METRO

Tracking Transportation Project Outcomes:

Light rail case studies suggest path to improved planning

June 2013

A Report by the Office of the Auditor

Suzanne Flynn
Metro Auditor

Audit Team:

Mary Hull Caballero
Senior Management Auditor

Kristin Lieber
Principal Management Auditor

Emilia Callero
Audit Intern

Knighton Award
for Auditing

Metro receives ALGA Gold Award

The Auditor's Office was the recipient of the Gold Award for Small Shops by ALGA (Association of Local Government Auditors). The winning audit is entitled *"Metro's Natural Areas: Maintenance strategy needed.* Auditors were presented with the award at the ALGA conference in Nashville, TN , in May 2013. Knighton Award winners are selected each year by a judging panel and awards presented at the annual conference.

Metro Ethics Line

The Metro Ethics Line gives employees and citizens an avenue to report misconduct, waste or misuse of resources in any Metro or Metropolitan Exposition Recreation Commission (MERC) facility or department.

The ethics line is administered by the Metro Auditor's Office. All reports are taken seriously and responded to in a timely manner. The auditor contracts with a hotline vendor, EthicsPoint, to provide and maintain the reporting system. Your report will serve the public interest and assist Metro in meeting high standards of public accountability.

To make a report, choose either of the following methods:

Dial 888-299-5460 (toll free in the U.S. and Canada)
File an online report at www.metroethicsline.org

METRO

SUZANNE FLYNN
Metro Auditor
600 NE Grand Avenue
Portland, OR 97232-2736
Phone: (503)797-1892 fax: (503)797-1831

MEMORANDUM

June 19, 2013

To: Tom Hughes, Council President
Shirley Craddick, Councilor, District 1
Carlotta Collette, Councilor, District 2
Craig Dirksen, Councilor, District 3
Kathryn Harrington, Councilor, District 4
Sam Chase, Councilor, District 5
Bob Stacey, Councilor, District 6

From: Suzanne Flynn, Metro Audito

Re: Audit of Transportation Project Case Studies

This report covers our audit of the effectiveness of Metro's planning strategies to increase light rail ridership. This audit is related to a previous audit released in 2010 that analyzed all transportation investments from Federal Fiscal Years 2004 through 2008. In that audit, we noted that Metro could not determine whether transportation projects moved the region toward desired outcomes in the 2040 growth management plan because of incomplete data collection. This audit was included in our FY2010-11 Audit Schedule to delve a little deeper and demonstrate the value of outcome evaluation.

We chose a case study methodology to complete our audit. We reviewed many transportation projects and decided to study light rail transit stations. Metro plans recommend certain strategies that are intended to increase ridership. If the region is to meet many of its growth management goals, ridership on transit must be maximized. The three stations that we chose to study in depth provided us a rich complement of data and observations. From this, we learned that while ridership had increased at each station over time, there were other factors than the recommended strategies that should be considered to maintain that trend. We continue to believe that Metro should not only use data to predict what plans should be implemented, but also review after the fact whether these predictions were accurate.

We have discussed our findings and recommendations with Martha Bennett, COO, and Robin McArthur, Director, Planning and Development. A formal follow-up to this audit will be scheduled within two years. We would like to acknowledge and thank the management and staff in the Department who assisted us in completing this audit.

Table of Contents

Summary

As the federally designated metropolitan planning organization for the region, Metro must adopt a long-range transportation plan and approve short-term project priorities before federal funds can be received. This audit builds on a 2010 audit report that found Metro was unprepared to evaluate whether completed transportation projects resulted in progress on the region's growth management goals. In this audit, we completed three case studies of light rail transit stations to further illustrate the benefit of retrospective evaluation. The case-study stations were Tuality Hospital/SE 8th Avenue in Hillsboro, North Killingsworth Street in Portland, and East 162nd Avenue in Gresham.

Light rail transit is important to the region and represents a significant public works investment. It cost about $3 billion in today's dollars to construct and additional resources annually for operations. While operated by TriMet, it is also a key component of Metro's growth management plan intended to reduce fuel consumption, air pollution, drive-alone trips and distances traveled by car. The best measure of whether this investment is of benefit to the region is its level of use – ridership.

Planning criteria suggests several strategies to increase ridership. The responsibility for implementing these strategies is shared among various governments. This audit assessed the effectiveness of these strategies in combination by analyzing:

- Government investments
- Ridership trends
- Demographic data, and
- Surveys of residents

We determined that ridership at the three stations went up over time. However, we were unable to make a determination whether these increases were caused by the planning strategies. Conversely, we were unable to determine that they were ineffective. Evidence indicated that other factors present in study areas could have played a role in ridership changes.

In household surveys we conducted, residents identified different actions than the strategies that would influence them to ride more. A comprehensive look at the neighborhoods surrounding the stations led us to conclude that Metro could improve the effectiveness of its future plans and current programs by reviewing actual results. This would lead to tailored strategies that addressed barriers to ridership at individual locations.

In addition to findings related to our original objective, we concluded that one of our study areas was less able to compete for government investment because some programs that fund transit-supportive projects are dependent on private-sector involvement. We also found the city limit boundary between Portland and Gresham impeded planning and problem-solving around the same station, which could make it difficult to attract non-riders and retain frequent riders who live near it.

Multiple governments and the public must act in partnership to increase ridership. We found that the region's decision-making process related to transportation planning was not organized to enable collaboration. As a result, the shared resources needed to maximize the region's investment in the light rail system were not available.

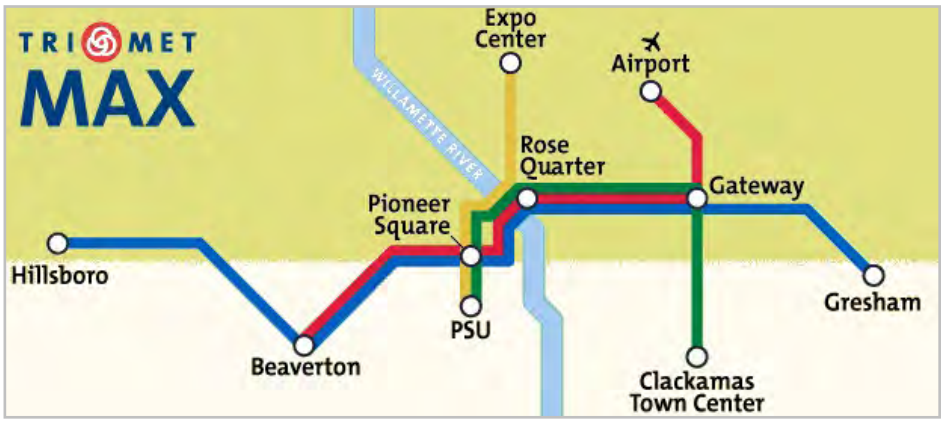
We made recommendations to Metro to improve the effectiveness of planning transportation projects. As a result of our case study analysis, it was clear that different strategies would be more effective in some stations and not others. As a result, we recommended more place-specific analysis be conducted of transportation needs. We also recommended that Metro increase the use of outcome measures and assess and report on the effectiveness of local transportation projects in reaching regional outcomes as well as any inequitable outcomes that have resulted.

Background

Light rail transit is important to the Portland metropolitan region. It is a far-reaching public works project, costing about $3 billion in today's dollars to construct and annual sums more to operate. It is a significant component of Metro's long-range growth management and transportation plans. As such, it must attract and retain riders in increasing numbers if the goals in those plans are to be achieved.

Multiple governments share in the responsibility to plan for, fund, operate and support the region's Metropolitan Area Express light rail system, which is known as the MAX. While TriMet operates the MAX, Metro and other governments use a variety of strategies to influence people to use it. They are based on planning principles that say urban areas should be designed for pedestrians. The strategies also include fare-reduction programs, marketing campaigns and crime prevention.

Exhibit 1
Metropolitan Area Express light rail system



Source: TriMet

Many of the government actions related to the MAX system are coordinated through Metro's Joint Policy Advisory Committee on Transportation (JPACT). That 17-member body is made up of elected officials and government agency representatives from around the region, including TriMet, the region's largest transit authority. JPACT and the Metro Council must agree on transportation policies, plans and projects that involve federal funding or are regionally significant.

As the federally designated metropolitan planning organization for the region, Metro must adopt a long-range transportation plan and approve short-term project priorities before federal funds can be spent. Those transportation plans and projects affect decisions related to Metro's other role as the state-authorized land-use planner for the region. In that role, Metro must manage a growing urban population within a designated boundary to protect against expansion into rural areas.

This audit builds on a 2010 Metro audit report that demonstrated that Metro was unprepared to evaluate whether transportation investments put the region on track to achieve its growth management goals. Planning criteria says long-range plans should be periodically assessed using actual results and adjusted as needed. The audit found that Metro did not routinely collect or analyze data on completed transportation projects and, therefore, could not effectively gauge progress being made to achieve the growth-management goals.

Changes occurring at the federal level could have implications for how Metro and its regional partners act to optimize transportation investments generally and the MAX system specifically. In 2012, Congress passed a surface transportation funding bill that included requirements to begin evaluating program outcomes against national goals. There also is movement unrelated to the transportation bill for federal agencies who share responsibility to achieve complex goals to act in a collaborative manner rather than merely coordinating activities, which is how the region's transportation decision-making process currently functions.

Scope and methodology

This audit was a continuation of a previous audit completed in 2010 in which we recommended that Metro improve its ability to evaluate outcomes of its transportation plans. The purpose of this audit was to use a case study methodology to evaluate outcomes of a specific or group of transportation projects. We considered many types of projects as potential study areas and chose light rail.

We conducted assessments of stations throughout the light rail system and reviewed potential data sources before choosing those we studied. The secondary purpose of this audit was to assess the combined effect of planning strategies used to increase ridership.

The strategies assessed were urban improvements, transit-oriented development, marketing campaigns, fare-reduction incentives and crime prevention. Criteria say they should be assessed in combination because the sum of their total effects is intended to be greater than their individual effects. Given that, we did not set out to evaluate the outcomes of individual programs that implement the strategies. We did, however, establish findings related to the funding mechanisms of two of them.

We used case study as our method to evaluate how actual practice compared to the planning theory on which the strategies were based. We picked three neighborhoods around the following MAX stations as our cases:

- Tuality Hospital/SE 8th Avenue in Hillsboro;
- North Killingsworth Street in Portland; and
- East 162nd Avenue in Gresham.

With the stations at the center, we set the study area boundaries approximately a quarter-mile away in all directions. That distance is commonly used in transit-related studies.

Case study methodology encourages a comprehensive understanding of each area. We used observation, interviews, Census data analysis and reviews of planning documents. We developed inventories of projects and plans in each study area to track capital improvements, policy changes, and other events over time that could affect ridership. We also obtained historical ridership data from TriMet, which operates the region's largest transit system. The data included annual ridership by station for FY 2007-11 and average weekday and weekend "on and off" counts by station from 2002 to 2012. That data for the North Killingsworth Street MAX Station started in 2004.

We surveyed residents in each study area to test their awareness of the strategies and whether they influenced their decisions to ride the MAX. In the survey, we described the strategies as:

- Placing retail businesses and services near stations;
- Increasing residential options near stations;

- Enabling a sense of personal safety in the neighborhood, at the station and on MAX trains;
- Improving sidewalks, crosswalks and bike lanes near stations; and,
- Encouraging people to drive less and use other travel methods.

A more detailed explanation of the survey methodology is in Appendix 1. The survey questions and results are in Appendix 2.

Only the Hillsboro study area contained employers large enough to fall under state environmental requirements to provide commuting options for employees. The Oregon Department of Environmental Quality requires employers to periodically survey their workers to determine how they get to work and submit the results to the state agency. We reviewed the data for the two large employers in the study area.

This audit was included in the FY 2010-11 audit schedule. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Results

The purpose of this audit was to use a case study methodology to evaluate outcomes of transportation projects. The focus of the audit was light rail transit. We studied three MAX stations in-depth to determine if the ridership strategies used to influence people to ride light rail were effective.

We considered the outcome of the strategies in combination from several perspectives. We concluded that ridership at the three stations went up over time. However, we were unable to make a determination whether these increases were caused by the strategies. We also were unable to determine if the strategies were ineffective. Evidence indicated that other factors present in the study areas could have played a role in the ridership changes.

In household surveys we conducted, residents identified different actions than the strategies that would influence them to ride more. A comprehensive look at the neighborhoods surrounding the stations led us to conclude that Metro could improve the effectiveness of its future plans and current programs by reviewing actual results. This would lead to tailored strategies that addressed barriers to ridership at individual locations.

In addition to findings related to our original objective, we concluded that one of our study areas was less able to compete for government investment. This was because some programs that funded transit-supportive projects were dependent on private-sector involvement. We also found the city limit boundary between Portland and Gresham impeded planning and problem-solving around the MAX station, which could make it difficult to attract non-riders and retain frequent riders who live near it.

The MAX system is a significant regional asset that is an important tool to help the region achieve its long-term growth management goals. Multiple governments and the public must act in partnership to maximize its value by increasing ridership. We found that the region's decision-making process related to transportation planning was not organized to enable collaboration. As a result, the shared resources needed to maximize the region's investment in the MAX system were not available.

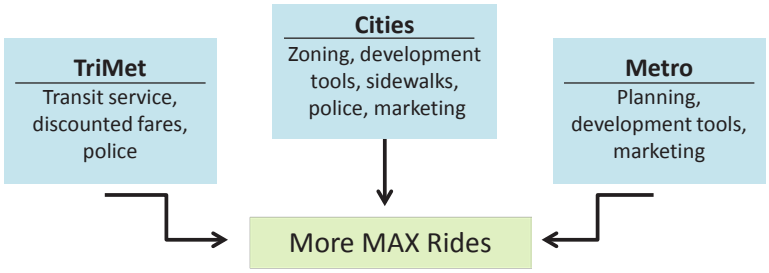
Ridership increased, but effectiveness of strategies unclear

Metro's transportation plan for the region included a diverse set of goals. Some of them included building a transportation system that would reduce fuel consumption, air pollution, drive-alone trips and distances traveled by car. The MAX system was an integral part of the plan.

Planning criteria suggest several strategies to increase ridership. The responsibility for implementing them varies among levels of government. Some strategies focus on the pedestrian environment. For these, block length should be short, walking should be easy and without barriers and buildings at the ground level should be appealing. Others encourage increasing the number of people who live or work around the stations, providing incentives

to employees to commute by transit, and using marketing campaigns to show potential users the value of transit. We added crime prevention to this list after learning about government and citizen activities in proximity to the MAX in our study areas. See Exhibit 2.

Exhibit 2
Examples of government roles in the strategies



To assess the effect of these strategies, we developed an inventory of government investments in each study area to implement them. The inventories included spending on mixed-use buildings, pedestrian improvements and crime prevention programs. They did not include investments in law enforcement activities or tax abatements. We plotted them on a timeline and noted other events that could have affected ridership, such as the recession beginning in 2007 and non-governmental activities. We then added average weekday ridership data from TriMet to the timelines. We found:

- North Killingsworth Street (Killingsworth) received the highest level of government investment and had an overall increase in riders;
- Tuality Hospital/SE 8th Avenue (Tuality Hospital) received the second-highest level of investment and had an overall increase in riders; and,
- East 162nd Avenue (East 162nd) received the least government investment and had an overall increase in riders as well.

The rate of the ridership increases varied. East 162nd had the highest average annual growth and added more daily rides per year on average than the other two stations. That indicated that other factors besides the ridership strategies influenced the results. See Exhibit 3 and Infographic #1.

Exhibit 3
Ridership data comparisons and estimated investment levels

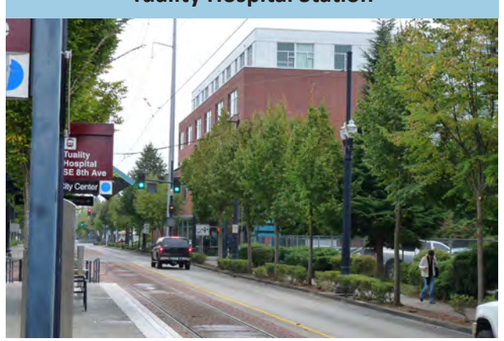
Station	Annual growth in average daily rides*	Annual growth rate in average daily rides*	Total boardings & alightings FY 2011	Public investment since 2005
Tuality Hospital	35	2.9%	459,342	$12 million
Killingsworth	86	4.3%	737,334	$28 million
East 162nd	147	4.8%	1,219,530	$900,000

Source: Metro Auditor's Office estimate of investments and analysis of TriMet data.
* *Based on average weekday ridership from 2002-20012 for the Tuality Hospital and East 162nd stations; from 2004-2012 for Killingsworth.*

Has ridership increased over time?

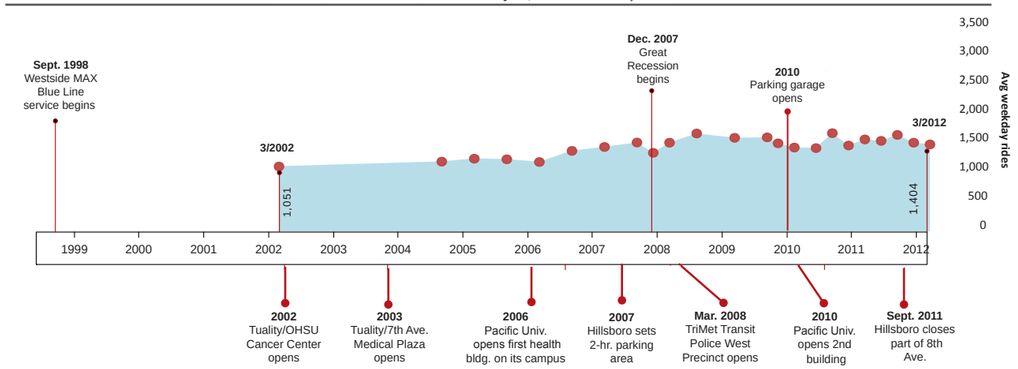
We found ridership increased for all three stations, but both the rate of increase and number of rides taken annually was more dramatic for the East 162nd station. Tuality Hospital is an employee destination, while at the other two stations, ridership is primarily from residents commuting to work.

Tuality Hospital Station



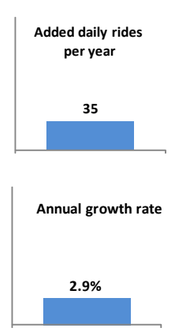
Average weekly rides over time

Source: Metro Auditor's Office analysis, TriMet ridership data



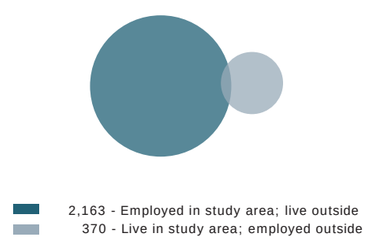
Ridership growth

Source: Metro Auditor's Office analysis, TriMet ridership data

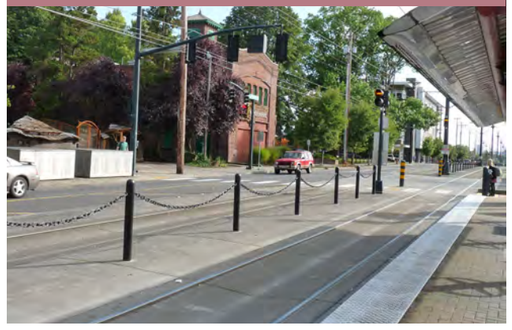


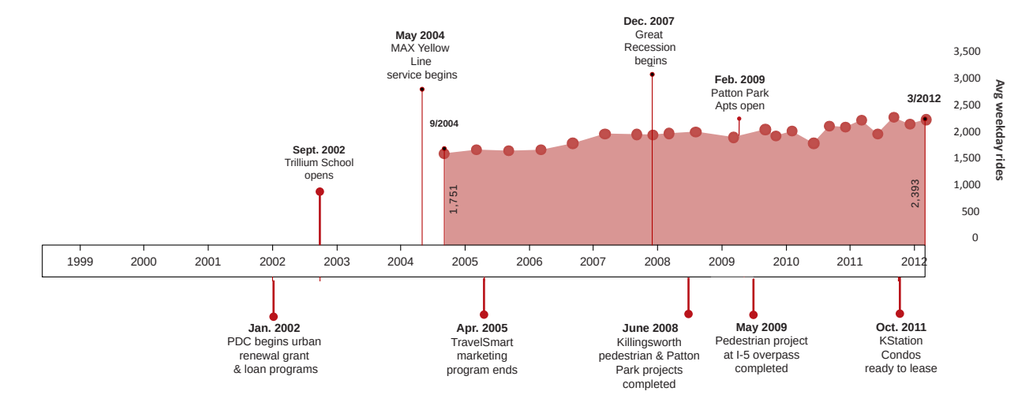
People coming and going (2010)

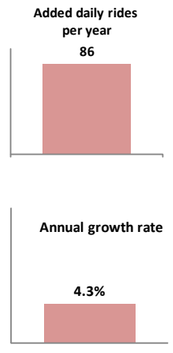
Source: U.S. Census Bureau

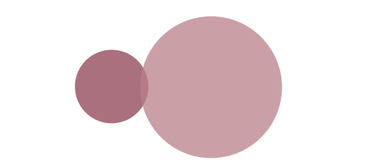


Killingsworth Station

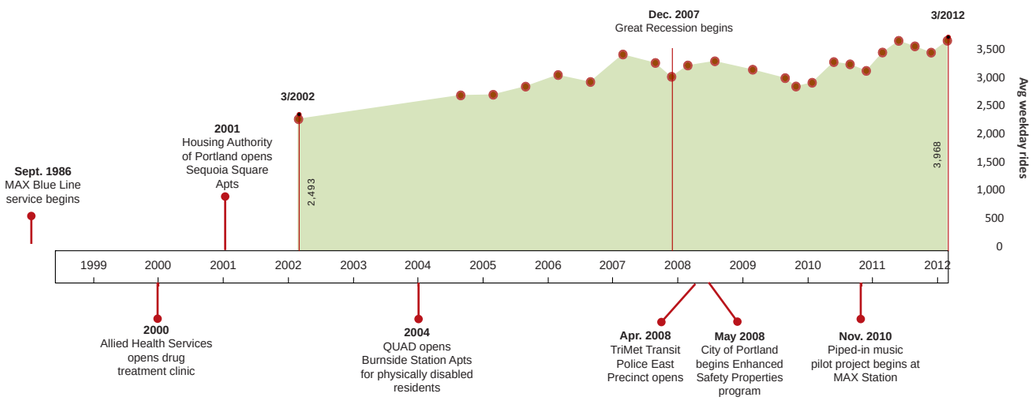


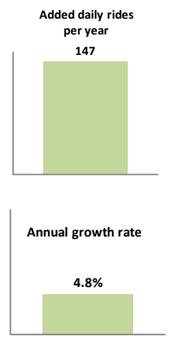


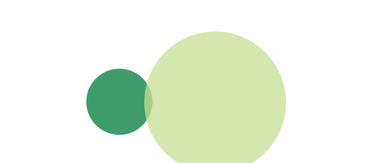




East 162nd Station

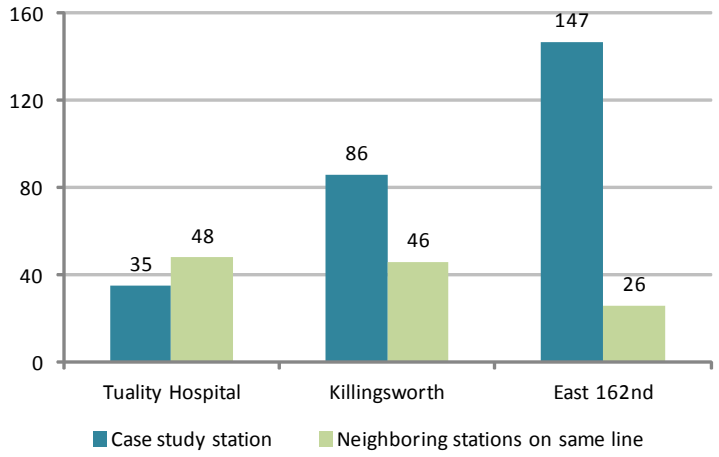






One possible explanation for varying ridership trends was that they were affected by the line on which they were located because some lines are busier than others. To determine if that was the case, we compared average ridership growth at each case study station to average ridership growth at neighboring stations on the same line, omitting those that served more than one line. The results were mixed. East 162nd and Killingsworth added more daily rides per year on average than their neighboring stations. Tuality Hospital added fewer rides than other stations on its line. See Exhibit 4.

Exhibit 4
Average added daily rides per year at case-study stations compared to neighboring stations on the same line



Source: Metro Auditor's Office analysis of TriMet data.
* *Based on average weekday ridership from 2002-20012 for the Tuality Hospital and East 162nd stations; from 2004-2012 for Killingsworth.*

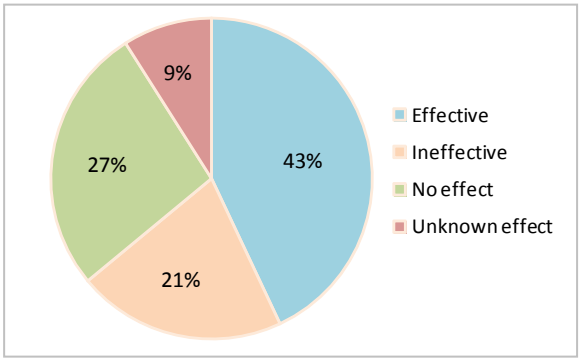
Residents say different improvements would lead to more rides

We surveyed residents in each study area to solicit their views of the MAX and gain insight into whether the ridership strategies influenced their decision to use it. Overall, residents said they valued the existence of the MAX line in their neighborhood even if they didn't use it.

We asked different questions depending if the respondent was a rider or a non-rider. For our purposes, a rider had taken the MAX in the previous 30 days while a non-rider had not. We received 406 responses, 275 (68%) of which came from riders and 131 (32%) came from non-riders.

Forty-three percent of the riders who responded to the question said they were more likely to take the MAX because of the combined effect of the strategies. The remaining 57% rated the strategies as ineffective, neutral or unknown on their likelihood to ride. See Exhibit 5.

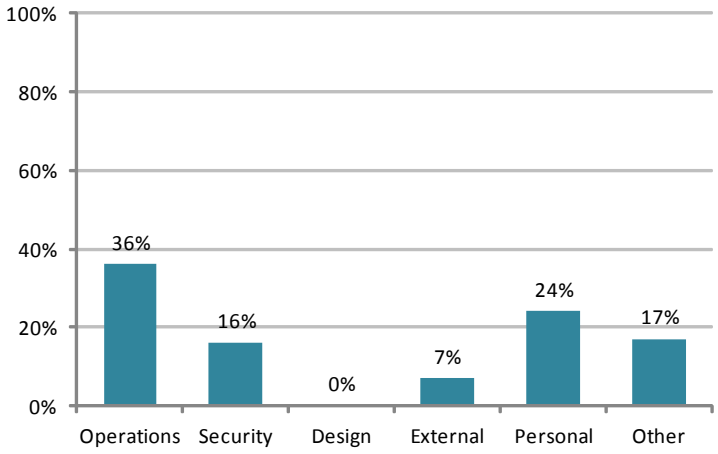
Exhibit 5
Riders' assessment of overall effect of strategies on their likelihood to ride



Source: Metro Auditor's Office survey data

We did not ask non-riders about the strategies because we concluded their lack of use indicated the strategies had not been effective in influencing them to take the MAX. We asked non-riders why they had not ridden and what changes would influence them to do so. More than a third of non-riders chose responses related to MAX operations, such as not being interested in MAX destinations or trips taking too long. Nearly one-quarter cited personal reasons, such as needing a car to run errands, while 16% listed security issues. See Exhibit 6.

Exhibit 6
Top reason non-riders had not taken the MAX



Source: Metro Auditor's Office survey data

The variation in the responses showed the challenge governments face in developing strategies to overcome the barriers reported by non-riders. Some operational barriers, such as those related to available MAX destinations, are structural and cannot be readily addressed in a fixed-rail system. There are, however, strategies that exist to help those who said they needed their car for errands. It is possible that non-riders were unaware of them or the solutions offered could not overcome the reasons the non-riders needed a car.

We also asked both riders and non-riders to indicate changes that would influence them to use the MAX more. The response indicated that changes to MAX operations, such as lower fares or quicker trips, would result in the largest ridership gains. There also could be opportunities to improve existing strategies, such as marketing campaigns and crime-prevention programs, to be more effective with some riders, depending on their location. We explore these more in the next section. See Appendix 2 for complete survey results.

Neighborhood-level analysis could better align strategies and needs

Achieving ridership gains across the system calls for a better understanding of local needs rather than a one-size fits-all approach. Optimizing the taxpayers' investment in light rail may require a more place-specific solution with various levels of government working in unison.

In addition to survey data, we assembled profiles for each study area based on observations, interviews, and data that included:

- Demographic information about the people who lived there;
- Travel information about the employees who lived in or commuted to the study areas for work;
- Types of businesses present;
- Types of crime reported and other nuisance factors near the stations;
- Levels of transit service available; and,
- Investments made to implement the strategies.

The profiles combined with survey data provided information that could be used to develop more effective station-specific strategies. For example, few Tuality Community Hospital employees in Hillsboro used transit to commute to work even though a MAX station is a short walk away. At Killingsworth, the residents who live there now probably did not participate in the outreach events before their MAX Line was built, so what was expected to influence them to ride may no longer be pertinent. At East 162nd, 12% of workers who lived in the area were dependent on transit. Our subsequent survey data showed the percentage of frequent riders decreased as incomes rose. See page 11a for Infographic #2.

Employees in Tuality Hospital study area are a potential source of ridership

While the Hillsboro study area in many ways was a model of transit-supportive design, it had the lowest overall ridership and the lowest average annual ridership growth rate of our three case studies. It also added fewer average daily rides annually than its neighboring stations on the same MAX line. It was an example of how the pedestrian environment alone was not enough to overcome the operational and other barriers to ridership cited by survey respondents. There is an opportunity to increase ridership at this station by targeting strategies to meet the needs of workers who commute to the area.

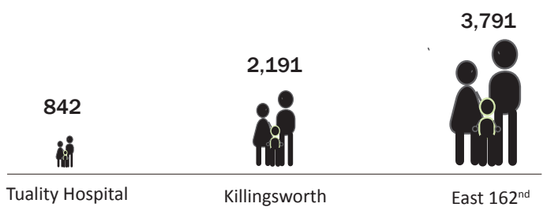
Who lives near these stations?

(Source: U.S. Census Bureau)

Everything was not the same in the neighborhoods surrounding our transit station study areas. East 162nd and Killingsworth stations were on opposite ends of the spectrum in terms of median household income, educational attainment, racial diversity and foreign-born residents, while Tuality Hospital was in the middle.

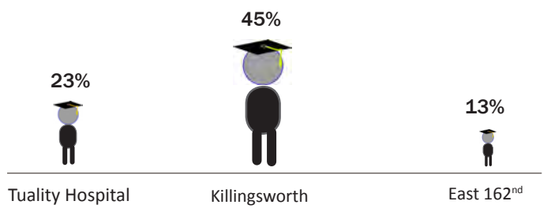
Which area is the most populated?

There are 3,791 residents in the East 162nd study area. This is more than four times the number of residents living in the Tuality Hospital area.



How do the areas vary in educational attainment?

45% of residents near the Killingsworth station have at least a bachelor's degree. This is up from 19% in the 2000 census.



What is the household income?

The East 162nd area has a lower average household income than the other two stations.

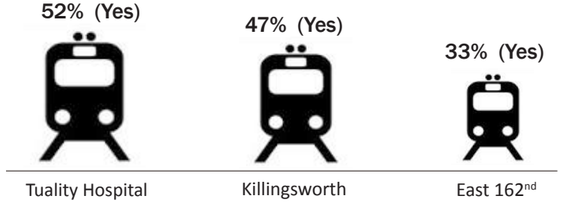
What did they tell us?

(Source: Metro Auditor's Office survey)

There were other factors in addition to operational improvements that affected their choice to ride the MAX or not.

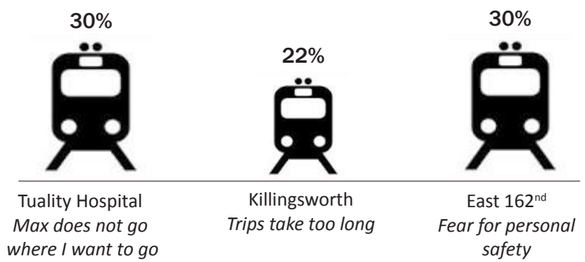
Are riders more likely to ride after improvements near the station?

Overall, 42% of riders said they were more likely to take the MAX because of improvements that had been made since the line started.



What is the top reason why non-riders do not ride?

The top reasons that were cited by non-riders for not taking MAX were not related to the amenities or new buildings near the station.



Did riders move to the area because of MAX?

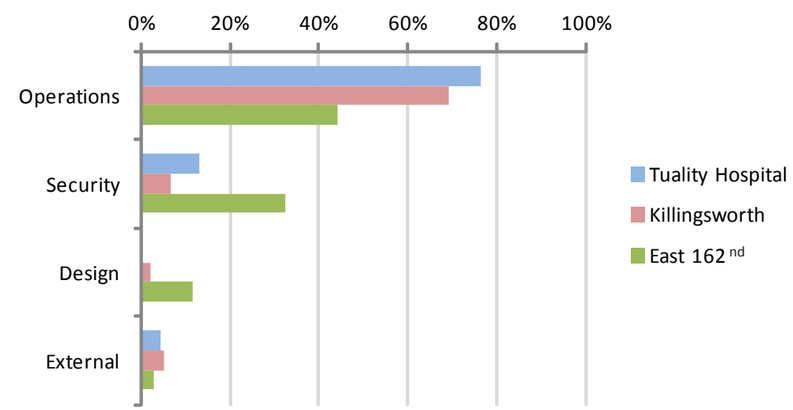
Two-thirds of riders said they moved to the area of the Killingsworth station in part because of the MAX. This was true for over 1/2 of riders living near the East 162nd station.

What would make both riders and non-riders ride more?

We asked residents in the station areas what would make them ride MAX more and asked them to choose from a list of 17 items. We combined those into larger categories of:

- Operations, which included more frequent service, better bus connections and lower fares;
- Security, which included more police at stations or on the trains;
- Design, which included more stores, a more pleasant walking environment and other activities around the station, and;
- External factors, such as higher gas prices or parking fees.

We found that Tuality Hospital and Killingsworth station area residents overwhelming chose operational factors. At East 162nd, concerns over personal safety were nearly as important as operational factors.



(Tuality Hospital continued)

The area around this MAX station, located where downtown transitions to residential neighborhoods, has many pedestrian elements and other features that planning criteria say should increase transit ridership. Shade trees, decorative street lamps and brickwork, and limited vehicle traffic contribute to its visual and pedestrian appeal. Two satellite college campuses, a hospital, medical clinic, and retail shops are within steps of the MAX platform, making the area a destination for commuters. Of the three case study areas, this one was unique because it contained more large employers and a smaller residential zone than the other two.

The neighborhood around the Tuality Hospital MAX Station also contained a few examples of factors that can discourage transit ridership. The City of Hillsboro assembled $11 million in public funds to help build a $16 million multi-story parking garage with commercial space near the station. Planning criteria say access to convenient and inexpensive parking can be a disincentive for people to choose transit when it is near their destinations.

Tuality Hospital had the largest percentage of riders (52%) who found the combination of ridership strategies effective. The non-riders most often cited two reasons for not using MAX – the line did not go where they wanted to go and they needed their car for errands.

The best opportunity for ridership gains may lie with the commuters who travel to work at the various employers near the MAX Station. According to the 2010 Census, almost 2,200 people worked in the study area but lived elsewhere, and 370 lived in the study area but worked outside of it. Only 20 people both lived and worked within the study area boundary.

Two large employers in the area were required by the Oregon Department of Environmental Quality to provide employees with alternatives to driving alone to work. The state set targets for Tuality Community Hospital and the College of Health Professions at Pacific University to reduce drive-alone trips by 10%. It monitored progress through periodic surveys. The surveys did not distinguish between bus and light rail travel for the transit option.

The hospital met the state target to reduce drive-alone trips, but a small percentage of its employees used the transit option. This was despite the fact that their employer provided discounted transit passes. About 7% of employees used transit, a proportion that has remained relatively unchanged since the MAX line began operating.

Pacific University's College of Health Professions, which opened its Hillsboro campus in 2006, had not met its drive-alone reduction target, but 31% of its faculty and staff commuted by transit the first year. That percentage declined to 26% by 2011. MAX use by students was not collected by the state.

The top reasons employees gave for driving to work were similar to those of the non-riding residents who responded to our survey: they needed their car for errands and transit trips took too long.

Strategies may need to be updated for the rapidly changing Killingsworth study area

New residents started moving into North Portland long before the MAX line was built along Interstate Avenue. That trend has continued over the past decade. Census data for the Killingsworth area showed total population between 2000 and 2010 was stable, but its make up changed. Over the 10 years, the Killingsworth area became less diverse in age, race, and ethnicity, while income and education levels increased. The aspects of the MAX that appealed to residents when the line was built may not be the same for the people who live there now.

Residential turnover showed up in our survey results as well. Seventy-one percent of the Killingsworth respondents said they moved to their homes after the MAX line was built in 2004. Sixty-six percent of MAX users said proximity to the line factored into their decision to move to the area.

Changes to the physical landscape of the Killingsworth study area coincided with the demographic changes. During construction of the MAX line, the City of Portland sought input from the North Portland community to develop a revitalization plan for individual station areas. The guiding principle was that the subsequent investments benefit the existing business owners and residents. The investments reflected the community's vision for Killingsworth, but those who lived in the area at that time may not have stayed in the neighborhood to enjoy the benefits, including proximity to the MAX line.

An older motel was torn down and replaced with a mixed-use building that included apartments for low-income residents above ground-floor retail and office space. Most recently, a multi-story condominium building, also with retail space on the ground floor, filled an empty lot. Investments were made to improve a small park near the MAX station and make pedestrian crossings safer.

We observed factors oriented to car use too. A gas station was located on one corner by the MAX station platform and drive-up fast food and banking services businesses were nearby. Though outside of our study area, a Portland Community College Campus was within walking distance of the station, but Interstate 5 passed between the two. The freeway competed with MAX travel in this area in two ways: it made car travel convenient and the walk to destinations east of the MAX station noisy.

Less than half of the riders in our survey reported that the combined effect of the ridership strategies made them more likely to use the MAX. The non-riders most often cited three reasons for not using the MAX: Trips took too long, lack of interest in MAX destinations and needing their car for errands. Almost seven in 10 of both riders and non-riders said they would ride more if improvements were made to operations, including more frequent service, lower fares and access to transit passes.

Given the higher household income in this study area compared to the other two, we did not expect the sensitivity to cost to be cited as often as it was by Killingsworth respondents. A possible explanation was that using transit is an added cost to vehicle ownership in these households.

A more comprehensive approach is needed to attract and retain riders at East 162nd

The dominant feature of this study area was the large number of people who got on and off the MAX throughout the day. The platforms were located just inside the Gresham city limit, but about half of the study area was in Portland. Few examples of the planning suggestions for neighborhood design were within view of the platforms. There was a small medical clinic, a convenience store, some vacant lots and apartment complexes.

Pedestrians were present in large numbers, but the infrastructure to support them was insufficient. Though we observed work being done to complete sidewalks, some paths still were unpaved. Sidewalks generally were narrow and, along the busiest streets, unshielded from fast-moving traffic. Apartment buildings were set back from the street, bordered by large asphalt parking lots. Some of them were buffered by landscaping, but many were not. Blocks were long and some were unconnected cul-de-sacs. One street was unpaved.

Despite these shortcomings, East 162nd, which was on the oldest line in the system, produced the highest annual ridership and added more daily rides on average than the other two study areas combined. It also added more daily rides than its neighboring stations on the MAX line. We identified three factors that contributed to ridership at this MAX station: 1) the number of apartment complexes; 2) the number of patients traveling daily to the medical clinic; and, 3) the proportion of residents without access to a vehicle.

The East 162nd study area had considerably more residents-per-acre than the other two. It had 29 residents per acre, compared to 13 in Killingsworth and six in the Tuality Hospital study area. While the concentration of employees working in the Tuality Hospital study area did not translate into high ridership, the residential population around East 162nd appeared to have done so.

Travel to a medical clinic that provided outpatient drug treatment services also had an effect. It treated about 400 patients a day, 136 of whom traveled for appointments by light rail. The clinic provided TriMet passes to its employees to reduce vehicle traffic in the area and limit demand for parking spaces.

Finally, residents at East 162nd were more dependent on transit. This area had the highest percentage of workers without cars, the longest commutes, and, at $29,390, the lowest median household income of the three areas. Almost half of our survey respondents from East 162nd said they used transit as their primary method of travel.

East 162nd had the lowest percentage of riders (34%) who reported that the strategies affected their decision to ride. More than half of riders said the strategies were ineffective or had no effect on their likelihood to ride. Non-riders said fear for their personal safety and needing a car for errands were the main reasons they did not use the MAX.

Even though they used the MAX, riders also said crime was an issue that affected their travel decisions. The crime rate around this station was higher than the other two, and some steps had been taken to address it. Overall, riders at East 162nd were the least likely of the three study areas to take the MAX because they felt safe using it.

The combination of the limited pedestrian environment and fear of crime may also have caused frequent MAX riders to use other travel options as their incomes rose. The proportion of frequent riders at East 162nd decreased as incomes levels went up. That was not the case at Killingsworth, which better maintained its proportion of frequent riders as income levels rose.

East 162nd area less able to compete for funding

The extent to which the ridership strategies had been implemented varied among the three study areas. New multi-story buildings, aided by government investment, had been constructed in the Tuality Hospital and Killingsworth areas within view of their MAX platforms. Capital investments at East 162nd mostly occurred away from the station and were much smaller in scale.

We identified $41 million in public spending for projects related to ridership strategies in the three study areas. Of that, Killingsworth accounted for $28 million (68%), Tuality Hospital accounted for $12 million (30%), and East 162nd accounted for less than $900,000 (2%).

We concluded the lack of resources was attributable in part to:

- Government programs that relied on the involvement of private-sector investors, and
- The city limit boundary between Portland and Gresham, which hindered the development and implementation of comprehensive solutions.

The lack of investment risks the loss of frequent riders when they can afford other options and fails to address the barriers non-riders at East 162nd say keeps them away from the MAX. It also runs counter to one of Metro's six values, which states that the benefits and burdens of growth and change are distributed equitably.

City governments used urban renewal funds to pay for projects that planning criteria say will encourage ridership. Urban renewal programs establish zones and target investments in hopes that property owners and investors will respond by making their own improvements. All three study areas were

in urban renewal zones. The Gresham program had identified recipients for a handful of apartment rehabilitation grants in our East 162nd study area, but none had been accepted by the property owners. Some agreements expired after two years and before any work was done. Gresham prioritized other locations than East 162nd within the zone for its significant investments.

Metro's Transit-Oriented Development Program used funds to provide small grants to encourage private and non-profit developers to build projects that combine dwellings and space for businesses near transit stations. It also bought vacant land to hold it for future development. It invested in the Tuality and Killingsworth study areas, but not East 162nd.

To participate in either of these programs, an area must appeal to private investors. They will not invest in an area without an expectation of a return on their investment. That means neighborhoods that do not appeal to developers will not receive funding, and higher-income areas are more likely to receive assistance through these programs. Areas like East 162nd that are unlikely to attract private-sector investment need programs that operate with different funding criteria.

To its credit, two years ago Metro made equity part of the criteria used to select projects to receive federal flexible funds in 2014 and 2015. Applicants were asked to demonstrate how their projects benefited historically under-served neighborhoods, enabled services necessary for daily living and provided bicycle, pedestrian and transit-access improvements. A project selected for funding in Hillsboro could benefit the Tuality Hospital study area. The proposal described changes along Baseline Street that would remove its "barrier effect" on a nearby low-income neighborhood. In addition to the flexible funds, urban renewal money was to be used to pay for it. No projects selected for that funding cycle would affect the East 162nd study area.

When the federal government gave the region an additional $34 million after the original flexible fund awards had been decided, JPACT used a different criteria to select projects. None of the projects that received funding in the second round were in the vicinity of East 162nd either.

In the meantime, the MAX Station continues to be a source of conflicting opinions among the residents and other property owners in the area. Seventy-seven percent of the riders and non-riders who responded to our survey said the MAX line overall was good for their neighborhood, though that proportion was smaller than those at Killingsworth (94%) and Tuality Hospital (84%).

During interviews, those who viewed the MAX station area unfavorably cited a list of grievances they associated with it: crime, litter, foul language, the drug rehabilitation clinic on the corner. Many were afraid of it and their approaches to dealing with the station varied. Some people instructed their children to use

neighboring MAX stations rather than East 162nd Ave. Others avoided taking the MAX altogether. Anecdotal evidence suggested that people who live farther east in Gresham would not ride because they feared criminal activity related to the MAX.

As discussed previously, sidewalks were inadequate for the volume of pedestrians who needed them. We observed people stepping into the roadways to pass other pedestrians on their way to and from the MAX station. Fear of crime came up repeatedly during our audit and was the main reason non-riders gave for staying away from the MAX. It is unlikely these issues could be resolved without more government investment.

Solutions to these problems in the East 162nd study area would not be easy in ordinary circumstances, but they are made more difficult by the city limit boundary. When Portland and Gresham annexed the unincorporated area around East 162nd from Multnomah County in the 1980s, they established a boundary that followed a sewer line that zigzags around and through individual properties.

That decision created a state of jurisdictional confusion among residents. Planning and spending programs operated by both cities in our study area were largely uncoordinated. For example, there were two separate and uncoordinated urban renewal programs in the area, one in Gresham and one in Portland. However, Gresham's focus was east of the area while Portland's was to the west.

While TriMet and the municipalities agreed that the eastside MAX station areas need attention, we found no plan underway that would comprehensively address both sides of East 162nd Ave. In 2008, the City of Portland launched the Eastside MAX Station Communities Project to take "a comprehensive look at station community areas within one-half mile of light rail stations in Northeast and Southeast Portland." But when it got to East 162nd, the plan stopped at the city limit instead of encompassing the whole station area. We found no comparable effort on the Gresham side.

Without effective collaboration, investments were not maximized, the MAX Station was not prioritized, and land uses not optimized to increase ridership. An additional effect was that the civic needs of the residents were not met and their frustration mounted. Governments responsible for decision-making in the East 162nd area could increase the value of the MAX system by coordinating priorities, sharing resources, and focusing investments to maximize ridership.

Collaborative approach needed to be most effective

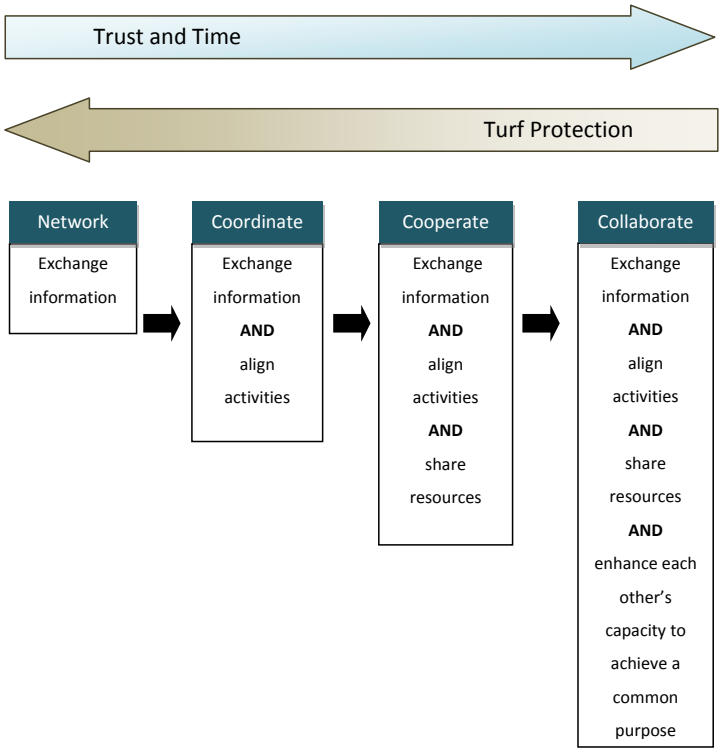
Metro is the regional planning and coordination agency for federal transportation funding. A policy advisory committee (JPACT) consisting of elected officials and transportation agency representatives, including three members of the Metro Council, makes recommendations to the full Metro Council on transportation priorities. Both JPACT and the Metro Council have to agree on projects before federal funds can be spent on them.

In an audit issued in 2010, we determined that Metro was successful in meeting federal planning requirements. It was less clear whether Metro succeeded in aligning transportation projects with larger goals designed to manage growth in the region. Projects were not developed as part of a concerted strategy. Most of the transportation projects that are funded came directly from the individual city and county jurisdictions' plans. Metro did not screen the list to determine if those locally planned projects supported regional goals and policies.

The MAX is a regional transportation system that touches most of the local jurisdictions represented on JPACT. It is also a key element in the region's strategy for keeping people and goods moving throughout the region. To make full use of this large regional investment required a commitment by JPACT to recommend projects, such as roadways, sidewalks, and safe pedestrian crossings designed to increase ridership.

Organizations often work together in a coalition for a common purpose. There are four recognized approaches for this effort described as networking, coordinating, cooperating, or collaborating. Each of these approaches can be appropriate depending on the degree to which three barriers to working together – time, trust, and turf protection – are present . When an organization acts in a collaborative way, resources are maximized and solutions to difficult problems can be found. See Exhibit 7.

Exhibit 7
Decision-making approaches



Based on: The Collaboration Primer by Gretchen Williams Torres and Frances S. Margolin and Collaboration for a Change by Arthur T. Himmelman.

During our audit, we found an example that illustrated the components and actions needed for a collaborative effort. Both the Cities of Portland and Gresham fire departments found ways to collaborate to varying degrees across the jurisdictional divide at East 162nd. Gresham and Portland firefighters shared a fire station and resources, which saved both cities money and improved service delivery. This collaboration between the two cities' fire departments had a mutual goal of public safety. The department shared resources, risks and responsibilities.

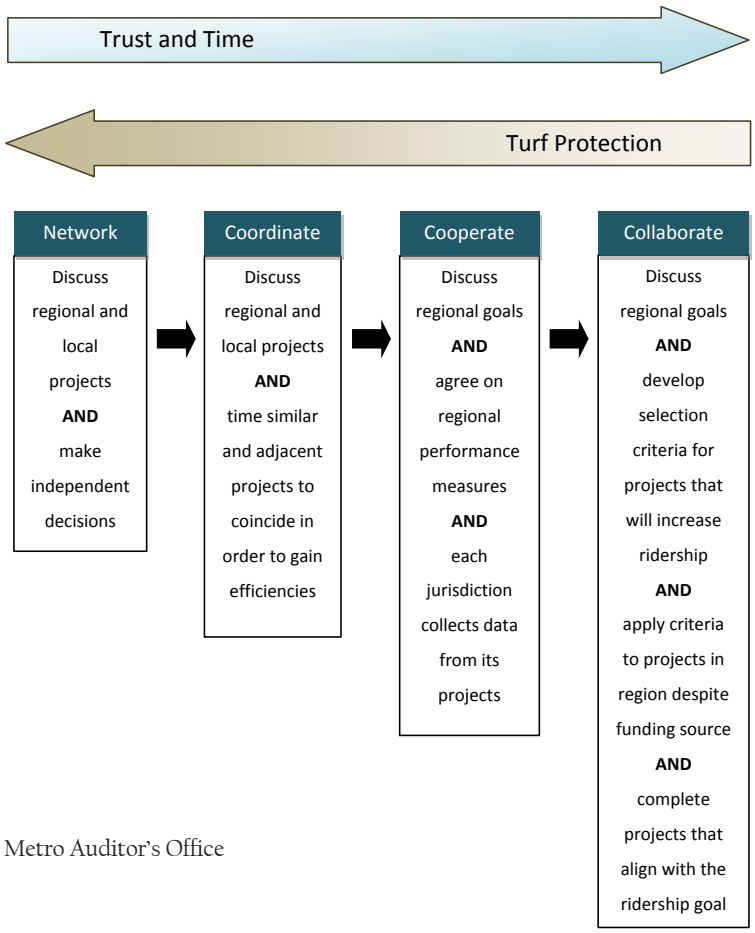
According to our survey of light rail riders and non-riders, efforts to increase ridership may require different strategies than those currently in place. Many of the strategies they mentioned would require enhancing TriMet's ability to effectively operate the MAX. This characteristic – enhancing each other's capacity to reach a common goal – suggests that a collaborative process is required.

An organization such as JPACT could be well positioned to do this. However, when we examined documents and written accounts of JPACT's funding recommendations in the last two years, we found that there was a low level of trust among JPACT members. Without trust, it was difficult for the group to pursue a common goal. Members were not willing to forgo their own community's projects for a regional goal. We found one instance where members approved specific selection criteria based on a common policy. However, that decision was not fully supported by the membership and was reversed in the next funding cycle.

We determined that JPACT recommendations were more closely related to a coordinating process where members exchange information and generally align activities. Based on its recent actions, we concluded that this group would find it more difficult to share resources. To be completely collaborative, JPACT would have to be strongly committed to a common goal and its members would relinquish local aspirations to the most pressing need in the region whether it benefited their jurisdiction directly or not. At this point, the key elements of trust and relinquishment of turf are not strong enough to effectively make collaborative regional decisions.

However, based on our case studies and the strategies they suggested, it is clear that Metro, TriMet or the local jurisdictions cannot effectively make improvements working independently. Further, because of the large public investment and value to the regional transportation system, it is important that the light rail be fully used. To get increased benefit from this resource, JPACT would need to act collaboratively. If that type of approach is not possible in the current environment, it should use other approaches until the barriers to collaboration – time, trust and turf protection - can be reduced. See Exhibit 8 for an application of the various approaches to potential JPACT actions.

Exhibit 8
Potential regional decision-making approaches



Source: Metro Auditor's Office

Recommendations from 2010 audit have not been implemented

It is standard audit practice to follow up on recommendations from prior reports in related areas previously assessed by the Metro Auditor. We found that recommendations made in a 2010 audit, Tracking Transportation Project Outcomes: *Better information needed to measure effectiveness*, had not been implemented.

In that audit, the Metro Auditor attempted to assess the effectiveness of transportation projects in helping the region achieve the goals outlined in Metro's 2040 Plan. The audit found that the Planning Department had two core functions. It provided technical expertise and support for Metro's role as the federally designated transportation planning organization. That process produced outputs, namely the long-range transportation plan and the short-term project prioritization program.

Planning's second function was to support Metro's long-range growth management plan, which contains specific outcomes for the region to achieve by 2040. The audit found the Planning Department was not organized or equipped to measure progress toward those outcomes.

The audit recommended that the Chief Operating Officer and the Planning Department improve Metro's ability to measure the outcomes of its transportation planning function. To do that, they needed to define roles and responsibilities for the evaluation of 2040 Plan outcomes, improve data collection and management within those roles, and improve the tools used to measure outcomes.

During this audit, we interviewed management to determine if the recommendations had been implemented. They had not. Since the original recommendations were made, Metro hired a new Chief Operating Officer and the Planning Department director took a leave of absence. During that time, an interim director led the Department. There had been turnover on the Metro Council as well. These changes may have contributed to the lack of attention to the recommendations.

Based on the findings in this audit, we believe the recommendations in the 2010 audit remain valid.

Recommendations

To improve the effectiveness of transportation plans and their intended outcomes, the Planning Department should:

1. Increase the use of place-specific analysis of transportation needs.
2. Assess and report on whether local transportation projects have increased the ability to achieve regional outcomes.
3. Increase the use of outcome measures:
    a. Select a reasonable number of outcome measures that will enable an evaluation of the effectiveness of transportation strategies in maximizing the benefit of transportation funding;
    b. Collect data needed to measure results at the appropriate level of measurement;
    c. Include people who are affected by the plans in the measurement process;
    d. Adjust plans and programs as needed based on actual quantitative and qualitative data;
4. Assess and respond to any inequitable outcomes of funding decisions:
    a. Determine which funding mechanisms for transportation projects lead to inequitable investment patterns;
    b. Mitigate the inequities by altering the mechanisms or funding projects through other means.
5. Periodically report to the Metro Council and JPACT on actions that will improve the effectiveness of transportation funding decisions in achieving regional goals. Identify barriers to achieving the goals and make suggestions for improvement.

Management Response

600 NE Grand Ave.
Portland, OR 97232-2736
www.oregonmetro.gov

Metro | *Memo*

Date: Tuesday, June 11, 2013
To: Suzanne Flynn, Metro Auditor
From: Martha Bennett, Chief Operating Officer
Robin McArthur, AICP, Planning and Development Director
Subject: Management response to Light Rail Transit Audit

Dear Auditor Flynn:

Thank you for undertaking an initial look at three light rail transit station areas in the Portland metropolitan area to assess the effectiveness of various investment strategies on transit ridership.

The Region 2040 Growth Concept, the blueprint for growth and development in the Portland metro area, was adopted almost 20 years ago to improve livability, foster jobs, protect farm and forest land, provide access to nature, and reduce greenhouse gas emissions. Your audit correctly notes that the Joint Policy Advisory Committee on Transportation and the Metro Council are committed to increasing travel options for the residents and employees of this region consistent with the Region 2040 Growth Concept. A centerpiece of that strategy is to build high capacity transit corridors which connect our more densely developed downtowns, main streets and employment areas and to promote mixed-use, transit-friendly development in station areas.

I am pleased to highlight one of your findings: transit ridership increased at all three station areas that you studied. Your audit goes on to state that you were unable to determine the cause and effect relationship between the specific planning strategies you chose to evaluate and ridership. Rather, you based your recommendations on an assessment of a bundle of strategies being implemented at each station. By using a survey instrument targeted at station-area residents, you acquired some public opinion input on other strategies that may increase transit ridership.

Surprisingly, ridership increased the most at a station where the audit identified the most problems with coordinated public investment. The East 162nd station is one of the oldest stations in the system. It was built over 20 years ago along the region's first light rail transit line from downtown Portland to Gresham.

Your audit reinforces some of the key findings gleaned from national and local studies on factors that influence transit use: density, design, income and access are key determinants of ridership. We can maximize the public's investment in our high capacity transit system by focusing on these factors. As noted below, the region has embarked on a new approach to corridor planning which, in fact, is doing just that.

Over the years, Metro, Tri-Met and our city and county partners have become more sophisticated both in terms of where to locate stations along an alignment as well as how to proactively engage

community interests in developing well designed station area plans and development strategies. Much as your audit points out, all of the governments in the region have learned that strong coordination across jurisdictions and different services are essential to achieving our goals for both vibrant communities and strategic transportation investments. The SW Corridor Plan is an example of that new approach.

This summer, the elected officials representing communities in the SW Corridor will decide which transit options should move into the next phase of environmental assessment. The decision will represent the culmination of two years worth of work that began with each community articulating how and where it wants to grow and develop. Transportation solutions, including potential station area locations, have evolved from those community based plans.

The approach also reinforces the need for a coordinated investment strategy for each station area. The plan that is ultimately adopted will indicate who is responsible for which investments designed to increase travel choices. For example, a local community will need to commit to actions such as increasing zoned densities, building sidewalks and offering development incentives to ensure that the region's investment in high capacity transit and other public infrastructure is successful. The region will need to commit to evaluating and building the preferred transit solution. TriMet will need to commit to providing enhanced transit service. That explains why the study includes an extensive analysis of development potential and job creation, sidewalk/bikeway/roadway needs, socioeconomic and health conditions, and parks and open space along with an evaluation of transit alternatives.

This approach models some of the points you raised in your audit including the need to use public dollars wisely, focus on place-based analysis and investments, coordinate investments among various partners, and measure progress toward desired outcomes.

Below is our response to the audit recommendations.

1) **Increase the use of place-based analysis of transportation needs**.
   We concur with your assessment. It is critically important to evaluate how various policies and investments affect development patterns, transportation choices, and quality of life for our residents and employees.

   We have been evolving new and better ways to do that over the past several years including:
   - Refining our approach to corridor planning (e.g., East Metro Connections Plan, SW Corridor Study)
   - Assessing site-specific development needs and identifying the right combination of strategies necessary to foster creation of jobs, housing and community amenities (e.g., Industrial Lands Inventory, Fall 2012, Transit Oriented Development Program).
   - Developing a broader array of tools to help communities at different levels of development readiness (e.g., development tool kits, case studies, planning and development grants).

2) **Assess and report on whether local transportation projects have increased the ability to achieve regional outcomes**.

The Regional Transportation Plan (RTP) update process includes an aggregate assessment of existing and proposed transportation improvements. It is an effective tool to highlight "gaps" in the overall network, congestion bottlenecks, and system inefficiencies. Importantly, it also provides insights on whether cumulative investments in the transportation system are helping us meet our vision as articulated in the Region 2040 growth concept and embodied in the land use and transportation system plans of all 28 jurisdictions in the Metro boundary. We continually seek improvements in the transportation system by incorporating these findings into each RTP update process.

As you point out, however, a finer level of analysis that more clearly evaluates the cause and effect relationship of specific investment strategies on shared local and regional outcomes would be beneficial. This type of evaluation requires a more refined array of evaluation tools than are currently in place in the Portland metro area and around the nation.

The task may sound easier to do than it really is. Most transportation models, like the one we use for the RTP, evaluate how decades of transportation investments worth billions of dollars affect system-wide performance. It is extremely difficult, therefore, to discern the benefits and costs associated with construction of a single new facility on overall system performance.

Fortunately, there is a national movement afoot to develop more sophisticated modeling techniques to answer the kinds of questions posed in your audit. We are testing some of those techniques locally as part of the Climate Smart Communities project and hope to apply our new knowledge to other transportation endeavors.

3) **Increase the use of outcomes measures**.

The Metro/JPACT adopted 2035 Regional Transportation Plan made significant progress on this front. It embraced an "outcomes-based" approach in an effort to achieve Six Desired Outcomes: vibrant downtowns and main streets, jobs, equity, access to nature, more transportation choices and reduction in greenhouse gas emissions. The policy framework and list of projects included in the plan were developed to meet those outcomes. The approach received national recognition and an EPA "Smart Growth" award.

As you noted in your audit, Congress has awakened to this type of approach. Last summer, it passed MAP-21, new federal transportation legislation governing the planning, development, construction and management of the nation's transportation system.

We just embarked on the next RTP update. The RTP adopted in mid-2014 will incorporate all federal requirements related to measuring outcomes and improving system performance.

4) **Assess and respond to any inequitable outcomes of funding decisions**.

One of the region's adopted Six Desired Outcomes is to ensure that the benefits and burdens of growth are shared equitably within the region. Over the past few years, Metro has enhanced its capacity to engage a broader range of community partners and assess how various transportation improvements may affect low income and minority populations.

The Regional Flexible Funds Allocation (RFFA) process is a prime example of how far we've come. Metro includes a thorough evaluation of the aggregate burdens and benefits of proposed funding allocation packages on minority populations and the traditionally under-served. This analysis is shared with JPACT, the Metro Council and the public in the decision-making process. Our approach is consistent with all federal and state requirements and in many cases goes beyond those requirements to ensure the adoption of fair and equitable solutions.

5) **Periodically report to the Metro Council and JPACT on actions that will improve the effectiveness of transportation funding decisions in achieving regional goals. Identify barriers to achieving the goals and make suggestions for improvement**.
Metro periodically reports to the Metro Council, JPACT, the Metropolitan Policy Advisory Committee and the public on ways to improve the effectiveness of the transportation system. This happens in the context of the RTP update process as well as during local transportation system planning efforts. We are constantly looking at ways to reduce transportation bottlenecks, enhance mobility in the region's corridors (e.g., East Metro Connections Plan, SW Corridor Plan), improve safety (Safety Action Plan), add critical freight, bike and pedestrian connections, and provide access to jobs, housing, and natural areas.

A large barrier to achieving our livability goals is the lack of sufficient dollars to invest in our transportation system. Regional forecasting suggests that if we had sufficient dollars to fundthe high capacity transit, roadway, bikeway and walkway improvements included in our regional and local land use and transportation system plans, we would have more vibrant communities, more travel options, more jobs, better access to nature, and a more equitable environment for our citizens.

cc:
Scott Robinson
Elissa Gertler
John Williams
Megan Gibb

Appendices

Appendix 1
Survey methodology

We conducted the residential survey from July 11 to August 14, 2012, and received 406 valid responses. We could not calculate a response rate because we invited households to participate rather than individuals. The responses were distributed among the three study areas as follows:

	Tuality Hospital	Killingsworth	East 162nd
Count (% of total)	72 (18%)	156 (38%)	178 (44%)
Riders (% by area)	40 (56%)	120 (77%)	115 (65%)
Non-riders (% by area)	32 (44%)	36 (23%)	63 (35%)

We mailed postcards to residential addresses within a quarter-mile of the MAX stations to announce the survey and provide information about how to access it. During the survey period, we went door-to-door, distributed flyers, and attended community events to encourage people to respond. As an incentive, respondents could enter a drawing for a $50 gift card.

The surveys were available in electronic and hardcopy formats and in English and Spanish. We tailored the text to the individual locations, but kept the substance of the questions the same.

We sought input from riders and non-riders. Riders were asked questions to determine the effect of the strategies on their MAX use. Non-riders, whom we defined as those who had not used the MAX in the previous month, were asked why they had not. Both groups were asked what changes would lead them to ride more.

We used a five-point scale to test relative agreement or disagreement of riders with a series of statements related to the individual ridership strategies. The survey also provided an option to indicate if a statement did not apply to them. The strategies were described as:

- Placing retail businesses and services near stations;
- Increasing residential options near stations;
- Enabling a sense of personal safety in the neighborhood, at the station, and on MAX trains;
- Improving sidewalks, crosswalks, and bike lanes near stations;
- Encouraging people to drive less and use other travel methods.

The final statement tested whether the combination of the strategies in their study area made the riders more likely to use the MAX.

Variation in our outreach activities may have affected the proportion of riders and non-riders who responded. For example, we spent less time going door-to-door in Killingsworth because residents from that study area were more likely to respond on-line. That may have led to non-riders being under-represented in that study area compared to the other two.

Appendix 2 - Metro survey results

Do you live within the boundary of the map area?	Tuality Hospital	Killingsworth	East 162nd	Total
Yes	**100%**	**100%**	**100%**	100%
Responses	72	156	178	406

Did you live in your current home before your MAX line started operating?	Tuality Hospital	Killingsworth	East 162nd	Total
Yes	**37%**	**29%**	**8%**	22%
No	**63%**	**71%**	**92%**	78%
Responses	**71**	**156**	**177**	404

Do you think that, overall, the MAX line is good for your neighborhood?	Tuality Hospital	Killingsworth	East 162nd	Total
Agree	**84%**	**94%**	**77%**	85%
Disagree	**6%**	**4%**	**15%**	9%
Don't know	**10%**	**2%**	**8%**	6%
Responses	**71**	**156**	**176**	403

Do you usually have a working car, truck, or motorcycle available for your use?	Tuality Hospital	Killingsworth	East 162nd	Total
Yes	**76%**	**80%**	**62%**	71%
No	**24%**	**20%**	**38%**	29%
Responses	**71**	**156**	**177**	404

How do you usually get around?	Tuality Hospital	Killingsworth	East 162nd	Total
Car/Truck/Motorcycle	**62%**	**50%**	**51%**	52%
Bus/MAX	**24%**	**26%**	**45%**	34%
Bicycle	**1%**	**17%**	**2%**	8%
Walk	**13%**	**7%**	**2%**	6%
Responses	**63**	**155**	**171**	389

Have you used your MAX line in the past 30 days?	Tuality Hospital	Killingsworth	East 162nd	Total
Yes (riders)	56%	77%	65%	68%
No (non-riders)	44%	23%	35%	32%
Responses	72	156	178	406

Questions for riders only

In the past 30 days, how often did you use your MAX line?	Tuality Hospital	Killingsworth	East 162nd	Total
Almost every day	13%	24%	42%	30%
One to three times per week	37%	40%	29%	35%
A couple of times	42%	26%	26%	28%
Once	8%	10%	3%	7%
Responses	38	120	113	271

In the past 30 days, which MAX station did you use the most?	Tuality Hospital	Killingsworth	East 162nd	Total
Study area station	87%	96%	93%	100%
Responses	38	120	113	271

In the past 30 days, what was the main purpose of most of your MAX trips?	Tuality Hospital	Killingsworth	East 162nd	Total
Commute to work or school	21%	44%	36%	37%
Personal business/recreation/other	79%	56%	64%	63%
Responses	39	120	109	268

Compared to a year ago, do you use the MAX more or less?	Tuality Hospital	Killingsworth	East 162nd	Total
More	31%	29%	29%	29%
Same	54%	51%	55%	53%
Less	15%	14%	9%	12%
Does not apply to me	0%	6%	7%	6%
Responses	39	120	112	271

The following statements referenced maps of individual study areas.

New shops, schools, and businesses in the map area are an improvement.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	3%	1%	4%	2%
Disagree	8%	2%	17%	9%
Neutral	28%	10%	30%	21%
Agree	26%	35%	24%	29%
Strongly agree	33%	51%	16%	34%
Does not apply to me	2%	1%	9%	5%
Responses	39	118	108	265

The appearance of some existing businesses in the map area has been improved.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	1%	5%	3%
Disagree	10%	1%	25%	12%
Neutral	20%	20%	29%	24%
Agree	53%	47%	28%	40%
Strongly agree	10%	29%	8%	18%
Does not apply to me	2%	2%	5%	3%
Responses	40	119	110	269

I shop at the stores in the map area.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	1%	6%	4%
Disagree	3%	10%	10%	9%
Neutral	10%	16%	14%	14%
Agree	52%	38%	45%	43%
Strongly agree	30%	35%	25%	30%
Does not apply to me	0%	0%	0%	0%
Responses	40	117	110	267

I eat at restaurants in the map area.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	10%	1%	10%	6%
Disagree	5%	8%	20%	12%
Neutral	8%	7%	9%	8%
Agree	47%	39%	42%	42%
Strongly agree	25%	43%	17%	30%
Does not apply to me	5%	2%	2%	2%
Responses	40	117	111	268

I go to doctors or health services in the map area.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	13%	18%	21%	18%
Disagree	5%	31%	35%	29%
Neutral	3%	8%	7%	7%
Agree	23%	14%	10%	13%
Strongly agree	36%	9%	13%	15%
Does not apply to me	20%	20%	14%	18%
Responses	39	118	110	267

My children go to school or daycare in the map area.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	6%	9%	7%
Disagree	8%	7%	18%	12%
Neutral	5%	5%	6%	5%
Agree	5%	3%	8%	6%
Strongly agree	12%	6%	9%	8%
Does not apply to me	65%	73%	50%	62%
Responses	40	118	110	268

I am more likely to take the MAX because of the businesses in the map area.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	13%	8%	18%	13%
Disagree	18%	31%	19%	24%
Neutral	27%	31%	20%	26%
Agree	20%	14%	19%	17%
Strongly agree	7%	7%	15%	10%
Does not apply to me	15%	9%	9%	10%
Responses	40	118	108	266

The MAX line was among the reasons I moved to the map area.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	8%	5%	10%	9%
Disagree	15%	5%	12%	9%
Neutral	13%	12%	15%	13%
Agree	18%	30%	27%	27%
Strongly agree	23%	36%	27%	30%
Does not apply to me	23%	12%	9%	12%
Responses	39	119	108	266

Creating housing in the map area is a good idea.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	8%	4%	7%	6%
Disagree	8%	7%	12%	9%
Neutral	31%	17%	16%	19%
Agree	36%	36%	29%	33%
Strongly agree	15%	36%	35%	32%
Does not apply to me	2%	0%	1%	1%
Responses	39	118	109	266

New housing in the map area improved the area.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	2%	4%	10%	7%
Disagree	5%	9%	14%	10%
Neutral	49%	30%	24%	30%
Agree	31%	32%	32%	32%
Strongly agree	8%	24%	18%	19%
Does not apply to me	5%	1%	2%	2%
Responses	39	115	110	264

I am more likely to take the MAX because people live near the station.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	10%	4%	12%	8%
Disagree	16%	14%	8%	11%
Neutral	23%	37%	30%	32%
Agree	23%	18%	20%	20%
Strongly agree	23%	19%	26%	23%
Does not apply to me	5%	8%	4%	6%
Responses	39	119	112	270

I feel safe walking to and from the MAX station.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	0%	1%	27%	11%
Disagree	5%	5%	22%	12%
Neutral	7%	7%	23%	13%
Agree	50%	50%	19%	38%
Strongly agree	38%	37%	9%	26%
Does not apply to me	0%	0%	0%	0%
Responses	40	119	110	269

I feel safe while at the MAX station.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	3%	0%	29%	12%
Disagree	5%	4%	18%	10%
Neutral	10%	11%	23%	16%
Agree	52%	54%	19%	40%
Strongly agree	30%	31%	11%	22%
Does not apply to me	0%	0%	0%	0%
Responses	40	118	112	270

I feel safe while waiting for the train at the East 162nd Ave. MAX Station because of the piped-in music.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	--	--	38%	--
Disagree	--	--	20%	--
Neutral	--	--	25%	--
Agree	--	--	12%	--
Strongly agree	--	--	5%	--
Does not apply to me	--	--	0%	--
Responses	--	--	110	--

I feel safe while riding the MAX line.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	0%	1%	17%	7%
Disagree	8%	5%	8%	7%
Neutral	8%	15%	25%	18%
Agree	63%	49%	32%	44%
Strongly agree	23%	30%	16%	23%
Does not apply to me	0%	0%	1%	0%
Responses	40	119	111	270

I am more likely to take the MAX because overall I feel safe using it.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	3%	2%	20%	9%
Disagree	8%	7%	14%	10%
Neutral	25%	29%	30%	29%
Agree	47%	44%	25%	37%
Strongly agree	15%	17%	9%	13%
Does not apply to me	2%	1%	2%	2%
Responses	40	119	112	271

Parking around the MAX station is well-managed.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	3%	4%	25%	13%
Disagree	10%	11%	19%	14%
Neutral	8%	26%	18%	20%
Agree	32%	14%	12%	16%
Strongly agree	10%	1%	4%	3%
Does not apply to me	37%	44%	22%	34%
Responses	38	119	107	264

Traffic around the MAX station is well-managed.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	3%	4%	11%	7%
Disagree	3%	8%	18%	12%
Neutral	10%	23%	28%	23%
Agree	60%	55%	32%	46%
Strongly agree	16%	7%	6%	8%
Does not apply to me	8%	3%	5%	4%
Responses	38	119	106	263

Sidewalks and crosswalks in the map area have been improved.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	3%	2%	8%	4%
Disagree	8%	7%	13%	10%
Neutral	16%	29%	33%	29%
Agree	58%	44%	34%	42%
Strongly agree	10%	15%	7%	11%
Does not apply to me	5%	3%	5%	4%
Responses	38	119	103	260

Bike lanes and/or bike parking in the map area have been improved.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	8%	1%	7%	4%
Disagree	13%	11%	20%	15%
Neutral	32%	23%	34%	28%
Agree	29%	39%	22%	31%
Strongly agree	8%	13%	6%	10%
Does not apply to me	10%	13%	11%	12%
Responses	38	119	107	264

I am more likely to take the MAX because of work done in the map area on sidewalks, crosswalks, and bike improvements.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	1%	12%	6%
Disagree	20%	25%	12%	19%
Neutral	36%	37%	36%	36%
Agree	18%	24%	33%	27%
Strongly agree	8%	11%	5%	8%
Does not apply to me	13%	2%	2%	4%
Responses	39	119	109	267

I have received messages or materials at home asking me to drive less.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	6%	10%	17%	13%
Disagree	32%	29%	31%	30%
Neutral	16%	12%	14%	13%
Agree	16%	31%	13%	21%
Strongly agree	6%	6%	3%	5%
Does not apply to me	24%	12%	22%	18%
Responses	37	117	109	263

I have received messages or materials at work asking me to drive less.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	12%	14%	12%
Disagree	26%	26%	28%	27%
Neutral	13%	9%	12%	11%
Agree	19%	20%	15%	18%
Strongly agree	5%	7%	2%	4%
Does not apply to me	32%	26%	29%	28%
Responses	38	117	108	263

I drive less because of the information I have received.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	6%	17%	10%
Disagree	45%	37%	29%	35%
Neutral	13%	15%	14%	15%
Agree	11%	9%	8%	9%
Strongly agree	0%	1%	0%	0%
Does not apply to me	26%	32%	32%	31%
Responses	38	118	108	264

I am more likely to take the MAX because of information I have received.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	8%	16%	11%
Disagree	38%	34%	27%	31%
Neutral	24%	20%	22%	22%
Agree	8%	11%	11%	11%
Strongly agree	0%	3%	2%	2%
Does not apply to me	24%	24%	23%	23%
Responses	37	118	109	264

I am more likely to take the MAX because the map area overall has improved since the line began operating.	Tuality Hospital	Killingsworth	East 162nd	Total
Strongly disagree	5%	2%	17%	8%
Disagree	10%	15%	11%	13%
Neutral	23%	27%	28%	27%
Agree	44%	32%	26%	32%
Strongly agree	8%	15%	8%	11%
Does not apply to me	10%	9%	10%	9%
Responses	39	117	110	266

Questions for non-riders only

When was the last time you used your MAX line?	Tuality Hospital	Killingsworth	East 162nd	Total
Less than 2 months ago	19%	28%	19%	22%
2 to 6 months ago	29%	33%	21%	26%
More than 6 months ago	49%	39%	43%	43%
I have never used it.	3%	0%	17%	9%
Responses	31	36	63	130

Compared to a year ago, do you use the MAX more or less now?	Tuality Hospital	Killingsworth	East 162nd	Total
More	16%	6%	6%	8%
Same	44%	55%	29%	40%
Less	28%	31%	36%	33%
Does not apply to me	12%	8%	29%	19%
Responses	32	36	63	131

What are all the reasons you did not use the MAX in the past 30 days?	Tuality Hospital	Killingsworth	East 162nd	Total
Trips take too long.	11%	13%	6%	9%
MAX does not go where I want to go.	21%	13%	9%	13%
MAX does not operate during the hours I travel.	1%	0%	2%	1%
MAX trips are more expensive than my other options.	5%	14%	5%	8%
I need my car for errands.	21%	17%	23%	21%
There is convenient parking where I go.	10%	10%	9%	9%
There is free parking where I go.	8%	12%	5%	8%
The walk to the station is unpleasant.	0%	2%	9%	5%
I fear for my personal safety.	7%	6%	19%	12%
I am opposed to the MAX.	1%	0%	1%	1%
Other	15%	13%	12%	13%
Responses	87	103	138	328

What is the main reason you did not use the MAX in the past 30 days?	Tuality Hospital	Killingsworth	East 162nd	Total
Trips take too long.	13%	22%	5%	12%
MAX does not go where I want to go.	30%	17%	9%	16%
MAX does not operate during the hours I travel.	0%	0%	4%	2%
MAX trips are more expensive than my other options.	3%	11%	4%	6%
I need my car for errands.	27%	17%	27%	24%
There is convenient parking where I go.	7%	3%	7%	6%
There is free parking where I go.	0%	6%	0%	2%
The walk to the station is unpleasant.	0%	0%	0%	0%
I fear for my personal safety.	3%	3%	30%	16%
I am opposed to the MAX.	0%	0%	0%	0%
Other	17%	21%	14%	16%
Responses	30	36	56	122

Questions for all

I would ride the MAX more if there were: (check all that apply)	Tuality Hospital	Killingsworth	East 162nd	Total
more frequent MAX service	5%	11%	6%	7%
more destinations that interested me	9%	6%	6%	6%
quicker trips	12%	8%	6%	8%
fewer transfers	2%	4%	4%	4%
better bus connections between MAX and my destination	6%	4%	5%	5%
lower TriMet fares	11%	12%	9%	10%
more police patrolling MAX stations	9%	5%	10%	8%
more police on the train	7%	4%	10%	7%
more TriMet fare enforcement	8%	5%	6%	6%
a more pleasant walking environment near the MAX station	3%	4%	9%	7%
more stores or restaurants near the station	4%	5%	6%	6%
more doctors, daycare, or schools near the MAX station	1%	1%	4%	3%
free or discounted transit passes available to me	12%	13%	8%	10%
better information about how to use the MAX system	2%	1%	2%	2%
higher gas prices	3%	6%	4%	4%
higher parking prices	1%	3%	1%	2%
other	5%	8%	4%	5%
Responses	303	594	993	1,890

I would ride the MAX more if there were: (check most important)	Tuality Hospital	Killingsworth	East 162nd	Total
more frequent MAX service	2%	20%	6%	11%
more destinations that interested me	18%	7%	4%	8%
quicker trips	15%	8%	4%	8%
fewer transfers	0%	2%	2%	2%
better bus connections between MAX and my destination	10%	2%	1%	3%
lower TriMet fares	10%	16%	12%	13%
more police patrolling MAX stations	6%	3%	19%	10%
more police on the train	7%	4%	13%	9%
more TriMet fare enforcement	1%	1%	3%	2%
a more pleasant walking environment near the MAX station	0%	1%	9%	4%
more stores or restaurants near the station	0%	1%	2%	1%
more doctors, daycare, or schools near the MAX station	0%	0%	1%	0%
free or discounted transit passes available to me	19%	12%	12%	13%
better information about how to use the MAX system	1%	1%	1%	1%
higher gas prices	4%	4%	3%	4%
higher parking prices	0%	1%	0%	1%
other	7%	17%	8%	10%
Responses	68	152	163	383

What is your gender?	Tuality Hospital	Killingsworth	East 162nd	Total
Female	52%	60%	58%	58%
Male	48%	40%	42%	42%
Responses	71	151	170	392

Are you of Hispanic, Latino, or Spanish origin?	Tuality Hospital	Killingsworth	East 162nd	Total
Yes	17%	3%	13%	10%
No	83%	97%	87%	90%
Responses	69	152	166	387

What is your race?	Tuality Hospital	Killingsworth	East 162nd	Total
White	95%	90%	75%	84%
Black/African American	2%	6%	11%	7%
American Indian/Alaska Native	2%	0%	1%	1%
Asian	0%	1%	4%	2%
Native Hawaiian/Pacific Islander	0%	0%	1%	1%
Some other race	1%	3%	8%	5%
Responses	64	146	158	368

What is your age?	Tuality Hospital	Killingsworth	East 162nd	Total
< 5	0%	0%	0%	0%
5 to 9	0%	0%	0%	0%
10 to 14	2%	1%	1%	1%
15 to 19	4%	0%	5%	3%
20 to 24	3%	3%	7%	5%
25 to 34	10%	31%	20%	22%
35 to 44	15%	37%	20%	26%
45 to 54	22%	12%	24%	19%
55 to 59	13%	4%	9%	8%
60 to 64	12%	6%	5%	7%
65 to 74	12%	6%	7%	7%
75 to 84	7%	0%	1%	2%
> 85	0%	0%	1%	0%
Responses	68	152	163	383

How many people lived in your household in 2011?	Tuality Hospital	Killingsworth	East 162nd	Total
Median	2	2	3	2
Average	3.0	2.4	3.1	2.8
Mode	2	2	2	2
Maximum	9	7	11	11
Minimum	1	1	1	1
Responses	64	143	154	361

What was your total household income in 2011 from all sources?	Tuality Hospital	Killingsworth	East 162nd	Total
Less than $10,000	9%	1%	22%	12%
$10,000-$14,999	6%	2%	10%	6%
$15,000-$24,999	19%	14%	18%	16%
$25,000-$34,999	11%	14%	23%	17%
$35,000-$49,999	11%	16%	15%	15%
$50,000-$74,999	21%	22%	6%	15%
$75,000-$99,999	13%	11%	3%	8%
$100,000-$149,999	4%	17%	3%	9%
$150,000-$199,999	0%	2%	0%	1%
More than $200,000	6%	1%	0%	1%
Responses	53	146	154	353

What is the highest degree or level of school you have completed?	Tuality Hospital	Killingsworth	East 162nd	Total
No schooling completed	5%	0%	3%	2%
Grade 12 or under, but no diploma	5%	1%	15%	8%
High school diploma	13%	4%	18%	12%
GED or alternative credential	5%	2%	9%	5%
Some college credit	25%	17%	28%	23%
Associate's degree	9%	7%	15%	11%
Bachelor's degree	24%	43%	10%	26%
Master's degree	11%	19%	2%	10%
Professional degree beyond a bachelor's degree	0%	6%	0%	2%
Doctoral degree	3%	1%	0%	1%
Responses	63	153	163	379

Office of the Metro Auditor
600 NE Grand Avenue
Portland, Oregon 97232
503-797-1892
www.oregonmetro.gov