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CHAPTER 1

Introduction

This chapter sets the stage for the On-Demand Last Mile Feasibility Study and why the Westside Transportation Alliance is studying last mile solutions. This chapter also establishes the goals for a future on-demand last mile transit program in Washington County and summarizes the study process.
The On-Demand Last Mile Feasibility Study was initiated by the Westside Transportation Alliance in 2015 to help more employees take transit to work. Although the MAX line, WES commuter service, buses, and shuttles serve much of the county, the work locations of approximately 175,000 employees are more than a comfortable walk to frequent transit service, making transit a less viable option.¹ Today, less than 4% of employees in the county take transit to work. Convenient and reliable transit options will be critical to support continued job growth and employee attraction and retention in the county.

The goal of this project is to identify an on-demand last mile solution – or set of solutions – to help employees take transit to work. The field of on-demand transportation is changing at an unprecedented pace – new technology paired with a burgeoning industry of private transportation providers are challenging the traditional public transit model that has relied largely on a fixed-route, fixed-schedule system. This study capitalizes on this growing and exciting field and documents the feasibility of on-demand transportation services in meeting the last mile needs of Washington County employees.

This report includes the following:

- **Chapter 2 Current Conditions** provides an overview of the employee travel commute patterns and the transit services currently available in Washington County.
- **Chapter 3 Emerging and Best Practices** provides a snapshot of lessons learned from emerging and best practices in communities across the U.S.
- **Chapter 3 Market Identification** identifies the number and location of employees that are in need of last mile solutions.
- **Chapter 4 Feasibility Assessment** evaluates the feasibility of on-demand rideshare, private and publicly operated shuttles, and ridesourcing companies to serve the last mile needs of Washington County employees.
- **Chapter 5 Recommendations and Next Steps** recommends a set of on-demand solutions to serve the last mile needs of employers and next steps for implementation.
- **Appendix A Best Practices** provides detailed findings from case studies and emerging best practices in on-demand last mile transportation services.

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¹ For the purposes of this study, last mile need is defined as employees who work within a half mile and three miles of frequent or very frequent transit service.
• **Appendix B Existing Conditions & Market Analysis** provides a detailed overview of the existing travel patterns in Washington County, transportation services provided, and an assessment of the last mile market.

• **Appendix C Business Outreach Summary** provides a summary of the business stakeholder focus groups held in March 2015 with Washington County employers.

**WHAT ARE THE GOALS?**

The Westside Transportation Alliance initiated this study to better serve the transportation needs of employees in Washington County. The successful implementation of a last mile solution will require strong partnerships with the business community, build off of existing transportation services, and provide a service that is flexible, safe, and comfortable. With input from the Project Advisory Committee, eight key goals were developed to guide the study:

1. **Economy** – Enhance the economic vitality of Washington County by supporting access to jobs and local businesses and helping goods move reliably.

2. **Equity** – Provide a last mile transportation solution that is affordable and scalable to different employee markets, geographies, and size of employer.

3. **Flexibility** – Provide a last mile transportation solution with flexibility in routing, time of day, and application, ensuring that it is adaptable to changing technology and consumer needs.

4. **Safety** – Provide a safe and secure last mile transportation solution for all users.

5. **Communication** – Develop information about the range of last mile transportation solutions and potential cost savings to program users and sponsors.

6. **Coordination** – Work collaboratively with the business community, local and county jurisdictions, and service providers to develop a last mile transportation solution that meets the needs of employees, limits duplication of existing services, and attains cost and operational efficiencies.

7. **Customer Experience** – Provide a last mile transportation solution that is convenient, reliable, legible, and comfortable, integrating seamlessly with current and future transportation options.

8. **Implementation** – Identify stable funding sources and willing and able partners to implement the last mile transportation solution.

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**Project Advisory Committee**

The On-Demand Last Mile Feasibility Study was guided by a Project Advisory Committee with representatives from the region, local jurisdictions, the WTA, the business community, and service providers. Representatives included:

- City of Beaverton, Todd Juhasz
- City of Hillsboro, Brad Choi
- City of Tigard, Lloyd Purdy
- Hillsboro Chamber of Commerce, Deanna Palm
- Metro, Dan Kaempff
- RideConnection, Alex Page
- Tualatin Chamber of Commerce, Linda Moholt
- TriMet, Tom Mills
- WTA Board, Phil Wu
- Westside Economic Alliance, Pam Treece
WHAT LAST MILE SOLUTIONS WERE EVALUATED?

Several “last mile” strategies help transit riders meet their final destinations: bike share, bike racks on buses, bicycle parking at transit stations, public and private shuttles, shared rides, taxi service, and ridesourcing companies (such as Uber and Lyft). While many of these strategies may be viable for Washington County, this study focused on the opportunity for “on-demand” last mile solutions, meaning that a passenger can use a cell phone app, website, or other push button application to summon the transportation service as needed. On-demand services typically do not follow a fixed route, although some services may be stationed at the transit stop during the peak hour and then operate on-demand during the midday.

On-demand last mile solutions are the focus of this study for three primary reasons:

- **Serve the diverse travel needs of Washington County employees.** A key goal of this study is to serve both traditional shifts (e.g. 9:00 – 5:00) and shift workers (those who work at odd hours of the day and into the evening and early morning). An on-demand service, or combination of services, could be provided during peak hours, the midday, and into the evening and early morning.

- **Provide a cost effective service.** The geographic context of Washington County may not support fixed-route service all day and into the evening. An on-demand service, or combination of services, could provide a cost-effective way to meet demand.

- **Respond to the changing needs of riders.** Transportation preferences are changing; the traditional transit model must be reimagined to provide a seamless, comfortable, and efficient connection to work.

Three on-demand last mile strategies were evaluated: rideshare, on-demand shuttle (public and private), and ridesourcing companies (such as Uber, Lyft, and Summon). Figure 1 presents the basic characteristics of each last mile strategy evaluated.

A Two-Phased Project

The On-Demand Last Mile Feasibility Study is a two-phased project:

- **Phase I**, which is outlined in this report, documents the feasibility of on-demand last mile solutions in Washington County, including the location of greatest last mile need and the type of last mile service to explore in greater detail in Phase II.

- **Phase II** will identify partnerships and funding opportunities to implement the selected service type identified in Phase I, identify a pilot route, and develop a work plan to launch the service.¹

¹ Note: Phase II is not funded as of September 2015.
The Westside Transportation Alliance On-Demand Last Mile Feasibility Study is evaluating three potential last mile strategies to help employees in Washington County connect to work from transit. The following presents the basic characteristics of each last mile strategy.

- **Rides are matched on an ad hoc basis between an individual requesting a ride and an individual who is driving their personal vehicle.**
- **Carpools are formed on-the-fly using a smartphone app.**
- **Passengers and drivers meet at a designated spot (often a park-and-ride location or transit stop) and travel together for some distance to a designated drop-off point.**

- **Shuttles are “anchored” at transit stops and provide on-demand service to destinations within a designated zone; in other cases, shuttles are reserved ahead of time and a temporary “route” is designed to meet demand.**
- **On-demand shuttle service typically operates in areas that cannot support fixed-route service.**
- **Shuttles can be publicly (e.g., a transit agency) or privately (e.g., an employer, chamber of commerce, or transportation management association) operated.**
- **Shuttles are summoned either using a smartphone application, a push button at the transit stop, or by calling to make a reservation.**

- **Also referred as Transportation Network Companies, Ridesourcing companies such as Uber, Lyft, Sidecar, and Summon provide on-demand, point-to-point transportation similar to a taxi service.**
- **Ridesourcing companies use a web-based platform to serve as an online marketplace for trips, connecting passengers in real-time with drivers for personal trips.**
- **The difference between ridesourcing companies and taxis is that passengers are connected to drivers who use their personal vehicles rather than vehicles in association with a taxi or limousine company.**
This chapter provides an overview of existing transportation services in Washington County. Appendix B provides a complete documentation of existing conditions and a detailed account of the market analysis.
HOW DO WASHINGTON COUNTY EMPLOYEES TRAVEL?

Washington County is a critical economic generator for the state of Oregon with over 250,000 jobs in 2011 and a projected 2% growth per year in employment, reaching 380,000 jobs by 2035.²

Over half the county’s employees – or 125,000 – travel into the county for work on a daily basis. Transit use to work varies by employee home and work location:

- Only 3.3% of employees who both live and work in the county take transit to work
- Employees who live outside of the county and commute into the county for work are more likely to take transit (at 4.4%)
- Washington County residents who commute to jobs outside Washington County are four times more likely to use transit (12.1%) than workers who live and work in Washington County. This is likely due to disincentives to drive into Portland (which represent a large concentration of jobs), including congestion and the limited availability and high cost of parking in downtown Portland. On the other hand, parking is generally free and plentiful for employees in Washington County.

Large employers in Washington County (those with over 100 employees) are required to adhere to the State Department of Environmental Quality Employee Commute Options (ECO) program. Interestingly, most ECO sites in Washington County are within a quarter-mile walking distance to transit. Approximately half of all sites have more than 7% of employees using transit for their commute – which is significantly higher than the typical transit mode share in the county (see map in Figure 2 below). This suggests employment sites closer to transit are more likely to have a greater number of employees who use transit. Implementing an on-demand last mile connection between transit and employment sites could increase the viability of transit as a line haul mode for the commute trip.

Figure 2 Washington County ECO Sites, Transit Use, and Distance to Transit
WHAT TRANSIT SERVICES ARE AVAILABLE?

Transit service in Washington County is provided primarily by the regional transit agency, TriMet. Services include local and regional bus, MAX light rail, and Westside Express Service (WES) commuter rail. Public transportation services, including last mile shuttles and intercity service, are also provided by non-profit organizations and other regional transit service providers. Public transit service is shown in the map in Figure 3; transit service is detailed in Error! Reference source not found..
### Figure 3  Public Transit Service Options in Washington County

<table>
<thead>
<tr>
<th>Transit Service Type</th>
<th>Description</th>
<th>Key Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>TriMet MAX Service</td>
<td>Red and Blue MAX lines serve Washington County, providing key east/west service between Hillsboro, Beaverton, downtown Portland, the Portland airport, and Gresham.</td>
<td>Service provided between 4:00 a.m. and 1:00 a.m. every 10 minutes during the peak, every 15 minutes midday, and every 15-30 minutes in the evening.</td>
</tr>
<tr>
<td>TriMet WES Commuter Rail</td>
<td>The Westside Express Service (WES) is a commuter rail line between Wilsonville and the Beaverton Transit Center.</td>
<td>WES operates during weekday peak hours every 30 minutes.</td>
</tr>
<tr>
<td>TriMet Frequent Bus Service</td>
<td>Thirty local and regional bus routes serve Washington County.</td>
<td>Routes 12 and 57 provide the most frequent service, operating every 15 minutes all day on weekdays.</td>
</tr>
<tr>
<td>Intercity Bus Service</td>
<td>Tillamook County Transportation District provides transit service between Downtown Portland, Sunset Transit Center, North Plains, Banks, and Tillamook; Yamhill County Transit Area provides service between Washington County and McMinnville.</td>
<td>Tillamook County service operates 2 trips in each direction, 7 days a week; Yamhill County service operates between 5:00 a.m. and 9:00 p.m. every 3 hours during the week and 4 times a day on Saturday.</td>
</tr>
<tr>
<td>Public Shuttles</td>
<td>Public shuttles include: GroveLink, the Tualatin Shuttle, and Community Bus.</td>
<td>GroveLink: weekdays between 6:30 a.m. and 7:00 p.m.; Tualatin Shuttle: weekdays timed to meet the WES; Community Bus: weekdays during the morning and evening commute times only.</td>
</tr>
</tbody>
</table>
Figure 4  Washington County Transit Service
PRIVATE TRANSIT SERVICE

Several private companies are already meeting the last mile needs of employees and customers in the county. These include:

- **Employer-sponsored shuttles**: Nike, Intel, and EID Passport operate their own shuttles to connect employees to MAX and provide on campus circulation.
- **Residential shuttle**: Forest Heights Homeowners Association Shuttle located in north Beaverton provides a shuttle to connect residents to the Sunset Transit Center.
- **Ridesourcing companies**: Uber (as of Fall 2014) and Lyft (as of Spring 2015) are operating in Washington County, providing on-demand transportation service 7 days a week, 24 hours a day.

![Image of shuttle](image-url)
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This chapter provides highlights from emerging and best practices in on-demand last mile transportation services. Appendix A provides a detailed account of Best Practices.
WHAT ARE THE EMERGING & BEST PRACTICES IN ON-DEMAND LAST MILE SERVICES?

The field of on-demand transportation services is ever evolving. Start-up companies are emerging that have the potential to change how passengers travel and how service providers structure their business. Even over the course of this study, new types of services have been developed and implemented in communities across the U.S. To maintain flexibility in a changing market, Washington County will benefit from selecting a dynamic transportation service that is adaptable to new technologies and new opportunities as the market evolves. A summary of lessons learned from the Best Practices review (see Appendix A) is detailed below.

On-Demand Rideshare
Key findings from the on-demand rideshare best practice review include:

- **Critical mass is difficult to achieve organically.** Having enough drivers available so that a rider is confident that they can not only make their trip to work in the morning, but also have confidence that they will find a match for the return, if necessary, is key to participation. When drivers and riders attempt a match and are unable to find one, they may become reluctant to try again.

- **Legal requirements related to participant registration can be a large barrier.** Background check requirements create a substantial barrier to participation, both by introducing a sense of “big brother” intruding on the program and by inserting a fairly substantial time lag between the time a rider or driver would download the app and the time the user could actually participate.

- **Leverage existing relationships with employers and TMAs to coordinate marketing efforts.** Transportation coordinators and human resources staff at large employers usually control communications to employees regarding transportation options. They also are responsible for organizing outreach events. Establishing these relationships is imperative to a successful marketing approach.

- **Leverage existing carpool and vanpool commuters.** Existing rideshare commuters can help market new programs and offer available seats to people new to ridesharing.
Publicly Operated On-Demand Shuttle

Key findings from the publicly operated on-demand shuttle best practice review include:

- **Promising solution for suburban settings near light rail service.** Results from the best practice review provide strong evidence that publicly operated on-demand shuttle can provide a high level of service in a suburban setting, such as Washington County, at lower cost than fixed-route transit.

- **Requires fewer vehicles than fixed-route service for the same 15-minute headways.** Because of the flexibility introduced by dynamic management of transit resources, existing capacity can be used more efficiently and fewer vehicles are required, reducing capital costs.

- **Flexible application.** The ability for users to schedule a ride using a smart phone app or through a kiosk located at each station expands the market for an on-demand shuttle and helps to ensure people of all ages, income-levels, and abilities are able to access the service.

Source: Pace
Privately Operated On-Demand Shuttle

Key findings from the privately operated on-demand shuttle best practice review include:

- **Customer experience.** Privately operated shuttle service has been an attractive transportation option due to its attention to the customer experience – comfortable seats, on-time performance, and wifi.

- **Coordination with transit provider.** While privately operated shuttles can compete with transit, private operators note the importance of collaborating with the local transit agencies and offer service where either transit is not currently offered or where service is infrequent or limited. Pricing the shuttle appropriately helps keep public transit competitive in areas that are well served by transit.

- **Looking to expand.** Given its early success and positive feedback from passengers, many privately operated shuttles are growing their businesses and looking to expand to new markets. Service implementation is nimble and therefore it may be possible to implement such a service with new partners in Washington County.

Source: Leap Transit
**Ridesourcing companies**

Key findings from the transportation network company best practice review include:

- **Driver supply**: Achieving balance between driver supply and customer demand is the most critical key to success when formalizing a last mile ridesourcing program. While targeting the use of ridesourcing companies for last mile trips is a new phenomenon, a program that does not offer sufficient driver supply to meet demand will likely correspond to a lack of perceived reliability from the user’s standpoint.

- **Coordination with transit agencies**: Instead of viewing ridesourcing companies as competition, transit agencies are beginning to partner with this type of service to fill in service gaps and improve the transit experience.

- **Effective marketing**: Education and promotion will be critical to ensure transit users understand how ridesourcing companies can support transit trips. One effective marketing approach would likely be to position ridesourcing companies as a reliable emergency ride home service to help capture greater captive transit demand.

- **Traditional shuttles may not be the most cost-effective solution for first/last mile trips, especially for late night trips**: While fixed-route or on-demand shuttles can be a cost-effective solution along routes with relatively high demand, off-peak trips are costly on a per-passenger basis. Using a service that scales capacity with demand can provide a cheaper service.

Source: Uber
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CHAPTER 4

MARKET IDENTIFICATION

This section provides a high level summary of last mile need findings; the detailed market analysis is provided in Appendix B.
A core component of determining the feasibility of on-demand last mile solutions in Washington County is to understand the current and latent market demand for this unique portion of commute trips. The market identification process identified the general location of employment sites in Washington County that could most benefit from last mile solutions. These employment sites are defined as those that are between a half-mile and three miles from frequent or very frequent transit service.  

**Summary of Findings**

- Over 65% (or 175,000 employees) in Washington County are located within a half mile and three miles of very frequent peak transit service.
- Assuming 3.3%-4.4% of employees use transit, up to 6,400 employees could benefit from last mile connections from transit.
- The majority of last mile need is north of US 26 and between US 26 and the MAX line.

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3 For employment sites that are closer than ½ mile to transit, it is assumed that employees can walk easily to transit. Employment sites that are beyond 3 miles from frequent or very frequent transit are assumed to be outside of the last mile market. “Very frequent” transit service is defined as service that is available every 14 minutes or better during the peak hour. “Frequent” transit service is based on TriMet’s classification of its frequent transit network; service arrives at least every 15 minutes for most of the day.


5 This does not include latent demand or employment and residential growth.
WHERE IS THE “LAST MILE” NEED?

A high concentration of employers are located in an arc along the WES commuter line to the south and the MAX light rail line to the west (Figure 5). Three key analyses were conducted to understand which of these employers are in need of last mile solutions:

1. Analyzed employer data from the Oregon Employment Department (OED) statewide employee database.
2. Assessed regional and localized commute pattern and flow data from Longitudinal Employer-Household Dynamics (LEHD) datasets.
3. Reviewed travel behavior and attitudinal surveys developed as part of the TriMet Westside Service Enhancement Plan.

The employer location analysis (step #1 above) identified the specific number and location of employees located in Washington County with a last mile need. In addition to distance from transit service, a leading factor in encouraging people to use transit is the frequency of the system. Frequent service makes transit more convenient and simpler by eliminating the need for schedules or to plan ahead. Therefore, the analysis identified the employment sites that are between a half mile and three miles from very frequent transit service during the peak hour.

Over 67% (or 175,000 employees) in Washington County work in areas between a half mile and three miles from frequent transit and could benefit from last mile connections (see Figure 6). The highest concentration of employees is between the MAX Blue Line and the Sunset Highway, central Beaverton, and south along the Beaverton-Tigard Highway. Detailed recommendations to serve this unique commute market are outlined in Chapter 5.

### Why Does Frequency Matter?

People’s propensity to use transit depends on a number of factors, including:

- **Span of service** - Does the service operate when people need it?
- **Frequency of service** - How often is an employment site or a connecting stop/station served by transit?
- **Availability of service** - Are viable end-to-end or last mile options available?

Because Washington County generally exhibits abundant amounts of free parking, transit needs to be highly attractive. The On-Demand Last Mile Feasibility Study assesses both the distance between employment sites and transit service and the frequency of that transit service. Transit service frequencies considered in this analysis are those that exceed TriMet’s frequent service standards (e.g. service that is available every 14 minutes or better during the peak and all day). This analysis illustrates which employment clusters are well served by the most frequent service in the county.

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6 Employment sites that are within 0.5 and 3 miles of non-frequent service are not included in this analysis because it is assumed that transit would not be an attractive option. Private shuttles operated by employers were removed from the analysis because they are designed to serve only a specific employer.

7 Note: This last mile market analysis was conducted prior to route and stop changes on the Tualatin Shuttle that took effect on May 4, 2015. Although the maps show the Tualatin Shuttle’s new alignment, the underlying data is based on the service prior to May 2015. It is also important to note that some employment sites already have existing last mile connections, such as Nike and Intel.
Figure 6  Employment Clusters with Last Mile Needs
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This chapter provides an overview of the evaluation criteria used to evaluate the three on-demand strategies, including a summary of feedback from the business outreach focus groups, followed by key findings from the feasibility assessment.
EVALUATION CRITERIA

While each of the on-demand last mile solutions under evaluation could meet the last mile needs of employees, local factors, lessons learned from the best practice research, and feedback from the business community helped to prioritize a last mile solution that will be best suited to Washington County. A detailed feasibility assessment of each of the on-demand last mile strategies was conducted; feasibility scoring was based on the following criteria:

Figure 7 Evaluation Criteria

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Evaluation Criteria Description</th>
<th>Relevant Goal(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to serve the four user markets identified(^8)</td>
<td>A key goal of this study is to serve all types of work trips, not just the typical 9:00-5:00 shift.</td>
<td>Economy, Equity</td>
</tr>
<tr>
<td>Ability to serve last mile need (geographically)</td>
<td>The selected strategy should effectively serve the last mile need identified.</td>
<td>Economy, Flexibility, Safety</td>
</tr>
<tr>
<td>Ability to secure funding (public)</td>
<td>The ability to secure public funding is an obvious factor in the successful implementation of an on-demand last mile solution.</td>
<td>Implementation, Coordination</td>
</tr>
<tr>
<td>Interest from private sector to support (private and/or public/private partnership)</td>
<td>The level of business support will be an important assessment to ensure successful implementation and use of the last mile solution.</td>
<td>Implementation, Coordination</td>
</tr>
<tr>
<td>Likelihood of employees using the service</td>
<td>Based on feedback from the business community, it is important to understand whether or not the selected last mile solution will be appealing to the employer market.</td>
<td>Communication, Coordination, Customer Experience</td>
</tr>
<tr>
<td>User experience (convenience and reliability)</td>
<td>To ensure the service is actually used by employees, the service must be seamless, comfortable, and convenient for passengers.</td>
<td>Customer Experience</td>
</tr>
<tr>
<td>User cost</td>
<td>Since employees will already be spending money to take transit most of the way to work, the last mile solution should be low- or no-cost.</td>
<td>Economy, Equity</td>
</tr>
<tr>
<td>Operational cost</td>
<td>Operational cost and cost effectiveness (cost per rider) is an important consideration.</td>
<td>Economy, Implementation</td>
</tr>
<tr>
<td>Technology barrier</td>
<td>Not everyone has access to a smart phone; on-demand strategies that have the ability to use a push-button or on-line reservation system are appealing to ensure equitable access.</td>
<td>Equity, Implementation</td>
</tr>
<tr>
<td>Opportunity for market expansion</td>
<td>The field of on-demand transportation is ever evolving. The last mile solution(s) selected for implementation should be scalable to different markets and changing technology needs and requirements.</td>
<td>Exploring</td>
</tr>
<tr>
<td>Willing and able</td>
<td>Willing and able partners to launch the selected service will</td>
<td>Coordination</td>
</tr>
</tbody>
</table>

\(^8\) The four user markets are: traditional commute market (9:00-5:00); alternative work schedule commuters (off-peak during the day); shift workers (evening into early morning); midday trips. See Appendix B for further details.
<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Evaluation Criteria Description</th>
<th>Relevant Goal(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>partners to launch</td>
<td>be critical to a speedy implementation.</td>
<td>Implementation</td>
</tr>
<tr>
<td>Barriers to entry</td>
<td>Implementation without significant operational barriers or start up costs will be important.</td>
<td>Implementation</td>
</tr>
</tbody>
</table>

### Business Community Input
In March, 2015, a focus group was held to inform the business community about the On-Demand Last Mile Feasibility Study and get their feedback on issues and opportunities for last mile connections in the county. Key input received from the business community is summarized below.

#### Last Mile Challenges
- Frequent and reliable transit service is not available at many employment locations
- Midnight – 8:30 a.m. is a shift which prevents people from taking transit
- Walkable distances may not be accessible or safe
- Not everyone has a smart phone
- Limited to no transportation options marketing
- Transit not chosen due to ample free parking

#### Attitudes and Preferences

**On-Demand Rideshare:**
- Appealing for students and possibly responds to shift needs
- Should be a closed system; stranger concerns
- Concerned about vetting process and liability issues

**Ridesourcing Companies:**
- Positive response to flexibility
- Ethical concerns about promoting certain companies
- User cost could be a big barrier, especially for students
- Concern about driving with strangers

**On-Demand Shuttle:**
- Most employers/employees prefer a last-mile shuttle service
- Needs to be reliable and frequent
- Concerned about long, circuitous routing
- Must respond to future growth

### KEY FINDINGS
Using the evaluation criteria outlined above, a detailed feasibility assessment was conducted to identify the most suitable set of strategies for Washington County. The results of the assessment are detailed in Figure 8 below.

On-demand publicly-operated shuttle was identified as the most feasible last mile strategy for Washington County. This option scored the highest on a range of criteria, including the ability to secure federal funding, user experience and cost, and willing and able local partners to help ensure implementation. However, this strategy did not score well in terms of its ability to serve all employee markets (including midday trips and shift workers). Ridesourcing was therefore
identified as a supplemental strategy to help ensure the level of service required to make the last mile solution an attractive option. Detailed recommendations are provided in Chapter 5.
## Evaluation Criteria

<table>
<thead>
<tr>
<th>Key Question</th>
<th>On-Demand Hands</th>
<th>On-Demand Shuttle (Privately-Operated)</th>
<th>On-Demand Shuttle (Publicly-Owned)</th>
<th>Ridesourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to serve the four user markets identified</td>
<td>Does the service serve all user markets (shift workers, regular workers, etc.)? Is it service flexible?</td>
<td>1 = Based on best practice research, it is difficult to achieve a critical mass of on-demand driver supply, particularly just for the “last mile.” On-demand driver supply for end-to-end trips is much more feasible to achieve.</td>
<td>1 = Current service providers typically only operate during traditional commute times (AM and PM peak) to capture the highest demand. This model would likely leave out shift workers.</td>
<td>3 = Service could be made available all day or during peak transit service hours; likely would not be feasible in the late evening (after 8pm) to serve shift workers.</td>
</tr>
<tr>
<td>Ability to serve last mile need (geographically)</td>
<td>Does the service serve the last mile need?</td>
<td>1 = While this service option theoretically could serve last mile trips, achieving a critical mass of drivers to commit to being “on-demand” will be challenging in this land use context.</td>
<td>1 = It is unlikely that a privately operated shuttle company (such as Bridj) would establish service just to serve the last mile; would need to be integrated with end-to-end service model. Most private services operate on an end-to-end service model and are reluctant to service modifications.</td>
<td>5 = The last mile on-demand shuttle model has been implemented in a number of places across the US, including Pace Call-n-Ride in Illinois and Lynx Flexibus in Orlando.</td>
</tr>
<tr>
<td>Ability to secure funding to operate (public)</td>
<td>Can local, state, and/or federal funding be leveraged to implement the service?</td>
<td>3 = An on-demand shuttle pilot project could secure federal funding particularly as a pilot project. For example, the MTC Dynamic Rider project in Marin used Congestion Mitigation and Air Quality Funding. However, these funding sources are competitive in the Portland region and there may be limited tolerance for a new web-based rideshare system in addition to Drive Less. Connect.</td>
<td>1 = Privately-operated on-demand shuttles would not be eligible to secure federal funding.</td>
<td>5 = Publicly operated on-demand shuttles could be eligible for federal funding. Pace Call-n-Ride, for example, is funded in part by Section 5310/New Freedom grants.</td>
</tr>
<tr>
<td>Interest from private sector to support (private and/or public/private partnership)*</td>
<td>Are Washington County businesses interested in promoting/supporting a particular on-demand service?</td>
<td>1 = Based on understanding of employer TDM programs and discussion with Washington County employer representatives, it would be unlikely for the business community to pay drivers for service.</td>
<td>3 = The business community expressed interest in collaborating with other businesses and establishing a last mile shuttle.</td>
<td>5 = TriMet recognizes the lack of service and is open to new service types; the business community expressed interest in establishing a last mile shuttle and collaborating with TriMet.</td>
</tr>
<tr>
<td>Likelihood of employees using the service**</td>
<td>Will their employees use the system? Based on business community input.</td>
<td>3 = The likelihood of employees using the service would be dependent on the availability of drivers; critical mass is critical.</td>
<td>5 = Shuttles tend to be an attractive option for people and have proven successful in other places. Business focus group participants expressed an interest in shuttles.</td>
<td>5 = Shuttles tend to be an attractive option for people and have proven successful in other places. Business focus group participants expressed an interest in shuttles.</td>
</tr>
<tr>
<td>User experience (convenience and reliability)</td>
<td>Is the service attractive enough that it will lure choice riders not to drive?</td>
<td>1 = Because this type of service is typically unable to attract enough drivers, potential users of the system do not see it as a viable option. This challenge impacts the reliability of on-demand rideshare for the user.</td>
<td>3 = Privately operated shuttles are typically of lower quality services including self/comfortable seats, etc. Service can be frequent and reliable.</td>
<td>3 = Although ridesourcing companies provide a flexible option to serve the last mile, business focus group participants expressed hesitancy about aligning themselves with ridesourcing companies. It is unclear whether people were scoring this type of service based on using a ridesourcing or using the ridesourcing-type service profile.</td>
</tr>
<tr>
<td>User cost</td>
<td>How much will it cost the user? Is there a fare?</td>
<td>3 = On-demand rideshare is typically affordable for the user. For example, the GoShare project in Seattle cost users $1 for first mile and $0.20 for every subsequent mile.</td>
<td>2 = Privately operated shuttle service could be upwards of double the cost of public transit. In Boston, for example, Bridj is twice the cost of transit.</td>
<td>5 = Publicly operated shuttle service is the most attractive option from a cost standpoint. Fares are typically the same as a transit fare. Publicly operated shuttles could also be considered a “transfer” and could therefore be free to transit passengers.</td>
</tr>
<tr>
<td>Operational cost</td>
<td>How much will it cost to operate? How difficult will this be to get the service up</td>
<td>3 = Assuming the transit station is not significantly out of the way, the cost to</td>
<td>1 = Privately operated shuttles are expensive from a capital (vehicle) and</td>
<td>1 = Ridesourcing companies are likely the most expensive option for passengers with fares equivalent to a typical taxi ride.</td>
</tr>
</tbody>
</table>

*Nelson\Nygaard Consulting Associates Inc. | 31*
<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Key Question</th>
<th>On-Demand RideShare</th>
<th>On-Demand Shuttle (Privately-Operated)</th>
<th>On-Demand Shuttle (Publicly-Operated)</th>
<th>Ridesourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>and running?</td>
<td>provide a ride for the driver is very minimal. Additional cost would be required to administer, maintain, and promote the app that matches drivers and passengers.</td>
<td>operations (driver, vehicle maintenance, etc.) standpoint.</td>
<td>(driver, vehicle maintenance, etc.) standpoint.</td>
<td>Some efficiencies may be gleaned if service is provided by a local transit provider.</td>
<td>are required. Driven ridesourcing companies streamlined administrative, marketing, and operations; some administrative efficiencies would also be achieved.</td>
</tr>
<tr>
<td>Technology barrier</td>
<td>Does the service require a smart phone? Are we excluding people based on their access to technology?</td>
<td>1 – An on-demand rideshare app requires smart phone technology to match drivers and passengers in real time. It is unlikely that TriMet would allow a physical push-button to be installed at a TriMet station.</td>
<td>1 – An on-demand shuttle app requires smart phone technology to match drivers and passengers in real time. It is unlikely that TriMet would allow a physical push-button to be installed at a TriMet station.</td>
<td>3 – Although the publicly operated shuttle would also benefit from an on-demand shuttle app, TriMet could implement a push-button system to sync with the app if necessary.</td>
<td>1 – Ridesourcing companies run exclusively through a mobile phone app-based system. It is unlikely that TriMet would allow a physical push-button to be installed at a TriMet station. Additionally, it is unlikely that the existing ridesourcing model would be adaptable to a push button system at a transit station.</td>
</tr>
<tr>
<td>Opportunity for market expansion/scalability</td>
<td>Can the service be expanded to serve end-to-end trips?</td>
<td>5 – On-demand rideshare has historically been most successful as an end-to-end service, meaning that it serves trips from home to work. If an end-to-end system is rolled out, drivers could still be available to pick up transit passengers to serve the “last mile” need.</td>
<td>3 – Privately operated shuttles have historically been most successful as an end-to-end service, meaning that it serves trips from home to work. Bridi, for example, develops home to work “zones” based on known trip patterns and underserved transit areas.</td>
<td>1 – A publicly operated on-demand shuttle that serves the last mile would likely not transition to also serve end-to-end trips.</td>
<td>5 – Ridesourcing companies are already operating both as an “end-to-end” type service and as a last mile solution.</td>
</tr>
<tr>
<td>Willing and able partner to launch</td>
<td>Is there a willing and able organization to manage/implement this service?</td>
<td>1 – On-demand rideshare would require a centralized entity to establish the app, recruit drivers, and promote the system. This entity has not been established in Washington County.</td>
<td>1 – Because a private shuttle service would not likely be able to operate a profitable off-peak period service, it will be difficult to attract a private company to offer this type of service.</td>
<td>5 – TriMet and RideConnection are already working to partnership with stakeholders in Washington County to operate shuttle service as a last mile solution; both entities have expressed interest to continue serving this need.</td>
<td>5 – Uber is already operating in Washington County and is actively looking to expand market and serve the last mile needs of employees in Washington County.</td>
</tr>
<tr>
<td>Barriers to entry</td>
<td>Can the strategy be implemented without significant operational barriers or start up costs?</td>
<td>1 – On-demand rideshare would require a centralized entity to develop or adapt a new app for employers in Washington County. Developing a new app would require reeducating employees and differentiating between other services like DriveLess.Connect. and ridesourcing options.</td>
<td>1 – Land use characteristics and demand in Washington County likely do not support a privately operated shuttle service unless it is a closed loop system serving end-to-end trips with a common destination.</td>
<td>3 – Operating a publicly shuttle would require navigating political processes; last mile solutions were not identified as a recommendation in the Westside Service Enhancement Plan. Shuttles would also need to adhere to Title VI and ensure that the needs of shift workers are met in a cost effective manner.</td>
<td>5 – Uber is already operating in Washington County and is actively looking to expand market and serve the last mile needs of employees in Washington County.</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>27</td>
<td>46</td>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation scale:** Evaluation criteria were informed by the project goals, statements made by the business focus group, and best practice research. Evaluation scoring was informed by existing conditions findings, business focus group findings, and best practice research.
This chapter outlines a set of recommendations and next steps to implement an on-demand shuttle service supported by ridesourcing companies.
Last mile connections in Washington County should be reliable, serving all types of commuters. Last mile connections should respond to demand on-the-fly and limit transfer times to 5-10 minutes in the peak commute periods.

**Service Elements**

1A. Develop public on-demand community shuttles focused around fixed transit anchors (e.g., MAX stations, WES stations, and transit centers). Based on the results of the Feasibility Assessment in Chapter 4, WTA should work with local employers, TriMet, and potential service operators to develop a series of localized community shuttles that provide on-demand, frequent connections between fixed-route transit and employment destinations.

- **Functionality:** The on-demand service allows passengers to request a shuttle via smartphone apps, web, or a phone call, giving users multiple choices to request a ride. Boardings could be allowed at designated transfer points and potentially at random pick-up points.

- **Service Zones and Markets Served:** Key areas that are ripe for last mile service include employment centers north of US-26, southeast of Beaverton Transit Center, between US-26 and the MAX Blue Line, southeast of Tigard Transit Center, and between Tigard and King City along Highway 99W. These potential zones are illustrated below. More detailed analysis is needed to account for the location of projected employment growth throughout Washington County; much of this new employment may also be in need of last mile connections. Phase II of the process will further define the most appropriate location for a pilot last mile shuttle.

- **Roles/Responsibilities:** The on-demand community shuttle should be operated by one or more third-party transportation carrier(s). TriMet should ultimately support the service by purchasing the software needed for the on-demand application, and provide technical assistance, service planning, and system marketing/branding to ensure consistent community shuttle messaging across the TriMet system. TriMet should also identify and manage community shuttle funding as these services are an extension of the regional fixed-route transit network and serve employers who pay in to the TriMet payroll tax. WTA will continue leading the business case outreach to educate employers and employees about last mile needs and benefits and generate excitement about planned on-demand community shuttle services. WTA could also play an active role in managing the portfolio of Washington County on-demand community shuttles. This will require hiring an experienced transit service manager.

**Recommendation 1:** On-Demand Last Mile Services

Develop a network of public on-demand community shuttle services throughout Washington County that frequently and reliably serve last mile trips.

![Conceptual Overview of Last Mile On-Demand Community Shuttles](image)
1B. Establish a “Level of Service Guarantee” ensured by ridesourcing services. Providing an on-demand shuttle service with 5-10 minute service frequency may be difficult given Washington County’s land use conditions and historic funding levels for public transit. To guarantee a high level of service and achieve very frequent last mile transit service (in the range of 5-10 minutes), the on-demand community shuttles should be paired with ridesourcing to guarantee minimum service levels. This will help to serve existing transit riders and attract new customers. If a rider is unable to be served within the minimum service level timeframe (assume a range of 7-10 minute frequency), their request is pushed to one or more ridesourcing services that can quickly and cheaply accommodate the last mile trip. This approach is being pursued in several California cities. This type of partnership benefits all parties. Passengers are provided great level of service without increasing TriMet’s cost per ride. TriMet gains more ridership from an effective increase in service levels. Ridesourcing companies like Uber and Lyft also benefit by increasing demand in suburban locations that typically do not generate the number of ride request as more urban areas.

1C. Invest in state-of-the-art fleet automation software and application. The value and sustainability of an on-demand service is dependent on the fleet automation software and smart phone application. Developing this transit service model will require fleet automation software investment to enable on-demand responsive service and intelligent, customizable routing logic to direct shuttle operators to passengers based on location, current heading, capacity, and common or co-located destination points. A smart phone and web application is also needed for the user to request the ride. TriMet should procure the software and work with one or more service operators to implement the technology. The selection of the fleet automation software and application should be further explored during Phase II.

1D. Identify a service model for last mile services. Demand-responsive service can be designed to meet a variety service needs. Service can provide flexible routing pulsing from a designated time point (like a MAX station), or operate as a fluid dial-a-ride service in one or more service areas. The next phase of study should explore these potential service options in more detail and recommend a preferred service model based on an assessment of all viable service design options.

Recommendation 1 | Action Items

- Secure funding for Phase II
- Conduct a Phase II Implementation Study to further refine the service areas, select a preferred service type, develop unique service standards and service design principles, and identify the on-demand community shuttle system manager and operator for Washington County
- Coordinate with ridesourcing companies in Washington County to gauge their level of interest in collaborating and potentially integrating on-demand systems
- In partnership with TriMet, pursue a pilot project based on Phase II work
- Coordinate with TriMet to review best practices in fleet automation technologies and develop an RFP for procurement (owned by TriMet)
- Identify funding streams and potential public-private partnerships to support the services
- Consider hiring a full-time last mile shuttle coordinator (depends on the result of the Phase II Implementation Study)

Note: The time frame of the action items and roles and responsibilities are detailed in Figure 10 below.
Recommendation 2: Branding and Messaging

Develop a branding and messaging approach that is distinct from other public transit services available, that is adaptable to new service areas, and builds support from the business community.

Last mile connections in Washington County should have a distinct look and feel to spur recognition among existing transit riders and attract new riders.

### Branding and Messaging Elements

| 2A. Develop a unique brand for the on-demand last mile shuttle that is recognizable and distinct from other transit services. |
| Transit vehicles are the face of transit and therefore must appear attractive and comfortable. Transit “branding” uses transit elements to communicate information about the service. Branding is most effective when it is applied to all transit elements, including: |
| **Service Name and Logo:** Before the on-demand shuttle service is launched, a unique brand name and logo with a distinct color scheme should be identified. The brand should be applied to all future on-demand last mile shuttles in the TriMet service area to ensure service recognition. It will be valuable to develop sub-brand names in specific market areas to garner local support. |
| **Transit Vehicles:** Once a brand name and logo are selected, transit vehicles should be clearly marked with the brand identity by a distinctly colored vehicle and the brand name clearly identified on the vehicle. |
| **Transit Stops:** The last mile shuttle will generally pick up at high demand transit stops (such as at MAX, WES, or a major transit center). Transit stops should clearly indicate where the shuttle picks up with a distinctly branded sign, bench, and shelter. |
| **Website:** Information about the last mile shuttle, including shuttle pick up locations and service zones, should be posted on a centralized, branded website. |
| **Smart Phone Application:** The smart phone application that hails the shuttle should have the same look and feel as the website and overall brand. |
| **Information/Marketing Materials:** Press releases, newsletters, and printed information distributed to employers and employees in the county to market the service should be branded. |

| 2B. Widely distribute the Business Case brochure to build support for the on-demand last mile services. |
| As part of this study, a highly graphic brochure was developed outlining the need for improved last mile connections in the county, the benefits, and next steps. This brochure should be distributed to the business community and other partners to inform them of the process, build momentum, and secure support for implementation. |

| 2C. Develop a promotional campaign. |
| The on-demand last mile service will only be successful if people know about it. The WTA, in partnership with TriMet, ridesourcing companies, local chambers of commerce, local businesses and employers, and the selected service operator, should develop a promotional campaign to raise awareness of the options and build ridership. The promotional campaign should include press releases, email blasts, and presentations and “transportation fairs” at employment sites. |

### Recommendation 2 | Action Items

- Develop templates for on-demand last mile communications materials, including press releases, newsletters, and flyers
- Develop a promotional campaign to promote the on-demand last mile services in partnership with TriMet, ridesourcing companies, local businesses and employers, and the selected service operator
- Coordinate with TriMet to develop unique brand for on-demand last mile shuttles in the TriMet service area
- Consider hiring a branding firm to develop the unique brand for the system

Note: The time frame of the action items and roles and responsibilities are detailed in Figure 10 below.
Recommendation 3: Business Outreach and Partnerships

Engage with the business community, local jurisdictions, and service providers to build implementation support for on-demand last mile transportation services.

The Westside Transportation Alliance needs the support of the business community, employees, local jurisdictions, and service providers to successfully launch on-demand last mile services in the county.

### Business Outreach and Partnership Elements

#### 3A. Promote the completion of the On-Demand Last Mile Feasibility Study to local partners and related initiatives.

A key first step for the WTA will be to present the completion of the On-Demand Last Mile Feasibility Study to local partners and related initiatives, such as the Washington County Transportation Futures Committee, Metro, and the Washington County Coordinating Committee.

#### 3B. Form a standing “last mile committee” to build awareness and foster collaboration.

The last mile problem is not a new phenomenon; many jurisdictions, employers, and individuals face this problem throughout TriMet’s service area because transit service just can’t reach everyone. A standing “last mile committee,” convened by the WTA, would be an important forum for partners to collaborate on this important issue and gain the momentum it needs to find solutions that work across the region. TriMet and other jurisdictional and business partners should attend the “last mile committee.”

#### 3C. Work with Uber, Lyft, and other potential/future ridesourcing companies in Washington County to promote last mile service.

The on-demand shuttle service will be supported by local ridesourcing companies in the county to ensure a high level of service guarantee. These companies, such as Uber and Lyft, should post information about the availability of these on-demand services on their websites to build recognition and increase the number of rides on the shuttle and using the ridesourcing companies.

#### 3D. Target new members who are specifically located in high-demand last mile zones.

The Market Analysis specifically identified areas with a particularly high demand for last mile connections. WTA should reach out to businesses in these areas to build membership and gauge interest in participating in the last mile shuttle implementation process.

#### 3E. Partner with the Westside Economic Alliance (WEA) and other Chambers of Commerce in the County to reach the business community and promote the benefits of reducing the number of employees that drive alone to work.

The Westside Economic Alliance and the Chambers of Commerce in the County have deep roots in the Washington County business community. This study – as outlined in the Business Case Brochure “Getting Your Employees to Work” – outlines the benefits of reducing the number of employees driving alone to work. The WTA should hold a membership event, in partnership with the WEA and the Chambers of Commerce, to publicize the On-Demand Last Mile Feasibility Study and promote the Business Case brochure, building momentum for last mile shuttle implementation.

#### 3F. Engage with employees to understand their transportation needs.

This study identified a need for last mile service. More work in Phase II is needed to document the type of last mile service that would be most appealing to employees, the time of day and frequency of service needed, and exactly where services is needed. A critical next step will be to work with the business community and employees to document the needs of the end user.

### Recommendation 3 | Action Items

- Work with TriMet to form a standing “last mile committee”
- Reach out to Uber, Lyft, and other potential ridesourcing companies to discuss the opportunity for partnerships and support of an on-demand last mile shuttle
- Hold a membership event, in partnership with the WEA and the Chambers of Commerce in the County, to publicize the On-Demand Last Mile Feasibility Study
- Identify and engage with existing and new members located in high-demand last mile zones
- Engage with employees to understand their transportation needs

Note: The time frame of the action items and roles and responsibilities are detailed in Figure 10 below.
NEXT STEPS

Figure 10 below outlines the detailed next steps, action items, timeframe, and roles and responsibilities for each recommendation outlined above.

Figure 10 Summary of Recommendations

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action Items</th>
<th>Time Frame</th>
<th>Roles &amp; Responsibilities</th>
</tr>
</thead>
</table>
| Recommendation #1: On-Demand Last Mile Services | Conduct a Phase II⁹ Implementation Study to further refine the service areas, select a preferred service type, develop unique service standards and service design principles, and identify the on-demand community shuttle system manager and operator for Washington County | Within 1 year     | Lead: WTA  
  Support: TriMet |
|                | Coordinate with ridesourcing companies in Washington County to gauge their level of interest in collaborating and potentially integrating on-demand systems | Within 6 months   | Lead: WTA  
  Support: Ridesourcing companies, TriMet |
|                | Pursue a pilot project based on Phase II work                                 | Contingent on Phase II completion | Lead: Hillsboro Chamber of Commerce  
  Support: WEA, WTA, TriMet |
|                | Coordinate with TriMet to review best practices in fleet automation technologies and develop an RFP for procurement (owned by TriMet) | 6 months to 1 year | Lead: TriMet  
  Support: WTA |
|                | Identify funding streams and potential public-private partnerships to support the services | 6 months to 1 year | Lead: TriMet  
  Support: WTA |
|                | Consider hiring a full-time last mile shuttle coordinator (depends on the result of the Phase II Implementation Study) | +1 year           | Lead: TBD  
  Support: TBD |

⁹ Note: Phase II is not funded as of September 2015.
<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action Items</th>
<th>Time Frame</th>
<th>Roles &amp; Responsibilities</th>
</tr>
</thead>
</table>
| Recommendation #2: Branding and Messaging | Develop templates for on-demand last mile communications materials, including press releases, newsletters, and flyers | Within 6 months         | Lead: WTA  
Support: n/a                              |
|                                | Develop a promotional campaign to promote the on-demand last mile services in partnership with TriMet, ridesourcing companies, local businesses and employers, and the selected service operator | Within 6 months         | Lead: WTA  
Support: TriMet, ridesourcing companies, local chambers of commerce |
|                                | Coordinate with TriMet to develop unique brand for on-demand last mile shuttles in the TriMet service area | 6 months to 1 year      | Lead: TriMet  
Support: WTA                                  |
|                                | Consider hiring a branding firm to develop the unique brand for the system   | 6 months to 1 year      | Lead: TriMet  
Support: WTA                                  |
| Recommendation #3: Business Outreach and Partnerships | Promote the completion of the On-Demand Last Mile Feasibility Study to local partners and related initiatives | Within 6 months         | Lead: WTA  
Support: n/a                              |
|                                | Work with TriMet to form a standing “last mile committee”                   | Within 6 months         | Lead: WTA  
Support: TriMet and jurisdictional partners     |
|                                | Reach out to Uber, Lyft, and other potential ridesourcing companies to discuss the opportunity for partnerships and support of an on-demand last mile shuttle | Within 6 months         | Lead: WTA  
Support: Ridesourcing companies                |
|                                | Partner with the Westside Economic Alliance (WEA) and other Chambers of Commerce in the County to reach the business community and promote the benefits of reducing the number of employees that drive alone to work | Within 6 months         | Lead: WTA, WEA, Chambers of Commerce  
Support: Business community                     |
|                                | Identify existing and new members located in high demand last mile zones     | Within 6 months         | Lead: WTA  
Support: Business community                     |
|                                | Engage with employees to understand their transportation needs              | Within 1 year (part of Phase II) | Lead: WTA  
Support: Business community/employees            |