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1 HOW DID WE GET HERE?

1.1 PREVIOUS WORK

This report is the second part of a Comprehensive Service Analysis performed for Salem-Keizer Transit (SKT).

SKT has been through a difficult period in which its resources are stretched very tight and it is simply not able to meet all of the community’s expectations for transit service.

The *Existing Conditions Report*, which constitutes the first volume of this study, explains in detail the history and current performance of the network.

The most critical issue confronted in this analysis has been the inevitable tradeoff between service that’s capable of robust ridership growth and service whose purpose is to provide basic access despite low ridership. That tradeoff, and how it is balanced in the current Cherriots network, is explained in greater detail in the *Existing Conditions Report*.

1.2 OUTREACH TO DATE

All recommendations in this report are provisional, pending more extensive public outreach. However, we did conduct initial discussions with the Board directly (in a workshop open to the public) and also in a January 2014 workshop with 29 invited stakeholders – from businesses, neighborhoods, social services, local elected bodies, and transit riders.¹

1.3 PRELIMINARY DIRECTION: MORE RIDERSHIP, LESS COVERAGE

The stakeholders who participated in the January workshop overwhelmingly supported a move towards more ridership services. The Cherriots network is currently about 66% oriented towards ridership, and 34% towards coverage. (See Section 6 of the *Existing Conditions Report* for more detail on this estimate.)

About 79% of stakeholders at the January workshop favored spending ¾ of the Cherriots budget on ridership

¹ These reports, and others related to this Comprehensive Service Analysis, are available for download at cherriots.org/about-us.
services, and ¼ on coverage. (A small number supported an even bigger shift towards ridership.)

This response was not off-the-cuff, but the result of an extensive conversation in which the downsides of this shift were fully explored. Those downsides include disruption to some existing riders, and total loss of service to a few.

To act on this input, we identified the corridors where ridership was high, and was likely to grow in response to more service. In the networks recommended in this report, these corridors offer higher frequency, more direct travel, and more hours or days of service than they do today.

We also identified those areas where ridership is low, and is unlikely to ever grow due to fundamental geographic features (such as low street connectivity and low density of people or jobs even after full development). In these “coverage” areas, transit services will not generate much ridership, and so they must be justified by a goal of providing service regardless of ridership.

In order to move the Cherriots network towards a 75%/25% ridership/coverage balance, we designed the recommended networks with reduced service to some of these coverage areas. Most segments with reduced or eliminated service have demonstrably low ridership (some near zero), as described in the Existing Conditions Report.

1.4 DESIGN PRINCIPLES

1.4.1 THE FREQUENT NETWORK

Within the larger Cherriots transit network, there is a small core network of routes that have high productivity (boardings per unit of cost), travel straight paths across the region, and link major destinations together.

These routes have the best Cherriots service today, and they will always have the best Cherriots service, because they have the potential to connect the greatest number of people to the greatest number of destinations, for a diversity of trips, all day long.

We recommend that SKT start thinking and talking about this network in a way that makes it:

- Visible to the public,
• Valuable to the public, to developers, to social service agencies, school districts and governments, and
• Different from the other transit services that SKT offers.

From a development perspective, this network could be thought of as the “permanent network.” It is where a person, business or school should be located in order to be near transit now and in the future.

From a customer’s perspective, however, the “permanence” of the network is not as urgently important. When a person considers catching the bus, the features of that network that will be most important are its destinations – Where does it go? – its frequency – How soon is the bus coming? – and its span – How late does it run?

Many transit agencies have made their permanent, core network visible by giving it a specific brand that conveys its high frequency and long span to customers. Integral to this branding is that the frequent network is shown in a distinct color on network maps.

The branded core network is then worked into land use plans, zoning, social services and school district plans, and other processes that benefit from knowing where the “permanent transit network” is and will always be.

Examples of core network brands from around the U.S. and Canada include:

• The Metro Rapid in Los Angeles (which has high frequencies, wider stop spacing, different colored buses and nicer stops).
• The Frequent Transit Network in Vancouver, BC (around which specific land use and development targets are set for the region).
• The Hi-Frequency Service Network in Minneapolis (along which higher density housing and less car parking are incentivized).

Many other cities do not have a specific brand for their frequent network, but they make sure to show it prominently on all network maps.

We recommend that SKT take the following steps towards a permanent, high-frequency network:

• Develop an internal “permanent and frequent network” and an approach to managing it. This may be a large subset of the “Ridership Corridors” we describe in Section 5.
1.4.2 **ALL-DAY FREQUENCY**

All-day frequency is one of the strongest drivers of all-day ridership. Frequencies better than every 15 minutes, in particular, create a sensation that the bus is available whenever you need it, which fundamentally transforms its usefulness. At that frequency, transit begins to approximate the convenience of a personal vehicle that is ready to go whenever you are.

In most transit systems, the highest performing all-day lines are frequent two-way services running through areas where density, walkability, and the straightness of available transit paths are all conducive to transit. These are generally the routes on which ridership grows when frequency is increased.

1.4.3 **SERVICE HIERARCHY**

Because frequency is expensive, however, it must be deployed carefully where it will be useful to the most people for access to the most activities and jobs. For that reason, the services we recommend in this report can be thought of as belonging to three different categories:

- First, we designed the frequent services, and did our best to maximize the number of people, jobs, and existing riders who would have access to frequent all-day service. This frequent network corresponds to the SKT concept of Corridors, and these would be the first routes to get service restored on Saturdays.

- Second, we designed a network of routes covering the other parts of the city with some ridership potential. Some of these routes could grow into Corridors over time. In designing this network, we made sure that it overlapped with the frequent services as little as possible, so that the services aren't duplicative and competing with one another. These routes are described as “Intermediate” in purpose, between “Ridership Corridors” and “Coverage Circulators,” in Section 5, below.

- Collaborate with partner cities and counties on the integration of this network into land use and development plans.

- Design the Cherriots network map and other public information so that the frequent network is visible and distinct from the rest of the network.
Finally, we designed the Circulators, which provide access to lower-density, lower-ridership areas that still generate enough demand to support some fixed-route transit service (and possibly too much demand to rely on dial-a-ride).

In the end, because the high-level guidance we received from the community was to push the network toward greater ridership, some very low-ridership areas would no longer be served by the network we recommend here.

1.4.4 CONSISTENT WALKING DISTANCE

In designing this recommended network we have assumed, based on industry research and experience, that people will walk further to more useful service. For this reason, in cases where today parallel services run close together, such as on Center, Market and D Streets, the recommended network asks some customers to walk further to more useful service on a nearby street – to Center or Market in this case.

It is very likely that people are already doing this, given the pattern of boardings observed on these three streets: there are far more boardings on Center and Market Streets, where service comes every 15 minutes, than on D Street, where service is hourly. This is despite D Street actually having slightly higher densities, transit orientation and mix of uses (all three of which have been shown to cause transit ridership) along it.

D Street was discussed in the workshops as an example of a case where a transit service is useful to only a very narrow slice of the community – those people who are unwilling or unable to walk ¼ mile, and who have the time to use an hourly service.

While we fully understand that some people have mobility limitations, running low-ridership fixed routes in these cases is a big expense benefiting small numbers of people. CherryLift remains as the ultimate resort for people who cannot walk ¼ mile for reasons of disability and cannot locate on a transit corridor.

In this recommended network, some people who currently have service close by may have to walk further than they would like. And yet, in a 2013 poll of South Salem residents, given a choice between a shorter walk to a bus stop and a shorter wait time for the bus, 40% of respondents said they would prefer the shorter walk, but 55% said they would prefer the shorter wait.

Within a fixed budget, getting some service closer to everyone would inevitably lead to lower frequencies, and
therefore longer waits. Designing a network with a more consistent maximum walking distance allows for higher frequencies on the corridors, and shorter waits. This is why, within a fixed budget, walking distance and waiting time are inexorably linked in any transit network.

1.4.5 No New Coverage without New Resources

Like many communities, the Salem-Keizer area is growing horizontally at its edges. A few of these growth areas, notably planned apartments along Cordon Road north of OR22, have some potential to generate new transit demand but are sited and designed in a way that makes them expensive and awkward to serve.

Many others are low density and unlikely to ever generate much transit demand. Future low-density job growth in the southeast part of the city, for example, will contend with many barriers to efficient service.

Requests have come, or can be expected to come, for new service to many areas that SKT does not currently serve. But if the primary goal of the network is higher ridership, there is no basis for extending new service to any of these horizontal growth areas.

More fundamentally, extending a fixed operating budget over more area would mean cutting service for the parts of the region already served.

If one of these new areas had all the features indicating high ridership potential (density, street connectivity, safe places to walk, and reasonably straight transit paths) a case could be made for serving these areas in a ridership-growing scenario, even with no new resources. But none of these areas comes close to presenting conditions as favorable for high ridership as the major urban corridors that SKT already serves.

Given our focus on growing ridership, it follows logically that adding new routes into new lower ridership areas must come from a new funding source.

This is not necessarily a recommended long-term policy for SKT. But it is the only logical and conservative approach if SKT is to grow ridership in the short term, as desired by stakeholders, without considerable new funding.
2 ASSUMPTIONS

In the design of an improved transit network for Salem-Keizer, we made a number of assumptions.

2.1 NO NEW RESOURCES

We propose, in Section 3, two options for a “constrained” Cherriots network. These networks are designed for the same revenues and costs that Cherriots experiences today.

However, we find that today’s Cherriots network, and either of these constrained networks, are really inadequate to meet the demands of the urban area. Most of Salem-Keizer’s peer cities (such as Spokane, Boise, Eugene and Olympia) offer more transit service than Salem-Keizer, seven days each week.

In Section 4, we present the estimated costs of further in the transit network, and we would urge SKT to pursue new funding to make at least some of these investments. These additions would better meet the region’s needs for transit service than the meager amount of service that is funded today.

2.2 REVENUE HOURS

A revenue hour is a common measure of the available supply of fixed-route transit service. (“Fixed-route” transit follows the same route over and over again, unlike “dial-a-ride” or “deviated-route” service, which changes its route to respond to calls and may even pick passengers up at their doorstep.) A revenue hour represents one hour of a bus and its operator out in public, providing service and collecting revenue.

Figure 2-1: Fixed-route transit service in Salem-Keizer is provided as Cherriots (top).

Paratransit is provided as CherryLift (bottom).

A third service, CARTS, provides deviated-route transit for areas outside of Salem-Keizer.

A fourth service, REDLine, offers deviated-route transit to major shopping destinations.
As of 2013, one Cherriots revenue hour cost SKT about $105. Our estimates are presented in terms of revenue hours rather than dollars so that they can be used to calculate dollar costs in any future year.

In designing the constrained Cherriots networks, we assumed the same “supply” of Cherriots service as existed in 2013, which was 156,670 revenue hours. (This includes Routes 1-25; the 1X, 2X and 25CX; and the 91 and 92 special job site routes.)

The estimated costs of additional investments in Cherriots service, presented in Section 4, are also presented in revenue hours.

2.3 CherryLift Costs

Using 156,670 revenue hours as the “budget” for a constrained Cherriots network became less straightforward, however, once we considered providing more service on evenings or weekends as well as weekdays.

The reason for this is the Americans with Disabilities Act (ADA) paratransit service requirement. The ADA requires that Salem-Keizer Transit provide CherryLift service for people who cannot use Cherriots, for trips that begin and end within ¾ mile of the Cherriots network.

This requirement applies on days and times when the Cherriots network is operating. If SKT were to expand Cherriots service until late at night, or onto the weekends, CherryLift would also be expanded. In considering the introduction of Cherriots service on Saturday, therefore, we also have to account for the costs of providing CherryLift service on Saturday.

SKT provides CherryLift service not only within the area required by ADA, but also for any trips within the Urban Growth Boundary (UGB). We have assumed that CherryLift demand within the urban boundary would be a little lower on a Saturday than on a weekday, estimating it at 75% (this is a conservative estimate; it would likely be lower).

To account for this Saturday CherryLift cost, we set aside about 7,500 revenue hours, which left 149,162 revenue hours per year for Cherriots weekday and Saturday service.

However, the cost of providing CherryLift service on Saturdays, or later in the evening on weekdays, will be
lower than it otherwise would be if SKT were to change its policy about where CherryLift service is provided.

The constrained Saturday network we recommend below covers less area than the weekday network. About 70% of today’s CherryLift trips begin and end within ¾ mile of the constrained Saturday Cherriots network recommended in this report.

Were SKT to implement this constrained Saturday network, there would likely be a difference between the cost of providing paratransit service to the entire urban area on Saturdays, and the cost of providing paratransit service only where there is fixed-route transit service. A change to SKT’s policy of providing paratransit service beyond where it is federally-required would likely reduce CherryLift service and costs, and therefore increase the funding that is available for Cherriots service.

2.4 Layover Requirements

Layover is the time that a bus and its operator spend dwelling, at the end of a route or at certain points in the middle of a route. It is also often called recovery time.

Layover is an essential part of transit operations. Though it may look to the public as though a bus and its operator were sitting still, wasting time, layover has these extremely important functions:

- Layover allows routes to stay on schedule. With a few minutes of recovery time at specific places built into its schedule, a bus will normally sit still and dwell for those minutes. But buses often encounter small delays: unpredictable congestion, a crash, a special event, or a particularly time-consuming passenger boarding. When they do, they can skip those layovers, and “recover” enough time to get back on schedule.

- A layover may be intentionally scheduled at a place where passengers will be transferring among different bus routes. This is known as a “pulse,” and it currently takes place at the Downtown, Keizer and Glen Creek Transit Centers, and at Chemeketa Community College.

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2 As of 2012, CherryLift costs per trip were about $27 compared to $5.50 per boarding for Cherriots. This is typical of the difference between fixed route and paratransit costs everywhere, and explains why even small increases in paratransit can have devastating effects on transit budgets.
Layovers are sometimes long enough that they are intended as a break for bus operators, to use the restroom and attend to other needs. In Salem-Keizer, while the 10+ minute layovers at the transit centers are not official driver breaks, they are perceived and used as such.

Today, SKT schedules Cherriots services so that 21.6% of revenue hours (hours that buses and operators are out providing service and collecting revenue) are spent laying-over.

In addition, Cherriots schedules have some “slack” built into them. Adding “slack” to a schedule is another strategy for ensuring on-time arrivals despite delays. It also happens when a schedule is written to be the same all day long, even though a trip takes longer at a certain time of day (typically the evening rush hour). In that case, the rest of the day’s schedules will have “slack” in them, and those buses will often arrive early.

In Salem-Keizer, buses do often reach transit centers and layover locations early (as we observed in the Existing Conditions Report). As a result of these early arrivals, the amount of time actually spent laying-over and recovering is higher than the schedules suggest.

Based on the Ridecheck survey in October of 2013, we estimate that about 32% of Cherriots revenue hours are spent in layover, recovery and slack in the schedules. (This does not include operator lunch breaks.) This is a very high number by industry standards, representing excessive hours that SKT pays for but gets no useful transit service from.

In consultation with SKT planning staff, we agreed to design a future Cherriots network based on a smaller amount of layover time. The industry-wide standard for network planning is 10-15%.\(^3\) In designing this future network, we assumed that it could operate with 15% of its revenue hours used for layover.

\(^3\) For the purposes of this study, we investigated the layover practices at transit agencies in Spokane, WA; Portland, OR; the Seattle, WA, area; Eugene/Springfield, OR; Alameda County, CA; and Fresno, CA. Scheduled recovery and driver break time per hour ranges from 8% to 20% at these agencies, depending on their policies, contracts with operators, the lengths of routes and the variability of congestion they encounter. In Eugene/Springfield, between 6% and 17% of revenue hours are devoted to layover and operator breaks.
2.5 **Cherriots Operating Speed**

Another important assumption for the design of an improved transit network is the speed at which buses travel.

The technical term for this speed is “revenue speed.” It describes the speed a bus travels when it is in revenue service, picking up and dropping off passengers. It does *not* include the speed a bus travels when it leaves the garage, and goes to the starting point of its route.

In consultation with SKT staff, and based on the speeds observed in the October 2013 Ridecheck, we decided that 17 mph was an appropriate revenue speed assumption for most routes.

On certain routes, we used a slightly higher or lower revenue speed assumption, to more accurately reflect the speeds we observed in the Ridecheck.
3 RECOMMENDED CONSTRAINED SCENARIOS

With the values-based guidance of stakeholders and Board members in one hand, and our technical assumptions in the other, we drafted a pair of constrained Cherriots transit networks, one that operates 5-days-per-week and one that operates 6-days-per-week.

However, it is our finding that either of these networks would be insufficient to meet the transit needs of Salem-Keizer residents and the potential for transit oriented development in the city. Neither of these networks would match the level of service provided in most of Salem’s peer cities, where service runs not only on Saturdays but on Sundays and holidays as well.

In the next section, we therefore also present estimates of the costs and benefits of unconstrained scenarios in which additional funding supports:

• A Saturday network that offers effective service far beyond the anemic network presented in this section.
• Effective service on Sundays and holidays.
• Weekday service later in the evening, to better serve service workers’ commutes as well as everyone’s social and commercial travel needs, thanks to additional funding.

3.1 INTRODUCTION

We must emphasize that the routes that make up a transit network are strongly interrelated. Changes to one route, or even one segment of one route, may have major impacts on other routes, and on the overall budget. A change as seemingly simple as adding a little bit more distance to a bus route, or moving it, or making it more frequent – while working within a fixed budget – has impacts that may affect a completely different area.

In addition, this network cannot be good news for everyone, because it is constrained – it is redeploying a fixed budget to achieve more ridership.

Increasing service to a certain neighborhood, or increasing frequency on a certain route, necessarily requires cutting service or frequency on another route, or ending service earlier in the evening for all routes, or not providing Saturday service.
To the extent that these transit network design trade-offs have to do with community values – and many of them do – there will not be a technical answer to the question of which trade-offs are worthwhile. The answer will depend on what balance of values the Salem-Keizer Transit system wishes to serve.

Based on the values articulated by the Board and stakeholders in their workshops, and our experience in designing transit networks, we are confident that this constrained network is a better fit to Salem-Keizer community values, and better for ridership. Yet it is an intrinsic part of this kind of design that not everybody will like the results, especially if they are used to relying on low-ridership service.

Maps of the recommended constrained scenario networks (showing weekdays and Saturdays) are on the next two pages. Descriptions of the changes they include are detailed in Section 5.

3.2 ROUTE NAMES

In this report we have used letters to identify recommended future routes. Some are very similar to existing Cherriots routes, while others are made up of segments of existing routes, recombined.

This route naming convention is not intended for public use – it is only meant to reduce confusion in discussions comparing the current network with this recommended future network. In fact, it is our view that the naming convention SKT uses today – in which the smallest numbers possible are used to identify routes – is a very good one.

3.3 CONSTRAINED FIVE-DAY SCENARIO (A1)

Should Cherriots continue to operate under such severe financial constraint, one scenario SKT should consider is a modest redesign of the existing weekday network.

This A1 "Constrained Five-Day Scenario" shows the estimated costs of implementing network changes on weekdays only.

The A1 weekday network below offers slightly more weekday frequency and coverage than the following weekday network included in the following six-day scenario, because in the six-day scenario weekday service would be reduced to pay for Saturday Cherriots and
CherryLift service. The additional service in this scenario is:

- Routes F-Market and G-Edgewater have higher frequency,
- Route J-Liberty branches and circulates through South Salem neighborhoods, and
- Routes L and M have a longer span of weekday service by one hour; route H has a longer span by half an hour.

The following pages present a map showing this weekday network, along with a map of the current Cherriots network, for comparison purposes, and a table detailing the service parameters and costs for the A1 Constrained Five-day Scenario.
Recommended Cherriots Network
5-Day Scenario

Route Frequency
- 15 minute
- 30 minute
- 60 minute
- Limited daily trips / Express
- Frequency Change

Downtown Transit Mall
Keizer Transit Center
Chemeketa CC
Routes 9 and 19 schedules are offset, yielding a combined 15 minute frequency on their duplicative segment.

Routes 24 and 25 have combined frequency of 30 minutes between Downtown and West Salem immediately west of the Willamette.
<table>
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<th>Route name</th>
<th>Round-trip miles</th>
<th>Assumed service speed (mph)</th>
<th>Round-trip minutes (with recovery) (PM peak)</th>
<th>Frequency</th>
<th>Vehicles required</th>
<th>Daily span of service (hours)</th>
<th>Daily revenue hours</th>
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<td>Mid</td>
<td>PM</td>
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<td>AM</td>
<td>Mid</td>
<td>PM</td>
<td>Eve</td>
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<td>Eve</td>
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<td>PM</td>
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<td>59</td>
<td>AM</td>
<td>Mid</td>
<td>PM</td>
<td>Eve</td>
<td>1 1 1 1</td>
</tr>
<tr>
<td>Q - Wallace/Turner</td>
<td>13.3</td>
<td>17.5</td>
<td>55</td>
<td>AM</td>
<td>Mid</td>
<td>PM</td>
<td>Eve</td>
<td>1 1 1 1</td>
</tr>
<tr>
<td>1X Wilsonville express</td>
<td>64.4</td>
<td></td>
<td></td>
<td>AM</td>
<td>Mid</td>
<td>PM</td>
<td>Eve</td>
<td>unchanged</td>
</tr>
<tr>
<td>2X Grande Ronde</td>
<td>63.4</td>
<td></td>
<td></td>
<td>AM</td>
<td>Mid</td>
<td>PM</td>
<td>Eve</td>
<td>unchanged</td>
</tr>
<tr>
<td>91 Garten Foundation</td>
<td></td>
<td></td>
<td></td>
<td>AM</td>
<td>Mid</td>
<td>PM</td>
<td>Eve</td>
<td>0.5</td>
</tr>
<tr>
<td>92 Rockwest</td>
<td></td>
<td></td>
<td></td>
<td>AM</td>
<td>Mid</td>
<td>PM</td>
<td>Eve</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Peak fleet: 48
Daily total: 613 8,164
Annual weekdays total: 155,076 2,065,545
3.4 CONstrained SIX-DAY SCENARIO (B1)

Should Cherriots continue to operate under this financial constraint, it would be possible to offer an anemic Saturday network. However, this would require cuts in weekday service (relative to what we recommend in the Five-day Scenario above) to pay for both Cherriots and CherryLift Saturday service.

We consider this Six-day Scenario and the Five-day Scenario described above "worst-case" scenarios, because the financial constraints assumed for them are so severe.

The Saturday network shown below is made up of corridors on which ridership is high on weekdays, nearly all day long. Were SKT to add Saturday service, at the low levels possible under current financial constraints, these would be the corridors along which that service would reach the most people and the most trips.

Maps weekday and Saturday networks we would recommend in this constrained scenario are shown on the following pages, along with the current weekday Cherriots network. They are followed by a table showing the service parameters for this scenario.
Routes 9 and 19 schedules are offset, yielding a combined 15 minute frequency on their duplicative segment.

Routes 24 and 25 have combined frequency of 30 minutes between Downtown and West Salem immediately west of the Willamette.

Network Frequency
Cherriots Routes
Midday Frequency

- 15 minute
- 30 minute
- 60-120 minute
- Peak-only
Routes B,C,D operate as a single two-way loop on Saturdays.

Recommended Cherriots Network
6-Day Scenario: Saturday

60 minute
### B1 Constrained 6-day scenario: Weekday service

<table>
<thead>
<tr>
<th>Route name</th>
<th>Round-trip miles</th>
<th>Round-trip speed (mph)</th>
<th>Assumed service speed (with recovery) (PM peak)</th>
<th>Frequency</th>
<th>Vehicles required</th>
<th>Daily span of service (hours)</th>
<th>Daily revenue hours</th>
<th>Daily revenue miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Commerical/River Rd</td>
<td>25.0</td>
<td>17.0</td>
<td>107</td>
<td>AM 15</td>
<td>Mid 15</td>
<td>Eve 30</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>B - Lancaster</td>
<td>20.8</td>
<td>17.0</td>
<td>89</td>
<td>AM 15</td>
<td>Mid 15</td>
<td>Eve 30</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>C - Center St</td>
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<td>15.0</td>
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<td>Eve 30</td>
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<tr>
<td>D - Portland Rd</td>
<td>12.5</td>
<td>16.0</td>
<td>57</td>
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<td>Mid 30</td>
<td>Eve 30</td>
<td>2</td>
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</tr>
<tr>
<td>E - Silverton Rd</td>
<td>10.8</td>
<td>15.0</td>
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<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>F - Market-Brown</td>
<td>12.5</td>
<td>15.0</td>
<td>60</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>G - Edgewater</td>
<td>7.5</td>
<td>15.0</td>
<td>36</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>H - Keizer/Cherry Ave</td>
<td>14.5</td>
<td>17.0</td>
<td>62</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>2</td>
<td>2</td>
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<tr>
<td>J - Pringle/Liberty</td>
<td>19.6</td>
<td>16.0</td>
<td>89</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
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<td>3</td>
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<tr>
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<tr>
<td>K - State St (branches)</td>
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<td>15.5</td>
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<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
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<td>1</td>
</tr>
<tr>
<td>L - Keizer Circulator</td>
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<td>Mid 60</td>
<td>Eve 60</td>
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<td>M - Hayesville Circulator</td>
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<td>15.0</td>
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<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
<td>1</td>
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<td>N - Sunnyview/Fisher</td>
<td>11.1</td>
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<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>P - SE Industrial</td>
<td>13.8</td>
<td>17.0</td>
<td>59</td>
<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Q - Wallace/Turner</td>
<td>13.3</td>
<td>17.5</td>
<td>55</td>
<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1X Wilsonville express</td>
<td>64.4</td>
<td></td>
<td></td>
<td>unchanged</td>
<td></td>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2X Grande Ronde</td>
<td>63.4</td>
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<td>unchanged</td>
<td></td>
<td></td>
<td>2</td>
<td>1</td>
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<tr>
<td>91 Garten Foundation</td>
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<td></td>
<td>unchanged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>92 Rockwest</td>
<td></td>
<td></td>
<td></td>
<td>unchanged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Peak fleet: 44
Daily total: 571
Annual weekdays total: 144,463 1,933,686
### B1 Constrained 6-day scenario: Saturday service

<table>
<thead>
<tr>
<th>Route name</th>
<th>Round-trip miles</th>
<th>Assumed service speed (mph)</th>
<th>Round-trip minutes (with recovery) (PM peak)</th>
<th>Frequency</th>
<th>Vehicles required</th>
<th>Daily span of service (hours)</th>
<th>Daily revenue hours</th>
<th>Daily revenue miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Commercial/River Rd</td>
<td>25.0</td>
<td>17</td>
<td>107</td>
<td>AM 60 Mid 60 PM 60 Eve 60</td>
<td>2 2 2 2</td>
<td>14</td>
<td>28</td>
<td>350</td>
</tr>
<tr>
<td>BCD - Portland/Center/Lancaster</td>
<td>23.0</td>
<td>16.7</td>
<td>101</td>
<td>AM 60 Mid 60 PM 60 Eve 60</td>
<td>2 2 2 2</td>
<td>14</td>
<td>28</td>
<td>322</td>
</tr>
<tr>
<td>G - Edgewater</td>
<td>7.5</td>
<td>15</td>
<td>36</td>
<td>AM 60 Mid 60 PM 60 Eve 60</td>
<td>1 1 1 1</td>
<td>14</td>
<td>14</td>
<td>105</td>
</tr>
<tr>
<td>K - State/Penn.</td>
<td>9.7</td>
<td>16</td>
<td>44</td>
<td>AM 60 Mid 60 PM 60 Eve 60</td>
<td>1 1 1 1</td>
<td>14</td>
<td>14</td>
<td>136</td>
</tr>
</tbody>
</table>

Saturday Cherriots cost: 84913
Annual Cherriots cost: 43684746

Saturday CherryLift cost estimate: 144
Annual Saturday CherryLift cost estimate: 7488
4 RECOMMENDED UNCONSTRAINED SCENARIOS

In this section, we describe four future scenarios that we would recommend SKT consider, were Cherriots to operate with additional funding.

As mentioned above, SKT has only enough operating revenue today to either run a decent transit network on weekdays-only, or to run less service on weekdays in order to afford an anemic Saturday network.

The four scenarios detailed below are unconstrained, meaning they would require additional revenue. They would provide a level of transit service that is similar to Salem-Keizer's peers, and would meet both the need and the potential for transit in Salem-Keizer.

The table on the following page compares the costs of all of the scenarios presented in this report.
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Cherriots costs</th>
<th>Additional CherryLift costs?</th>
<th>Fleet requirements</th>
<th>Degree of &quot;ridership-purpose&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 Constrained 5-day</td>
<td>Run service on weekdays only, with existing budget</td>
<td>155,000 revenue hours</td>
<td>No</td>
<td>Weekday peak: 48 buses</td>
<td>74%</td>
</tr>
<tr>
<td>B1 Constrained 6-day</td>
<td>Run service on weekdays and Saturdays, with existing budget</td>
<td>148,800 revenue hours</td>
<td>Estimated equivalent of 7,500 Cherriots revenue hours (for Saturday CherryLift service)</td>
<td>Weekday peak: 44 buses Saturdays: 6 buses</td>
<td>76%</td>
</tr>
<tr>
<td>A2 Effective Saturdays</td>
<td>Add service on Saturdays, with new funding</td>
<td>16,500 revenue hours (in addition to A1)</td>
<td>Estimated equivalent of 7,500 Cherriots revenue hours (for Saturday CherryLift service)</td>
<td>Saturdays: 21 buses</td>
<td>80%</td>
</tr>
<tr>
<td>A3 Effective Sundays and holidays</td>
<td>Add service on Sundays and holidays, with new funding</td>
<td>19,400 revenue hours (in addition to A1 and A2)</td>
<td>Estimated equivalent of 8,600 Cherriots revenue hours (for Sunday and Holiday CherryLift service)</td>
<td>Sundays and holidays: 21 buses</td>
<td>80%</td>
</tr>
<tr>
<td>A4 Effective evenings</td>
<td>Extend span of service to 16-18 hours per day, with new funding</td>
<td>16,500 revenue hours (in addition to A1)</td>
<td>Yes, unknown</td>
<td>Weekday peak: 48 buses</td>
<td>74%</td>
</tr>
<tr>
<td>B2 Coverage circulators</td>
<td>Add four coverage circulators (Dial-a-ride) in low-demand areas, Mon-Sat</td>
<td>17,000 revenue hours (in addition to B1)</td>
<td>Yes, unknown</td>
<td>Additional 4 buses</td>
<td>0%</td>
</tr>
</tbody>
</table>
4.1 EFFECTIVE SATURDAYS (A2)

The Saturday network presented as part of the B1 "Constrained Six-day Scenario," in Section 3, above, is fairly minimal. Service is limited to the most transit-oriented corridors, only comes once per hour, and runs just 14 hours each Saturday.

Were funding to become available, we would recommend as a first step the implementation of an effective Saturday network with the following features:

- Weekend routes should resemble their weekday versions as much as possible, so that people do not have to understand a different route structure for a different time of the week. (Note that the Saturday network in the B1 "Constrained Six-Day Scenario" would not achieve this.) As shown in the table below, this A2 scenario would run 9 of 15 routes on Saturday, along the same alignments they serve on weekdays.
- Saturdays should offer at least 16 hours of service.
- The Saturday network should serve all high-ridership corridors with at least 30-minute frequencies.
### A2 Effective Saturdays scenario

<table>
<thead>
<tr>
<th>Route name</th>
<th>Round-trip miles</th>
<th>Assumed service speed (mph)</th>
<th>Round-trip minutes (with recovery)</th>
<th>Frequency</th>
<th>Vehicles required</th>
<th>Daily span of service (hours)</th>
<th>Saturday revenue hours</th>
<th>Saturday revenue miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Commercial/River Rd</td>
<td>25.0</td>
<td>17.0</td>
<td>101</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>AM 4</td>
<td>Mid 4</td>
</tr>
<tr>
<td>B - Lancaster</td>
<td>20.8</td>
<td>17.0</td>
<td>84</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>AM 3</td>
<td>Mid 3</td>
</tr>
<tr>
<td>C - Center</td>
<td>10.8</td>
<td>15.0</td>
<td>50</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>AM 2</td>
<td>Mid 2</td>
</tr>
<tr>
<td>D - Portland Rd</td>
<td>12.5</td>
<td>16.0</td>
<td>54</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>AM 2</td>
<td>Mid 2</td>
</tr>
<tr>
<td>F - Market-Brown</td>
<td>19.6</td>
<td>16.0</td>
<td>57</td>
<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
<td>AM 1</td>
<td>Mid 1</td>
</tr>
<tr>
<td>G - Edgewater</td>
<td>12.5</td>
<td>15.0</td>
<td>35</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>AM 2</td>
<td>Mid 2</td>
</tr>
<tr>
<td>H - Keizer/Cherry Ave</td>
<td>9.7</td>
<td>15.0</td>
<td>59</td>
<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
<td>AM 1</td>
<td>Mid 1</td>
</tr>
<tr>
<td>J - Pringle/Liberty (trunk)</td>
<td>20.0</td>
<td>16.0</td>
<td>87</td>
<td>AM 30</td>
<td>Mid 30</td>
<td>Eve 30</td>
<td>AM 2</td>
<td>Mid 2</td>
</tr>
<tr>
<td>J - Pringle/Liberty (branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K - State St (trunk)</td>
<td>10.6</td>
<td>15.5</td>
<td>48</td>
<td>AM 60</td>
<td>Mid 60</td>
<td>Eve 60</td>
<td>AM 1</td>
<td>Mid 1</td>
</tr>
<tr>
<td>K - State St (branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Peak weekend fleet:** 21

- **Daily Saturday Cherriots total:** 336 3,860
- **Annual Saturday Cherriots total:** 17,472 200,728

**Annual Saturday CherryLift costs:** 7,488
4.2 **Effective Sundays and Holidays (A3)**

With additional funding, SKT could also implement service on Sundays and holidays. The A3 "Effective Sundays and Holidays" scenario described in the table below would essentially run the A2 "Effective Saturdays" services on Sundays and all holidays as well.

<table>
<thead>
<tr>
<th>Route name</th>
<th>Round-trip miles</th>
<th>Assumed service speed (mph)</th>
<th>Round-trip minutes (with recovery)</th>
<th>Frequency</th>
<th>Vehicles required</th>
<th>Daily span of service (hours)</th>
<th>Revenue hours</th>
<th>Revenue miles</th>
</tr>
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<tbody>
<tr>
<td>A - Commercial/River Rd</td>
<td>25.0</td>
<td>17.0</td>
<td>107</td>
<td>AM 30</td>
<td>4</td>
<td>16</td>
<td>64</td>
<td>800</td>
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<td>B - Lancaster</td>
<td>20.8</td>
<td>17.0</td>
<td>89</td>
<td>AM 30</td>
<td>3</td>
<td>16</td>
<td>48</td>
<td>666</td>
</tr>
<tr>
<td>C - Center</td>
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<td>52</td>
<td>AM 30</td>
<td>2</td>
<td>16</td>
<td>32</td>
<td>346</td>
</tr>
<tr>
<td>D - Portland Rd</td>
<td>12.5</td>
<td>16.0</td>
<td>57</td>
<td>AM 30</td>
<td>2</td>
<td>16</td>
<td>32</td>
<td>398</td>
</tr>
<tr>
<td>F - Market-Brown</td>
<td>19.6</td>
<td>16.0</td>
<td>89</td>
<td>AM 60</td>
<td>1</td>
<td>14</td>
<td>14</td>
<td>175</td>
</tr>
<tr>
<td>G - Edgewater</td>
<td>12.5</td>
<td>15.0</td>
<td>60</td>
<td>AM 30</td>
<td>2</td>
<td>16</td>
<td>32</td>
<td>240</td>
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<td>H - Keizer/Cherry Ave</td>
<td>9.7</td>
<td>15.0</td>
<td>47</td>
<td>AM 60</td>
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<td>14</td>
<td>203</td>
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<td>J - Pringle/Liberty (trunk)</td>
<td>20.0</td>
<td>16.0</td>
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<td>AM 30</td>
<td>2</td>
<td>14</td>
<td>28</td>
<td>274</td>
</tr>
<tr>
<td>J - Pringle/Liberty (branches)</td>
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<td></td>
<td></td>
<td>AM 60</td>
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<td>K - State St (trunk)</td>
<td>10.6</td>
<td>15.5</td>
<td>50</td>
<td>PM 30</td>
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<td>16</td>
<td>16</td>
<td>155</td>
</tr>
<tr>
<td>K - State St (branches)</td>
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<td></td>
<td></td>
<td>PM 60</td>
<td>1</td>
<td>16</td>
<td>16</td>
<td>184</td>
</tr>
</tbody>
</table>

**Peak weekend fleet:** 21

**Daily Sunday or holiday Cherriots total:** 324 3,726

**Annual Sunday and holiday Cherriots total:** 19,440 223,573

**Annual Sunday or holiday CherryLift costs:** 8,640
4.3 Effective Evenings (A4)

Should SKT decide to improve weekdays first, before providing service on weekends, the next step after implementing scenario A1 could be to extend the span of service later on weekdays. This would require additional funding.

This A4 "Effective Evenings" scenario is based on the A1 "Constrained Five-day Scenario," above, but the span of daily service is lengthened to 16-18 hours for all routes.

Evening service is incredibly important, and not only because it supports the social and cultural life of the city. A long service day - on weekdays and weekends - is very useful to people who work service jobs (in retail and restaurants), whose work schedule is rarely 9-to-5 or Monday-through-Friday. Without evening service, they cannot rely on transit for their commutes.

The table on the following page describes service parameters for this "Effective Evenings" scenario.
### A4 Effective evenings: Longer span of service on weekdays

<table>
<thead>
<tr>
<th>Route name</th>
<th>Round-trip miles</th>
<th>Assumed service speed (mph)</th>
<th>Round-trip minutes (with recovery) (PM peak)</th>
<th>Frequency</th>
<th>Vehicles required</th>
<th>Daily span of service (hours)</th>
<th>Daily revenue hours</th>
<th>Daily revenue miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Commercial/River Rd</td>
<td>25.0</td>
<td>17.0</td>
<td>107</td>
<td>AM 15</td>
<td>7</td>
<td>18</td>
<td>117</td>
<td>1600</td>
</tr>
<tr>
<td>B - Lancaster</td>
<td>20.8</td>
<td>17.0</td>
<td>89</td>
<td>AM 15</td>
<td>6</td>
<td>18</td>
<td>96</td>
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<tr>
<td>C - Center St</td>
<td>10.8</td>
<td>15.0</td>
<td>52</td>
<td>AM 15</td>
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<td>18</td>
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<td>62</td>
<td>AM 30</td>
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<td>16</td>
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<td>20.0</td>
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<td>91</td>
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<td>16</td>
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Peak fleet: 48

Daily total: 678
Annual weekdays total: 171,534
Annual evening CherryLift costs: unknown
4.4 **Coverage Circulators (B2)**

In the B1 "Constrained Six-day Scenario" some of the very low-ridership service that SKT provides today would be reduced or eliminated (in South Salem and West Salem).

The purpose of these services is not ridership (rather, it is coverage of areas that have inherently low demand for transit) so for Cherriots to shift towards a more ridership-oriented system these services would have to be reduced. However, note that this would lower the percentage of the Cherriots budget that is devoted to growing ridership, rather than providing coverage, and this may not be the direction in which stakeholders would want SKT to move.

In the future, should additional revenue for transit service become available, SKT may want to restore some of this coverage service, or add additional coverage service in areas that lack it (for example, around South River Road). This could be done in the form of dial-a-ride services, rather than fixed route services.

The four areas that are not covered by scenario B1 that could conceivably be served by dial-a-ride in Salem-Keizer are:

- South Salem
- South River Road
- West Salem
- Hayesville/East Salem

We assume that each dial-a-ride area is served by one bus, for 14 hours per day, six days per week (Monday-Saturday). These services would therefore cost the equivalent of 17,000 revenue hours per year.
5.1 Improvements and Efficiencies

In this section we describe in detail some of the changes and improvements included in the recommended constrained networks. Further improvements would of course take place were any of our unconstrained recommendations to be implemented as well.

5.1.1 Higher Frequency on Corridors

A top priority for SKT stakeholders was to increase ridership. This can best be done by growing the number of people and destinations that have access to frequent service. On certain corridors, service would now be coming soon, all day, whenever you want to travel. This frequency, in places where demand is high, is a very strong inducement of ridership.

River Road – Lancaster Drive continuity

In the existing system, 15-minute service extends out River Road from downtown Salem to central Keizer, as Routes 9 and 19 combined, but not to Keizer Transit Center, where the frequent Route 11-Lancaster begins.

This gap means that although River Road and Lancaster Drive both have frequent service, they don’t make a frequent connection to one another.

We recommend closing this gap so that it’s easy to travel east-west between Keizer and Lancaster Drive. Frequent Commercial/River Road service (Route A) would continue directly to Keizer Transit Center via Lockhaven Drive, following the path of today’s Route 19.

South Commercial frequency upgrade and extension

Today Route 1-Commercial, South Salem’s spine service, runs every 15 minutes during the peaks but only every 30 minutes during the rest of the day, from downtown to Kuebler. This is low frequency for such a high-density, high-activity corridor.

(While the 8-Liberty shares the 1-Commercial’s route as far as Madrona, the 8 and the 1 leave downtown at the same time, and as a result they do not combine to give people a bus every 15 minutes.)
We recommend that the frequency of the 1-Commercial be increased to every 15 minutes all day. In part, this is because the 1 is a fairly productive route and we expect ridership to grow in response to higher frequency. Also, this would allow it to run directly from South Salem to Keizer and back as a single long route.

In addition, we recommend running this Route A-Commercial/River Road south beyond Kuebler to Madras Street, where a turnaround is available. We are recommending this in the context of deleting the low-ridership Sunnyside Road segment of Route 21.

Summer-Capitol, Portland Road, and a frequent Downtown-College link

The most productive Cherriot route today, by far, is the Route 3-Portland Road. The highest concentration of boardings outside of downtown is at its terminus, Chemeketa Community College.

We recommend increasing the frequency and span of service between downtown and Chemeketa CC, and along corridors between them, by:

- Maintaining the frequency of Route 3 (which we have labeled Route D) at every 30 minutes, and running it at that frequency for 15 hours a day.
- Increasing the frequency of the 13-Silvertown Road (here labeled Route E) to every 30 minutes.
- Redesigning the 13-Silvertown Road (Route E) so that it follows the same route as Route D along Summer-Capitol and Portland Road, and then offsetting its schedule from that of Route D by 15 minutes.

The combined effect of the D-Portland Road and the E-Silvertown Road, in this improved network, would be:

- 15-minute frequency between downtown and Chemeketa Community College, from 6:30 am to 9:30 pm, by the alternate paths of the D (Portland Road) and the E (Silvertown Road).
- 15-minute frequency on the shared route of the D and E from the downtown Transit Center, past the capitol buildings, to the intersection of Silvertown and Portland Roads.
- A frequent link to downtown and Lancaster Drive for the neighborhoods just west of the intersection of Portland and Silvertown Roads, which are very walkable and have very high transit-orientation
The constrained scenarios include a number of improvements of citywide relevance.

### 5.1.2 Consistent All-day Frequency

In the *Existing Conditions Report*, we identify latent, unmet demands for transit service. One source of such demand is actually in time, not in space – it is in the midday.

We observed that productivity on many routes was highest during the midday, and lower during peak periods. On many Cherriots routes, higher frequencies during the AM and PM periods are not attracting proportionately higher ridership at those times. In other words, today’s demand pattern does not support Cherriots’s current “two-peaks” service design.

According to a 2010 national survey, about 29% of U.S. workers do not work a standard “9-to-5” schedule. These workers are more likely to be in lower-paid jobs than others. At present (though this may change in the future), students and low-income people are disproportionately represented among Cherriots riders.

In this context, it is unsurprising that Cherriots has a fairly consistent demand pattern all day long, with a small peak in the afternoon (when schools get out, and service workers head to an evening shift).

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

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*Figure 5-1: Route 5. The pattern of ridership throughout the day on most Cherriots routes is relatively "un-peaked," as exemplified by that of Route 5.*
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 flexibility.

While Cherriots’s *current* pattern of demand can be explained by certain characteristics of its *current* riders, a future all-day network should offer the freedom and flexibility that invite people of all incomes to use transit.

(Another consideration about peak-only services is that they come with some hidden costs, which we discuss in detail in Section 6.4 Lower Peak Fleet Requirement, below.)

We recommend that SKT design its services as a consistent all-day pattern of frequency on all routes.

In the future, stronger peak demands may emerge, especially if transit pass programs (for students or for employees) are restored. If this comes to pass, the agency should consider supplementing the all-day frequency during the peak period(s), or adding a few buses at certain times to relieve crowding.

We also recommend that SKT work to increase the span of service late into the evening. If many Cherriots riders are commuting to service jobs, their shifts may begin in the midday or afternoon and end at night. Even office workers who are considering a transit commute find a late bus reassuring. Adding a few nighttime trips to the frequent network may therefore increase daytime ridership.

5.1.3 LESS DELAY FOR FREQUENT SERVICES

With its Corridors and Centers network, Salem-Keizer Transit has been gradually moving away from a transit network in which every trip must involve a transfer downtown.

Inherent in the network we recommend here is a feature that continues this transition, though it is invisible on a map. This feature is a change to the pattern of pulses.

Today, nearly all Cherriots buses are scheduled to lay-over for at least 10 minutes at a transit center (especially downtown), every hour, as part of a pulse that allows people to transfer between infrequent services without a long wait. (As we note above, buses often arrive early and spend more than 10 minutes laying-over downtown.)
We recommend that frequent Cherriots services do not dwell for more than 5 minutes at any pulse. A pulse is useful for connections among infrequent services, but not worthwhile for frequent routes. This is because the negative impact of missing a frequent bus is low, while the cost of making those buses (and their passengers) dwell for the pulse is quite high.

Through-routing the frequent Route A (and establishing layovers and operator breaks at the ends of those routes instead of downtown) would allow people to travel across the city on a single bus without spending 10 minutes or more sitting still downtown.

This change is made possible by our starting assumption that Cherriots would spend 15% of revenue hours laying-over, rather than the 32% currently spent. That 15% would include recovery time at the Transit Centers (which passengers will experience as a helpful pulse when they make connections) but it could not possibly accommodate the tradition of 10+ minute layovers on every trip for nearly every route.

5.1.4 Reliable Connections for Infrequent Services

We recommend continuing to pulse the less-frequent services downtown, at Chemeketa CC, Keizer Transit Center and at the future South Salem Transit Center. This way, people connecting between, for example, the half-hourly G-Edgewater and the hourly N-Sunnyview/Fisher can do so quickly and reliably.

To facilitate this, we have designed most of these routes as 30-, 60- or 120-minute modules. This means that it would take a bus that length of time to drive the entire route, and back again, including recovery time. (In some cases, a desire to make specific connections or to provide coverage caused us to settle on a less efficient module).

All of the pulses happening across town – at KTC, CCC, Downtown and South Salem – could then happen on the half hour and the hour, for 30- and 60-minute services. The exceptions would be:

- Route E, which would be offset from this pulse by 15 minutes so that the combined schedules of Routes D and E provide 15-minute frequency on Summer and Capitol and to Chemeketa Community College.
Route Q, which runs up Wallace Road and down Turner Road, passing through downtown in between. Because each half of the route takes just ½ hour, one of the passes through downtown would miss the hourly pulse (but would meet the half-hourly pulse).

At Keizer Transit Center, the hourly Route L would be timed to meet Route M. The M would be able to participate in this pulse at KTC as well as a pulse at Chemeketa Community College half an hour later.

5.1.5 **Fewer One-Way Loops**

In today’s Cherriots network, one-way loops are prevalent.

Routes 6, 7, 8, 9, 14, 16, 18, 21, 22, 23 and 24 all include large one-way loops. (In the case of the 14, 18, 21, 22 and 23, the route is entirely or almost entirely a one-way loop.)

Sometimes a bus route will do a small one-way loop at its end, in order to turn around. But more often, a one-way loop is designed to provide coverage of a large area without requiring more buses (and thereby more expense).

When drawn on a map, one-way loops may look as useful as two-way loops, but one-way loops actually sacrifice directness and quick travel time in order to cover a larger geographic area.

How does a passenger experience this sacrifice? It may be that on a trip to someplace, they can get on the bus and it goes in the direction they are traveling, so the trip feels fairly direct. But on their way home, they must ride *around the loop the long way*, out of direction, to get back to where they started.

Like hourly service, a one-way loop can never attract a passenger whose time is scarce and valuable (and that person may be rich or poor) because it guarantees that in one direction or another, the trip will be long and circuitous.

Some one-way loops are narrow enough that people could walk to one stop for their outbound trip, and from a different stop for their inbound trip, and thereby avoid riding around in a circle. But in this case, the number of residences (or jobs) that are within walking distance of *both* the inbound and outbound stops is actually lower than if the loop were simply a straight line, down the middle of the area. For people who are averse to walking,
or unable to walk very far, a one-way loop therefore forces them to ride in a circle.

One-way loops are an inexpensive way of providing coverage service to low-density, low-ridership areas. Two-way loops that run at half the frequency are also an inexpensive way of providing coverage service.

It is our preference, when given the choice, to design a loop as a two-way, hourly service rather than a one-way, half-hourly service. The only difference in cost is that a two-way loop needs bus stops on both sides of the street. Neither service can effectively compete with the car for people who have some choice of whether or not to use transit, but both provide coverage service at a relatively low cost.

Why do we recommend the less-frequent two-way loop? A service that only loops one-way is frustrating to passengers on every round-trip they make, whereas a two-way loop at half the frequency can at least be planned around. A one-way loop is also worse for local circulation within a neighborhood.

Finally, people often misread one-way loops on a map, even when the map indicates the looping direction with arrows.

5.1.6 OTHER SPECIFIC IMPROVEMENTS

Lancaster Drive and Hyacinth-Verda (Route B)

Route 11 today shows moderate productivity. By looking at its pattern of boardings, we can see fairly high demand for it all along Lancaster.

North of Chemeketa CC, however, boardings on the 11 drop off, and it’s no wonder why. Between Lancaster and the Keizer Transit Center, the route of the 11 is essentially rural, with long stretches of road on which neither walking nor waiting for the bus would be safe and there would be few or no people within walking distance of any stop.

Meanwhile, in Keizer, the neighborhoods around Chemawa, Verda and Hyacinth are all fairly busy and walkable, and yet they receive only infrequent and indirect service from Routes 14 and 15.

We recommend realigning the 11 so that it connects Lancaster and Chemeketa Community College to Keizer.
via Portland Road, Hyacinth, Verda and Chemawa. We have named this new alignment the Route B-Lancaster.

This has the added benefit of running all-day 15-minute service past the ends of the cul-de-sacs on which the Rockwest Training Company, the Capitol City Business Center and other industrial sites are located.

Marion County Corrections is currently served by Route 11. We recommend replacing this with a branch of Route K-State Street, which would connect the Corrections facility directly to downtown and regional transit services. Route B would then turn around and serve the shopping district at Rickey Street.

**Keizer circulation and Cherry Ave (Routes H and L)**

We recommend that Routes 9 and 14 be reconfigured. The existing Route 14 is an extremely low-ridership one-way loop, with the lowest productivity and highest subsidy per boarding in the entire system. The existing Route 9 provides coverage service in North Keizer, but also travels down River Road; in this recommended future network, all River Road service should terminate at Keizer Transit Center (not in residential neighborhoods) to facilitate connections to East Salem at the highest frequency.

To replace today’s Routes 9 and 14, we recommend a new Route H-North Keizer/Cherry Ave. that would connect North Keizer to central Keizer. Passengers could transfer in this area to and from Route A, or they could continue south to Portland Road and Brooks Ave, where Route H would connect to Route D-Portland Road or E-Silverton Road for access to downtown and Chemeketa Community College.

(Precisely how Routes H, D and E would come together at Brooks/Pine/Portland Road will require a detailed look at the intersections and stops. There may be a conflict between providing shared stops for multiple routes and minimizing passengers’ needs to cross hostile intersections on the one hand, and not sending full buses – at this location, they will likely be at their peak load – in time-consuming circles and through delay-prone left turns on the other hand.)

Transit service along Cherry Ave and Hyacinth Street would be upgraded from the old Route 14 to the new Route B-Lancaster or Route H-Keizer.

Route 18 (named Route L-Keizer Circulator, here) could remain unchanged, but we recommend converting it to a
two-way loop (at half the frequency) providing access in both directions along each segment.

Southwest Salem (Route 8/J)

With Route A-Commercial/River Road running every 15 minutes, running additional overlapping service along this segment, as Route 8 does today, would be unnecessary.

To eliminate duplication and increase frequency, we recommend shifting this service onto 12th/13th and Pringle Streets, and increasing its frequency to every 30 minutes, all day. This Route J-Pringle/Liberty would essentially replace today’s Route 6, at a higher frequency.

Route J would then extend west along Madrona, past Commercial (where passengers could connect to Route A) to Liberty Road, and then continue south on Liberty as it does today.

South of Kuebler, Route J would turn west to serve neighborhoods between Liberty and Commercial, looping at Commercial and Kuebler in the short term (and at a future South Salem Transit Center, in the long term).

In this way, both Commercial and 12th/13th/Pringle/Madrona/Liberty would be served by higher frequencies than they are today.

Route J would also provide transit service past the front door of the Amtrak/Greyhound station, whereas today the nearest stop is a long and unpleasant walk away.

Southeast industrial area (Routes 7/P and Q)

In today’s Cherriots network, the southeast industrial area is served by the 7 Fairview Industrial Drive.

Today’s Route 7 consists of a very large one-way loop around the airport, with a diversion down and back on Fairview Industrial Drive. It operates at 60-minute frequency midday and 30-minute frequency during the peaks. Its productivity is, today, quite low, and most of its boardings are either on Mission or on Fairview Industrial Drive, not around the airport.

The experience of riding the 7 must be very frustrating today, given how much distance has to be driven up-and-down Fairview, and around the entire airport, for every person’s trip.
We recommend splitting Route 7 into two separate services, each of which would be two-way and thus more direct.

The new Route P-SE Industrial would connect downtown to Fairview Industrial Parkway, and then continue on to South Salem, where it would connect with Routes A and J. It would run both directions, every 60 minutes.

The new Route Q-Turner Road would connect West Salem and downtown to the WalMart and a pocket of dense residential development on Turner Road. It, too, would run every 60 minutes in both directions. If possible, it could extend as far south as the Paradise Island Mobile Home Park, to provide service to residents there, but a turnaround in Paradise Island may not be possible. In this case, it could end and turn around at or near the WalMart.

Routes P and Q could leave downtown for the southeast industrial area half an hour apart. This would mean that one of them would miss the hourly downtown pulse, but it would also mean that there would be service past the west and south sides of Salem Hospital every 30 minutes (in addition to service along the east side every 30 minutes).

Northeast Salem (Routes C, D, E, F, N)

In addition to the streamlining of Routes D-Portland Road and E-Silverton Road to offer a 15-minute frequency between CCC and downtown, we recommend several other changes in the area north of Center and east of Portland Road.

- D Street. We recommend that the infrequent service along D Street (currently Route 2) be removed, as almost all of this corridor is within walking distance of either Center or Market (on which we recommend running 15- and 30-minute frequency). (Part of D Street would be served by our recommended Route N, as described below.)

- We recommend redesigning Route 17-Market and separating it from Route 5-Center (with which it is combined, today, as a two-way loop). Due to the low ridership (for a frequent service) that Route 17 shows today, in the Constrained Six-day Scenario we recommend reducing the frequency to every 30 minutes on the new Route F-Market/Brown (though in the Five-day Scenario there is enough funding to operate it at 15 minute frequency). East of the freeway, Route F would
turn north on Brown Road and end at Chemeketa Community College.

- Route C-Center, still at 15-minute frequency, would take over service from Route 17 on part of Market Street, east of Lancaster Drive.

- Route 20 Sunnyview would be altered slightly so that it approaches downtown via 17th and D Streets. This new Route N would provide access to North Salem High School and could serve the stop at the Chemeketa Center for Business and Industry. (We attempted to design Route N to serve Hawthorne Street, but the distance between downtown and Chemeketa Community College via Hawthorne is simply too long for a bus to still make timed pulses at both ends which, for service with 60-minute frequency, is essential.)

West Salem

Today West Salem is served by a very complex network of five infrequent routes. Three of these routes are very unproductive. Two of them, the 22 and 23 in the hills of West Salem, receive most of their meager ridership on just one or two school trips.

But two of the West Salem routes are remarkably productive – the 24 and 25. Unlike the other West Salem routes, they go to downtown. Because of the way their routes and their schedules come together, they actually offer 30-minute frequency from the west side of the bridge to downtown.

Today, the 24 and 25 share a common inbound stop, so people can walk to one place to wait for a bus to downtown, but they do not share an outbound stop, which means that people are let off in a different place depending on which bus they caught. In addition, the 24’s route is complex, with a one-way loop around Edgewater.

Meanwhile, the 12-Edgewater serves a dense, walkable part of West Salem, and many commercial destinations, but does not go downtown. Wallace Road, where new apartments and affordable housing are planned, today has a very long, infrequent circuitous one-way loop (the 22-Brush College) connecting it to Glen Creek.

With the savings generated by eliminating the most unproductive West Salem coverage routes, the 12-Edgewater could be extended to downtown.
We therefore recommend combining these five services into Route G-Edgewater, which could operate with either 30-minute frequency (in the Constrained Six-day Scenario) or 60-minute frequency (in the Constrained Five-day Scenario), and Route Q-Wallace/Turner Roads, with hourly frequency.

In our constrained scenarios, West Salem would have half-hourly or frequent service to downtown from Edgewater and southern Wallace Road, and two-way hourly service (a big improvement over one-way bi-hourly service) from northern Wallace Road to southern Wallace Road, downtown and Southeast Salem. This local network would be more frequent, more legible to riders, and more accessible, thanks to simpler routing, concentrated frequency and more direct connections to major destinations.

5.1.7 SATURDAYS

Because the constrained Saturday network we recommend in the Constrained Six-day Scenario would be infrequent, with each route running every 60 minutes, it would be essential that the routes all pulse downtown every hour. (Otherwise, if buses were to arrive at their connections randomly, a person’s average wait would be 30 minutes, and could be as long as 59 minutes!)

To make this possible, in the Constrained Six-day Scenario Routes B, C and D are designed as one triangular loop that can cycle in 120 minutes. While this does not provide a direct route between Lancaster Drive and Keizer, it is the only arrangement within the constrained budget that creates the hourly pulses downtown on which the whole Saturday network relies.

These Saturday routes are the corridors in Salem-Keizer on which transit can best compete with the private car for many people. This is due to some combination of the corridors’ straightness, street connectivity, walkability, major destinations at both ends, and – crucially – the number of jobs, residences and other activities within walking distance of each stop.

By operating on these corridors six days a week, SKT would not only be providing a badly-needed transit service, it would also be signaling to the people who live there, to developers, to businesses and to future residents that these corridors are where a person or a business should locate if they want access to quality transit.
This constrained Saturday network concept correlates with the “permanent Cherriots network,” made up of the corridors on which SKT will always provide its longest span of service (in terms of hours per day and days per week) and the highest frequencies.

However, the Saturday network described in the Constrained Six-day Scenario is really insufficient to meet Salem-Keizer's needs, and service on Sunday and holidays should be provided as well, as it is in similar cities across the U.S.

5.2 Access Outcomes

When a transit plan proposes to eliminate any services, we should examine how many people will lose service and how many will gain service.

Today’s Cherriots network passes within 1/4 mile of 69% of residents and 85% of jobs. The Six-day Scenario network drops these to 60% and 79% respectively.

Yet this measurement, of access by any service, must be weighed against the number of people with access to
frequent service. This is because ridership potential is affected far more by useful service than by just any service.

If we look at the change in access to frequent service, we see that it increases considerably - up from 20% of the population covered to 26%, and up from 37% of jobs covered to 49%.

The Constrained Six-day Scenario's weekday network would offer more useful, frequent transit service within a short walk of more people and more jobs than the existing Cherriots network, while also freeing up funds to provide limited service on Saturdays.

We must keep in mind, when reviewing the results of this coverage analysis, that while some people can’t or won’t want to walk at all to reach transit, some people will walk more than 1/4 mile to reach frequent, fast transit service. Some of the “uncovered” residents, jobs, and riders, for example, are on D Street stops that are just a few feet more than 1/4 mile from service. The frequent service on

Table 1: Changes in access to frequent services and all services, between the existing and recommended Constrained Six-Day networks. (Residential population data comes from the U.S. Census; employment data comes from the Mid-Willamette Valley Council of Governments.)

<table>
<thead>
<tr>
<th>Networks</th>
<th>Residential population</th>
<th>Jobs</th>
<th>Daily boardings on existing system</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Within 1/4 mile</td>
<td>Total</td>
</tr>
<tr>
<td>Cherriots Service Area</td>
<td>217,938</td>
<td>99,746</td>
<td></td>
</tr>
<tr>
<td>Present-day network</td>
<td>All service</td>
<td>151,272</td>
<td>69%</td>
</tr>
<tr>
<td>Recommended &quot;constrained&quot; network</td>
<td>All service</td>
<td>130,969</td>
<td>60%</td>
</tr>
<tr>
<td>Present-day frequent network</td>
<td>Frequent service</td>
<td>43,275</td>
<td>20%</td>
</tr>
<tr>
<td>Recommended &quot;constrained&quot; frequent network</td>
<td>Frequent service</td>
<td>57,551</td>
<td>26%</td>
</tr>
</tbody>
</table>

Table 1: Changes in access to frequent services and all services, between the existing and recommended Constrained Six-Day networks. (Residential population data comes from the U.S. Census; employment data comes from the Mid-Willamette Valley Council of Governments.)
Center Street is already worth walking to for some of them.\(^4\)

There are some places that can access service today that is of little practical use. For example, the Capitol City Business Center has access to Route 14. But that one-way loop generates very little ridership, even though it drives right up to the Center's front door, because its low frequency and looping shape make it *not very useful*.

In the Constrained Six-day Scenario's weekday network, jobs at the Capitol City Business Center would no longer be considered to have access, because transit service would be just over \(\frac{1}{4}\) mile away. But that new transit service - Route B-Lancaster - *would be coming every fifteen minutes*, and it would directly connect people to vastly more places than the old Route 14 did.

If we look closely, we can find many examples like the Capitol City Business Center, where a barely-useful service is today providing theoretical access within \(\frac{1}{4}\) mile, and could be replaced with a more useful service that is a farther walk away.

We must also evaluate how many of the daily boardings on the present-day Cherriots network would be within \(\frac{1}{4}\) mile of any service, or of frequent service, in the Constrained Six-day Scenario, as we do on the following page.

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\(^4\) For more information about how far people will walk to different types of service, see the Transit Capacity and Quality of Service Manual, 2\(^{nd}\) Ed. (http://www.trb.org/Main/Blurbs/153590.aspx), pages 3-9 and 3-10. Note, however, that the data reported there are for walks to *any* bus stop, and do not reveal differences in willingness to walk to frequent vs. infrequent bus stops.
Of the 13,327 boardings counted on today's network, 458 (3%) are at stops that would be eliminated and that would then be more than ¼ mile away from another stop on the Constrained Six-day Scenario weekday network.\(^5\)

More than twice as many boardings, 941 of them (7%), are today farther than ¼ mile from a frequent service stop but would gain that close access to the frequent network in this recommended scenario.

(See the table on page 32 for these numbers, and the chart at right for the changes they represent.)

This is how a shift from providing coverage services to providing ridership services works out in practice: a small number of people no longer have access to any transit at all, while a much larger number of people now have access to very useful transit and, as a result, their use of the transit system increases.

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\(^5\) Note that each of these boardings doesn’t necessarily represent a person, since a person may board at a certain stop more than once a day.

Figure 3: The recommended network would provide a stop within ¼ mile of the stops where all but 458 of 13,327 daily boardings happen today. Meanwhile, 941 current boardings would become closer to the frequent network.
This is also how an agency would increase ridership on a fixed budget, and shift a 66%/34% ridership/coverage balance to a 75%/25% ridership/coverage balance.

While SKT stakeholders indicated that they desire this shift, we realize that in practice it may have a strongly negative impact on a small number of people. The high-level values-based change that this represents should be vetted among a bigger group of stakeholders and the general public, now that the impacts - positive and negative - are known.

5.3 PURPOSE AND PERFORMANCE

In the Existing Conditions Report, we made a distinction between routes whose main purpose is ridership and routes whose main purpose is coverage.

This distinction allows an agency to focus on how to make each service succeed on its own terms, and how to measure results in a way that is consistent with the service’s purpose.

In this way, a route designed to provide coverage and not to grow ridership can be evaluated and managed with the goal of coverage in mind. Its failure to attract much ridership should not be seen as a performance failure.

In measuring and monitoring routes’ performance against their purposes, we offer the following cautions:

- The performance of any single route is linked to service provided on other connecting routes, especially in a network that relies on connections (rather than complexity) to get people from one part of the city to another.
- Aside from connections, the performance of any one route can be affected by service provided (or not provided) on parallel routes.
- Even high-ridership routes may have segments with few boardings.
- Low-ridership routes should be evaluated by looking at stop-by-stop boardings. Certain segments may have ridership potential that is undermined by the design of the route.

Keeping these considerations in mind, we recommend that SKT take the following approach to monitoring performance of a new network.
5.4 Route Classifications

Today Cherriots routes are classified as Corridors, Connectors and Circulators. We recommend continuing this approach, though with routes that are intermediate between the two purposes called Intermediate rather than “Connectors.”

This Corridors and Circulators classification could also be described as a “Ridership Corridors” and “Coverage Circulators” classification. Some routes would be exclusively Ridership or Circulators, while others would have a mix of purposes – as we’ve shown them in the table at right.

The classification used today (Corridors, Circulators and Connectors) is based partly on ridership/coverage purpose, and partly on route structure in the network. We recommend shifting towards a classification scheme that focuses more on ridership/coverage purpose.

Figure 5-3 We estimate the extent to which each weekday route in the recommended Constrained Six-Day Scenario is serving or pursuing ridership, and the extent to which it is simply providing coverage, regardless of ridership. As we describe earlier in this report, initial stakeholder guidance was that SKT should move towards a 75%/25% ridership/coverage balance in the design of its system, which this scenario approximates.
A great tool for evaluating routes is a productivity scatterplot, like the one included in the *Existing Conditions Report*, repeated below for reference.

This chart allows us to compare route performance within a category (e.g. compare Route 11 to the other Corridors, in red) and between categories (e.g. compare Corridors, in red, to Circulators, in green).

![2013 Cherriots network route productivity](chart)

*Figure 5-4* This scatterplot shows each route in the existing Cherriots network, plotted according to its productivity (on the y-axis) and how much service it offers each day (on the x-axis). A scatterplot like this, created for a future Cherriots network, would help transit planners see which routes are serving their purpose (whether it is ridership or coverage) and which are not.
5.5 Ridership Corridors

The performance of each Ridership Corridor should be measured relative to the rest of the ridership corridors. Essentially, if one of these corridors is considerably less productive than the others, SKT should evaluate:

- Any characteristics of the route or the schedule that may be depressing boardings (such as out-of-direction travel, missed pulses, low frequency or difficult-to-access stops).
- Stop-by-stop boardings and on-board load along the route, to identify high- and low-demand segments.
- The maximum ridership potential of the area the route serves (based on current or future land uses, density, street connectivity and the directness of the transit path).

If a Ridership Corridor is attracting less ridership than its peers, it may be that the area it serves is simply not, relative to the rest of the region, going to generate much transit ridership. In this case, SKT should consider redefining the route’s purpose, and adjusting the service (especially its frequency and span) accordingly.

5.6 Coverage Circulators

The purpose of Coverage Circulators is not to attract much ridership but to provide some transit service as a "lifeline" or social service. Their performance should therefore not be compared to the Ridership Corridors in the SKT system.

There are two ways in which ridership should be used to evaluate Coverage Circulators:

- At the January 30th Stakeholder Workshop held as part of this planning process, 92% of stakeholders in attendance said that there was some ridership cutoff below which SKT should stop running a particular service. About half of those who supported a cutoff said it should be 10 or 15 boardings per hour, and the others said it should be 5 boardings per hour. (Today eight Cherriots routes attract between 5 and 15 boardings per hour.)
- In general, below a certain number of boardings per hour (around 8, depending on local factors) coverage service may be provided more cost-effectively by dial-a-ride than by fixed routes. How cost-effectively will depend on the size of the
contiguous dial-a-ride zone that can be served by one bus and driver, and on labor arrangements with fixed-route operators.

Coverage circulators may be evaluated based on:

- The severity of the needs of the people who ride them.
- The social service and civic destinations they serve.
- The amount of geographic area they cover with some service.
- The connections they make to Corridor services.

Of course, should a coverage circulator start to attract a number of boardings per hour that is more in the range of the Corridors, that would be a success worth celebrating!

In that case, the productivity of the route should be plotted alongside the other routes in the system, and the route should be evaluated as described for Corridors, above. It may be that certain segments pass through areas with higher transit demand and should be made part of Ridership Corridors rather than a Coverage Circulator.

Intermediate routes – which have some ridership purpose (and potential), but also provide coverage in areas where ridership will likely never grow – should also be regularly reevaluated in this way.
6 SHORT-TERM FACILITY AND EQUIPMENT IMPLICATIONS

6.1 IMPROVED STOPS

We recommend a number of small-scale, short-term improvements to stops and waiting environments, where passengers will be connecting among routes in this improved network. The improvements called out below are in addition to the requirement for new stop poles on all new routes, and would support either the Constrained Five-day or Six-day Networks.

Commercial and Kuebler
Routes P and J, as we have designed them, would terminate in the vicinity of Commercial and Kuebler. Route A would continue further south. In the long term, the South Salem Transit Center (described in more detail, below) may facilitate connections among these routes. In the short term, we recommend creating shared stops and shelters on Commercial north or south of Kuebler, and looping Routes P and J so that they can each share a pair of stops with the A.

Madrona and Commercial
Where Routes J and A intersect, shared stops and shelters may be appropriate. (This can be achieved if one of the routes stops at the far side of the intersection.)

Chemeketa Community College
The College has the highest concentration of boardings outside of downtown, and is a strong, high-demand anchor for the routes that end there. It would make a good informal or official “East Salem Transit Center.”

Even without this designation, however, the increase in service we recommend here may require additional space at the College, either where buses stop today or in another location close to the College buildings.

North River Road
Where the H and the L connect to the frequent A on River Road, passengers should be able to wait at shared stops and shelters.

Hyacinth/Verda/Chemawa
The frequent service that would be offered on Hyacinth, Verda and Chemawa by Route B should be supported by shelters.
6 Short-term facility and equipment implications

Southern Wallace Road

Shared stops and shelters near Taggart on Wallace Road would allow passengers to connect between Routes G and Q, and to wait for either bus in order to travel downtown.

Pine/Portland/Brooks

The recommended network includes a timed-connection at Portland Road and Highland Ave for the H, D and E.

As we note above, precisely how Routes H, D and E would come together here will require a detailed look at the intersections and stops. There may be a conflict between providing shared stops for multiple routes and minimizing passengers’ needs to cross hostile intersections on the one hand, and not sending full buses in time-consuming circles on the other hand.

Shared stops at this location should include shelters and route information.

6.2 Turnarounds

At the ends of new routes, or newly extended routes, new bus turnarounds would be required.

- Route Q-Turner Road. A turnaround in the Paradise Island Mobile Home park would allow the Q to serve that neighborhood. If that is not operable or acceptable to the neighborhood, this route could be truncated with a turn-around at the WalMart.

- Route A-Commerical, at Madras St. Even once a South Salem Transit Center is built, we recommend running Route A further south (and not laying it over at the Transit Center) so that it serves the entirety of the high-demand part of Commercial. In the short-term, a turnaround using Madras Road may suffice. In the long-term, a small operator restroom/breakroom may also be desirable at the end of this long route.

6.3 Roadway Changes

Two small roadway adjustments would significantly improve the operability and attractiveness of this improved network.

- Stop line adjustments allowing Route N to turn at 17th & D Streets.
• On the CCC campus, slight adjustments to the design of the intersection of Fire Protection Way and South Campus Loop. This would allow Route F buses to enter and leave the campus via Fire Protection Way and 45th Avenue, providing new access to the neighborhood east of the campus. Without these adjustments, Route F could not serve 45th Avenue.

6.4 LOWER PEAK FLEET REQUIREMENT

The present-day Cherriots network provides higher frequency on most routes during peak hours, and some peak-only routes.

A transit network built around peak-only services or higher peak frequencies has a few hidden costs:

• Bus operators must be transported to and from the start of their shifts twice a day, for which the agency must pay them.
• Peak-only routes and frequencies require two very short work periods each day for bus operators. Such split shifts are expensive for the transit agency (because the operator is paid for the time in between the shifts, or at least paid a higher rate for each shift) and can be exhausting for operators, especially if they care for family.
• The agency must maintain a large fleet of buses for the peaks, a fleet that sits idle at other times. For each extra bus that is run during peak times, the agency had to purchase the bus, find land to store it on, pay people to maintain it, and pay extra to the operator who works a brutal schedule to drive it.

Given the high costs of running peak-only services and higher frequencies during the peak, and the fairly level transit demand we have observed on the Cherriots system, SKT should ask itself whether it is a peak-transit-agency that runs some service at other times, or an all-day-transit-agency that supplements services during periods of high demand.

In the recommended future network, frequencies on all routes are consistent throughout the day. This would have a positive impact on passengers’ flexibility and spontaneity, and would better serve Salem-Keizer’s high afternoon demand.
Consistent all-day frequencies and reduced layover would allow SKT to reduce its peak fleet requirement, for regular and express service, from 53 buses to 44 buses.
7 LONG-TERM FACILITY AND EQUIPMENT NEEDS

7.1 SOUTH SALEM TRANSFER STRATEGY AND TRANSIT CENTER

The network design effort we undertook with SKT staff, Board and stakeholders resulted in a South Salem transit network with two nodes: Commercial and Madrona and Commercial and Kuebler.

In the short term, as described above, these intersections should be enhanced so that transferring among Routes A, J and P is comfortable and intuitive. (In the case of Commercial and Kuebler, however, the intersection is so hostile to walking and transit that the transfer location should be north or south of it.)

In the long term, a number of South Salem facilities can support this transit network. Such improvements in South Salem would have the effect of:

- Allowing quick and comfortable connections between transit services from South Salem neighborhoods, as well as the southeast industrial area.
- Facilitating a “pulse” among low-frequency services.
- Focusing development around the Commercial transit corridor.
- Supporting bike-to-transit trips.
- Providing end-of-line facilities for operators.

We recommend a South Salem Transfer Strategy that has three elements, which may be implemented independently and may be located at some distance from one another:

1. **Within ½ mile of Commercial and Kuebler**, a passenger- and pedestrian-oriented Transit Center that supports transfers among Routes A, J and P (and could accommodate up to three more future routes). Route A-Commercial, however, would not dwell at this Transit Center, but instead would spend its recovery time (and operator break time) at the end of its route.

2. Enhanced stops and pedestrian safety improvements at Madrona and Commercial, to support transfers between Routes A and J.

3. If necessary, a driver break facility at the end of Route A, either on the Madras loop or further south.
For the first element, a small and probably off-street transit center, the optimal site for the function of the transit network appears to be adjacent to the WalMart on Commercial just south of Kuebler, but other nearby sites are also workable.

Specific Transit Center sites and designs must be assessed with a high priority assigned to:

- Easy bus ingress and egress from all the directions specified in this network.
- Easy through-operations for Route A-Commercial with the understanding that this is not its logical terminus and that its path through the area must respect the needs of through riders a direct travel along Commercial.
- Short and direct walking connections to and within the Transit Center.

We urge SKT to be cautious that the size and scope of the South Salem Transit Center does not get so large (for example, with so many bays for potential future pulsing buses) that it can no longer be built in the logical place for the network, and in a way that is efficient and appealing to walk to and from. This is an ever-present danger in the design and placement of transit centers.

### 7.2 Signals and Street Connections

The recommended constrained six-day network would benefit from some changes to streets and signals, which are controlled by the City of Salem and the City of Keizer:

- High speeds and a lack of signals on State Street and Cordon Road make it dangerous for a bus to make a left turn out of the Four Corners neighborhood onto either of those roads. As a result, SKT can only run one-way looped service through the Four Corners neighborhood.
- Buses cannot turn left out of the KTC, and must travel a 1.6-mile loop to the north (that results in very few boardings, despite high frequency of service). This costs SKT approximately $283,000 per year in extra mileage, fuel, operator salaries and other costs. (To say nothing of the time wasted by Cherriots passengers, who spend more than 4 minutes of every trip through KTC riding in needless circles.)
In the constrained six-day network, the annual cost of this wasted service would be reduced to about $201,000 per year, still an excessive amount. Permitting left turns out of KTC would save operating costs and improve transit service for all Keizer passengers.

- We have recommended an alignment for Route C-Center Street that uses Clay and Lancaster as a turnaround. In the absence of a signal at Market and Clay (or at Lancaster and Cypress), however, the necessary left turn may be difficult for buses to make at rush hour. An alternative turnaround loop, using Tierra and Weathers, would be much larger and would therefore have the undesirable characteristics of one-way loops, which we describe above.