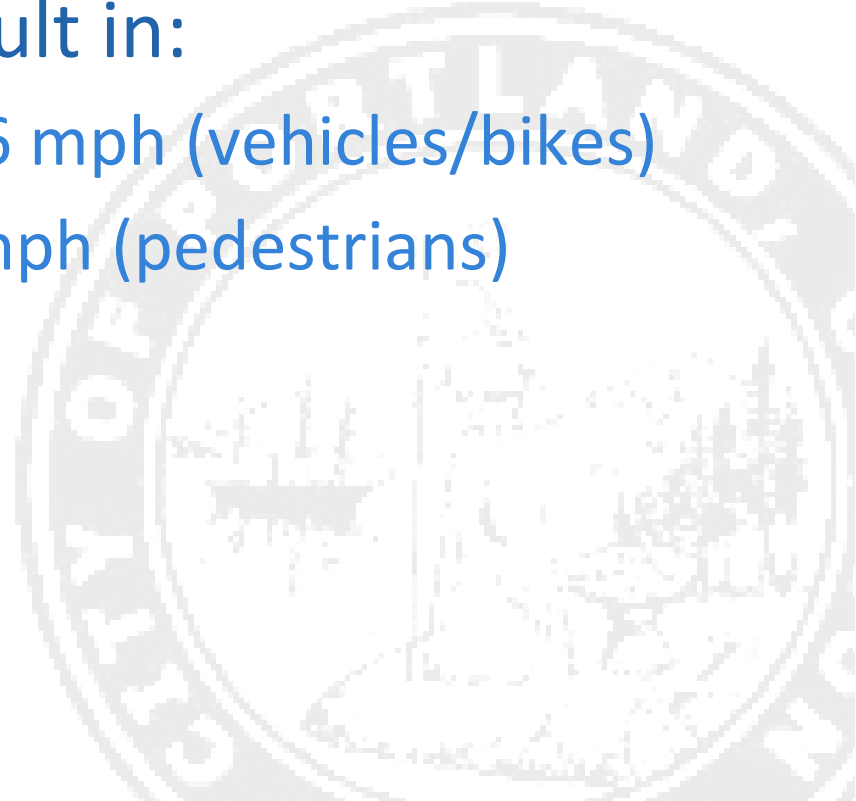
Passive Pedestrian Detection

- Vehicles aren't forced to push a button
- Extension of green for pedestrians that need a little more time



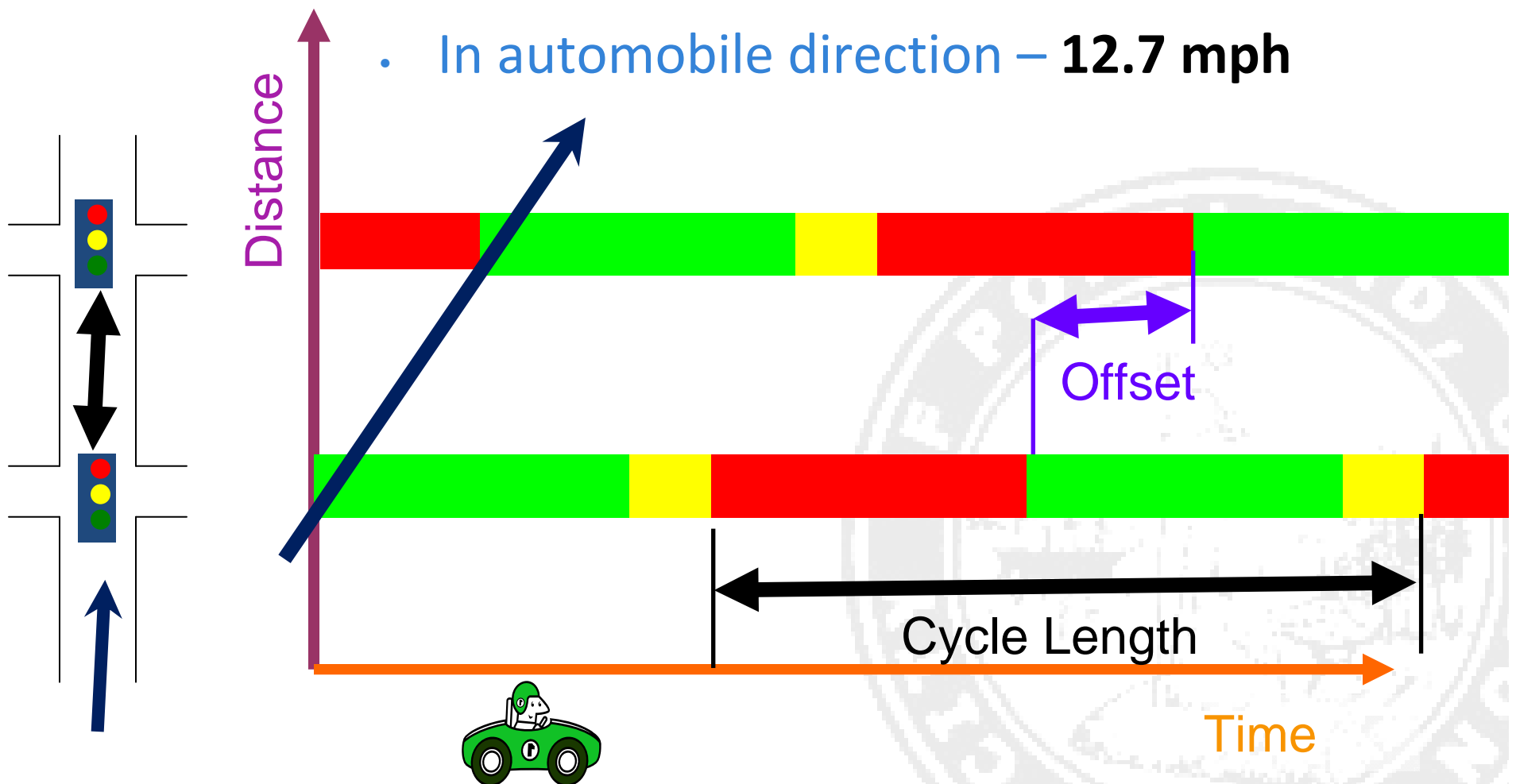


Downtown Signal Timing

- 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

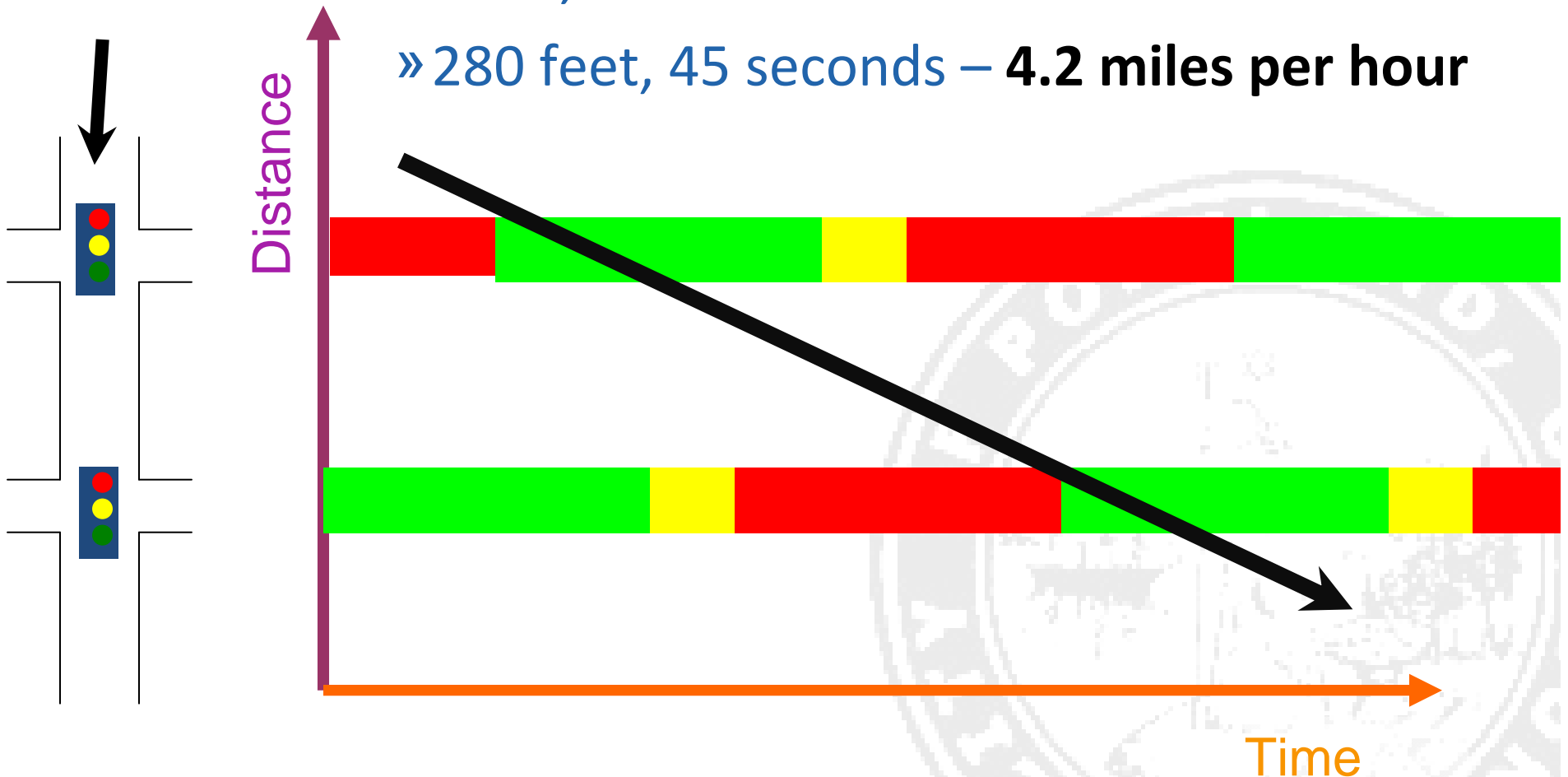
- Short blocks = 280 feet, 15 second difference
- In automobile direction – **12.7 mph**



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...



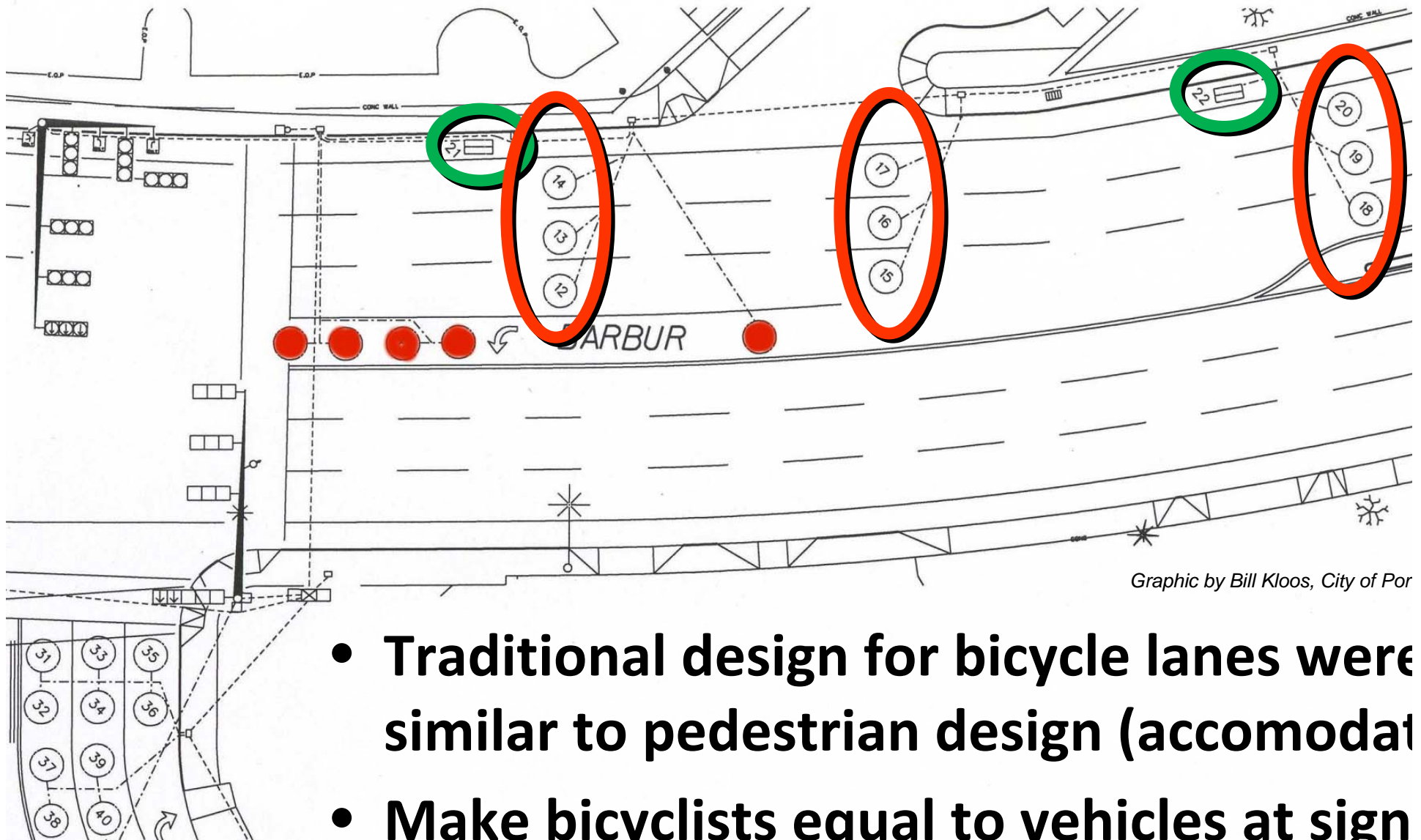
3 ...cyclists can cross the intersection as shown here.



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

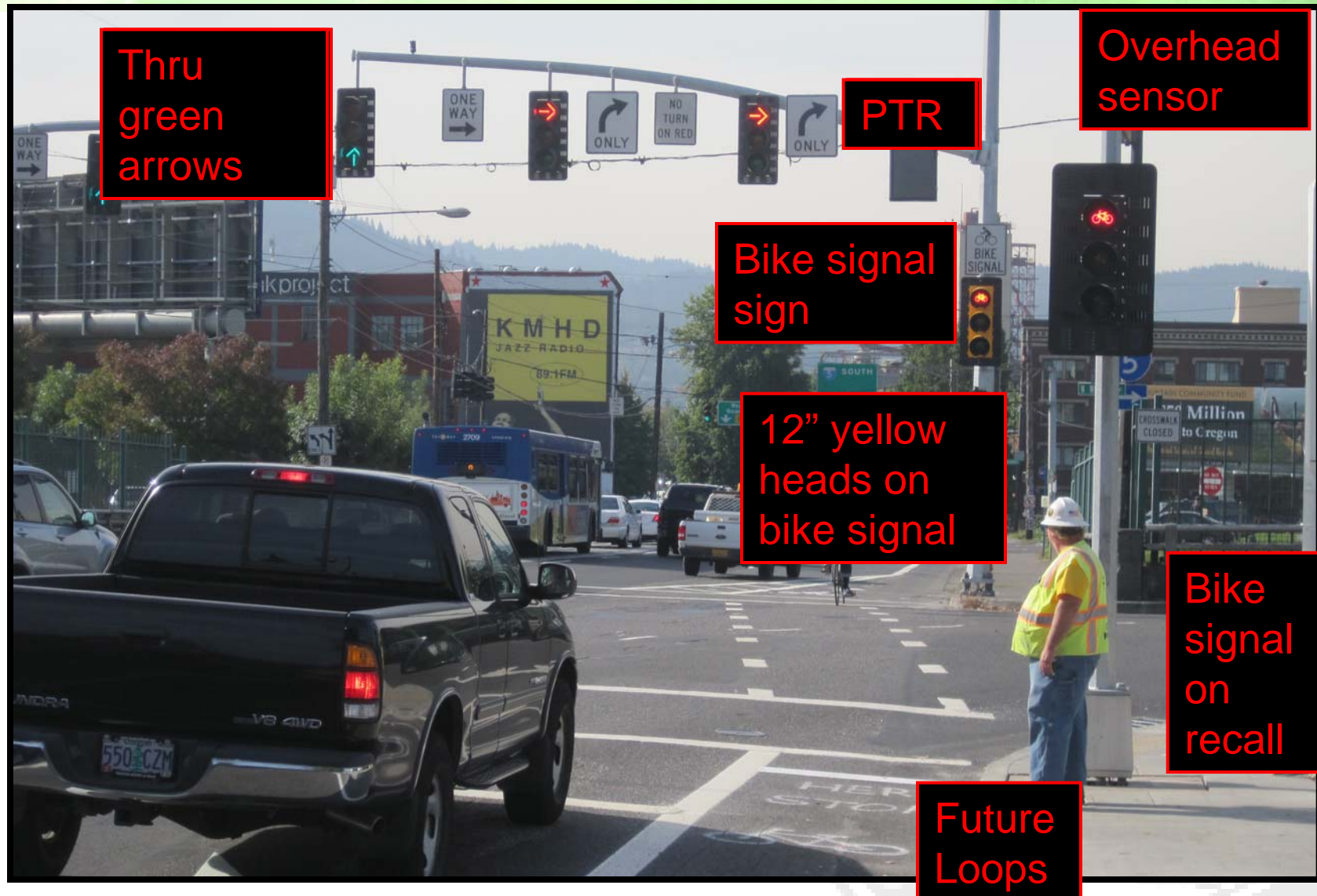


Bicycle Detection



- 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



N Broadway St & N Williams Ave Improvements



Research & Experience

- 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
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A nighttime photograph of a city street intersection. On the right, a modern building features a large, brightly lit sign that reads "GO BY STREETCAR" in red and yellow neon. The building's windows are illuminated from within, showing interior details. To the left, another building has a "COFFEE" sign and a Starbucks logo. The street is dark, with light trails from cars and streetlights creating a sense of motion. A "ONE WAY" sign is visible on the left side of the street. The overall scene is a vibrant urban night view.

Thank you for your Time

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