

I-225 Reconfiguration Performance Report

Monday October 2 - Friday October 6, 2017



Executive Summary

This report is meant to provide an in-depth analysis of the impacts on arterials and interstates in the Denver Tech Center (DTC) area before CDOT's I-225 reconfiguration project. This report includes analyses of traffic volumes, travel times, an origin destination analysis, and travel time index heat maps. Ramp meter and interstate volumes were collected from COGNOS via ITS devices. Historical travel times taken from the corresponding week of 2016, Interstate travel times, and travel time index were collected using INRIX. Finally, current travel times, as well as the origin-destination data were collected using Bluetooth identification devices.

Reporting Period

Current data collected Monday October 2nd to Friday October 6th, 2017

Historical data collected Monday October 3rd to Friday October 7th, 2016

AM Peak Period: Weekdays 6AM to 9AM

PM Peak Period: Weekdays 3PM to 7PM

Construction Project Status and Other Updates

Construction is scheduled to start in mid-November. This report provides a baseline of travel times and volumes on both interstates and arterials prior to the beginning of construction.

Inaccurate Ramp Meter volumes are a result of failing in-pavement sensor pucks at both I-25 SB @ Belleview and I-25 NB @ Orchard. Inaccurate historical interstate volumes are a result of radar alignment/configuration issues in 2016 on I-25 NB @ Hampden and Belleview.

Executive Summary – Overall Trends – Week of October 2, 2017

Following the summary is a more detailed analysis of each metric including comparisons with historical data.

Average Total On-Ramp Volumes

 Not Accurate

Location	Peak	Week ending Oct 6, 2017
I-225 SB @ DTC Blvd	AM Peak	4,665
	PM Peak	5,087
I-25 SB @ Belleview	AM Peak	2,791
	PM Peak	3,431
I-25 NB @ Belleview	AM Peak	3,952
	PM Peak	4,586
I-25 SB @ Orchard	AM Peak	1,659
	PM Peak	3,816
I-25 NB @ Orchard	AM Peak	1,787
	PM Peak	3,479
I-25 SB @ Hampden	AM Peak	11,406
	PM Peak	9,126
I-25 NB @ Hampden	AM Peak	4,488
	PM Peak	3,715

Average Total Interstate Volumes

Location	Peak	Week ending Oct 6, 2017
I-225 SB @ DTC Blvd	AM Peak	18,913
	PM Peak	17,429
I-25 SB @ Belleview	AM Peak	45,254
	PM Peak	39,196
I-25 NB @ Belleview	AM Peak	25,447
	PM Peak	23,483
I-25 SB @ Orchard	AM Peak	41,099
	PM Peak	39,225
I-25 NB @ Orchard	AM Peak	39,530
	PM Peak	35,870
I-25 SB @ Hampden	AM Peak	36,515
	PM Peak	35,868
I-25 NB @ Hampden	AM Peak	33,679
	PM Peak	34,627

Average Interstate Travel Times

Corridor	Peak	Week ending Oct 6, 2017
I-225 SB Parker to I-25	AM Peak	11.94
	PM Peak	7.87
I-225 NB I-25 to Parker	AM Peak	4.19
	PM Peak	6.32
I-25 NB Orchard to Hampden	AM Peak	5.36
	PM Peak	5.83
I-25 SB Hampden to Orchard	AM Peak	3.15
	PM Peak	3.41

Average Arterial Travel Times

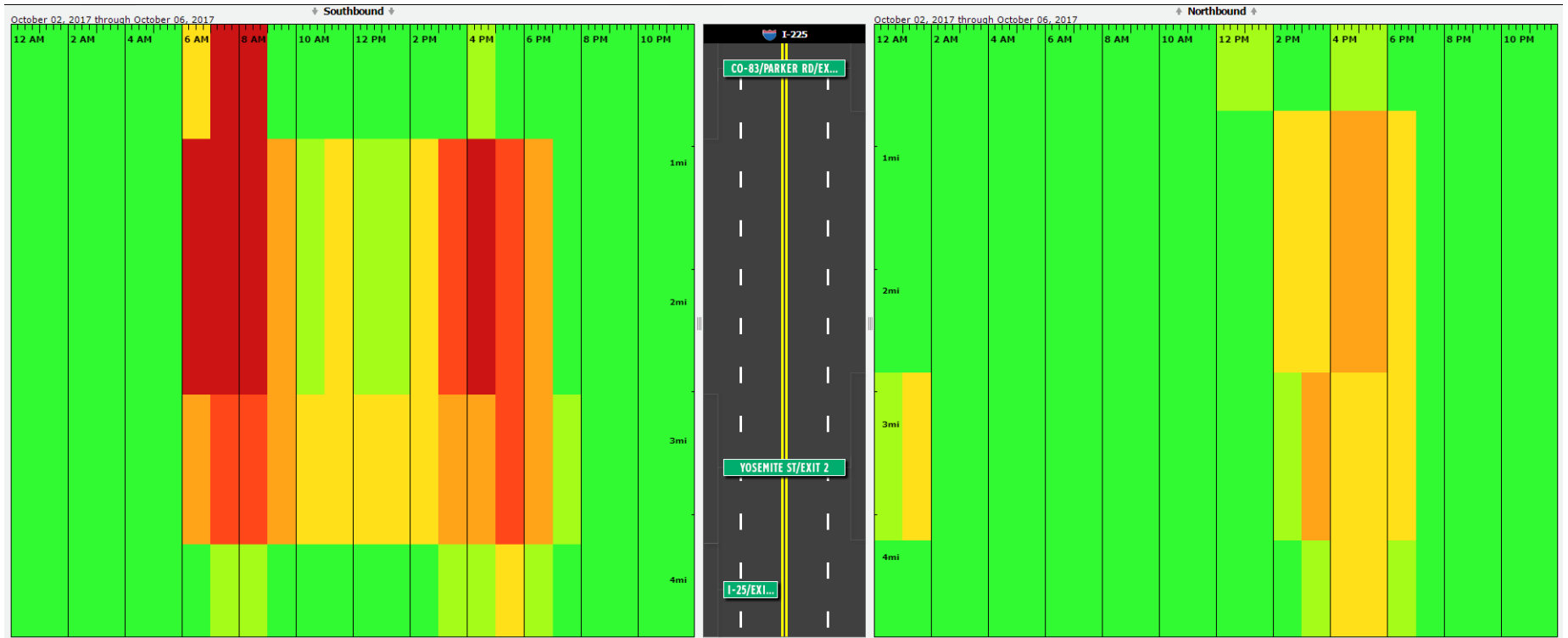
Corridor	Peak	Week ending Oct 6, 2017
Dam Rd SB Parker to Dayton	AM Peak	8.38
	PM Peak	5.93
Hampden Ave WB Dartmouth to I-25	AM Peak	11.34
	PM Peak	10.84
Yosemite St SB Hampden to Bellevue	AM Peak	3.98
	PM Peak	4.15
Yosemite St NB Bellevue to Hampden	AM Peak	3.85
	PM Peak	4.77
Monaco Pkwy SB Hampden to Quincy	AM Peak	2.87
	PM Peak	2.83
Bellevue Ave EB Dayton to I-25	AM Peak	5.11
	PM Peak	5.8
Bellevue Ave WB, I-25 to Dayton	AM Peak	5.49
	PM Peak	6.71
Union Ave WB Dayton to Monaco	AM Peak	3.8
	PM Peak	3.85
Union Ave EB Monaco to Dayton	AM Peak	4.18
	PM Peak	4.38
Monaco St SB Happy Canyon to Bellevue	AM Peak	1.78
	PM Peak	1.86
Monaco St NB Bellevue to Happy Canyon	AM Peak	1.71
	PM Peak	1.86

Origin-Destination Data

- AM Peak: 30% of vehicles utilize the DTC/Tamarac I-225 SB On-ramp for access to I-25 SB
- PM Peak: 27% of vehicles utilize the DTC/Tamarac I-225 SB On-ramp for access to I-25 SB

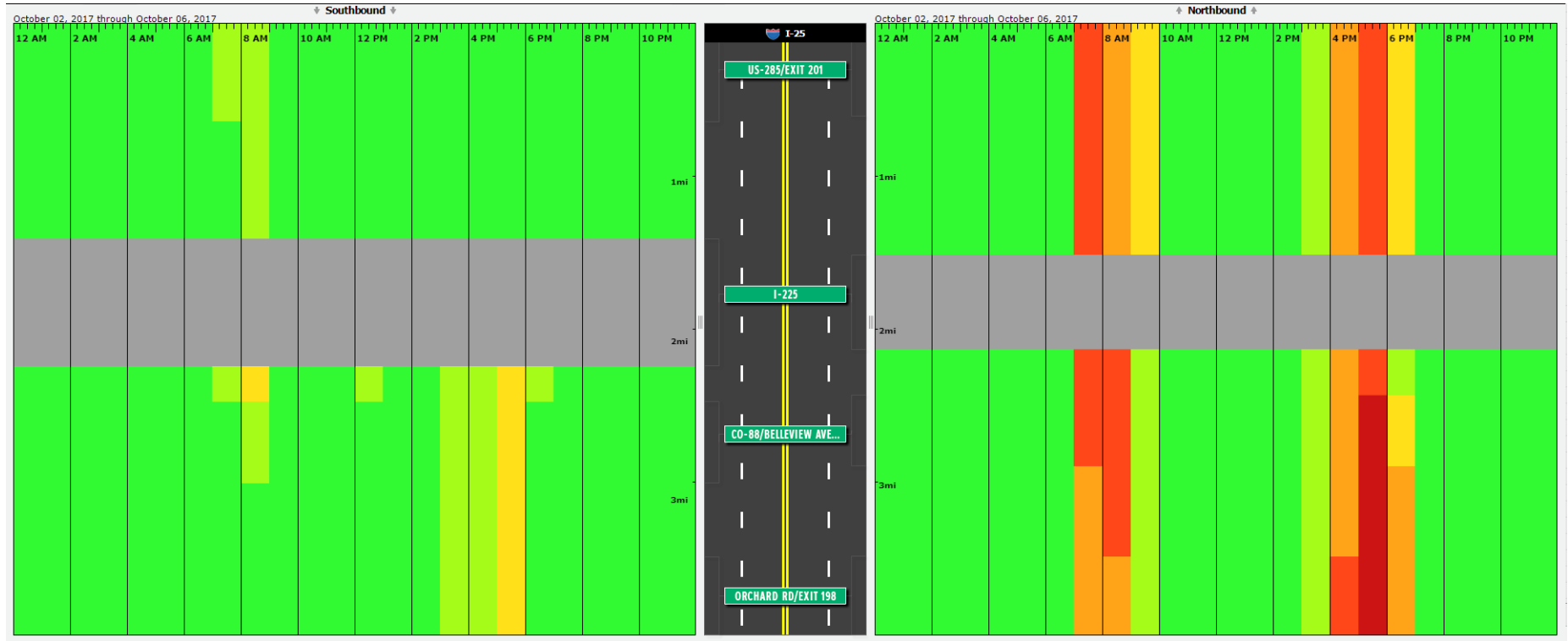
Travel Time Index (TTI) Heat Maps

I-225 from Parker to I-25



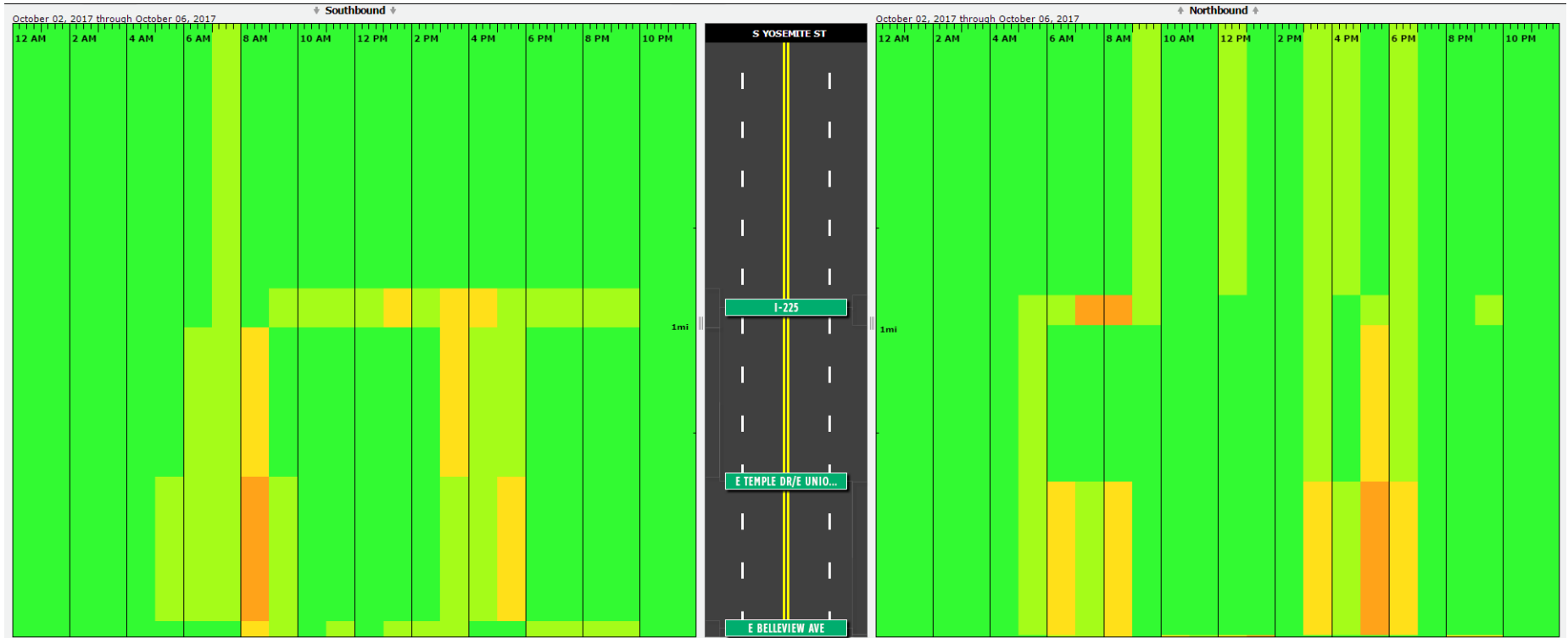
- ❖ High TTI from 6AM until 9AM and from 3PM to 6PM on I-225 SB

I-25 from Orchard to Hampden



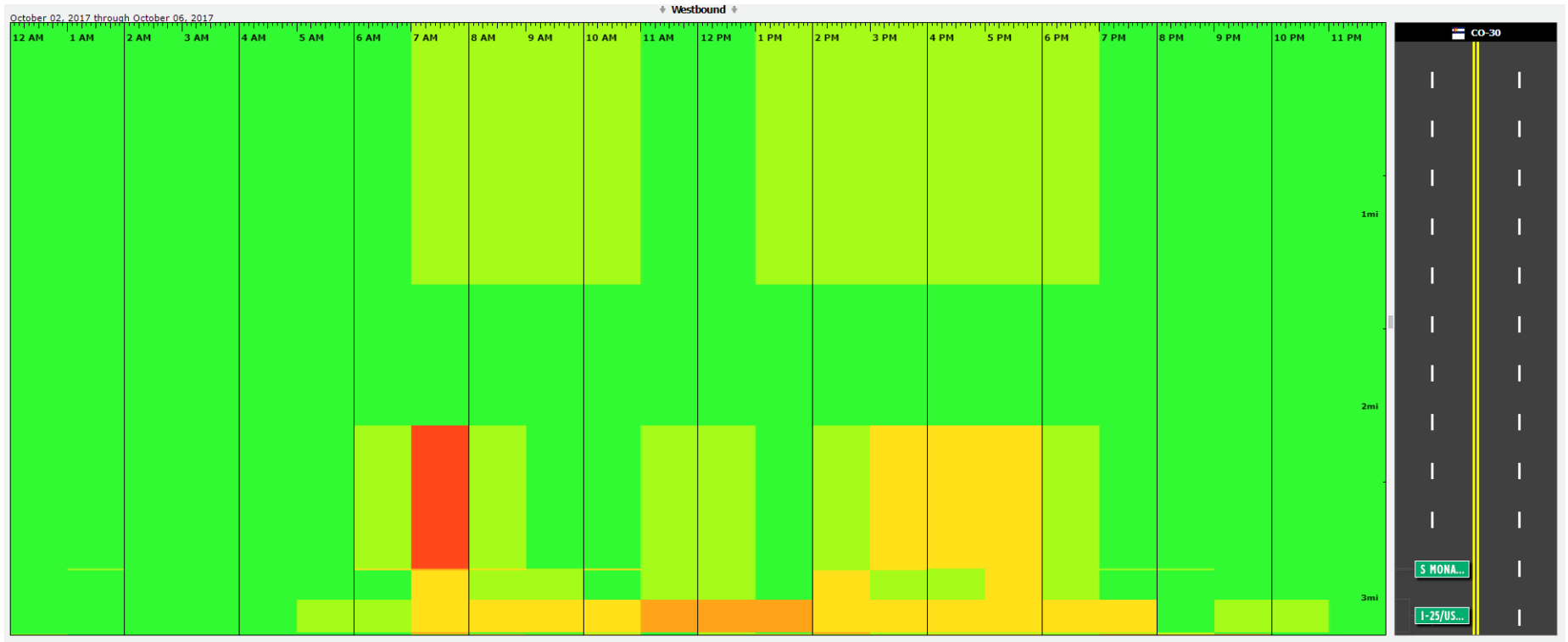
❖ High TTI from 7AM to 9AM and from 4PM to 6PM on I-25 NB

Yosemite from Hampden to Bellevue



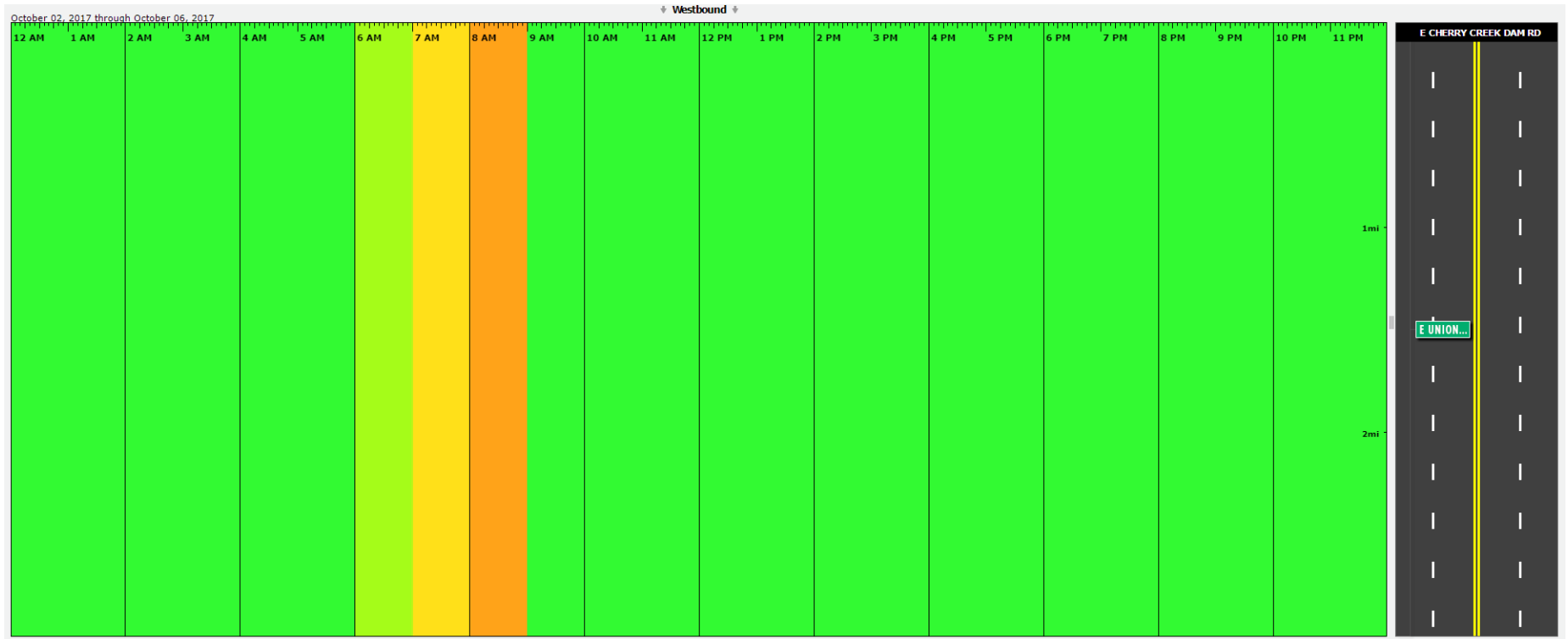
❖ No major declines in TTI throughout the day

Hampden from Dartmouth to I-25



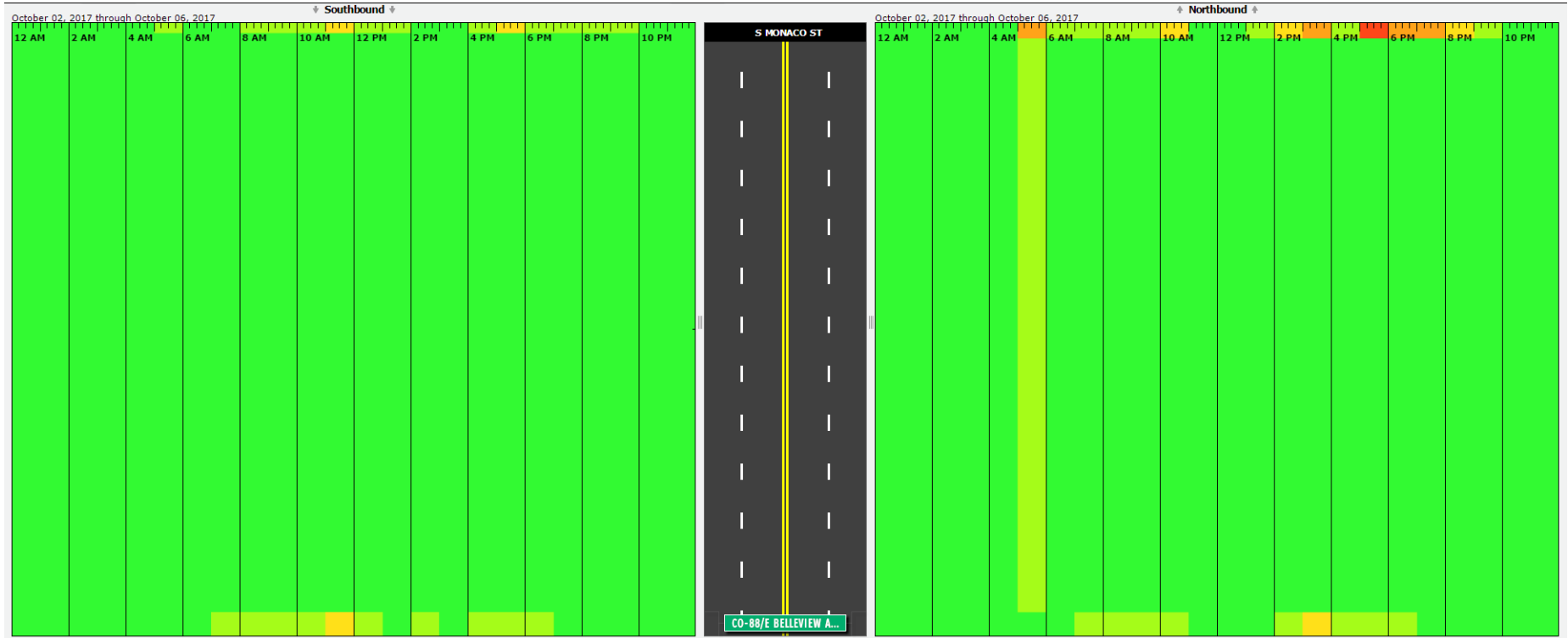
❖ High TTI from 7AM to 8AM on Hampden WB approaching I-25

Dam Rd from Vaughn to Dayton



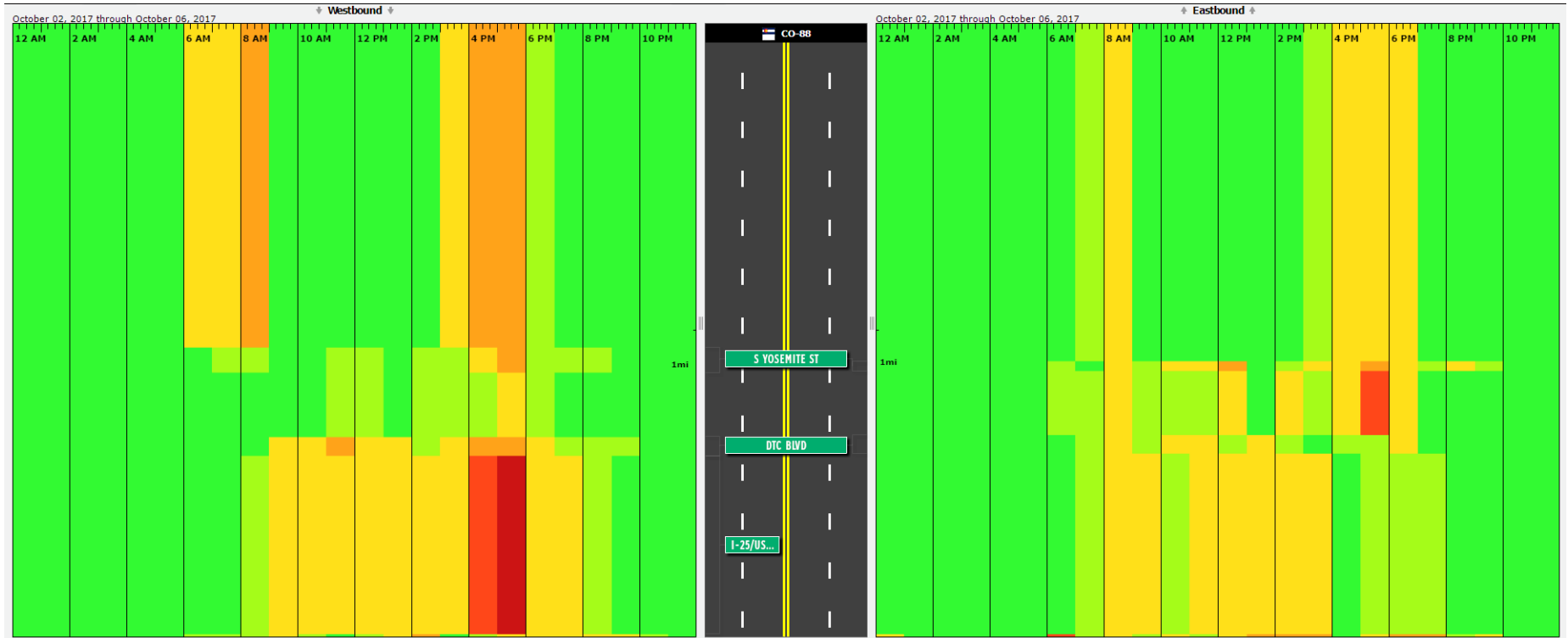
❖ Moderate TTI from 8AM to 9AM on Dam Rd WB

Monaco from Happy Canyon to Belleview



❖ No major declines in TTI throughout the day

Belleview from Dayton to I-25



- ❖ High TTI from 4PM to 6PM on Belleview WB approaching I-25
- ❖ High TTI from 5PM to 6PM on Belleview EB between DTC Blvd and Yosemite

Section 1: Traffic Volumes

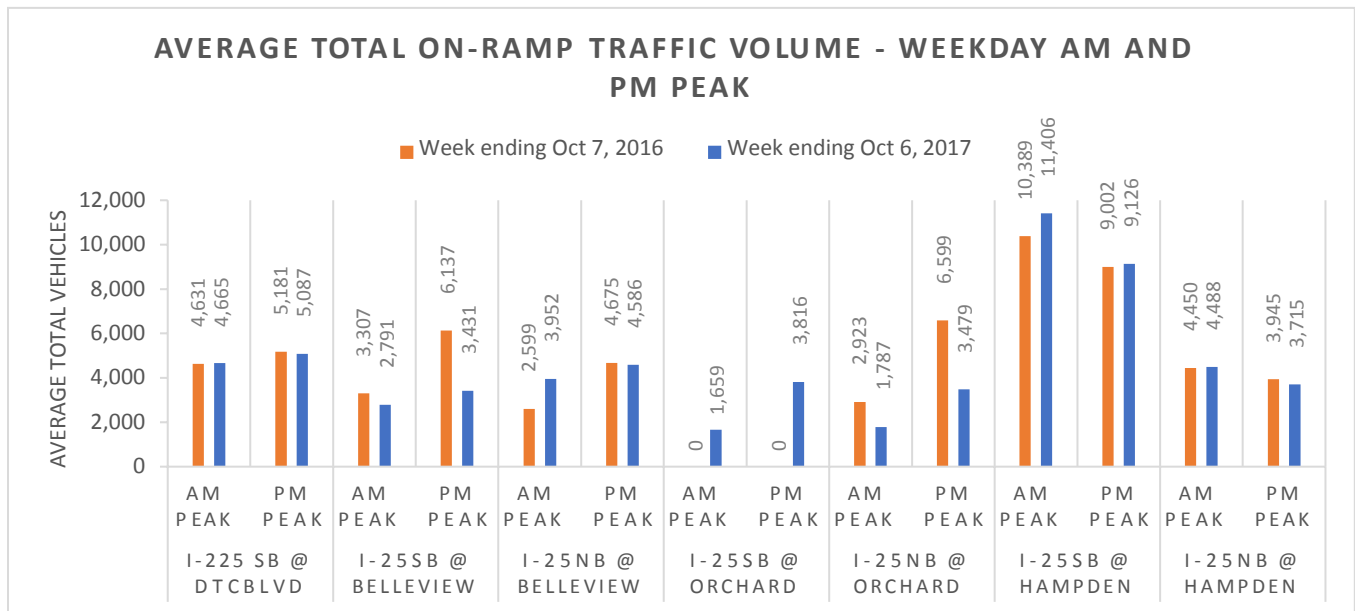
Measure: Average total traffic volumes during the AM and PM peak period Monday – Friday

Missing Data: Historical ramp meter volumes for I-25 SB @ Orchard

Ramp Meter Volumes

 Not Accurate

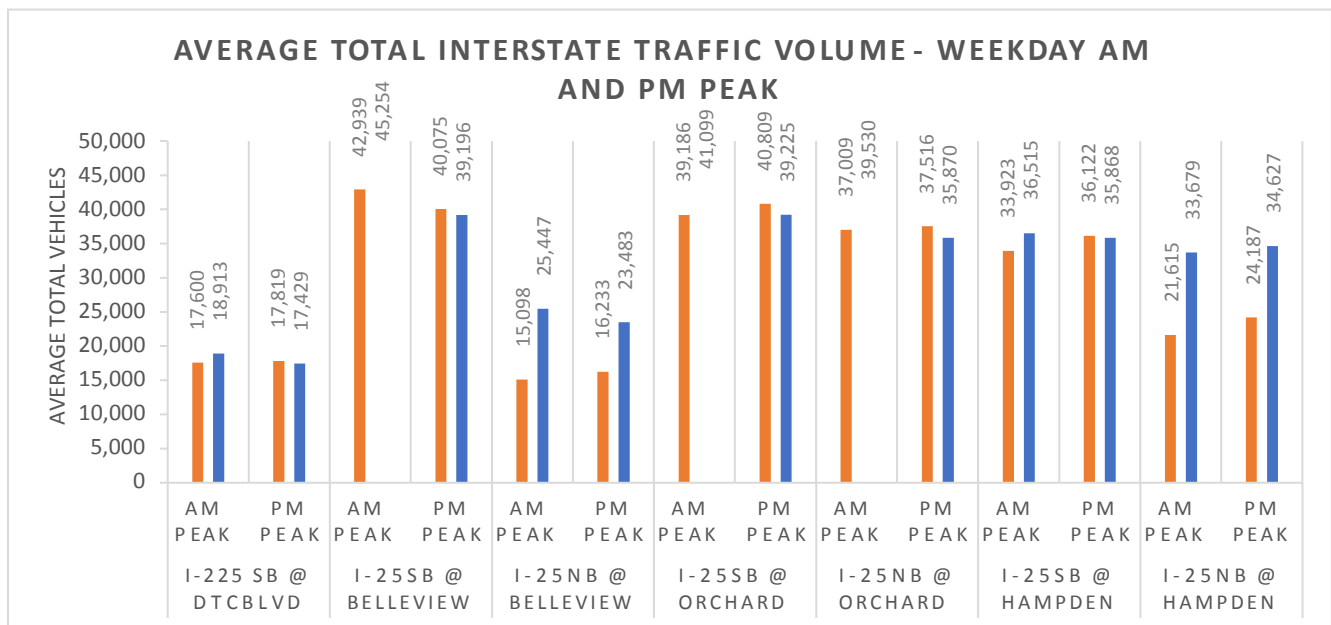
Location	Peak	Week ending Oct 7, 2016	Week ending Oct 6, 2017
I-225 SB @ DTC Blvd	AM Peak	4,631	4,665
	PM Peak	5,181	5,087
I-25 SB @ Belleview	AM Peak	3,307	2,791
	PM Peak	6,137	3,431
I-25 NB @ Belleview	AM Peak	2,599	3,952
	PM Peak	4,675	4,586
I-25 SB @ Orchard	AM Peak	NO DATA	1,659
	PM Peak	NO DATA	3,816
I-25 NB @ Orchard	AM Peak	2,923	1,787
	PM Peak	6,599	3,479
I-25 SB @ Hampden	AM Peak	10,389	11,406
	PM Peak	9,002	9,126
I-25 NB @ Hampden	AM Peak	4,450	4,488
	PM Peak	3,945	3,715



- ❖ 44% decline at PM Peak on I-25 SB @ Belleview
- ❖ 39% decline at AM Peak on I-25 NB @ Orchard
- ❖ 47% decline at PM Peak on I-25 NB @ Orchard

Interstate Volumes

Location	Peak	Week ending Oct 7, 2016	Week ending Oct 6, 2017
I-225 SB @ DTC Blvd	AM Peak	17,600	18,913
	PM Peak	17,819	17,429
I-25 SB @ Belleview	AM Peak	42,939	45,254
	PM Peak	40,075	39,196
I-25 NB @ Belleview	AM Peak	15,098	25,447
	PM Peak	16,233	23,483
I-25 SB @ Orchard	AM Peak	39,186	41,099
	PM Peak	40,809	39,225
I-25 NB @ Orchard	AM Peak	37,009	39,530
	PM Peak	37,516	35,870
I-25 SB @ Hampden	AM Peak	33,923	36,515
	PM Peak	36,122	35,868
I-25 NB @ Hampden	AM Peak	21,615	33,679
	PM Peak	24,187	34,627



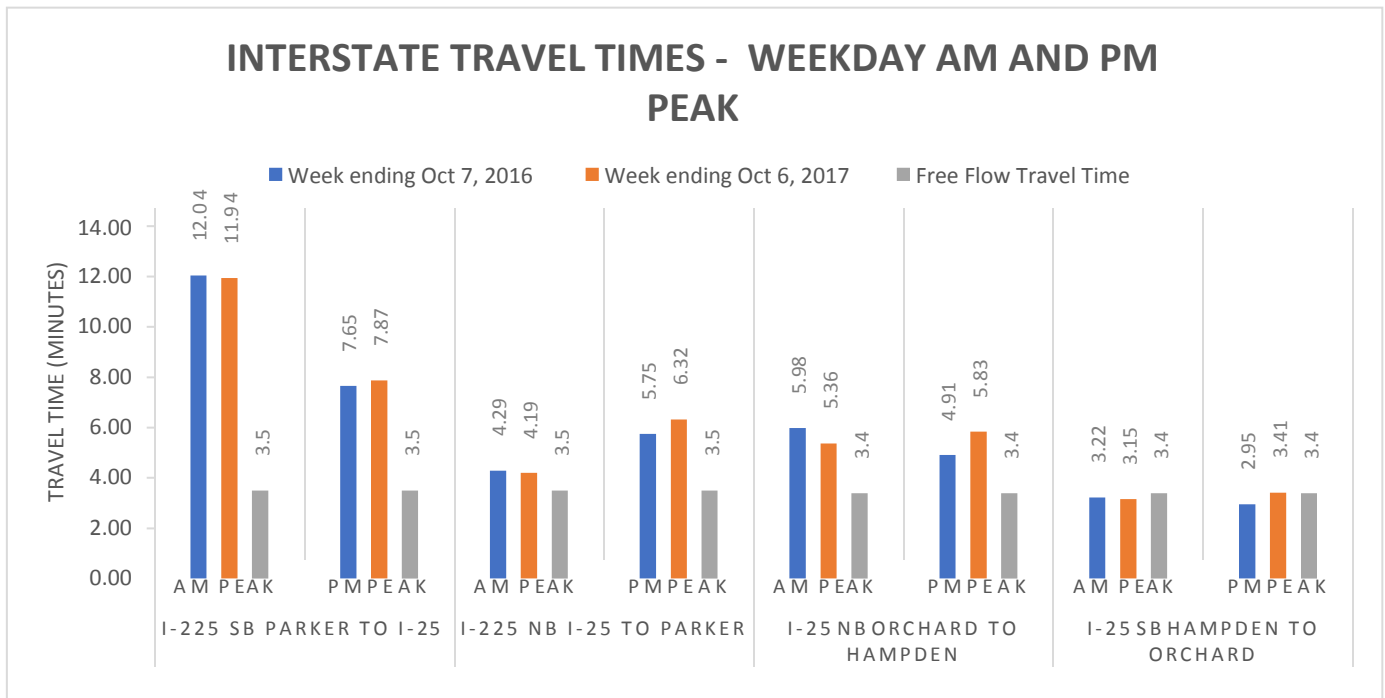
- ❖ 69% increase at AM Peak on I-25 NB @ Belleview
- ❖ 45% increase at PM Peak on I-25 NB @ Belleview
- ❖ 59% increase at AM Peak on I-25 NB @ Hampden
- ❖ 43% increase at PM Peak on I-25 NB @ Hampden

Section 2: Travel Time

Measure: Average travel time during the AM and PM peak period Monday – Friday

Interstate Travel Times

Corridor	Peak	Week ending Oct 7, 2016	Week ending Oct 6, 2017	Free Flow Travel Time
I-225 SB Parker to I-25	AM Peak	12.04	11.94	3.5
	PM Peak	7.65	7.87	3.5
I-225 NB I-25 to Parker	AM Peak	4.29	4.19	3.5
	PM Peak	5.75	6.32	3.5
I-25 NB Orchard to Hampden	AM Peak	5.98	5.36	3.4
	PM Peak	4.91	5.83	3.4
I-25 SB Hampden to Orchard	AM Peak	3.22	3.15	3.4
	PM Peak	2.95	3.41	3.4

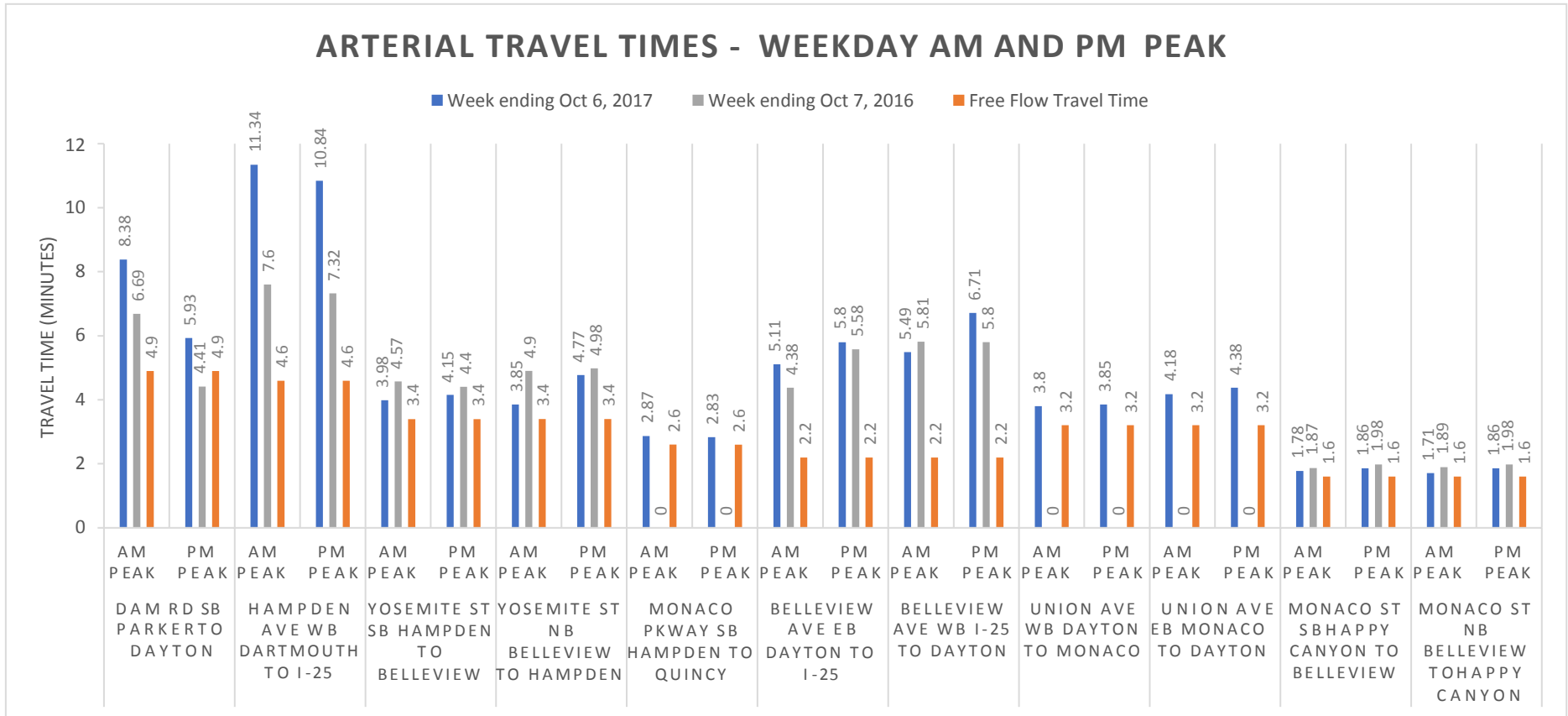


❖ No major changes in interstate travel times

Arterial Travel Times

Missing Data: Current data for all of Monday, all of Tuesday, and Friday PM Peak
Historical data on Monaco Pkwy and Union Ave corridors

Corridor	Peak	Week ending Oct 7, 2016	Week ending Oct 6, 2017	Free Flow Travel Time
Dam Rd SB Parker to Dayton	AM Peak	6.69	8.38	4.9
	PM Peak	4.41	5.93	4.9
Hampden Ave WB Dartmouth to I-25	AM Peak	7.6	11.34	4.6
	PM Peak	7.32	10.84	4.6
Yosemite St SB Hampden to Belleview	AM Peak	4.57	3.98	3.4
	PM Peak	4.4	4.15	3.4
Yosemite St NB Belleview to Hampden	AM Peak	4.9	3.85	3.4
	PM Peak	4.98	4.77	3.4
Monaco Pkwy SB Hampden to Quincy	AM Peak	NO DATA	2.87	2.6
	PM Peak	NO DATA	2.83	2.6
Belleview Ave EB Dayton to I-25	AM Peak	4.38	5.11	2.2
	PM Peak	5.58	5.8	2.2
Belleview Ave WB I-25 to Dayton	AM Peak	5.81	5.49	2.2
	PM Peak	5.8	6.71	2.2
Union Ave WB Dayton to Monaco	AM Peak	NO DATA	3.8	3.2
	PM Peak	NO DATA	3.85	3.2
Union Ave EB Monaco to Dayton	AM Peak	NO DATA	4.18	3.2
	PM Peak	NO DATA	4.38	3.2
Monaco St SB Happy Canyon to Belleview	AM Peak	1.87	1.78	1.6
	PM Peak	1.98	1.86	1.6
Monaco St NB Belleview to Happy Canyon	AM Peak	1.89	1.71	1.6
	PM Peak	1.98	1.86	1.6



- ❖ 33% increase at AM Peak on Hampden Ave WB from Dartmouth to I-25
- ❖ 32% increase at PM Peak on Hampden Ave WB from Dartmouth to I-25
- ❖ 20% increase at AM Peak on Dam Rd SB from Parker to Dayton
- ❖ 26% increase at PM Peak on Dam Rd SB from Parker to Dayton
- ❖ 27% decrease at AM Peak on Yosemite St SB from Hampden to Bellevue

Section 3: Origin-Destination Study

Measure: The devices assign an anonymous MAC ID address to each vehicle (with active Bluetooth) that passes the “origin” location. From the origin, a number of destinations are selected and allows us to determine what percent of drivers went to each destination. For this initial report, we matched MAC Addresses starting at the DTC/Tamarac On-Ramp to I-225 S (Origin) and ending at either I-25 NB or I-25 SB to better understand the percent of cars currently using the DTC/Tamarac On-Ramp to merge onto I-25 S. This will help us to predict the volume of cars that will be affected by the new on-ramp restrictions.

Origin	Destination	Peak	Percent Arrived	Daily On-Ramp Average Total Volume	Daily Average Total Volume Each Direction
DTC BLVD @ I-225 SB On-Ramp	I-25 SB	AM	30%	4,665	1,399
	I-25 NB		70%		3,265
	I-25 SB	PM	27%	5,087	1,373
	I-25 NB		73%		3,713

What this tells us is that on average during the daily AM Peak, a total of 4,665 vehicles use the DTC Blvd/Tamarac I-225 SB On-ramp, of which 30% (1,399 vehicles) continue on to I-25 SB and 70% (3,265 vehicles) continue on to I-25 NB. During the PM Peak, a daily total average of 5,087 vehicles use the DTC Blvd/Tamarac I-225 SB On-ramp, of which 27% (1,373 vehicles) continue on to I-25 SB and 73% (3,713 vehicles) continue on to I-25 NB.