Agenda

Metro
600 NE Grand Ave.
Portland, OR 97232-2736

Meeting: Transportation Policy Alternatives Committee (TPAC) RCPS Workshop #3
Date: Thursday, February 25, 2021
Time: 9:00 a.m. – 11:15 am
Place: Virtual meeting – Please click the link below to join the webinar:
https://us02web.zoom.us/j/82917589800?pwd=WXlUVUdyU1Zyb2pZUkNiUHhpTVRkUT09
Password: 869255
Phone: 877-475-4499 (Toll Free)

9:00 am	**1.**		**Introductions and Workshop Purpose**	**Tom Kloster, Chair**
9:10 am	**2.**		**Metro Regional Congestion Pricing Study Update** • Benefits of Congestion Pricing in other cities • A quick review of the group's October 7, 2020 discussion • What we have accomplished since that time • Updated Schedule	**Elizabeth Mros-O'Hara, Metro**
9:20 am	**3.**		**Pricing Scenarios: High Level Findings, Costs and Benefits** • Refresher on study goals, performance measures, and scenarios • Main findings overall • Main findings by family (VMT, Cordon, Parking, Roadway) • Looking at the overall costs to the region by scenario • Example of costs and benefits for individual trips • Reminder of scenario benefits ***Discussion: Do any of the scenarios seem particularly promising? Are any of them particularly concerning, looking at the data?***	**Alex Oreschak and Matt Bihn, Metro**
10:30 am	**4.**		**5 Minute Break**	
10:35 am	**5.**		**Equity: What we have Learned from Talking with Equity Experts** ***Discussion: How do you feel about these recommendations from equity experts? Are there other things we should be considering?***	**Elizabeth Mros-O'Hara, Metro**
10:50 am	**6.**		**Revenue Investment Opportunities** • What types of investments should pricing revenues be focused on to make each scenario work better? ***Discussion: How does reinvestment of revenues play into your thinking of Congestion Pricing in general, and in relation to any of these scenarios in particular?***	**Elizabeth Mros-O'Hara, Metro**
11:05 am	**8.**		**Expert Review Panel** • Purpose of the Expert Review Panel • Timing • Composition of the Panel	**Elizabeth Mros-O'Hara, Metro**
11:10 am	**9.**		**Schedule and Next Steps** • Overall project schedule • Outreach to stakeholder groups	**Elizabeth Mros-O'Hara, Metro**
11:15 am	**10.**		**Adjourn**	**Tom Kloster, Chair**

Metro respects civil rights

Metro fully complies with Title VI of the Civil Rights Act of 1964, Title II of the Americans with Disabilities Act , Section 504 of the Rehabilitation Act and other statutes that ban discrimination. If any person believes they have been discriminated against regarding the receipt of benefits or services because of race, color, national origin, sex, age or disability, they have the right to file a complaint with Metro. For information on Metro's civil rights program, or to obtain a discrimination complaint form, visit oregonmetro.gov/civilrights or call 503-797-1790. Metro provides services or accommodations upon request to persons with disabilities and people who need an interpreter at public meetings. If you need a sign language interpreter, communication aid or language assistance, call 503-797-1790 or TDD/TTY 503-797-1804 (8 a.m. to 5 p.m. weekdays) 5 business days before the meeting. All Metro meetings are wheelchair accessible. Individuals with service animals are welcome at Metro facilities, even where pets are generally prohibited. For up-to-date public transportation information, visit TriMet's website at trimet.org

Thông báo về sự Metro không kỳ thị của

Metro tôn trọng dân quyền. Muốn biết thêm thông tin về chương trình dân quyền của Metro, hoặc muốn lấy đơn khiếu nại về sự kỳ thị, xin xem trong www.oregonmetro.gov/civilrights. Nếu quý vị cần thông dịch viên ra dấu bằng tay, trợ giúp về tiếp xúc hay ngôn ngữ, xin gọi số 503-797-1700 (từ 8 giờ sáng đến 5 giờ chiều vào những ngày thường) trước buổi họp 5 ngày làm việc.

Повідомлення Metro про заборону дискримінації

Metro з повагою ставиться до громадянських прав. Для отримання інформації про програму Metro із захисту громадянських прав або форми скарги про дискримінацію відвідайте сайт www.oregonmetro.gov/civilrights. або Якщо вам потрібен перекладач на зборах, для задоволення вашого запиту зателефонуйте за номером 503-797-1700 з 8.00 до 17.00 у робочі дні за п'ять робочих днів до зборів.

Metro 的不歧視公告

尊重民權。欲瞭解Metro民權計畫的詳情，或獲取歧視投訴表，請瀏覽網站www.oregonmetro.gov/civilrights。如果您需要口譯方可參加公共會議，請在會議召開前5個營業日撥打503-797-1700（工作日上午8點至下午5點），以便我們滿足您的要求。

Ogeysiiska takooris la'aanta ee Metro

Metro waxay ixtiraamtaa xuquuqda madaniga. Si aad u heshid macluumaad ku saabsan barnaamijka xuquuqda madaniga ee Metro, ama aad u heshid warqadda ka cabashada takoorista, booqo www.oregonmetro.gov/civilrights. Haddii aad u baahan tahay turjubaan si aad uga qaybqaadatid kullan dadweyne, wac 503-797-1700 (8 gallinka hore illaa 5 gallinka dambe maalmaha shaqada) shan maalmo shaqo ka hor kullanka si loo tixgaliyo codsashadaada.

Metro의 차별 금지 관련 통지서

Metro의 시민권 프로그램에 대한 정보 또는 차별 항의서 양식을 얻으려면, 또는 차별에 대한 불만을 신고 할 수www.oregonmetro.gov/civilrights. 당신의 언어 지원이 필요한 경우, 회의에 앞서 5 영업일 (오후 5시 주중에 오전 8시) 503-797-1700를 호출합니다.

Metroの差別禁止通知

Metroでは公民権を尊重しています。Metroの公民権プログラムに関する情報について、または差別苦情フォームを入手するには、www.oregonmetro.gov/civilrights。までお電話ください公開会議で言語通訳を必要とされる方は、Metroがご要請に対応できるよう、公開会議の5営業日前までに503-797-1700（平日午前8時～午後5時）までお電話ください。

សេចក្តីជូនដំណឹងអំពីការមិនរើសអើងរបស់ Metro

ការគោរពសិទ្ធិពលរដ្ឋរបស់ ។ សំរាប់ព័ត៌មានអំពីកម្មវិធីសិទ្ធិពលរដ្ឋរបស់ Metro ឬដើម្បីទទួលពាក្យបណ្តឹងរើសអើងសូមចូលទស្សនាគេហទំព័រ www.oregonmetro.gov/civilrights។ បើលោកអ្នកត្រូវការអ្នកបកប្រែភាសានៅពេលអង្គប្រជុំសាធារណៈ សូមទូរស័ព្ទមកលេខ 503-797-1700 (ម៉ោង 8 ព្រឹកដល់ម៉ោង 5 ល្ងាច ថ្ងៃធ្វើការ) ប្រាំពីរថ្ងៃ ថ្ងៃធ្វើការ មុនថ្ងៃប្រជុំដើម្បីអាចឲ្យគេសម្រួលតាមសំណើរបស់លោកអ្នក ។

إشعار بعدم التمييز من Metro

تحترم Metro الحقوق المدنية. للمزيد من المعلومات حول برنامج Metro للحقوق المدنية أو لإيداع شكوى ضد التمييز، يُرجى زيارة الموقع الإلكتروني www.oregonmetro.gov/civilrights. إن كنت بحاجة إلى مساعدة في اللغة، يجب عليك الاتصال مقدماً برقم الهاتف 503-797-1700 (من الساعة 8 صباحاً حتى الساعة 5 مساءاً، أيام الاثنين إلى الجمعة) قبل خمسة (5) أيام عمل من موعد الاجتماع.

Paunawa ng Metro sa kawalan ng diskriminasyon

Iginagalang ng Metro ang mga karapatang sibil. Para sa impormasyon tungkol sa programa ng Metro sa mga karapatang sibil, o upang makakuha ng porma ng reklamo sa diskriminasyon, bisitahin ang www.oregonmetro.gov/civilrights. Kung kailangan ninyo ng interpreter ng wika sa isang pampublikong pulong, tumawag sa 503-797-1700 (8 a.m. hanggang 5 p.m. Lunes hanggang Biyernes) lima araw ng trabaho bago ang pulong upang mapagbigyan ang inyong kahilingan.

Notificación de no discriminación de Metro

Metro respeta los derechos civiles. Para obtener información sobre el programa de derechos civiles de Metro o para obtener un formulario de reclamo por discriminación, ingrese a www.oregonmetro.gov/civilrights . Si necesita asistencia con el idioma, llame al 503-797-1700 (de 8:00 a. m. a 5:00 p. m. los días de semana) 5 días laborales antes de la asamblea.

Уведомление о недопущении дискриминации от Metro

Metro уважает гражданские права. Узнать о программе Metro по соблюдению гражданских прав и получить форму жалобы о дискриминации можно на веб-сайте www.oregonmetro.gov/civilrights. Если вам нужен переводчик на общественном собрании, оставьте свой запрос, позвонив по номеру 503-797-1700 в рабочие дни с 8:00 до 17:00 и за пять рабочих дней до даты собрания.

Avizul Metro privind nediscriminarea

Metro respectă drepturile civile. Pentru informații cu privire la programul Metro pentru drepturi civile sau pentru a obține un formular de reclamație împotriva discriminării, vizitați www.oregonmetro.gov/civilrights. Dacă aveți nevoie de un interpret de limbă la o ședință publică, sunați la 503-797-1700 (între orele 8 și 5, în timpul zilelor lucrătoare) cu cinci zile lucrătoare înainte de ședință, pentru a putea să vă răspunde în mod favorabil la cerere.

Metro txoj kev ntxub ntxaug daim ntawv ceeb toom

Metro tributes cai. Rau cov lus qhia txog Metro txoj cai kev pab, los yog kom sau ib daim ntawv tsis txaus siab, mus saib www.oregonmetro.gov/civilrights. Yog hais tias koj xav tau lus kev pab, hu rau 503-797-1700 (8 teev sawv ntxov txog 5 teev tsaus ntuj weekdays) 5 hnub ua hauj lwm ua ntej ntawm lub rooj sib tham.

Memo

Metro
600 NE Grand Ave.
Portland, OR 97232-2736

Date: February 25, 2021
To: Transportation Policy Alternatives Committee and Interested Parties
From: Elizabeth Mros-O'Hara, RCPS Project Manager
Subject: Regional Congestion Pricing Study – Workshop #3

Purpose
This workshop is a follow up to the TPAC Workshop on October 7, 2020. Staff will provide TPAC an update on the Regional Congestion Pricing Study (RCPS), focusing on the modeled outcomes and analysis around eight refined pricing scenarios tested and next steps.

Request to TPAC
Provide input and comment on the congestion pricing analysis and modeled findings.

Scope of Work

The RCPS is evaluating the performance of different pricing concepts by testing a series of modeling scenarios, research, memos, and feedback from experts in the field. The study is evaluating congestion pricing as a tool to accomplish the four primary transportation regional priorities identified in the 2018 Regional Transportation Plan (RTP): addressing climate, managing congestion, getting to Vision Zero (safety), and reducing disparities (equity).

This analysis will provide a foundational understanding of how congestion pricing tools could perform with our region's land use and transportation system. This information will be combined with research and analysis around implementation and equity considerations. The intent is to inform policy makers and existing and future projects in our region.

Project Goal**:** *To understand how our region could use congestion pricing to manage traffic demand to meet climate goals without adversely impacting safety or equity.*

The study is evaluating four different pricing concepts to understand how they would perform in our region with our land use and transportation system. Pricing concepts being assessed are:

- Cordon/Area: charges drivers to enter and/or drive within a defined boundary
- Vehicle Miles Traveled/Road User Charge: a charge based on how many miles are traveled by auto
- Roadway: a direct charge to use a specific roadway or specific roadways
- Parking: charges to park in specific areas

Refined Scenarios

Since we last met in October, the RCPS team has refined modeling scenarios to better test the performance of the different pricing concepts and further analyze how well they perform relative to the RTP priorities. Table 1: Base and Refined Pricing Model Scenarios describes the Base Scenario and the eight refined scenarios analyzed.

Table 1. Base and Refined Model Scenarios Descriptions

Scenario Name	Description	Detailed Description/Assumptions
Base	Background network for all scenarios. Baseline for comparison.	• 2027 Constrained Scenario from the 2018 RTP o Assumes growth in population and employment, capital investments, and increased spending on transit operations o Vehicle operating cost per mile $0.211 o 4-County Region including Clark County
Vehicle Miles Traveled B - (VMT B)	Charge per mile driven – higher than Base	• Price applied for driving anywhere within the Metropolitan Planning Area (MPA) (see Figure 1) • VMT charge included in $0.2795 vehicle operating cost per mile (32% increase over Base)
Vehicle Miles Traveled C- (VMT C)	Charge per mile driven – higher than VMTB	• Price applied for driving anywhere within the MPA • VMT charge included in $0.343 vehicle operating cost per mile (63% increase over Base)
Cordon A – (COR A)	Charge to enter a defined boundary – central west side	• Cordon A boundary includes downtown Portland, South Waterfront and parts of NW Portland (see Figure 2) • $7 (2020$) to enter cordon • No charge for through trips on highways (i.e. US 26 from Sunset Hwy to Powell Blvd) through cordon
Cordon B – (COR B)	Charge to enter defined boundary – central west and east sides	• Cordon B boundary is Cordon A plus areas east of the Willamette River (Central Eastside Industrial District and the Lloyd District) (see Figure 3) • $7 (2020$) to enter cordon • No charge for through trips on highways (i.e. US 26 from Sunset Hwy to Powell Blvd) through cordon
Parking A – (Park A)	Charge to park in key areas – higher cost, new locales	• Charges for all areas identified in the 2018 RTP 2040 FC Scenario- except in Clark Co. (same as Base Clark Co.) • More locations charged and higher costs than Base o Up to $16.30 per hour in downtown Portland • Locations and prices are shown on Figure 4
Parking B- (Park B)	Charge to park in key areas – very high cost, new locales	• Doubles charges for all areas identified in the 2018 RTP 2040 FC Scenario- except in Clark Co. (same as Base in Clark Co.) • More locations charged and much higher costs than Base o Up to $32.60 per hour in downtown Portland • Locations and prices before doubling are shown on Figure 4
Roadway A- (RD A)	Charge per mile driven on throughways	• Throughways (limited access roadways) in MPA are charged • $0.132 vehicle operating cost per mile on throughways
Roadway B- (RD B)	Charge per mile driven on throughways – double cost of RD A	• Throughways (limited access roadways) in MPA are charged • $0.264 vehicle operating cost per mile on throughways (doubled Roadway A)

Note: All costs are 2010 dollars unless otherwise specified.

Figure 1. Metropolitan Planning Area (MPA) Boundary

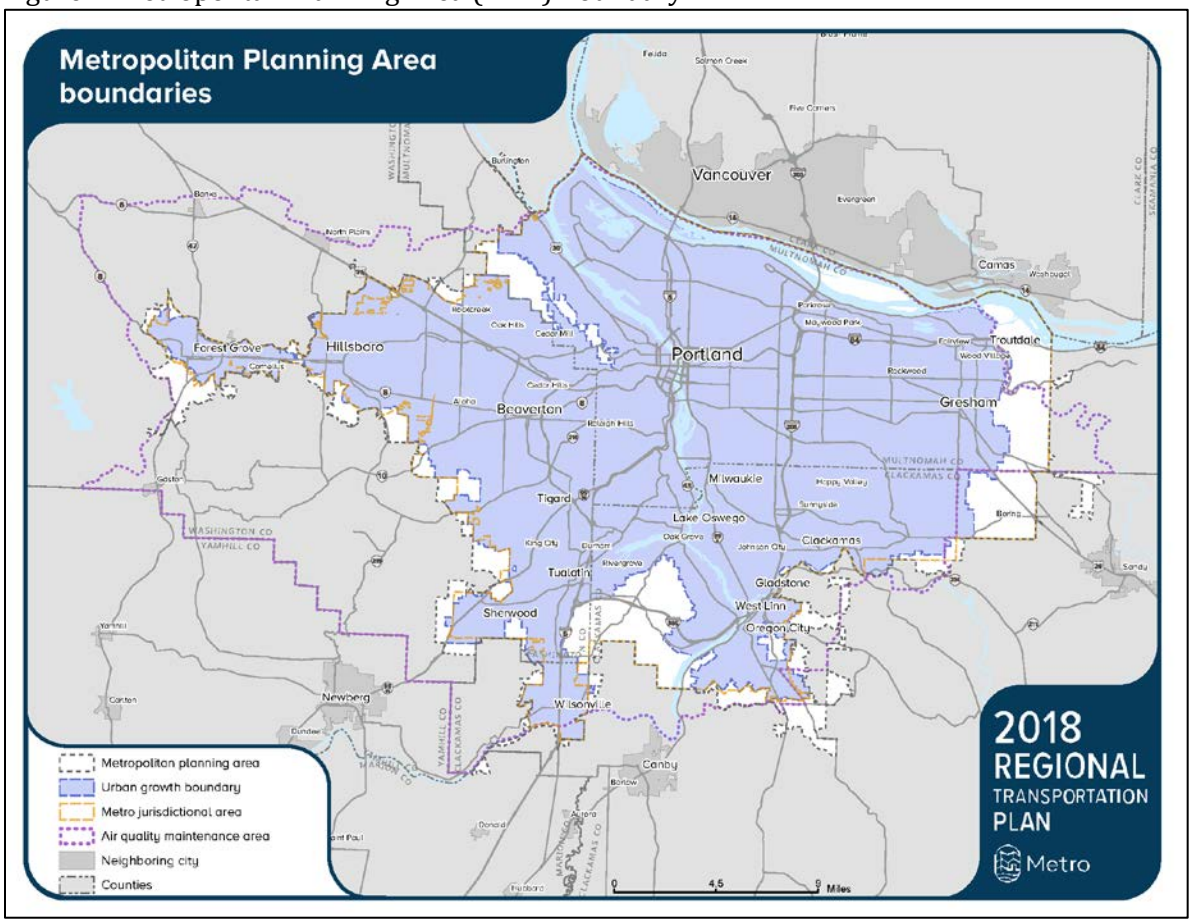


Figure 2. Cordon A- charge to enter yellow area

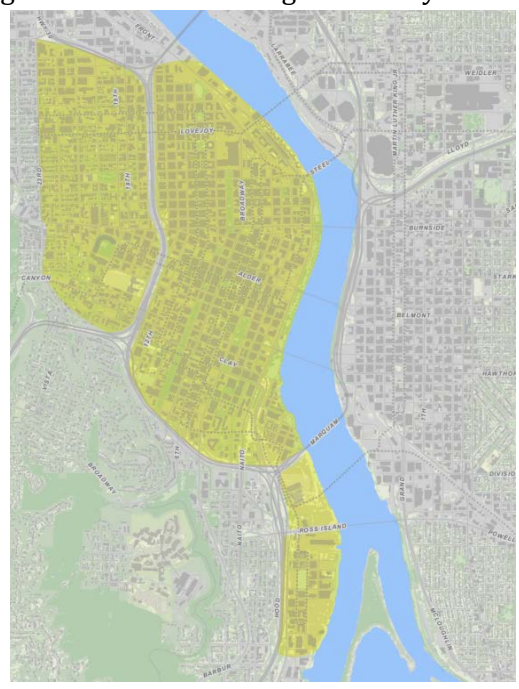


Figure 3. Cordon B- charge to enter yellow area

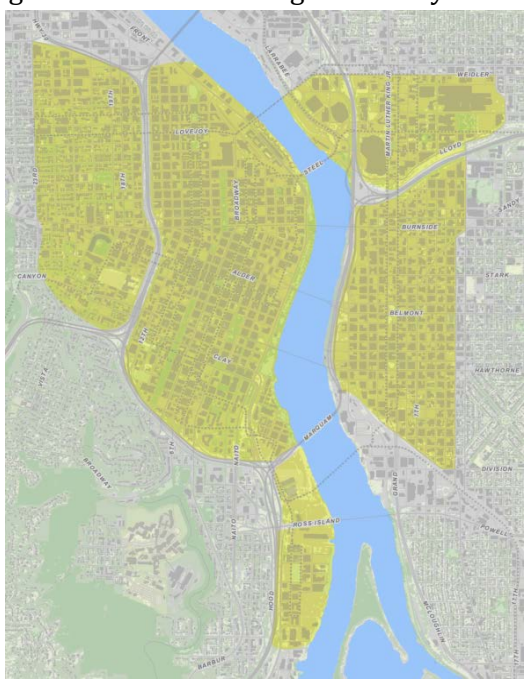
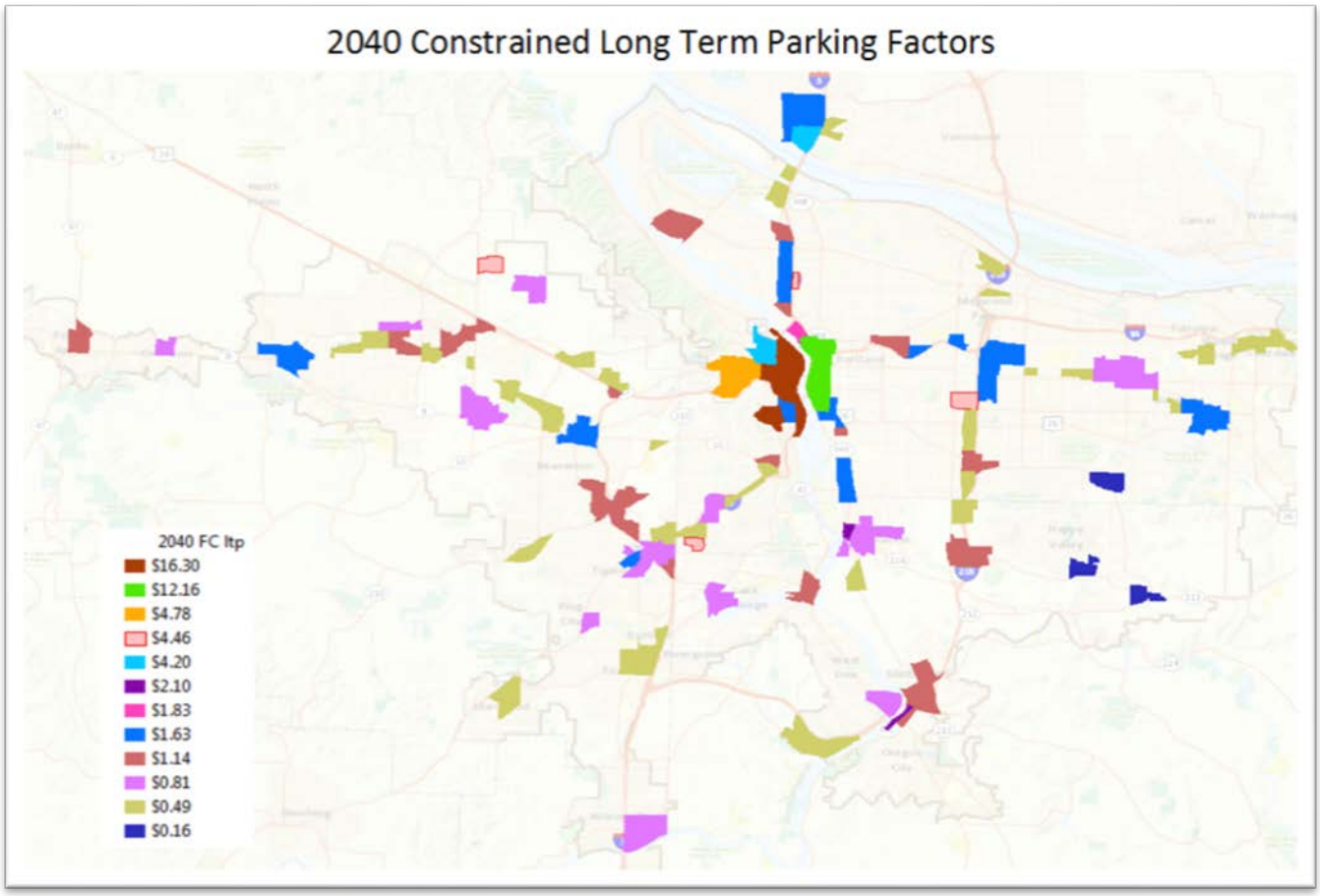
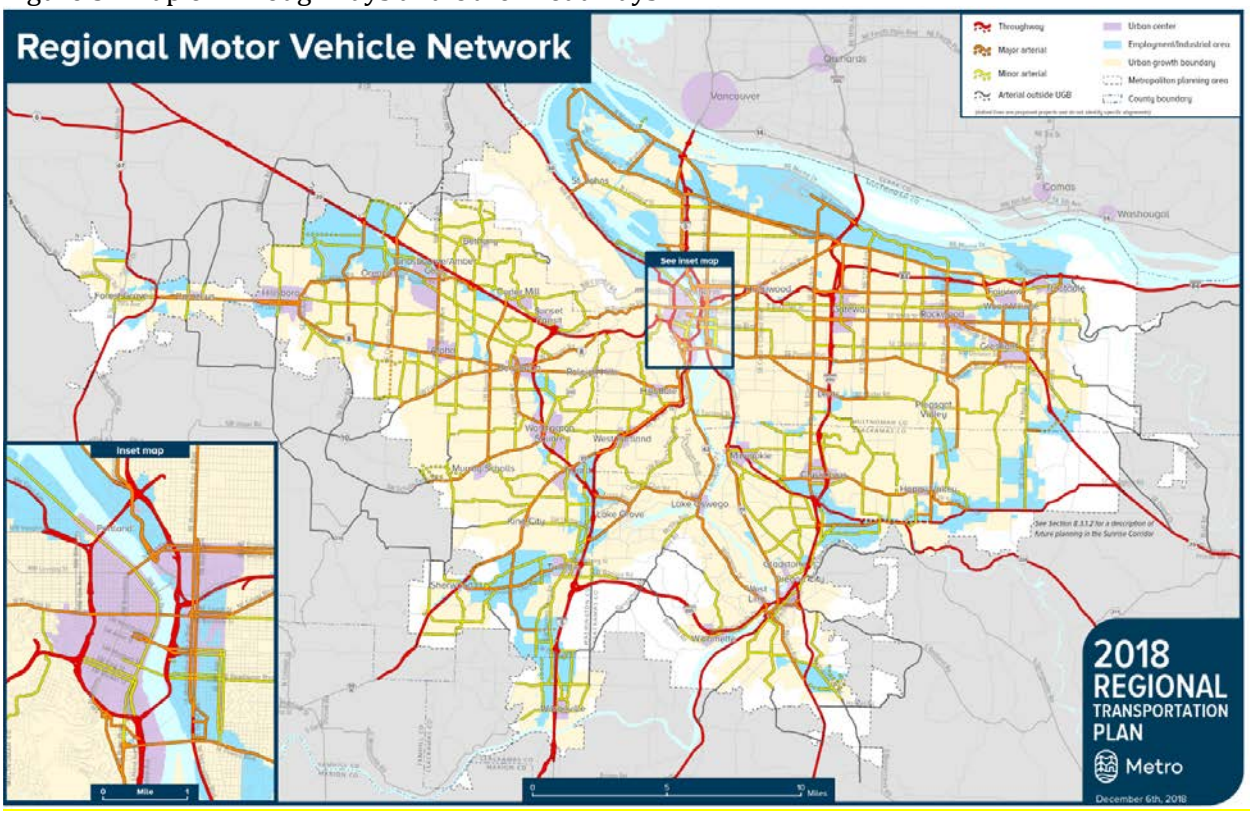


Figure 4: Parking Scenarios Parking Charge Locations and Amounts



Note: In Oregon, Parking A Scenario applied these charges, and Parking B Scenario doubled these charges. The parking areas in Vancouver maintained the charge rates from the Base Scenario.

Figure 5: Map of Throughways and Other Roadways



Throughways include the freeways and limited access roadways shown in red in Figure 5. Throughways are assessed a charge under the Roadway scenarios, but are exempt from charges as they run through the cordon area under the Cordon scenarios.

Key Findings

Context

The RCPS findings are based on outcomes from modeled scenarios that have not been adjusted to address concerns that the modeled outcomes show for the scenarios. The study scenarios provide a general assessment of performance and do not to take into account potential for discounted charges for key groups or targeting revenue investment to address areas of concern that arise from the analysis. Equity of a pricing program is largely determined by three things:

1. who is receiving the benefit of more reliable/better travel options,
2. who is being charged and how much, and
3. where and how the revenues are invested.

Any actual project proposed would be expected to address issues around congestion, safety, climate, and equity—considering targeted discounts, project design, and/or funding investments that address concerns. The RCPS findings do not address the concerns revealed but point to areas for project proponents to keep in mind when developing a pricing project.

Big Picture and More-detailed Key Findings from the Modeled Scenarios

All four types of pricing are shown to help address congestion and climate priorities.

- All eight scenarios reduce the drive alone rate, vehicle miles traveled, and greenhouse gas emissions.
- All scenarios increase daily transit trips, except Roadway A which has minimal change.

Overall regional transportation costs and individual traveler costs vary by scenario.

- All eight scenarios increase the overall cost for travel for the region, but some scenarios spread the costs widely while others concentrate them on fewer travelers. Those that spread the costs also have the highest overall cost for the region.

Geographic distribution of benefits and costs varies by scenario.

- Roadway scenarios reduce delay on freeways, but increase delay on arterials relative to the Base Scenario.
- Corridor scenarios create delay around the perimeter of the cordon boundaries with vehicles avoiding paying the charge.
- Distribution of benefits and costs have implications for where fee discounts and investments from revenues should be targeted.

There are tradeoffs for implementing pricing scenarios

- Vehicle miles traveled scenarios have positive results for all eight summary metrics for congestion, climate, and equity, but also had the highest overall travel costs for the region. However, the costs are spread widely as they are shared by all drivers.

Attachment 1: Draft Summary of Key Findings describes in more detail how the eight scenarios performed relative to the Base Scenario on eight modeled performance measures.

Questions for TPAC

- What questions or comments do TPAC members have regarding the findings?
- Are the modeling outputs and findings intuitive?
- Are there specific areas where you want more information?

Next Steps

Staff will incorporate feedback from the TPAC and augment the model and geographic analysis with equity and implementation considerations to better assess the potential for different congestion pricing options to succeed in our region. The equity analysis will incorporate feedback gathered from equity experts at Metro's Committee on Racial Equity (CORE), the City of Portland's Pricing Options for Equitable Mobility (POEM) Task Force, and ODOT's Equity and Mobility Advisory Committee (EMAC). In addition, the findings will be reviewed by an independent Expert Review Panel that will evaluate our methods and findings and provide insights gleaned from their work in North America and Europe. TPAC and other regional bodies will be invited to hear the Expert Review Panel discussion. Draft and final reports will be shared with the TPAC, JPACT, and Metro Council in June.

Table 2: Regional Congestion Pricing Technical Study Schedule

Activity	Timeframe
Create draft findings memorandum- include feedback from TPAC Workshop, Equity Groups, and research from consultant team and staff	April 2021
Share draft findings with regional leadership • Metro Council Briefing • JPACT Briefing	April 15, 2021
Expert Review Panel Discussion • Congestion pricing experts with experience on pricing projects in different parts of the world weigh in on our findings and provide insights from work done elsewhere	April 22, 2021
Revise/incorporate feedback and create final analysis report with feedback from TPAC, JPACT, and Metro Council. Return to TPAC, JPACT, and Metro Council with results for discussion • TPAC presentation --June 4, 2021 • JPACT presentation-- June 17 ,2021 • Metro Council presentation--June 24, 2021	May - June 2021
Release final pricing analysis report	June/July 2021

Attachments:

Attachment 1: Draft Summary of Key Findings

Metro Regional Congestion Pricing Study

DRAFT MODELING RESULTS – 02/25/21 FINDINGS

Key Takeaways

VMTB –charge per mile driven

1. Approximately 1.3 times the cost of driving in Base.
2. Improvements on all modeled performance measures.
3. VMTB shows impacts to driver behavior at a region-wide scale.
   a. Performs well at reducing VMT, drive alone rate, delay, and emissions.
   b. Also improves transit trips and job access via both transit and auto.
   c. Auto volumes decrease on most facilities
4. Second highest travel costs at a regional scale; costs are throughout MPA on all drivers
5. Combines high increase in travel costs with low improvement in auto jobs access in outer areas (many Equity Focus Areas[i]).

VMTC – higher charge per mile driven

1. Approximately 1.6 times the cost of driving in Base.
2. Even more improvement on all modeled performance measures than with VMTB.
3. VMTC shows a very substantial impact to driver behavior at a region-wide scale.
   a. Largest reduction in VMT, drive-alone rate, and emissions.
   b. Largest improvement in job access via both transit and auto
   c. Very effective at reducing delay
4. Highest travel costs at a regional scale; costs are throughout MPA shared by all drivers
5. Combines high increase in travel cost with low improvements in auto accessibility to jobs occur in outer areas (many Equity Focus Areas[i]).

CordonA – drivers charged to enter an area

1. Charge of $7 ($2020) to enter downtown, South Waterfront and Northwest Portland core from any direction.
2. No charge for using highways (US-26, I-405, I-5) to travel through the cordon area.
3. Benefits and impacts are diluted when observed at a regional scale. Benefits are localized.
4. Overall, increases delay (especially on throughways near downtown Portland) as drivers seek to avoid paying toll and shift to freeways and arterials parallel to cordon.
5. Jobs access decreases via auto, improves slightly via transit. Reductions in drive-alone rate and VMT, and increase in transit trips.
6. Cost to the region as a whole is low. The cost will only accrue to those entering the cordon.
7. Highest travel costs occur to people living outside, but near the cordon.

CordonB – drivers charged to enter larger area

1. Same charge as CordonA, but extends boundary to Central Eastside and Lloyd District.
2. No charge for using highways (US-26, I-405, I-5) to travel through the cordon area.
3. Results similar to CordonA. Benefits and impacts are diluted when observed at a regional scale. Benefits are localized.
4. Overall, increases delay (especially on throughways near downtown Portland) as drivers seek to avoid paying toll and shift to freeways and arterials parallel to cordon.
5. Jobs access decreases via auto, improves via transit.
6. Reductions in drive-alone rate and VMT, and increase in transit trips.
7. Cost to the region as a whole is low. The cost will only accrue to those entering the cordon.
8. Highest travel costs occur to people living outside, but near the cordon.

ParkingA – higher charges to park

1. ParkingA scenario charges for parking locations identified in the 2040 FC RTP.
2. Benefits and impacts are diluted when observed at a regional scale. Benefits are localized.
3. VMT, delay, and drive alone rates decrease, and job access increases for both auto and transit.
4. Some reduction in auto volumes mainly near downtown Portland, mainly due to drivers shifting to transit.
5. Cost to region as a whole is low. Only drivers who park in areas with parking charges will pay; some areas have low charges and some have higher charges.

ParkingB – much higher charges to park

1. Same locations charged as ParkingA. Costs are doubled over 2040 FC RTP assumed costs for short-and long-term parking.
2. Benefits and impacts are diluted when observed at a regional scale. Benefits are localized.
3. VMT, delay, and drive alone rates decrease, and job access increases for both auto and transit.
4. Some reduction in auto volumes mainly near downtown Portland and other employment centers, mainly due to drivers shifting to transit.
5. Cost to region as a whole is low. Only drivers who park in areas with parking charges will pay; some areas have low charges and some have higher charges.

RoadwayA – toll on highways

1. Charges for use of "throughways" at a similar rate to VMTC per mile: $0.312/mile over base. Other roadways are not charged. (Throughways are freeways and limited access roadways.)
2. Reduces VMT, drive alone rate, and emissions, and increases job access via auto.
3. Reduces delay on highways, but increases delay on arterials (traffic diverts onto arterials to avoid tolls).
4. Diversion onto arterials reduces access to jobs via transit, impacting lower wage workers and people in equity focus areas more than the region as a whole.
5. More region-wide travel costs than Parking or Cordon scenarios, with more travelers paying a charge.
6. People living near freeways tend to pay higher costs.

RoadwayB – higher toll on highways

1. RoadwayB doubles the cost of RoadwayA for travel on throughways.
2. Reduces VMT, drive alone rate, and emissions, and increases job access via auto.
3. Largest reduction in delay on highways, but largest increase in delay on arterials (traffic diverts onto arterials to avoid tolls) for all scenarios.
4. Diversion onto arterials reduces access to jobs via transit even more than RoadwayA, impacting lower wage workers and people in equity focus areas more than the region as a whole.
5. Lower region-wide travel costs than RoadwayA despite a much higher per-mile charge.

Table 1: Summary of Draft Key Findings from Metro Regional Congestion Pricing Study

RTP Goal	Metrics	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Congestion & Climate	Daily VMT								
	Drive Alone Rate								
	Daily Transit Trips								
	2HR Freeway VHD								
	2HR Arterial VHD								
Climate	Emissions								
Equity	Job Access (Auto)								
	Job Access (Transit)								
	Total Regional Travel Cost	Medium-High	High	Medium-Low	Medium-Low	Low	Low	Medium	Medium

The above table provides a high-level summary of the draft findings discussed in this document for each scenario across the modeled metrics. Scenario modeling results were compared results from Metro's 2018 Regional Transportation Plan to determine approximate benchmarks to indicate positive or negative impacts for each metric. This table displays how each scenario performs against those benchmarks, and allows for a quick comparison of different scenarios in a visual format; a legend that details the ranges for categorizing each metric is provided below, and descriptions of each metric are provided on the following page. The results shown in this table show only the effects of charging drivers under different scenarios; implementation of mitigations, discounts, or other changes to policies could results in changes to the performance of a scenario.

All eight scenarios provide at least a small positive change for drive alone rate and emissions, while seven of the eight scenarios provide at least a small positive change for daily VMT and daily transit trips.

The two VMT scenarios and the Parking B scenario have all positive regional results across metrics, while the Parking A scenario has mostly positive results, but also minimal changes for two metrics (Daily VMT and Job Access via Transit). The two Cordon scenarios and the two Roadway scenarios have more mixed results. Both Cordon scenarios have small to moderate negative changes for both delay and job access via auto. This appears to be the result of drivers seeking to avoid the charge in the cordon area and remaining on highways or nearby arterials instead of utilizing surface streets within the cordon boundaries. The two Roadway scenarios see moderate to large negative changes in arterial delay, as well as minimal change to small negative change in Job Access via Transit. This appears to be the result of drivers seeking to avoid the charge on the highways and diverting to arterial streets near the charged roadways. As noted above, a specific tolling program could be designed and implemented in a way that could mitigate these negative changes; however, this study does not model the effects of any such mitigations.

Legend	Daily VMT	Drive Alone Rate	Job Access (Auto)	Job Access (Transit)	Daily Transit Trips	2HR Freeway VHD	2HR Arterial VHD	Emissions
Large Negative Change	5% or more	5% or more	-10% or more	-5% or more	-10% or more	10% or more	10% or more	5% or more
Moderate Negative Change	2% to 5%	2% to 5%	-5% to -10%	-2% to -5%	-5% to -10%	5% to 10%	5% to 10%	2% to 5%
Small Negative Change	0.5% to 2%	0.5% to 2%	-1% to -5%	-0.5% to -2%	-1% to -5%	1% to 5%	1% to 5%	0.5% to 2%
Minimal Change	0.5% to -0.5%	0.5% to -0.5%	1% to -1%	0.5% to -0.5%	1% to -1%	1% to -1%	1% to -1%	0.5% to -0.5%
Small Positive Change	-0.5% to -2%	-0.5% to -2%	1% to 5%	0.5% to 2%	1% to 5%	-1% to -5%	-1% to -5%	-0.5% to -2%
Moderate Positive Change	-2% to -5%	-2% to -5%	5% to 10%	2% to 5%	5% to 10%	-5% to -10%	-5% to -10%	-2% to -5%
Large Positive Change	-5% or more	-5% or more	10% or more	5% or more	10% or more	-10% or more	-10% or more	-5% or more

Definitions of Performance Metrics:

Daily VMT: vehicle miles traveled (daily)

Drive Alone Rate: percentage of total daily trips undertaken by drivers without passengers

Daily Transit Trips: Number of total transit trips (daily)

2HR Freeway VHD: freeway vehicle hours of delay. The total time accrued by all vehicles traveling on model freeway links with volume-to-capacity ratio of over 0.9 during the PM peak.

2HR Arterial VHD: arterial vehicle hours of delay. The total time accrued by all vehicles traveling on model arterial links with volume-to-capacity ratio of over 0.9 during the PM peak.

Emissions: percent change in greenhouse gas and other emissions including: CO_{2e}, $PM_{2.5}$, PM_{10}, NOx, and VOC, calculated using Metro's Multi-Criteria Evaluation (MCE) tool, which estimates quantitative social return on investment of scenarios and applies emission rates derived from Metro's application of EPA's MOVES model to VMT of each scenario

Job Access (Auto): the number of jobs within 30 minutes by auto, averaged by TAZ and weighted by number of households

Job Access (Transit): the number of jobs within 45 minutes by transit, averaged by TAZ and weighted by number of households

Total Regional Travel Cost: The average weekday (2027) sum of all users' cost to travel, including auto operating cost, tolls, parking charges, and transit fares, expressed in thousands of 2010$.

---

[i] **Equity Focus Areas:** locations identified as part of the 2018 RTP Equity analysis that include census tracts with high concentrations of people of color, people in poverty and people with limited English proficiency.

Community	Geography Threshold
People of Color	The census tracts which are above the regional rate for people of color (28.6%) AND the census tract has twice (2x) the population density of the regional average (regional average is 1.1 person per acre).
People in Poverty	The census tracts which are above the regional rate for low-income households (28.5%) AND the census tract has twice (2x) the population density of the regional average (regional average is 1.1 person per acre).
People with Limited English Proficiency	The census tracts which are above the regional rate for limited English proficiency speakers (7.9%) AND the census tract has twice (2x) the population density of the regional average (regional average is .3 person per acre)

Source: Metro, 2018 RTP transportation equity work group

Materials following this page were distributed at the meeting.

Regional Congestion Pricing Study

TPAC Workshop – February 25, 2021

DRAFT

Agenda

- Study Update
- Pricing Scenarios: High Level Findings, Costs and Benefits
- Equity Considerations
- Improving on Scenarios– Design considerations, Revenue Investment Opportunities, Further analysis
- Expert Review Panel
- Schedule and Next Steps

DRAFT

Workshop Purpose

1. *To review what we found from modeling VMT, Cordon, Parking, and Roadway scenarios.*
2. *To share what we have found from talking with Equity Experts and looking at current conditions in our region.*

DRAFT

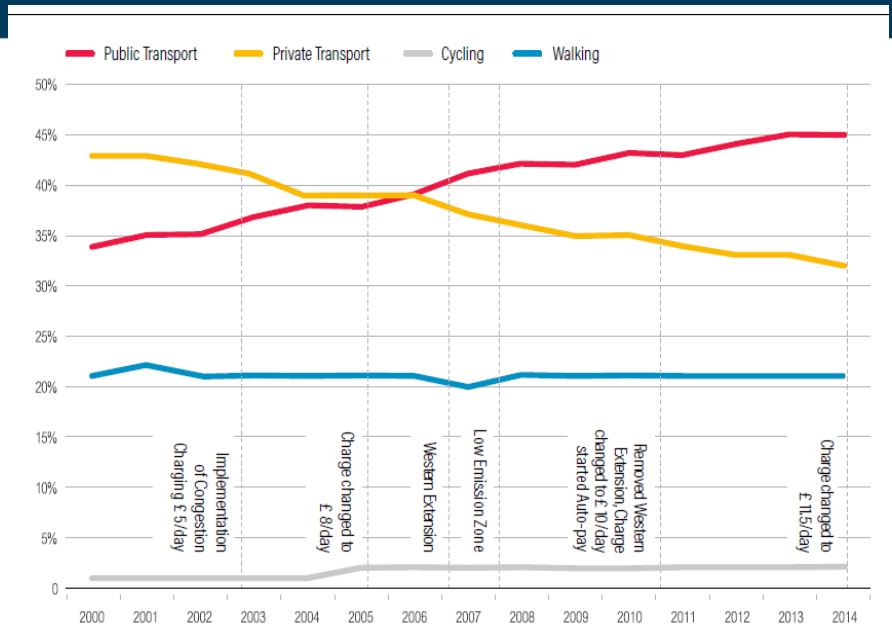
Benefits of Congestion Pricing Elsewhere

	Stockholm	London	Singapore	Milan	Gothenburg
Trip Reduction	-22%	-16% all -30% charged	-15% with new technology -44% in 1975	-34%	-10%
GHG Benefit	-14% CO2	-17% CO2	-15% CO2	-22% CO2	-2.5% CO2
Travel Time Results	-33% delays	-30% delays	Managed by price for 45-65 km/h (expressways) 20-30 km/h (other roads)	-30% delays	-10% to 20% travel time in corridors
Net Annual Revenue	$150M	$230M	$100M	$20M	$90M

DRAFT

What are the benefits?

- In every case, congestion pricing has reduced vehicle trips, reduced CO2 emissions, and lowered travel times
- Businesses have seen economic benefits
- Programs have evolved to meet new challenges



DRAFT

What are the benefits?

- London has invested revenues in new buses and active transportation projects
- Road space has been prioritized to move more people
- Traffic collisions have fallen by 40%

DRAFT

At Our Last Worksession

On October 7, 2020, we presented an overview of congestion pricing, introduced scenario families and performance measures, and shared some initial draft findings

We asked for feedback on how we were sharing the findings, equity considerations, and anything you wanted us to explore moving forward

DRAFT

Progress Since our Last Worksession

Since October we have…

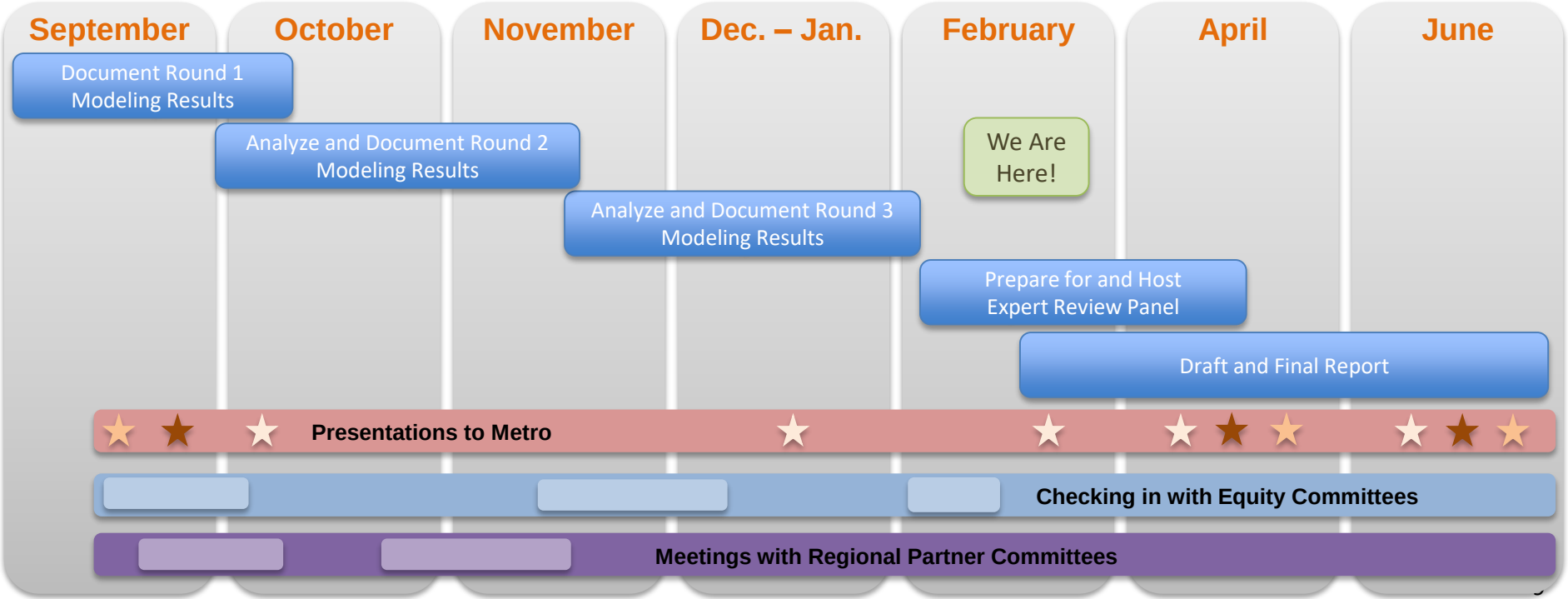
Performed additional modeling on congestion pricing scenarios; *and*

Analyzed how the different scenarios perform within the region on different metrics; *and*

Reached out to equity stakeholders to share an overview of the project and receive feedback.

DRAFT

Our Schedule



Pricing Scenarios:
High Level Findings

DRAFT

Regional Congestion Pricing Study

RCPS Goal:

To understand how our region could use congestion pricing to manage traffic demand to meet climate goals without adversely impacting and potentially improving safety and equity.

Not recommending or implementing any pricing measures

Pricing strategies will be measured against the Region's 4 Priorities (RTP 2018)

DRAFT

Equity-
Reduce disparity

Climate Smart –
Reducing GHG emissions

Safety-
Getting to Vision Zero

Congestion

DRAFT

Performance Measures…Where we Started

2018 RTP Priority	Outcome Being Measured	Performance Measures Proposed for RCPS
Equity	• Accessibility	★Access to jobs (emphasis on middle-wage) • Access to community places • System completeness of active transportation network
Safety	• Eliminate fatal and severe injury crashes for all modes of travel	• Level of investment in improvements that address fatalities and serious injuries on high injury corridors
Climate Change	• Reduce emissions from vehicles	★Percent reduction of greenhouse gases per capita ★Percent reduction of criteria pollutants and transportation air toxics ★Percent reduction of vehicle miles traveled per capita ★Shift in travel behavior
Traffic Congestion	• Multimodal travel times • Mode split/shift • Mode miles traveled (e.g. person miles traveled, vehicle miles traveled)	★Travel time between regional origin-destination pairs during mid-day and evening commute hour peak by mode of travel (e.g. transit, bicycle) ★System-wide number of miles traveled (total and share of overall travel) by different modes of travel ★Average weekday transit boardings for all transit service providers (e.g. TriMet, SMART, C-TRAN and Portland Streetcar, Inc.)

★ = Measures used in current analysis

DRAFT

Key Performance Measures

- Vehicle Miles Traveled (VMT)
- Mode Share
- Accessibility to Jobs – Transit + Auto
- Delay
- Emissions
- Cost - *total cost of travel for the region and cost per traveler paying a charge*

DRAFT

Discussion

Do any of the scenarios seem particularly promising? Are any of them particularly concerning, looking at the data?

DRAFT

The Four Families of Tools We Considered

- Focus on 4 tools with multiple possible program designs
- Provide assessment of overall value, not a recommendation

VEHICLE MILES TRAVELED FEE

Drivers pay a fee for every mile they travel

CORDON PRICING

Drivers pay to enter an area, like downtown Portland (and sometimes pay to drive within that area)

ROADWAY PRICING

Drivers pay a fee to drive on a particular road, bridge or highway

PARKING PRICING

Drivers pay to park in certain areas

DRAFT

Base Scenario - RTP 2027 FC Plan

All pricing scenarios were tested against a base scenario, the 2018 RTP 2027 Financially-Constrained Scenario

- Cost to travel is $0.211/mile
- Assumes more transit service than today

DRAFT

Scenario Assessment- Caveats

- Scenarios tested provide a general assessments of how congestion pricing could perform with our land use and transportation system
- Scenarios are NOT iterative. They demonstrate model results ***without*** adjustments to address issues that arise around the scenario
- Actual projects would take the next step to explore:
  - Design changes to improve benefits and reduce impacts
  - Targeting revenues to improve performance (safety, equity, congestion, climate)
  - Discounts for key groups

Metro Trip-Based Travel Demand Model

DRAFT

Limitations of Model

No current roadway pricing in region

- Impacts of pricing are derived from surveys, not from observed data

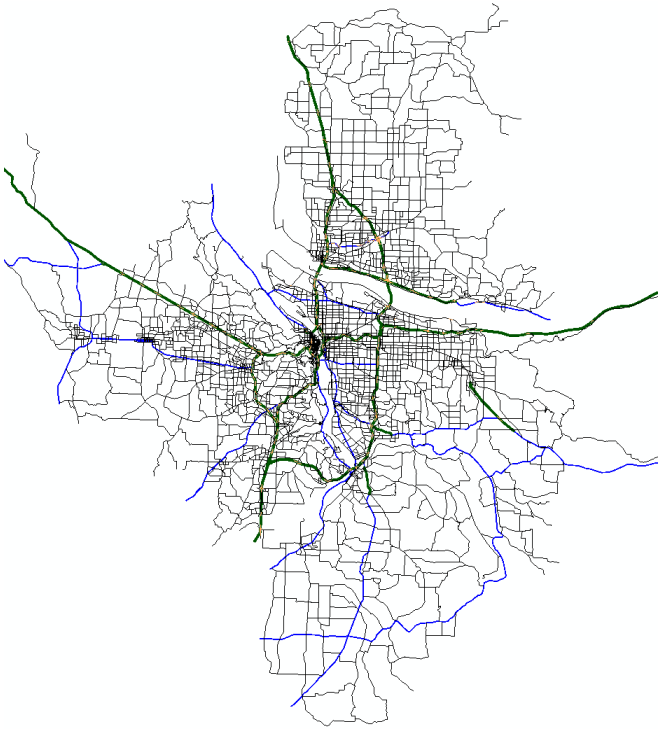
Values of Time established > 10 years ago

Static assignments in regional model

- Do not represent high congestion well at facility level
- Model best analyzed at regional / sub-regional levels

Can only narrow results to 1-hour increments

Model not sensitive to *trips not taken* as a result of a policy change, and trips in model do not change time of day



DRAFT

Summary of Scenarios

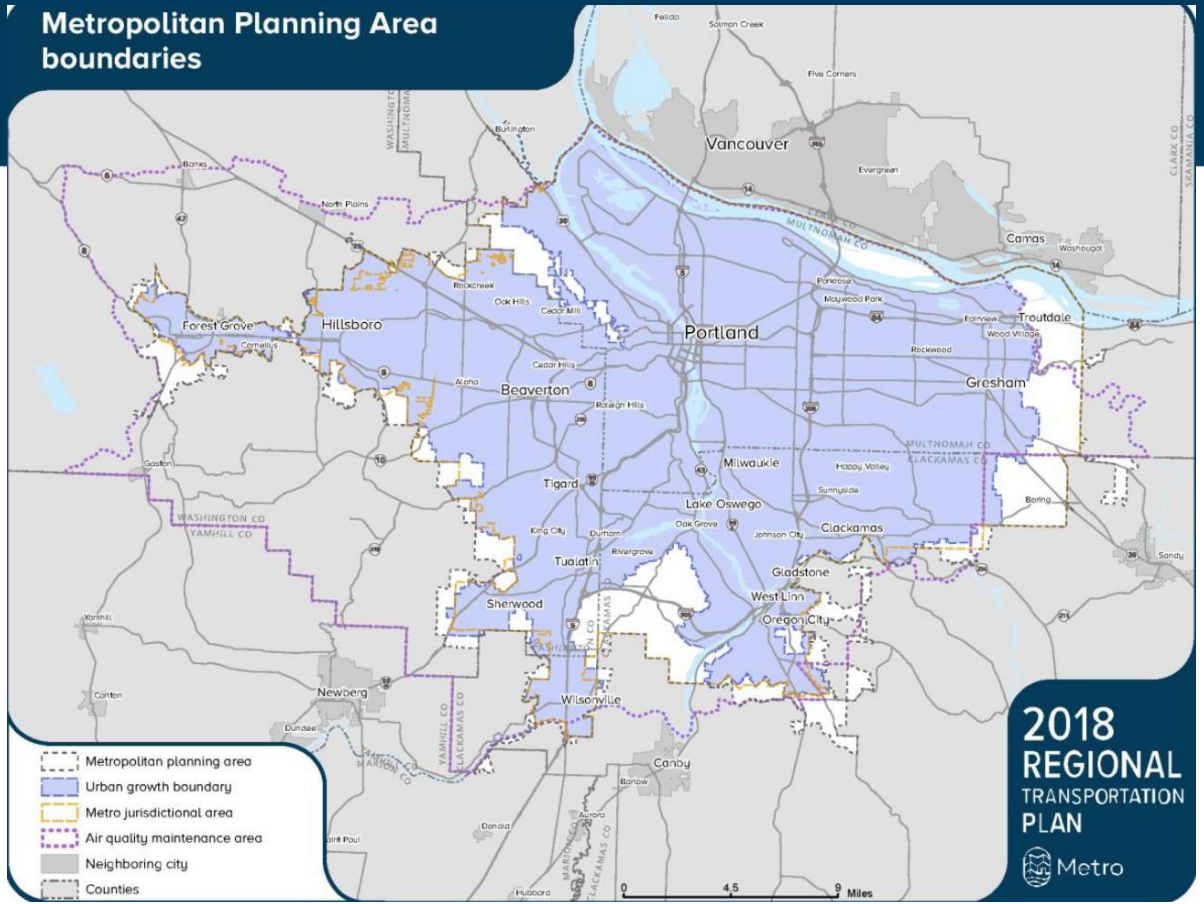
VMT B	VMT C	COR A	COR B
• Charge per mile driven • $0.2795/mile vehicle operating cost • $0.0685/mile charge over base	• Higher charge per mile driven • $0.343/mile vehicle operating cost • $0.132/mile charge over base	• Drivers charged $5.63 to enter cordon area • Higher end of price range based on other cities	Same as COR A, but including a larger area (Central Eastside and Lloyd District)
PARK A	**PARK B**	**RD A**	**RD B**
Higher charges to park: Parking assumptions from 2040 FC	Much higher charges to park: Doubles the parking assumptions from 2040 FC	▪ Toll on highways ▪ Equivalent to VMT C per-mile charge ▪ $0.132/mile	▪ Higher toll on highways ▪ Double the cost of RD A ▪ $0.264/mile

Base Scenario Charge: $0.211/mile vehicle operating cost

- 8 scenarios (two from each family)
- Charges assessed within MPA boundaries only (in $2010)
- Compare effects of different types of charges and amount charged

VMT Scenarios

DRAFT

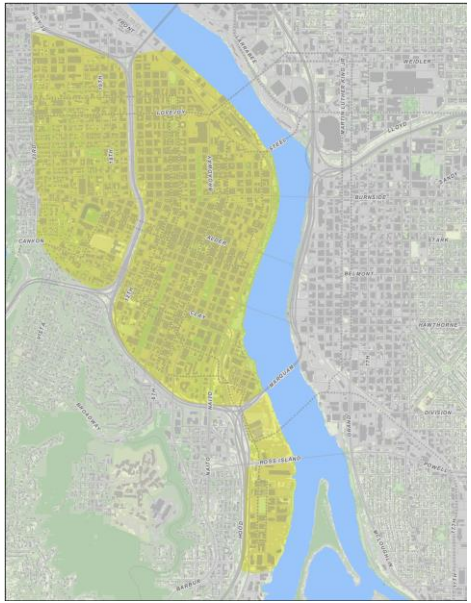


- Charges assessed within MPA boundaries for VMT B and VMT C

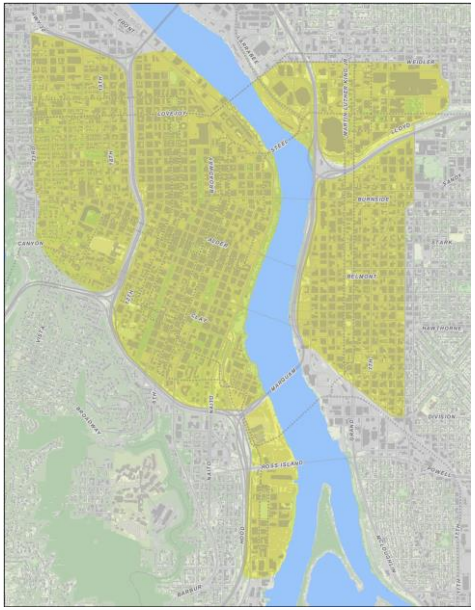
Cordon Scenarios

DRAFT

Cordon A



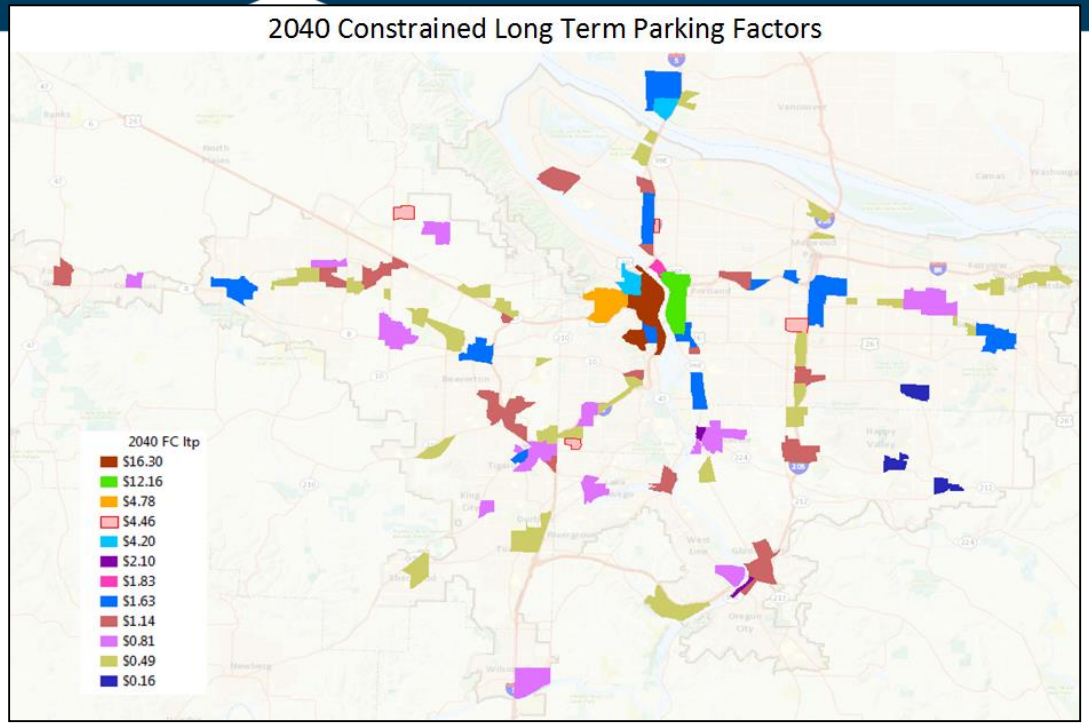
Cordon B



- Cordon A encompasses downtown Portland, South Waterfront, portions of NW Portland
- Cordon B expands to include Lloyd District and CEID
- Travel through the cordons on freeways/highways (i.e. I-5/I-405, or US-26 to Ross Island Bridge) are not charged

Parking Scenarios

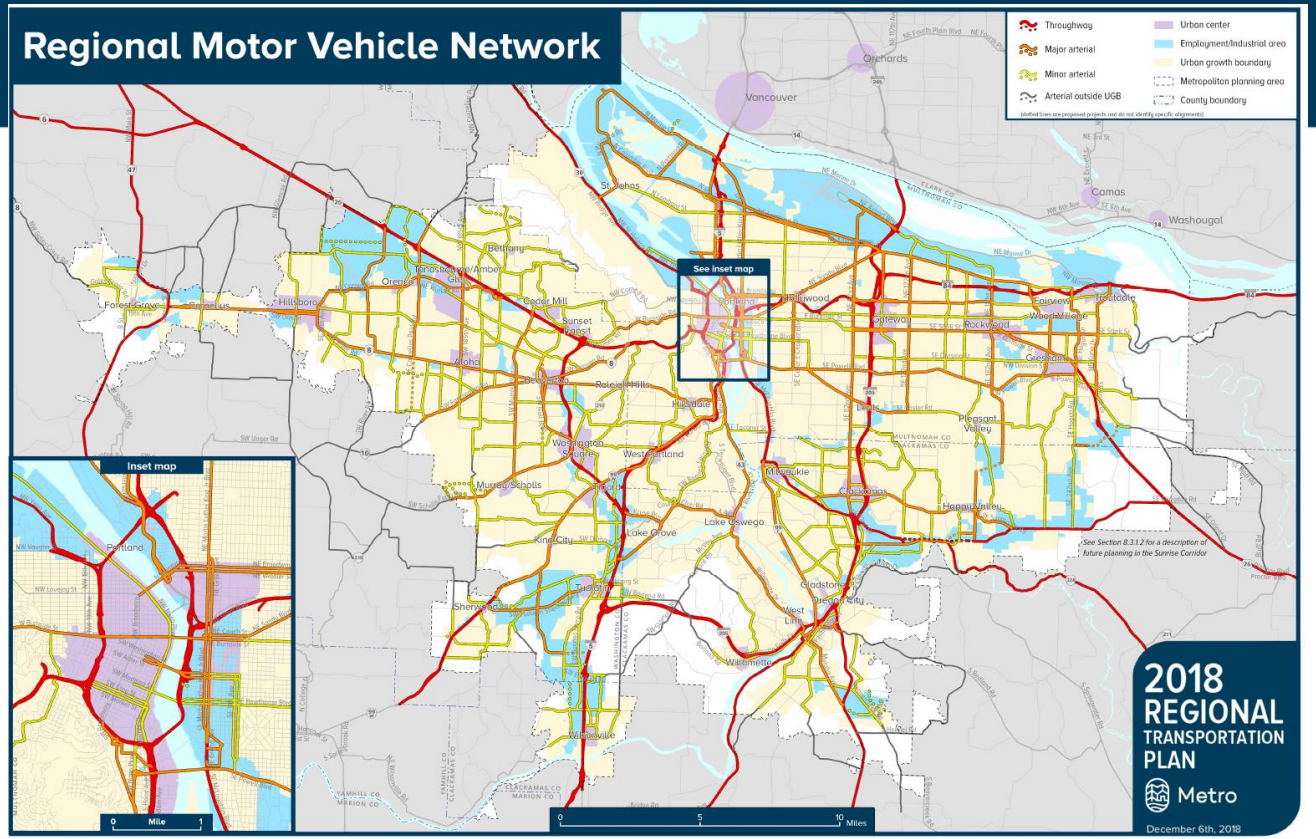
DRAFT



- Parking A and B do not include changes to parking charges outside of MPA boundaries
- Parking B doubles the rates shown
- Rates in Vancouver remain at 2027 Base level

Roadway Scenarios

DRAFT



- All throughways (shown in red) within MPA boundaries are charged in Roadway A and Roadway B
- Roadway A charges the same rate as VMT C, while Roadway B doubles that rate

DRAFT

Summary of Scenario Performance

- All four scenario types help address climate and congestion priorities.
- All eight scenarios reduce the drive alone rate, vehicle miles traveled, and emissions, while increasing daily transit trips.
- Geographic distributions of benefits and costs vary by scenario.
- There are tradeoffs for implementing pricing scenarios.

DRAFT

Summary of Cost Impacts

- All eight scenarios increase the overall cost for travel for the region, but some scenarios distribute the costs widely while others concentrate them on fewer travelers. Those that distribute the costs also have the highest overall cost for the region.
- Overall regional transportation costs and individual traveler costs vary by scenario.
- Distribution of costs and benefits have implications for where fee discounts and revenues should be targeted.

DRAFT

High-Level Findings from Modeling

RTP Goal	Metrics	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Congestion & Climate	Daily VMT								
	Drive Alone Rate								
	Daily Transit Trips								
	2HR Freeway VHD								
	2HR Arterial VHD								
Climate	Emissions								
Equity	Job Access (Auto)								
	Job Access (Transit)								
	Total Regional Travel Cost	Medium-High	High	Medium-Low	Medium-Low	Low	Low	Medium	Medium

	Large Positive Change
	Moderate Positive Change
	Small Positive Change
	Minimal Change
	Small Negative Change
	Moderate Negative Change
	Large Negative Change

- VMT and Parking scenarios show the most positive changes, no negative changes
- Cordon and Roadway scenarios see some increases in delay and reductions in job access

DRAFT

Summary of Scenario Performance

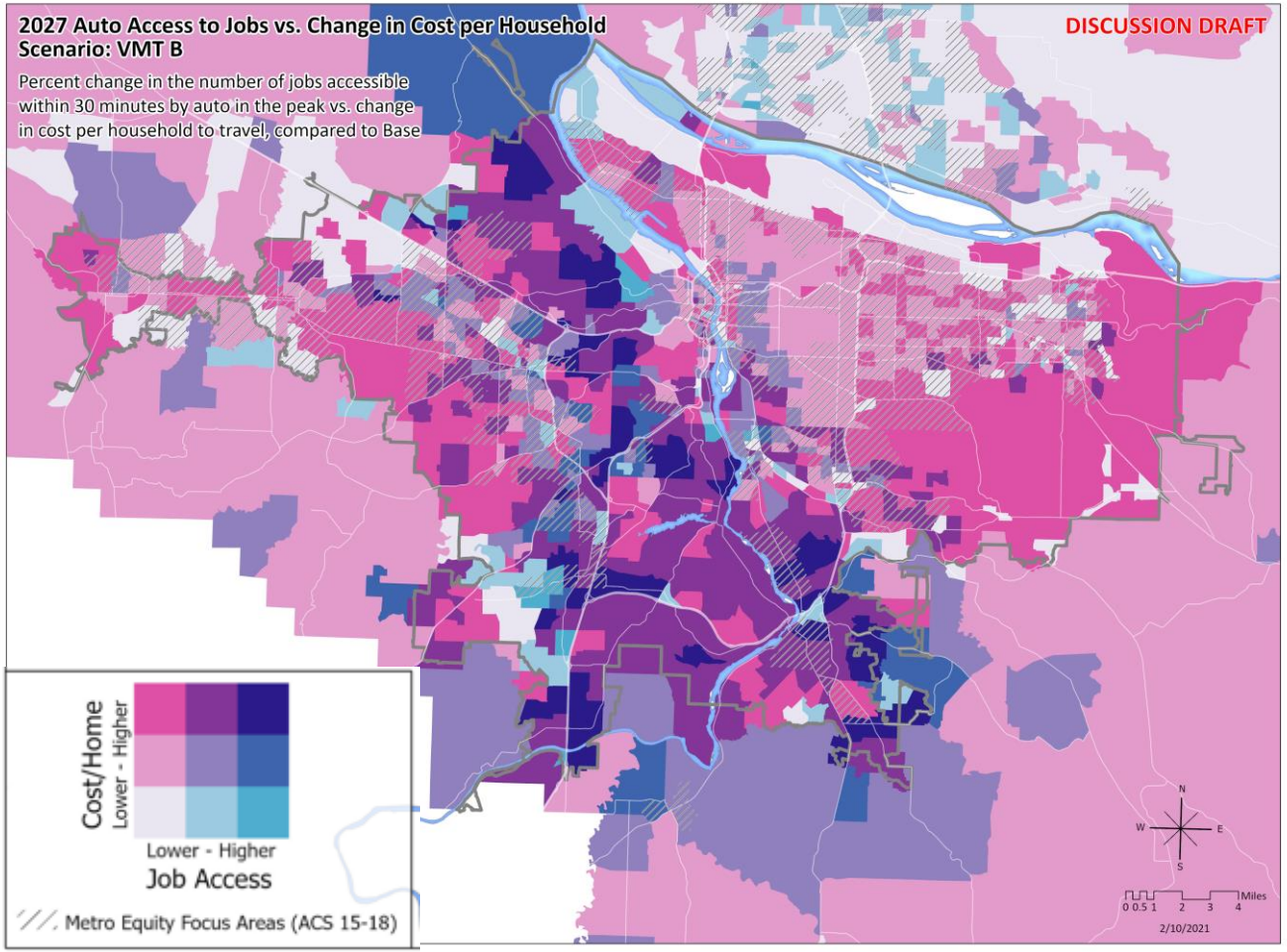
VMT Scenarios

Metrics	VMT B	VMT C
Daily VMT		
Drive Alone Rate		
Daily Transit Trips		
2HR Freeway VHD		
2HR Arterial VHD		
Emissions		
Job Access (Auto)		
Job Access (Transit)		
Total Regional Travel Cost	Medium-High	High

- VMT B and C generally perform better than other scenarios, but also have the highest regional costs
- Both scenarios reduce VMT, drive alone rate, delay, and emissions
- Both scenarios improve transit trips and job access via both transit and auto
- Cost and job access changes vary depending on location

DRAFT

VMT B

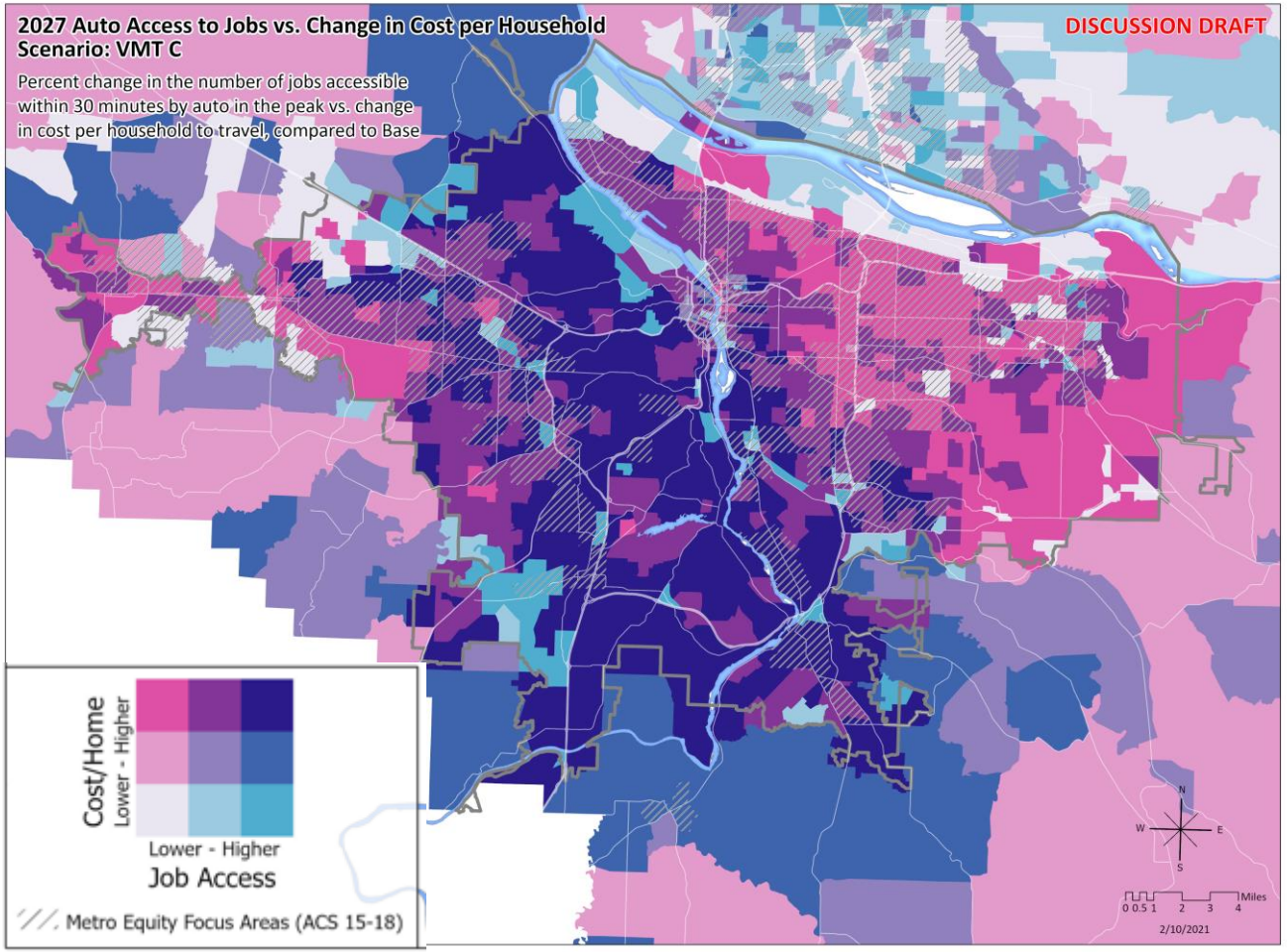


With VMT B, outer areas see a higher increase in cost, but a lower increase in job access.

Many EFAs are similarly affected

DRAFT

VMT C

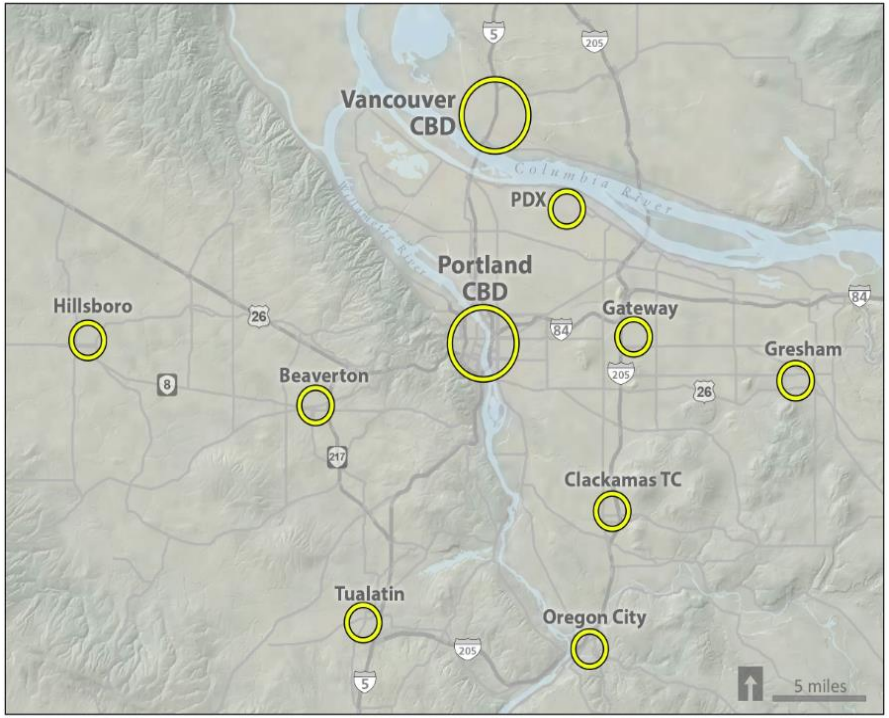


With VMT C, more areas see increased job access by auto along with higher costs to travel, but the negative impacts in outer areas are more prominent.

Findings from Modeling

DRAFT

Travel Time Changes between destinations



Travel times for trips between 9 centers

- Portland Central Business District
- Portland Airport
- Gresham
- Oregon City
- Clackamas Town Center
- Tualatin
- Beaverton
- Hillsboro
- Vancouver Central Business District

Findings from Modeling

DRAFT

VMT B: Travel Time Changes – PM Peak

- VMT B shows travel time reductions by auto for trips between many different centers – **up to 5%**

	Draft	To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-2%	-3%	-3%	-3%	-3%	-4%	-5%	-4%	-3%
	PDX	-2%	--	-1%	-1%	-3%	-2%	-4%	-4%	-4%	-2%
	Gateway	-2%	0%	--	-1%	-4%	-3%	-4%	-5%	-4%	-2%
	Gresham	-2%	-1%	-1%	--	-3%	-2%	-3%	-4%	-3%	-2%
	Oregon City	-3%	-3%	-4%	-3%	--	-4%	-4%	-4%	-3%	-3%
	Clackamas TC	-3%	-2%	-3%	-2%	-4%	--	-4%	-4%	-4%	-3%
	Tualatin	-3%	-3%	-4%	-3%	-4%	-4%	--	-4%	-2%	-4%
	Beaverton	-4%	-4%	-4%	-4%	-4%	-3%	-3%	--	-2%	-4%
	Hillsboro	-4%	-3%	-4%	-3%	-3%	-4%	-2%	-2%	--	-4%
	Vancouver CBD	-1%	0%	-1%	-1%	-3%	-2%	-4%	-4%	-4%	--

Findings from Modeling

DRAFT

VMT C: Travel Time Changes – PM Peak

- VMT C shows greater auto travel time savings between centers compared to VMT B – **up to 9%**

	Draft	To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-3%	-6%	-5%	-5%	-5%	-7%	-9%	-8%	-5%
	PDX	-3%	--	-2%	-2%	-5%	-4%	-6%	-7%	-6%	-4%
	Gateway	-4%	-1%	--	-2%	-6%	-5%	-8%	-8%	-7%	-3%
	Gresham	-3%	-1%	-2%	--	-5%	-3%	-5%	-7%	-6%	-3%
	Oregon City	-5%	-6%	-7%	-5%	--	-7%	-8%	-8%	-6%	-5%
	Clackamas TC	-5%	-4%	-6%	-3%	-7%	--	-7%	-7%	-7%	-5%
	Tualatin	-6%	-6%	-7%	-6%	-7%	-7%	--	-7%	-4%	-6%
	Beaverton	-7%	-6%	-7%	-6%	-6%	-6%	-6%	--	-3%	-7%
	Hillsboro	-6%	-6%	-7%	-6%	-5%	-6%	-4%	-4%	--	-6%
	Vancouver CBD	-3%	-1%	-1%	-2%	-5%	-3%	-7%	-8%	-7%	--

DRAFT

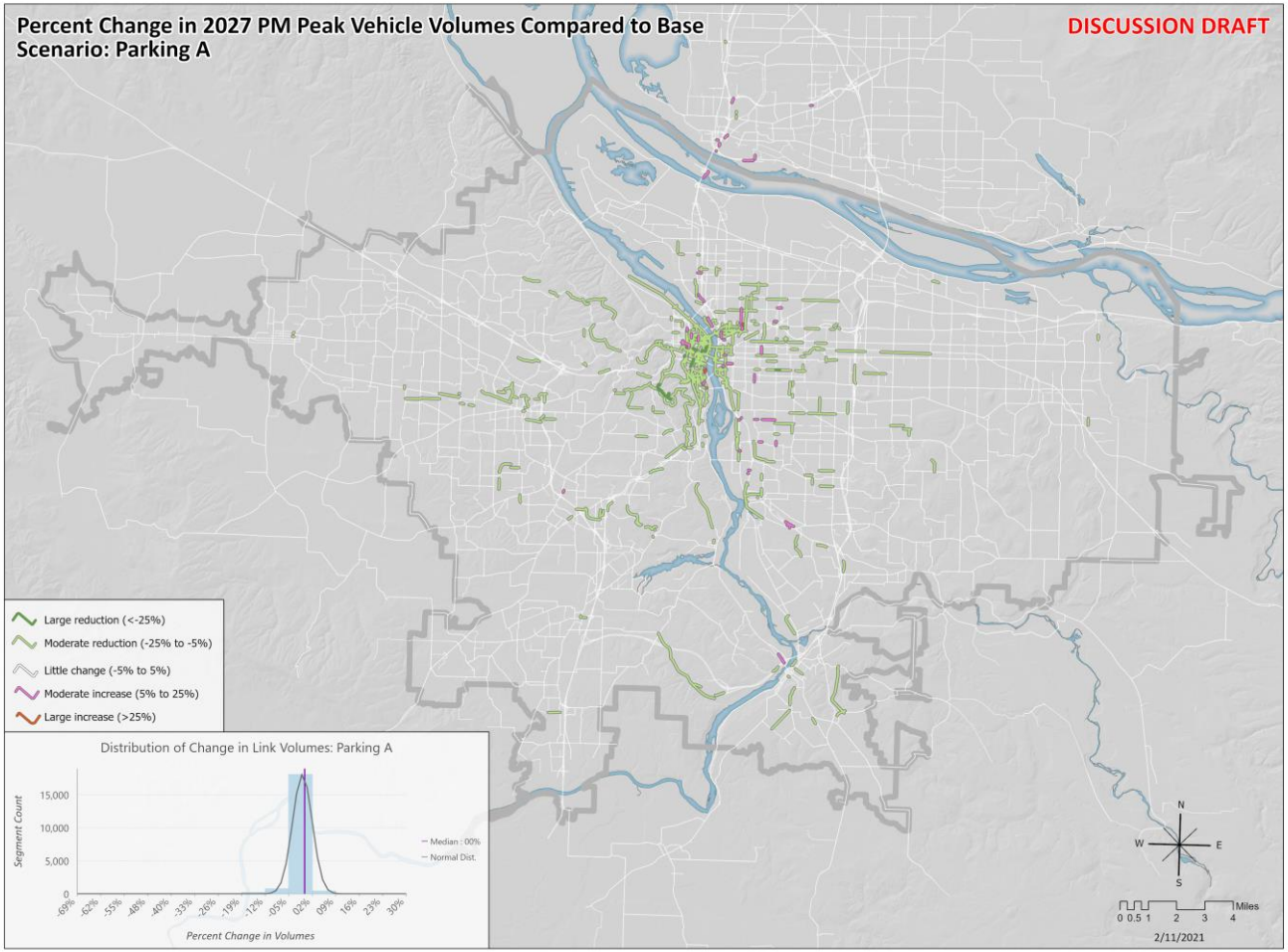
Summary of Scenario Performance

Parking Scenarios

- Parking A improves across all metrics, though not as much as Parking B.
- Parking has lowest costs at regional level.
- Reduces VMT, drive alone rate, delay, and emissions
- Improves transit trips and job access via both transit and auto

Metrics	PARK A	PARK B
Daily VMT		
Drive Alone Rate		
Daily Transit Trips		
2HR Freeway VHD		
2HR Arterial VHD		
Emissions		
Job Access (Auto)		
Job Access (Transit)		
Total Regional Travel Cost	Low	Low

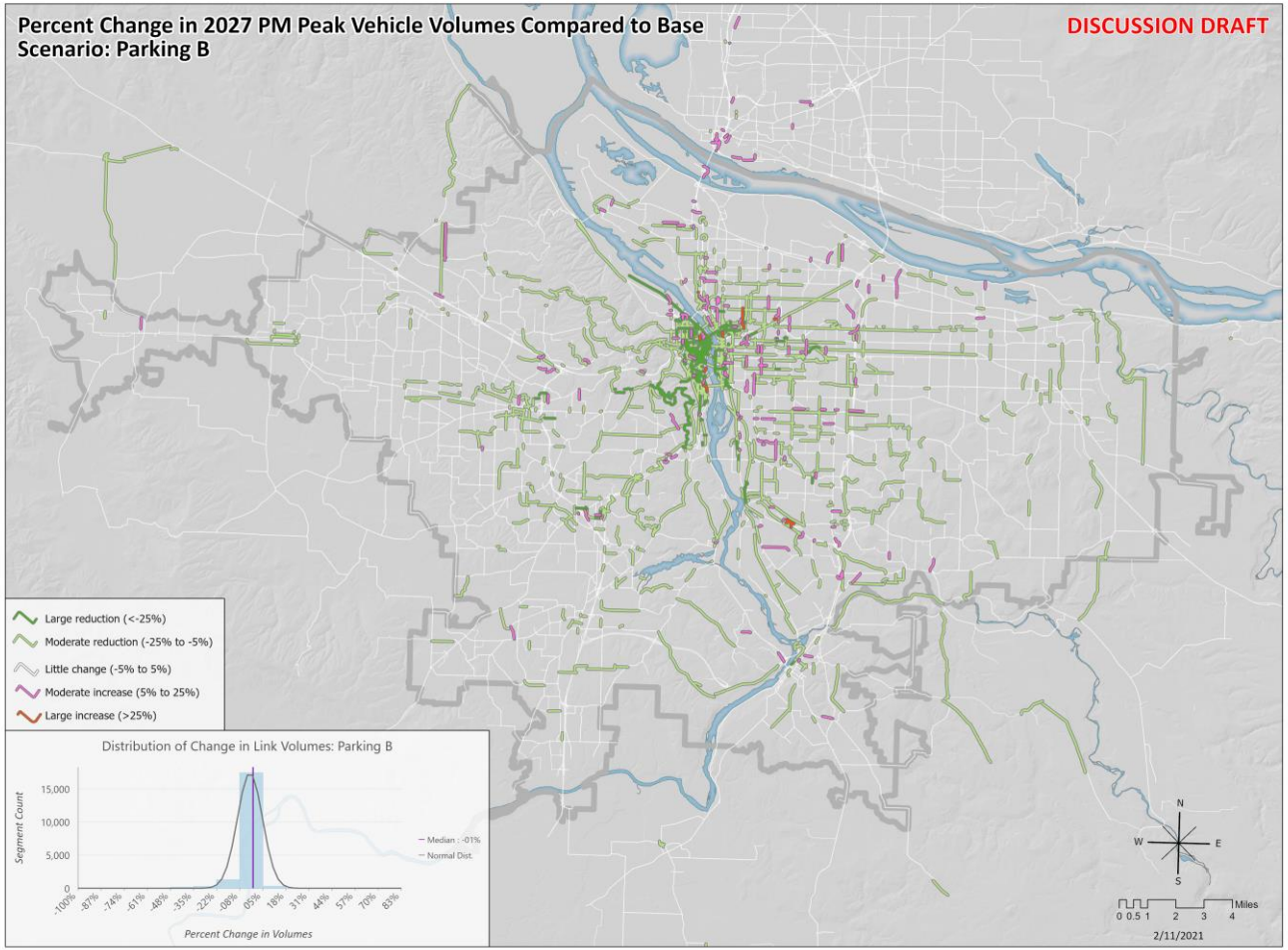
Parking A



Vehicle volumes decrease, mainly in downtown Portland.

Minimal diversion occurs.

Parking B



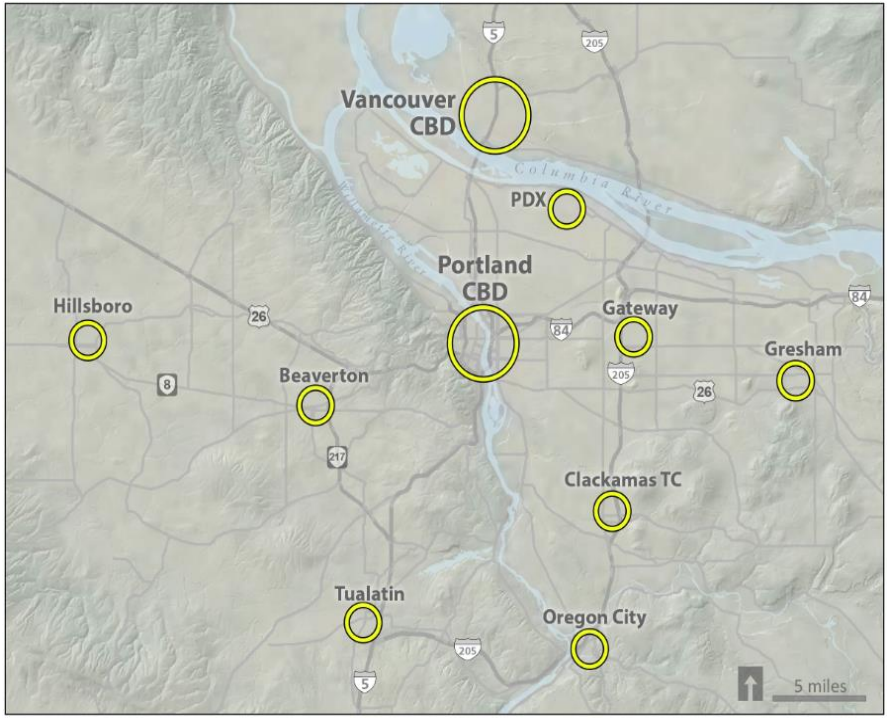
As with Parking A, vehicle volumes decrease, mainly in downtown Portland, but also in other employment areas.

Minimal diversion occurs.

Findings from Modeling

DRAFT

Travel Time Changes between destinations



Travel times for trips between 9 centers

- Portland Central Business District
- Portland Airport
- Gresham
- Oregon City
- Clackamas Town Center
- Tualatin
- Beaverton
- Hillsboro
- Vancouver Central Business District

Findings from Modeling

DRAFT

Parking A: Travel Time Changes – PM Peak

- Parking A shows travel time reductions by auto to most centers (up to 3%) and no increases in travel times

	Draft	To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-2%	-3%	-2%	-3%	-2%	-3%	-3%	-2%	-2%
	PDX	-1%	--	0%	0%	-1%	-1%	-2%	-2%	-1%	0%
	Gateway	-1%	0%	--	0%	-2%	-1%	-2%	-2%	-2%	0%
	Gresham	-1%	0%	0%	--	-1%	-1%	-1%	-2%	-1%	0%
	Oregon City	-1%	-1%	-1%	-1%	--	-1%	-1%	-1%	-1%	-1%
	Clackamas TC	-1%	0%	0%	0%	-2%	--	-1%	-1%	-2%	0%
	Tualatin	0%	-1%	-2%	-1%	-2%	-2%	--	-1%	0%	-1%
	Beaverton	-1%	-1%	-2%	-2%	-2%	-1%	-1%	--	0%	-2%
	Hillsboro	-1%	-1%	-1%	-1%	-1%	-2%	0%	0%	--	-1%
	Vancouver CBD	-1%	0%	0%	0%	-1%	-1%	-2%	-2%	-2%	--

Findings from Modeling

DRAFT

Parking B: Travel Time Changes – PM Peak

- Parking B shows travel time reductions by auto to most centers (up to 7%) and no increases in travel times

	Draft	To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-3%	-6%	-4%	-6%	-5%	-5%	-7%	-4%	-2%
	PDX	-1%	--	-1%	-1%	-2%	-1%	-3%	-4%	-3%	0%
	Gateway	-2%	0%	--	-1%	-3%	-2%	-4%	-5%	-4%	0%
	Gresham	-1%	0%	0%	--	-2%	-1%	-2%	-3%	-3%	0%
	Oregon City	-2%	-1%	-2%	-1%	--	-2%	-2%	-1%	-1%	-1%
	Clackamas TC	-2%	-1%	-2%	-1%	-4%	--	-3%	-3%	-4%	-1%
	Tualatin	-1%	-3%	-4%	-2%	-3%	-3%	--	-1%	-1%	-2%
	Beaverton	-1%	-2%	-4%	-3%	-2%	-2%	-2%	--	-1%	-3%
	Hillsboro	-1%	-2%	-3%	-3%	-1%	-3%	-1%	0%	--	-2%
	Vancouver CBD	-2%	0%	0%	-1%	-2%	-1%	-4%	-4%	-4%	--

DRAFT

Summary of Scenario Performance

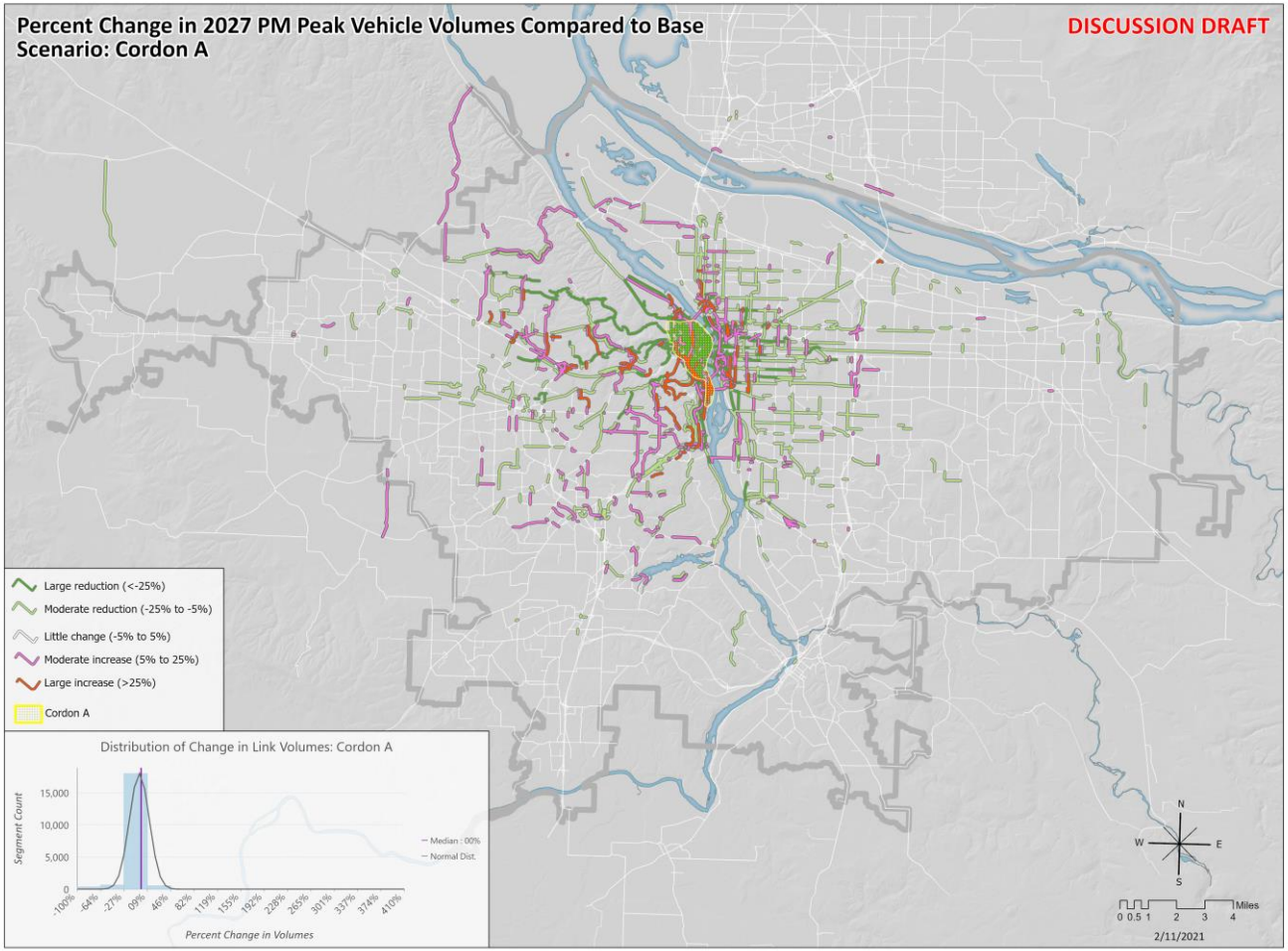
Cordon Scenarios

Metrics	COR A	COR B
Daily VMT		
Drive Alone Rate		
Daily Transit Trips		
2HR Freeway VHD		
2HR Arterial VHD		
Emissions		
Job Access (Auto)		
Job Access (Transit)		
Total Regional Travel Cost	Medium-Low	Medium-Low

- Cordon A and B effects are localized.
- Delay is worse near the cordon boundary, but better within cordon boundary.
- Jobs access via transit increases, but decreases via auto
- Transit trips increase
- Travel times between major destinations mostly improve
- Reduces VMT, drive alone rate, and emissions

DRAFT

Cordon A

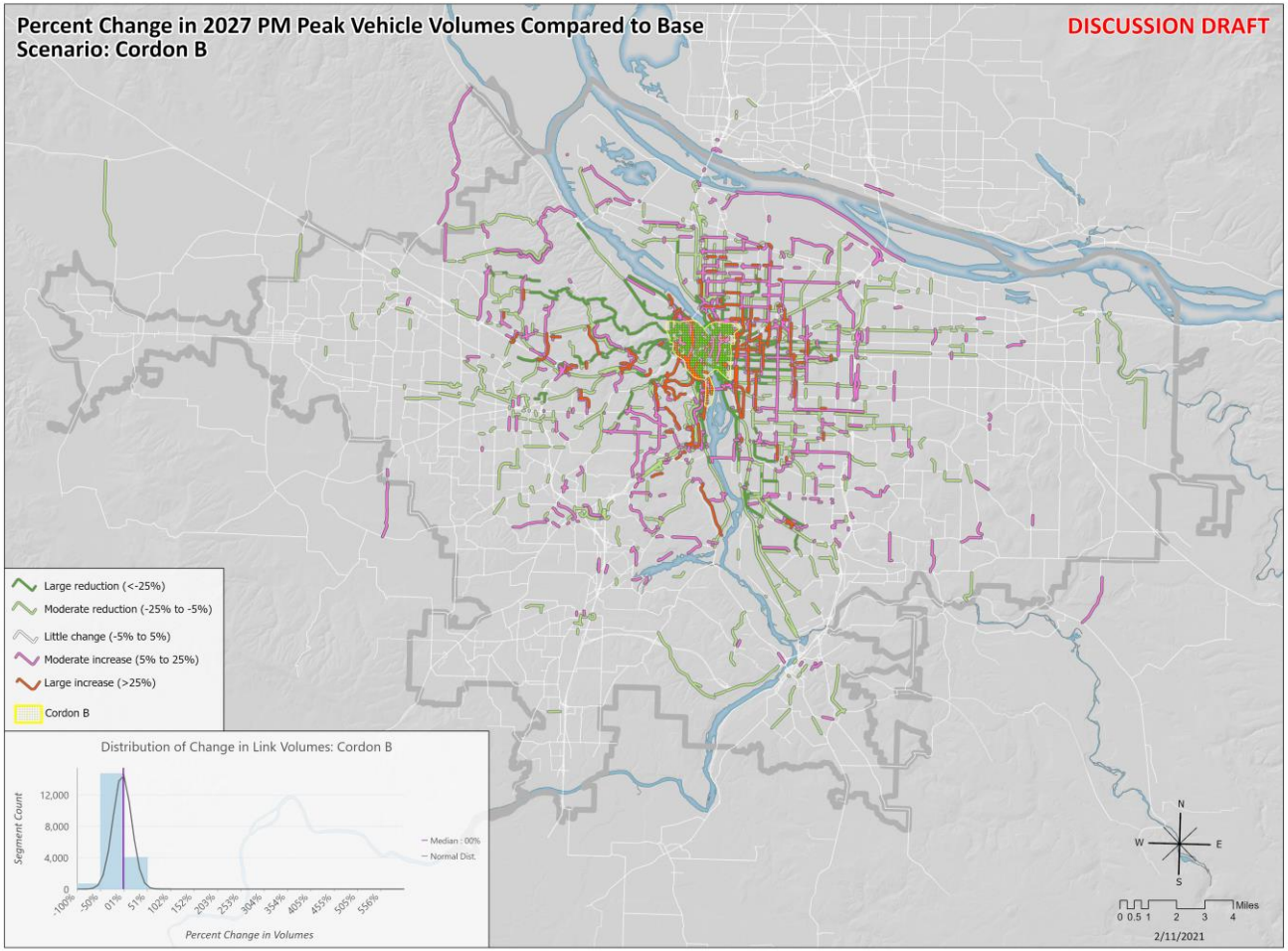


Volume changes are mostly focused in and near downtown Portland.

Arterials within and leading to the cordon see reduced volumes; volumes rise on freeways and on arterials adjacent to the cordon.

DRAFT

Cordon B

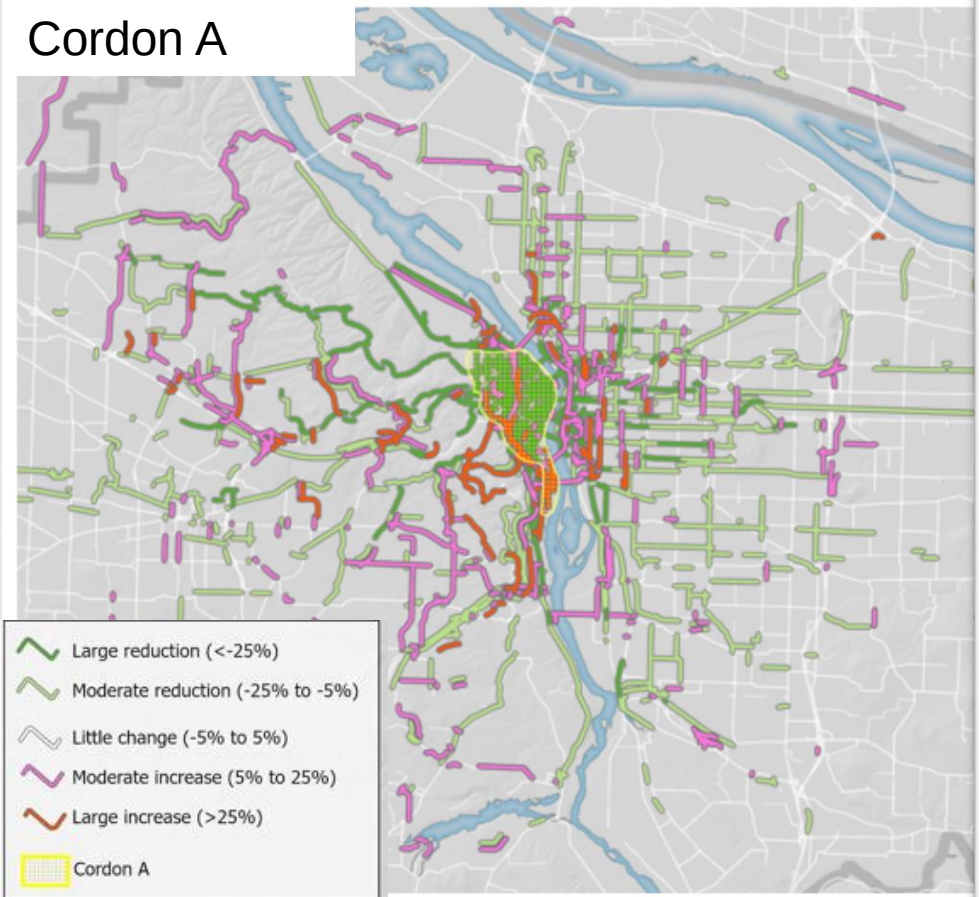


With the expanded cordon boundary, the volume increases extend, particularly to the east and north.

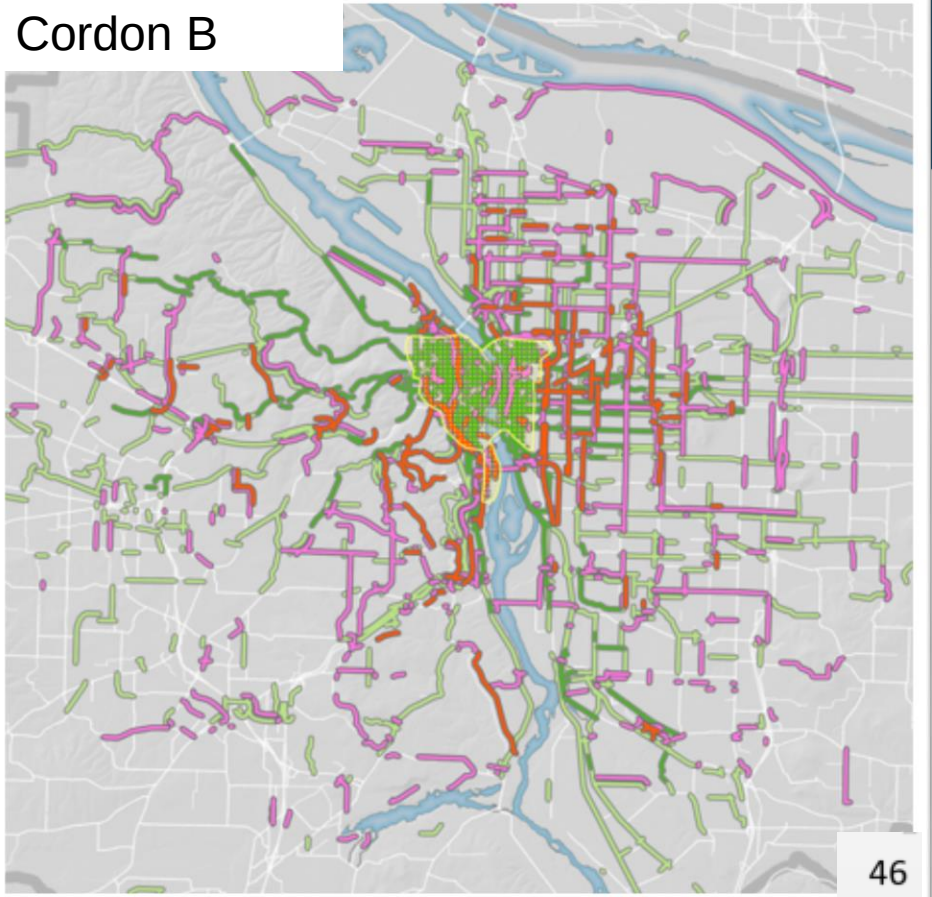
Change in Volumes Compared to Base (2-hr PM Peak)

DRAFT

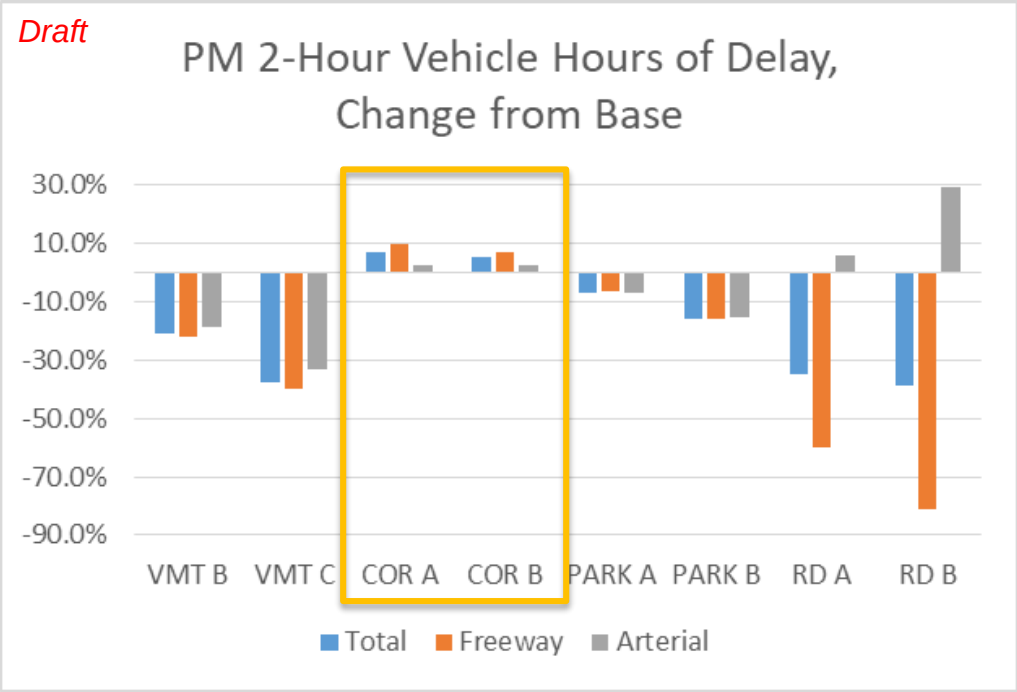
Cordon A



Cordon B

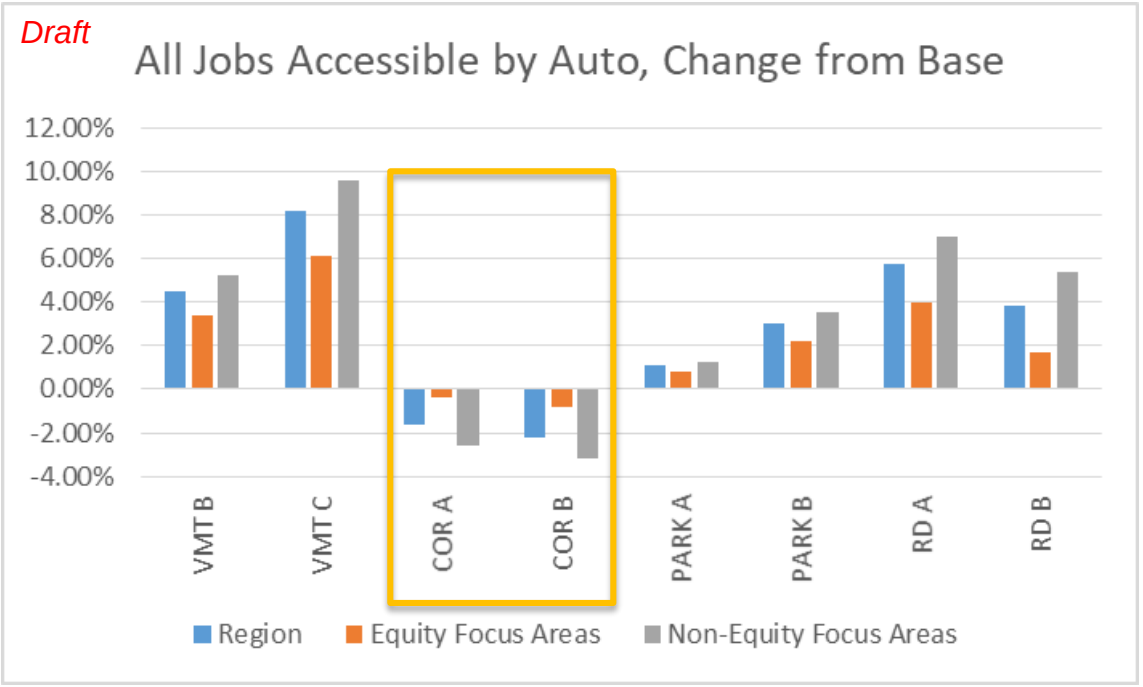


Vehicle Hours of Delay



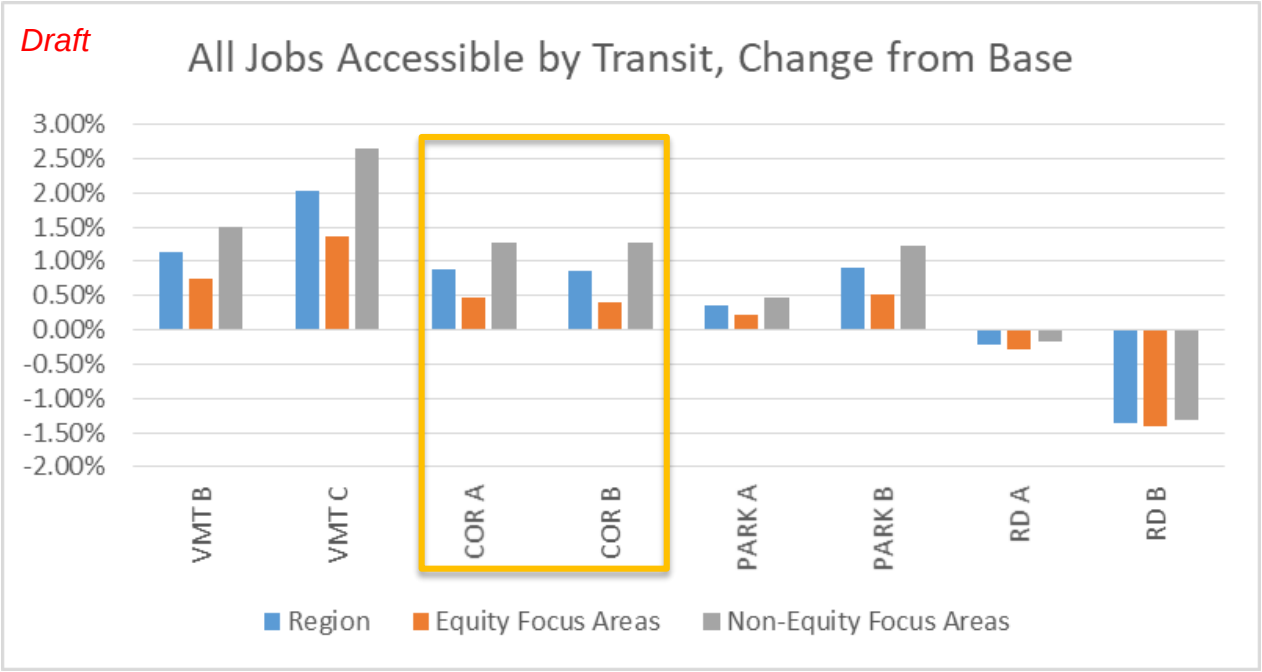
- With the two cordon scenarios, volume increases outside of the cordon boundaries increase delay on both freeways and arterials, at a regional level.
- Most other scenarios see a decrease in delay at a regional level.

Jobs Accessible by Auto



- Because of these volume and delay increases, the two Cordon scenarios see a reduction in jobs accessible via auto at a regional level, while all other scenarios see improvements for this measure.

Jobs Accessible by Transit

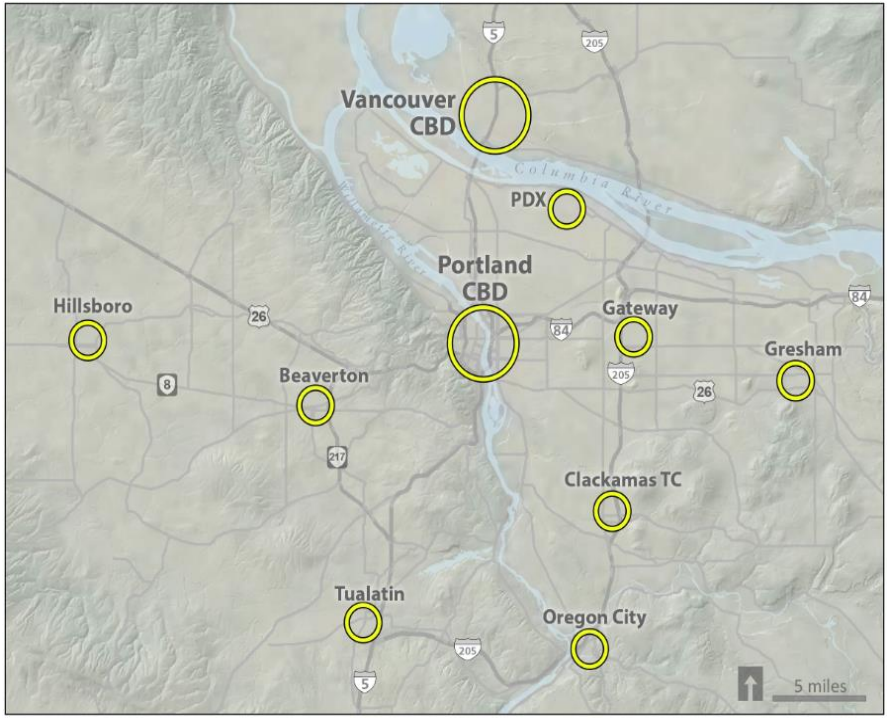


- Shifting volumes to freeways and to arterials outside of the cordon area increases transit speeds within the cordon, which improves job access by transit at the regional level.

DRAFT

Findings from Modeling

Travel Time Changes between destinations



Travel times for trips between 9 centers

- Portland Central Business District
- Portland Airport
- Gresham
- Oregon City
- Clackamas Town Center
- Tualatin
- Beaverton
- Hillsboro
- Vancouver Central Business District

Findings from Modeling

DRAFT

Cordon A: Travel Time Changes – PM Peak

- Cordon A shows travel time reductions by auto for trips to/from Portland CBD (up to 13%) and most trips to Vancouver CBD, but no change or small increases (up to 3%) elsewhere

	Draft	To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-6%	-8%	-5%	-2%	-3%	-7%	-13%	-8%	-2%
	PDX	-2%	--	-1%	0%	0%	0%	1%	3%	2%	-1%
	Gateway	-2%	0%	--	0%	0%	0%	1%	3%	1%	-1%
	Gresham	-2%	0%	0%	--	0%	0%	0%	2%	1%	-1%
	Oregon City	-4%	0%	0%	0%	--	0%	2%	1%	1%	-1%
	Clackamas TC	-5%	0%	-1%	0%	0%	--	1%	2%	3%	-1%
	Tualatin	-4%	0%	0%	0%	0%	0%	--	1%	0%	0%
	Beaverton	-7%	1%	3%	1%	0%	1%	0%	--	-1%	1%
	Hillsboro	-4%	1%	2%	1%	0%	2%	0%	-1%	--	1%
	Vancouver CBD	-3%	0%	0%	0%	0%	0%	0%	3%	2%	--

Findings from Modeling

DRAFT

Cordon B: Travel Time Changes – PM Peak

- Cordon B also shows travel time reductions by auto for trips to/from Portland CBD (up to 12%), but no change or small changes (+/- 2%) elsewhere

	Draft	To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-3%	-6%	-4%	-12%	-12%	-6%	-12%	-8%	-4%
	PDX	-1%	--	0%	0%	1%	2%	0%	1%	1%	-1%
	Gateway	-3%	0%	--	-1%	0%	1%	0%	0%	0%	-1%
	Gresham	-2%	0%	0%	--	0%	0%	0%	0%	0%	-1%
	Oregon City	-7%	0%	0%	0%	--	0%	1%	0%	0%	-1%
	Clackamas TC	-9%	0%	0%	0%	-1%	--	0%	0%	1%	-1%
	Tualatin	-4%	0%	-1%	-1%	-2%	-2%	--	0%	0%	-2%
	Beaverton	-8%	0%	0%	0%	-1%	0%	0%	--	-1%	-1%
	Hillsboro	-5%	0%	0%	0%	-1%	0%	0%	-1%	--	-1%
	Vancouver CBD	-4%	0%	0%	0%	1%	1%	-2%	1%	0%	--

DRAFT

Summary of Scenario Performance

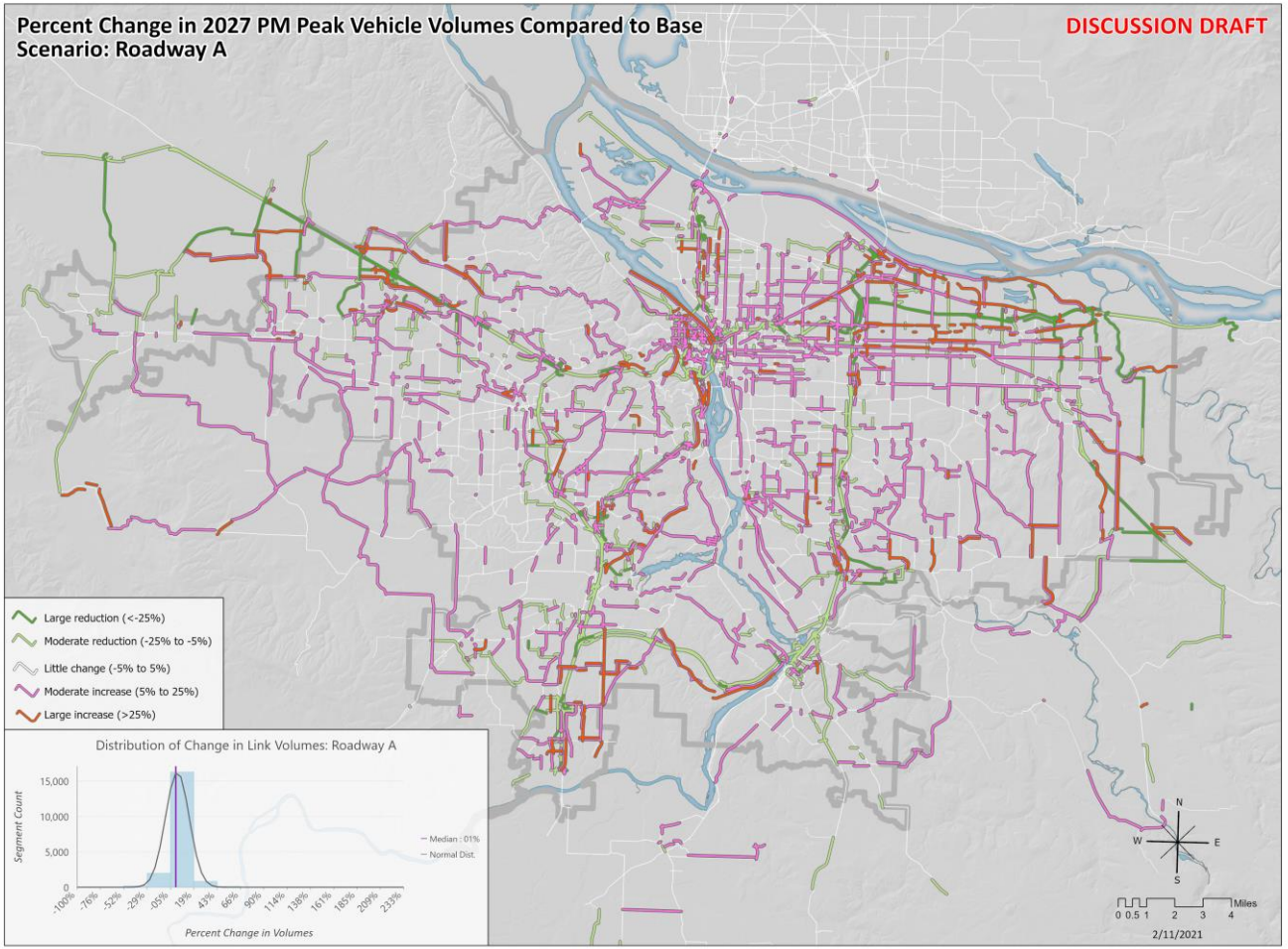
Roadway Scenarios

- Roadway A and B generally reduce VMT, drive alone rate, throughway congestion and emissions.
- Both roadway scenarios reduce job access by transit and increase congestion and delay on arterials.
- Improves transit trips and job access via auto

Metrics	RD A	RD B
Daily VMT		
Drive Alone Rate		
Daily Transit Trips		
2HR Freeway VHD		
2HR Arterial VHD		
Emissions		
Job Access (Auto)		
Job Access (Transit)		
Total Regional Travel Cost	Medium	Medium

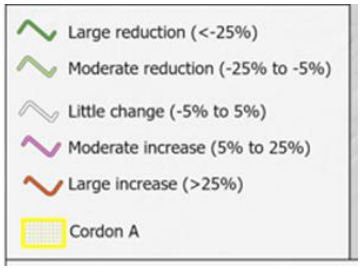
DRAFT

Roadway A



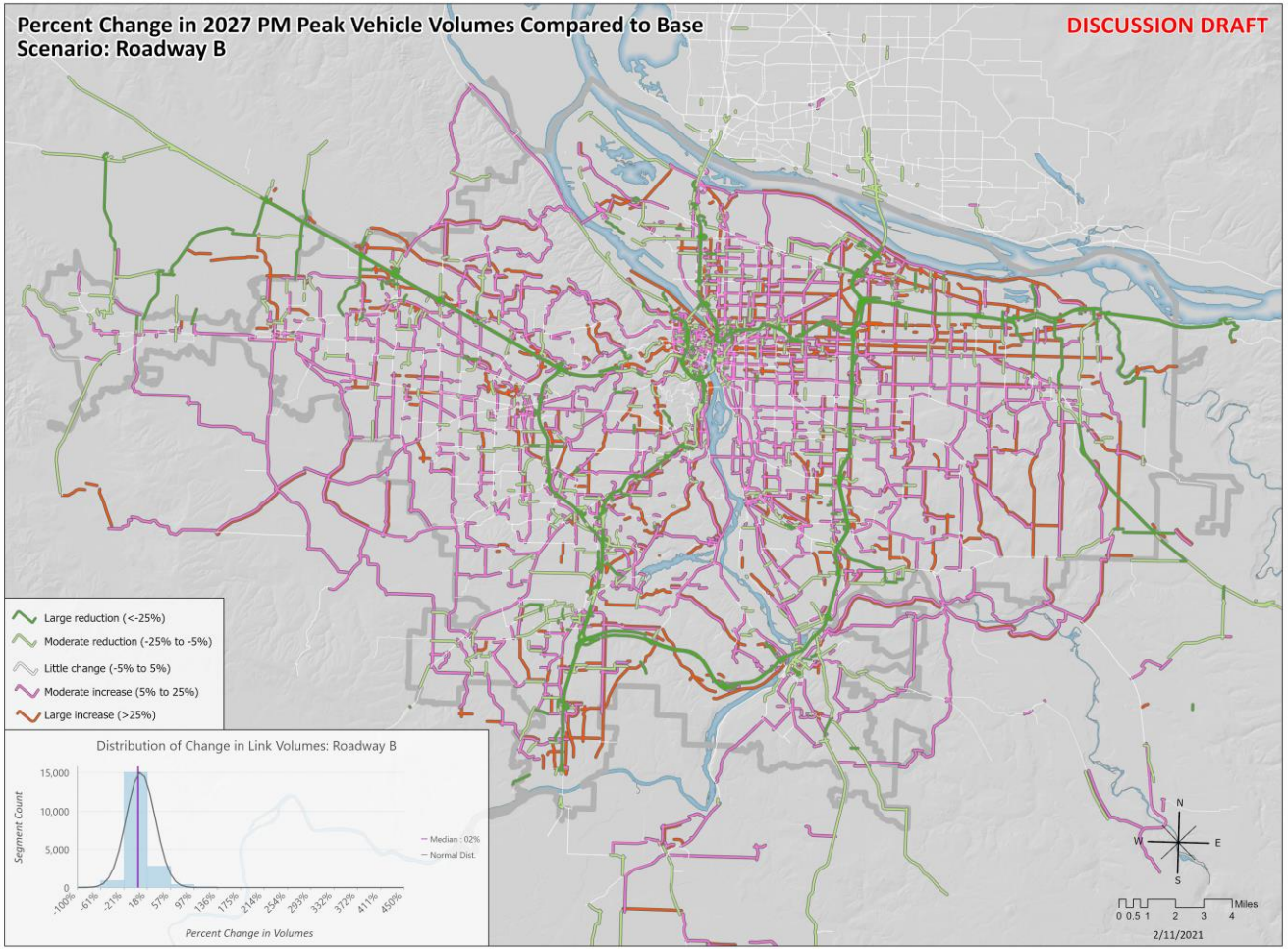
Volumes drop across the freeway network as drivers divert to arterials to avoid charge.

Most arterials near freeways see an increase in volumes.

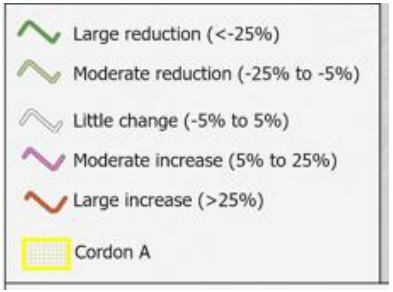


DRAFT

Roadway B

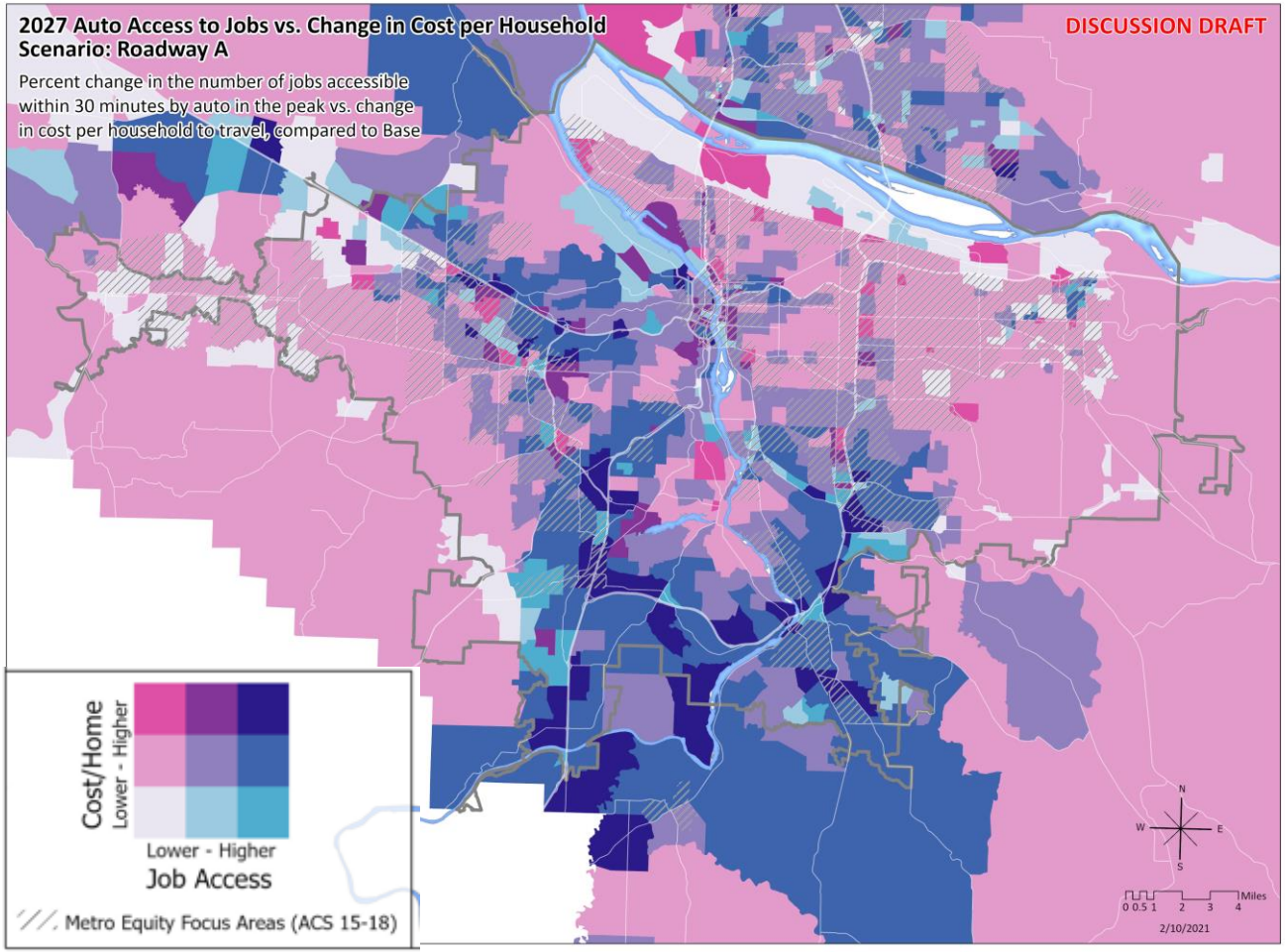


Changes are magnified with Roadway B, with more arterials seeing volume increases, and freeways seeing increasingly lower volumes.



DRAFT

Roadway A

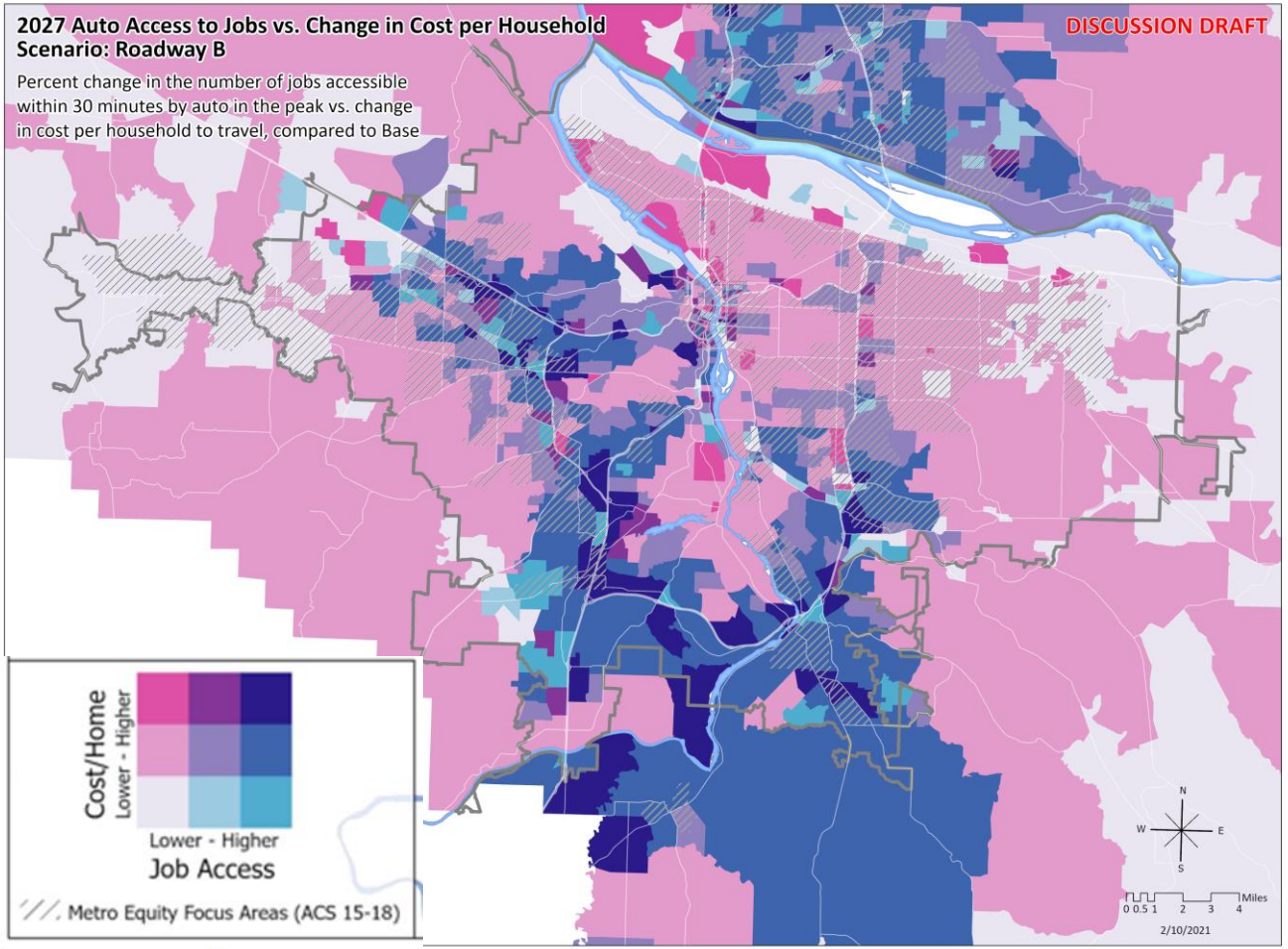


Areas near freeways (particularly to the south and west) see greater job access improvements compared to cost increases.

These changes are not seen to the same extent along the northern parts of I-5 and I-205, or along I-84

DRAFT

Roadway B

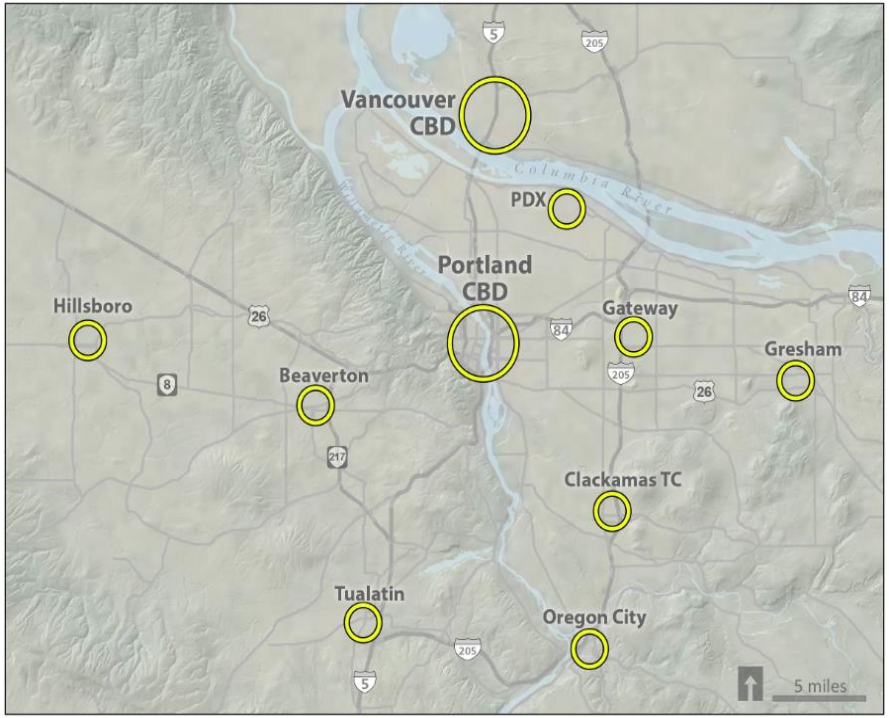


With Roadway B, the areas that see a greater benefit compared to cost shrink. Doubling the charge does not result in more improvements to job access compared to the cost.

Findings from Modeling

DRAFT

Travel Time Changes between destinations



Travel times for trips between 9 centers

- Portland Central Business District
- Portland Airport
- Gresham
- Oregon City
- Clackamas Town Center
- Tualatin
- Beaverton
- Hillsboro
- Vancouver Central Business District

Findings from Modeling

DRAFT

Roadway A: Travel Time Changes – PM Peak

- Roadway A substantially improves some trips between centers (up to 15%), but worsens others (up to 6%)

	Draft	To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-4%	-13%	-9%	1%	1%	-10%	-4%	-4%	-7%
	PDX	-2%	--	0%	-9%	-12%	-11%	-8%	-4%	-4%	3%
	Gateway	-10%	1%	--	4%	-13%	-12%	-12%	-9%	-8%	1%
	Gresham	-2%	2%	6%	--	0%	-5%	-4%	-5%	-5%	-6%
	Oregon City	2%	-12%	-13%	-8%	--	-8%	-10%	-14%	-2%	-10%
	Clackamas TC	3%	-10%	-12%	-4%	-9%	--	-12%	2%	-2%	-8%
	Tualatin	-9%	-8%	-13%	-12%	-15%	-14%	--	-12%	1%	-9%
	Beaverton	-3%	-6%	-11%	-8%	-14%	2%	-12%	--	2%	-7%
	Hillsboro	-6%	-7%	-10%	-9%	2%	-4%	1%	1%	--	-8%
	Vancouver CBD	-5%	1%	0%	5%	-10%	-8%	-10%	-8%	-7%	--

Findings from Modeling

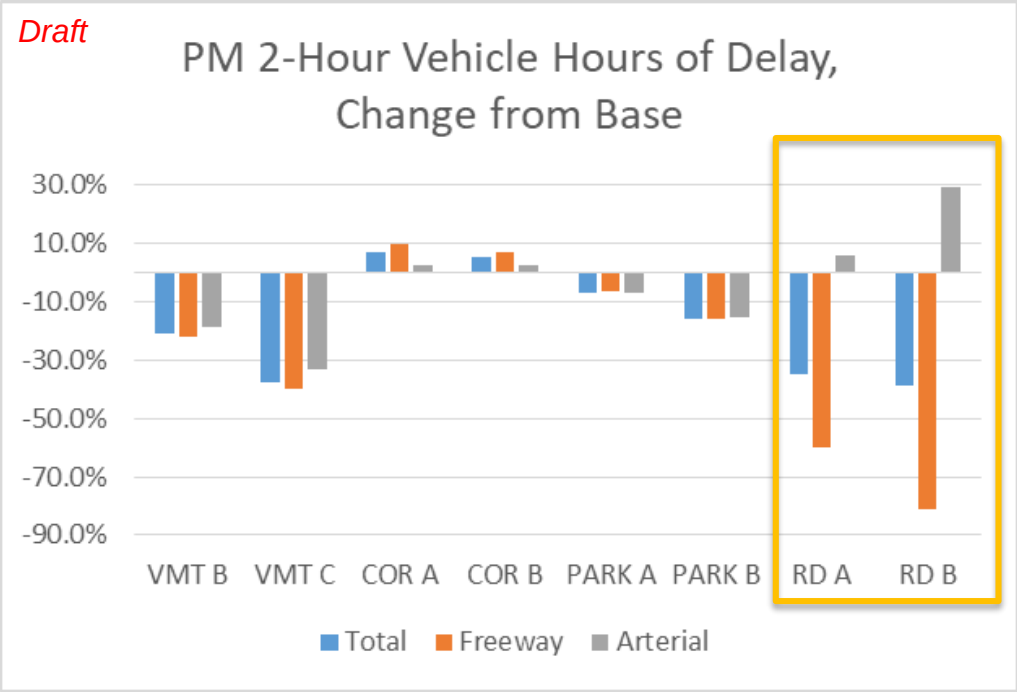
DRAFT

Roadway B: Travel Time Changes – PM Peak

- Roadway B substantially improves some trips between centers (up to 24%), but worsens others (up to 12%)

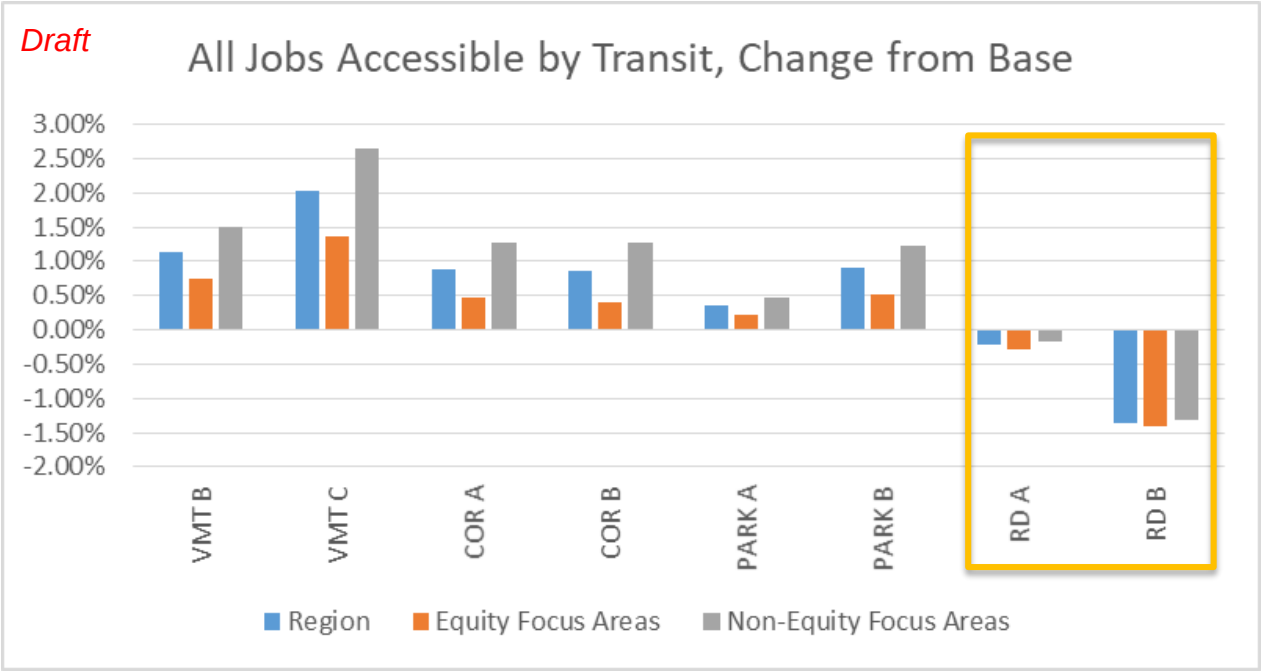
Draft		To									
	TAZ	Portland CBD	PDX	Gateway	Gresham	Oregon City	Clackamas TC	Tualatin	Beaverton	Hillsboro	Vancouver CBD
From	Portland CBD	--	-7%	-24%	4%	3%	5%	-16%	-5%	-8%	-13%
	PDX	-2%	--	4%	9%	-19%	-16%	-13%	-4%	-7%	5%
	Gateway	-15%	4%	--	12%	-21%	-18%	-21%	-15%	-14%	3%
	Gresham	11%	3%	10%	--	2%	5%	-6%	-7%	-9%	-6%
	Oregon City	6%	-17%	-19%	5%	--	-11%	6%	-19%	10%	-15%
	Clackamas TC	8%	11%	-17%	6%	-15%	--	-18%	7%	-2%	-13%
	Tualatin	-14%	-13%	-22%	-6%	-22%	-23%	--	-19%	4%	-16%
	Beaverton	-3%	-9%	-18%	-3%	-22%	6%	-19%	--	4%	-13%
	Hillsboro	-7%	-10%	-16%	-6%	7%	-1%	4%	4%	--	-13%
	Vancouver CBD	-7%	2%	2%	8%	-15%	-11%	-17%	-12%	-12%	--

Vehicle Hours of Delay



- Because of the diversion from freeways to arterials, the two roadway scenarios see increasing delays on the arterial network, even as freeway delays are substantially reduced.
- The negative impacts to arterials are magnified under Roadway B.

Jobs Accessible by Transit



- The two Roadway scenarios are the only ones with a negative impact to jobs accessible by transit.
- This is likely caused by delays to buses that run on arterials near the freeways.

Congestion Pricing Costs

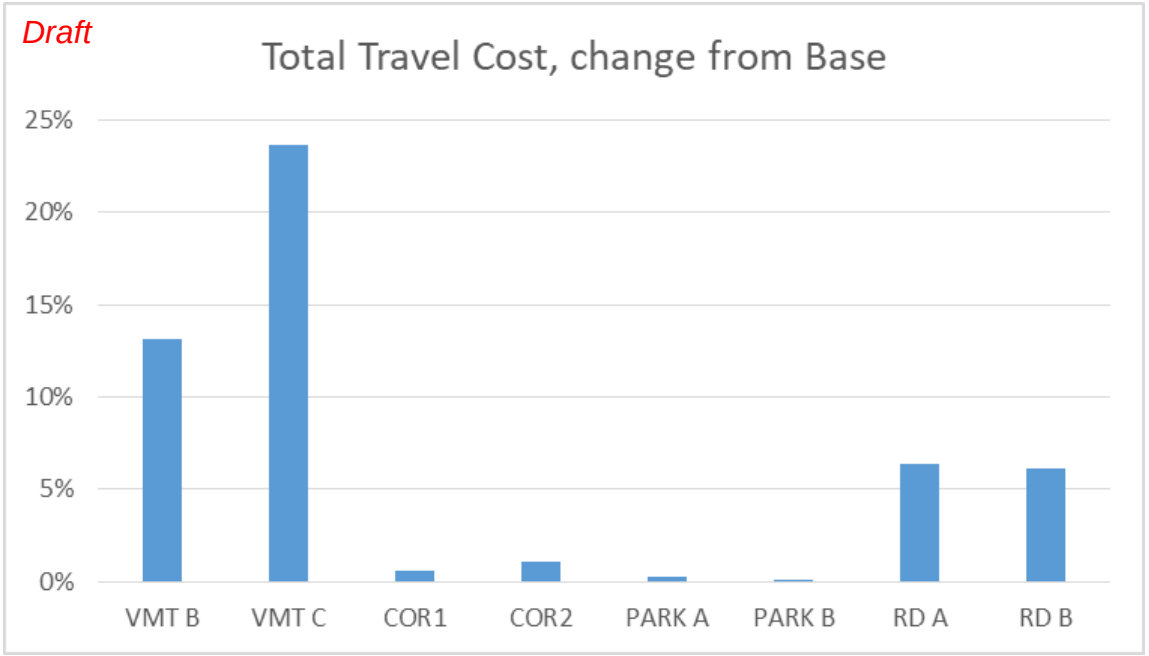
DRAFT

Summary of Cost Impacts

- All eight scenarios increase the overall cost for travel for the region, but some scenarios distribute the costs widely while others concentrate them on fewer travelers. Those that distribute the costs also have the highest overall cost for the region.
- Overall regional transportation costs and individual traveler costs vary by scenario.
- Distribution of costs and benefits have implications for where fee discounts and revenues should be targeted.

DRAFT

Regional Travel Costs

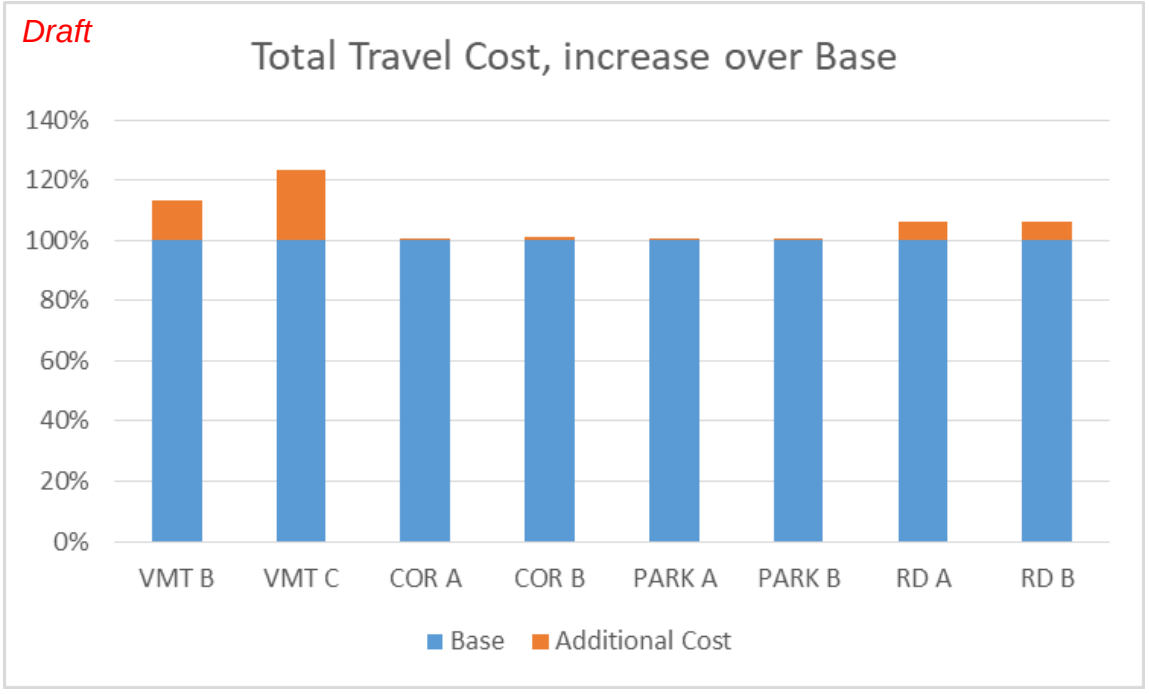


Total Travel Cost includes auto operating costs, tolls, parking, and transit at a regional level.

VMT B and C show much higher change in travel costs

Cordon and Parking scenarios show minimal regional change in travel costs

Regional Travel Costs



Total Travel Cost includes auto operating costs, tolls, parking, and transit at a regional level.

VMT B and C show much higher change in travel costs

Cordon and Parking scenarios show minimal regional change in travel costs

DRAFT

Individual Costs – Example Driving Trips

Draft

Additional Round-Trip Costs For Various Driving Trips (over 2027FC base)

From	To	Dist. (Total)	Dist. (FWY)	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B	Base Total
Troutdale Airport	Hillsboro Intel Campus	62.8	58	$ 4.30	$ 8.29	$ -	$ -	$ -	$ -	$ 7.66	$15.31	$ 13.25
Portland Airport	Bridgeport Village	44.6	40	$ 3.06	$ 5.89	$ -	$ -	$ -	$ -	$ 5.28	$10.56	$ 9.41
Downtown Beaverton	Oregon City	37.2	36	$ 2.55	$ 4.91	$ -	$ -	$ -	$ 4.46	$ 4.75	$ 9.50	$ 9.95
Clackamas Town Center	Gateway	15.4	14	$ 1.05	$ 2.03	$ -	$ -	$ 0.40	$ 2.03	$ 1.85	$ 3.70	$ 4.48
Gateway	Montgomery Park	18.8	18	$ 1.29	$ 2.48	$ -	$ -	$ -	$ -	$ 2.38	$ 4.75	$ 3.97
Adidas Headquarters	Nike Headquarters	24.4	20	$ 1.67	$ 3.22	$ -	$ -	$ -	$ -	$ 2.64	$ 5.28	$ 5.15
Downtown Gresham	Lloyd District	29.6	24	$ 2.03	$ 3.91	$ -	$ 5.63	$ 3.97	$16.13	$ 3.17	$ 6.34	$ 14.44

*For RD A and RD B, trips are assumed to utilize the throughway.

*For COR A and COR B, trips not ending in downtown Portland are assumed to remain on the throughways.

*Costs are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Costs – Example Transit Trips

Draft

Additional Round-Trip Costs For Various Transit Trips (over 2027FC base)

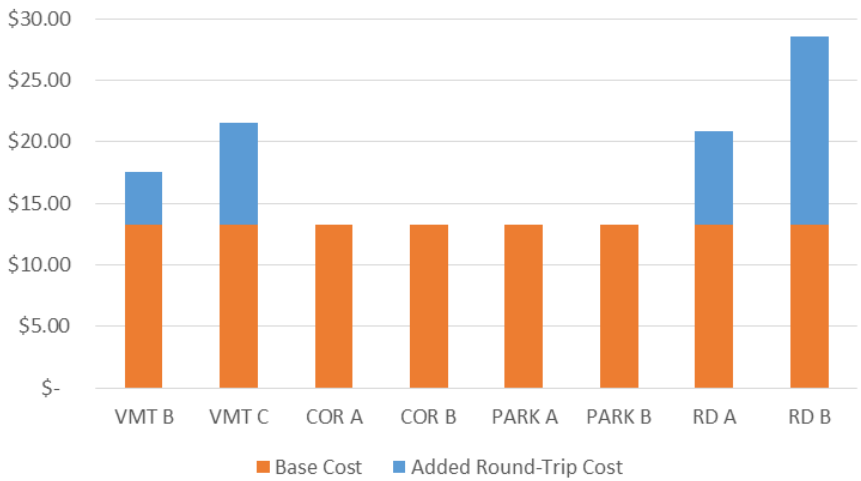
From	To	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Troutdale Airport	Hillsboro Intel Campus	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Portland Airport	Bridgeport Village	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Downtown Beaverton	Oregon City	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Clackamas Town Center	Gateway	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Gateway	Montgomery Park	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Adidas Headquarters	Nike Headquarters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Downtown Gresham	Lloyd District	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

*Costs are estimated without taking into account potential toll/parking discounts that may be applied for key groups

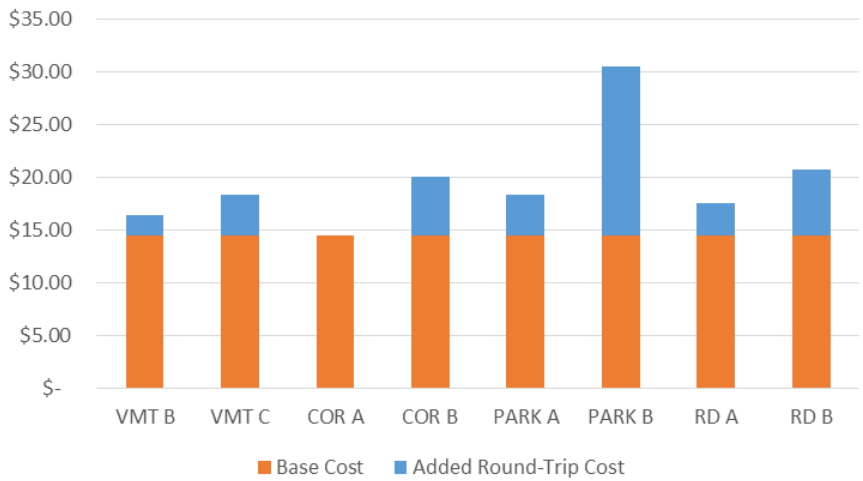
DRAFT

Individual Costs – Example Driving Trips

Draft



Draft



*Costs are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples

- Sally lives in Oregon City and drives to work on Swan Island.
- Sally sees some improvement in travel times under each scenario, but also pays more in some scenarios

Draft	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Improvement in Travel Time (minutes)	2.0	4.0	2.0	10.0	1.5	3.5	7.0	16.0
Increase in Total Auto Costs	$2.50	$4.50	$0.00	$11.50	$0.00	$0.00	$7.50	$12.50

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples

- Sally can avoid the toll for Cordon B and both Roadway Scenarios
- This will increase her travel time and decrease her cost

Draft	CORB		RWA		RWB	
	Toll	Avoid	Toll	Avoid	Toll	Avoid
Improvement in Travel Time (minutes)	10.0	-5.5	7.0	-0.5	16.0	-2.0
Increase in Total Auto Costs	$11.50	$2.00	$7.50	$0.50	$12.50	$1.00

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples

- Jill lives in Beaverton and drives to work in Hillsboro.
- Jill sees some improvement in travel times under some scenarios, but also pays more in some scenarios.

Draft	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Improvement in Travel Time (minutes)	1.0	1.5	0.0	0.0	0.0	0.0	-0.5	-1.5
Increase in Total Auto Costs	$1.50	$2.50	$0.00	$0.00	$0.50	$2.00	$0.00	$0.00

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples

- Roberto lives in Woodstock and drives to work in downtown Portland.
- Roberto sees some improvement in travel times under most scenarios, but also pays more in most scenarios.

Draft	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Improvement in Travel Time (minutes)	1.0	2.0	2.5	5.0	1.0	2.0	-0.5	-1.5
Increase in Total Auto Costs	$1.00	$1.50	$5.50	$5.50	$4.00	$20.50	$0.00	$0.00

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples

- Ben lives in Gresham and takes MAX to work in Gateway.
- Ben does not see any changes to his travel time or costs.

Draft	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Improvement in Travel Time (minutes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Increase in Transit Fare	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples

- Martha lives in inner-East Side Portland, and takes the bus to work in downtown Portland.
- Martha sees no changes in costs, and very minimal changes in travel times.

Draft	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Improvement in Travel Time (minutes)	0.5	0.5	0.5	0.0	0.5	0.5	0.0	-0.5
Increase in Transit Fare	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples

- Sarah lives in Lake Oswego and takes transit to her doctor at St. Vincent's on Barnes Road.
- Sarah sees no increase in fares and minimal travel time change.

Draft	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Improvement in Travel Time (minutes)	1.0	2.0	1.5	1.5	0.5	1.5	-0.5	-1.0
Increase in Transit Fare	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

Individual Trip Examples – VMT B

Name	Mode	Trip *Draft*	VMT B	
			Change in Travel Time	Change in Cost
Sally	Drive	Oregon City to Swan Island	2.0	$2.50
Ben	Transit	Gresham to Gateway	0.0	$0.00
Jill	Drive	Beaverton to Hillsboro	1.0	$1.50
Jack	Drive	Vancouver to Lloyd Center	0.5	$1.50
Martha	Transit	Inner-East Side Portland to Downtown Portland	0.5	$0.00
Angela	Drive	Northeast Portland to Hillsboro	2.5	$2.50
Roberto	Drive	Woodstock to Downtown Portland	1.0	$1.00
Marcus	Transit	Tigard to PSU	0.5	$0.00
Sarah	Transit	Lake Oswego to St. Vincent's	1.0	$0.00
Mike	Drive	Milwaukie to Wilsonville	1.5	$2.50
Carrie	Drive	Vancouver to Downtown Portland	0.5	$1.50

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Individual Trip Examples – RD B

Name	Mode	Trip *Draft*	RD B	
			Change in Travel Time	Change in Cost
Sally	Drive	Oregon City to Swan Island	16.0	$12.50
Ben	Transit	Gresham to Gateway	0.0	$0.00
Jill	Drive	Beaverton to Hillsboro	-1.5	$0.00
Jack	Drive	Vancouver to Lloyd Center	5.5	$4.50
Martha	Transit	Inner-East Side Portland to Downtown Portland	-0.5	$0.00
Angela	Drive	Northeast Portland to Hillsboro	13.0	$7.50
Roberto	Drive	Woodstock to Downtown Portland	-1.5	$0.00
Marcus	Transit	Tigard to PSU	0.0	$0.00
Sarah	Transit	Lake Oswego to St. Vincent's	-1.0	$0.00
Mike	Drive	Milwaukie to Wilsonville	9.0	$10.00
Carrie	Drive	Vancouver to Downtown Portland	5.5	$3.50

*Costs and travel times are estimated without taking into account potential toll/parking discounts that may be applied for key groups

DRAFT

Draft Benefits

With some exceptions, each of these pricing scenarios move the needle in the right direction in multiple categories:

- VMT per person declines
- Job access increases
- Drive alone rate decreases
- GHG and other emissions decrease
- Total transit trips increase
- Our region's most congested roadways see some relief

DRAFT

Draft High-Level Findings from Modeling

RTP Goal	Metrics	VMT B	VMT C	COR A	COR B	PARK A	PARK B	RD A	RD B
Congestion & Climate	Daily VMT								
	Drive Alone Rate								
	Daily Transit Trips								
	2HR Freeway VHD								
	2HR Arterial VHD								
Climate	Greenhouse Gas Emissions								
Equity	Job Access (Auto)								
	Job Access (Transit)								
	Total Regional Travel Cost	Medium-High	High	Medium-Low	Medium-Low	Low	Low	Medium	Medium

	Large Positive Change
	Moderate Positive Change
	Small Positive Change
	Minimal Change
	Small Negative Change
	Moderate Negative Change
	Large Negative Change

Discussion

Do any of the scenarios seem particularly promising? Are any of them particularly concerning, looking at the data?

Equity

DRAFT

Equity Outreach

Staff has reached out to specific groups for targeted feedback on analysis:

- Metro Committee on Racial Equity (CORE) - 9/20 & 12/20
- Portland's Equitable Mobility Task Force subgroup – 12/20
- ODOT's Equity and Mobility Advisory Committee – 2/21

How pricing programs can be designed to improve equity?

DRAFT

- Affordability can be built into a program
  - More flexible than current funding sources. Can provide discounts or exemptions for key groups.
- Revenue can be focused on equity outcomes
  - Invest in key neighborhoods
  - Focus on transit, sidewalks, bike lanes
  - Invest in senior and disabled services
- Targeting pricing benefits to key locations
  - Mobility improvements and air quality

DRAFT

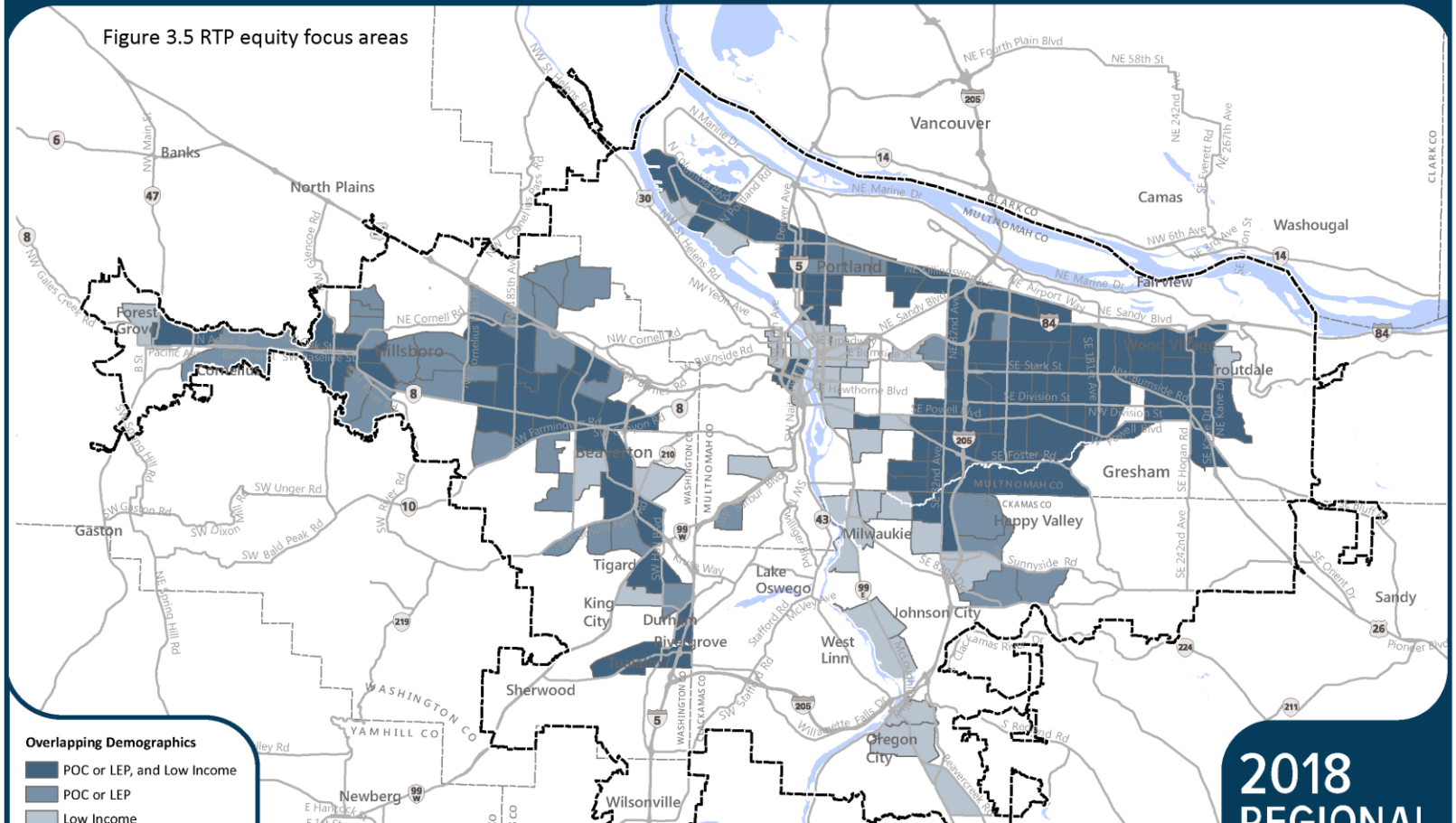
How Can We Measure Equity Impacts?

- Access to Jobs
  - Model can show how access to jobs changes with different pricing strategies
- Impacts for all compared to key areas (EFAs and others)
  - Travel time, costs, mode shift, congestion
  - Use new tools to measure impacts related to emissions, noise, pollution

Communities of Color, English Language Learners, and Lower-Income Communities

This map shows census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, people with low income, and English language learners. Census tracts where multiple demographic groups overlap are identified.

Figure 3.5 RTP equity focus areas



2018 REGIONAL

DRAFT

RCPS Assessment of Equity Performance

RCPS will include input in the best practices on equity discussion

- General agreement that our metrics -**better jobs access and geographic focus on benefits and costs** -were helpful to understand pricing performance
- Agreement that any pricing project will need to assess the equity benefits and consideration in much more detail
- Agreement that current system is inequitable

DRAFT

RCPS Key Themes Heard

- Community must be engaged throughout projects
- Promises made for equity are not guaranteed
  - How can we ensure targeted revenue, discounts, etc.. are carried out?
- Pricing should be paired with an access strategy
  - Access to Jobs, education, and community services
- Public health should be considered –*emissions helpful, but there is more*
- Focus on the future state we want then assess where the benefits occur
  - Concern that wealthier drivers will just pay the toll and continue business as usual

DRAFT

RCPS Key Themes for Pricing Projects

- Focus on using revenues to make alternative transportation and transit more viable for BIPOC and low income communities (ex. “transportation wallet”)
- Concern over potentially disparate impacts
  - BIPOC and low-income residents, esp. those who commute off-peak and to multiple jobs
  - and urban areas versus more suburban/rural areas
- Issues with car culture/difficulty in using transit/privacy concerns
- How can a pricing project increase equity rather than “do no harm”?
- How will COVID / work from home change commute patterns and needs?
- Interest in continuing the conversation

DRAFT

Equity Outreach – Discussion

How do you feel about this feedback from equity experts? Are there other things we should be considering?

Improving Scenario Performance-
Design, Discounts, Reinvestment Considerations

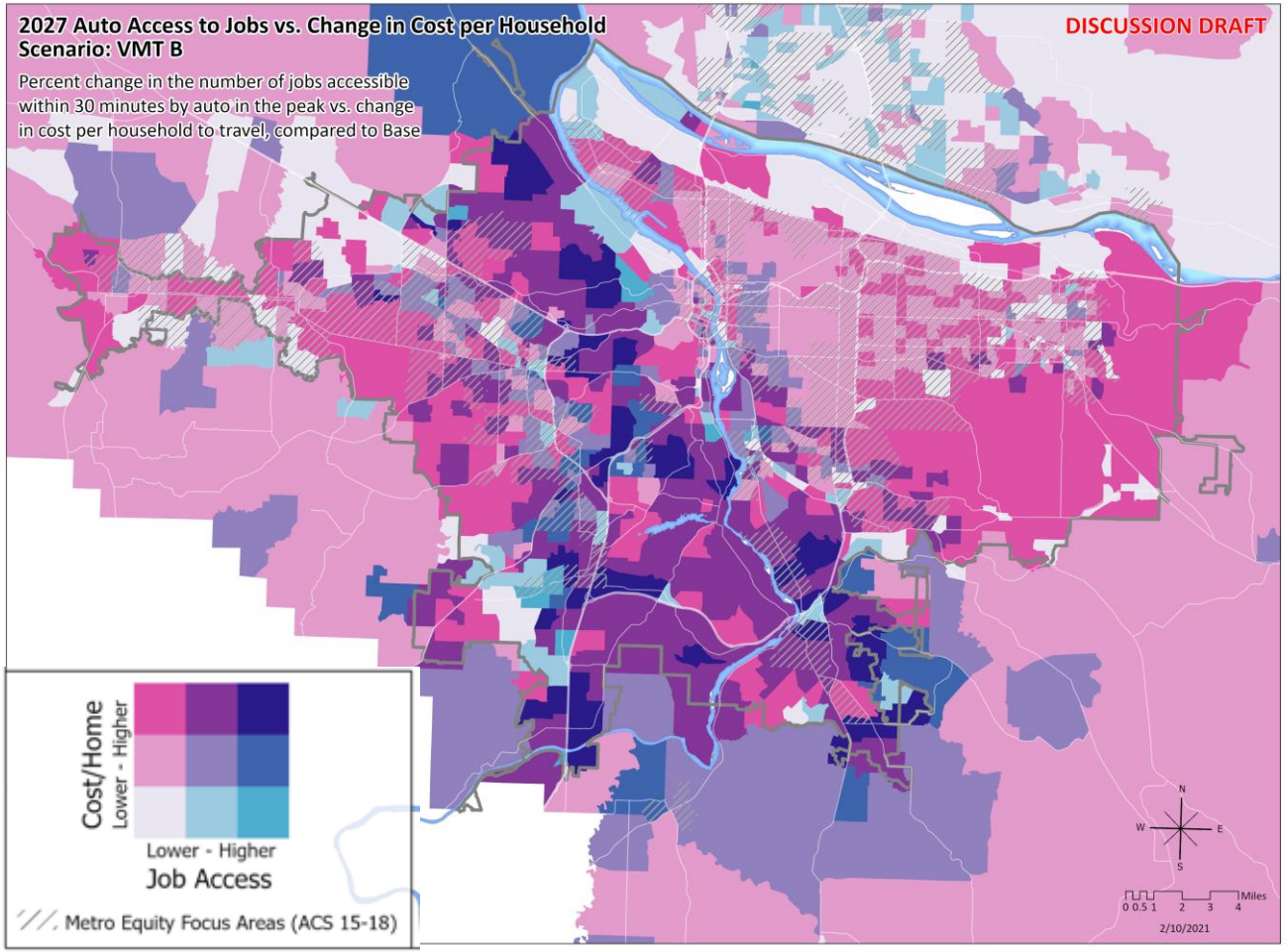
Improving Scenario Performance – Reinvestment, Discount, Design Considerations

DRAFT

- Any pricing scenario presumably would generate more revenue than it costs
- The region/communities will be asked how best to use those revenues
- What design considerations, targeted reinvestments, or targeted areas for discounts could improve performance including equity and safety?

DRAFT

VMT B



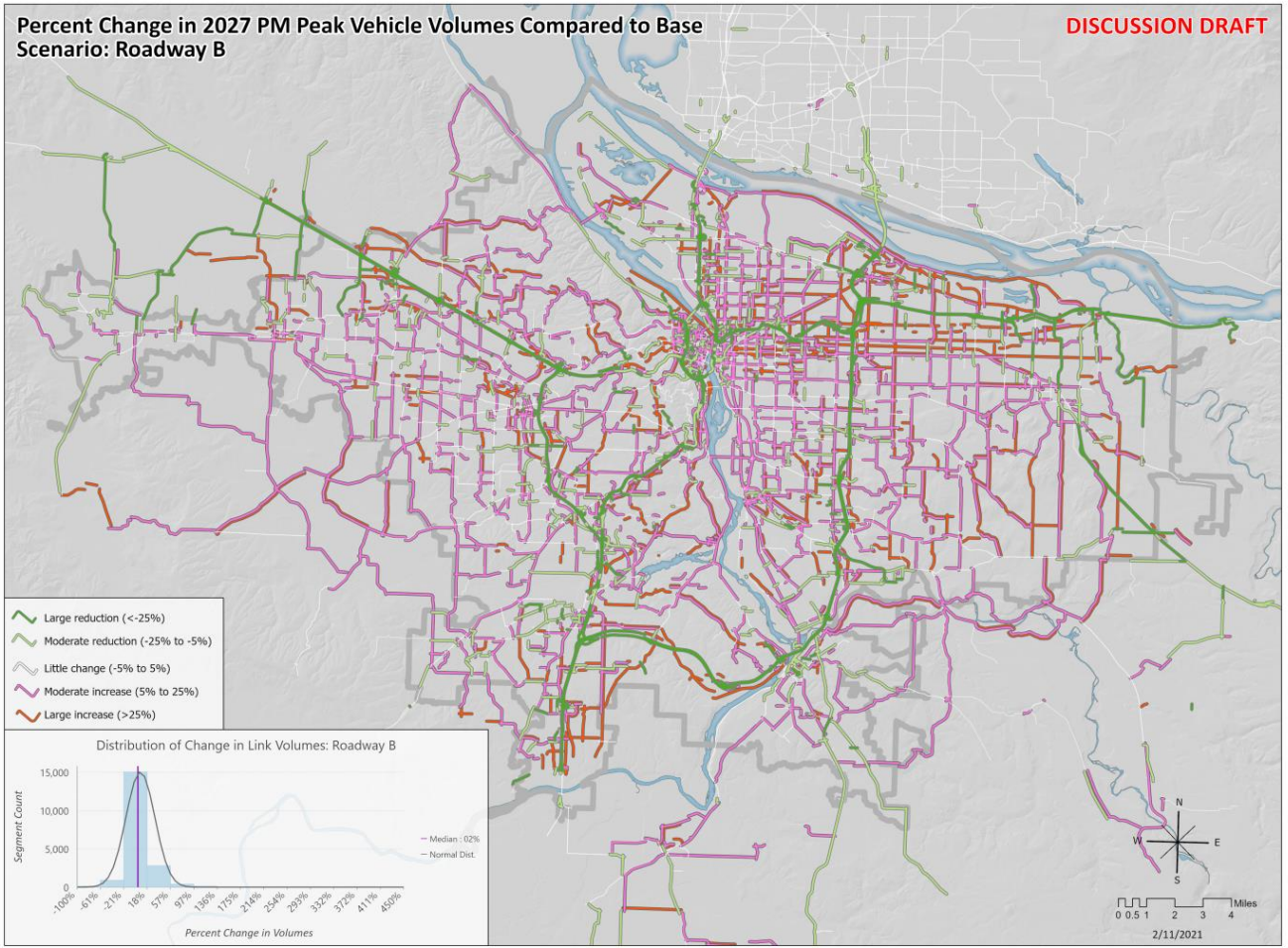
Uneven distribution of benefits.

Revenues and discounts for key groups could be targeted to areas of concern.

- Equity Focus Areas
- Low car ownership
- Limited transit

DRAFT

Roadway B



The higher charge on freeways results in arterials performing worse.

Variable charges by time of day?

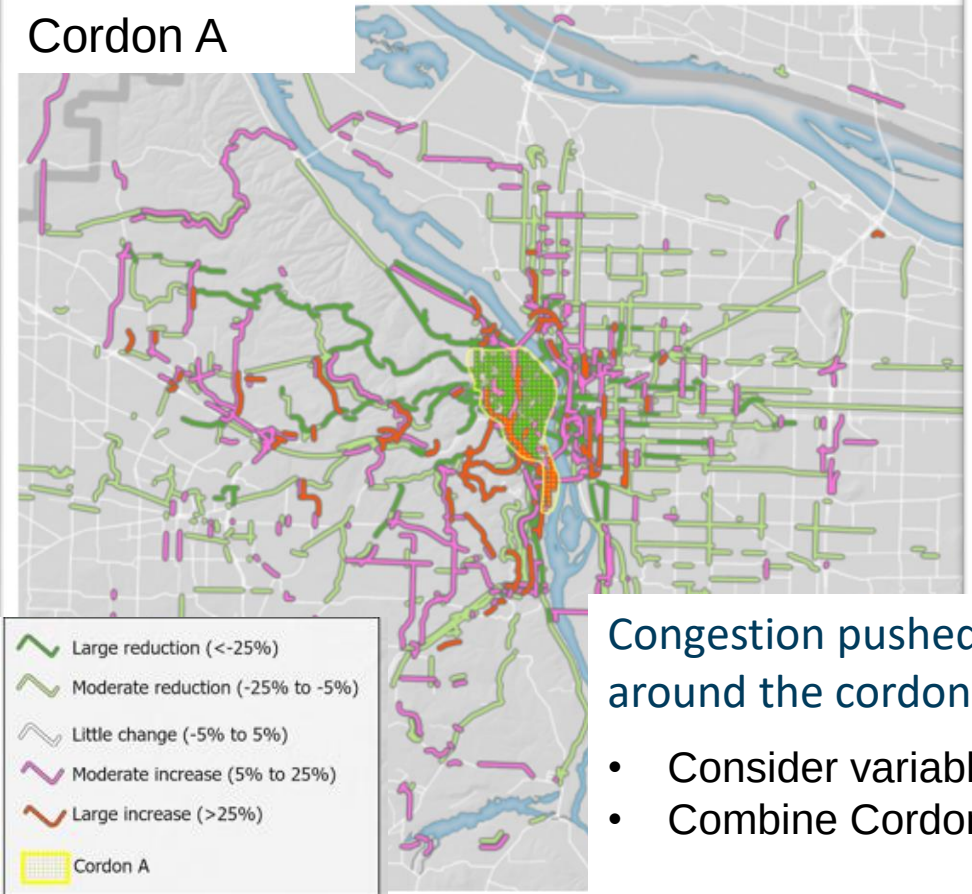
Revenue could focus on improving arterial function.

- Bus priorities?
- Safety fixes?
- Pedestrian/bike fixes?

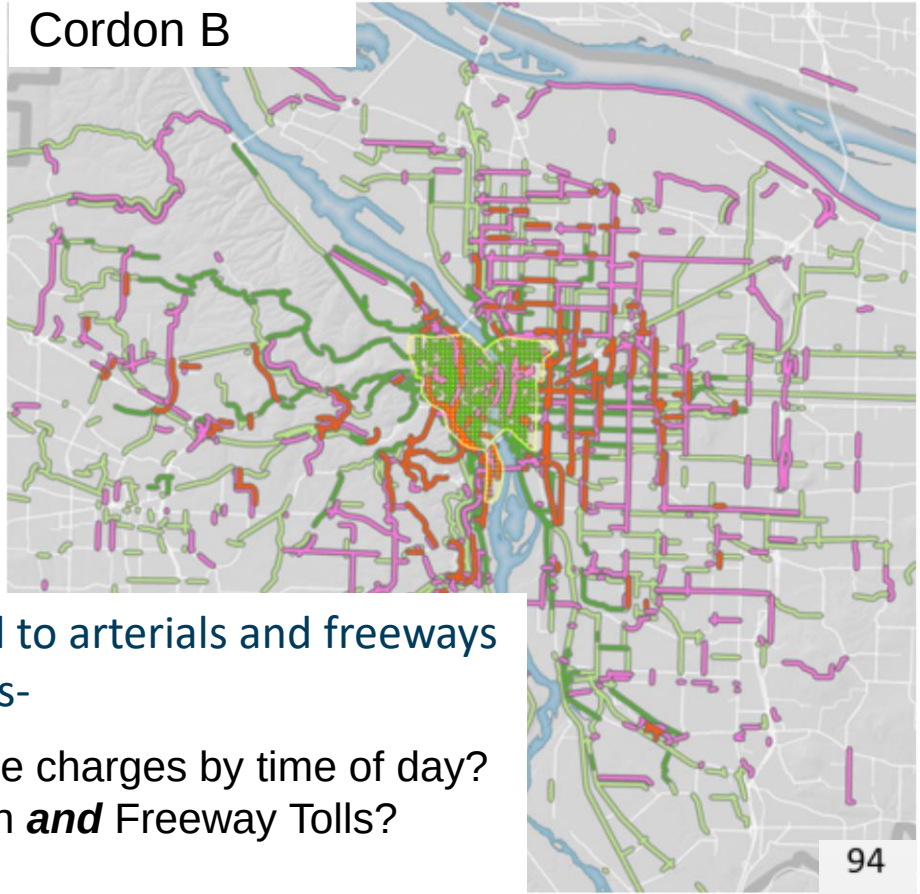
Change in Volumes Compared to Base (2-hr PM Peak)

DRAFT

Cordon A



Cordon B



Congestion pushed to arterials and freeways around the cordons-

- Consider variable charges by time of day?
- Combine Cordon ***and*** Freeway Tolls?

Discussion

How does reinvestment of revenues play into your thinking of Congestion Pricing in general, and in relation to any of these scenarios in particular?

Schedule and Next Steps

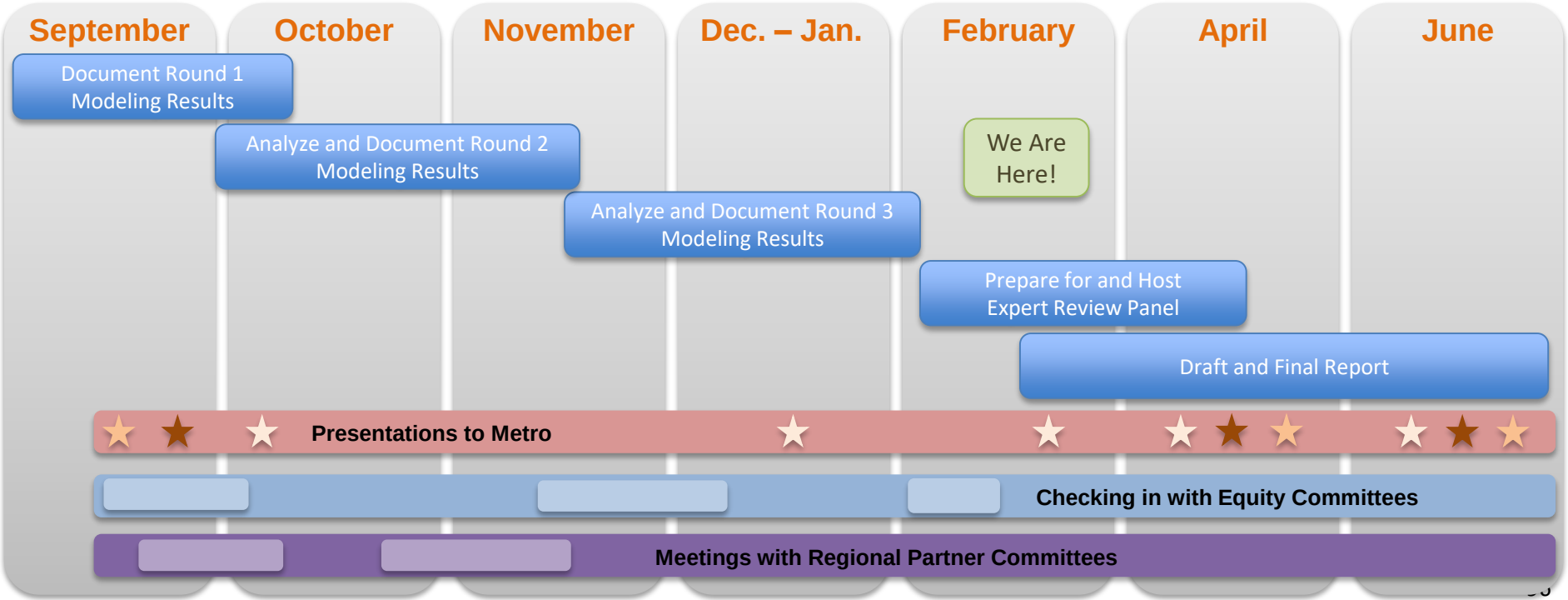
DRAFT

Expert Review Panel

- Convening a group of congestion pricing experts with experience in US, Canada, and Europe to look at our efforts and provide guidance on next steps
- Timing: April 2021
- Metro Council, JPACT, and TPAC will be invited to hear the discussion, as will pricing partners

DRAFT

Our Schedule



DRAFT

Next Steps

- Metro Council and JPACT – April 15
- Expert Review Panel – April 22
- TPAC, JPACT, MPAC and Metro Council – June 2021
- Final Report – June 2021

Regional Congestion Pricing Study

Thank you for your feedback!

Elizabeth.Mros-OHara@oregonmetro.gov