

Following the last Powell-Division Steering Committee meeting, you indicated a desire to receive additional detailed information to facilitate your ability to make upcoming decisions on the project.

Attached, please find this information, provided in a number of formats. Topics have a short summary, as well as a more comprehensive response if you wish to dive into greater detail. A number of topics additionally have a link to a short (2 minute) video with a Metro staff member walking through the information with a more graphically-oriented focus, and/or a link to an even more detailed memo. To jump to a specific topic, simply click on that topic within the table of contents.

This document contains information which is tailored to your specific needs. For a comprehensive document including additional questions and answers, please go to [Metro's project website](#). More information will be shared with you regarding technical analysis and engagement as we move forward. In addition, we will check in with each of you about the data prior to the September 26th Steering Committee Meeting.

If you have any additional questions after reviewing this information, please feel free to contact me (the Metro project manager).

Thank you,

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Powell-Division Steering Committee: METRO Responses to Powell-Division Survey Requests

METRO Responses to Powell-Division Survey Requests

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1) Why is Powell not a viable option for BRT? If the project doesn't go on inner Powell, what else can be done to help address issues on Powell?

- BRT on inner Powell and outer Division would cost more than a Small Starts, near term budget of \$300 million or less could meaningfully address.
- Significant congestion and constrained urban environment indicate that a separate, detailed investment strategy that addresses multiple needs on Powell Blvd is needed.
- Using 82nd, 52nd, or 50th avenues as a transition between outer Division and inner Powell would have significant property impacts.
- ODOT, City of Portland, Metro, and TriMet are working together to develop both a near- and long-term strategy to address Powell, including safety and transit improvements, a future high capacity transit investment, and equitable development actions.

[Click here for a video with more explanation](#)

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2) Why aren't we putting inner Powell on a road diet?

- A road diet is a term used to describe the conversion of general travel lanes to other uses, such as transit only, bus priority, or bike lanes.
- When considering whether inner Powell was a candidate for a road diet, the main factor examined was existing traffic volumes.
- Most road diets in the United States are on streets with traffic volumes less than 1,500 vehicles per hour.
- Traffic volumes on Powell range from 2,000-3,700 per hour, which is much higher than other Portland locations where road diets are being considered.
- Implementing a road diet on Powell with such high traffic volumes would result in unacceptable traffic impacts on nearby streets because cars would likely move to nearby streets such as Division, Gladstone, Holgate and neighborhood streets.

[Click here for a video with more explanation](#)

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3) How would the transit project perform on inner Division west of 82nd Ave?

- Technical analysis shows that a context-sensitive BRT could fit within the current inner Division street character while providing improved transit performance.
- BRT would be 15-20% faster than current 4-Division, and would improve reliability and quality of service.
- Inner Division BRT would cost less than an 82nd Ave / inner Powell Blvd alignment, and would minimize property impacts by using wider stop spacing, faster boarding, and traffic signal priority to operate more effectively in the existing street width.
- Traffic on inner Division moves slowly, but is more consistent and less congested than inner Powell during rush hour. Project improvements may also improve auto traffic congestion and travel times.

[Click here for a video with more explanation](#)

[Click here for more detailed information](#)

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4) Why focus on the Division corridor over other locations?

- The Powell-Division corridor has very high travel demand between Gresham and downtown Portland and is projected to grow with increases in residential and commercial development.
- Current and projected ridership shows that 4-Division route connects people to where they want to go now and will be even more important in the future. The current 4-Division route has over 10,000 rides each weekday. Ridership on the 4-Division is projected to grow to 17,400 weekday rides by 2035.
- Travel time, reliability, and overcrowding on the buses, already problematic in the peak times, will get worse as the area continues to grow.
- The Powell-Division transit project on Division Street will improve access to major origins and destinations with better travel times and reliability, and greater vehicle capacity.

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5) What are the origin and destination information for transit trips and desired trips (existing and future?)

The BRT stations locations and route connections are proposed where the highest ridership activity is currently occurring and where the model data shows the highest demand for future transit trips.

- Stations are located at high transit ridership locations. [See project map book here.](#)
- Stations and routing connect the number one origin/destination (downtown Portland) with major activity locations and travel districts with high demand as shown by the Metro regional model. [See memo regarding market analysis here.](#)
 - District 2 (between the Willamette River to approximately SE 80th Avenue) has 31% of trip origins and destinations;
 - District 1 (downtown Portland, South Waterfront, and Marquam Hill) with 24% trip origins and destinations;
 - and District 4 (between SE 106th Avenue and SE 187th Avenue) with 21% of trip origins and destinations.
- Routing and station locations will serve the average ride length (3.2 miles) that was determined by onboard surveys.

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6) Will a transit project on inner Division/outer Division still serve communities of concern?

An Inner Division/Outer Division alignment still serves communities of concern which are primarily located east of 82nd Avenue which is still directly served by the route. The table below shows the minor change in demographic composition served by the project with an Inner Division/Outer Division alignment (between 0.6 and 2.9 percent difference for the three categories).

Alignment East of Willamette River	Communities of Concern (Residents and % of total population)						
	Minority		Low income		LEP		Total pop.
Inner Division/Outer Division Alignment	30,575	31.7%	43,070	44.7%	12,244	12.7%	96,373
Inner Powell/Outer Division Alignment	33,886	33.3%	48,354	47.6%	13,564	13.3%	101,655
<i>Percent Difference</i>	1.6%		2.9%		0.6%		n/a

Notes: Source: 2008-2012 American Community Survey; Geography within ½ mile of alignment; LEP = Limited English Proficiency

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7) What types of property impacts could we expect from an inner Division alignment and how does that compare to inner Powell and 82nd Ave?

There would be far fewer property impacts on Division than Powell. Traffic congestion and corridor constraints on inner Powell and 82nd Avenue would require extensive property impacts and/or expensive treatments to make the bus trip fast and reliable during the morning and evening rush hours.

See [“Why is Powell not a viable option for BRT”](#) for more information on property impacts on a Powell Blvd alignment.

- An inner Division route would require minor changes to the streetscape to accommodate quicker, multiple-door boarding and adjust parking and curb extensions at new stations.
- A BRT on SE Division west of 82nd Ave, should be able to operate mostly within the existing street width and be faster and more reliable than the Line 4-Division is today.
- Early conceptual designs assume street character will be mostly maintained, but there will be some changes to sidewalks and parking where new stations are added and curb areas extended to accommodate multiple-door bus boarding.
- Where current bus stops are removed the area could be altered and used for other purposes.

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8) Results of Conversations with Key Groups

- The MultiCultural Collaborative convened 11 culturally-specific, transit-dependent focus groups in winter 2016.
- Key themes from the focus groups were a desire for better sidewalks and crossings to stops and improved stations.
- Better reliability is the key improvement people would like to see.
- Most participants (79%) thought the proposed station locations would meet their travel needs.
- An online survey open July-Sept 2016 indicates that Most People (93%) like all or some of the changes proposed on inner Division, and a Majority (64%) say the proposed station locations work well for them.
- Those (26%) who support more stations cite the increased distance to the station.

[Please see this PowerPoint for more information on feedback from key groups.](#)

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9) What are the BRT travel times and travel time savings (end to end and for different trips)?

- A new BRT service would be faster than the existing Line 4-Division between Gresham Transit Center and Pioneer Courthouse Square using Inner Division Street, as shown in the table below.
- A Hawthorne Bridge route would typically be faster than a Tilikum Crossing route to the heart of downtown, but a Tilikum Crossing route would directly serve OHSU and PSU with a faster trip.
- There are reliability concerns for either a Tilikum Crossing route (Union Pacific Railroad trains and Max Orange Line) or a Hawthorne Bridge route (bridge lifts during off-peak hours).
- The project is exploring ways to reduce disruptions by Union Pacific Railroad freight trains between Division Street and the Tilikum Crossing Bridge which can last up to 40 minutes.
- A Hawthorne Bridge route is subject to disruption from bridge lifts which are only allowed in the off-peak hours. These typically last between 8-15 minutes.
- While a Hawthorne Bridge route would provide a faster trip to Pioneer Courthouse Square than a Tilikum Crossing Route, a Tilikum Crossing route would provide a direct connection to OHSU, South Waterfront, and Portland State University.
- An extension of the BRT to Mount Hood Community College is estimated to take between 10-13 minutes on the BRT compared to the Line 20-Burnside/Stark that takes between 11-14 minutes today, plus 8 minutes to transfer from the Line 4-Division at Gresham TC which has 15 minute frequency.

Between Gresham Transit Center and Pioneer Courthouse Square Total Travel Time (in minutes)					
Alignment	WB AM Peak	WB PM Peak	EB AM Peak	EB PM Peak	Reliability Concerns
Line 4-Division Today	64	66	56	70	Hawthorne Bridge lifts during off peak
BRT via Hawthorne Bridge	54	55	47	61	Hawthorne Bridge lifts during off peak
Time saved over current service	10	11	9	9	
BRT via Tilikum Crossing	61	62	52	64	UPRR/Max crossings at all times.
Time saved over current service	3	4	4	6	

Sources: TriMet Trip Planner April 2016, CH2M model run times, February 2016 and April 2016.

Between PCC Southeast (82 nd Ave) and Gresham Transit Center Total Travel Time (in minutes)				
Alignment	WB AM Peak	WB PM Peak	EB AM Peak	EB PM Peak
Line 4-Division Today	31	37	29	35
BRT	26	31	24	31
Time saved over current service	5	6	5	4

Sources: TriMet Trip Planner April 2016, CH2M model run times, February 2016 and April 2016.

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10) How did the project identify proposed stations?

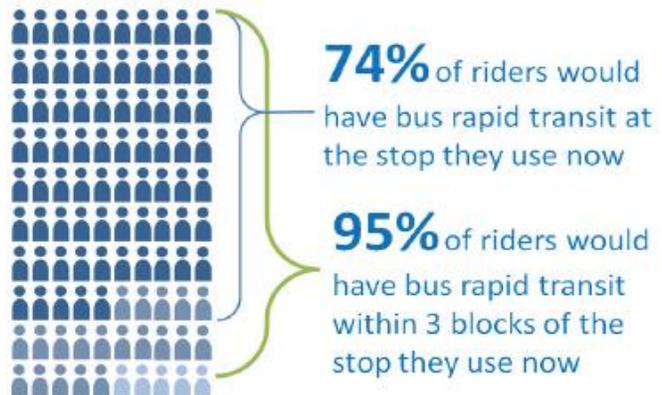
Station locations were identified based on an analysis of:

- Existing ridership at current bus stops (both average daily rider ons/offers and monthly ramp deployment),
- Location of key destinations (especially those that may be used by people that depend on transit for their necessities and major transfer points to other transit),
- Access to stations (sidewalks infrastructure, and street crossings that are ideally signaled or marked to identify pedestrian priority),
- And spatial analysis to maintain reasonable station spacing (filling in gaps if stations are over ½ mile apart).

The approximately 38 stations making up the route vary from about 1/2 to 1/3 of a mile apart. Half of the stations are proposed where there are current or future transit transfer locations. Station locations would serve most current transit trips with 74% of riders using stations in the same locations as their current stops.

[Click here for a video with more explanation](#)

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11) What were key themes the project heard from bus stop surveys/focus groups?

- The majority of bus riders who participated in the online survey and focus groups felt that the proposed station locations would meet their travel needs.
- Most people said they were likely to use a BRT station.
- People who felt unlikely to use a BRT station said the station was too far or there were insufficient safe crossings and/or sidewalks.

- July through September 2016, residents, businesses and bus riders will tell us how well the proposed stations on inner Division meet their travel needs. The Steering Committee will be able to review this input prior to making a decision on general station locations.

Please see the [June 2016 Public Engagement Report](#) for more information.

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12) Will there be an opportunity to weigh in on future service planning?

- TriMet will coordinate with key stakeholders at least annually to identify and discuss priorities for new transit service
- Riders and community members can always communicate with TriMet through their customer service phone number and website (503-238-RIDE and trimet.org/contact)
- The next phase of the project will include a new Community Advisory Committee (CAC) to continue to provide input on the Powell-Division corridor project and related bus service.
- The CAC's work will help inform the Annual Service Plan development process.

[Click here for more detailed information](#)

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13) How will the BRT be coordinated with other north/south bus service?

- Several north/south service improvements in the corridor have been identified through the Eastside and North/Central Service Enhancement Plans.
- Proposals include future north/south bus service on 223rd, 162nd, 148th, and 20th avenues.
- Improvements to north/south bus service are a component of the Powell-Division Corridor Wide Strategy.
- TriMet considers and prioritizes service improvements from the Service Enhancement Plans annually through the Annual Service Plan, which is a detailed list of service improvements that are included in TriMet's budget each year.

[Click here for more detailed information](#)

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14) Are there plans to address issues that remain along Powell Boulevard?

ODOT, the City of Portland, Metro, and TriMet are working together to develop a near-and long-term strategy to address Powell. It will include safety, transit, and equitable development improvements (per the Portland Action Plan) and the housing development at 82nd/Division, that can be implemented in the short and long term.

In addition, the Powell-Division High Capacity Transit (HCT) Project is currently included in the Regional Transportation Plan for completion between 2014 and 2024. A Division/Division High Capacity Transit project addresses many needs identified for the Powell-Division HCT project, but does not address remaining needs on Powell Boulevard. Consequently, Metro will advance, for consideration, Powell Boulevard as a future high capacity transit investment and recommend modifying the RTP to include a future Powell Blvd transit study.

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15) How would the project connect to OHSU and PSU?

A Tilikum Crossing route would directly serve OHSU-South Waterfront and PSU, and provide a fairly direct connection to OHSU-Marquam Hill with a transfer or short walk. It would require a walk (0.6 mile/12 minute) to PCC Climb Center. However, the route would have very poor reliability, unless the freight train interruptions can be minimized at the UPRR tracks. (TriMet is discussing potential solutions with the UPRR.) It would take longer to get to the center of downtown Portland.

A Hawthorne Bridge route would provide access to OHSU, Portland State University, and OHSU-Marquam Hill with a transit transfer or for PSU the choice of a transfer to multiple routes or a short walk. Access to the PCC Climb Center would require a roughly 9-10 minute walk. It would be more direct to the heart of downtown.

Route	New BRT Access to Destinations			
	OHSU-South Waterfront	Portland State University	OHSU-Marquam Hill	PCC Climb Center
Tilikum Crossing	Direct	Direct	Short transfer	Walk
			<i>Streetcar or Line 35 or 0.3 mile walk ~6 min. to Tram</i>	<i>0.6 mi walk ~ 12 min.</i>
<i>Reliability</i>	<i>Poor without changes to freight train traffic or a new bus bridge at 8th over UPRR and Max Orange Line – Up to 45 minute delays from freight trains, any time of day</i>			
Hawthorne Bridge	Transfer	Transfer or walk	Transfer	Walk
	<i>Line 8 1 block north of Madison or on bus mall</i>	<i>Lines- 1, 8, 12, 94 (1 block) from 5th/Madison, Orange or Green Line (3 blocks), Line-9 at (5 blocks)</i>	<i>Orange Line (3 blocks), or Line-9 (5 blocks) or Line -9 (3 blocks) SW Columbia/5th</i>	<i>0.5 mi from SE 7th/ Harrison or 0.4 mi from SE Madison/SE Grand ~9-10 min.</i>
<i>Reliability</i>	<i>Subject to Hawthorne Bridge lifts outside of peak hours lasting 8-15 minutes</i>			

Source: TriMet schedules

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16) How would the project interact with and/or impact truck traffic (particularly on Hogan)?

Trucks on Hogan

A BRT route along Hogan is not expected to experience significant conflict with truck traffic, and is not in conflict with the road's designation as one of four local truck routes.

Hogan is one of four north south truck routes in east Multnomah County. During the development of the East Metro Connections Plan, extensive conversations were held regarding the preferred north-south route for trucks connecting I-84 and US 26 (Mt. Hood Highway). The consensus was that no single route was preferable for trucks, and that four freight routes should be maintained – 181st, 223rd, Hogan/238th, and Kane/257th. Actual truck counts conducted in 2011 confirmed that none of the four routes had greater than 1% truck traffic during the peak hour. Given these counts, a BRT route along Hogan is not expected to experience significant conflict with truck traffic, even with expected future localized increases in truck traffic.

Traffic on Hogan

Future 2035 analysis shows the intersections of Hogan with Stark and Division with average delays of 56 and 64 seconds, respectively, which is comparable to 2035 performance projections at most arterial-arterial intersections in the area. Turning at major intersections will always incur some delay. A BRT on Hogan is not expected to experience greater delays at intersection on Stark and Division than other comparable arterial to arterial intersections in the area. The PM peak-hour BRT travel time between Division/Cleveland and MHCC via Hogan is estimated at 10-13 minutes, an average of 10-14 mph, with the range depending on the direction of travel and the level of investment in BRT lanes at the intersections of Hogan with Division and Stark.

[Please see this memo on Hogan Model Analysis Results for more information.](#)

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17) Travel time from GTC to MHCC for BRT compared to the Line 20

An extension of the BRT to Mount Hood Community College could add an additional 10 to 13 minutes based on modeled travel times, which should take less time than transferring from the 4-Division waiting for a transfer and riding the Line 20- Burnside/Stark.

- Line 20 takes 11-14 minutes to get between Gresham TC and Kane/29th (July 2016 TriMet Trip Planner).
- Since current Line 4 riders have to transfer to Line 20 to get to MHCC, it would on average take Line 4 riders closer to 19-23 minutes to go between MHCC and GTC today, assuming an 8 minute

average wait (from TriMet's online schedules, headways for Line 20 appear to be around 15 minutes in the peak hours).

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18) Primer on funding sources

What is Small Starts?

Small Starts is a transit project funding source administered by the Federal Transit Administration (FTA) under the Section 5309 Capital Investment Grant program. Small Starts provides funding for lower cost transit projects, including corridor-based bus projects such as the Powell-Division project, through a competitive project evaluation and rating process.

Does Powell-Division qualify for Small Starts?

Yes! The qualifications for small starts are as follows:

- ✓ The total project cost must be less than \$300 million
- ✓ The total grant amount requested must be less than \$100 million
- ✓ The project must be a fixed guideway for at least 50% of the project length in the peak period and/or be a corridor-based bus project
- ✓ A corridor-based bus project must have the following minimum elements:
 - ✓ Substantial transit stations
 - ✓ Signal Priority / Pre-Emption (for bus/LRT)
 - ✓ Low Floor / Level Boarding Vehicles
 - ✓ Special Branding of Service
 - ✓ Frequent Service – at least every 10 minutes in the peak and 15 minutes off-peak
 - ✓ Service offered at least 14 hours per day

The Powell-Division project meets all of these qualifications to be eligible for Small Starts funding as a corridor-based bus project.

What is New Starts? New Starts is another transit project funding source administered by the FTA that provides for bigger projects. The Powell-Division project would not qualify for New Starts, because it would require the bus to have its own, exclusive travel lane for at least 50% of the length of the project route. This would impact many properties and would not fit the narrow streets and urban character along inner Division and in downtown Gresham and downtown Portland.

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19) What are the effects of traffic congestion by the Union Pacific Railroad (UPRR), and what could improve the problem?

Potential for disrupting the BRT:

- A BRT route connecting SE Division Street to the Tilikum Crossing would need to cross the UPRR railroad and the TriMet Max Orange Line tracks either at grade or via a new elevated over-crossing.
- Train traffic can disrupt north-south bus, auto, pedestrian, and bicycle travel when trains block 11th and 12th avenues at all times of day. The UPRR creates delays at all times of day that can last up to 45 minutes.

Potential solutions:

- A conceptual cost estimate for a new bus bridge over the UPRR tracks is around \$35 million dollars.
- TriMet is working with the UPRR to identify other methods of minimizing freight train disruptions.

Challenges of working with the UPRR

- The Union Pacific Railroad (UPRR) is a private entity that owns the railroad right-of-way running through the project area between Division Street and the Tilikum Crossing.
- Federal law protects the railroads from potential infringement that could impede rail traffic and/or present safety concerns. Coordination with railroads can be challenging and time consuming because railroads are interested in minimizing any potential interference with the railroad operation within their right-of-way and other travel modes are often viewed as potentially conflicting with railroad operations.

[For more information see this memo comparing potential Hawthorne and Tilikum alignments.](#)

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20) What are the effects of the new Multnomah County Courthouse (Hawthorne Bridgehead) on ridership/delay?

The new Multnomah County Courthouse is scheduled to be open by the year 2020 which should not conflict with construction of the BRT which should open in 2021. The courthouse is moving to a lot adjacent to the Hawthorne bridgehead. Jobs and visitors to the courthouse should have excellent access from the BRT.

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21) When is the Hawthorne Bridge raised and how can it affect travel? What is the source of the bridge lift data for the Hawthorne Bridge?

Multnomah County normally does not perform Hawthorne Bridge lifts during the weekday morning or evening peaks, 7-9 am, and 4-6 pm. During the four months of bridge lift logs reviewed (June – September 2015), there were zero (0) lifts during these weekday peak periods. Bridge lifts are typically in the summer months when the Willamette River is high. However, Federal law requires bridge lifts when requested by river traffic, and river traffic therefore receives priority.

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22) Do the project's design treatments preclude future service?

While a BRT is a more flexible design than many other treatments, some changes to the design can be difficult retrofit. For example stations at intersections are built to minimize any property impacts and maintain safe travel ways for bicyclists, autos, and pedestrians. If there is a desire to lengthen a station to accommodate additional buses service, it could require moving the station, closing driveways, or buying property to make the longer station fit. Designs can and are often altered over time, but larger capital infrastructure is more difficult to change. In addition, if the project uses federal money to pay for improvements there can be consequences for removing infrastructure that the federal government helped fund. FTA has been known to have local governments pay back funds when they have removed capital improvements that were funded by that agency.

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23) Can station locations be changed in the future?

Station locations can be changed in the future to reflect changing priorities. However, removing infrastructure that the Federal Transit Administration (FTA) helped pay for can have consequences. To protect its investments, the FTA has rules around removing investments that it helped pay for and the local governments/agencies could be required to pay the FTA back for their investment. Stations may be added in the future, but the cost would likely be incurred locally without federal matching funds.

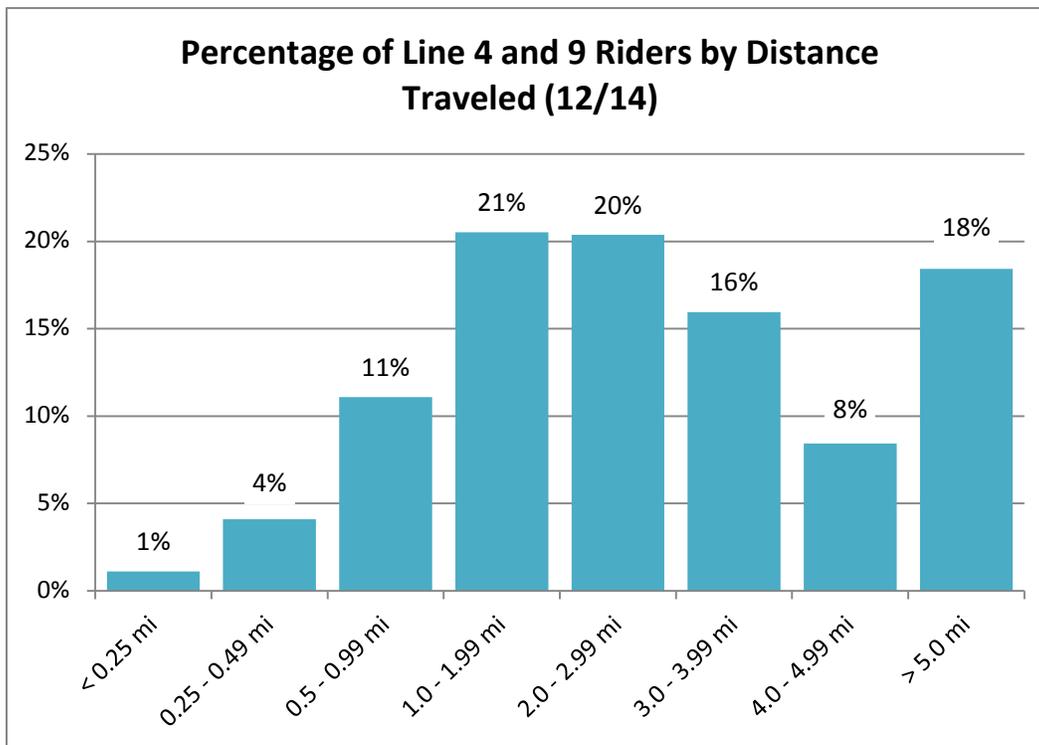
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24) How many people are taking very short transit trips?

TriMet gathered data on distances traveled on the Line 4-Division and Line 9-Powell (December 2014) on weekdays between 6 am and 10 pm from over 3,600 passengers. The data showed that less than 5 percent of riders were making trips under half of a mile long. The average trip length was 3.2 miles. There was no substantial difference in the distance traveled by time of day, geography or route.

Percent of Line 4 and 9 Riders Distance Traveled by Geography		
Distance Traveled	West of 82nd	East of 82nd
< 0.25 mi	1%	1%
0.25 - 0.49 mi	4%	4%
0.5 - 0.99 mi	11%	11%
1.0 - 1.99 mi	19%	23%
2.0 - 2.99 mi	19%	22%
3.0 - 3.99 mi	17%	14%
4.0 - 4.99 mi	8%	8%

Source: TriMet onboard survey, date December 2014



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25) Information on service hours saved from less frequent 4-Division that can be reinvested in other bus service

The amount of service provided on transit is measured in vehicle hours. TriMet currently allocates approximately 1,400 weekly vehicle hours to operate the Line 4-Division with service levels at 15 minutes or better most of the day, seven days a week. Implementation of BRT on Division will provide faster and more reliable service to riders in this corridor, and would allow TriMet to redirect some or all of those service hours provided on Line 4-Division. There are many ways that the savings in service hours could be reinvested into the Powell-Division corridor. TriMet currently assumes that service hours from Line 4-Division when replaced by BRT would primarily go to north-south service that provides service to communities and connects to the BRT. Some numerical examples of ways this could be done include those listed below.

- If Line 4-Division were reduced to 30 minute service all day, 400 vehicle hours would be available to invest in other service. 400 vehicle hours would be enough to make improvements such as 30 minute service on 162nd Avenue most of the day.
- If Line 4-Division were reduced to 60 minute service all day, 800 vehicle hours would be available to invest in other service. 800 vehicle hours would be enough to make improvements such as frequent service (15 minutes all day) on Line 87.
- If Line 4-Division were completely replaced by the BRT, 1400 vehicle hours would be available to invest in other service. 1400 vehicle hours would be sufficient to implement improvements such as:
 - 30 minute service on Line C (148th Avenue) most of the day with 15 minute service during the peak hours AND
 - 30 minute service on Line D (162nd Avenue) most of the day, AND
 - Frequent service (15 minutes all day) on Line 87

TriMet is planning to provide additional vehicle hours to operate the BRT above the amount of service hours currently spent on local service in the corridor. BRT vehicle hours are not transferrable to local service, because TriMet has prioritized service hours for regionally-supported high capacity transit such as the Powell-Division Corridor BRT.

TriMet and project partners held a workshop on April 25th, 2016, to ask people what their preferences would be with 1,400 service hours to spend on transit service in the Powell-Division Corridor. People were divided about the importance of underlying service in addition to bus rapid transit (BRT). Those who favored keeping underlying service on the line 4-Division stressed the importance of serving East Portland where many people rely on transit and the pedestrian network is less safe and accessible. Those who favored BRT service without underlying service on Division stressed the need to reinvest

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service hours for Line 4-Division into nearby areas that have less or no transit service. In general, there was a strong interest in reallocating at least some service, and for those who did want underlying service on Division, the focus appeared to be east of 82nd Avenue. Safety was a critical issue with interest in improved sidewalks and crossings. Please see the [June 2016 Public Engagement Report](#) for more information.

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Appendix: Additional Detailed Information

1) Why is Powell not a viable option for BRT? If the project doesn't go on inner Powell, what else can be done to help address issues on Powell?

- BRT on inner Powell and outer Division would cost more than a Small Starts, near term budget of \$300 million or less could meaningfully address.
- Significant congestion and constrained urban environment indicate that a separate, detailed investment strategy that addresses multiple needs on Powell Blvd is needed.
- Using 82nd, 52nd, or 50th avenues as a transition between outer Division and inner Powell would have significant property impacts.
- ODOT, City of Portland, Metro, and TriMet are working together to develop both a near- and long-term strategy to address Powell, including safety and transit improvements, a future high capacity transit investment, and equitable development actions.

As we learned in early 2016, a BRT project serving Powell Blvd and linking to Outer Division would entail improvements beyond what a Small Starts transit project (no more than \$300 million) can meaningfully address. The high level of congestion and the constrained urban environment on Powell Blvd (and 82nd Avenue) showed that a separate multimodal effort to improve Powell Blvd is needed.

Project staff developed conceptual transit designs to improve bus travel on congested Inner Powell and the connection to Outer Division on 82nd Ave based on the Steering Committee initial route recommendation. Unfortunately, despite high costs and potential impacts to parks, buildings, and historic resources; the designs for Inner Powell only partially addressed the traffic delays. For example, a new bus flyover on Powell Blvd at 17th Ave with a bus lane to SE 24th Ave (estimated cost of \$28-\$42 million) would help buses get around a major bottleneck, but the traffic issues extend to 50th Avenue in the morning. A more complete traffic solution would require additional intersection and bus lane improvements that would add to costs millions of dollars more and likely impact property along the highway (such as the historic Cleveland High School building and sports field and the new Catholic Charities headquarters). In addition, these designs would not improve eastbound congestion, which slows buses in the evenings.

Transit designs for an 82nd Ave connection between Powell Blvd and Division St would require property impacts that are inconsistent with the neighborhood vision to avoid congestion. Early conceptual engineering estimates showed between \$25 and \$46 million in costs and 27 buildings with potential impacts. After further design analysis, it was evident that many more buildings would be impacted *with much higher costs*. The same type of impacts would be required for a connection between Inner Powell and Outer Division on either 50th or 52nd avenues.

ODOT, the City of Portland, Metro and TriMet are working together to develop a near- and long-term strategy to address Powell. It will include safety and transit improvements, equitable development actions included in the Portland Action Plan, and recommending continued regional consideration of Powell Blvd for a future high capacity transit investment. (A high capacity transit investment on Powell that does not directly connect to Outer Division would be much less expensive and avoid extensive property impacts, while improving travel times and safety.)

For more information on the constraints on Powell and 82nd Avenue, please see pages 4 and 5 of the [March 28, 2016 Steering Committee Packet](#).

[Click here for a video with more explanation](#)

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2) Why aren't we putting inner Powell on a road diet?

- A road diet is a term used to describe the conversion of general travel lanes to other uses, such as transit only, bus priority, or bike lanes.
- When considering whether inner Powell was a candidate for a road diet, the main factor examined was existing traffic volumes.
- Most road diets in the United States are on streets with traffic volumes less than 1,500 vehicles per hour.
- Traffic volumes on Powell range from 2,000-3,700 per hour, which is much higher than other Portland locations where road diets are being considered.
- Implementing a road diet on Powell with such high traffic volumes would result in unacceptable traffic impacts on nearby streets because cars would likely move to nearby streets such as Division, Gladstone, Holgate and neighborhood streets.

Road diets are the conversion of general travel lanes to other uses. A common example is the re-striping of a 4-lane road to 3 lanes with bike lanes. A road diet could also be used to convert a vehicle lane to transit only. During the Powell Division BRT planning process, the concept of converting a travel lane in each direction on Powell was raised.

There are several factors to consider when determining if a road diet is feasible. One indicator that traffic engineers look at is existing traffic volume. Most road diets are completed on streets on which the peak hour or rush hour volume is less than 1,500 vehicles per hour. The practical limit for consideration is generally felt to be at about 2,000 vehicles per hour. Each location requires its own traffic study, and there are exceptions to every rule, but based on Powell's characteristics including

traffic signal spacing, we think that about 2,000 vehicles per hour is the upper limit above which a road diet would result in more congestion and traffic diversion into neighborhoods than the public is willing to tolerate. Powell carries well more than 2,000 vehicles per hour between the river and 50th Avenue – more than 3,000 vehicles per hour at 26th, and more than 3,000 vehicles per hour at 42nd. Between 52nd and 82nd, the range is between 2,000 and 2,200 vehicles per hour.

We cannot find a comparable example in the United States of a road with such high volume and a similar traffic signal spacing on which a road diet was attempted. While it's true that such a proposal would be possible to implement, the impacts to traffic would be more than what the public would likely tolerate. Completing a road diet on Powell with such high traffic volumes would result in unacceptable traffic impacts on nearby streets because of diverted traffic to streets such as Division, Gladstone, Holgate and neighborhood streets.

Road diets are an important tool in the traffic engineer's toolbox, and should be considered in appropriate locations. An investment like Bus Rapid Transit should raise questions like this one. The characteristics of Powell simply don't fit within the range that a road diet would normally be considered in, particularly between the river and 50th.

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3) How would the transit project perform on inner Division west of 82nd Ave?

- Technical analysis shows that a context-sensitive BRT could fit within the current inner Division street character while providing improved transit performance.
- BRT would be 15-20% faster than current 4-Division, and would improve reliability and quality of service.
- Inner Division BRT would cost less than an 82nd Ave / inner Powell Blvd alignment, and would minimize property impacts by using wider stop spacing, faster boarding, and traffic signal priority to operate more effectively in the existing street width.
- Traffic on inner Division moves slowly, but is more consistent and less congested than inner Powell during rush hour. Project improvements may also improve auto traffic congestion and travel times.

Technical analysis shows a BRT project could be designed to fit within the current inner Division street character (wide sidewalks, crosswalks, plantings, etc...) and provide improved transit performance. Early conceptual designs assume some potential changes to sidewalks and parking where new stations are added and current bus stops are removed.

Technical Performance of Inner Division Routing	
Travel times	BRT on inner Division would be 15-20% faster than current 4-Division bus and will be much more reliable (on time).
Property impacts (fits street context)	Reliability and travel times can be achieved mostly within the existing street width using wider stop spacing, faster boarding, and traffic signal priority.
Ridership	4-Division has 8,600 weekday riders east of the Willamette River (more than 9-Powell) and as much as many existing BRT routes. Improvements to reliability and quality of service should improve ridership.
Potential cost	Less expensive than 82 nd Ave and Inner Powell alignment that would require extensive engineering treatments to improve travel time and would have multiple building impacts (See the answer to “Why is Powell not a viable option for BRT” for more information)
Ability to serve communities of concern	The alignment would still serve these communities which are largely located along Outer Division. (Please see page 8 of the June 1, 2016 Steering Committee Packet)
Traffic Performance	While traffic moves slowly along Inner Division Street, it is more consistent than Inner Powell where congestion during rush hour is much worse. Project treatments can improve congestion and travel times for traffic along Inner Division.

Ridership data is from TriMet Spring 2015 boardings on Line 4-Division east of the Willamette River.

[Click here for a video with more explanation](#)

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4) Why focus on the Division corridor over other locations?

- The Powell-Division corridor has very high travel demand between Gresham and downtown Portland and is projected to grow with increases in residential and commercial development.
- Current and projected ridership shows that 4-Division route connects people to where they want to go now and will be even more important in the future. The current 4-Division route has over 10,000 rides each weekday. Ridership on the 4-Division is projected to grow to 17,400 weekday rides by 2035.
- Travel time, reliability, and overcrowding on the buses, already problematic in the peak times, will get worse as the area continues to grow.
- The Powell-Division transit project on Division Street will improve access to major origins and destinations with better travel times and reliability, and greater vehicle capacity.

The Powell-Division corridor has been identified as a regional priority for transit investment because of its current and future projected ridership as well as projected growth in residential and commercial

development. The existing Line 4-Division operates in this corridor from downtown Portland to Gresham Transit Center and is currently one of the most frequent buses in the TriMet system. Even with that, the frequency provided today is not enough to meet the existing demand for service, and will not be enough to meet the demand in the future. In addition to the need for more capacity, riders on Line 4 today experience a substantial difference in travel time between the peak and offpeak hours, and have to contend with a service that struggles to stay on time, as described further below.

The importance of investing in capital improvements in the Powell-Division corridor is further underscored by the City of Portland's expectations that future housing development in this corridor will include substantial numbers of new low- and medium-income housing, particularly along outer Division Street. The capital improvements envisioned in the Powell-Division project will strengthen the transportation connection from housing to schools, jobs and other services for thousands of low- and middle-income Portlanders.

- **Travel Time and Reliability:** Traveling between downtown Portland and Gresham Transit Center on Line 4 takes at least 10-20 minutes longer during peak commuting hours than it does at other times. In addition to that, riders of Line 4 have to contend with a substantial variation in their travel time. Nearly all trips that provide service eastbound during the evening commute between downtown Portland and Gresham (4-6 PM) are late at least once a week. There are many reasons that bus trips can run late – unpredictable traffic congestion, high numbers of riders trying to get on at a single bus stop, waiting through more than one signal cycle – and all of these things can and do affect Line 4. TriMet continually makes adjustments to the Line 4 schedule in the hopes of improving its reliability, but because the traffic conditions in this corridor are highly variable, it is not possible to create a schedule that completely compensates for when and where the congestion will occur. Without the investments in capital infrastructure that have been identified in the Powell-Division project, it is not likely that service on Line 4 will become substantially more reliable. A recent example of this kind of capital infrastructure can be seen on NE Sandy Boulevard eastbound between NE 92nd Avenue and the Parkrose/Sumner Transit Center. In fall 2015, TriMet worked with ODOT and the City of Portland to extend a bus-only lane in this segment of the roadway that would allow buses to bypass the traffic congestion immediately west of the Parkrose/Sumner Transit Center. This segment of Sandy Boulevard is heavily used as an access point to I-205, and traffic congestion was having a substantial impact on both Line 12 and Line 71. Since the installation of that bus-only lane in fall 2015, median travel times in that segment of roadway have been reduced by 75%.
- **Capacity.** Many of current riders report overcrowding while riding buses on Division and request that TriMet adds more service. Buses currently operate on average every 4-5 minutes on Division during the peak hour and in the peak direction (westbound towards downtown in the morning, and eastbound towards Gresham in the evening). Currently, more than half of the trips on Line 4 are overcrowded in the evening commute from downtown Portland to Gresham

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(meaning that they hold more than the typical 51 passengers per bus at least once every two weeks, so people are either getting left behind at a bus stop or are uncomfortably crowded while on the bus). However, the other fifty percent of trips are often not full – and this is because of the phenomenon known as “bus bunching” where a bus that is empty gets stuck behind a bus that is full. Without the capital investments to improve trip reliability, adding more trips to this bus line in the hopes of adding more capacity would likely only lead to more bus bunching.

The capital investments included as part of the Powell-Division project are necessary in order to provide a faster, more comfortable, and more reliable transit trip. Although people who live and work along the Powell-Division corridor travel in every direction, Division Street itself is one of the most heavily traveled. Providing a more reliable trip with capacity for more riders along Division helps everybody who rides along any part of that corridor, whether or not they transfer to another bus line to begin or end their trip. Investing the same amount of money into service elsewhere would not likely have the same benefit to the Powell-Division corridor and to the region as a whole.

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5) What are the origin and destination information for transit trips and desired trips (existing and future?)

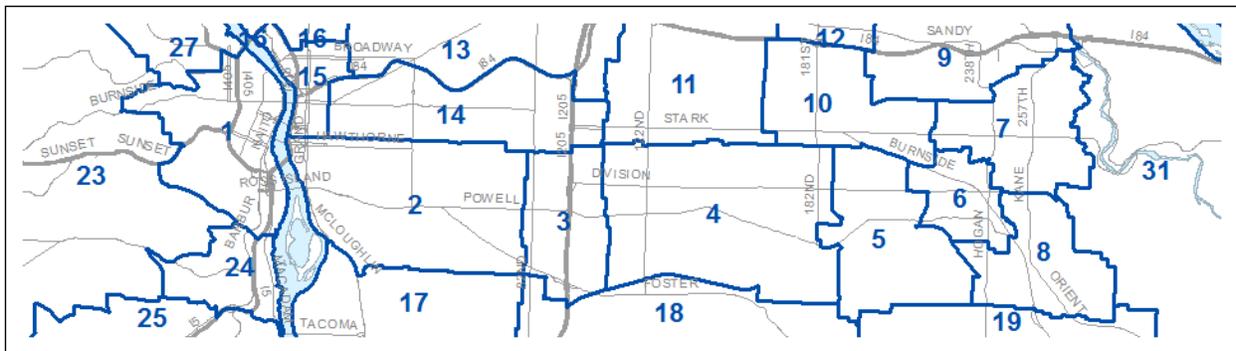
The BRT stations locations and route connections are proposed where the highest ridership activity is currently occurring and where the model data shows the highest demand for future transit trips.

- Stations are located at high transit ridership locations. [See project map book here](#)
- Stations and routing connect the number one origin/destination (downtown Portland) with major activity locations and travel districts with high demand as shown by the Metro regional model. [See memo regarding market analysis here.](#)
 - District 2 (between the Willamette River to approximately SE 80th Avenue) has 31% of trip origins and destinations;
 - District 1 (downtown Portland, South Waterfront, and Marquam Hill) with 24% of trip origins and destinations; and
 - District 4 (between SE 106th Avenue and SE 187th Avenue) with 21% of trip origins and destinations.
- Routing and station locations will serve the average ride length (3.2 miles) that was determined by onboard surveys.

Three excellent sources of data show where people want to go in the corridor: TriMet’s counts of rider ons and offs by bus stop; TriMet’s onboard survey data for the 4-Division and the 9-Powell showing where people started and ended their rides in the corridor; and Metro’s regional travel demand model showing trip demand within and between different districts of the corridor.

Metro’s regional travel demand model projections of the origins and destinations of BRT riders were aggregated to districts to show the general areas where riders want to travel to or from. Trips that originate *and* end in District 1 (downtown Portland, South Waterfront, and Marquam Hill) were excluded to avoid counting short trips by people within downtown Portland.

Powell-Division Corridor includes Districts 1-8



Percentage of Origins/Destinations occurring in each district for all modeled BRT trips

District Number	1	2	3	4	5	6	7	8
Origin/Destinations Percentage	24%	31%	6%	21%	3%	7%	7%	1%

Three districts account for 76% of the corridor trip origins and destinations in the 2015 model.

- 31% of BRT riders would travel to or from District 2 (between the Willamette River to approximately SE 80th Avenue);
- 24% of BRT riders would travel to or from District 1 (downtown Portland, South Waterfront, and Marquam Hill); and
- 21% of BRT riders would travel to or from District 4 (between SE 106th Avenue and SE 187th Avenue).

At a finer level of detail, projected stops usage is similar to current 4-Division stops only with higher activity. The busiest stops are forecast to be in downtown Portland and at major transit transfer locations including: SE Cesar Chavez Boulevard, SE 82nd Avenue, and the Gresham Transit Center. Mt. Hood Community College (MHCC) is projected to have just under 400 daily ons and offs as is the Kane/Stark intersection near the MHCC. [See memo regarding market analysis here.](#)

TriMet bus stop activity (ons/offs) for the 4-Division and 9-Powell and major nearby destinations are shown in the project mapbook. [See project map book here.](#)

TriMet conducted an onboard study to understand where riders were getting on and off Line 4-Division and Line 9-Powell in the corridor in December 2014. The survey showed:

- The average trip length on the 4 and 9 was around 3.2 miles.
- Close to 20% of trips on 4-Division and 9-Powell start or end in downtown Portland.
- Around 21% of trips start and end between 82nd Avenue and the Gresham transit center on the 4-Division.

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12) Will there be an opportunity to weigh in on future service planning?

- TriMet will coordinate with key stakeholders at least annually to identify and discuss priorities for new transit service
- Riders and community members can always communicate with TriMet through their customer service phone number and website (503-238-RIDE and trimet.org/contact)
- The next phase of the project will include a new Community Advisory Committee (CAC) to continue to provide input on the Powell-Division corridor project and related bus service.
- The CAC's work will help inform the Annual Service Plan development process.

TriMet staff will coordinate with key stakeholders (including but not limited to jurisdictions, major destinations, business associations, and community based organizations) on at least an annual basis to identify and discuss priorities for new transit service. Additionally, riders and community members communicate with TriMet every day through TriMet's customer service phone number and website (503-238-RIDE and trimet.org/contact) regarding their experiences riding our system and needs for new service. This information is regularly taken into account when addressing reliability and overcrowding challenges on our system, and is used on an annual basis when developing the Annual Service Plan.

A new Community Advisory Committee (CAC) will be convened for the next phase of the project to continue to provide input on bus service in the Powell-Division Corridor related to transit project. In addition, information from the CAC will be used in the Annual Service Plan development process in the same manner that input from other key stakeholders is used: by providing input to staff in developing recommendations to the TriMet Board for new service to implement on a yearly basis. Staff use input from key stakeholders along with technical analyses of the five key service planning considerations (demand, connections, equity, productivity, and growth) to make recommendations for future service improvements to the TriMet Board of Directors. Service improvements are adopted by the TriMet Board of Directors through the agency's budgeting process, which is adopted each spring in March or April.

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13) How will the BRT be coordinated with other north/south bus service?

- Several north/south service improvements in the corridor have been identified through the Eastside and North/Central Service Enhancement Plans.
- Proposals include future north/south bus service on 223rd, 162nd, 148th, and 20th avenues.
- Improvements to north/south bus service are a component of the Powell-Division Corridor Wide Strategy.
- TriMet considers and prioritizes service improvements from the Service Enhancement Plans annually through the Annual Service Plan, which is a detailed list of service improvements that are included in TriMet's budget each year.

TriMet has identified several north/south service improvements in the Powell-Division corridor through the development of the Eastside Service Enhancement Plan and the North/Central Service Enhancement Plan. Proposals for future north/south bus service on 223rd, 162nd, 148th, and 20th have all been developed with consideration towards providing a convenient connection to future BRT service. Improvements to north/south bus service are a component of the Powell-Division Corridor Wide Strategy.

TriMet considers and prioritizes the service improvements identified in the five [Service Enhancement Plans](#) on an annual basis through the Annual Service Plan. The Annual Service Plan is a detailed list of service improvements that are included in TriMet's budget for each fiscal year. Staff recommendations for improvements in the Annual Service Plan are guided by two things: 1) community input and 2) technical analyses of how well proposals meet the considerations listed in TriMet's [Service Guidelines Policy](#) and [Service Guidelines Framework](#), both of which were adopted by the TriMet Board in December 2014.

TriMet's [Service Guidelines Policy](#) lays out five key considerations that drive decisions for service improvements; these include equity, demand, productivity, connections, and growth. TriMet staff prepare technical analyses of how well each service improvement meets the five key considerations. More detail on the specific technical criteria used to analyze each potential improvement is available in [this memo](#) that describes service improvements recommended for Fiscal Year 2017.

TriMet staff use both the results of the technical analyses as well as the community input heard throughout the year to make recommendations to the TriMet Board each spring. The TriMet Board adopts each fiscal year's budget in March or April, and service enhancements included in the budget go into effect the following September and March.

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