Regional Effort on Performance-based Signal Timing and Coordination

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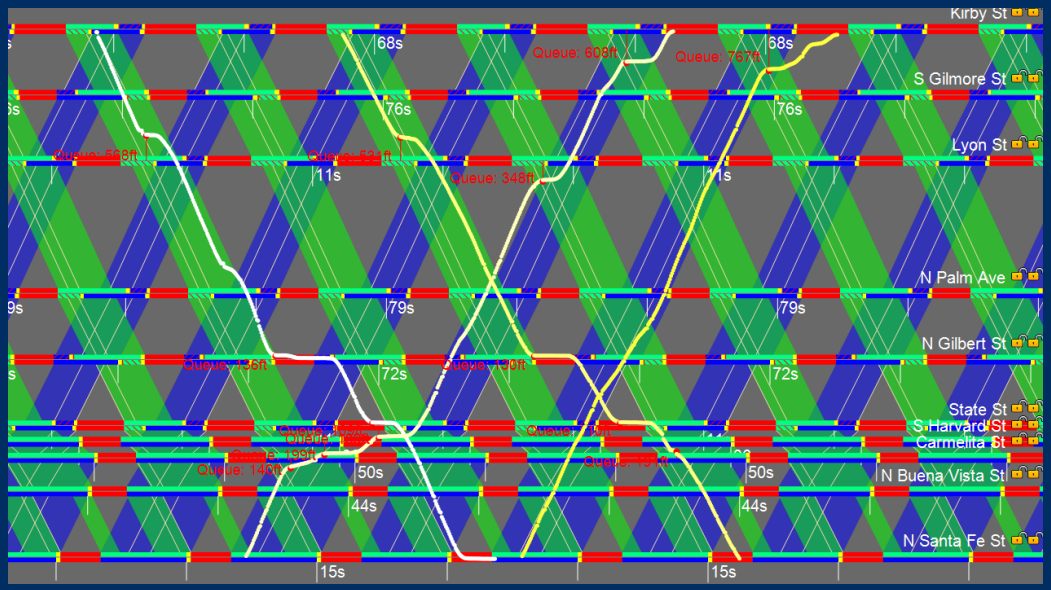
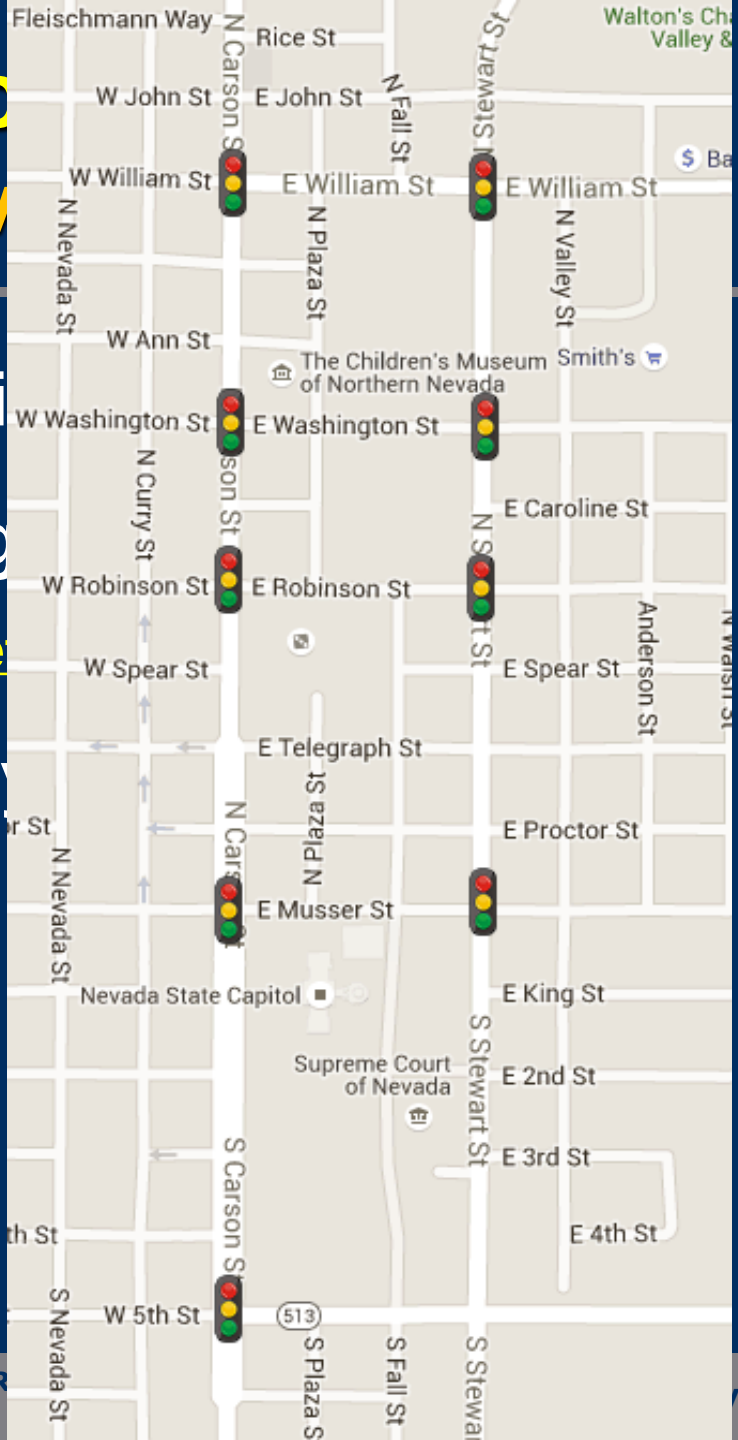
Outline

- Regional Activities in Northern Nevada
- UNR Signal Timing Research
- Case Demos



Major Activities in No
(CATER Involv

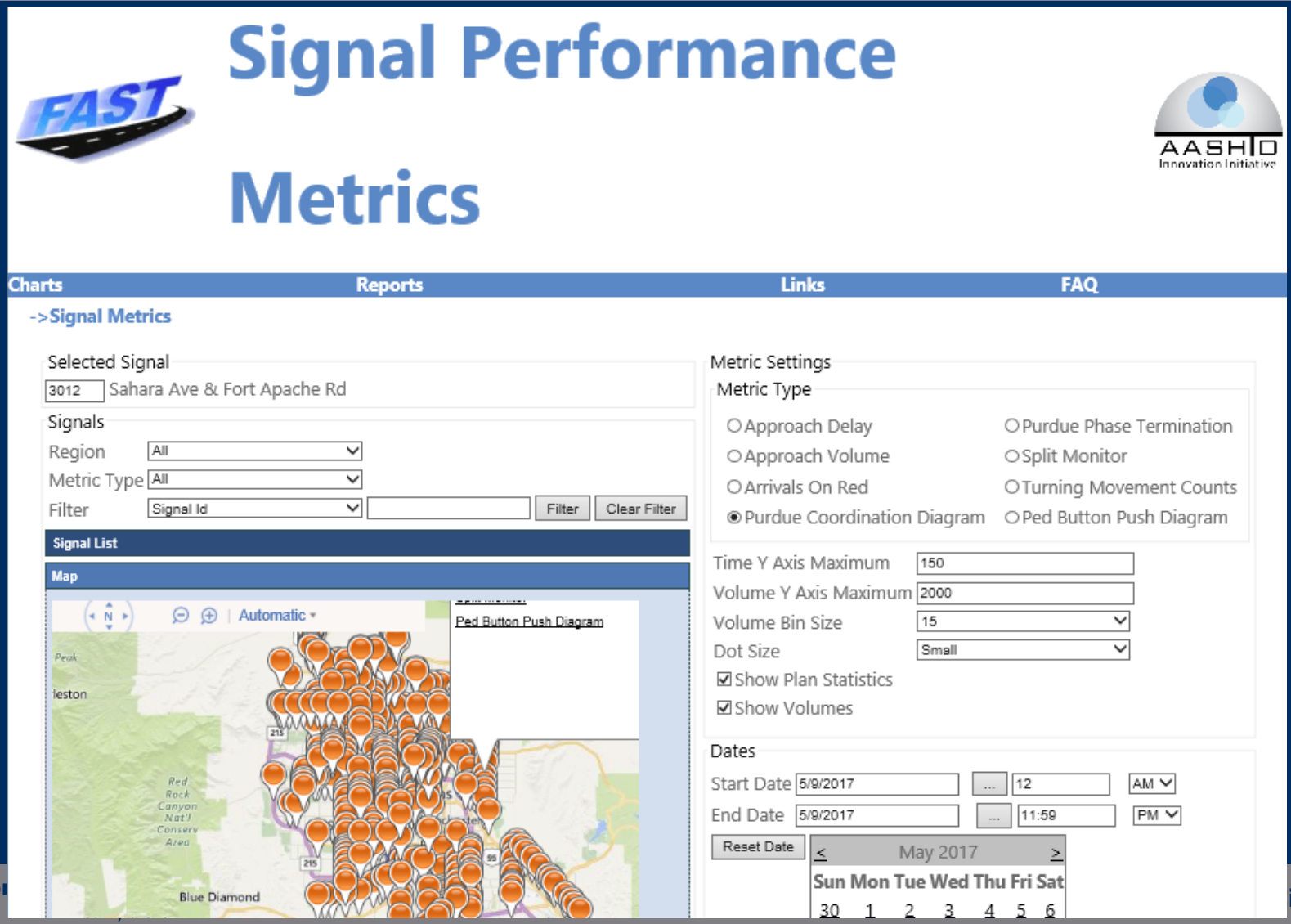
- Carson Street Signal Re-ti
- Reno-Sparks Regional Sig
  - About $300K-400K annual budge
- NDOT Research on Qualit
  Performance Index



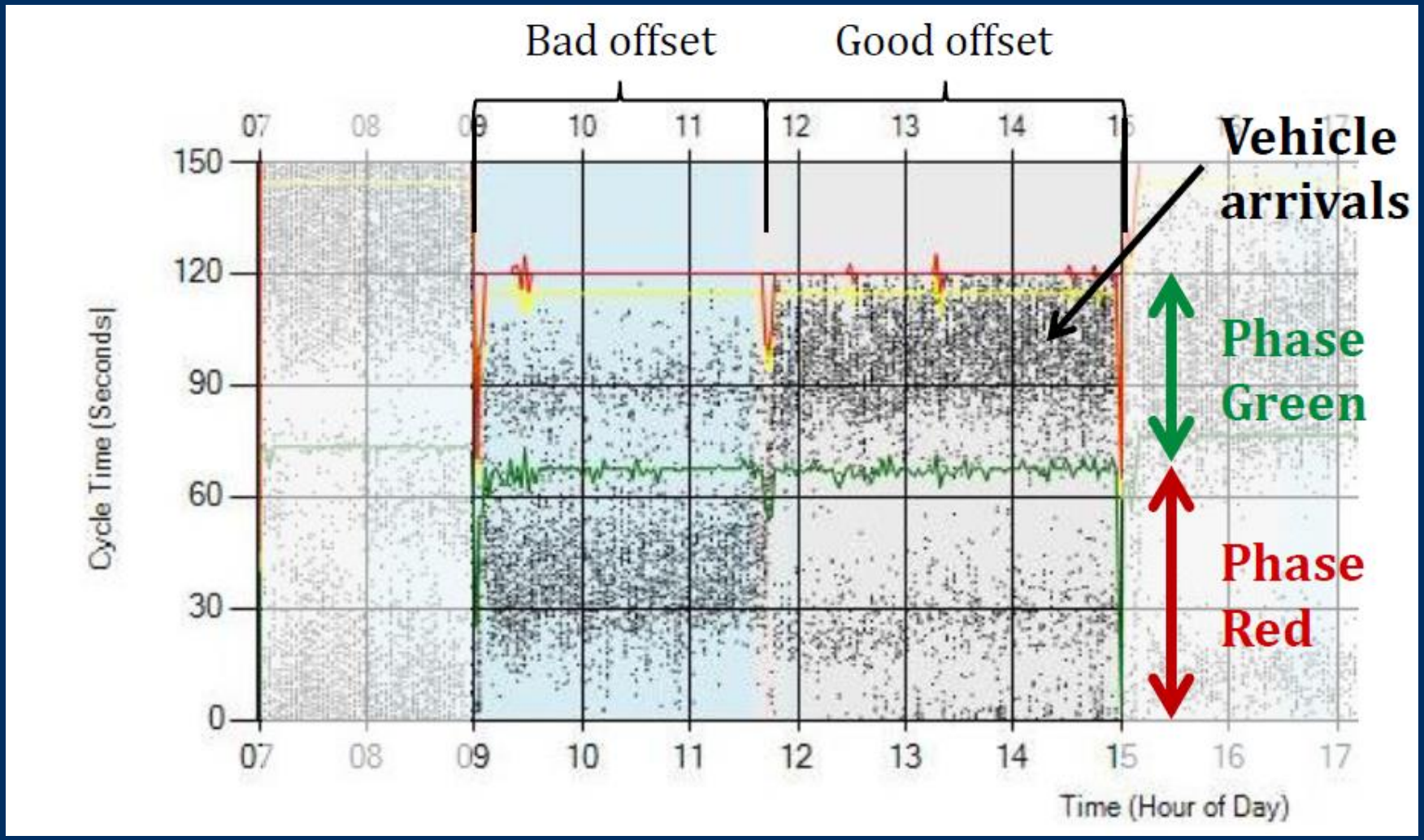
About Performance Measures

- PMs tell us how we are doing or how well we have done
- PMs DO NOT tell us how to do better
- Freeway operation and its PM are relatively more mature compared to arterials
- Arterial performance is largely dependent on the quality of signal operations
- No established PMs yet on signal operations

Purdue's Automated SPMs



Purdue's Automated SPMs



Orange County's CSPI

- Measures of Effectiveness (MOEs)
  - Average Speed (S)
  - Green per Red (GpR)
  - Stops per Mile (SpM)
- Performance index (PI)

PI = 1.5*(S - 10) + GpR*8 + 40 - SpM*10

= 1.5*(30-10)+4*8+40-1*10

= 92

OCTA's CSPI

CSPI Score	Signal Synchronization Description	Level
>=80	Very good progression – traveling through signalized intersections with minimal stops and favorable travel speeds.	Tier 1
70-80	Good progression – traveling through signalized intersections with few stops and good travel speeds.	Tier 2
60-70	Fair progression – traveling through signalized intersections with moderate stops and fair travel speeds.	Tier 3
50-60	Limited progression* – traveling through signalized intersections with moderately high stops and slower travel speeds.	Tier 4
< 50	Very limited progression* – traveling through signalized intersections with frequent stops and slow travel speeds.	Tier 5

Case Demo - Carson Street

Corridor Synchronization Performance Index

Summary

Arterial: Project within William

Timing	No. of Runs	Average Speed (mph)	Average Speed Score	Average Stop Score	Average Score	Quality of Signal Timing
MD (Avg)	8	14.8	69	88	85	B
MD (NB)	4	14.2	67	83	81	B-
MD (SB)	4	15.5	72	93	89	B+

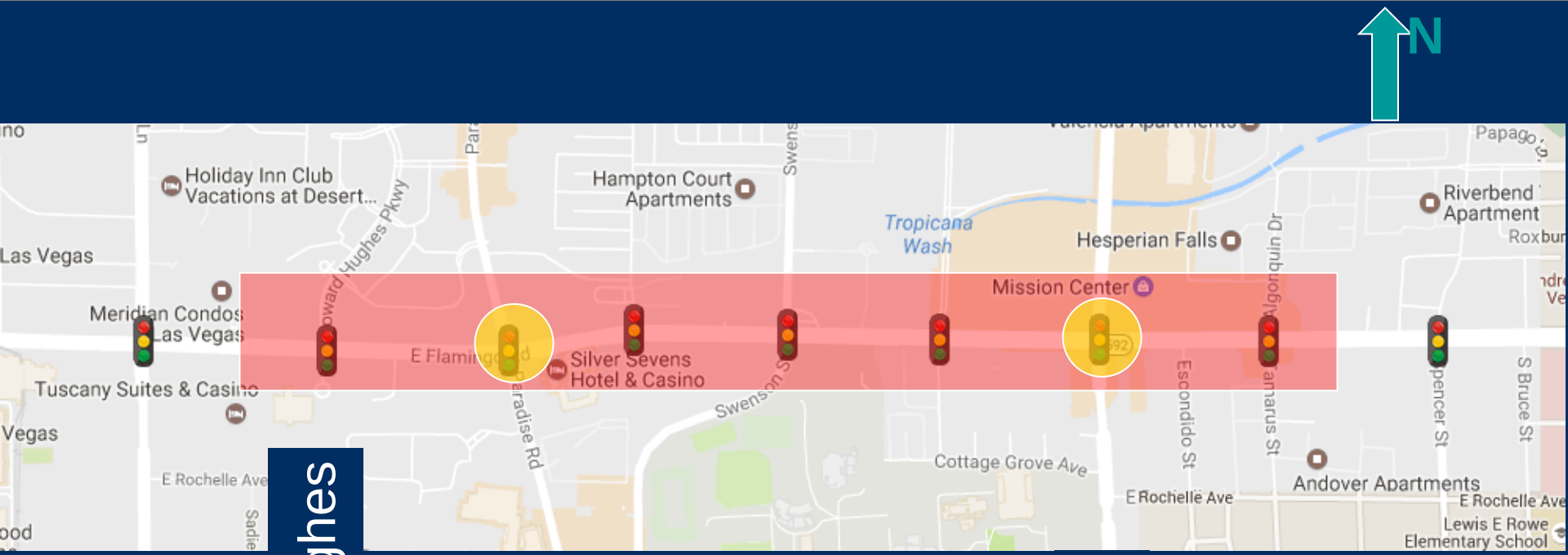
Details

Arterial: Project within William

Timing Plan: MD

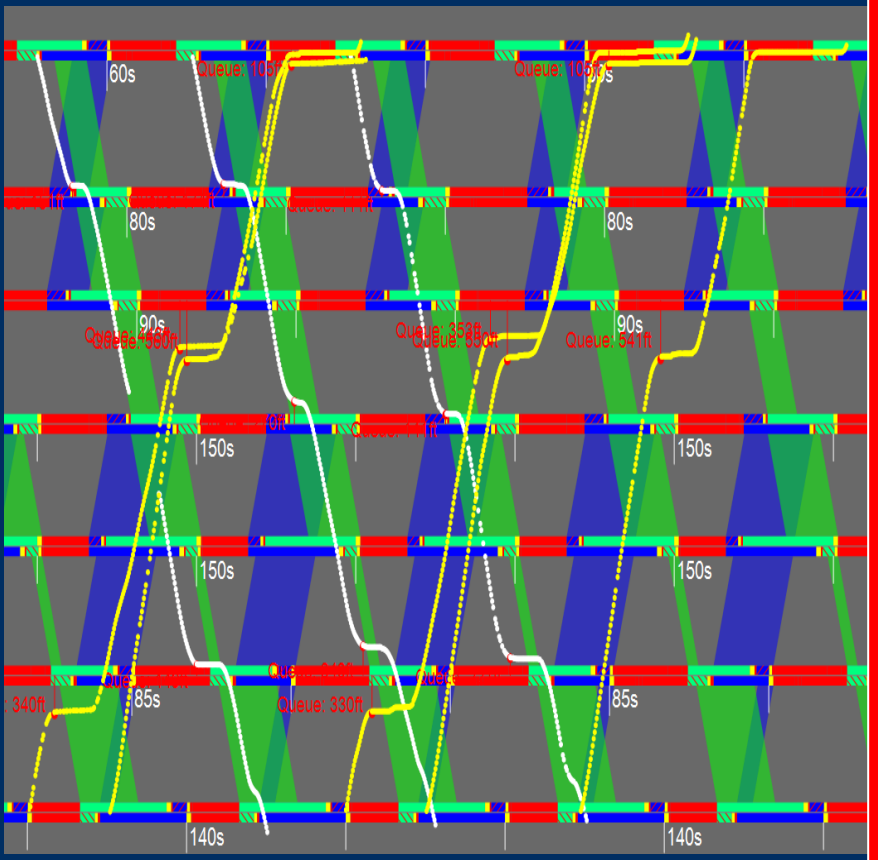
Timing	GPS File Name	Average Speed (mph)	% Speed	Speed Score	No. of Stops	Stand No. of Stops	% Stop	Stop Score	Original Score	Cycle Adj.	Spacing Adj.	Adjusted Score	Quality of Signal Timing
MD (NB)	Project within William [MD]-NB-2017-04-18 12-42-07	14.2	57%	67	1	1.3	26%	80	76	77(+1)	79(+2)	79	C+
MD (NB)	Project within William [MD]-NB-2017-04-18 13-10-14	10.7	43%	53	3	1.7	33%	66	62	63(+1)	65(+2)	65	D
MD (NB)	Project within William [MD]-NB-2017-04-18 14-11-13	14.2	57%	67	3	1.2	23%	84	79	80(+1)	82(+2)	82	B-
MD (NB)	Project within William [MD]-NB-2017-04-18 14-18-00	17.7	71%	81	0	0	0%	100	94	95(+1)	97(+2)	97	A
MD (SB)	Project within William [MD]-SB-2017-04-18 12-47-17	13.6	55%	65	3	1	20%	88	81	82(+1)	84(+2)	84	B

Flamingo Rd, Las Vegas

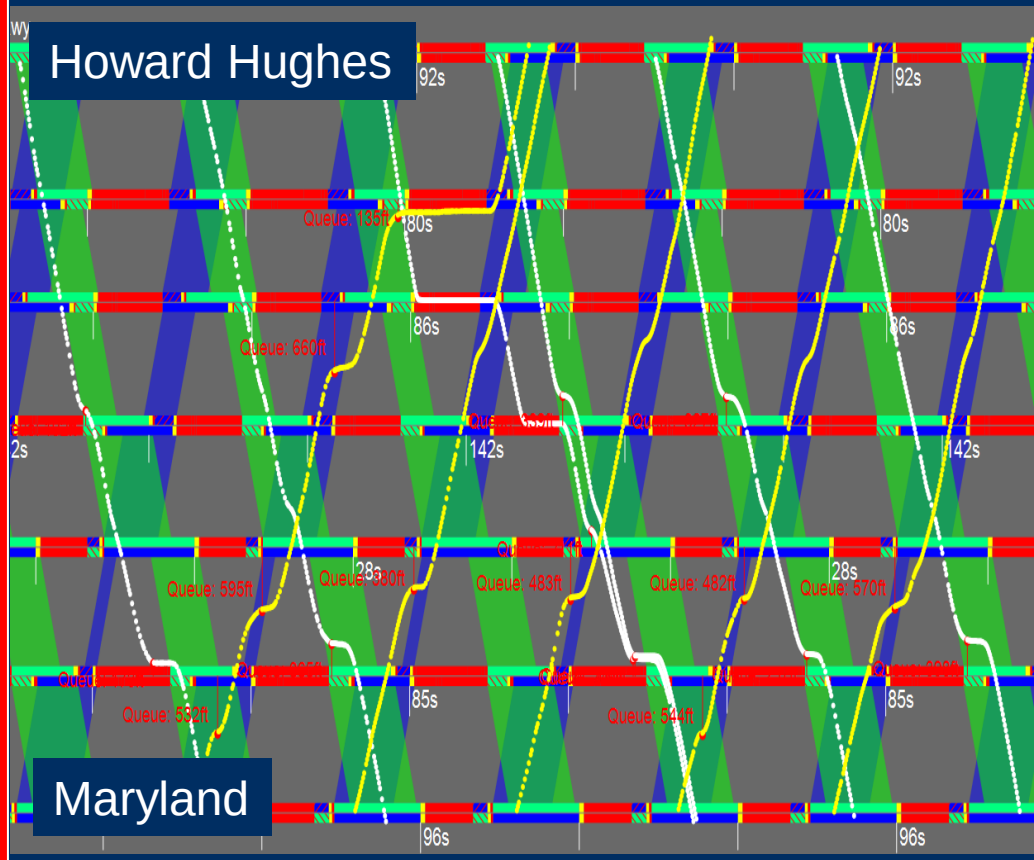


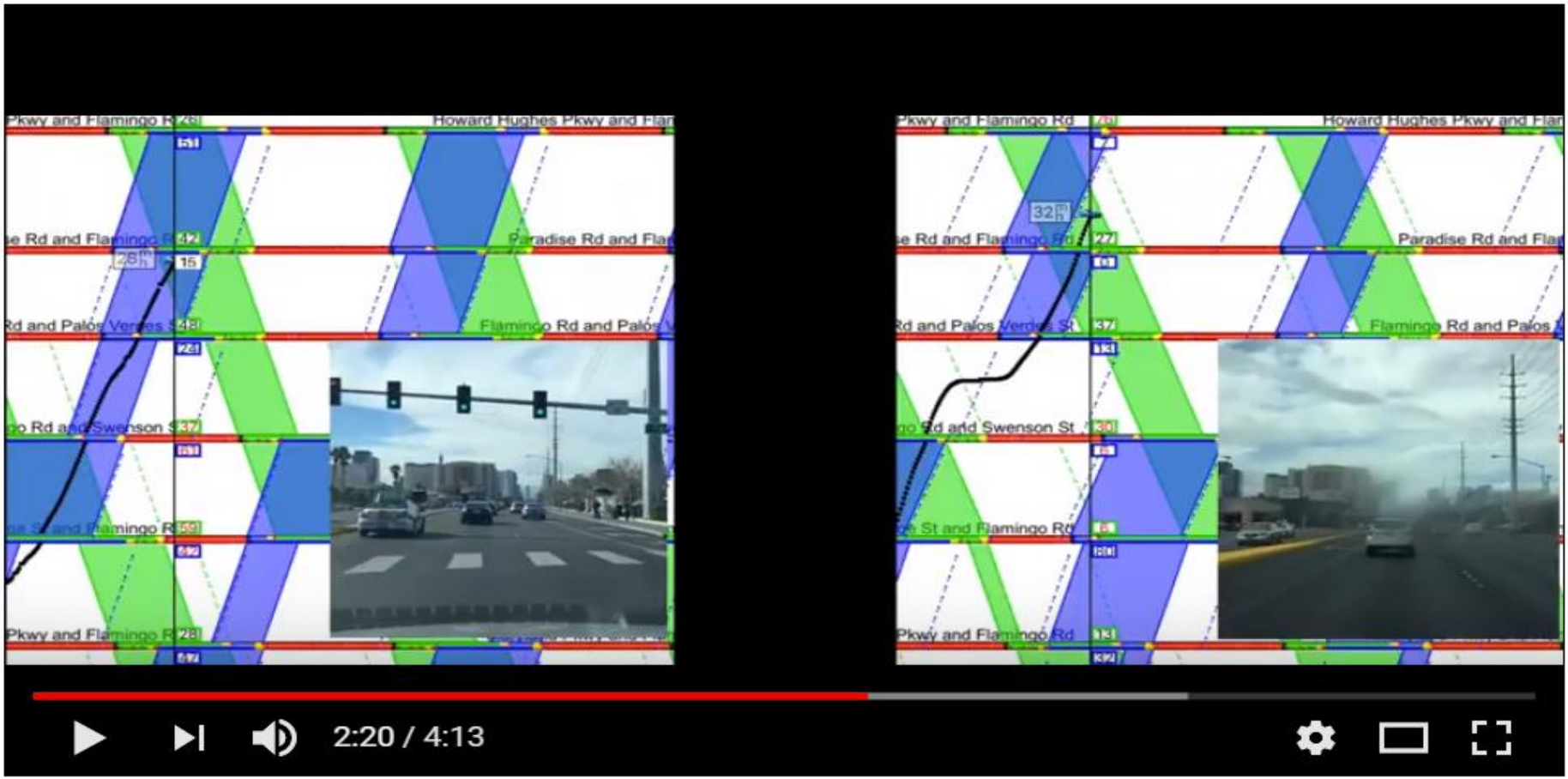
UNR TranSync Data

Before



After

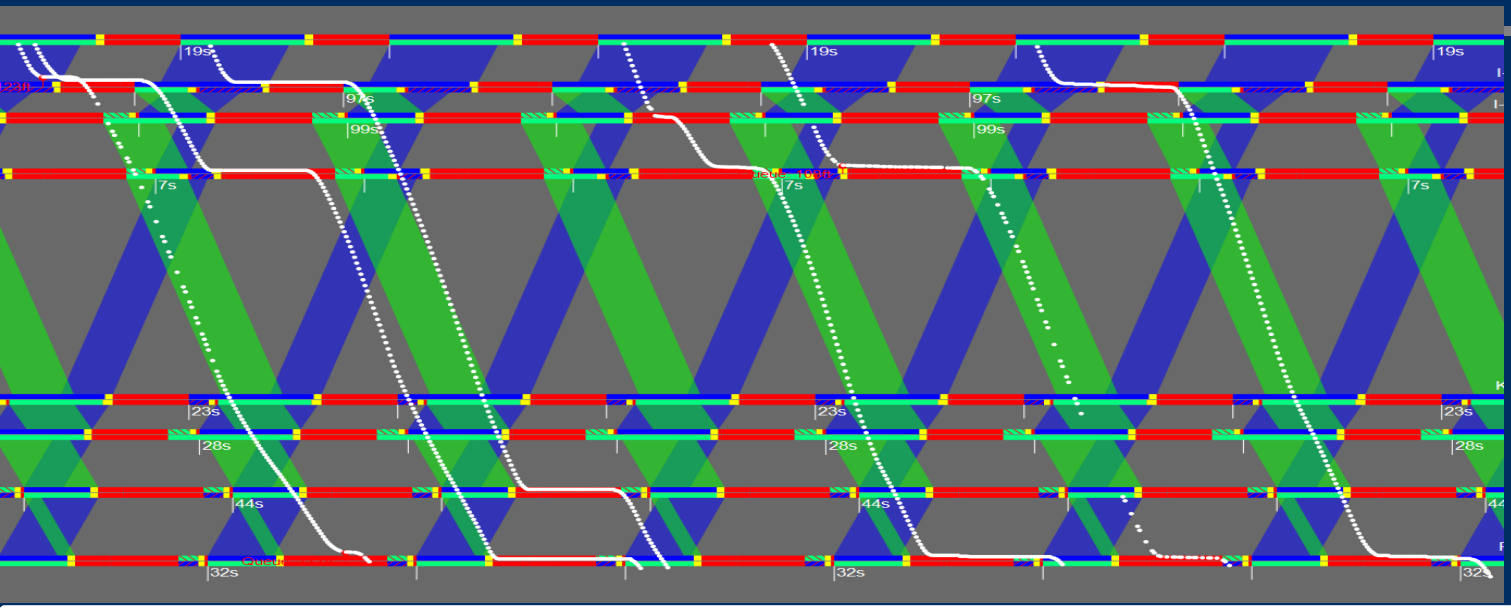




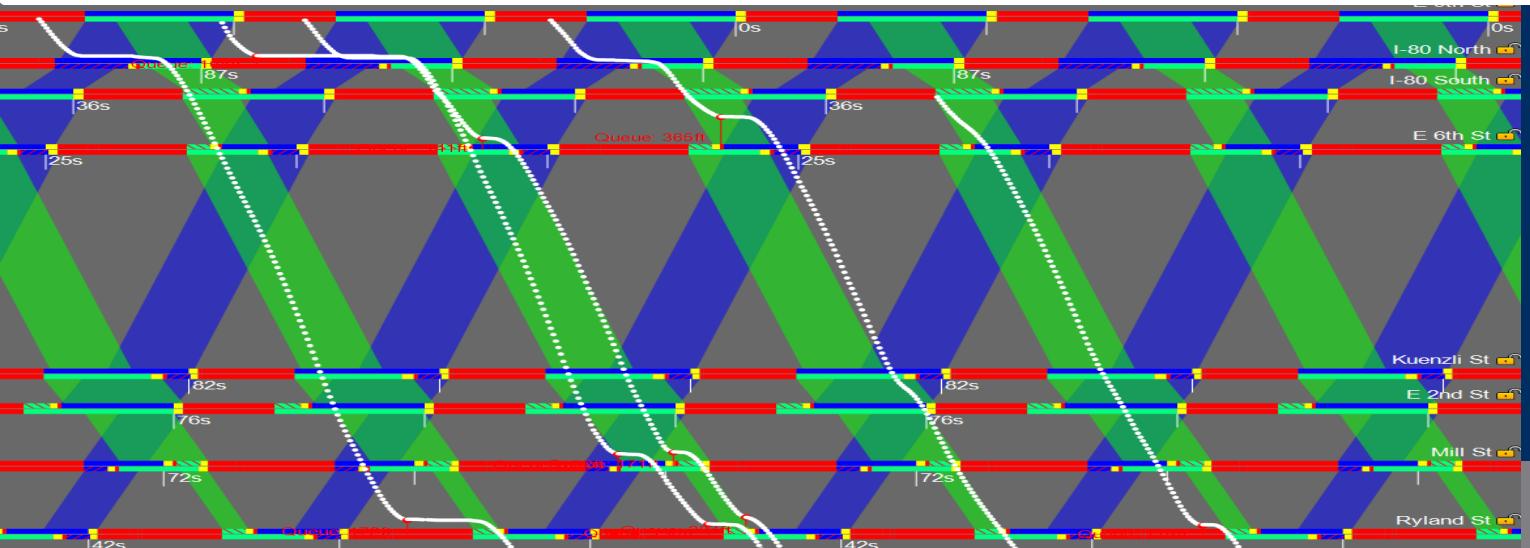
Before and After Re-timing on Flamingo Rd, Las Vegas

https://www.youtube.com/watch?v=9Gf-ECjtfGE&t=30s

Wells Avenue, Reno (SB)

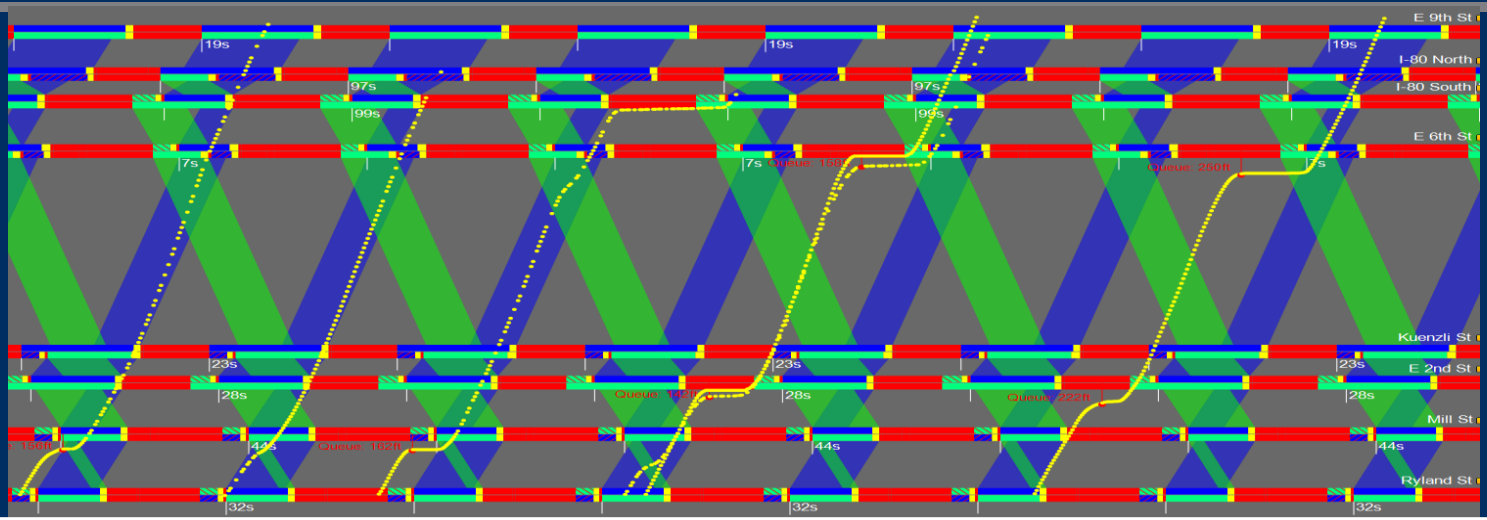


Before

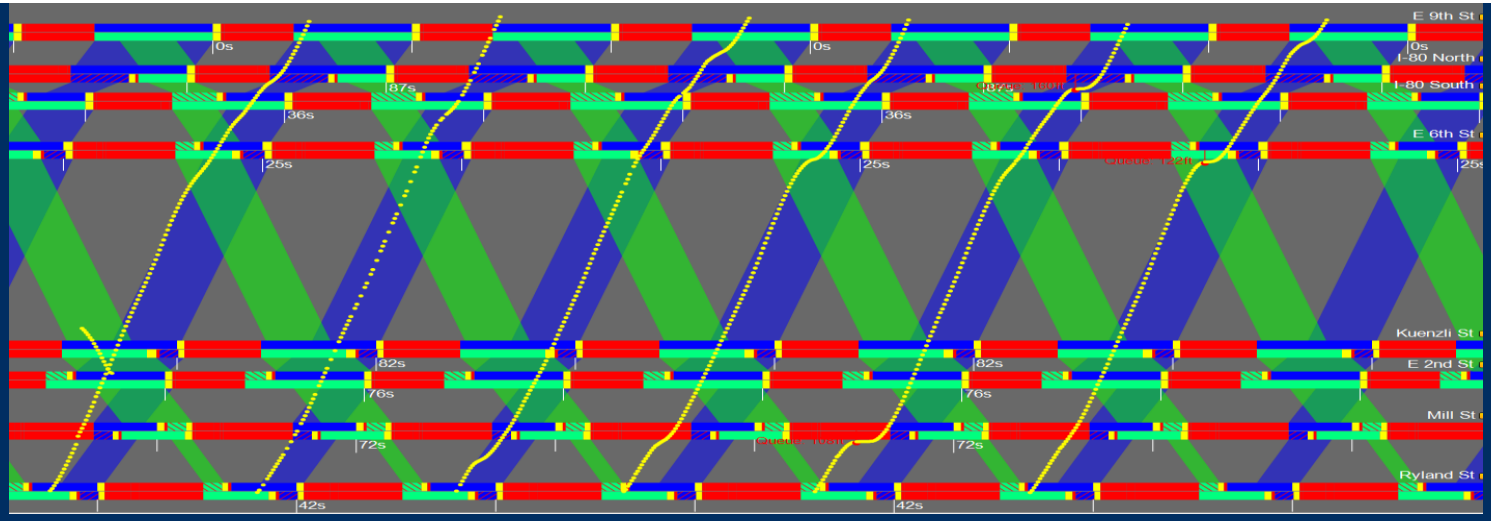


After

Wells Avenue – Reno (NB)



Before



After

Wells Avenue Re-timing Benefits

- The travel time savings per day is about **244** hours.
- The fuel savings per day is about **285** gallons.
- The average annual savings per traveler is about **$68**.
- The total annual savings in both delay and fuel is about **$1.5 million**.
- The benefit-cost ratio for one year of operation is about **62.5 to 1**.

Our Sincere Appreciation to the Continuous Support from NDOT and Other Agencies in the Region!