Date: June 7th, 2022
To: Metro Transportation Policy Advisory Committee (TPAC)
From: Eliot Rose, Senior Transportation Planner
Subject: Emerging Transportation Trends tasks 3-5: technical memo

Introduction

The COVID-19 pandemic and other recent disruptions significantly changed travel patterns in the Portland region. Metro's Emerging Transportation Trends study seeks to understand how these changes could continue to impact transportation moving forward in order to ensure that the next update to the Regional Transportation Plan meets the shifting needs of people in the region.

Based on feedback from stakeholders during February 2020 presentations on the draft analysis of the impacts of emerging trends, the project team identified three follow-up tasks to complete the project:

1. A scenario analysis that estimates the range of impacts of the trends included in this study could have on vehicle travel and transit ridership.
2. An analysis of arterial traffic data that examines in more detail how travel behavior on some of the region's key mobility corridors changed during the past several years.
3. Guidance how Metro and its agency partners can address emerging trends during the 2023 Regional Transportation Plan update.

Below we describe those tasks, including how they are grounded in the feedback we received and in in prior results from this study. This memorandum adds to previous analytical work conducted to identify emerging trends (under Task 1 of this project) and to identify the potential trajectory and range of impacts from each trend (Task 2); it does not summarize the results of these tasks. A high-level summary of the research and findings behind each trend is available from the accompanying fact sheets, and the technical memoranda from previous tasks (cited here where appropriate) are available by request from Metro staff.

Scenario analysis

Purpose and scope

The COVID-19 pandemic dramatically changed travel behavior. Teleworking and online shopping rose dramatically, and both driving and transit ridership fell. As of the writing of this memo, the region is still in the midst of change, and these changes in behavior have yet to stabilize into a "new normal." Successive waves of new COVID variants continue to influence people's choices about whether to work, shop, and gather in person. It is not clear when or how travel behavior will stabilize, but it is apparent that many current changes in behavior were not accounted for in the 2018 Regional Transportation Plan. Metro and partner agencies need to better understand the nature and potential impact of these trends, making the best of the limited information that is available to capture these ongoing

changes, in order to account for how the investments in the 2023 RTP may shape people's travel choices.

The purpose of this analysis is to better understand the uncertainty that pandemic-related changes in behavior introduce into the RTP, and to estimate how accounting for these trends might influence the results of some of the key performance measures used in the RTP process. Scenario analysis is commonly used in planning to explore the implications of potential future changes to transportation and land use, estimate the general direction and magnitude of impacts resulting from these changes, and identify gaps where current assumptions, data, and tools do not capture these changes. It is an approach that is well-tailored to examining the evolving and unanticipated changes in behavior introduced by the pandemic. However, scenario analysis is different from the detailed modeling that Metro often uses to understand future conditions during the RTP process, and it is important to keep in mind the value and limitations of this analysis:

Scenarios represent different potential futures; they are not forecasts. During February, we shared the results of background research and analysis of available data on each of the emerging trends included in this study. Since these trends are still evolving and the available data is often sparse and from disparate sources and studies, we were only able to quantify likely future ranges for variables like teleworking rates and online shopping rates. As discussed below, we defined three different scenarios using these ranges of values, with the goal of defining scenarios that are internally consistent (i.e., a scenario with high levels of teleworking should also assume high levels of online shopping, since both behaviors are related to higher levels of online engagement and lower levels of in-person engagement) and that collectively represent futures where trends are more durable and impactful and where trends are less durable and impactful. In other words, these scenarios represent different versions how the future *might* look – not a prediction about how it *will* unfold.

This analysis focuses on the impacts of pandemic-related changes to travel behavior, and does not account for many other factors influence travel behavior. The Emerging Trends Study is focused on analyzing a specific set of changes – such as increased teleworking and increased online shopping – that were recommended by Metro partner agencies and stakeholders[1] because they are potentially causing significant changes to travel behavior that are not well-accounted for by the data and assumptions that are normally used in regional transportation planning. There are many other changes happening right now – such as rising gas prices, inflation, and the lack of adequate housing supply – that will also affect future travel behavior. This analysis does not account for these changes for two reasons. First, accounting for a broader variety of factors would make it harder to discern the specific impacts of the trends that stakeholders have directed this study to focus on. Second, the relationship between travel behavior and travel costs or housing supply is well-captured by Metro's travel model, whereas the levels of teleworking and online shopping are not. Focusing on pandemic-related changes helps to better understand how the RTP may need to update its approach to analyses.

[1] See Emerging Trends Task 1 memo, presented in fall 2021.

The purpose of this exercise is to evaluate the 2018 RTP, not to update it. The RTP is a 20-year plan that is updated every 5 years. Each RTP update introduces some changes to projects and policies, but most projects and policies are often carried over from the previous RTP. Many agencies in the region are already making significant efforts to respond to the changes brought on by the pandemic. The scenarios do not attempt to account for these changes – they instead assume that the 2018 RTP will be implemented as adopted so that we can identify opportunities for change and avoid carrying over assumptions or ideas that seem out-of-date given recent changes to travel behavior.

Throughout the remainder of 2022, Metro will be working with partners and stakeholders to update the policies and projects in the RTP. In early 2023, Metro will use its travel model to forecast how the region performs under the updated policies and projects. In the meanwhile, this scenario analysis is intended to help RTP stakeholders assess whether updated policies and projects are responsive to recent changes in travel behavior. It also responds to stakeholder feedback on previous deliverables. The prior tasks in the Emerging Trends Study analyzed each trend that was included in the study individually, and estimated impacts based on the best research and data available.[2] When we presented the results, stakeholders observed that different trends are inter-related (for example, higher levels of teleworking could lead to lower levels of transit service and ridership if the transit system continues to focus on serving commuters), and that each trend could potentially have a wide range of impacts depending on how lasting recent changes in travel behavior turn out to be.

This scenario analysis estimates how vehicle miles traveled (VMT) and transit ridership – which are two key indicators that we use to measure progress on climate, travel choices, safety and other regional goals – may vary depending upon how emerging trends unfold. It also estimates changes in morning peak congestion since congestion is a consideration for many transportation projects in the region, and research suggests that teleworking and other trends have impacts on peak travel.

About TrendLab+

TrendLab+ is an analytical tool developed by Fehr and Peers (the consultant on the Emerging Trends Study) that allows for quick-response testing of a variety of scenarios on economic, social, and technological forces on transportation trends. In its standard form, TrendLab+ considers up to twenty different trend variables individually and in combination, and projects the resulting near-term, mid-term and longer-term impacts on regional vehicle miles traveled (VMT) and transit ridership. The relationships between inputs and outputs are defined based on available research, and can be customized based on local, regional or state data from the area being analyzed.

TrendLab+ was selected from among the tools available, which include Metro's travel model and other scenario planning tools, for use in this analysis for two reasons: first, it is

[2] See the Emerging Transportation Trends Study Fact Sheets, which are attached separately with the materials for this item, as well as Emerging Trends technical memos 2.1 and 2.2, presented in February 2021.

designed to capture the impact of behaviors like teleworking and online shopping that are not well-captured in the other tools reviewed. Though Metro's travel model and some of the other scenario planning tools reviewed are more nuanced, they are not designed to capture behaviors like online shopping or health-related aversion to transit. Metro's travel model is also based on dated surveys that do not represent current levels of online shopping or teleworking. Second, TrendLab is a relatively simple tool, which makes it easy to define different scenarios and therefore to examine a range of possible futures. Metro's model and other scenario planning tools use more complex inputs, which makes it labor-intensive to design scenarios, limiting the ability to study a range of scenarios and raising the risk of false precision given the lack of detailed data on the changes that we are exploring.

In order to represent conditions in the Portland region, the version of TrendLab+ used in this scenario analysis incorporates several assumptions and relationships derived from Metro's travel model and from the 2018 RTP, including:

- Total trips and average mode shares by trip purpose (e.g., shopping, commuting, home-based trips, work-based trips)
- Vehicle miles traveled by trip purpose
- The relationship between transit ridership and transit service
- The relationship between transit mode shares and car ownership
- Assumed future levels of transit service (for certain scenarios)

The assumptions and data sources used in the version of TrendLab+ discussed here are detailed in the Task 2 Technical Memo.

Defining scenarios

The analysis quantifies VMT and transit ridership under three different scenarios, each of which represents different assumptions about how the changes explored in this study might persist into the future. Metro staff and the project consultant team, Fehr and Peers, developed three different scenarios that represented a range of different possible futures:

- **Return to pre-pandemic**, which assumes that people will resume their pre-pandemic behavior in the future.
- **Transformative Trends**, which assumes that the COVID-19 pandemic was a transformative event that will continue to alter people's behavior into the future.
- **New Status Quo**, which treats the pandemic as an event that led to significant one-time changes in people's behavior.

We used Fehr and Peers' TrendLab+ scenario planning tool – which applies national and regional research and data to estimate the impact of changing travel behaviors on outcomes including VMT, greenhouse gas emissions, transit ridership, and congestion – to quantify the impacts of each scenario. TrendLab+ uses inputs identified in the underlying research and data to define scenarios. Below we describe each scenario and how it was defined, and which values we used when inputting the scenario into TrendLab+. We also provide information on the data sources that were used to create these assumptions following the descriptions of each scenario.[3]

[3] More detail on the background research behind these assumptions can be found in the Task 2 technical memos.

Return to Pre-pandemic: This scenario treats the pandemic as an anomaly and assumes that people will resume their pre-pandemic behavior as society reopens. The scenario assumes that behaviors like teleworking and online shopping will return to 2019 levels in 2023 and will continue to grow at pre-pandemic rates (i.e., the rates observed between 2015 and 2019) thereafter. Table 1 summarizes these assumptions.

Table 1: Return to Pre-pandemic scenario assumptions

Trend	Independent Variable	Starting Assumptions		Trend Magnitude		
		2019	2022	2025	2030	2045
Commute Levels	Percent of total workforce who telecommute on an average weekday	8%	9%	10%	11%	15%
	Percent of employees who leave the workforce[1]	2%	2%	2%	2%	2%
Online Shopping	Percent of daily shop trips that are online	11%	12%	13%	18%	31%
Car Ownership	Percent of households with cars[1]	92%	92%	92%	92%	92%
Safety Concerns	Percent of former riders avoiding transit due to health/safety concerns	0%	50%	15%	7%	3%
Transit Service	Percent of 2019 service miles	100%	90%	94%	105%	138%

[1] Workforce departure and car ownership rates were held constant at 2019 levels for all scenarios in order to focus the scenario analysis on other factors that were more directly related to the trends that stakeholders had directed the project team to explore.

Transformative Trends: This scenario treats the pandemic as a transformative event that will continue to alter people's behavior. It assumes that the trends observed during the pandemic will continue, and that behaviors like teleworking and online shopping stabilize at levels closer to those observed during the peak of the pandemic in 2023 and continue to grow at current rates (i.e., the rates of change observed between mid-2020 and mid-2022) thereafter. Table 2 summarizes these assumptions.

Table 2: Transformative Trends scenario assumptions

Trend	Independent Variable	Starting Assumptions		Trend Magnitude		
		2019	2022	2025	2030	2045
Commute Levels	Percent of total workforce who telecommute on an average weekday	8%	15%	19%	25%	31%
	Percent of employees who leave the workforce[1]	2%	2%	2%	2%	2%
OnlineShopping	Percent of daily shop trips that are online	11%	18%	32%	43%	58%
Car Ownership	Percent of households with cars[1]	92%	92%	92%	92%	92%
Safety Concerns	Percent of former riders avoiding transit due to health/safety concerns	0%	50%	20%	14%	7%
Transit Service	Percent of 2019 service miles	100%	90.0%	112%	131%	151%

[1] Workforce departure and car ownership rates were held constant at 2019 levels for all scenarios in order to focus the scenario analysis on other factors that were more directly related to the trends that stakeholders had directed the project team to explore.

New Status Quo: This scenario treats the pandemic as an event that led to significant one-time changes in people's behavior and assumes that we will not see the same kind of rapid evolution in travel patterns moving forward as we saw during the pandemic. This scenario assumes that behaviors like teleworking and online shopping stabilize at or close to current levels in the coming year and continue to grow at pre-pandemic rates (i.e., the rates observed between 2015 and 2019) thereafter.

Table 3: New Status Quo scenario assumptions

Trend	Independent Variable	Starting Assumptions		Trend Magnitude		
		2019	2022	2025	2030	2045
Commute Levels	Percent of total workforce who telecommute on an average weekday	8%	13%	13%	14%	19%
	Percent of employees who leave the workforce[1]	2%	2%	2%	2%	2%
Online Shopping	Percent of daily shop trips that are online	11%	16%	25%	30%	45%
Car Ownership	Percent of households with cars[1]	92%	92%	92%	92%	92%
Safety Concerns	Percent of former riders avoiding transit due to health/safety concerns	0%	50%	15%	10%	5%
Transit Service	Percent of 2019 service miles	100%	90%	112%	131%	151%

[1] Workforce departure and car ownership rates were held constant at 2019 levels for all scenarios in order to focus the scenario analysis on other factors that were more directly related to the trends that stakeholders had directed the project team to explore.

Data sources used for scenario assumptions

As discussed above, we assumed different starting (typically 2022) values and subsequent rates of growth for the inputs that define each scenario, based on the available data describing historic trends and future projections for each input. Below we describe the data sources that we used in defining the assumptions for each input.

Percent of total workforce who telecommute on an average weekday: Assumptions for this input are based on the historical and projected percentage of workers who say that they work from home. Historical data on pre-pandemic statewide telework rates comes from the US Census.[4] Data on teleworking during the pandemic comes from the Census as well as analyses from the Oregon Office of Economic Analysis[5] that used the Census in combination with data from the Bureau of Labor Statistics and other sources to closely monitor how the nature and prevalence of teleworking changed during the pandemic. Research on and forecasts of future teleworking activity come from the National Bureau of Economic Research[6], the McKinsey Global Institute,[7] Deloitte,[8] Gitlab,[9] and the U.S. Bureau

[4] American Community Survey (ACS), Census Bureau. (2019). 5-year estimates for Portland MSA.
[5] Oregon Office of Economic Analysis. (2020). COVID-19: Social Distancing, Isolation, and the Workforce.
[6] National Bureau of Economic Research. (2020). How Many Jobs Can Be Done At Home?
[7] McKinsey Global Institute. (2021 & 2020). The future or work after COVID-19 & What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries, Reports.
[8] Deloitte. (2021). Remote Work: The Road to the Future, Transformation of the Global Workforce.
[9] Gitlab. (2021). The Remote Work Report 2021.

of Labor Statistics.[10] Collectively, these sources find that teleworking rates were climbing steadily in the years leading up to the pandemic, peaked during the early months of the pandemic, and are now on the decline. However, they are still significantly higher than pre-pandemic levels. Most forecasts expect that average teleworking rates will continue to increase over the long term. Several of these sources emphasize that many workers – particularly low-income workers – will continue to do their jobs in person, suggesting that there is a limit to the number of jobs that can allow working from home, which one analysis estimates as roughly 35%.[11]

The Oregon Office of Economic Analysis' teleworking analyses are particularly useful because they are regularly updated and because, as their latest summary of this data[12] highlights, Oregonians telework at higher rates than average Americans, and people in the Portland region telework at higher rates than most Oregonians, so these analyses are particularly useful in understanding regional trends. Together, this data shows that teleworking rates grew slowly from roughly 6 to 8 percent between 2015 and 2019, peaked in May 2020 at 35 percent, and declined to 19 percent in September 2021. Based on the available research we assumed that this decline would continue in the short term as offices reopen, but that teleworking rates would continue to rise over the long term. Table 4 below summarizes the 2022 values and rates of change assumed under each scenario.

Table 4: Telecommuting assumptions by scenario

Percent of Workforce that Telecommutes	Assumed 2022 value	Assumed rate of change
Return to Pre-pandemic	9%	2015-2019 rate (~0.25% per year)
New Status Quo	13%	2015-2019 rate (~0.25% per year)
Transformative Trends	15%	Trendline based on linear growth rate between 2010-2022 (~1% per year) between 2023-2030, assumed to slow thereafter as teleworking rates trend toward the assumed limit of 35% (average of ~0.4% per year between 2031-2045)

Percent of employees who leave the workforce: Data on workforce departures comes from the Bureau of Labor Statistics.[13] Workforce departures are an important input in TrendLab+ but were not part of the package of trends that Metro Council and partner agencies recommended for inclusion in this study. As such, we did not have the chance to gather stakeholder input on future forecasts for this scenario. Though there are many reasons why this variable could change, such as increasing levels of automation and worker productivity, all scenarios assume that workforce attrition remains at current levels (~2%)

[10] U.S. Bureau of Labor Statistics (2021). Projections overview and highlights, 2020–30. Monthly Labor Review.
[11] National Bureau of Economic Research. (2020). How Many Jobs Can Be Done At Home?
[12] https://oregoneconomicanalysis.com/2021/12/16/just-how-much-is-working-from-home-on-the-rise/.
[13] U.S. Bureau of Labor Statistics (2022), Labor Force Statistics from the Current Population Survey, Data for Civilian Labor Force Leve, Series LNS11000000, years 2012-22.

in order to maintain a focus on understanding the impacts of the trends that stakeholders directed this study to focus on.

Percent of daily shopping trips that are online: Historical data on the percentage of retail sales that are conducted online come from Sorin Garber & Associates,[14] Portland Bureau of Transportation,[15] and Statista,[16] and research and forecasts of future e-commerce activity come from the University of Oregon[17], Statista,[18] UBS Global,[19] Market Watch,[20] the U.S. Department of Commerce,[21] CBRE,[22] McKinsey & Company,[23] Deloitte[24] and ParcelHero.[25] After growing from 5 to 10 percent, or roughly 0.9 percentage points per year, between 2015 and 2019, e-commerce's market share grew rapidly during the initial months of the pandemic, reaching roughly 14 percent of all sales in early 2022. Growth rates have since slowed but e-commerce continues to account for a growing share of overall retail sales, and the available research suggests that this growth will continue, though not at the rates observed during the pandemic.

[14] Sorin Garber & Associates (2020-2021). Are Home Deliveries Increasing during the Pandemic? Reporting between August 2020 and December 2021.
[15] PBOT. (2019). E-Commerce and Emerging Logistics Technology Research Report.
[16] Statista. (2021). Retail e-commerce revenue in the United States from 2017 to 2025.
[17] University of Oregon. (2021). Urbanism Next: E-commerce and COVID Research.
[18] Statista. (2021). Retail e-commerce revenue in the United States from 2017 to 2025.
[19] UBS Wealth Management. (2021). E-commerce growth is here to stay.
[20] MarketWatch. (2021). Global E-commerce Market Growing By 13.5% Size, Future Trends, Current Growth 2021, Emerging Technologies, Global Regions with Industry Share Analysis, Gross Margin, Regional Demand and Forecast to 2030.
[21] US Department of Commerce. (2022). Quarterly Retail E-Commerce Sales.
[22] CBRE. (2022). How High Will E-Commerce Sales Go? The Definitive Guide to Omnichannel Real Estate.
[23] McKinsey & Company. (2021). How e-commerce share of retail soared across the globe: A look at eight countries.
[24] Deloitte. (2017). A brave new world: The Retail Profitability Challenge Report.
[25] Milt, D. (2021). 2030: The Death of the High Street: Why the rise in e-commerce means Britain's town centres will be unrecognizable within 15 years. Parcelhero.

Table 5 below summarizes the 2022 values and rates of change assumed under each scenario.

Table 5: Online shopping assumptions by scenario

Percent of daily shopping trips that are online	Assumed 2022 value	Assumed rate of change
Return to Pre-pandemic	12% (which would have been the 2022 value had e-commerce continued to grow at the 2015-19 rate during 2020-22)	2015-2019 rate (~1% per year)
New Status Quo	16%	2015-2019 rate (~1% per year)
Transformative Trends	18%	Based on projections that e-commerce will account for ~60% of sales in 2045.[26] E-commerce market share is assumed to grow rapidly in the short term and more slowly in the long term.

Percent of households with cars: Data for this input comes from the American Community Survey. Car ownership rates are an important input in TrendLab+ but were not part of the package of trends that Metro Council and partner agencies recommended for inclusion in this study. As such, we did not have the chance to gather stakeholder input on future forecasts for this scenario. Though there are many reasons why this variable could change, such as changing gasoline prices and changing availability of other transportation options, all scenarios assume that car ownership remains at the regional levels found in the 2016-20 American Community Survey (~92%) in order to maintain a focus on understanding the impacts of the trends that stakeholders directed this study to focus on.

Percent of former riders avoiding transit due to health/safety concerns: This input estimates the percentage of former transit riders who stopped using transit during the COVID pandemic and continue to avoid transit due to concerns about health or personal

[26] This projection is based on several sources:

- A pre-pandemic projection of e-commerce from the New Jersey Transportation Planning Authority, which estimated that e-commerce would account for 47% of sales in 2050 without accounting for pandemic-era increases (https://www.njtpa.org/NJTPA/media/Documents/Planning/Regional-Programs/Studies/2050%20Freight%20Industry%20Level%20Forecasts/NJTPA-2050-Freight-Forecasts-Final-Report.pdf?ext=.pdf)
- Extrapolations of market research on COVID-era e-commerce market share growth rates and short-term forecasts from McKinsey (https://www.mckinsey.com/featured-insights/coronavirus-leading-through-the-crisis/charting-the-path-to-the-next-normal/how-e-commerce-share-of-retail-soared-across-the-globe-a-look-at-eight-countries) and Statista (https://www.statista.com/statistics/272391/us-retail-e-commerce-sales-forecast/).

safety. Assumptions for this input are based on surveys that asked transit riders – particularly those who stopped using transit during the pandemic – whether they plan to return to transit following the pandemic, and why. Several of these surveys report the percentage of lapsed transit riders who cite health and safety concerns as the top reason for not planning to return to transit.

In global surveys conducted at the onset of the pandemic,[27] 40-60% of travelers said that they had health concerns about using transit in the future. As the pandemic progressed and public knowledge about COVID-19 risks and transmission grew, U.S. transit agencies conducted more nuanced surveys of riders that are likely more reflective of current perceptions in the Portland region. These surveys found that a more modest share of former riders – between 10-22% – reported that health and safety concerns would keep them from returning to transit. The authors of these surveys often use results and other research to estimate how health and safety concerns will evolve into the future, and forecast that these concerns will diminish over time, but that a smaller portion of riders will continue to avoid transit due to these concerns well into the future. It is important to note that these surveys use different questions to ask about issues; some focus explicitly on health risks and some on safety more broadly, but they generally have a stronger focus on health. A series of surveys conducted by TriMet[28] finds that, though most riders feel safe on transit, safety concerns over the behavior of other riders rose significantly during the pandemic.

Assumptions for this input were defined based on the results of the research discussed above for three different years – 2022, 2025, and 2045 – and it was assumed that linear changes occur between these points. For 2022, a transit aversion rate of 50 percent was assumed for all scenarios based on research from the early stages of the pandemic. For 2025, values were selected from the range of results found in U.S. transit agency surveys (10-22%), using higher-end values for the Transformative Trends scenario and mid-range values for the other two scenarios (we did not use low-range values in order to account for the significant personal safety concerns observed in regional data). For 2045, we selected from a range of values (3-10%) derived from available research, with higher values for more pandemic-sensitive scenarios. Table 6 below summarizes these assumptions.

Table 6: Health/safety-related transit aversion assumptions, by scenario

Percent of former riders avoiding transit due to health/safety concerns	Assumed 2022 value	Assumed 2025 value	Assumed 2045 value
Return to Pre-pandemic	50%	15%	3%
New Status Quo	50%	15%	5%
Transformative Trends	50%	20%	7%

[27] https://www.bcg.com/publications/2020/how-covid-19-will-shape-urban-mobility, https://www.weforum.org/agenda/2020/07/masks-subway-disinfectant-how-to-make-commuters-feel-safe-after-covid-19/

[28] Trimet. (2018 & 2021). TriMet Attitude and Awareness Survey, Title VI Service Equity Analysis: Covid-19 Service Changes (Rep.), and . Portland, OR: TriMet.

Transit service: This input uses transit revenue miles as a proxy for the overall amount of transit service in the region. Historical information on fixed-route transit revenue miles is available through TriMet[29] and other transit agencies in the region and is also compiled by Metro and other partner agencies for planning and analysis purposes. Between fiscal years 2015 and 2019, transit revenue miles increased by roughly 11%, and then fell by 8% between 2019 and 2021, returning to close to 2015 levels, as the pandemic forced service cuts. Since the end of fiscal year 2021, service levels have continued to fluctuate, due in large parts to challenges with hiring drivers. TriMet is currently offering hiring bonuses and other incentives to recruit more drivers and anticipates that the current driver shortage will not last over the long term.

The transit service variable is presented as a percentage of 2019 service levels for ease of interpretation. All scenarios assumed that transit service in 2022 would be at 90% of pre-pandemic levels based on data from October 2021, which was the most recent data available at the time this analysis (as noted above, current service levels as of July 2022 are lower than they were in October 2021 due to the labor shortage). The Return to Pre-pandemic scenario assumed that transit service in the Portland region would continue to grow at the historical rate observed between 2015 and 2019. The other two scenarios assumed that transit service would increase in a manner consistent with the set of transit investments identified in the adopted 2018 RTP, which reflected a desire among agencies in the region to increase transit service more rapidly it had been growing in order to meet regional goals, and prioritized a number of transit projects for completion before 2027 Table 7 below summarizes the 2022 values and rates of change assumed under each scenario.

Table 7: Transit service assumptions by scenario

Transit service (transit revenue miles, indexed to 2019 levels)	Assumed 2022 value	Assumed rate of change
Return to Pre-pandemic	90%	2015-2019 rate (~2% increase per year)
New Status Quo	90%	2018 RTP rate (~5% increase per year for 2025-30, ~1.3% increase per year thereafter)
Transformative Trends	90%	2018 RTP rate (~5% increase per year for 2025-30, ~1.3% increase per year thereafter)

It is important to note that, by using data from the 2018 RTP and from 2015-19, the analysis implicitly assumes that the transit network continues to function as it did prior to the pandemic, with an emphasis on serving commute trips to Downtown Portland and other regional job centers. TriMet is working to reconfigure service based on how people are currently traveling, and these changes will be reflected in the updated 2023 RTP.

[29] TriMet (2021). Annual Performance Report.

Draft results

Figure 1, Figure 2, and Figure 3 below show TrendLab+ estimates of transit ridership and VMT per capita for each of the three scenarios described above. All of these metrics are indexed to pre-pandemic levels, i.e., we show the percent change in each metric compared to 2019 values. It is important to note that these estimates do not account for the many projects and policies under consideration in the region that could influence these outcomes, such as congestion pricing and planned capital projects. We will account for these impacts in more detail during the 2023 RTP update. The Emerging Transportation Trends Study focuses on understanding the impact of external forces so that Metro and its partners can assess whether these projects and policies adequate to meet regional goals during the RTP update.

Figure 1: Forecasted change in transit ridership by scenario

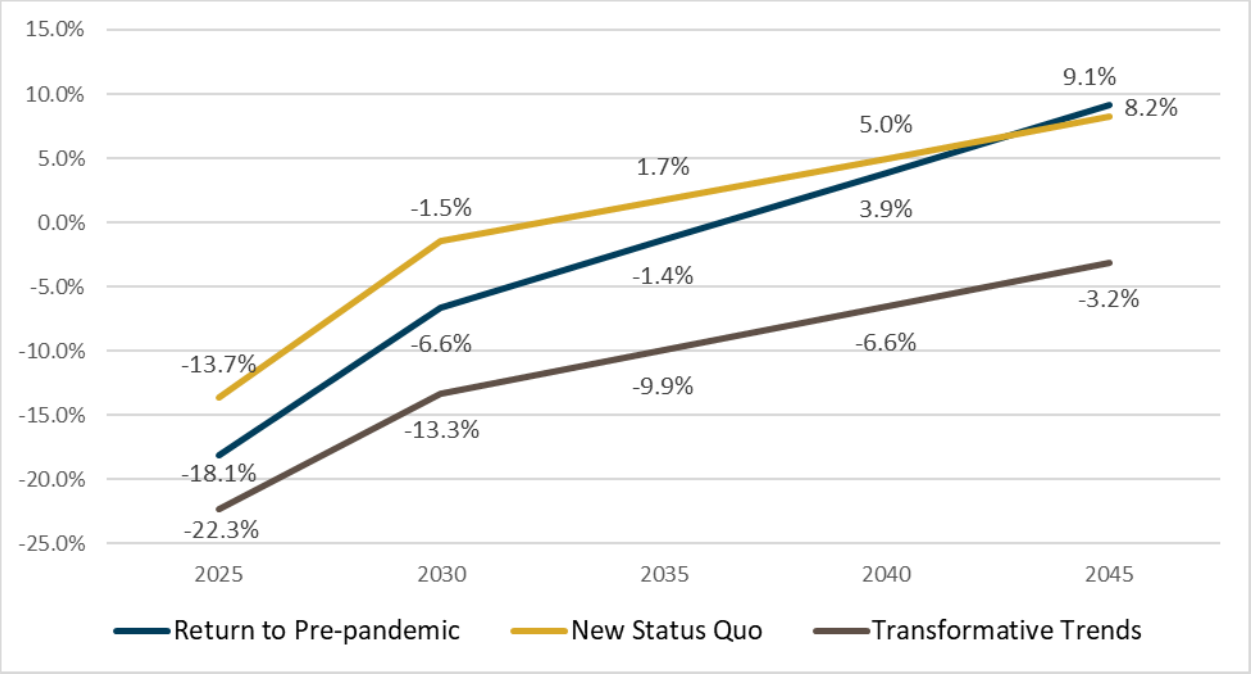


Figure 2: Forecasted change in VMT per capita by scenario

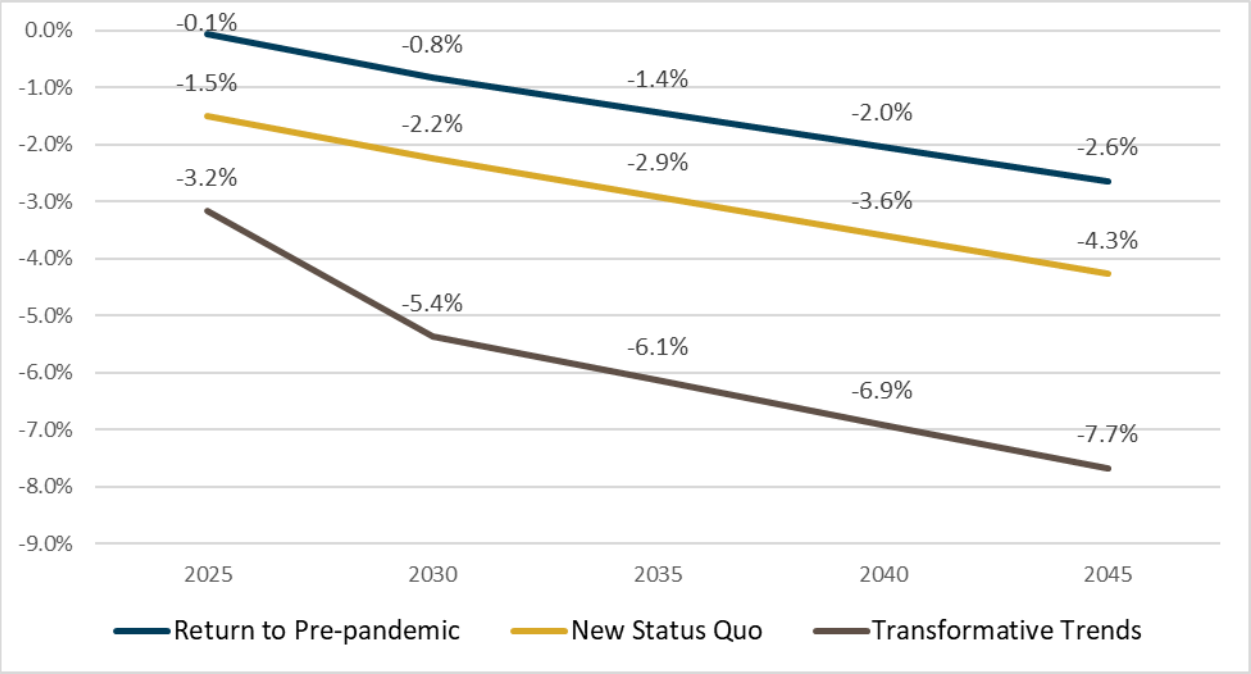
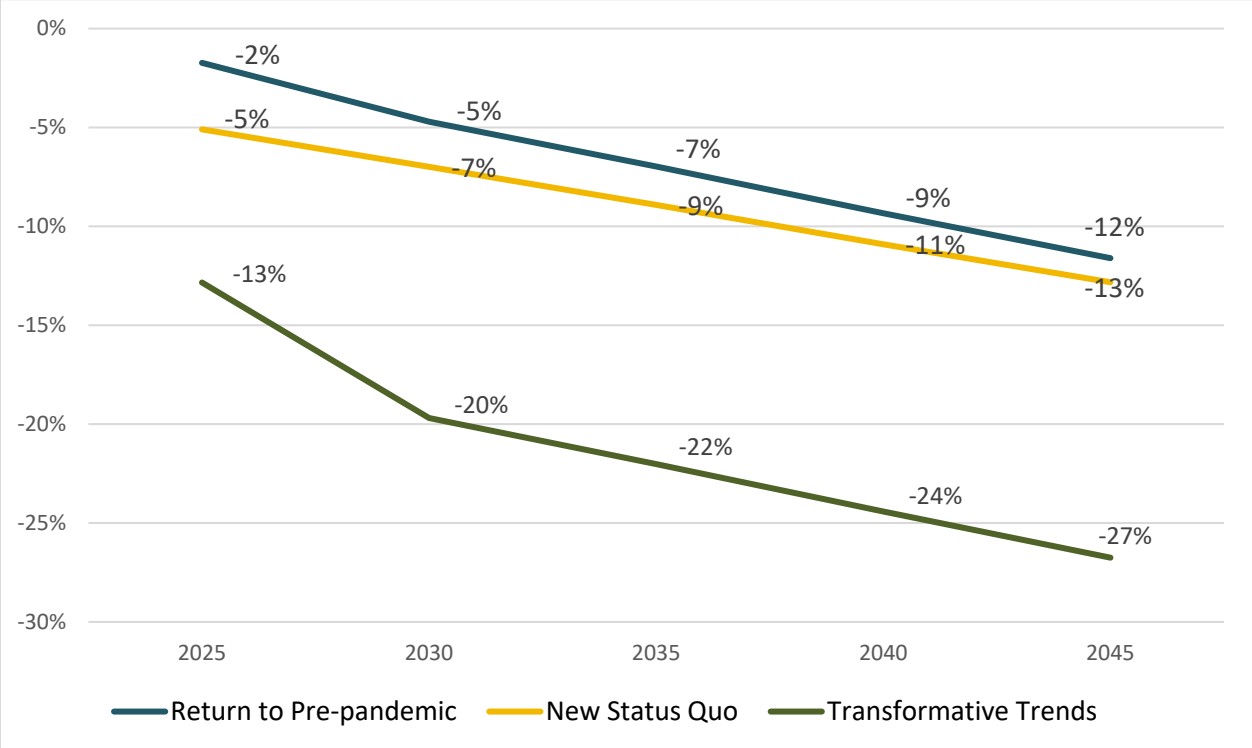


Figure 3: Forecasted change in morning peak congestion by scenario



Emerging trends help to reduce VMT per capita. Forecasted VMT per capita decreases under all scenarios, by between 2.6% (Return to Pre-pandemic) and 7.7% (Transformative Trends) in 2045. This represents partial progress toward the region's target to reduce VMT

per capita to 35 percent by 2045.[30] The more that current trends – particularly teleworking (see below) – persist, the lower VMT per capita is likely to be.

Emerging trends could reduce or increase transit ridership compared to pre-pandemic levels. Transit ridership and service is currently below pre-pandemic levels due to challenges hiring drivers and the ongoing impact of the pandemic. As of June 2022, TriMet ridership was at roughly 60% of pre-pandemic levels.[31] All scenarios project that transit ridership will increase significantly above current levels. Over the short term, all scenarios forecast that ridership will return to between 14 and 22% below pre-pandemic levels between now and 2025 as TriMet restructures service and hires more drivers, and over the long-term all scenarios forecast that transit ridership will continue to increase. However, these increases are not necessarily enough to restore pre-pandemic ridership levels, both because transit service and ridership declined so steeply during the pandemic and because our analysis assumes that some former riders will not return to transit due to health concerns and/or shifting travel needs. Comparing results to 2019 levels, we see transit ridership increasing under some scenarios and decreasing under others, ranging from a 3.2% decrease (Transformative Trends) to a 9.1% increase (Return to Pre-pandemic) in 2045. The more that current trends persist, the lower transit ridership is likely to be.

Congestion during the morning peak period declines under all scenarios, by between 12% (New Status Quo) and 27% (Transformative Trends). This is due to teleworkers replacing peak period commute trips with errands throughout the day, and declining VMT; small increase in VMT can significantly reduce congestion when roads are operating at or near peak capacity, as was the case many areas of the region prior to the pandemic. As the data in the next section illustrates, travel has declined more during the weekday AM peak period than any other time period, and demand is higher and closer to pre-pandemic levels during the PM peak. Since this analysis is focused on capturing areas where the assumptions underlying the RTP may be off base, it focuses on AM peak congestion, which has experienced greater changes.

Teleworking has a significant influence on outcomes. Teleworking reduces VMT, because teleworkers typically replace long commute trips with shorter trips throughout the day, but it leads to even bigger reductions in transit ridership, because currently people are roughly 50% more likely to use transit for commuting than for other trips. Our forecasts assume that the transit system continues to focus on serving commutes; reconfiguring the network to focus on other trips could help maximize both teleworking and transit ridership, as well as the resulting VMT reductions.

[30] VMT targets can be found at Oregon Department of Land Conservation and Development, Climate-Friendly and Equitable Communities Rulemaking Advisory Committee, RAC 11 item 10: Proposed Amendments to Division 44, January 11, 2022, p. 7. https://www.oregon.gov/lcd/LAR/Documents/2022-01_Div44.pdf. In addition to the 2045 target, the Metro region has a target to reduce VMT per capita by 20 percent by 2035.

[31] http://www.trimet.org/about/performance.htm

Table 8 below summarizes the range of impacts associated with each of the four metrics discussed above. These ranges represent the uncertainty that emerging trends create for these outcomes, which are critical to measuring progress toward regional goals. During the system-level performance analysis of the RTP we can use these factors to identify the range of uncertainty associated with different performance measure and assess how likely the region is to meet its performance targets given the different ways in which emerging trends could continue to unfold.

Table 8: Uncertainty ranges for key transportation metrics

Metric	Range
VMT per capita	-2.6% to -7.7%
Transit ridership	-3.2% to +9.1%

Arterial traffic analysis

Throughout the Emerging Transportation Trends Study we have shared data about how throughway traffic volumes and transit ridership have been changing. These data are consistently collected and reported by ODOT, TriMet, SMART and other agency partners.[32] However, these agency partners do not collect the same high quality of data on how arterial traffic volumes are changing. Metro's agency partners often conduct arterial counts at key points in the planning process, but rarely do so regularly and consistently in a way that would allow us to monitor how traffic is changing over time. Stakeholders have noted the absence of this arterial data and its importance in understanding how travel patterns are changing in the region, because throughways carry a higher proportion of people and goods that are passing through the region on route to other destinations than arterial do. Arterials are also a key area of focus for the RTP since they are the streets where most transit runs, where most crashes occur, and where many jobs and other destinations are located.

Arterial locations and data source

The project team purchased data from Streetlight, which estimates traffic volumes based on data from cell phones and other sources, for this analysis. The project budget allowed us to purchase data for 20 arterial count locations. Three factors drove the selection of these locations:

Aligning with ODOT automated traffic recorders: we selected arterial locations that paralleled stretches of throughways where ODOT has installed automated traffic recorders (ATRs) that continuously monitor traffic counts; these ATRs have supplied the data on throughway volumes that we have previously shared in the Emerging Trends study. Aligning arterial count locations with a subset of ATR locations allows us to validate

[32] In particular, prior Emerging Trends work has drawn on ODOT's COVID-19 Traffic Reports (https://www.oregon.gov/odot/data/pages/traffic-counting.aspx) for information on changes in throughway volumes and speeds during the pandemic, and TriMet's Ridership and Performance Statistics (https://trimet.org/about/performance.htm) for information on changes in transit ridership and performance. See the Task 1 and Task 2 technical memoranda for more detail on how these data sources were presented in prior Emerging Trends work.

Streetlight data against the ATR data[33] and ensure the two sources are comparable, as well as to compare counts between arterials and throughways located along the same corridor.

Representing regional mobility corridors: Metro has defined a set of mobility corridors throughout the region that connect different regional centers, and commonly uses these corridors in transportation analysis. Most of the locations we selected are on a geographically representative set of mobility corridors throughout the region. This enables us to compare throughway, arterial, and transit data and paint a more complete picture of how travel is changing along these corridors. For longer arterials that pass through the region, like Powell Boulevard and TV Highway, we selected several count locations along their length in order to examine how traffic changes as they pass through different communities.

Capturing freight routes: One of the trends under study is the increase in online shopping. The data we have reviewed in previous tasks suggests that goods kept moving through the region during the pandemic, even as people took fewer shopping trips, and that workers continued to travel to in-person jobs in the growing transportation and warehousing sector at facilities that are often located along freight routes. We included several count locations along the regional freight routes that were adopted in the 2018 RTP so that we could monitor how travel to and from some of the region's growing transportation, warehousing and industrial areas is changing. In particular, we included several freight routes along freight-heavy arterials that do not have parallel ATRs; these are locations where goods movement and in-person commutes may be a factor in how travel volumes are changing. The Streetlight data does not distinguish between freight vehicles and other vehicles but comparing changes in traffic volumes between freight routes and other locations may yield insights about the unique and/or changing role of freight routes during the pandemic. Table 9 summarizes the count locations used in this analysis.

Table 9: Summary of arterial count locations

Count location	Mobility corridor	Parallel ATR	Freight route?
NE Martin Luther King Blvd. @ NE Ainsworth St.	1: Portland to Vancouver	I-5 @ N Ainsworth St.	N
N. Interstate @ N Ainsworth St.	1: Portland to Vancouver	I-5 @ N Ainsworth St.	Y
SW Barbur Blvd. @ SW Capitol Hwy.	2: Portland to Tigard	I-5 @ Capitol Hwy.	N
NE Halsey Blvd. @ NE 148th Ave.	6: Gateway to Troutdale	1-84 @ NE 148th Ave.	N
NE Sandy Blvd. @ NE 148th Ave.	6: Gateway to Troutdale	1-84 @ NE 148th Ave.	N
SE Stark St. @ NE 148th Ave.	6: Gateway to Troutdale	1-84 @ NE 148th Ave.	N

[33] In addition to collecting Streetlight data from arterial count locations, we also collected Streetlight data for the same throughway count locations captured by the ATRs in the Portland region. We found that the average error between the Streetlight and ATR data was 0% for 2019 and -1% for 2020. Except for 3 outliers, the Streetlight values were within +/- 15% of the ATR values for the 40 observations included in the validation dataset. This is generally consistent with an ODOT assessment of pre-pandemic Streetlight data (https://www.oregon.gov/odot/Programs/ResearchDocuments/StreetlightEvaluation.pdf), which found an absolute percent error of 11% or less for facilities that carry over 10,000 vehicles per day – as is the case for all of the study locations except for one. We repeated this exercise with volume data from INRIX, another private transportation data source that ODOT makes available to transportation agencies in Oregon, and found that INRIX consistently overestimated traffic volumes during 2020, by an average of 15%. These findings led us to opt to use Streetlight instead. Contact Metro staff for more information on the results of this validation exercise.

Count location	Mobility corridor	Parallel ATR	Freight route?
NW Marine Dr. @ NW Frontage Rd.	6: Gateway to Troutdale	N/A	Y
NE 82nd Ave. @ NE Halsey St.	7: Gateway to Clark County	I-205 @ SE Washington St.	N
SE 82nd Avenue @ SE Foster Rd	8: Gateway to Oregon City	I-205 @ SE Steele St.	N
SE 122nd Avenue @ SE Foster Rd	8: Gateway to Oregon City	I-205 @ SE Steele St.	N
99W @ SW 124th Ave.	11: Tigard to Sherwood	I-5 @ SW Wilsonville Rd.	Y
NW Cornell Rd. @ 185th Ave.	14: Beaverton to Hillsboro	US-26 @ NW 170th Ave.	N
SW TV Hwy. @ SW 185th Ave.	14: Beaverton to Hillsboro	US-26 @ NW 170th Ave.	Y
SW Farmington Rd. @ SW 185th Ave.	14: Beaverton to Hillsboro	US-26 @ NW 170th Ave.	Y
SW TV Hwy. @ SE Brookwood Ave.	14: Beaverton to Hillsboro	N/A	Y
N Columbia Blvd. @ N Portland Rd.	17: Rivergate to I-5	N/A	Y
SE Powell Blvd. @ E end of Ross Island Br.	19: Portland to Lents	I-405 @ Marquam Br.	Y
W Powell Blvd. @ NE Hogan Dr.	20: Lents to Gresham	N/A	Y
OR 212 @ SE 98th	23: Clackamas to Damascus	OR-224 @ SE Mather Rd.	Y
OR 212 @ SE 172nd	23: Clackamas to Damascus	N/A	Y

For each of the locations listed above, we collected data for October 2019, 2020 and 2021. We focused on the month of October because it was during fall/spring instead of during summer/winter, when vacations influence travel patterns, and because October 2021 was one of the most recent months for which data was available at the time when we made the purchase. However, there are reasons why October may not be representative of normal travel conditions; new COVID-19 cases were high but declining from the peak of the Delta variant in October 2021, and the Labor Day wildfires of 2020 continued to impact travel into October of that year.[34]

Results

Comparing changes during different time periods

We examined how traffic volumes on the arterials studied changed by time of day (AM/PM peak,[35] midday) and by day of week (weekday[36] vs. weekend). Table 10 below summarizes how volumes changed between October 2019 and 2021 for the various time periods studied, by arterial. All values in the table are indexed to October 2019; i.e., they show the percentage change in traffic volumes between October '19 and '21.

[34]Though it was useful to have 2020 data for performing validation, we focus on comparing 2019 and 2021 data in our analysis, so the impact of the 2020 wildfires does not influence the results shown in this memo.

[35] Peak periods are defined as 7-10 AM and 4-7 PM, consistent with how these periods are defined in Metro's travel model.

[36] Weekday volumes are based on data from Tuesday-Thursday, which tend to be the days that best represent "typical" travel, consistent with Metro practice.

Table 10: Percent change in study arterial volumes by time period

Segment	Weekday All day 2019 to 2021 Change	Weekday 2019 to 2021 Change			Weekend 2019 to 2021 Change		
		AM Period	Midday Period	PM Period	AM Period	Midday Period	PM Period
NE Martin Luther King Blvd. @ NE Ainsworth St.	-14%	-17%	-7%	-16%	1%	-4%	-7%
N. Interstate @ N Ainsworth St.	-14%	-28%	-18%	14%	-30%	-13%	-20%
SW Barbur Blvd. @ SW Capitol Hwy.	-23%	-36%	-9%	-27%	22%	4%	14%
NE Halsey Blvd. @ NE 148th Ave.	-16%	-30%	-11%	-12%	-21%	-7%	2%
NE Sandy Blvd. @ NE 148th Ave.	-14%	-26%	-6%	-17%	-14%	4%	-9%
SE Stark St. @ NE 148th Ave.	-14%	-23%	-16%	-12%	27%	0%	8%
NW Marine Dr. @ NW Frontage Rd.	-6%	-16%	-2%	-9%	22%	12%	16%
NE 82nd Ave. @ NE Halsey St.	-17%	-25%	-12%	-18%	-17%	-6%	-6%
SE 82nd Avenue @ SE Foster Rd	-13%	-25%	-13%	-3%	-18%	-5%	-6%
SE 122nd Avenue @ SE Foster Rd	-9%	-21%	-8%	-5%	-30%	-19%	-1%
99W @ SW 124th Ave.	-12%	-26%	-4%	-12%	-8%	-1%	3%
NW Cornell Rd. @ 185th Ave.	-18%	-34%	-11%	-13%	1%	-5%	-3%
SW TV Hwy. @ SW 185th Ave.	-10%	-8%	-9%	-10%	-11%	6%	-4%
SW Farmington Rd. @ SW 185th Ave.	-13%	-22%	-6%	-9%	-21%	-7%	2%
SW TV Hwy. @ SE Brookwood Ave.	-14%	-22%	-12%	-16%	-11%	-3%	-1%
N Columbia Blvd. @ N Portland Rd.	-16%	-32%	-6%	-20%	-19%	-15%	-3%
SE Powell Blvd. @ E end of Ross Island Br.	-18%	-28%	-13%	-19%	1%	-4%	-1%
W Powell Blvd. @ NE Hogan Dr.	-9%	-14%	-4%	-5%	-6%	-11%	-2%
OR 212 @ SE 98th	-9%	-12%	-14%	-10%	-4%	-3%	3%
OR 212 @ SE 172nd	-6%	-11%	9%	-13%	-18%	-7%	-2%
Average	**-13%**	**-23%**	**-9%**	**-12%**	**-8%**	**-4%**	**-1%**

As of October 2021, **weekday arterial volumes were below pre-pandemic levels throughout the day at almost every location studied**. Weekend results were more scattered; traffic increased on some arterials and fell on others. The decline in weekday arterial volumes appears to be more severe than the decline in volumes on the region's throughways. Weekday volumes on the arterials studied declined by an average of 13 percent between October 2019 and 2021, compared to the declines of 5 percent and 3 percent that ODOT found when comparing throughway volumes between July 2019 and 2021 for I-5 and I-84 within the Portland region.

Arterial traffic decreased most significantly (by an average of 23%) during the weekday morning peak, followed by the weekday evening peak (by an average of

12%). This observation is consistent with research[37] and data analysis[38] finding that teleworkers are more likely to run errands in the afternoon than in the morning. It is significant since many transportation projects and policies in the region focus on managing peak levels of travel demand – and the congestion, safety risks, and emissions that come from that demand. Though peaks are less intense, research suggests that they may be spreading, such that the region is seeing a single continuous peak throughout the day that increases in intensity until the evening, and then declines. This may help to explain why many locations saw midday trips decline significantly less than peak trips.

The locations where peak demand fell the least are regional freight corridors in suburban areas of the region (e.g., Farmington Rd., OR 212, outer Marine Drive and outer Powell). There are several potential explanations for this, including:

- Goods kept moving during the pandemic, so freight traffic may have remained high on these routes.
- Traffic volumes have rebounded more in other parts of Oregon than in the Portland region, and trips through / into / out of the region could be driving up volumes in locations at the edge of the region.
- These corridors serve communities where incomes are lower, and people with low incomes are more likely to have in-person jobs.
- There are fewer travel options in these areas, which makes residents more likely to rely on cars.

Comparing changes in arterial throughway, arterial, and transit use

Many of the arterial locations that we studied carry transit and/or are aligned with traffic counters on parallel throughways. We combined transit and throughway data at these locations to get a more complete picture of how travel is changing along our study corridors. Though we do not have a large enough dataset to examine in detail how regional travel patterns are changing, having consistent data for this set of locations allows us to make an "apples-to-apples" comparison of regional trends in throughway, arterial and transit use.

[37] For example, see Pabilona and Vernon (2022), Telework, Wages, and Time Use in the United States, Review of Economics of the Household 20, 687-734. https://link.springer.com/article/10.1007/s11150-022-09601-1.
[38] https://www.streetlightdata.com/work-from-home-climate-change/?type=blog/

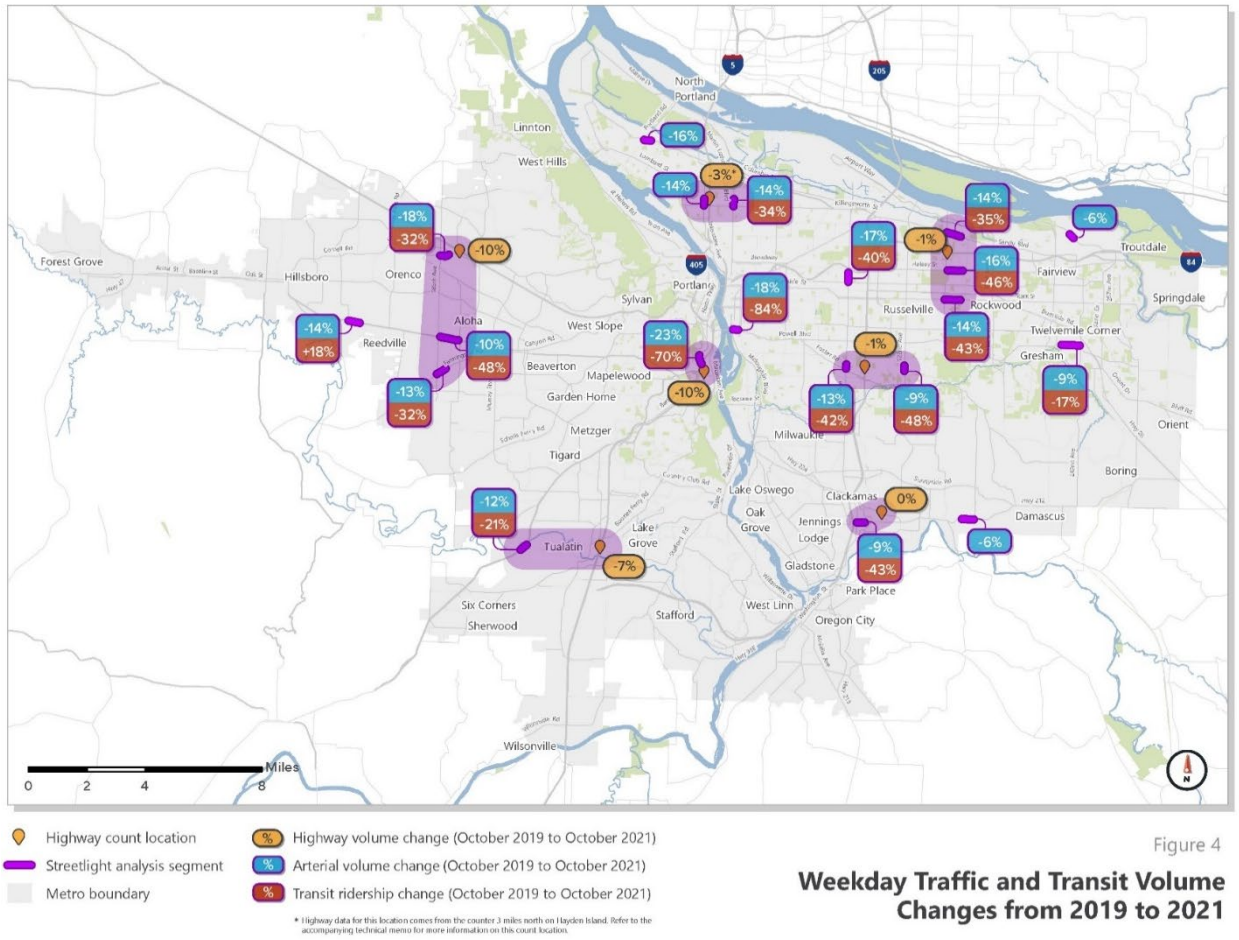
Table 11 summarizes arterial, throughway, and transit volume changes by corridor, and Figure 4 displays this data on a map.

Table 11: Percent change in weekday throughway, arterial, and transit use, 2019-21, by corridor/location

		Highway[1]	Parallel Arterial[2]		Transit Ridership[3]	
Highway	**Parallel Arterial**	**Percent Change**	**Percent Change**	**Average of Parallel Routes**	**Percent Change in Stop Ridership**	**Average of Parallel Routes**
Locations with highway, arterial, and transit data						
OR-224 @ SE Mather Rd.	OR 212 @ SE 98th Ave.	0%	-9%	-9%	-43%	-43%
I-5 @ SW Capitol Hwy.	SW Barbur Blvd. @ SW Capitol Hwy.	-10%	-23%	-23%	-70%	-70%
I-205 @ SE Steele St.	SE 82nd Ave. @ SE Foster Road	-1%	-13%	-11%	-42%	-45%
	SE 122 Ave. @ SE Foster Road		-9%		-48%	
I-84 @ NE 148th Ave.	NE Sandy Blvd. @ NE 148th Ave.	-1%	-14%	-15%	-35%	-41%
	NE Halsey Blvd. @ NE 148th Ave.		-16%		-46%	
	SE Stark St. @ NE 148th Ave.		-14%		-43%	
I-5 @ Hayden Island[4]	NE Martin Luther King Blvd. @ NE Ainsworth St.	-3%	-14%	-14%	N/A[5]	-34%
	N Interstate @ N Ainsworth St.		-14%		-34%	
I-5 @ SW Wilsonville Rd.	99W East of SW 124th Ave.	-7%	-12%	-12%	-21%	-21%
US-26 @ NW 170th Ave.	NW Cornell Rd. @ SW 185th Ave.	-10%	-18%	-14%	-32%	-37%
	SW TV Hwy @ SW 185th Ave.		-10%		-48%	
	SW Farmington Rd. @ SW 185th Ave.		-13%		-32%	
Average		**-5%**	**-14%**		**-41%**	
Locations with arterial and transit data only						
N/A	NE 82nd Ave. @ NE Halsey St.	N/A	-17%	-17%	-40%	-40%
	N Columbia Blvd. @ N Portland Rd.		-16%	-16%	N/A[5]	N/A
	NW Marine Dr. @ NW Frontage Rd.		6%	6%	N/A[5]	N/A
	OR 212 @ SE 172nd Ave.		-6%	-6%	N/A[5]	N/A
	SE Powell Blvd. @ E end of Ross Island Bridge.		-18%	-18%	-84%	-84%
	W Powell Blvd. @ NE Hogan Dr.		-9%	-9%	-17%	-17%

[1] Throughway data comes from ODOT's Automatic Traffic Recorders (ATR) and is a comparison of October 2019 and October 2021 volumes.
[2] Arterial data comes from Streetlight, Inc. and is a comparison of October 2019 and October 2021 volumes.
[3] Transit ridership data comes from TriMet quarterly Automatic Passenger Counters (APC) and is a three month average of weekday boardings/alightings from fall 2019 and fall 2021.
[4] I-5 @ N Ainsworth St. was one of 3 ATR locations used in this analysis that did not have complete data for October 2019, 2020, and 2021; we were able to use these locations in validation but not in the results. (The other two locations were I-205 @ SE Washington St. and I-405 @ Marquam Br.) Since I-5 from Portland to Vancouver is a high-volume corridor with several future projects planned and we had two parallel arterial count locations we prioritized collecting ATR data for this location. After comparing data from the I-5 @ N Ainsworth ATR with data from the Hayden Island ATR, roughly 3 miles to the north, we determined that the Hayden Island ATR was a valid proxy for the I-5 @ N Ainsworth ATR.
[5] N/A (not applicable) indicates that no transit routes serve the arterial count location in question.

Figure 4: Percent change in throughway, arterial, and transit use (average all-day travel volumes), 2019-21, by location



On average, across the study corridors:

- **Daily throughway trips decreased by five percent.**
- **Daily arterial trips decreased by 14 percent.**
- **Daily transit ridership decreased by 41 percent.**

In almost every location studied, **arterial volumes have decreased more significantly from pre-pandemic levels than throughway volumes have**. Potential explanations for this include:

- Throughways carry more freight trips (which have held steady during the pandemic) and trips through the region (which have fallen less than trips within the region).[39]
- Traffic is flowing more freely on throughways due to below-normal volumes, which means that fewer drivers divert off of the freeway onto arterials to avoid traffic.

[39] According to ODOT's COVID-19 traffic reports, throughway volumes in other areas of Oregon have returned to, and in some cases exceeded, pre-pandemic levels, while they are still slightly below normal in the Portland region.

Transit volumes are further below pre-pandemic levels in locations closer to the center of the region. Potential explanations for this include:

- Transit ridership and service levels are generally lower in suburban areas of the region, and a higher proportion of riders in these areas could be transit-dependent riders who continued to rely on transit throughout the pandemic.
- Commutes fell throughout the region, and some data suggests that trips to Downtown Portland fell more precipitously than in other regional downtowns. The two study locations where transit ridership declined the most – at SW Barbur and Capitol Highway and SE Powell at the Ross Island Bridge – involve transit routes that carry people into downtown. The table above presents all-day changes in transit ridership for comparison with throughway and arterial volumes. However, TriMet has found that off-peak service continues to see better ridership retention compared to peak service (as of July 2021, weekend ridership was down 38.7%, weekday off-peak ridership was down 45.3%, and weekday peak ridership was down 53.7% compared to May 2019[40]). Commute trips are more likely to occur during the peak, so this suggests that declining use of transit for commuting is a significant factor behind overall ridership losses.
- Incomes are generally higher toward the center of the region, and workers with higher incomes are more likely to be able to telework, so teleworking may be competing more with transit in communities at the center of the region.

Draft RTP guidance

Based on the draft findings from the Emerging Trends Study and their knowledge of how regional agencies are responding to these trends, the consultant team has identified seven opportunities to respond to these trends for Metro and its partners to pursue during the development of the RTP. For each of these opportunities, the team has identified *why* the opportunity is important to consider (based on findings from this study) and *how* the region might address the opportunity, both during the short term (through the process of developing the RTP in 2022-23) and the long term (when implementing the RTP in 2024 and beyond). Some of these recommendations are already being implemented by Metro and partner agencies, and many emphasize strategies that are already being implemented in the RTP in response to existing needs and policy direction. Table 12 below summarizes this draft guidance.

[40] Figures provided by TriMet staff.

Table 12: Summary of draft RTP guidance

Opportunity	Why	How
Prioritize transit ridership recovery	• Increasing transit service is critical to meeting the region's climate and equity goals. • Transit service and ridership fell dramatically during the pandemic. • Lingering health concerns and changing patterns of behavior (e.g., teleworking replacing transit commutes) make some former riders unlikely to return to transit.	In the short term: • Reconfigure the transit network to serve changing travel patterns (more midday errands, fewer peak commute trips, continued demand on routes that serve people of color and people with low incomes). • Extend existing options / explore new service options to expand coverage in selected areas. • Communicate with the public about measures that are underway to keep people safe and healthy when riding transit. • If arterial traffic volumes remain low, consider redesigning certain streets to prioritize transit. Over the long term: • Seek funding to expand the transportation system.
Confirm that previously planned high-priority/high cost auto and transit projects meet changing travel demand patterns	• Many major projects in the region aim to address peak levels of demand. As of the latest data, peak-period trips on the region's throughway, arterial and transit networks are all still below pre-pandemic levels. • Teleworking seems likely to remain popular, and teleworkers make fewer trips, particularly during the morning peak. • Transportation projects often seek to address peak-period conditions, which is when demand and congestion are the highest.	Over the short term: • Continue to monitor traffic volumes in the region until conditions stabilize. • Identify major capital projects in the RTP that are intended to address peak period demand and/or congestion, and review assumptions to ensure that they are consistent with how peak period traffic levels are changing. Over the long term: • Consider more frequent updates to transportation data sources and Metro's travel model to keep pace with changing behavior. • Increase the focus on managing demand – including accounting for new opportunities like congestion pricing and teleworking – before investing in system expansions.
Provide more diverse travel options to support changing travel patterns	• As teleworking increases, travel patterns are less driven by long-distance commutes and more by short-distance errands, school drop-offs and other trips. • E-bikes are gaining popularity, and workplace shuttles, and bike/scooter-share are thriving in some parts of the region.	Over the short term: • Develop consistent, comparable information on the benefits and cost-effectiveness of fixed-route transit, shuttles/vanpools, bike/scooter share, and other emerging modes to help identify the best type of service for different communities. • Prioritize closing gaps in bike/ped access to transit stations. • Consider whether additional safety measures are needed to protect midday travelers from potentially higher levels of midday traffic. Over the long term: • Seek stable funding for shuttles/vanpools, shared mobility, and other emerging travel options.
Maximize potential VMT reductions from teleworking	• Teleworkers are more likely to run errands by car throughout the day, potentially offsetting reductions in commute VMT. • Employers' teleworking policies and employees' reaction to office reopenings both vary widely.	Over the short term: • Consider the potential for mode shifts to teleworking when developing pricing and demand management programs. • Consider reallocating transit service to better serve short trips to commercial centers and corridors. Over the long term: • Coordinate with employers in job centers to balance day-to-day travel using hybrid work schedules.

Opportunity	Why	How
		• Support innovations that enable more teleworking at employers with a high number of in-person jobs.
Prioritize safe access to transit	• Personal safety is a growing concern for many travelers. • Safety is a particular concern for people of color, who are less likely to feel safe while using a variety of modes, including walking and transit. • People feel especially vulnerable when walking to / waiting for transit. Most transit riders report feeling safe when on the bus or train.	• Support equitable and innovative approaches to transportation safety, such as creating response teams trained in mental health and de-escalation. • Identify opportunities for travel options programs to fund lighting and other safety measures. • Improve transit reliability, frequency, and coordination to minimize the time riders spend waiting for transit.
Plan for the changing role of freight	• Freight played an increased role in shaping travel demand during the pandemic; goods continued to move even as people traveled less. • Increased online shopping is changing how goods move through our region. • Delivery trips have been concentrated in central cities. Some cities have used curb and parking management to manage conflicts between delivery vehicles and other modes.	Over the short term: • Increase data collection on freight, goods movement, and delivery activity. • Improve freight models and analysis tools. Over the long term: • Expand the use of parking management in regional centers.
Accelerate the adoption of electric bicycles, scooters, and shared vehicles.	• Electric bicycles and scooters are becoming more popular, more affordable, and more efficient for longer trips. • Shared e-bike and scooter systems can be effective in providing affordable access to these modes • Oregon's current transportation electrification programs focus overwhelmingly on electric cars and trucks. EV buyers are eligible for State rebates; e-bike buyers are not.	Over the short term: • Explore whether recent changes to federal funding sources enable regional programs to subsidize shared EV, bike, and scooter systems. • Advocate for the expansion of state and federal electric vehicle rebate programs to also provide rebates for electric bicycles. Over the long term: • Explore the potential to fund larger-scale deployment of shared EVs, bikes, and scooters through discretionary grants. • Coordinate investments in shared mobility with affordable housing investments. • Support transportation system plan updates in addressing shared and electric transportation. • Fund completion of the regional bicycle network.
Consider digital approaches to providing equitable access to opportunities.	• The pandemic both highlighted and elevated the importance of technology in connecting people to jobs, school, and goods. • Low-income people are significantly less likely to be able to telework or shop online. • Low-income people are more likely to face barriers to accessing technology, such as lack of affordable internet access and lack of bank accounts. • It seems likely that teleworking will continue to increase in the future, and that people who are able to telework will be able to apply for more job openings in a broader variety of locations.	Over the short term: • Explore opportunities to fund digital access (e.g., laptops and internet hotspots) or education programs that can help people shop, work, book transportation services, and meet other needs online. Over the long term: • Support investments in publicly-owned broadband networks or public-private partnerships that create low- or no-cost plans for low-income households.