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Figure 1: This map shows existing SKT regional transit services, as well as other neighboring services. The amount of service offered on each SKT route is described, in the box, in terms of daily round trips. All SKT services operate on weekdays only.
Introduction

This is the second volume of a report on Salem-Keizer Transit’s regional network.

The first volume is called the Existing Conditions Report. It describes how CARTS, 1X and 2X services are currently performing, and where regional goals and needs for transit are currently in conflict.

This second volume describes the planning process that followed publication of the Existing Conditions Report, and the recommendations that it produced.

The input of stakeholders had a large effect on these recommended future plans. The ways stakeholders were involved and the priorities they expressed are also described in this volume.

Key Choices

Volume I of this report laid out five key choices for SKT. The subsequent planning process focused on three of these choices:

- How should SKT balance the goal of maximizing ridership with the goal of providing lifeline service to people no matter where they live?
- Should SKT’s regional routes be designed and operated to help people travel between cities, or within cities?
- Should SKT’s regional services be integrated with neighboring networks? If so, which connections are the highest priority?

Ridership vs. coverage

Many transit agencies have adopted goals like “We will serve everyone” and “We will run efficiently and maximize ridership.” Yet these two high-level goals are fundamentally in conflict. (For an explanation of this conflict, see the section titled “Ridership vs. coverage” starting on page 7 of Volume I.)

For example, SKT today provides a dial-a-ride service that achieves low ridership relative to its cost. If SKT were exclusively focused on maximizing ridership, SKT would spend those resources running a different kind of service, or in a different place, so that more riders would use the service relative to its cost. This would maximize ridership relative to cost.

Yet the right thing to do in this situation is not so cut-and-dried, because maximizing ridership isn’t SKT’s only goal. High ridership isn’t the only transit outcome that SKT stakeholders value. They also value providing transit for people who need it badly.

In places where transit achieves high ridership, there are people with severe needs who use it and benefit from it. High ridership transit serves many different kinds of people, making many kinds of trips; low-income, elderly and disabled people are among them.

Yet in places where transit achieves low ridership, the compelling reason to continue providing it is the presence of low-income, elderly and disabled people who rely on it because they have so few other choices.

Salem-Keizer Transit wrestles with the trade-off between maximizing ridership and providing service in some places where ridership will always be low. Stakeholders were asked for their input on how to balance these two competing goals. The trade-off will never go away, but SKT and its stakeholders can acknowledge the conflict between their own goals for transit, and establish how those goals should be traded-off against one another. This discussion was begun at the Stakeholder Workshop, described in this report; continued in meetings with city leaders; and will surely continue in the future.

Stakeholders in this process, as is described in the next chapter, expressed a desire to shift the SKT network’s balance towards higher ridership (but not all the way to a completely ridership-focused network). This would result in lower coverage, and negative impacts to small
numbers of people with severe needs who today depend on those coverage services.

**RECOMMENDATION**
Based on this input from stakeholders, we recommend that SKT switch from providing a regional deviated-fixed route network to a regional Express network, supplemented in certain high-need places by dial-a-ride or deviated fixed routes. Further, we also recommend that SKT shift some of its service away from geographic areas where ridership is low (and ridership potential will always be low, because of small numbers of people and long travel distances) and towards places with higher ridership and more people.

**Cost-effective coverage**
The group of stakeholders who participated in this planning process mostly agreed that SKT should provide some socially-important transit services, even if those services do not maximize ridership. However, a question still remains about how cost-effective those services should be.

In Marion and Polk Counties, the concentration of low-income people is very similar to the concentration of all people (compare Figures 2 and 3, above, maps showing where all people and where low-income people reside). Thus SKT is not forced to make a choice between running low-ridership coverage services to reach low income people, and running higher-ridership services that serve fewer low-income people. Useful transit anywhere in the region can serve low-income people in large numbers.

(Information about where people with disabilities live is kept confidential, to protect those people from exploitation. However, anecdotal information suggests that there are people with disabilities throughout the region, and they are more concentrated where the general population is more concentrated. However, there is an unusually high concentration in Dallas, Monmouth and Independence.)

Today, two of SKT’s dial-a-ride services (CARTS 25 and 35) have very high costs per boarding (about $47 and $76, respectively). Even if SKT were to continue providing some low-ridership, coverage service in these areas, there is no doubt that more people with severe needs can be reached for the same total cost as today (at a lower cost per passenger).

This raises a difficult question about the cost-effectiveness of coverage services: Is there some minimum ridership that coverage services should achieve? Or is there a maximum justifiable cost per rider, above which a service should be redesigned or moved elsewhere so that it reaches more people in need?

Stakeholders in this process expressed low support for continuing to spend as much per rider as SKT does through the CARTS 25 and 35 services. For these stakeholders, then, there is some maximum justifiable cost per rider, even for coverage services that aren’t intended to maximize ridership.

**RECOMMENDATION**
We recommend that SKT reallocate resources that are currently spent on very small numbers of riders (through CARTS 25 and 35), and instead spend them on services that provide socially-important coverage more cost-effectively. The more cost-effective coverage service we recommend takes the form of deviated-fixed routes or Express routes, going to cities that are too small to generate high ridership, but are home to people with severe needs for transit. These are
likely to reach much larger numbers of people in need more cost-effectively than CARTS 25 and 35 do today.

**Between vs. within cities**

Today, SKT’s regional services run through some cities, making just a few stops, and circulate through other cities, making many stops. Some cities operate their own local circulators (such as Woodburn and Silverton), while others rely on SKT for local circulation (such as Dallas).

In general, many more people will find intercity transit useful than transit circulating within small towns. For longer intercity trips, there is a greater payoff for leaving one’s car behind or relieving a family member of having to give one a ride. For shorter within-town trips, most people can walk, drive or bike rather than wait for an infrequent and circuitous bus. For these reasons, intercity transit routes connecting many small cities are likely to achieve higher ridership relative to their cost than are within-city transit routes.

Most of the stakeholders in this process expressed support for more inter-city “Express” service and less within-city circulation. This input was consistent with their preference for a higher ridership regional network.

(The term “Commuter Express” is a Federal Transit Administration (FTA) designation that relates to paratransit, not to how useful the route is for different kinds of people and trips. Unfortunately, the word “commuter” connotes that the people who use such services are white-collar commuters. In fact, Express routes can and should be useful to a broad range of people, who work many types of jobs, starting and ending work at all times of the day, studying, traveling to medical appointments, shopping, or just being social. For this reason, we refer to these routes simply as Expresses, but the FTA knows them as “Commuter Expresses.”)

**RECOMMENDATION**

Given the consistent stakeholder input in support of higher regional transit ridership, and Express services, we recommend that SKT shift away from deviated fixed routes and dial-a-ride, and towards more Express routes that reliably connect the region’s cities to one another.

**Integrating with neighboring networks**

Some of the travel into and out of the Salem-Keizer Urban area, and the smaller cities outside it, comes from other regions. This raises questions about where SKT should connect with neighboring services, and which connections are most urgent.

Stakeholders in this process were enthusiastic about the potential for better transit connections with other regions, especially with Albany/Corvallis and Canby/Oregon City.

**RECOMMENDATION**

We suggest that a transit connection between Salem and the Portland Metro area via 99E, Canby and Oregon City has higher potential for ridership relative to its cost than does a connection with Albany. We therefore recommend that SKT prioritize developing a connection with Canby Area Transit (CAT) along the 99E corridor. The potential for additional connections to Albany, Wilsonville or the coast (via Grand Ronde) are also discussed in this report.
Background Information

Information about the current performance of SKT’s regional services, and the underlying development and demographics that relate to performance, is detailed in Volume I of this report.

The maps on the following pages are repeated from Volume I, to provide some geographic context for the discussion and recommendations in this report.

These maps give us a rough sense of where ridership potential is high (because there are many residents or jobs near any transit stop) and where the need for transit may be severe (because there is a high density of people in poverty). Additional maps showing where seniors and people of color reside are included in Volume I.
Figure 2: This map shows where people reside in the areas around Salem-Keizer. Darker-shaded places have higher densities than lighter-shaded places.
Figure 3: This map shows where low-income people live in the areas around Salem-Keizer. This pattern is very similar to the pattern of general residential density in the region, suggesting that transit service anywhere has potential to serve low-income people.
Figure 4: This map shows job concentrations in Marion, Polk and Lane Counties. Employment density reveals not only commute destinations, but also the places that people shop, recreate, visit and access services.
Figure 5: Average daily boardings at each fixed stop on CARTS, 1X and 2X routes, in April 2015. For more maps and analysis of the existing regional transit system, see Volume I of this report.
Stakeholder Involvement

This chapter describes stakeholder involvement in the development of this recommendation, which took place largely at two points in the process:

- first, in an early workshop, at which stakeholders gave high-level input into the goals of any new network
- second, in meetings with the city leaders from each of the three major transit corridors in Marion and Polk county.

Jarrett Walker + Associates developed a draft regional transit network based on the input of stakeholders at the first event. That draft network was shown to city leaders at local meetings, to gather their reactions and feedback.

Stakeholder Workshop

Early in this process, Salem-Keizer Transit and Jarrett Walker + Associates led a stakeholder workshop, whose purpose was to solicit high-level guidance on future transit choices.

About 45 stakeholders attended the workshop. They included representatives from:

- city councils
- businesses and chambers of commerce
- community organizations and social service providers
- colleges
- both counties, and most of the cities in the region
- organizations that serve people with disabilities
- people with and without disabilities
- people who currently ride transit and people who don’t ride transit

A list of all the organizations represented at the Stakeholder Workshop is included in “Appendix A” on page 65.

The major outcome of this workshop was an expression, by the people in the room, of how much change they would like to see SKT pursue for the transit system, and towards what overarching goal. It can be summarized as follows:

- 23% of stakeholders at the workshop support SKT redesigning at least CARTS 25 and 35, to achieve higher ridership relative to cost.
- Another 67% of stakeholders support SKT changing more services, to achieve higher ridership network.
- Asked what type of investment they would make first if new funding were to become available for regional transit,
  - 57% would first spend it on weekend service,
  - 29% would first increase the frequency of service in cities that are already served...
  - ...rather than serving more cities (with low-frequency service), which only 11% would do first.

Of the eight regional transit networks designed by the stakeholders themselves, the two most stakeholders would want were:

- Network D, the first choice of 41% of stakeholders, and
- Network G, the first choice of 21% of stakeholders.

These two networks shared a high level of investment in Express service among major cities - such as Woodburn, Stayton and Dallas - rather than a heavy reliance on deviated fixed routes. They also both lacked any dial-a-ride service at all. The way these networks have informed this plan is described below.

**Designing the networks**
The stakeholder workshop began with a presentation on existing conditions in SKT’s regional system, and then quickly moved into a network design exercise. This exercise was intended to:

- Help people understand the choices that go into designing a transit network.
- Elicit new service ideas from attendees.
- Create a diverse set of networks that could be used to illustrate choices.

Stakeholders were divided into small groups, and given a large printed map of the Salem-Keizer region. The map showed current transit boardings at all stops on the network, and the density of jobs in the region. (Job density is generally a good predictor of transit demand.)

To draw their networks, the groups were all given the same “operating budget.” This budget was represented by a bundle of sticky strings, in three different colors representing three different types of service.

**Service types**
Just as in a real transit system, in this exercise different types of service cost different amounts
of money to operate. Some of them go faster, and can therefore go a longer distance for the same cost.

Each group was allowed to trade in one colored string for another, if they wanted to use a different service type. Thus their budget could stay the same, but the types of service they decided to run with that budget could change.

The groups were given three types of service to use in designing their networks. These three service types were:

- In bright orange, an Express bus route. This was the longest string, because it is the fastest and therefore goes the farthest for any given cost.
- In green, a deviated fixed route. This was nearly as long as the orange string, but its deviations make it a little slower and therefore it travels a shorter distance for any given cost.
- In yellow, dial-a-ride. Yellow strings were very short, to reflect the fact that making curb-to-curb trips on request takes a great deal of time, so dial-a-ride can’t cover much area for any given cost.

Stakeholders were not given string representing a local fixed route with paratransit, like Cherriots service, because SKT could not possibly afford to provide paratransit at this regional scale within the current budget.

**Network design choices**

As stakeholders worked together to design a regional network, they wrestled with a number of choices about the purpose of their network. These choices arose because the budget for transit was fixed – the more they spent on one purpose, the less they could spend on another.

**TRAVEL BETWEEN CITIES, OR LOCAL CIRCULATION?**

An important distinction between Express (orange) service and the other two services was that Express buses would only make a few stops in each city. This makes Express service fast and reliable for travel between cities, but it means that people have to get themselves (by foot, bike, car or local transit) to the bus stop.

In contrast, the deviated fixed route service can make many stops in a city, and can deviate on request to any address within 3/4 mile of the route, but it is slower and less reliable than Expresses. Dial-a-ride service doesn’t have a route or fixed stops, and picks up riders at their addresses, but can be slow and requires an advanced reservation.
BROAD APPEAL, OR TARGETED SERVICES FOR PEOPLE WITH SEVERE NEEDS?
Many stakeholders expressed a desire to build their networks around reliable, fast routes that many people would find appealing. Yet stakeholders also wanted to provide transit options for people who couldn’t reach a bus stop in the center of a town. As one attendee said, “I wanted to do both. I was torn.”

Each group struck a different balance.

At one extreme, the group that designed Network G (shown in Figure 2, top) traded in all of their green and yellow strings for orange. They designed a 100% Express network, of inter-city, fast, reliable routes. They decided not to serve anyone who could not walk, bike, drive, get a ride, or take a local transit service to the Express bus stops.

At the other extreme, the group that designed Network H (also in Figure 2, bottom) deployed mostly deviated fixed route and dial-a-ride services. They concentrated their yellow dial-a-ride service in Dallas, Monmouth and Independence, where today CARTS services are in high demand by people with disabilities.

MORE CITIES, OR MORE FREQUENCY
Many of the groups also debated whether they should focus their operating budgets on many trips per day between bigger cities, or spread their budgets around so that each city in the region got just a minimal level of service.

CONNECTIONS TO OTHER REGIONS
A number of groups included in their networks a transit connection to another region, or to cities not generally thought of as part of the Salem-Keizer region. Three networks included a minor route to North Albany; one included a minor route to Jefferson; and two included a major route to Canby.

Analyzing the networks
When the groups finished designing their networks, they posted them up and looked over them thoroughly. The facilitator then asked attendees a series of questions.

Their answers to these questions, as a big group, became a sort of “analysis” of the networks. This analysis was built on their collective knowledge of the region, and their instincts about what people of their communities need, want and would respond to.

The questions weren’t about any network being better or worse than the others, but rather about how different groups of people would react to them. The questions were:
STAKEHOLDER INVOLVEMENT

- Which network would major employers like most?
- Which network would be best for commuters to Salem-Keizer jobs?
- Which network would be best for college students?
- Which network would be best for people in a hurry?
- Which network would be best at serving every last person who might need to ride?
- Which network would have the highest total ridership?

Two of these questions in particular highlighted the conflict between providing coverage (getting a little bit of service close to everyone) and maximizing ridership. Those networks that the group thought would do best at reaching every last person were not expected to achieve the highest ridership, as shown in the pair of charts in Figure 8.

Figure 8: Different networks excelled at these competing goals: getting a little bit of service close to everyone, and maximizing ridership.
Figure 9: These eight networks were created by stakeholders at the workshop.
Informing Salem-Keizer Transit’s choices

PREFERRED NETWORKS
Once the group had thought about who would find these networks useful or valuable, and why, the facilitator then asked a more personal question:

• Which map comes closest to the network YOU would want?

The results of this poll are shown in the chart in Figure 10. While no network satisfied a majority of the stakeholders, the two front-runners – D and G – have a great deal in common, and contrast with the other networks in ways that can inform this planning process.

Networks D and G share a high level of investment in Express service among major cities (such as Woodburn, Stayton and Dallas) with only modest use of deviated fixed routes. (Networks B and C do this as well, to a lesser degree.)

Networks D and G also lack any dial-a-ride service. All of the other networks included at least some yellow strings representing dial-a-ride service.

Finally, Networks D and G both include an Express route to Albany.

SHORT-TERM ACTION
Networks D and G are both radically different from the regional transit network SKT operates today. If SKT were to immediately redesign its services along these lines, it would represent a major change for the region. In order to assess not just which network stakeholders preferred, but also how quickly they thought SKT should implement it, the facilitator asked:

• What should SKT do in the short term? On a spectrum from:
  - Shifting all the way to higher regional ridership, to...
  - Redesigning just the lowest-ridership services, to...

Figure 10: Among the eight different networks they designed, a majority of stakeholders at the workshop preferred D or G (as shown in the polling results above). These two networks (in photos below) share some notable traits.
- Keeping the status quo.

A majority of attendees expressed support for doing more than just redesigning the lowest-ridership services (CARTS 25 and 35). This would mean changing some or all of the deviated fixed routes that make up most of the regional network today.

No one in attendance spoke up for the status quo.

**PRIORITIES FOR NEW FUNDING**

These stakeholders had been constrained by a fixed budget, as they designed their networks. The facilitator asked attendees:

- If new funding were available for regional transit, what would you do first?

Their answers revealed very high support for adding weekend service. This issue was probably front-of-mind for many people, as a tax measure
to pay for Cherriots weekend service was on the ballot just weeks after this workshop.

Nearly three times as many people said they would increase the frequency of existing routes as said they would create new routes, given some additional funding.

Follow-up Meetings with City Leaders

In response to stakeholders’ input at the Workshop, and after analyzing where ridership potential is highest in the region, JWA designed a draft regional transit network.

The major changes suggested by this First Draft recommended network were:

- The use of Expresses to connect cities. These routes could only make one or two stops in each town.
- More trips, earlier trips and later trips among the biggest cities (Woodburn, Stayton, Dallas and Monmouth/Independence).
- Reallocation of the CARTS 25 and 35 dial-a-ride resources to higher-ridership services and to more cost effective coverage.
- Reduction in the number of hours of CARTS 45 dial-a-ride service (in Dallas, Monmouth and Independence). Those resources would go to Express routes among those cities instead.
- Elimination of any SKT transit service east of Stayton. Resources spent on that service today would instead be added to routes that travel between Salem and Stayton.

This First Draft recommended network is shown in the map in Figure 11 on page 23.

JWA and SKT staff led three meetings, in Dallas, Stayton and Woodburn, at which they presented this draft network and collected input and reactions to this draft. Local city elected officials and staff were invited to these smaller meetings, as were people from those communities who had attended the Stakeholder Workshop.

Participants’ reactions at these meetings, and the way they influenced the final recommendation, are described in the following chapter.
Figure 11: This First Draft regional network was presented to city leaders at meetings in early December, 2015. Their input led to some changes, which are shown in the recommended network in Figure 14 on page 27.
Recommended Networks

This chapter describes two recommended networks - one for existing funding levels, and one that could be achieved with 25% more funding.

These networks are designed based on high-level guidance given by participants in the Stakeholder Workshop and more detailed feedback from meetings with city leaders.

Balancing ridership and coverage

Participants at the Stakeholder Workshop said that they would support a shift to a higher-rider network, but not shifting all the way to a pure Express-only network.

These two recommended networks strike roughly that balance:

- most of the budget is spent on Express routes among bigger cities, which will achieve relatively high ridership;
- some dial-a-ride (in Polk County) is maintained, as is an option for deviated fixed route service between Salem and Stayton; and
- service to some very small towns (such as the smaller Canyon cities, and Mt. Angel) is funded, in recognition of severe needs in those towns, despite the fact that ridership relative to cost will always be lower there than elsewhere in the region.

Weekends

Neither of these networks could operate on Saturdays or Sundays, within the stated budgets. Weekend service is extraordinarily important for both social outcomes and for attracting high ridership.

Travel to and from Salem-Keizer is today and will likely continue to be the source of most of CARTS ridership. Without Cherriots service that gets people from the Downtown Transit Center to their destination, CARTS can only be useful to a small number of people on weekends.

Once Cherriots service is provided on weekends, then our recommendation would change. Instead of spending a 25% increase in regional transit funding on the increased weekend frequencies shown in Figure 24 on page 45, we would recommend that SKT spend it on limited weekend regional service.
**Corridor-by-corridor**

Because these networks represent only shifts of resources from one corridor to another, the SKT Board could decide to change only one or two corridors. (By “corridors” we mean Dallas/Monmouth/Independence; the Canyon Cities near Highway 22; Silverton/Mt. Angel; and 99E to Woodburn, and beyond to Canby/Oregon City.) Service quantities are summarized in Figure 12.

However, there are enormous benefits to implementing all of these corridors together, in particular the opportunities to “pulse” routes from different places together in downtown Salem.

A “pulse” happens when multiple bus routes come together, wait so that their passengers can transfer among them, and then head off again. Pulses make low-frequency services more useful by eliminating the long wait to transfer. Pulsing CARTS routes would allow people to make a quick and reliable transfer between, for example, Woodburn and Monmouth, without a long wait.

While the deviated fixed routes that SKT operates today can, theoretically, be pulsed, their running times are so variable (because of their deviations) that in practice this is unreliable.

Finally, if the SKT Board does not permit itself to shift service quantities among corridors, SKT’s ability to grow ridership and make the system more productive will be limited. Not all corridors have the same ridership potential, and SKT’s ability to increase ridership will arise mostly from reallocating some service from places of lower ridership to places with higher ridership.

Ridership and productivity can be increased by shifting from one service type to another (e.g. from deviated fixed route to Express), and by improving connections and refining schedules. However, once such changes have been made, any further increases in productivity would have to arise from a shift in service quantity towards higher-ridership places.

<table>
<thead>
<tr>
<th>Service Allocation Among Corridors, Counties</th>
<th>Service hours</th>
<th>Existing</th>
<th>No new funding network</th>
<th>Increased funding network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woodburn, 99E</td>
<td>15.0</td>
<td>18.0</td>
<td>30.3</td>
<td></td>
</tr>
<tr>
<td>Silverton/Mt. Angel</td>
<td>8.5</td>
<td>7.0</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Canyon Cities</td>
<td>12.2</td>
<td>8.8</td>
<td>10.4</td>
<td></td>
</tr>
<tr>
<td>Polk County Cities</td>
<td>31.4</td>
<td>31.2</td>
<td>34.2</td>
<td></td>
</tr>
<tr>
<td>Marion County</td>
<td>35.7</td>
<td>33.8</td>
<td>48.1</td>
<td></td>
</tr>
<tr>
<td>Polk County</td>
<td>31.4</td>
<td>31.2</td>
<td>34.2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67.1</td>
<td>65.0</td>
<td>82.2</td>
<td></td>
</tr>
</tbody>
</table>

Figure 12: Service allocation between the two counties, and across the four corridors, would only change slightly were SKT to implement either of these recommended networks.
No New Funding Network

This No New Funding network (shown in Figure 14 on page 27) represents the same amount of service that SKT currently funds, though it is provided using different types of service and it is more concentrated on routes between bigger cities.

The amount of service in this network is 65.1 service hours of service per weekday, just slightly less than what is provided today.

(A “service hour” is an hour during which a bus is out in public, available to passengers, and collecting revenue. In technical discussions, it is often called a “revenue hour.” These hours do not include time when a bus is being driven to the start of its route, or when a driver is on break. SKT currently pays its CARTS contractor, MV Transportation, $73.71 per hour of service provided.)

The description of this recommended network as a “No New Funding” scenario assumes that SKT’s costs per service hour will not increase significantly in the future, and existing funding sources will not be cut. If SKT’s operating costs per hour increase, then operating this recommended network could, in fact, require additional revenues. Similarly, if federal or state funding sources are reduced, new revenues would be needed simply to maintain existing levels of service.

Specific changes recommended for each of the three major corridors are described in the following sections.

<table>
<thead>
<tr>
<th>Service</th>
<th>Round trips per weekday</th>
<th>Cost (service hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Salem-Woodburn</td>
<td>6</td>
<td>18.0</td>
</tr>
<tr>
<td>20 Salem-Silverton</td>
<td>4</td>
<td>6.4</td>
</tr>
<tr>
<td>20 Silverton-Mt. Angel</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>30 Salem-Stayton (via Hwy 22)</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td>30 Stayton-Gates*</td>
<td>2</td>
<td>0.6*</td>
</tr>
<tr>
<td>60 Salem-Stayton (via Turner, et al, as an Express)</td>
<td>3</td>
<td>5.8</td>
</tr>
<tr>
<td>40 Salem-Dallas (via Mon.-Ind.)</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>50 Salem-Dallas (via Rickreall)</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>45 Dial-a-ride for Dallas-Mon.-Ind.</td>
<td>--</td>
<td>13.0</td>
</tr>
<tr>
<td>SKT total for all services:</td>
<td></td>
<td>65.0</td>
</tr>
</tbody>
</table>

*Because 27% of people living east of Stayton are in Marion County, we recommend that SKT reserve 27% of the 2.8 service hours it would cost to run Route 30 between Stayton and Gates, and pursue a partnership with Linn County to fully fund the service. This recommendation is discussed further starting on page 32.

Figure 13: Routes, and route segments, included in the No New Funding Network. Note that some cities are served by more than one segment. Stayton would get five round trips per day, from Routes 30 and 60 combined. Dallas would get eight trips per day, from Routes 40 and 50 combined.
Figure 14: This recommended network would shift SKT’s investment away from very low-ridership services and towards more frequent Express routes, connecting cities across long distances. This network would cost no more to operate than the present-day regional system.
Dallas-Monmouth-Independence
Four services would reach Polk County cities and rural areas:

- Route 40 would service Independence, Monmouth and Dallas six times a day (compared to five times a day at present).
- Route 50 would serve Dallas twice a day (as it does today).
- A dial-a-ride zone covering the three cities would allow residents to get a ride from anywhere to anywhere within the zone (including to an Express bus stop) with a reservation.
- Route 2X would continue to serve West Salem and Rickreall, on its trip between Grand Ronde and downtown Salem.

Express Routes
The Polk County cities would be served by Express routes from Salem (instead of deviated fixed routes).

Express routes are faster and more reliable, but come with two major consequences: first, they do not deviate in response to individual requests, and second, they are permitted to make only a small number of stops in a town. We recommend that SKT consider carefully how many stops an Express route should make in towns of various sizes, and set a policy defining those limits, to avoid running afoul of FTA regulations and federal laws. (The FTA requirements are explained in Volume I of this report.)

Many of the city leaders at the Polk County follow-up meeting expressed their concern that eliminating so many stops in their towns would have a negative impact. (There are currently 16 stops in Dallas alone, though some of them are hardly used.) Yet serving many fewer stops would make the service faster and more reliable, and would save enough time to allow SKT to provide another daily round-trip each day on Route 40. City leaders at the small group meeting found these improvements appealing. The trade-off between ample local fixed route stops, and more reliable and frequent service, went unresolved at the meeting.

The city leaders also discussed potential stop locations for Express routes. JWA and SKT staff recommended that they think about two stops in Dallas and three in Monmouth and Independence together.

For Dallas, the WalMart on Ellendale Road, the center of downtown, and West Valley Hospital were mentioned. West Valley Hospital runs its own reservation-based dial-a-ride service. Whether this service could connect to an Express route (and thus relieve the Express of having to make one of its two stops at the hospital) is not yet known.

For Monmouth-Independence, the group contemplated one stop near the center of Monmouth (and Western Oregon University), another stop in between the two cities, and a stop near the center of Independence.

Dial-a-Ride
Today, SKT provides 15.5 service hours of dial-a-ride in Dallas, Monmouth and Independence each weekday. This recommendation includes 13 service hours per day.

Some of these hours would be used by multiple vehicles, deployed simultaneously, when demand is high, so the span of service each day would be less than 13 hours long. For example, dial-a-ride might be available from 7:00 am to 5:00 pm (a 10 hour span), and for three hours service is provided by two vehicles and drivers. This would total 13 service hours of service per day.

How many drivers and vehicles should be deployed to handle peak demand will depend on the expectations (for wait time, availability and trip length) that SKT decides to set for the service, and on the underlying demand patterns of potential customers.

Dial-a-ride, even where it is relatively well-used, nearly always achieves low productivity (low...
Regional Commuting Patterns

Figure 15: This diagram shows commute travel (at all times of day) among cities in the region, including the Portland Metro area. Some of these trips are routed through other cities, e.g. shown trips from Salem to Portland may pass through Wilsonville or Oregon City. Only commutes made by more than 500 people each day are shown here.
ridership relative to cost), because the limitations of time and space simply prevent a driver from serving more than seven or eight people each hour. Polk County is the only part of the region where we recommend that SKT continue to offer dial-a-ride. We have not recommended dial-a-ride services in the Silverton or Canyon Cities areas, where CARTS 25 and 35 operate today.

This investment in low-ridership service is recommended for Polk County, but not other parts of the SKT service area, because of the high concentration of people with disabilities, and the services and jobs that support them, in Polk County. While all parts of SKT’s service area are home to people with severe needs, who could not access fixed route transit, Polk County seems to have a higher density of such people. (For reasons relating to their privacy and security, it is difficult to get fine-grained Census data on where people with disabilities live.)

A related recommendation, detailed starting on page 55, has to do with the relative prices of fixed route fares and demand-responsive fares. Today, SKT charges a customer the same price whether they walk to a bus stop and wait for a fixed route bus, or make a reservation and are picked up and dropped off at locations they select. We recommend that fares for dial-a-ride (and deviations, if SKT decides to continue operating deviated fixed routes) be increased.

2X SERVICE PAST DALLAS

Today, 2X service from Grand Ronde goes past Dallas on Highway 22, eight times each day. The Confederated Tribes of the Grand Ronde (who fund the 2X) have expressed a willingness to consider running it through Dallas, which would bring a very high level of daily service to Dallas (and anyone who can get to Dallas via another route).

However, it is currently not safe for buses to make left turns at the intersection of Highway 22 and Kings Valley Road, north of Dallas. Without some improvement there, the eight trips a day must pass Dallas (and connections to Monmouth and Independence), rather than going through.

The major travel demand around Dallas is for trips from Dallas to the Salem-Keizer urban area (as shown in Figure 15 on page 29). The most useful transit route in Polk County is the 2X, which doesn’t go to Dallas.

In an attempt to make use of the wealth of transit service going by on Highway 22, the draft network shown to city leaders included a Dallas-to-Salem connection six times a day that used the 2X. (Today, there are just two direct trips from Dallas to Salem each day, and another five that go the long way through Monmouth and Independence.) However, these six trips a day would be made possible by a transfer between the 40 and the 2X in Rickreall. (See Figure 16 on page 31.)

One of the representatives from Dallas said that he saw this as a worse scenario for the city than the existing service, because of the transfer. While transfers are inconveniences for riders, they can allow an agency to provide faster travel to many more cities, and more choices about when to travel, than can be provided with a network of infrequent one-seat-ride routes.

However, the consequences of a missed transfer in Rickreall would, under existing conditions, be severe. Thus the final network does not include this type of connection between Dallas and Salem (and did not make use of the existing investment in 2X service).

Unfortunately, this means that Dallas has only two direct trips a day to its biggest destination (Salem-Keizer) and six trips a day to a less-important destination (Monmouth-Independence).

Solving this mismatch between Dallas-to-Salem demand and service would require:

- a big increase in operational funding for more transit trips on the CARTS 50; or
- a fix to Highway 22 that allows the 2X to go to Dallas; or
• improvements in Rickreall that make transferring there more comfortable, and system-wide operational improvements (such as locational devices on all buses that allow operators to know if the bus they are supposed to meet is late) that make transfers more reliable.

Figure 16: The first draft recommendation is at top, and the final recommendation at bottom. In the first draft, service between Dallas and Salem would have taken advantage of existing spending on the 2X, by asking people to transfer at Rickreall. This idea is not included in the final network. Instead, Dallas is served with two trips each day to Salem, and six trips each day to Monmouth/Independence. However, if someday the transfer at Rickreall can be made comfortable and reliable, or if 2X buses can turn off of Highway 22 safely, Dallas could have much more service to Salem than it does under this recommendation.
Stayton-Sublimity-Aumsville-Turner and the Canyon Cities

Two routes would serve these towns to the southeast of Salem:

• A route running on local roads, through south Salem, Turner, Aumsville and Sublimity, ending in Stayton. This route could be operated as an Express or, at a slightly higher cost and a slower travel speed, as a deviated fixed route.

• An Express route running between downtown Salem and Stayton, via Highway 22. (There is an option for this route to go farther east, in partnership with Linn County.)

CANYON SERVICE

When JWA and SKT presented the draft network to city leaders, at the December meeting in Stayton, representatives from the Canyon Cities (Mill City and Gates) were alarmed to see that there would be no service at all east of Stayton.

Today, all of the towns east of Salem get the same amount of daily transit service, whether they are big (like Stayton) or small (like Mill City). Ridership is predictably lower in smaller towns, and SKT’s costs are higher in farther-away towns (because SKT pays for the minutes and miles it takes to get there).

Shifting transit service towards the bigger towns would increase ridership, but it would have negative consequences for the small numbers of people in the small towns who depend on (or would like to depend on) that transit service. Thus a goal of increasing ridership within this corridor is in direct conflict with a goal of providing coverage service to every town, regardless of its size and ridership.

Today, the productivity of CARTS 30 is much higher on the western segment (between Salem and Stayton) than on the eastern segment. The cost per passenger is much lower on the western segment (see the table in Figure 17), both

<table>
<thead>
<tr>
<th>Service name</th>
<th>Productivity (boardings per service hour)</th>
<th>Operating cost per boarding</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 Polk County 13</td>
<td>13.4</td>
<td>$5.49</td>
</tr>
<tr>
<td>30W Salem to Stayton</td>
<td>11.7</td>
<td>$6.29</td>
</tr>
<tr>
<td>50 Dallas/Salem</td>
<td>11.1</td>
<td>$6.64</td>
</tr>
<tr>
<td>1X Wilsonville/ Salem</td>
<td>22.0</td>
<td>$7.21</td>
</tr>
<tr>
<td>30 Canyon Connector</td>
<td>8.4</td>
<td>$8.80</td>
</tr>
<tr>
<td>10 Woodburn/ Salem</td>
<td>8.2</td>
<td>$8.98</td>
</tr>
<tr>
<td>20 Silverton/ Salem</td>
<td>7.4</td>
<td>$9.92</td>
</tr>
<tr>
<td>45 Polk County Flex</td>
<td>6.7</td>
<td>$11.00</td>
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<td>30E Mehama to Gates</td>
<td>4.3</td>
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<td>2X Grand Ronde/ Salem</td>
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<td>$22.20</td>
</tr>
<tr>
<td>35 Canyon Flex</td>
<td>1.6</td>
<td>$47.25</td>
</tr>
<tr>
<td>25 North Marion Flex</td>
<td>1.0</td>
<td>$75.72</td>
</tr>
</tbody>
</table>

Figure 17: This table shows the productivity (ridership relative to cost) of each route, and the average operating cost per rider. Route 30 is split into two segments (“30E” and “30W”). Productivity is much higher, and cost per boarding is much lower, on the western segment than on the eastern part. Ridership from the eastern towns will always be lower relative to cost, simply because the eastern towns are smaller, so there are fewer people available to ride transit.

Note also that the deadhead costs of Route 30 are spread across all routes, because this productivity measure uses service hours (which do not include deadhead) rather than vehicle hours.
because distances are shorter so the service costs less to provide, and because there are more passengers in those towns among whom to divide those costs.

Representatives from Mill City and Gates were alarmed at the potential elimination of any transit service to their communities. Their own communities’ plans include hopes for more transit service, not less. In addition, they described how low-income people are often pushed (by social service agencies, or by family and friends, or by market forces) to housing in the Canyon, because it is so inexpensive. Yet private transportation to and from this housing is unaffordable to many of these people, and without public transportation they will be stranded there.

Rather than a cut, Mill City and Gates representatives suggested an increase in daily Express trips up the canyon. This might increase ridership from those towns on a per-day basis. However, it is unlikely to increase ridership on a per-trip basis, and therefore would not reduce the cost per rider. Further, increasing service in bigger towns, instead of the smallest Canyon towns, would certainly garner bigger increases in ridership. Thus adding more trips per day up the Canyon would reduce ridership on the entire regional network, as service was pulled out of bigger towns like Dallas or Woodburn in order to reach the smaller Canyon towns.)

The upper Canyon Cities are not destinations for people living in the rest of the Salem-Keizer area, so there is very little travel demand to get there from somewhere else in SKT’s service area. However, there is clearly a need for lifeline transit service among a small number of people living in Gates, Mill City, Mehama and Lyons. Most of those people do not live in SKT’s service area - census data shows that 27% of Upper Canyon residents live in Marion County, while 73% live in Linn County (see Figure 18).

However, these Linn County residents all live...
along Highway 22, which leads into Salem, not into Albany (the center of Linn County and of its transit network). For this reason, any fixed route transit service to these parts of Linn County is much better delivered through the SKT regional network rather than through Albany or Linn County networks.

In order to take advantage of the SKT network to provide lifeline service to Canyon residents, while avoiding shifting Marion-Polk transit funds to a predictably low-ridership, high-cost route, we recommend that SKT set aside its fraction of the funds needed to run such lifeline service and approach Linn County with the offer of a partnership. Linn County has access to the same state and federal monies for transit service as does SKT.

Either of Routes 30 or 60 (shown in Figure 19) could be extended up the Canyon, for a total daily operating cost of 2.8 service hours (assuming the Upper Canyon route were an Express - as a deviated fixed route, it would be more costly). If SKT were to fund 27% of the service, that would be 0.6 service hours.

At SKT's current operating cost, with continued service on weekdays only, split in proportion to population, this partnership could result in a cost to SKT of about $14,000 per year and a cost to Linn County of about $38,000 per year.

EXPRESS VS. DEVIATED FIXED ROUTE

In the first draft presented to city leaders, Route 60, which serves the smaller towns between Salem and Stayton, was shown as a deviated fixed route. It would deviate to places within 3/4 mile of the fixed route, with an advance reservation, and so would offer an option to those people who cannot or prefer not to go to a stop in town.

The FTA does not require that Express routes provide paratransit service or deviate for people with disabilities. The choice between running Route 60 as an Express or a deviated fixed route is strictly a human services choice between providing more coverage at the expense of higher ridership.

Running this route as deviated fixed rather than Express has impacts on both cost and usefulness. Putting extra time in the schedule to make a deviation costs a little bit more on every round trip the bus and driver make. It would cost SKT about 0.3 more service hours per day to run it as a deviated fixed route than as an Express.

The other impact is usefulness. As a deviated fixed route, it offers access to transit to a group of people who otherwise might have no access, but it also deters a larger group of people who are in a hurry and who will be discouraged by the longer travel time, and the out-of-direction travel, that happens on a deviated fixed route. These people in a hurry aren’t just affluent people who could drive their car instead - they are also low-income, working people who cannot afford to be late to work, who hold multiple jobs,
and whose time is extremely valuable.

One of the city representatives at the Stayton meeting asked how many people would be “stranded” if the dial-a-ride and deviated fixed route were replaced by an Express, and they had to walk (or get a ride) to a stop in the center of their town. To evaluate this, we accessed data for passengers who regularly use either CARTS 35 (the dial-a-ride) or deviations off of CARTS 30.

Twenty-five unique people used dial-a-ride or a deviation in October 2015, and two of them used mobility devices. The rest of the passengers weren’t using mobility devices, but that doesn’t necessarily mean they could access a single stop in the center of town. (Nor are people who use mobility devices inherently unable to access a fixed stop.) Most of the trips made by these 25 people are within Stayton, for which an Express route would not be helpful. The average cost (to SKT) of each of these passengers’ trips is $47.50 (costs per passenger are shown in Figure 17 on page 32).

How to resolve this trade-off, and whether the Route 60 should be a deviated-fixed route or an Express, went unresolved at the meeting of city leaders.

Because the costs are so similar, and the impacts are so local, we have declined to recommend whether the Route 60 should operate as a deviated fixed route or an express, in this No New Funding scenario. The budget impacts of this decision are real but fairly small, while the travel time and reliability impacts on potential future riders are more significant.

This is a policy decision, and a difficult one, and we are not comfortable taking the high-level guidance from regional stakeholders and applying it to such a locally-contained trade-off. We recommend that this decision be made in discussion with local city leaders and stakeholders from Stayton, Sublimity, Aumsville and Turner, before the development of a final service plan.

However, if SKT can someday increase the number of daily round trips between Stayton and Salem (on the 30), thereby providing more frequency for people in a hurry, we would recommend that the Route 60 be operated as a deviated fixed route. For this reason, in the Increased Funding Network we have recommended that the Express on Highway 22 (the Route 30) be increased to three daily round trips, and the local route (Route 60) be operated as a deviated fixed route.

LOCAL ROADS VS. HIGHWAY 22
At the city leaders meeting, local roads vs. highway routing was debated.

In this recommendation, Route 30 would make no stops between Salem and Stayton, and so would be a fast ride for anyone in Stayton, or willing to drive to the Stayton park-and-ride.

Meanwhile, Route 60 would use local roads and hit all of the smaller towns between Salem and Stayton. It would be a slower ride to Salem, but would offer access to people in smaller towns (who don’t all own cars that they could drive to Stayton to catch a bus there).

There was a discussion about whether the Route 30 (on Highway 22) should serve only Stayton and the park-and-ride just north of it... or Sublimity as well...or Aumsville as well. These are all possible, though the more stops it makes in local cities near Highway 22, the slower it will get, before it isn’t very different from the local Route 60.

We estimate that someone’s travel time from Stayton to Salem would be 48 minutes on the local Express route (going through local towns), 60 minutes if the local were run as a deviated fixed route, and only 29 minutes on the Highway 22 Express route (Route 30). The bottom line is that the more time spent on local roads and stopping in additional towns, the more any travel time savings between Stayton and Salem will be eaten away.
One concern brought up by city leaders is the reliability of local roads in the spring and summer. Slow-moving farm equipment can cause serious delays. These roads are the only way to access these towns, but this means that the Route 30 (on Highway 22) would likely be even more attractive (for its speed and reliability) than Route 60, for the people who can access it.

Woodburn-Silverton-Mt. Angel
The recommended No New Funding Network would offer the following changes in the north-east part of SKT’s service area:

- A shift to Express services, rather than deviated fixed routes.
- Conversion of the resources used for the CARTS 25 dial-a-ride into more frequent service to Woodburn, Mt. Angel and Silverton.
- More opportunities for reliable, timed connections between SKT and Canby Area Transit in Woodburn.

City staff and elected officials from Woodburn, Silverton, Gervais and Mt. Angel, as well as one major employer (BrucePac), gathered for a meeting at the Woodburn Library in December to review and discuss a first draft network. Some of them had also been at the Stakeholder Workshop.

MORE EXPRESSES, LESS DIAL-A-RIDE
As in the rest of the network, this part of the network would be made up of Express services, making just one or two stops in each town, and not deviating in response to requests.

Generally, these city representatives supported a shift to Express services, because of the faster running time, lower cost and higher reliability they would offer to all riders.

They had concerns, however, about the loss of lifeline transportation for people who currently ride CARTS 25, in particular the small number of people in Mt. Angel who do not currently have any other transit service. (Silverton residents are able to use the Silver Trolley dial-a-ride within the city limits, and Woodburn is thoroughly covered by an hourly circulator.) Silverton Health patients can use that organization’s CareVan, from Woodburn, Mt. Angel or Silverton. However, this serves only medical trips.

INCREASED FREQUENCY, LESS COVERAGE
Implementing this recommended network would increase the frequency of services to most of the towns in this part of Marion County:

- Six daily round trips between Woodburn and Salem (serving Gervais, Brooks and Chemeketa Community College), instead of the four round trips offered today,
- Four daily round trips between Salem and Silverton (via Chemeketa Community College) which are already offered today, and

Figure 20: In the recommended network, service along 99E, and between Silverton and Mt. Angel, would increase. This would be paid for by the elimination of the CARTS 25 dial-a-ride.
• Two daily round trips from Salem to Mt. Angel, instead of the 1 round trip offered today.

However, much of this increase in frequency would be paid for by converting deviated fixed routes to Expresses, and by eliminating CARTS 25.

CARTS 25 is the least-productive and highest cost per passenger service in SKT’s system. (See Figure 17 on page 32 for a summary of productivities and costs on all services.) Each hour that it is operating, CARTS 25 serves on average just one person for a one-way trip, at an average cost of $75.70.

Twelve unique people used CARTS 25 during the month of October 2015, most of them for regular trips multiple times during the month. Many of their trips were within Silverton, which would not be accommodated by an Express route (but could be accommodated by the Silver Trolley). Some of their trips were between Mt. Angel and Woodburn, which would also not be accommodated by this network (as service from Mt. Angel goes to Salem via Silverton, not via Woodburn). Many of their trips were between Mt. Angel and Silverton; depending on their mobility, these riders might be able to use the recommended (more frequent) fixed route service between these two cities.

In the month of October 2015, none of these passengers were recorded as using a wheelchair.

The numbers of people who today use deviations on CARTS 10 or 20, or who use CARTS 25 is very low. Some of them may be able and willing to go to a stop in town and use an Express route. Those who are not, however, would be negatively impacted by this change.

**CONNECTIONS WITH CANBY, OREGON CITY**

Woodburn is an important transit destination because it is a big city, but also because it is where people can make a connection with Canby Area Transit (CAT). CAT’s Route 99 gets them to Hubbard, Aurora, Canby, and Oregon City eight times every weekday (and in Oregon City, a TriMet bus to downtown Portland comes every 15 minutes).

A great many people want to go from Salem to the Portland Metro area (as shown in the diagram on page 29). Today, ODOT provides all-day service between the two downtowns. SKT (and Wilsonville SMART) provide peak-only service between Salem and Wilsonville, which helps people access the west side of the Portland Metro area. We recommend that SKT (and CAT) work together to provide a connection to the east side of the Portland Metro area, through Oregon City.

Thanks to CAT’s existing Route 99, there are eight opportunities each day for people in the Salem-Keizer area to make a low-cost connection between this region and the Portland region, through Woodburn. Increasing the frequency and the reliability of CARTS service to Woodburn is a necessary prerequisite to making a great SKT/CAT connection, and ideally (someday) running a service across the county line, in partnership, much as SKT and SMART do with the 1X to Wilsonville.

**EXPRESS STOP LOCATIONS**

CAT service currently stops at the Bi-Mart north of downtown Woodburn, at the intersection of Highways 99E and 214. Thus when city leaders discussed which locations in Woodburn would be strong candidates for Express stops, the Bi-Mart and the downtown transit center (near Chemeketa Community College) were top candidates. (There was a lower level of interest in having CARTS service to the transit center near I-5, where parking is ample but the density of residents and activities is much lower.)

In the future, if SKT and CAT enter into a funding partnership, there may be an opportunity to pay CAT to run its 99E service further into the center of Woodburn (rather than stopping it at the Bi-Mart). Or, if the two agencies were to simply share a long route that goes from Salem...
to Oregon City, no transfer would be needed in Woodburn and this would become a moot point.

The other area of Woodburn where a CARTS stop would be desirable, but is not possible for Express routes, is along 99E. There are industrial jobs along 99E that are a long walk from both downtown and the Bi-Mart. BrucePac, located to the southeast of Woodburn, would particularly value a CARTS stop nearby. (BrucePac also has a location in Silverton, closer to a potential Express stop.) Unfortunately, federal regulations do not allow an Express route to make very many stops within cities. We do not recommend that SKT make more than two stops in Woodburn, without guidance to the contrary from federal regulators.

The locations of stops in other towns were also discussed. In Mt. Angel, Brooks and Gervais it is fairly obvious where a single stop would be best located, at the center of each town. In Silverton, however, there are three potential stop locations (at the hospital, downtown, and at the Roth’s), but an Express could only make two. Today, more passengers use the downtown and Roth’s stops than the hospital stop.

**MT. ANGEL CONNECTION**

The draft network shown at this meeting included a route connecting Mt. Angel to Salem via Silverton. However, it would also be possible to connect Mt. Angel directly to Woodburn, instead of Silverton, by extending CARTS 10 from Woodburn south. When asked whether this was an appealing idea, the representative from Mt. Angel said that she thought given a choice between the two, a connection to Silverton (and a more direct connection to Salem) was preferable. Census data shows that nearly the same number of people travel for work from Mt. Angel to Woodburn as from Mt. Angel to Silverton. Many of the networks designed at the Stakeholder Workshop included a two-way loop connecting Woodburn, Mt. Angel, Silverton and the Salem-Keizer urban area. This would be a great service for people living in Mt. Angel and Silverton in particular (because people in those communities could then access either of their big neighboring cities, without a transfer). However, we have not included it in either of our recommended networks because the additional cost of running service between Mt. Angel and Woodburn is large enough that frequency between Salem and Woodburn (or some other pair of large cities) would have to be cut to make it possible. There are simply too few people in Mt. Angel and Silverton to make such a loop a higher-ridership service than more frequent service between Salem and Woodburn (and, by extension, Canby and Oregon City).

This recommended No New Funding network includes two daily round trips between Mt. Angel and Salem (via Silverton and Chemeketa Community College), twice as round trips as are offered today. Today, transit only serves a peak commute from Mt. Angel to Salem, and back, each day. Adding a second round trip means that people who don’t live in Mt. Angel could get there in the morning and return in the afternoon.

**Wilsonville**

The recommended networks do not include any changes to the amount of service SKT currently provides to Wilsonville on the 1X.

However, some stakeholders at the Workshop expressed their desires for a 1X deviation to Woodburn, on some or all trips per day, and for some additional frequency on the 1X.

The 1X is currently funded out of the Cherriots
budget, not the regional CARTS budget. For that reason, we did not include it in this recommended regional network. However, given its current high productivity, additional round trips each weekday (and on weekends) would likely increase its productivity further.

If SKT adds service to the 1X in future years, and as SKT continues to evaluate the 1X’s performance, we recommend that staff be careful not to cut or add trips to the daily schedule based on the productivity of each individual trip alone.

Once a peak-only route has achieved such high ridership, and has many trips in each peak, additional off-peak trips can increase the daily productivity of the route even as those individual trips themselves appear unproductive in isolation. As described earlier in this report, mid-day and late-evening trips are valuable even to peak commuters, because they support flexibility and spontaneity. They are also valuable for all of the other kinds of work and non-work trips that potential riders make.

It is common for an agency to notice that the last evening trip on a commuter express route is unproductive, and to then cut that trip and reallocate it to the peak. Over time, however, what was the next-latest trip (and is now the last trip of the day) will drop in productivity, until it too looks as though it should be cut. Few responsible adults will plan their day - or their work life - around the last bus of the day, but the fact that it is there if they need it allows them to rely on transit for their commute. The same dynamic occurs with low-ridership midday trips.

WOODBURN-TO-WILSONVILLE

Woodburn representatives noted that most of their residents who travel outside the city for work head for the southwest part of the Portland metro area, not the southeast part (where CAT’s Route 99 goes). For this reason, they expressed an interest in either having the 1X get off the freeway on its route between Salem and Wilsonville, or having an additional express route connecting Woodburn and Wilsonville.

Figure 21: This recommendation does not include deviating the 1X to Woodburn. Such a deviation might actually decrease the productivity of the 1X, because the added travel time might drive away more riders than the added stop attracts.

The 1X is very productive today, and at first glance it might seem that another express route, between Woodburn and Wilsonville, would also be productive. However, it would be different from the 1X in two ways that would reduce its ridership potential.

First, the ride would be much shorter, which reduces the incentive for people to use it. If it is a low-frequency peak service - likely just two round trips per day - riders would be accepting a great deal of rigidity in their daily travel in exchange for a small benefit. The 1X, by contrast, offers people a very long ride, which means that there is a big payoff for organizing one’s daily schedule around the transit schedule.

Second, the number of commuters traveling between Woodburn and Wilsonville, and between Woodburn and the Portland Metro area north of Wilsonville, is lower than it is for Salem. (Commuter trips around the region are summarized in the diagram on page 29.) While
commuting is not the only reason people travel, it is a major component of daily transit ridership.

These factors would also affect the 1X should SKT decide to deviate off of I-5 to serve Woodburn, in between Salem and Wilsonville. The number of riders gained by the stop, on an average round trip, would likely be fewer than the riders lost due to the increased travel time on the route.

In a much higher-funding scenario, in the future, it may be appropriate to add a Woodburn-to-Wilsonville Express service. In the short-term, however, such a service would not be consistent with the input we have heard from stakeholders, that they prefer that SKT increase ridership within the existing budget.

**Peaks**

One of the questions that arose in conversations with stakeholders and city leaders is how much SKT’s Express service should be scheduled for peak commuting, rather than midday or evening travel.

Those of us who plan transit, and who have the time and energy to participate in public planning processes, tend to commute on the peaks. As of 2010, 29% of U.S. workers did not work a standard 8-to-5 schedule.

Transit decision-makers sometimes have a “blind-spot” to these facts and as a result, many transit systems are “over-peaked.” Routes run only on the peaks, or more frequently on the peaks, when in fact demand may be highest at other times of day. (On many routes in the Salem-Keizer urban area, demand is consistent all day long, with a small peak in early afternoon, when service workers are changing shifts and students are leaving school.)

People who commute on the peaks also have a reason to value midday and late trips. All people, regardless of their income, value flexibility and spontaneity. If a transit service does not support a midday trip home to pick up a sick child, or a late night at the office finishing a report, more affluent people can easily respond by using a private car. Even very low-income people who need to travel at uncertain times will find another option (such as a ride from a family member, or a very inexpensive car) if the transit network does not offer them needed flexibility.

That said, if a small town is connected to Salem-Keizer by just a few round trips per day, it will make sense for most or all of them to be early and late enough that people could use them to reach an 8-to-5 job. This means that they also work for people who need to make a medical appointment or run errands, though those people will likely have a very long wait sometime during the day.

For example, the two daily round trips to Mt. Angel should be timed so that someone could use them to commute to an office job. On the other hand, in cities like Stayton, Woodburn or Monmouth, where there are 4-6 round trips each day, SKT should make an effort to offer trips both on and off the peaks.

**Pulses**

Besides peaks, another scheduling consideration for these recommended networks will be pulsing. Pulses make low-frequency services (like the ones in SKT’s regional network) more useful to a wider range of people by eliminating the long wait to transfer. If two bi-hourly routes were to connect at random, a person transferring between them would wait, on average, one hour. If they are scheduled to pulse, however, the wait could be very short.

Pulses must be carefully scheduled and maintained over time, because if one bus is just a few minutes late, the consequences can be dire. In the example of two bi-hourly routes, the average un-pulsed wait would be one hour; with a pulse it could be just five minutes; but with a missed pulse it would be one hour and 55 minutes! And that person might lose their job as a result.
While Cherriots routes pulse for just a few minutes at the DTC, these CARTS routes would require longer pulses. For the purposes of estimating costs, we have assumed that Routes 10 and 40 would pulse together for 10 minutes at the DTC (and Route 10 would pulse with CAT’s Route 99 for 10 minutes in Woodburn).

SKT already owns an asset that makes pulsing regional routes more appealing, and that is the Salem Downtown Transit Center. The DTC is an excellent place to ask people to wait, and it gives riders some recourse - rest rooms, shelter, schedules, customer service staff - if they miss their connection or need to change their plans. There is also enough physical space to bring multiple CARTS buses together at stops at the DTC.

**Scheduling Service**

There are many different ways that these regional routes could be scheduled to come together at the Downtown Transit Center. A few considerations include:

- Routes 10 and 40 have similar “cycle times” (the amount of time it takes them to make a round trip, reliably), and could be “pulsed” together every three hours.
- Certain pairs of routes may serve more important cross-regional travel patterns, such as Polk County to Woodburn. Data on work travel among the cities on the regional network is available to SKT planners, and can be used to prioritize certain pulse combinations.
- A pulse between Route 10 and Canby’s Route 99, in Woodburn (or, in the future, in Canby) could govern the timing of Route 10’s pulse at the DTC.
- Routes that service Chemeketa Community College and Western Oregon University should be scheduled so that they go outbound early enough for students to reach morning classes on time.
- Routes coming from small towns that have little employment should be scheduled so that they come inbound (towards higher-employment towns) in the morning. However, this comes with a cost, if vehicles can’t be stored overnight in those towns, and must be driven out first thing in the morning (as described starting on page 63).
- Balancing desires for more frequent trips at peak-commute times with trips that allow non-peak commuters to reach their jobs, and allow people the flexibility to travel early, late, or in the midday.

**Potential Inter-agency Partnerships**

In explaining this recommended No New Funding Network, we have alluded to a number of opportunities for SKT to partner with other agencies. They are explained more fully in this section.

**CANBY AREA TRANSIT**

Today Canby Area Transit operates a single fixed route, the “99.” It runs from Woodburn...
to Oregon City eight times each weekday (and more frequently than that, within Canby) as described starting on page 37.

There are a number of reasons we believe an improved 99E connection with Canby and Oregon City would result in higher ridership:

- There is two-way travel demand all along the 99E corridor, from Salem to Portland, among many different towns. Buses running on this corridor would attract riders in both directions, on all segments of the route, at most times of the day. This offers great potential for high productivity, because the transit agency isn’t paying for empty buses in one direction.

- There is all-day travel demand along 99E. This relates to the mix of industry, service and office jobs; social and public services; and educational facilities, located walking distance from 99E. All-day demand makes transit more productive, compared to peak-only demand.

- All of the towns along 99E developed before the interstate freeways and are thus fairly transit-oriented. The cores of the towns are mostly walking distance from the highway, or on a nearby parallel road. This means that a route along 99E can get passengers close to a lot of destinations while still feeling fairly direct for long trips.

Canby Area Transit recognizes that Canby residents want to travel to Oregon City, and to Woodburn, and to the many towns in between. For that reason, CAT’s Route 99 goes far beyond the Canby service boundaries. SKT could certainly do the same, and send Route 10 to Canby, but a more substantial collaboration with CAT could be very fruitful.

We recommend that SKT begin a conversation with CAT about planning and funding service to the 99E corridor, together. A partnership that accomplishes this could be phased in this way:

1. First, CARTS 10 and CAT 99 are scheduled so that they reliably make a pulse at the Woodburn Bi-Mart.

2. As in #1, but with the exchange of some funding (to pay for the extension of CAT 99), the two routes pulse at the Woodburn Transit Center, which would be a better location for a pulse.

3. SKT runs the CARTS 10 to Canby, and CAT runs its Route 99 to Woodburn - the two routes overlap, sharing stops and shelters. Anyone traveling between Canby and Woodburn can wait at a single stop for either agency’s bus, and on many trips each day the routes may offer them a one-seat ride.

4. SKT and CAT run the 10 and the 99 all the way from downtown Salem to Oregon City. Each agency uses its own buses and its own drivers, but the routes are the same. It would probably make sense for SKT to rename the CARTS 10 to the CARTS 99, in this case. It would also make sense for the two routes to charge the same fare. This is the current arrangement between Wilsonville SMART and SKT, for operation of the 1X, today.

5. As in #5, but one agency or the other runs the new Route 99, from Salem to Oregon City. The agency that does not run the route itself compensates the other partner.

LINN COUNTY
As described earlier (starting on page 31) 73% of people living along Highway 22 east of Stayton live in Linn County.

Yet SKT’s authority as a transit provider was granted by Marion and Polk Counties, and it is due to that relationship that SKT accesses federal and state grants for transit.

Linn County and Albany Transit have access to similar funding. Unfortunately, Linn County residents in the Canyon are very isolated from the rest of their county, and from the Albany Transit network. They are much better connected to the
Salem-Keizer local and regional networks.

We recommend that SKT approach Linn County and start a conversation about pooling state and federal funds, in order to provide lifeline service up the Canyon. At SKT’s current operating cost, with continued service on weekdays only, split in proportion to population, this partnership could result in a cost to SKT of about $14,000 per year and a cost to Linn County of about $38,000 per year. The cost sharing arrangement could be updated every decade, when new Census data allows an update of which county the residents served by the route live in.

While we imagine that Linn County is already struggling to meet transit needs elsewhere, it will be hard for SKT to justify spending funding meant for Marion and Polk residents on service to a very rural part of Linn County. Canby Area Transit sends its service across county boundaries because large numbers of Canby residents and businesses have travel desires that cross those boundaries. The same cannot be said for this rural part of the Canyon, where transit service will primarily benefit local (Linn County) residents.

**CONFEDERATED TRIBES OF THE GRAND RONDE**

As described starting on page 30, the 2X Express funded by the Tribes could not pass through Dallas without improvements to the intersection of Highway 22 and Kings Valley Highway. A staff representative of the tribes indicated some openness to the idea of the 2X serving Dallas, though its impacts on travel time and cost would need to be discussed.

We recommend that SKT, the City of Dallas, Polk County and the Tribes jointly ask ODOT to look at this intersection, and to think about how to make improvements that would allow greater gains from the considerable transit investment already made in the 2X.

**ALBANY TRANSIT**

Another omission from this map is the addition of service to Albany. Many stakeholders expressed an interest in such service, either via I-5 or local roads, and there is a great deal of demand for travel between Albany and Salem (as shown in Figure 15 on page 29).

We have not designed this idea into either recommended network because there is already intercity service between Salem and Albany—six times each day (including on weekends) the Oregon POINT bus goes between the two. (In contrast, the POINT connects Salem with Woodburn only twice daily, and with Oregon City only once daily.)

However, the POINT bus departs from Salem’s Amtrak station, which is a 15 minute walk from the Downtown Transit Center (though it is closer to major state employment buildings). Also, Mission Street ramps in front of the Amtrak station preclude Cherriots bus stops near the station, which contributes to the lack of frequent service between the station and the DTC.

Further, the POINT bus is more expensive (at $11, one-way) than a CARTS Salem-to-Albany route would likely be.

Any SKT service between Salem-Keizer and Albany would be competing with POINT service (which is not true of either the 1X or the recommended connection to Canby and Oregon City). While connections on local roads between North Albany and Salem might generate modest ridership, they do not rise to the level of inclusion in this 125% funding recommendation.
Increased Funding Network

Today SKT’s regional services are paid for by federal funds; by state funds; by fares; by Salem-Keizer property taxes and Wilsonville payroll taxes (for the 1X); and by one partnership (funding of the 2X by the Tribes).

This package of funding represents the bare-bones level that is available in Oregon, and it is particularly low for a pair of counties with such a large urban area at their center. It is possible that in future years the state, counties or cities will decide to raise more money for transit service. The network shown in Figure 24 on page 45 would implement the stakeholder guidance received in this planning process, but would require 25% more funding for regional transit operations than is available today, for 84 service hours per weekday.

Weekends

Were SKT to begin operating Cherriots service on the weekends, we would recommend that instead of making any of the changes reflected in this Increased Funding Network, SKT simply pay for weekend service on the No New Funding Network.

When people at the Stakeholder Workshop were asked what they would do first, if they had more budget for regional transit, the most popular response was “Add weekend service.” However, once they realized that CARTS weekend service could go forward without Cherriots, a few people said that they would change their answer. Without the strong urban network to provide mobility within Salem-Keizer, weekend service from smaller towns to the heart of the urban area didn’t make as much sense to them.

To the No New Funding weekday network, SKT could add weekend and holiday services at lower frequencies, at half of the cost of weekdays. This would cost about one-quarter of the weekday-only network, coming close to the 125% budget for this Increased Funding Network.

(However, the cost of this 125% network is

"If new funding were available for regional transit, what would you do first?"

- Serve more cities: 11%
- Increase the frequency of service to cities that already have some service: 29%
- Improve the quality of buses, shelters, etc.: 0%
- Add weekend service: 57%
- Something else: 4%

Percent of stakeholders who selected each response

Figure 23: Adding weekend service was the most popular choice, at the Stakeholder Workshop, for how to spend any additional regional transit funding. However, without the urban network (Cherriots) also running on weekends, regional weekend service is unlikely to attract much ridership.
Figure 24: If funding for transit were increased by 25% in the Salem-Keizer region, we would recommend adding more trips among the biggest cities, so that people have more choices about when to travel each day. *Additional daily round trips over the No New Funding network.
estimated in service hours, not in dollars. Some costs related to adding weekend staff aren’t captured in service hours. Because shifts become more complicated, and staff may need to be paid more to work on weekends and holidays, the cost in dollars of adding weekend service may be a little higher than the service-hours-based estimate suggests.)

Providing weekend service on the regional network would do more to increase total ridership than the small additions of frequency and demand-response described below. However, this would only be the case if Cherriots were also operating on weekends. Thus, for this Increased Funding recommendation, under the assumption that regional funding could increase before Cherriots weekend service is added, additional revenue for CARTS has been spent on weekday-only service.

**Increased Frequencies & Spans**

The increases we recommend in this network are mostly designed to continue growing regional transit ridership, rather than to expand coverage. This is consistent with stakeholder input that, aside from adding weekend service, increasing service frequency among cities is more important than adding service to cities that currently have none.

The Increased Funding Network differs from the No New Funding Network in the following ways:

- One additional daily round trip between Salem and Woodburn on Route 10 (seven, instead of six).
- Route 10 would continue all the way to Canby three times a day. (By partnering with Canby Area Transit, SKT may be able to

<table>
<thead>
<tr>
<th>Increased Funding Network - Weekday Frequencies and Costs</th>
<th>Service</th>
<th>Round trips per weekday</th>
<th>Quantity (service hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Salem-Woodburn</td>
<td>7</td>
<td>21.0</td>
<td></td>
</tr>
<tr>
<td>10 Woodburn-Canby</td>
<td>3</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>20 Salem-Silverton</td>
<td>4</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>20 Silverton-Mt. Angel</td>
<td>2</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>30 Salem-Stayton (via Hwy 22)</td>
<td>3</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>30 Stayton-Gates*</td>
<td>2</td>
<td>0.6*</td>
<td></td>
</tr>
<tr>
<td>60 Salem-Stayton (as a deviated fixed route)</td>
<td>3</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>40 Salem-Dallas (via Mon.-Ind.)</td>
<td>7</td>
<td>18.0</td>
<td></td>
</tr>
<tr>
<td>50 Salem-Dallas (via Rickreall)</td>
<td>2</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>45 Dial-a-ride for Dallas-Mon.-Ind.</td>
<td>--</td>
<td>13.0</td>
<td></td>
</tr>
<tr>
<td><strong>SKT total for all services:</strong></td>
<td></td>
<td><strong>82.2</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Because 27% of people living east of Stayton are in Marion County, we recommend that SKT reserve 27% of the 2.8 service hours it would cost to run Route 30 between Stayton and Gates, and pursue a partnership with Linn County to fully fund the service. This recommendation is discussed further starting on page 32.

Figure 25: The number of daily round trips on each route, and the quantity of service (which correlates with cost), in the recommended Increased Funding Network.
make this investment go farther, perhaps all the way to Oregon City twice a day.)

- One additional daily round trip between Salem and Stayton via Highway 22 on Route 30 (three, instead of two).
- One additional daily round trip between Salem and Dallas, via Monmouth and Independence on Route 40 (seven, instead of six).

Route 60 between Salem and Stayton, which runs on local roads (rather than Highway 22), could more easily be run as a deviated fixed route in this Increased Funding Network, because a third daily trip would have been added to the Express (Route 30). Running Route 60 as a deviated fixed route would cost slightly more service hours than are shown in the table in Figure 25.

Running Route 60 as a deviated fixed route is the only change that we do not expect would increase ridership. However, city leaders in those towns expressed deep concern over the plight of people with severe needs who could not access an Express, and this increase in access would help address those severe needs. Given that stakeholders at the Workshop did not desire a totally ridership-maximizing network, this lower-ridership alternative seems appropriate in an increased funding scenario.

**Potential Inter-agency Partnerships**

**CANBY AREA TRANSIT**

In this network, some of the increased funding for regional transit has been spent running CARTS 10 past Woodburn, to Canby. This potential partnership, and how it might be phased, is described starting on page 41.

**WILSONVILLE SMART**

City representatives from Woodburn expressed a desire for access to 1X service, so that Woodburn commuters could reach Wilsonville and the southwest Portland Metro area.

We have not recommended this addition, in the Increased Funding Network, for two reasons: we are not confident that it would be a productive service (for reasons described starting on page 29), and are concerned about impacts on the large number of existing 1X riders.

**WESTERN OREGON UNIVERSITY**

A representative of Western Oregon University (WOU) participated in both the Stakeholder Workshop and the City Leaders meeting. He expressed WOU’s interest in greater frequency of service between WOU, Salem-Keizer and Dallas. He also suggested that if a financial partnership between SKT and WOU would help increase the frequency of service, that should be explored in the future.

The No New Funding recommendation shown in the map on page 27 includes one more round trip on Route 40, which connects WOU to Dallas, Independence and Salem, than exists today. Any further additions of frequency, such as the 8th daily round trip shown in the Increased Funding network map on page 45, would require new funding, and that could include funding from partners like WOU.
Implementation

This chapter describes some of the questions and processes that SKT will need to consider if the agency decides to implement part or all of these recommended networks.

Relationship between CARTS and Cherriots

CARTS and Cherriots are currently different services, in many ways:

- Different names
- Traveling different distances
- Different fares and tickets
- Serving different cities (except for Salem)
- Shown on different transit maps (at very different scales), using different colors
- Different vehicles
- Different drivers
- Different customer service centers
- Different sources of funding

And yet they are operated by the same agency, they come together in downtown Salem, and many people use both.

This raises the natural question: Should they be combined?

Complete integration of every element listed above would be a big undertaking, but only some of it would have an effect on customers, and not necessarily a positive effect at that.

We recommend that SKT start by thinking about whether certain types of integration would:

- increase ridership in other ways, or
- achieve other agency goals.

Certain types of potential integration between Cherriots and CARTS – and areas of potentially useful distinction – are described in this section.

Service Branding

Service branding makes the features of a transit network that relate to its utility visible to and understood by customers.

Some brands on transit do not relate to utility - such as the name of the operator (“Cherriots”) or the fuel powering the bus (“Hybrid”). These brands have a purpose, but the purpose is not describing a service’s usefulness.

In urban transit networks, agencies will sometimes brand certain routes based on their frequency (such as TriMet’s “Frequent Transit Network”) or their speed (“Rapid” buses or trains) or their path across the city (“crosstown”). In a rural network, these distinctions are minor.

There are distinctions relating to service utility that can be made between local, urban services and regional routes, and among the other services SKT operates. Some of these distinctions are inherent:

- Express routes will travel for very long distances between stops, whereas Cherriots routes (and Woodburn’s circulator, the other local fixed route in the area) make closely-spaced stops
- Express routes will make fewer trips per day than Cherriots routes; the latter run at least every hour, and as much as every 15-30 minutes
- Deviated fixed routes will accept requests for deviations, and will be slower than Express routes most of the time
- Dial-a-ride services accept reservations from the general public, for travel from anywhere
to anywhere within a zone. Unlike the other services, they have no fixed route or stops.

- Paratransit (CherryLift) is only available to people who have a disability that prevents them from using fixed-route transit. They can make a trip from anywhere to anywhere, within a zone, with a reservation. Paratransit has no fixed stops.

We recommend that SKT use these inherent distinctions, all of which relate to utility, to brand its services. This means that we recommend SKT continue to show the public through names, information, colors, maps and other indicators that regional services (like CARTS and the 1X) are not the same as local services (like Cherriots).

It may be that some naming conventions and service brands already being used would work well in the future - for example, if the “X” convention were applied to future regional routes that operate as Expresses. The route to Dallas would be called the 5X and to Stayton the 3X.

(A nice effect of naming routes with single-digit numbers is that they fight the impression that transit is complex and hard to figure out. Big numbers create a subtle, subconscious illusion that there are many, many routes.)

This is not to say that CARTS services – even deviated fixed routes – aren’t ready for a rebranding. Nor that some over-arching brand shouldn’t be applied to Cherriots, CARTS and the “X”s. However, such an over-arching brand would identify the agency, not the particular features of each type of service that makes it useful to the customer. This suggests that the over-arching branding should be subtle, so that service brands are distinct and visible.

CARTS has a legacy of social service that has been appropriate to its design and role in the community, and that now imbues its brand in peoples’ minds. It is primarily a low-ridership service that meets the needs of small numbers of people who have few other choices. People identify both the name and the vehicle (which resembles CherryLift vehicles) with this social service purpose.

If SKT implements some or all of these recommendations, regional services will attract a wider range of people as passengers. People with severe needs and disabilities should and will continue to ride, but they will joined by others who have more choices. Any future brand for Express services should convey this broader usefulness and appeal, so that larger numbers of people get the sense that the regional service might be useful to them or someone they know.

Non-Branded Integration

Many other distinctions between CARTS and Cherriots are not inherent, meaning that they could be changed without changing the fundamental distinctions between SKT’s urban and rural services. Two such differences are:

- The CARTS fare is higher than the fare for Cherriots; 1X and 2X fares are higher still. Transfers among them are not accepted, though one can purchase a Universal pass that is good on all of them.

- CARTS is operated with smaller, older buses than Cherriots and the 1X and 2X. The wheelchair lifts on CARTS buses are slow and intimidating.

Fares, transfers, and the comfort and reliability provided by a transit vehicle do relate to utility. Yet they needn’t differ between SKT’s local and regional services, and they are probably acting as barriers to increased ridership on the regional services. Branding regional services based on these differences would be short-sighted.

There are yet more non-inherent differences that are invisible and irrelevant to a customer’s understanding of what each transit service does:

- Cherriots, 1X and 2X drivers are employees of SKT. CARTS drivers are employees of a contractor (MV Transportation), and their...
compensation is lower than that of Cherriots drivers. This could potentially have an impact on the quality of service that riders receive, but it doesn’t necessarily. Contractors can provide excellent service just like agency employees.

• Cherriots, 1X and 2X services are funded by local tax revenues, whereas CARTS service is funded by minimal state and federal grants.

These two factors - staffing and funding - are enormously relevant to how SKT manages these services. There may be benefits to integrating CARTS and Cherriots across some or all of these three areas. (Fleet ownership and maintenance are already integrated: CARTS, Cherriots, 1X and 2X buses are all owned by SKT, maintained by SKT employees, at an SKT maintenance facility.) However, such distinction or integration, being irrelevant to a customer’s definition of service utility, doesn’t belong in the service brand.

Differences in Unit Costs
There is a large difference in unit costs between CARTS (which is contracted-out to MV Transportation) and Cherriots. CARTS services costs SKT about $74 per hour, whereas Cherriots services cost about $159 per hour. Choosing the operator for a service thus has a big effect on how much service can be provided, within a fixed budget.

For example, on the surface, it appears that were SKT to shift the 1X and 2X services from Cherriots operations to MV Transportation (contracted operations), the agency could suddenly afford twice as much service with those dollars.

However, there may be difficulties in shifting Cherriots services to CARTS if the two sets of operators have different training, expectations or follow different operating procedures.

There is likely an inherited (but not inherent) difference in expectations of CARTS and the 1X in particular. CARTS services have, for many years, been designed for the needs of a small number of people, many of whom are low-income, disabled or have limited choices for other reasons. The 1X, in contrast, was designed for peak-hour commuters, who are much more likely to be professional and affluent, and have more choices about how to travel.

The 1X and CARTS routes are both regional, can both run peak-only or all day, and can both be useful to a broad range of people for many kinds of trips. However, their independent evolutions and their current marketing emphasize their differences. Integrating them into a single regional Express brand would require eliminating some of these non-inherent differences, and would make them both more similar to one another. This could involve changes to the type of vehicles and how they are maintained, to the quality of stops, to the training and compensation of drivers, to the service brands, and to marketing and public information.

Governance
Volume I of this report, on Existing Conditions, described issues of CARTS governance at some length. While the system is regional, and draws on funding derived from its agreements with Marion and Polk Counties, the governing body that ultimately makes value judgements about how to design and run the system is elected from the Salem-Keizer urban area.

There is a very clear relationship between Cherriots service and the SKT Board. The relationship between 1X and 2X service and governance by the SKT Board is a little looser (since 2X service is provided by contract for the Confederated Tribes of the Grand Ronde, and the 1X benefits Salem-Keizer residents and Portland Metro residents alike). The relationship between CARTS services and the elected SKT Board is the least defined.

This mismatch may not cause problems, until it does. If that time comes, a number of potential changes to governance structure, or additions to
the structure that might address the problems, are described in Volume I.

SKT may wish to consider, in the near term, creating a committee to advise the agency on its regional services. This committee would have a broader purpose than the existing STF Committee (whose scope is more narrow, relating to state Special Transportation Funds for seniors and people with disabilities), but might include a delegate from the STF Committee. Such a regional transit advisory committee could be composed of representatives appointed by each County and each City in the region (except for Salem and Keizer), and would thereby help to balance out the urban constituents that the SKT Board naturally hears from most.

**Contracting**

Today, SKT pays MV Transportation for the hours of service it provides. (“Service” or “revenue” hours are the time that a bus spends in service, available to passengers, collecting revenue. These hours do not include deadhead time, during which the bus is driven to or from the garage or between routes, nor do they include driver breaks during which the transit vehicle is closed to passengers.)

We recommend that, in the future, SKT contract with providers for *vehicle* hours. Vehicle hours include deadhead time, and describe the time between when an operator pulls a transit vehicle away from a garage or an established storage location and when it is returned. Vehicle hours track most closely with the major driver of transit operating cost, which is drivers’ paid time.

It can seem, at first glance, that a transit agency would get more for its money by contracting for service (“revenue”) hours. In the very short term this is true, but in the long term, an agency will pay for deadhead time (which is counted in vehicle hours, but not revenue hours) one way or another.

The number of vehicle hours a given service requires arises from choices about where buses are stored, where maintenance is performed, and where the buses and drivers start and end service every day. Because SKT controls all of these factors, SKT controls the major cost drivers of regional transit operations, and SKT should pay for vehicle hours.

The reason this is in SKT’s interests (and the interests of SKT customers) is that when deadhead costs are buried in revenue hour costs, they become opaque. It’s hard for SKT to know how choices about where to put a route in service first thing in the morning (e.g. out in Woodburn or in Salem) affect its operating cost. In the short-term, the revenue hours cost is the same; in the long-term, the contractor providing the service will naturally load deadhead costs into the revenue hours cost, raising the revenue hours cost. Similarly, if SKT were to eliminate deadhead time through a service change, the savings associated with that would be hard to see and slow to accrue.

The cost consequences of deadhead time on CARTS routes are currently opaque and delayed, instead of clear and instantly calculable, and the latter condition would better support smart service design decisions by SKT planners. Paying for vehicle hours, rather than revenue hours, would be a step towards greater clarity for SKT.

(Our recommendation would be different if maintenance and storage facilities were placed and provided by the contractor, because then it would be up to the contractor to plan for and manage deadhead costs.)

The other reason agencies do not pay for revenue hours is that doing so gives a contractor a *disincentive to improve travel times*. Every minute faster a route is run is an improvement in travel times for riders, but it is a minute of lost revenue for a contractor. This incentive structure is backwards - at the very least, a contractor should be paid the same whether a route runs slower or faster, and in fact many contracts...
provide incentives for contractors to steadily improve travel times.

In order to contract for vehicle hours, SKT will have to think through and specify what type of time counts for compensation - for example, clear definitions of recovery time (which improves reliability), layover time (which provides a short driver break), time spent at pulses at transit centers, deadhead driving time, and time spent midday between peak-only services. The more specific SKT gets about the costs of its services, the more uncertainty is eliminated in contractors’ estimations of potential costs, and the less contractors must hedge against future service-design-related cost growth in their bids.

Fare Structure Changes

Fares for SKT services – regional and local, deviated and fixed – have not been comprehensively reviewed or redesigned in many years.

In general, the current fare structure treats each service as a stand-alone product rather than as part of a network. (Only the Universal Month Pass suggests that these services might be used together for a single trip).

The current fare structure also seems to treat the 1X and 2X as “premium” services, and prices them accordingly, while other services are priced lower. Yet the principles behind this distinction are hard to deduce.

Fares are sometimes set in proportion to costs per boarding, so that an agency can recover its operating costs proportionately from riders on each service, and “farebox recovery” is consistent across services within a category or all services in the system, and the transit agency’s subsidy to each rider is roughly equal. Another reason to set fares this way is to send people accurate signals about what each service costs to provide, so that people use different services in proportion to both the cost (to the agency) and the value (to themselves).

<table>
<thead>
<tr>
<th>Service</th>
<th>Full Fare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherriots</td>
<td></td>
</tr>
<tr>
<td>One-way</td>
<td>$1.60</td>
</tr>
<tr>
<td>Day pass</td>
<td>$3.25</td>
</tr>
<tr>
<td>30-day pass</td>
<td>$45.00</td>
</tr>
<tr>
<td>Annual pass</td>
<td>$540.00</td>
</tr>
<tr>
<td>CARTS</td>
<td></td>
</tr>
<tr>
<td>One-way</td>
<td>$2.25</td>
</tr>
<tr>
<td>Day pass</td>
<td>$4.50</td>
</tr>
<tr>
<td>Monthly pass</td>
<td>$60.00</td>
</tr>
<tr>
<td>Universal month pass</td>
<td>$85.00</td>
</tr>
<tr>
<td>Deviations/dial-a-ride</td>
<td>Free with fare</td>
</tr>
<tr>
<td>1X</td>
<td></td>
</tr>
<tr>
<td>One-way</td>
<td>$3.00</td>
</tr>
<tr>
<td>Day pass</td>
<td>Not offered</td>
</tr>
<tr>
<td>Universal month pass</td>
<td>$85</td>
</tr>
<tr>
<td>2X</td>
<td></td>
</tr>
<tr>
<td>One-way</td>
<td>$3.00</td>
</tr>
<tr>
<td>Day pass</td>
<td>$6.00</td>
</tr>
<tr>
<td>30-day pass</td>
<td>$85</td>
</tr>
</tbody>
</table>

Figure 26: Current fares on regional and local services. SKT also offers reduced fares for qualified individuals.

SKT’s fare structure for all of these services is complex:

- The universal month pass is good on CARTS, Cherriots and the 1X...but not the 2X.
- A day pass can be purchased for all services...except the 1X.
- The CARTS and 2X day passes are exactly twice the price of a one-way ticket, but the Cherriots day pass is twice the price...plus five cents.
- You can buy a Cherriots pass that is good for 30 days from the purchase date...but a
CARTS monthly pass applies to the calendar month.

These surprising exceptions to patterns, and the lack of obvious and consistent principles underlying the prices, surely confuse and frustrate riders.

We recommend that the agency conduct a detailed fare study in the future, to simplify its offerings, to bring its fares better in line with its goals, and to evaluate any new fare media (such as transfer slips or electronic fare cards) that a simplified, updated fare structure would require. This study might require the SKT Board to adopt some policies relating to farebox recovery and, with it, costs per boarding.

SKT currently offers a reduced fare for seniors, youth and people with disabilities. This is a good practice, and should be continued across all fare types in the future.

**TRANSFERS WITHIN THE REGIONAL NETWORK**

Today, transfers between CARTS routes are not free for riders – they must purchase another ticket upon boarding the second route. However, a CARTS day pass is available for the price of two single tickets. This means that anyone who is making a transfer between two routes and expects they will make a round-trip can buy a day pass, and gets to transfer for free. People who do not expect to make a round-trip, perhaps because they get a ride from a family member or carpool one-way, cannot make a transfer as part of their (one-way) trip without paying twice.

Transfers among CARTS services and either the 1X or 2X are not covered by a CARTS day pass. Thus anyone wishing to use those two (currently distinct) networks must also pay twice.

Charging for transfers would make sense if transferring were a premium service that added to peoples’ transit experience. In fact, transferring is slightly inconvenient for riders, but by asking them to transfer we can offer them a more abundant, direct and frequent transit network. The service a transit agency is providing is the transport of someone from one place to another; it is not the boarding of a single bus. In light of these considerations, it makes little sense to charge for transfers.

SKT’s current practice of selling a Day Pass at twice the price of a one-way ticket addresses this problem for people who make a predictable round trip, but many people will occasionally or often wish to make a regional trip by transit one direction, and by car the other.

SKT also sells a Universal Month Pass that allows for unlimited use of (and free transfers among) Cherriots, CARTS and 1X. The up-front price of this pass is $85, which is out of reach for most low-income people to purchase at once. Even more affluent people are wary of making a big up-front investment in a monthly pass when they aren’t sure how much they’ll ride in the next month.

While the Day Pass and Universal Month Pass mitigate the impacts of non-free transfers for some customers, a more comprehensive revision of fares, and some degree of integration of fares across services, would address this problem for all riders.

Non-free transfers are a legacy of a time when individual transit routes were run by separate, sometimes competing companies. They are also a legacy of a time when transit agencies were greatly concerned about lost revenue from shared or sold transfers – a person getting off the bus could hand their transfer to a person just getting on the bus, depriving the agency of that revenue.

We advise SKT to not worry too much about this problem. Defending themselves against this minor fraud has caused transit agencies to design networks that avoid transfers as much as possible, become more complex and less frequent, and thereby lose ridership and relevance in their communities. In the end, making transferring as easy as possible threatens a little bit of fare revenue, but offers great returns to the
IMPLEMENTATION

transit network and the community it serves.

**TRANSFERS BETWEEN REGIONAL AND LOCAL SERVICES**

SKT should consider reducing the cost of transferring from a regional service to Cherriots. Because the 1X, 2X and any future Express routes cannot make more than a few stops in Salem/Keizer, the Cherriots network is essential to helping many CARTS riders reach their final destinations. Offering free transfers between the two networks would not be unreasonable, though a discounted transfer would also be appropriate.

If SKT shifts to an Express network that makes limited stops in each city, it may also be wise for SKT and local governments to establish a discounted or free transfer to other local services. For example, the City of Woodburn and SKT could make such an arrangement. As described above, a partnership with Canby Area Transit to provide service along the 99E corridor should eventually include some fare reciprocity.

Finally, SKT should consider how much time fare payment adds to its services’ running times. When a bus stops for a passenger, some of this delay (to the other passengers on the bus) is caused by the boarding passenger paying their fare. Free transfers reduce this delay, as do the increased use of day or extended passes.

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**Figure 27: This chart shows hourly ridership on CARTS 45 in Dallas, Monmouth and Independence. The pattern may reflect general demand, or it may reflect how the service is currently scheduled. Multiple factors could affect this daily pattern in the future, including whether SKT schedules the service to connect with Express routes; whether the service is designed and dispatched around work shifts at large employers for people with disabilities; and how the dial-a-ride fare compares to the fare for fixed routes in the area.**
Pricing Regional Services

Also problematic, for transfers and for the overall legibility of the regional network, are the differences in price among CARTS, 1X and 2X fares. The 1X and the 2X have the highest price, which would make sense based on the total hourly cost of operating those services. Yet because of its high ridership, the cost per boarding on the 1X is much lower than other regional services (as can be seen in the table on page 32). These high fares likely arise from the 1X’s and 2X’s identities within the organization and the region as “premium” services marketed to professional commuters.

If certain regional services are to have a higher fare than others, SKT should be clear (internally and externally) about the basis for that difference, whether it relates to operating cost, cost per passenger, distance, the value of the service provided, passengers’ abilities to pay, or some other factor.

Pricing Dial-a-Ride or Deviations

The costs per passenger on dial-a-ride services and fixed routes (summarized in the table in Figure 17 on page 32) is radically different. While a fixed route bus can easily get 20 or 30 people through the door each hour, a dial-a-ride service or a deviated-fixed route service with many deviations simply cannot get to and from so many unique destinations in an hour. Dial-a-rides will always struggle to achieve more than eight passengers per hour.

Yet today these two services are priced the same. People have no financial incentive to use a fixed route – at far lower cost to SKT and to taxpayers – when they can get picked up at their door for the same price.

There are people who need a ride from their door, and there are people who prefer a ride from their door. To encourage people who just prefer dial-a-ride or a deviation to use a fixed route instead, SKT should adjust its fares to more closely communicate the enormous difference in the costs of these two services. Should SKT continue to operate its deviated fixed-routes, this would mean that passengers who wait at a fixed stop would pay a lower fare than passengers for whom the bus deviates.

FTA allows agencies to charge twice as much for a deviation as for a fixed stop on such routes, and many other Oregon transit providers do so. (See page 7-12 of the 2015 FTA Circular on ADA, “FTA C 4710.1”)

SKT currently offers reductions in all fares to qualifying individuals. Were SKT to charge a higher fare to all passengers for deviations or dial-a-ride, it would be reasonable to offer a proportional reduction in that fare to people who qualify. In this way, the price of dial-a-ride and deviation services would more accurately reflect the costs of providing those services, yet people with severe needs who depend on them would not experience that price as a barrier to access.

Dial-a-Ride

If SKT acts on these recommendations in their entirety, SKT’s only regional dial-a-ride service in the region will be in Dallas, Monmouth and Independence. (SKT operates the RED Line dial-a-ride within the urban area.)

We recommend that SKT then do a more detailed study to design the Polk County dial-a-ride service. (For precise instructions, see TCRP Report 161 and its accompanying spreadsheet.)

This dial-a-ride study should take into account:

- Current CARTS 45 daily ridership patterns (which are shown in Figure 27 on page 54);
- The proportion of current CARTS 45 riders who could use a fixed route – such as the recommended Expresses – for their trip;
- Potential coordination with other transportation providers in the area, such as housing and community organizations;
• Potential increases in the dial-a-ride fare, relative to the fixed route fare;

• Improvements in scheduling and dispatching technology, that could make the dial-a-ride service more useful to a broader group of people.

It will be very important to keep in mind, during such a study, that the current ridership patterns on CARTS 45 are a result of numerous factors that may change in the future. One such factor is the price – if dial-a-ride becomes even slightly more expensive than a fixed route, some riders may shift away from dial-a-ride.

Another factor is scheduling – SKT has historically focused the marketing and scheduling of the 45 around the needs of only people with disabilities, and their employers. That has generated a particular pattern of demand today.

Changes in marketing and scheduling, or changes in the way those employers (chiefly Goodwill and Garten Industries) operate, may affect future demand for dial-a-ride. For example, were the 45 scheduled to make reliable connections with the 40 or 50, for trips into Salem, and marketed with those connections in mind, it might attract a broader group of riders than it does today. But scheduling those connections, and also serving Goodwill and Garten at the times when their employees’ shifts change, may be hard or impossible.

Finally, SKT can consider making this dial-a-ride service specifically and exclusively available to seniors and people with disabilities. This would likely reduce ridership on the service, but might better meet the needs of these riders. If SKT were to do this, a qualification system would need to be implemented for riders, like the one that establishes eligibility for CherryLift riders.

Measuring Performance

The performance of transit services can and should be measured in ways that tell the public, stakeholders, the Board and staff how well those services are delivering on the outcomes for which they were designed. A key concept here is that transit services are not serving the same goals, and therefore should not be evaluated using the same measures.

Guidance from Stakeholders

Stakeholders and City Leaders who participated in this process have given SKT some insight into the balance of goals for which the regional transit network should be designed, and therefore the way that the network, and individual services, should be measured. However, additional work and – importantly – decision-making by the SKT Board must be done before a set of clear performance measures can be established.

At the Stakeholder Workshop and at follow-up meetings, most stakeholders’ had strong reactions to the performance of current services:

• The high costs per boarding and low productivities of CARTS 25 and 35 (shown in Figure 28 on page 58) were unacceptable to the vast majority of the stakeholders at the workshop.

• Their reactions to the high cost per rider on the 2X are less clear, perhaps because it is funded by the Confederated Tribes of the Grand Ronde rather than by SKT.

Stakeholders at the Workshop also gave general direction to SKT about how to balance competing goals for transit in the region. They said that, in the short-term, SKT should:

• Increase ridership within the existing budget overall, i.e. increase productivity, but also...

• ...Continue to provide some deviated- and dial-a-ride services, acknowledging that
these are likely to be the least productive in the system.

While this type of input was enough to inform this short-term planning effort – these stakeholders clearly indicated that they would support a move towards higher ridership but lower coverage – their guidance does not tell SKT how to balance ridership and coverage goals over time.

**Board Decisions**

The next step could be for the SKT Board to develop policies defining a particular balance between ridership-maximizing service and coverage-providing service (with further input from stakeholders and the public). For example, the Board might specify that 60% of funding (or vehicle hours) should be spent maximizing ridership, while 40% should be reserved for places where ridership is low or types of services on which ridership is inherently limited (such as dial-a-ride).

Alternately, the Board could assign different funding streams different goals, design services accordingly, scale those services up and down based on the availability of their dedicated funding, and then monitor performance based on those different goals.

There may be a desire, among stakeholders and SKT Board members, to maintain the existing balance of service quantity among different corridors, and between Polk and Marion Counties. This is understandable, but it will conflict with the desire to increase productivity in the future.

There is a potential conflict between these two goals: one goal of increasing the productivity of the regional network, and the other goal of keeping investment levels the same in each corridor or each county.

If the SKT Board does not permit itself to shift service quantities among corridors, SKT’s ability to grow ridership and make the system more productive will be limited. Different corridors have different ridership potential and, even more clearly, have different numbers of jobs and people. SKT’s power to increase ridership within a fixed budget comes mostly from its power to shift service from places with lower ridership to places with higher ridership.

Ridership and productivity can certainly be
increased by shifting from one service type to another (e.g. from deviated fixed route to Express), and by improving connections and refining schedules. However, once such changes have been made, any further increases in productivity would have to arise from a shift in service quantity towards higher-ridership places.

Most transit agencies have adopted a ridership and productivity policy that specifies a standard against which they measure the performance of their entire system, such as “Our system will average at least 13 boardings per vehicle hour.” In addition, specific standards may be adopted for different service types (as described in the following section.) The SKT Board could certainly adopt such policies and standards, but doing so would imply a willingness to shift service quantities among corridors and counties. This step should therefore not be taken lightly.

**Systemwide Productivity**

Productivity of the entire system (including dial-a-ride and deviated routes) is very likely to increase if these recommended networks are implemented. Today, SKT is achieving 7.7 boardings per service hour, across all CARTS services. (With the 1X included, it is achieving 9.0 boardings per service hour.)

A systemwide productivity measure would reflect the clearest direction we have from stakeholders: increase the ridership on the entire system, on average, within your current budget.

If the SKT Board decides that service quantities can change among corridors or between counties, then staff should develop a proposed systemwide productivity standard to guide service allocation and design.

**Productivity Standards for Different Services**

Once SKT resolves the potential conflict between ridership standards and maintenance of existing service quantities across the region, productivity standards should be developed for the entire system and for individual service types. Some basic principles that should inform the productivity standards for individual service types include:

- Services intended to attract high ridership (in particular, Expresses) should have a higher productivity standard than those providing coverage (dial-a-ride or deviated fixed route).
- Limitations of geography and time mean that more responsive services (dial-a-ride) have a lower maximum productivity than more fixed services (deviated fixed routes or Expresses).
- In corridors with fewer people, fewer jobs and lower density, productivity will likely be lower, all other things being equal.

<table>
<thead>
<tr>
<th>Service Name</th>
<th>Productivity (Boardings per Hour)</th>
<th>Operating Cost per Boarding</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 Polk County</td>
<td>13.4</td>
<td>$5.49</td>
</tr>
<tr>
<td>50 Dallas/Salem</td>
<td>11.1</td>
<td>$6.64</td>
</tr>
<tr>
<td>1X Wilsonville/Salem</td>
<td>22.0</td>
<td>$7.21</td>
</tr>
<tr>
<td>30 Canyon Connector</td>
<td>8.4</td>
<td>$8.80</td>
</tr>
<tr>
<td>10 Woodburn/Salem</td>
<td>8.2</td>
<td>$8.98</td>
</tr>
<tr>
<td>20 Silverton/Salem</td>
<td>7.4</td>
<td>$9.92</td>
</tr>
<tr>
<td>45 Polk County Flex</td>
<td>6.7</td>
<td>$11.00</td>
</tr>
<tr>
<td>2X Grand Ronde/Salem</td>
<td>7.1</td>
<td>$22.20</td>
</tr>
<tr>
<td>35 Canyon Flex</td>
<td>1.6</td>
<td>$47.25</td>
</tr>
<tr>
<td>25 North Marion Flex</td>
<td>1.0</td>
<td>$75.72</td>
</tr>
</tbody>
</table>

Figure 28: This table shows the productivity (ridership relative to cost) of each route, and the average operating cost per rider.
These factors will affect productivities and, as a result, costs per boarding.

**EXPRESS ROUTES**
The productivity standard for Express routes included in these recommended networks should probably be close to the current productivities of CARTS 40 and 50 (and substantially lower than the productivity of the 1X).

The only changes to Route 50 would be a small improvement in its reliability and connections to other regional routes; thus we would not expect its productivity to change very much. All of the changes to the routes that are currently less productive than Route 50 should have the result of increasing their productivities, bringing them closer to or above such a standard.

Note that if people can choose between dial-a-ride (CARTS 45) or deviations (CARTS 60), and an Express route, the difference in fares between those competing services could have an effect on their relative productivities.

**DEVIATED FIXED ROUTES**
The No New Funding recommendation includes just one potential deviated fixed route – CARTS 60, between Salem and Stayton.

Should SKT decide to implement this change, CARTS 60 should not be held to the same productivity standard as Express routes, but it should be held to a higher standard than dial-a-ride.

CARTS 60 and 30 would be competing with one another. The ridership potential that today shows up in the productivity of the current CARTS 30 would be divided between these two different services.

Thus the productivity of CARTS 60 may be much lower than that of the current and future CARTS 30. On average we expect the productivity of the two routes in combination – the 30 and the 60 – to exceed the productivity of the 30 today, i.e. 8.4 boardings per service hour.

Once it is decided whether CARTS 60 would be an Express or a deviated fixed route, we suggest that SKT staff set a performance standard for it that is greater than that of CARTS 45 but less than that of CARTS 30.

**DIAL-A-RIDE**
The CARTS 45 is currently quite productive for a dial-a-ride service (6.7 boardings per hour). It operates for 15.5 service hours per day, and in our No New Funding recommendation that is reduced by a small amount, to 13 service hours per day.

Ridership on the 45 today may arise from a high degree of coordination among SKT and MV customer service, housing organizations and employers of people with disabilities in Polk County. As their needs change – in particular, if Goodwill or Garten change their own business models – the amount or pattern of daily demand for the 45 may change.

Given this uncertainty, and the slight reduction in the availability of dial-a-ride in our recommended network, we suggest that an appropriate goal for the CARTS 45 in the No New Funding network would be close to its current performance.

**Cost Per Boarding**
Cost per boarding adds an additional consideration to productivity: operating cost per hour. Cost per boarding that will reflect any SKT decisions about whether Cherriots staff or MV contractors should operate the 1X or 2X, since the operating cost per hour using Cherriots staff is nearly twice that of MV, at least under the present MV contract.

Stakeholders at the workshop had a very strong reaction to the high costs per boarding on CARTS 25 and 35 (both operated by MV). They did not react strongly to the cost of the 2X, but that may be because the 2X is funded entirely by the Tribes.

We suggest that SKT set a maximum operating cost per boarding standard of $11, for all
services. The CARTS 45 dial-a-ride is currently meeting this potential standard (at $11.00 per ride) but were its productivity to drop slightly, without a drop in its costs, it would exceed this limit.

A related measure that may become relevant before or after any future changes to fares is subsidy per boarding, which takes into account the fares that each passenger pays to cover the cost of their boarding.

**Passenger Miles vs. Boardings**

It is common for the productivity of long-distance Express routes to be measured based not on boardings per hour but on passenger miles per hour. This reflects the greater value that some communities place on longer-distance transit trips.

Using passenger miles instead of boardings means that a smaller number of people making longer trips are a more positive outcome than a larger number of people making shorter trips.

<table>
<thead>
<tr>
<th>Route</th>
<th>Measures:</th>
<th>Boardings</th>
<th>Passenger miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Four people, three miles each</td>
<td>4 boardings</td>
<td>12 passenger miles</td>
</tr>
<tr>
<td>B</td>
<td>Two people, 20 miles each</td>
<td>2 boardings</td>
<td>40 passenger miles</td>
</tr>
</tbody>
</table>

Figure 29: This table shows how boardings and passenger miles would be calculated, for two different routes. Measuring productivity using boardings would make Route A look more productive. Measuring productivity using passenger miles would make Route B look more productive. Neither is correct – the best measure depends on which the community values most, distance travelled or number of people served.

(An example is shown in Figure 29.) A community that values distance travelled more, and the number of people served less, will prefer performance measures that use passenger miles.

**On-Time Performance**

We recommend that SKT measure on-time performance not only based on actual arrival and departure times relative to the schedule, but also based on whether pulses were made or missed.

For a trip without a pulsed connection, being 7 minutes late means being 7 minutes late. But for a trip with a pulsed connection, being 7 minutes late to the pulse can mean being 3 hours late to one’s destination.

If SKT decides to implement any pulsing at the Downtown Transit Center, and in Woodburn (with CAT), then measuring the reliability of those pulses will be important. Many hours of service would be spent making those pulses work, over and above what would be required simply to make the individual routes cycle on their schedules. If the pulses do not work reliably, those service hours are wasted, and the ridership potential of these networks is lower.

**Other Principles**

We recommend that SKT keep in mind a few other principles about setting and using performance measures. We also recommend that staff review the excellent, detailed guidance published in the Transportation Cooperative Research Program’s Report #88, including a “menu” of performance measures that relate to specific goals and outcomes.

**LIMITS, NOT RANGES**

We recommend that SKT not adopt a range for a standard, but simple minima or maxima, depending on whether the measure captures a negative or positive outcome. Sometimes when agencies worry that a standard is too high or too low, they set a range. It is far better to simply note the worry at the time of adoption, monitor performance over time, and then reevaluate the
WHICH ROUTES?
Another decision that SKT will need to make about its performance standards has to do with how regional services should be grouped into service types.

- There is justification for excluding both the 1X and the 2X from a regional “Express” category – they both have different funding sources from the other regional services.
- There is justification for excluding only the 1X, because the 1X’s corridor is such an outlier in the region. The number of people traveling for work in both directions between Salem and Portland is so much higher than in every other corridor SKT serves that we should not expect to replicate 1X productivity elsewhere in the regional network.
- There is justification for excluding only the 2X – it is the only route not paid for by SKT, and the service level is not determined by SKT.

We recommend that SKT consider only excluding the 2X from the category of regional “Express” services. If the 2X doesn’t meet SKT’s service standards, that is not a concern for SKT unless it is a concern for the Tribes. (Though of course its performance should continue to be measured, so that the Tribes can evaluate it based on their own values, and so that SKT can work with the Tribes to improve its performance if desired.)

VEHICLE HOURS VS. REVENUE HOURS
If SKT shifts to paying for vehicle hours, it will become very clear that deadhead adds to operating costs. (It already does today, but opaquely.) Then SKT should shift any productivity measure from using revenue hours in the denominator to using vehicle hours.

HOW SOON WILL WE SEE RESULTS?
How quickly ridership and productivity react to changes in the regional network will depend on many factors:

- the level of marketing that accompanies the changes
- the quality of implementation
- any changes in fares that happen at the same time
- changes to economic activity or major employers that are outside of SKT’s control.

In general, we recommend that an agency monitor performance quarterly, but not make a final judgment about large-scale network changes like the ones we have recommended here until 2 years after implementation.

Waiting this long gives nearly all current and potential riders time to be exposed to updated information, and to try new services. It also starts to capture the different location decisions (among individuals, businesses and organizations) that are made in response to transit service, which lead to durable growth in transit ridership over the long term.

PEERS’ PERFORMANCE
Looking at the performance of services run by peer agencies can help establish a realistic range. However, the performance of SKT’s services will always depend so much on the geography, built environment, land use and demographics of the Salem-Keizer region that performance should not be evaluated across peer groups. Rather, performance of SKT services should be evaluated relative to other SKT services.

A few peers currently operate Express services similar to those recommended in this report:

- In the Cascades East system (among Bend, Sisters, Redmond, and others), daily frequencies are about five trips per day, and productivities range from 5.6 to 10.4 boardings per service hour.
• Bend dial-a-ride achieves 4.5 boardings per hour, within the city (a much denser place than Polk County).

• Josephine County and Rogue Valley Transit District (RVTD) run an Express route five times each weekday between Grants Pass and Medford, and it achieves 5.8 boardings per service hour. The County’s Express to Cave Junction achieves 4.9 boardings per service hour.

• Lane Transit District runs an Express from Cottage Grove to Eugene eight times per day, and less on weekends. Its weekday productivity is 25 boardings per service hour.

Transit Stops

If SKT shifts to a largely Express network, the number of stops that the agency must buy, install and maintain will decrease.

Stop Infrastructure

With so few stops to maintain, there will be an opportunity to really invest in each stop. This will be especially true if the town is excited about the stop. In addition, once SKT is telling people they must get themselves to the stop (rather than be picked up at their home by a deviation or dial-a-ride), the agency will be under greater pressure to provide a good waiting environment.

SKT and many local cities already provide this level of infrastructure at some stops, but the level of comfort across all stops varies greatly. Some cities provide shelters and benches, with solar-powered lights and trash cans, at high-riderhip stops. At other stops and in other cities, there is only a sign at the curb. Sometimes the level of infrastructure provided doesn’t match the ridership.

The scale of stop infrastructure that would be appropriate to an Express network is:

• A lighted shelter, protected from rain and sun (from above) and wind (on three sides).

• One or more benches.

• Posted schedules, maps, fare information and other transit information.

• Lighting.

• Trash cans.

• Bike parking.

• Car parking (at certain stops).

Car Parking

There will be a natural tension in placing stops, which must be consciously debated and considered: Should a stop be someplace where there is ample car parking, or should it be near many destinations?

These two characteristics are only rarely found together. The reason is geometric - where there is lots of empty space to store cars, and no one is anxious about car parking, there is very little besides empty space within walking distance!

Residents of a town who are only thinking about using the service themselves typically advocate for a stop on the edge of town, where they will have an easy time parking their car. Yet people who would ride transit to that town would find that stop unsatisfactory, because it is a long walk from anywhere they want to go.

At the same time, downtown merchants consistently underestimate the number of employees and customers who will reach them by transit, and so they will mostly be concerned that a stop inside town will use up car parking.

If a town has only a single stop, on the edge of town, then SKT and that town should not expect anyone to arrive there by transit. (The exception is in cities with dial-a-ride, such as Silverton or Dallas - in those places, someone could conceivably reserve a dial-a-ride trip from the stop on the edge of town into the center of town.) Placing the single stop on the edge of town will depress inbound ridership potential, and
will cater to outbound ridership. This is likely to be an issue in Woodburn, Dallas, Monmouth/Independence, Silverton and Stayton, which are big enough to have potential for both outbound and inbound transit ridership.

The ideal solution, in towns big enough to support it, is to place one stop in the center of town, close to the library, the schools, the hospital, city hall, and other important destinations; and the second stop on the edge of town, where there is lots of empty space for parking cars.

In the smallest towns, this will probably not be necessary, because parking is more available and because the smallest towns can be crossed on foot in a matter of minutes.

**Flag Stops**

SKT no longer permits flag stops on CARTS routes. (A flag stop is when a person waiting on the side of the road simply waves down the bus as it passes, whether or not a signed stop is nearby.) This practice was officially ended years ago, though customer expectations take a long time to change, so it persists in very small numbers.

The speed and reliability of Express routes depend on them making few and predictable stops. In addition, flag stops are dangerous: passengers wait on the sides of unlit roads, with or without sidewalks, and flag down a driver with little warning. Very determined passengers may even step out in front of the bus to make it stop. For reasons of safety, therefore, as well as speed and reliability, none of SKT’s operators - whether they are driving Express or deviated-fixed routes - should tolerate any flag stops in the future.

**Transit Vehicle Storage**

Today, SKT stores CARTS buses in Mt. Angel and Dallas. This allows service to start in those cities first thing in the morning (for the commute into Salem/Keizer) without the deadhead time and costs that would be required were those vehicles stored in Salem, with the rest of SKT’s fleet.

In contrast, the existing Route 30 begins service in Gates early each morning. The bus and driver start their day in Salem, and deadhead all the way out to Gates, before starting the inbound service. Today, SKT does not pay for this time, because it is not included in service (“revenue”) hours. However, MV must pay its drivers for this time, and so recovers the cost through a higher per-revenue-hour cost charged to SKT. The costs of long deadheads will be paid by SKT, one way or another. “Parkouts” where vehicles can be safely stored, overnight, closer to the desired start of a route, reduce deadhead costs. A parkout in Stayton or another Canyon city would reduce deadhead costs for routes serving that corridor.

There are downsides to using such “parkouts,” however. Doing emergency and preventative maintenance on vehicles is harder to schedule and more expensive, because the mechanic must be transported to the vehicle (and away from his or her garage), or the vehicle must be transported to the garage (by a team of two drivers, or a tow truck). Parkouts also increase the fleet reserve requirement, because each parkout must have its own reserve vehicle.

If all SKT vehicles were stored at one central location, maintenance costs would go down and the required fleet size would go down. Whether the reduction in these costs offsets the increased deadhead costs that arise from central storage has yet to be determined.
Equipment Upgrades
A few upgrades to regional transit equipment should be treated as higher priority than others.

Wheelchair Lifts
The CARTS fleet is adequate, but its wheelchair lifts are terribly slow. This impacts all riders, and by slowing down service it raises the cost of service and reduces the amount of service SKT can provide. It also directly impacts riders who use mobility devices, since the experience of using the lift is reportedly anxiety-inducing.

If SKT shifts to Express routes, and thereby requires all customers to get themselves to just one or two stops, an improvement in wheelchair lifts will make the entire trip more accessible and appealing to wheelchair-using customers; will speed loading at the stop; and will reduce the overall travel time for people using the route.

Stops
As described above, a shift to Express services will modestly or radically reduce the number of stops that SKT provides (from the 58 official stops today, down to about 25). Even if the agency and its contractor were to spend the same amount of time and capital dollars on stop maintenance and amenities, the level of investment available per stop would double.

Automatic Vehicle Location (AVL)
SKT does not currently have AVL systems on any of its buses (neither Cherriots nor CARTS). The major consequence of this is that the agency’s supervisors, service planners and long-range planners have a hard time getting data on service speed and reliability. Operators can collect this data by hand, but they must do so while attending to all of their other duties, and even then the data only reflects a limited number of days.

The other great potential that AVL unlocks is real-time arrival information. Once an agency has reliable AVL, and the software to use it, then the next step is to provide real-time data to customers and third-party app developers. With this data, people can find out not just when the bus is scheduled to arrive, but when it is likely to actually arrive, based on where it is now.

Real-time arrival information has become standard in the large transit agencies around the world, and soon it will be standard among mid-sized agencies like SKT. Equipping all vehicles with AVL is a necessary (though not sufficient) first step towards offering customers real-time information about their bus.
Appendix A

Stakeholder Workshop
In attendance at the October Stakeholder Workshop were 45 people with the following organizations and affiliations:

- Chemeketa Community College
- Confederated Tribes of the Grand Ronde
- Goodwill Industries
- Kaiser Permanente
- Marion County Commissioner Sam Brentano
- Mid-Willamette Valley Council of Governments
- Monmouth-Independence Chamber of Commerce
- ODOT
- Office of Representative Paul Evans
- Oregon Cascades West Council of Governments
- Partnerships in Community Living
- Polk County Commissioner Jennifer Wheeler
- Salem Chamber of Commerce
- Salem-Keizer School District
- Silverton Health
- State of Oregon
- State Representative Jodi Hack
- Western Oregon University

Elected officials and staff from the Cities of:

- Aumsville
- Canby
- Dallas
- Independence
- Jefferson
- Keizer
- Mt. Angel
- Salem
- Silverton
- Stayton
- Wilsonville
- Woodburn

In addition, members of Salem-Keizer Transit’s two advisory committees (the Special Transportation Fund and Citizen’s Advisory Committees) participated in the workshop.

Follow-up Meetings with City Leaders
In December, a series of meetings were held to focus on network choices for the three major CARTS corridors. Anyone who attended the Stakeholder Workshop from these communities was invited to join local city officials at these follow-up meetings. The organizations represented at the meetings included:

DALLAS-MONMOUTH-INDEPENDENCE

- City of Dallas
- City of Independence
- City of Monmouth
- Western Oregon University
- Confederated Tribes of the Grand Ronde
- Partnerships in Community Living
- Monmouth-Independence Chamber of Commerce

SOUTH MARION COUNTY

- City of Stayton
• City of Sublimity
• City of Turner
• City of Gates
• City of Aumsville
• City of Mill City

WOODBURN-SILVERTON-MT. ANGEL

• City of Woodburn
• City of Mt. Angel
• City of Silverton
• BrucePac
• City of Gervais
## Appendix B

### Detailed Service Tables

#### No New Funding Network

<table>
<thead>
<tr>
<th>Destination</th>
<th>Type</th>
<th>Miles</th>
<th>Minutes</th>
<th>Recovery Time</th>
<th>Round-trip Cycle Time</th>
<th>Pulse Time</th>
<th>DTC Pulse Interval (if applicable)</th>
<th>Daily Round Trips</th>
<th>Daily Revenue Hours</th>
<th>Daily Revenue Miles</th>
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</thead>
<tbody>
<tr>
<td>10 Salem-Woodburn via Chemeketa CC, 99E</td>
<td>Express</td>
<td>19.7</td>
<td>57</td>
<td>10%</td>
<td>132</td>
<td>20</td>
<td>180</td>
<td>6</td>
<td>18.0</td>
<td>236.4</td>
</tr>
<tr>
<td>20 Salem-Silverton via Chemeketa CC</td>
<td>Express</td>
<td>16.2</td>
<td>49</td>
<td>10%</td>
<td>113</td>
<td>3</td>
<td>116</td>
<td>2</td>
<td>3.9</td>
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<tr>
<td>20 Silverton-Mt. Angel</td>
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<td>40</td>
<td>10%</td>
<td>92</td>
<td>3</td>
<td>95</td>
<td>2</td>
<td>3.2</td>
<td>8.4</td>
</tr>
<tr>
<td>30 Salem-Stayton via Hwy 22</td>
<td>Express</td>
<td>16.7</td>
<td>29</td>
<td>10%</td>
<td>67</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2.3</td>
<td>33.4</td>
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<td>30 Stayton-Gates via Lyons, Mill City</td>
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<td>21.7</td>
<td>31</td>
<td>10%</td>
<td>72</td>
<td>0</td>
<td>0</td>
<td>0.54</td>
<td>0.6</td>
<td>11.718</td>
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<tr>
<td>60 Salem-Salem</td>
<td>Express</td>
<td>23.6</td>
<td>53</td>
<td>15%</td>
<td>128</td>
<td>10</td>
<td>180</td>
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<td>18.0</td>
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<tr>
<td>40 Salem-Dallas</td>
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<td>39</td>
<td>10%</td>
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<td>3</td>
<td>95</td>
<td>2</td>
<td>3.2</td>
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<tr>
<td>45 Dallas-Ind.-Mon. DAR**</td>
<td>Dial-a-ride</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

*If SKT and Linn County share the cost of two daily round trips on this segment of Route 30, 27%–73%, SKT would be paying for the equivalent 0.54 round trips.

**3 daily revenue hours of dial-a-ride would also be provided by the Route 40, at the end of its trips to Dallas.

#### Increased Funding Network

<table>
<thead>
<tr>
<th>Destination</th>
<th>Type</th>
<th>Miles</th>
<th>Minutes</th>
<th>Recovery Time</th>
<th>Round-trip Cycle Time</th>
<th>Pulse Time</th>
<th>DTC Pulse Interval (if applicable)</th>
<th>Daily Round Trips</th>
<th>Daily Revenue Hours</th>
<th>Daily Revenue Miles</th>
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<tbody>
<tr>
<td>10 Salem-Woodburn</td>
<td>Express</td>
<td>19.7</td>
<td>57</td>
<td>10%</td>
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<td>3</td>
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<tr>
<td>20 Salem-Silverton</td>
<td>Express</td>
<td>16.2</td>
<td>49</td>
<td>10%</td>
<td>113</td>
<td>3</td>
<td>126</td>
<td>2</td>
<td>4.2</td>
<td>32.4</td>
</tr>
<tr>
<td>20 Silverton-Mt. Angel</td>
<td>Express</td>
<td>4.2</td>
<td>40</td>
<td>10%</td>
<td>92</td>
<td>3</td>
<td>95</td>
<td>2</td>
<td>3.2</td>
<td>8.4</td>
</tr>
<tr>
<td>30 Salem-Stayton</td>
<td>Express</td>
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<td>29</td>
<td>10%</td>
<td>67</td>
<td>3</td>
<td>2</td>
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<td>72</td>
<td>0</td>
<td>0</td>
<td>0.54</td>
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<td>15%</td>
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</tr>
<tr>
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<td>Dial-a-ride</td>
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</tr>
</tbody>
</table>

*If SKT and Linn County share the cost of two daily round trips on this segment of Route 30, 27%–73%, SKT would be paying for the equivalent 0.54 round trips.

**3 daily revenue hours of dial-a-ride would also be provided by the Route 40, at the end of its trips to Dallas.

Totals: 65.0  555.2

Totals: 82.2  707.5