Bicycle and Pedestrian Detection

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It's the Law!

- California AB 1581 (2007, Fuller)
 - Sec 1(a)(1): Bicyclists and motorcyclists are legitimate users of California roadways First installation of signal or when replacing loop detectors

 - Detection (not differentiation)
 - Delayed implementation until CalTrans published standards, specs, guidelines
 - Repealed January 1, 2018

CVC 21450.5; CalTrans Policy Directive 09-06 (August 2009)

- Incorporated AB 1581 into the CA MUTCD (2012)
- 6' x 6' zone immediately behind the limit line
- "If more than 50% of the limit line detectors must be replaced \rightarrow entire intersection
- Gmin = 6 seconds
- If detector can discriminate, can extend Gmin













Funding

- Since 1992 bicycle and pedestrian projects have been eligible for federal transportation funding.
- Since then, states have spent over \$7.2 billion on 22,000 dedicated bicycle and pedestrian projects.
- 1/2 of the funds are distributed to MPOs
- Per FHWA "virtually all the major transportation funding programs can be used for bicycle and pedestrian-related projects."







Funding!

- State Programs:
 - ATP (2013), CMAQ, HSIP, SHOPP
- Complete Streets
 - Caltrans Deputy Directive 64-R2 directs Caltrans to implement Complete Streets
- Vision Zero







Growing City Areas

A 2011 survey found nearly 2/3 of 18 to 32 year-olds preferred to live in walkable/bikeable communities with nearby retail shops, restaurants, cafes, bars, and workplaces.

Unwanted Costs of Vehicle Ownership









1978 vs 2008 US Licensed Drivers



16 Year Olds
19 Year Olds



1978 VS 2008 16 & 19 YEAR OLDS



Growth of Bicycle Commutes

46% increase in bicyclists on the road since 2005

BICYCLE COMMUTING



From 2000 to 2013, bicycle commuting rates in Bicycle Friendly Communities increased 105%



NATIONALLY, since 2005, states have seen, on average, a 46% increase in the share of people commuting by bike. But an average is just that - there are many states that



Bike Sharing Systems

Of the 2,655 bikeshare stations, 86.3% (2,291) are located within 1 block of a scheduled public transportation mode

Bicycles are often used to connect to and from Public Transportation









And What About...









Changing Modes of Transportation

In 2009, 16 to 34-year-olds took:

- 24% more bike trips than they took in 2001
- 16% more walked to their destination
- 40% more passenger miles on transit







han they took in 2001 their destination miles on transit









Detection Techniques



Bicycle Differentiation Benefits

- Allow for longer initial or min-green for Bicycles
- Allows use of separate timing from Vehicles or Pedestrians
- Allows for Extension when Bicycle is approaching so rider is not stranded in intersection with opposing phase becoming green
- Allows for Bicycle Counts to determine what application makes the most sense at that intersection
- Provide time of day data







Loops

LOOP CONNECTION







Note direction of loop current: especially in center segments of loop (same direction)

Improved Loops





C-1101/1201-B

Stop bar (round) and dual use





Ontario, CA



C1101-B / C1201-B (Differentiating Detector)

- Differentiates between bicycles and other two wheeled vehicles and all other vehicles.
- Provides bike initial (min green) and extension timing
 - Requires knowledge of field greens on bike phases.
 - Econolite NEMA cabinets provide this to the back plane of the detector rack
 - 33X cabinets require an additional piece of equipment call a Phase Green Interface
- Requires a specially designed loop (parallelogram)
- Can be used for designated bike lanes or dual use lanes.
- No special detector setup required
- Provides bike count outputs and loop errors to TS2 controller





AutoScope Vision





Accurate. Versatile. Simple.



Bicycle Differentiation









64 Outputs



Comm Manager

SDLC Interface to SDLC Cable





Cobalt



Accuscan Radar











Pedestrians



Stereoscopic Vision





Trafficon Safe Walk (2009)

- 2 ea CMOS 1/3" B/W cameras
- Monitoring area 3m x 4m
- Stationary and moving pedestrians

Vimo by Motionloft

- Vehicle and ped detection and tracking
- Commercial use: storefronts
- Traffic applications:
 - Vehicle and ped counts
 - Ped pathway tracking





WTI J5 (2018)

- 2018 product introduction from WTI
- Ped detection and motion tracking
- Location, speed, trajectory





New Forms and Applications









Thank You!

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