



Observed Statewide Traffic Volume Patterns: Related to COVID-19 Monitoring

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Introduction

The information provided in this weekly report is based on traffic volume data collected by the Oregon Department of Transportation (ODOT) from Automatic Traffic Recorder (ATR) stations along the following state highway corridors: I-5, I-84, I-205, I-405, US-97, US-197, US-20, US-26, US-30, US-395, OR-18, OR-22 and US-101. This includes reporting from 38 locations across the state highway system, which are provided in **Table A** in the Appendix.

Year-Over-Year Change in State Highway Traffic Volumes

Year-over-year comparison is an effective way of evaluating current traffic volumes compared to the same period in the previous year. This approach removes the effect of seasonal patterns and reveals trends, while avoiding misinterpretation of short term volatility as a longer term trend. The year-over-year change compares current traffic data to the same day of the previous year.

Table 1 illustrates highway user response to COVID-19-related directives for weekdays and weekends. The values provided in the table are a sum of traffic volumes for all ATR volumes on the corridor. This is a simple way to compare traffic patterns between two years. Changes in traffic volumes began in earnest mid-March, when schools were closed by executive order along with related restrictions for groups over 25 people and restaurants limited to take-out and delivery only. *The most recent week saw an average reduction of 40 percent in traffic volumes overall.* This week and last have generally consistent patterns in year-over-year traffic volumes, indicating a steady-state level of travel.

Table 1. Observed Year-Over-Year Difference in traffic Volumes by Corridor

| Date | Corridor | 2020 Volumes | | 2019 Volumes | | Weekday Diff | Weekend Diff |
|---|----------|-----------------|-----------------|-----------------|-----------------|-------------------|--------------|
| | | Average Weekday | Average Weekend | Average Weekday | Average Weekend | | |
| March 16-22, 2020 First week of school closures | I-5 | 517,960 | 328,804 | 656,882 | 562,665 | (0.21) | (0.42) |
| | I-205 | 202,741 | 121,366 | 262,471 | 217,961 | (0.23) | (0.44) |
| | I-405 | 99,899 | 55,948 | 142,360 | 109,866 | (0.30) | (0.49) |
| | I-84 | 302,183 | 206,654 | 357,887 | 326,080 | (0.16) | (0.37) |
| | US 97 | 105,554 | 73,448 | 141,194 | 117,028 | (0.25) | (0.37) |
| | US197 | 2,456 | 2,078 | 2,763 | 2,168 | (0.11) | (0.04) |
| | US20 | 19,199 | 16,087 | 23,631 | 12,045 | (0.19) | 0.34 |
| | US26 | 41,059 | 37,788 | | | 2019 data missing | |
| | US30 | 9,289 | 7,685 | 11,234 | 10,669 | (0.17) | (0.28) |
| | US395 | 22,703 | 16,184 | 27,541 | 20,955 | (0.18) | (0.23) |
| | OR18 | 13,603 | 13,623 | 17,195 | 24,298 | (0.21) | (0.44) |
| | OR22 | 24,708 | 17,380 | 29,600 | 23,260 | (0.17) | (0.25) |
| US101 | 65,127 | 50,134 | 78,030 | 74,887 | (0.17) | (0.33) | |
| March 23-29, 2020 First week of Stay Home Executive Order | I-5 | 377,452 | 221,464 | 654,202 | 601,716 | (0.42) | (0.63) |
| | I-205 | 151,962 | 86,162 | 259,796 | 224,402 | (0.42) | (0.62) |
| | I-405 | 77,314 | 64,136 | 133,077 | 112,451 | (0.42) | (0.43) |
| | I-84 | 224,142 | 139,231 | 356,527 | 337,425 | (0.37) | (0.59) |
| | US 97 | 86,299 | 55,226 | 146,581 | 125,016 | (0.41) | (0.56) |
| | US197 | 2,115 | 1,492 | 2,739 | 2,498 | (0.23) | (0.40) |
| | US20 | 14,821 | 9,806 | 24,674 | 16,481 | (0.40) | (0.41) |
| | US26 | 28,617 | 21,400 | | | 2019 data missing | |
| | US30 | 6,441 | 4,287 | 11,286 | 12,304 | (0.43) | (0.65) |
| | US395 | 18,515 | 12,872 | 25,930 | 21,426 | (0.29) | (0.40) |
| | OR18 | 6,885 | 4,756 | 20,017 | 26,975 | (0.66) | (0.82) |
| | OR22 | 18,844 | 11,928 | 23,704 | 25,105 | (0.21) | (0.52) |
| US101 | 43,518 | 26,684 | 85,605 | 80,047 | (0.49) | (0.67) | |
| March 30 -April 5, 2020 | I-5 | 328,267 | 203,735 | 659,035 | 569,566 | (0.50) | (0.64) |
| | I-205 | 146,535 | 93,957 | 261,226 | 216,760 | (0.44) | (0.57) |
| | I-405 | 75,513 | 44,907 | 141,260 | 109,501 | (0.47) | (0.59) |
| | I-84 | 199,481 | 123,609 | 352,334 | 316,384 | (0.43) | (0.61) |
| | US 97 | 90,487 | 85,485 | 150,075 | 117,144 | (0.40) | (0.27) |
| | US197 | 2,215 | 1,591 | 2,853 | 2,223 | (0.22) | (0.28) |
| | US20 | 14,853 | 11,008 | 15,927 | 7,909 | (0.07) | 0.39 |
| | US26 | 27,992 | 23,919 | 47,405 | 44,767 | (0.41) | (0.47) |
| | US30 | 6,563 | 4,873 | 11,897 | 10,365 | (0.45) | (0.53) |
| | US395 | 18,793 | 13,629 | 28,467 | 22,114 | (0.34) | (0.38) |
| | OR18 | 6,481 | 5,512 | 15,853 | 18,489 | (0.59) | (0.70) |
| | OR22 | 18,591 | 12,417 | 29,591 | 22,142 | (0.37) | (0.44) |
| US101 | 43,143 | 29,858 | 79,639 | 64,843 | (0.46) | (0.54) | |
| April 6-8, 2020 (partial week Mon-Wed) | I-5 | 313,351 | NA | 633,162 | NA | (0.51) | NA |
| | I-205 | 151,032 | NA | 256,220 | NA | (0.41) | NA |
| | I-405 | 77,966 | NA | 139,129 | NA | (0.44) | NA |
| | I-84 | 185,339 | NA | 344,861 | NA | (0.46) | NA |
| | US 97 | 96,480 | NA | 146,182 | NA | (0.34) | NA |
| | US197 | 2,127 | NA | 2,827 | NA | (0.25) | NA |
| | US20 | 14,746 | NA | 14,628 | NA | 0.01 | NA |
| | US26 | 29,359 | NA | 44,845 | NA | (0.35) | NA |
| | US30 | 6,844 | NA | 11,344 | NA | (0.40) | NA |
| | US395 | 19,369 | NA | 28,855 | NA | (0.33) | NA |
| | OR18 | 6,671 | NA | 16,082 | NA | (0.59) | NA |
| | OR22 | 19,475 | NA | 30,316 | NA | (0.36) | NA |
| US101 | 44,216 | NA | 77,022 | NA | (0.43) | NA | |

Observed Change in Total Traffic Volumes March 16 - April 8, 2020

Observing traffic volumes since mid-March reveals the day-to-day aggregate travel response to COVID-related restrictions. **Figure 1** illustrates the day-to-day change in traffic volumes on 13 corridors by indexing all days to volumes on March 16th. This enables direct comparison of patterns side-by-side across the entire state.

Generally speaking, there was a downward trend the first week across all corridors, ending with a rise in traffic volumes on Friday March 20th for US-97, US-197, US-26, US-30 and US-20. Weekend traffic volumes dropped by 20 to 40 percent with the exception of US-26 and OR-18. The March 23rd executive order initiated further decreases in traffic volumes that week, where volumes declined 25 to 30 percent, with the exception of US-97 and US-197. Larger reduction in travel occurs on weekends, where trips are dominated by non-essential household travel.

Week one of the Stay Home order compared to the previous week reveals further decreases in traffic volumes. The largest decreases occurred on OR-18, US-26, US-20, US-30 and US-101, which see high use for commute and recreation-based travel. Week two after the Stay Home order reveals further decreases in traffic volumes in I-5, I-205, I-405, and I-84. US-97 and US-197 saw small increases in traffic volume relative to the previous week, likely related to rising truck freight movement. Finally, looking at traffic patterns for late March and early April reveals a small increase in volumes, likely related to pay-day and households making essential trips for supplies and personal business. Continued monitoring of traffic patterns will reveal whether current patterns represent steady-state conditions moving forward or whether further change in overall traffic volumes will occur.

Figure 2 and **Figure 3** separate the corridors into two groups to better reveal patterns. **Figure 2** illustrates day-to-day change for I-5, I-205, I-405, I-84 and US-97. **Figure 3** illustrates day-to-day change for US-197, US-26, US-30, US-395, OR-18, OR-22 and US-101.

Figure 1. Daily Change in Corridor Traffic Volumes Indexed to Monday March 16, 2020

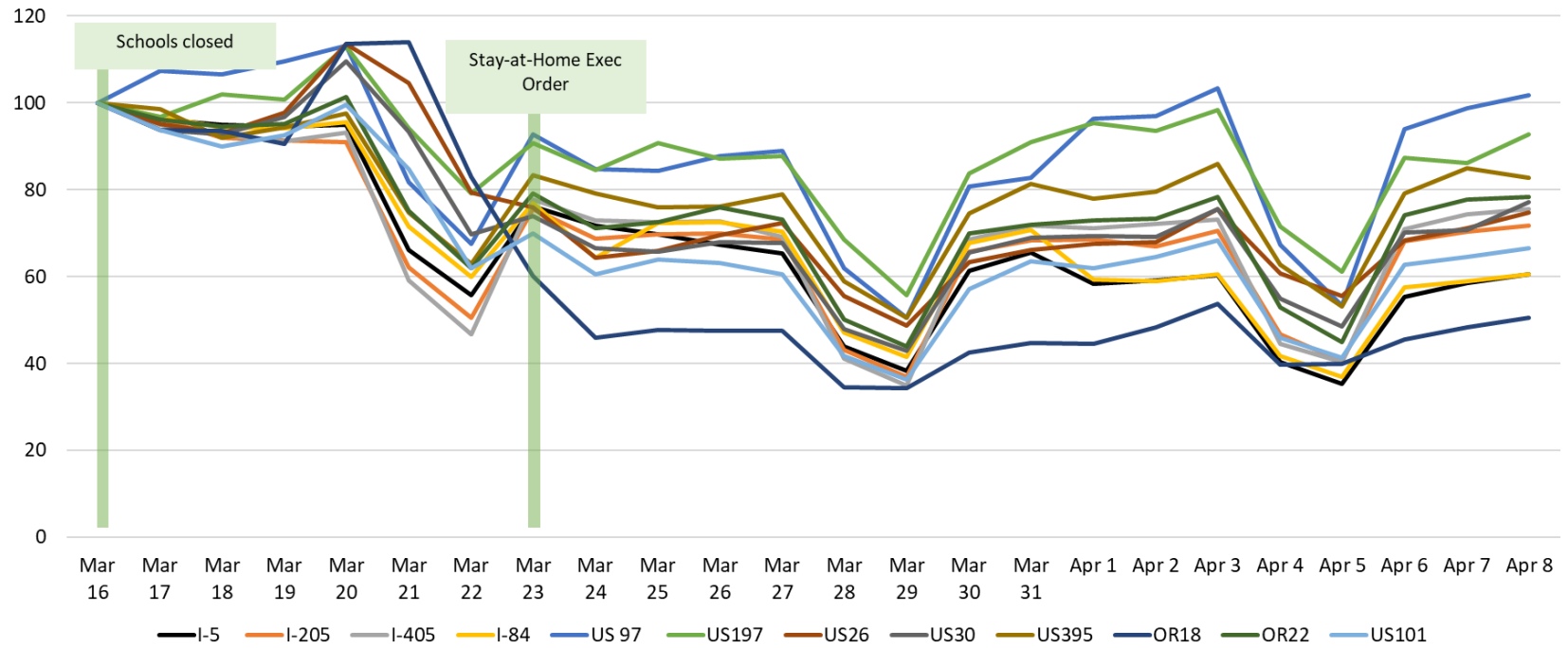


Figure 2. Daily Change in Traffic Volumes Indexed to Monday March 23, 2020: Interstate and US-97

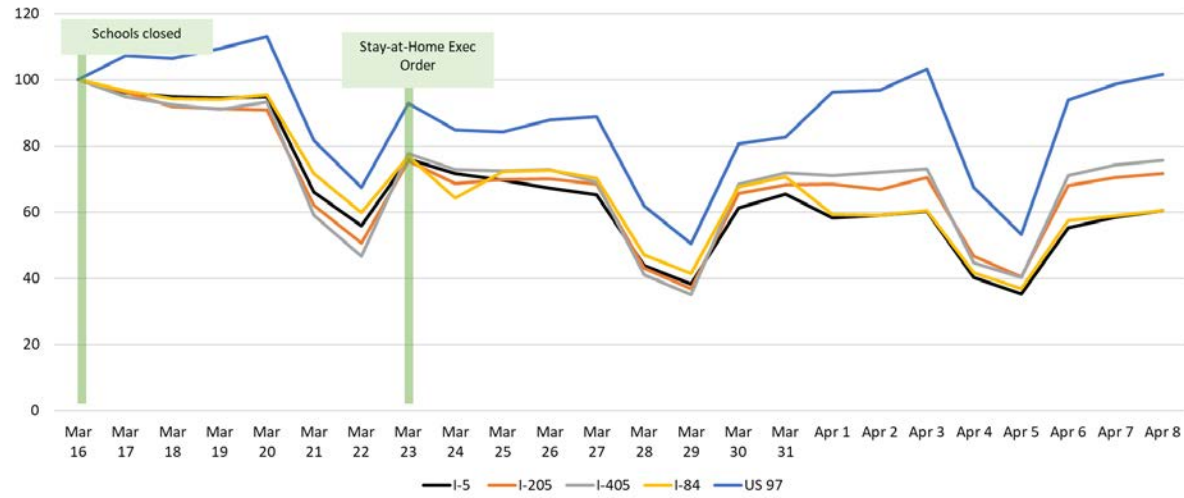
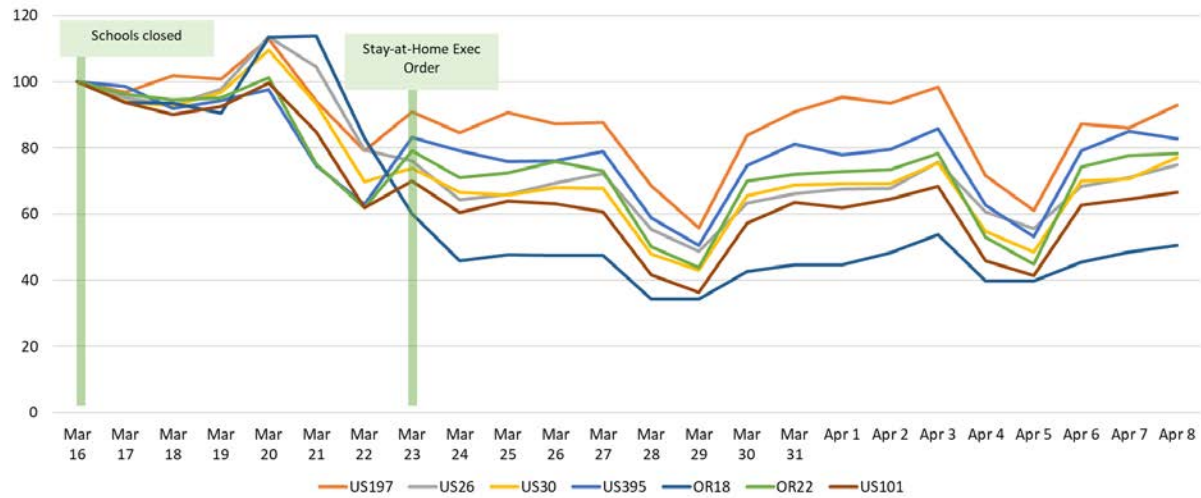


Figure 3. Daily Change in Traffic Volumes Indexed to Monday March 23, 2020: Non-Interstate Corridors



Observed Heavy Truck Patterns

COVID-19 restrictions and global impacts to trade between nations effects the flow of freight in Oregon. Seventy percent of Oregon freight moves by truck, so looking truck volume patterns by weight will reveal the net impact of these contrasting market forces. Freight originating from other countries, such as China, declined as quarantines were put into place and factories closed. Some domestic freight declined as Oregon businesses stopped or reduced activity. However, some domestic freight increased, providing goods needed to support essential activity, such as medical supplies, groceries and e-commerce.

Ideally, robust freight analysis would evaluate the flow of goods by commodity type, for example paper towels vs. car stereos. However, this data is unavailable, there is no reporting mechanism for that level of detail. What we can measure is the weight of trucks passing by weigh-in-motion scales to see if there are any new patterns arising during this time. **Table B** in the Appendix provides a list of the truck scales used to obtain observed truck data, locations focus on the major freight routes of I-5, I-84 (including US-730) and US-97.

Table 2 presents the week-over-week change in truck tonnage for 17 truck scales. Positive change is displayed as orange and negative change as blue. This table reveals freight tonnage increased the last week of February and the week before schools were closed and social distancing was advised. For the week of the Stay Home mandate freight tonnage was lower than the prior week, followed by a week when tonnage increased. Two locations stand out from the others revealing increasing freight movement: Woodburn NB (I-5) and Olds Ferry EB (I-84).

Table 2. Week-Over-Week Percent Change in Truck Tonnage for Select Weigh-in-Motion Truck Scales

| Scale Number | Scale Name* | Route | February 22-28 | Feb. 29- March 6 | March 7-13 | March 14-20 | March 21-27 | March 28-April 3 | Location Average for March |
|-----------------------|------------------|--------|----------------|------------------|------------|-------------|-------------|------------------|----------------------------|
| 10-07 | Booth Ranch SB | I-5 | 33 | -12 | 18 | 2 | -23 | 32 | 3 |
| 10-08 | Booth Ranch NB | I-5 | 44 | 1 | 15 | -8 | 18 | -14 | 2 |
| 15-06 | Ashland SB | I-5 | -11 | 41 | 0 | 13 | -21 | -5 | 6 |
| 15-07 | Ashland NB | I-5 | 27 | 14 | -5 | 21 | -22 | 16 | 5 |
| 2408 | Woodburn NB | I-5 | -18 | -78 | 311 | 13 | -19 | 68 | 59 |
| 24-09 | Woodburn SB | I-5 | -15 | 32 | -9 | 26 | -46 | 39 | 8 |
| 14-02 | Wyeth WB | I-84 | 2 | -9 | 24 | -3 | -5 | 9 | 3 |
| 14-04 | Cascade Locks EB | I-84 | 24 | -2 | 11 | 3 | 6 | -16 | 0 |
| 23-05 | Olds Ferry EB | I-84 | 0 | 32 | 22 | 0 | -66 | 284 | 54 |
| 23-06 | Farewell Bend WB | I-84 | -6 | 12 | -8 | -7 | 18 | 15 | 6 |
| 30-05 | Emigrant Hill WB | I-84 | 45 | 40 | 6 | -42 | 27 | 6 | 7 |
| 30-06 | Umatilla SB | US-730 | 29 | 3 | -11 | 13 | -5 | -7 | -2 |
| 09-06 | Bend NB | US-97 | 68 | -25 | -29 | 55 | -15 | 14 | 0 |
| 16-03 | Juniper Butte NB | US-97 | 0 | 9 | -20 | -25 | 102 | -15 | 10 |
| 16-04 | Juniper Butte SB | US-97 | 6 | 2 | 3 | 11 | -22 | -8 | -3 |
| 18-05 | Klamath Falls SB | US-97 | 117 | -19 | -6 | -22 | 52 | -19 | -3 |
| 18-07 | Klamath Falls NB | US-97 | 18 | 1 | -13 | 7 | 11 | 5 | 2 |
| Weekly Average | | | 21 | 2 | 18 | 3 | -1 | 24 | |

Observed Change in Travel Time Reliability

As traffic volumes decline, congestion declines, reliability and travels speeds increase. **Table 3** reports the weekday afternoon peak period travel speeds for each week in March by corridor in the Portland Metropolitan region. The largest change in speeds since the first week in March occurred on I-5 and I-405.

Table 3. Average Weekday Afternoon Peak Travel Speeds

| WEEK | I-5 | | I-205 | | I-405 | | I-84 | |
|-------------|------|------|-------|------|-------|------|------|------|
| | NB | SB | NB | SB | NB | SB | EB | WB |
| 3/1 - 3/7 | 33.2 | 38.1 | 44.3 | 49.3 | 34.6 | 29.2 | 47.8 | 51.1 |
| 3/8 - 3/14 | 35.1 | 42.2 | 58.4 | 61.3 | 33.8 | 31.8 | 50.3 | 49.2 |
| 3/15 - 3/21 | 45.8 | 60.0 | 63.1 | 63.1 | 54.9 | 53.4 | 58.3 | 61.6 |
| 3/22 - 3/28 | 59.7 | 60.5 | 63.1 | 62.8 | 55.2 | 56.0 | 60.3 | 61.1 |

Table 4 reports the percent change in travel speeds relative to the previous week. The second week of March saw some impact to travel speeds, especially on I-205. By the third week the other corridors followed the I-205 patterns with speeds rising as traffic volumes declined.

Table 4. Percent Increase in Travel Speeds from Previous Week

| WEEK | I-5 | | I-205 | | I-405 | | I-84 | |
|-------------|-----|-----|-------|-----|-------|-----|------|-----|
| | NB | SB | NB | SB | NB | SB | EB | WB |
| 3/1 - 3/7 | 10% | 9% | 13% | -4% | 26% | 15% | 2% | 3% |
| 3/8 - 3/14 | 6% | 11% | 32% | 24% | -2% | 9% | 5% | -4% |
| 3/15 - 3/21 | 30% | 42% | 8% | 3% | 62% | 68% | 16% | 25% |
| 3/22 - 3/28 | 30% | 1% | 0% | 0% | 0% | 5% | 3% | -1% |

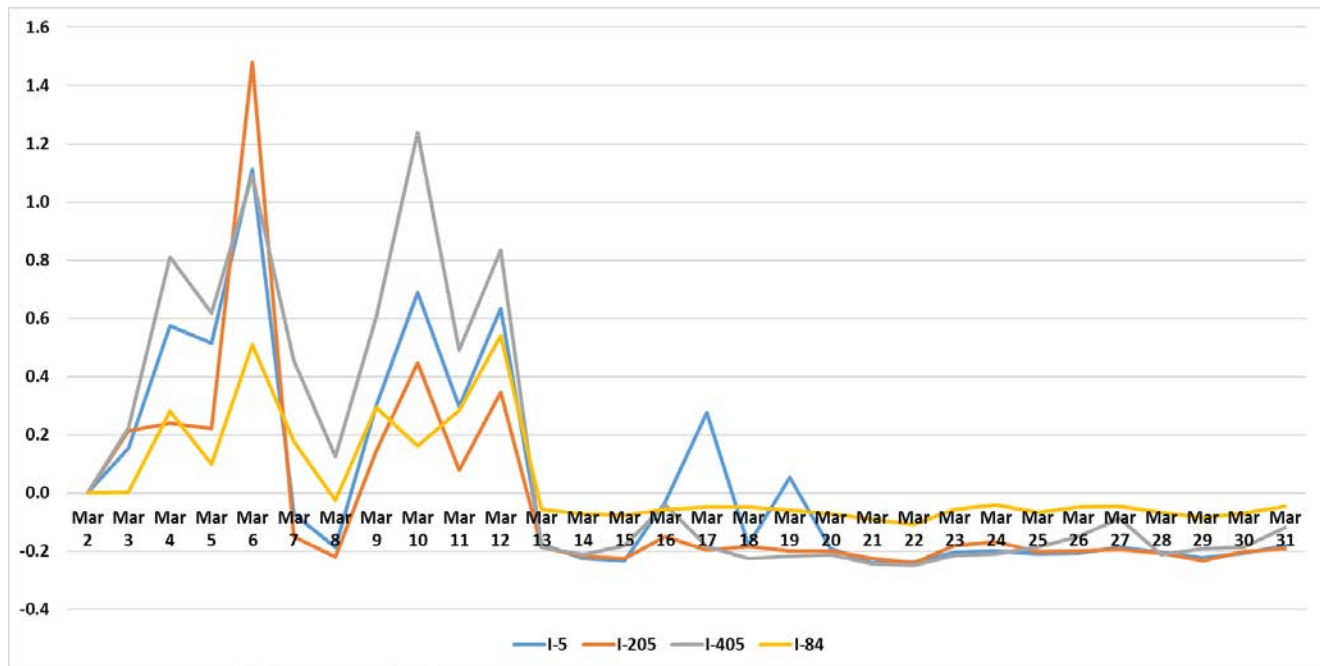
Table 5 presents average weekday speeds indexed to the first week in March, this reveals how speeds have changed over the course of the month. Travel speeds for I-5 have increased 80% in the north bound direction, 59% south bound. I-205 speeds have increased 42% north bound and 59% south bound. The travel speeds for I-405 have increased 92% in the south bound direction and increased 59% in north bound direction. I-84 has seen an overall increase of 20% - 26% in speeds. Continued monitoring reveals speeds are steady and mostly at free-flow levels across all corridors in the Portland region, continuing to show patterns established the end of March.

Table 5. Overall Percent Change in Average Weekday Speeds since March 1, 2020

| WEEK | I-5 | | I-205 | | I-405 | | I-84 | |
|-------------|-----|-----|-------|-----|-------|-----|------|-----|
| | NB | SB | NB | SB | NB | SB | EB | WB |
| 3/1 - 3/7 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 3/8 - 3/14 | 6% | 11% | 32% | 24% | -2% | 9% | 5% | -4% |
| 3/15 - 3/21 | 38% | 57% | 42% | 28% | 59% | 83% | 22% | 21% |
| 3/22 - 3/28 | 80% | 59% | 42% | 27% | 59% | 92% | 26% | 20% |

Travel times have an inverse relationship with travel speeds, as travel speeds increase travel times decrease. **Figure 4** illustrates how afternoon peak period travel times have changed across the different corridors over the month of March in the Portland region. As traffic volumes decline mid-March, congestion is reduced and travel speeds rise. By the week of March 16 when schools were closed, travel speeds are reliable and congestion levels low to moderate on most corridors, with the exception of I-5 that had a small rise on March 17th. Since March 20th, all corridors appear reliable with steady travel speeds.

Figure 4. Afternoon Peak Period Travel Times Indexed to Monday March 2, 2020



ODOT will continue to monitor and report highway traffic volumes and patterns as Oregon strives to protect the health and safety of Oregon families by decreasing the rate of COVID-19 infection and developing strategies to mitigate the negative impacts on the economy.

Appendix

Table A. Automatic Traffic Recorder Locations

| ATR Number | ATR Name | Route | ODOT Highway Number | Mile Point | County |
|-------------------|----------------------|--------------|----------------------------|-------------------|---------------|
| 03-016 | Stafford | I-205 | 064 | 0.76 | Washington |
| 26-024 | Glenn Jackson Bridge | I-205 | 064 | 25.50 | Multnomah |
| 26-027 | Fremont Bridge | I-405 | 061 | 3.05 | Multnomah |
| 03-011 | Wilsonville | I-5 | 001 | 281.20 | Clackamas |
| 10-005 | Roseburg | I-5 | 001 | 130.15 | Douglas |
| 15-019 | Medford Viaduct | I-5 | 001 | 28.33 | Jackson |
| 20-020 | Martin Creek | I-5 | 001 | 170.25 | Lane |
| 20-025 | Eugene-Glenwood | I-5 | 001 | 190.92 | Lane |
| 22-005 | North Albany | I-5 | 001 | 234.8 | Linn |
| 26-004 | Interstate Bridge | I-5 | 001 | 307.97 | Multnomah |
| 26-016 | Iowa Street | I-5 | 001 | 298.24 | Multnomah |
| 23-014 | Snake River | I-84 | 006 | 376.98 | Malheur |
| 26-014 | Hoyt | I-84 | 002 | 3.35 | Multnomah |
| 26-028 | Fairview | I-84 | 002 | 11.45 | Multnomah |
| 30-004 | Pendleton | I-84 | 006 | 203.34 | Umatilla |
| 33-001 | Rowena | I-84 | 002 | 75.93 | Wasco |
| 13-003 | Hines | US20 | 007 | 126.60 | Harney |
| 21-006 | Burnt Woods | US20 | 033 | 34.24 | Lincoln |
| 22-013 | Waterloo | US20 | 016 | 19.05 | Linn |
| 09-003 | Lava Butte | US97 | 004 | 142.41 | Deschutes |
| 09-007 | Bend-Empire | US97 | 004 | 135.95 | Deschutes |
| 09-020 | Redmond | US97 | 004 | 124.39 | Deschutes |
| 16-002 | Madras | US97 | 004 | 97.11 | Jefferson |
| 18-006 | Chemult | US97 | 004 | 204.65 | Klamath |
| 18-019 | Midland | US97 | 004 | 289.44 | Klamath |
| 33-005 | Dufur | US197 | 004 | 10.30 | Wasco |
| 16-006 | Warm Springs | US26 | 053 | 113.17 | Jefferson |
| 26-003 | Gresham | US26 | 026 | 14.36 | Multnomah |
| 34-005 | Timber Junction | US26 | 047 | 37.60 | Washington |
| 05-006 | Rainier | US30 | 092 | 53.33 | Columbia |
| 30-008 | South Pendleton | US395 | 028 | 1.77 | Umatilla |
| 27-001 | Valley Junction | OR18 | 039 | 23.23 | Polk |

| | | | | | |
|---------------|-----------------|-------|-----|--------|---------|
| 24-004 | North Santiam | OR22 | 162 | 2.82 | Marion |
| 04-001 | Gearhart | US101 | 009 | 15.90 | Clatsop |
| 06-009 | Coos Bay | US101 | 009 | 244.02 | Coos |
| 08-009 | Port Orford | US101 | 009 | 301.45 | Curry |
| 21-008 | D River Wayside | US101 | 009 | 114.91 | Lincoln |
| 21-009 | North Newport | US101 | 009 | 139.11 | Lincoln |

Table B. Truck Weigh-in-Motion Scales

| Scale Number | Scale Name* | Route | Mile Point |
|--|------------------|--------|------------|
| 10-07 | Booth Ranch SB | I-5 | 111.78 |
| 10-08 | Booth Ranch NB | I-5 | 111.07 |
| 15-06 | Ashland SB | I-5 | 18.24 |
| 15-07 | Ashland NB | I-5 | 18.08 |
| 2408 | Woodburn NB | I-5 | 274.15 |
| 24-09 | Woodburn SB | I-5 | 274.18 |
| 14-02 | Wyeth WB | I-84 | 54.30 |
| 14-04 | Cascade Locks EB | I-84 | 44.93 |
| 23-05 | Olds Ferry EB | I-84 | 354.38 |
| 23-06 | Farewell Bend WB | I-84 | 353.31 |
| 30-05 | Emigrant Hill WB | I-84 | 226.95 |
| 30-06 | Umatilla SB | US-730 | 184.00 |
| 09-06 | Bend NB | US-97 | 14.50 |
| 16-03 | Juniper Butte NB | US-97 | 106.90 |
| 16-04 | Juniper Butte SB | US-97 | 108.20 |
| 18-05 | Klamath Falls SB | US-97 | 271.41 |
| 18-07 | Klamath Falls NB | US-97 | 271.73 |
| * NB = Northbound direction, SB = Southbound direction | | | |