



Portland State UNIVERSITY

Addressing Bicycle-Vehicle Conflicts with Signal Control Strategies



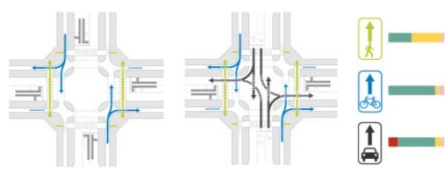
Michael Williams, Andy Kading, Dr. Sirisha Kothuri, Dr. Chris Monsere all of Portland State University; Dr. Edward Smaglik, Northern Arizona University; Dr. Krista Nordback, University of North Carolina

Objective: Compare Delay and Safety Characteristics of Four Signal Strategies Used to Reduce Bicycle-Vehicle Conflicts

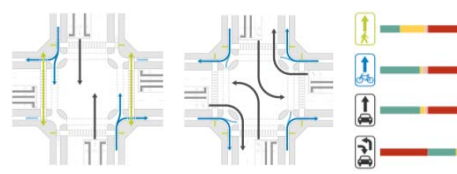
Method: Using Vissim simulation, compare the cyclist and vehicle delay of 4 signal strategies intended to reduce the incidence of right-hook crashes.



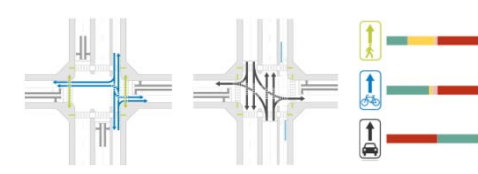
Base Case – Concurrent Phases



LBI - Leading Bicycle Interval (MassDOT 2015)

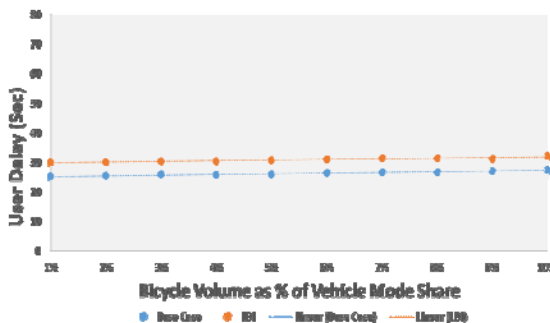


Split LBI – Split Leading Bicycle Interval (MassDOT 2015)

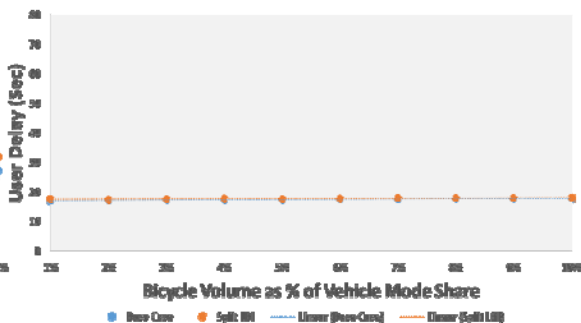


EBP - Exclusive Bicycle Phase (MassDOT 2015)

LBI Vehicle Results



Split LBI Vehicle Results



Vehicle Delay Results, EBP

Movement	Base	EBP	% Diff
EB TH	17.2	21.7	26%
EB RT	6.2	5.6	7%
EB LT	62.5	74.5	19%
WB TH	25.3	21.2	16%
WB RT	22.2	19.3	-13%
WB LT	52.2	56.3	8%
SB TH	34.1	35.2	3%
SB RT	8.1	6.1	-1%
SB LT	54.8	65.8	20%
NB TH	37.1	37.6	1%
NB RT	7.4	7.3	0%
NB LT	53.1	54.7	3%

None were statistically significant to the 95% CI

Bicycle Delay Results, EBP

Movement	Base	EBP	% Diff
EB TH	22.2	45.6	106%
EB RT	0.0	6.0	-25%
EB LT	42.7	85.5	100%
WB TH	17.8	44.7	152%
WB RT	2.2	14.3	558%
WB LT	29.3	40.8	39%
SB TH	33.3	30.6	-8%
SB RT	0.0	0.0	-
SB LT	0.0	0.0	-
NB TH	35.4	25.7	-27%
NB RT	3.2	3.3	1%
NB LT	54.6	50.7	-7%

None were statistically significant to the 95% CI

Conclusion

Compared to the Base Case – Concurrent Phases:

1. LBI resulted in zero cyclist delay and a vehicle delay equal to the LBI duration,
2. Split LBI resulted in zero cyclist delay and a vehicle delay of ~ .5 second,
3. EBP generated significant delays for both cyclists and vehicles.

Future Work

Assess safety characteristics of the four strategies via surrogate safety measures drawn from video of intersections where the signal strategies have been implemented.