

0 Introduction & Summary

Why change the bus network?

Transit Tomorrow

Lane Transit District (LTD) has launched Transit Tomorrow, an effort to understand how LTD’s services should be distributed in its service area.

LTD operates a variety of public transportation services throughout central Lane County. But people are most likely to experience LTD as the bus system in Eugene and Springfield. Over 90% of LTD’s rider-ship comes from the regularly scheduled bus routes (including EmX and Routes 1 through 85) that operate in the Eugene-Springfield metro area.

The last time LTD took a comprehensive look at its transit network was nearly 20 years ago. Since then, Lane County’s population has grown by nearly 20%, with much of that growth concentrated in Eugene and Springfield. In the same time period, LTD bus service hours have only increased by 5%.

Although there have been some significant improvements since 2000 (like EmX), much of today’s network reflects years of incremental change in response to immediate trends and circumstances rather than a comprehensive vision for the network. So it’s worth asking the question: **do LTD’s services still reflect the community’s values and priorities for transit service?**

Following two rounds of public consultation in 2018-2019, Transit Tomorrow is now proposing a redesigned bus network in Eugene and Springfield for implementation in the next three years.

In addition, we are looking at:

- Whether and how to implement any on-demand mobility services as a replacement for bus service in metro area neighborhoods;
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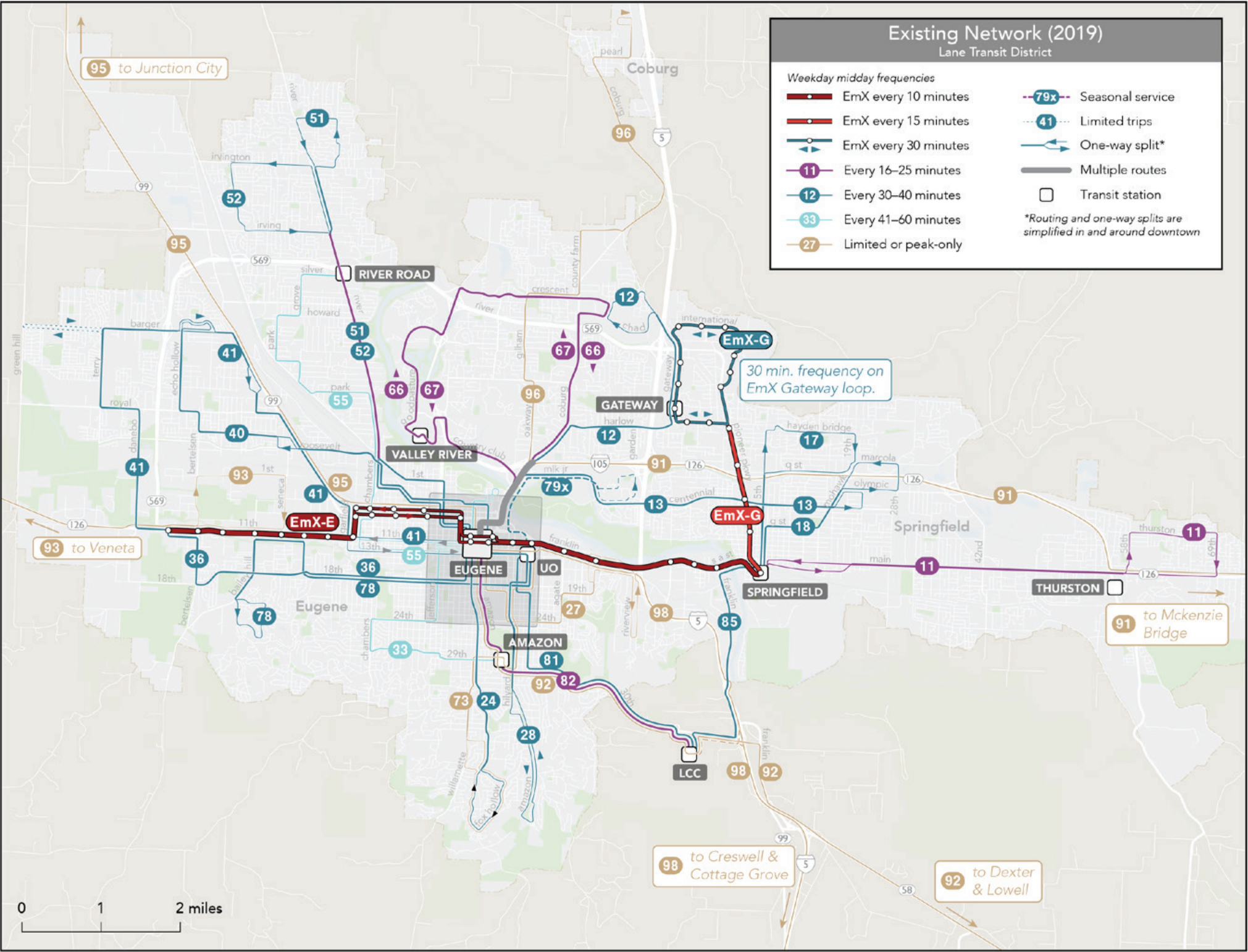


Figure 1: Existing Network Map. The existing bus network in Eugene and Springfield is the product of several decades of decisions. The last time LTD took a comprehensive look at its transit network was nearly 20 years ago. Is the service shown on this map the best possible match to the community’s values and priorities for transit?

¹ Regulations associated with the Americans with Disabilities Act (ADA) required all transit agencies to provide complementary paratransit within 3/4 mile of any all-day bus route. Complementary paratransit is an on-demand door-to-door transportation service for eligible people with disabilities. LTD provides this service through its RideSource division.

What choices were considered?

Key Trade-offs

The proposed bus network redesign has been developed around a public conversation on two major trade-offs:

- **Ridership vs. Coverage:** Is it more important to provide frequent service in places that will attract the most riders, or to provide a little bit of service to as many places as possible?
- **Added Service vs. Lower Fares:** Is it more important to use LTD's resources to provide as much service as possible, or to reduce the cost of getting on the bus?

Neither of these questions have technically "correct" answers. LTD will always need to balance the competing priorities they reflect. In both cases, the correct answer depends on what the community values most.

Public Outreach and Consultation

The Transit Tomorrow project has gathered the community's input on these trade-offs in two rounds of outreach. Both rounds involved:

- A stakeholder workshop, bringing together representatives from business, social service and transportation advocacy organizations active in the metro area.
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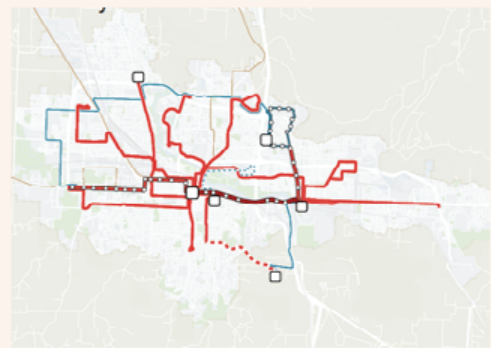
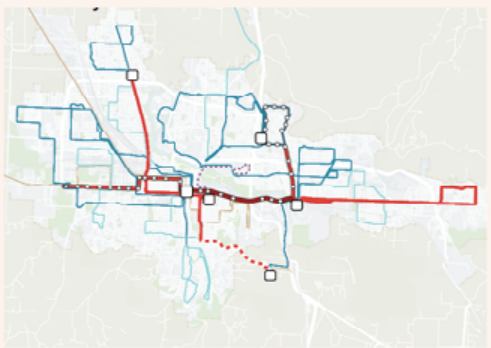
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Trade-offs and Decisions

Ridership vs. Coverage

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In contrast, pursuing extensive coverage means reaching as many places as possible. Service focused primarily on coverage:

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- Spreads service more thinly over a larger area.
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Coverage service often takes the form of infrequent bus routes serving low-density or isolated areas. Coverage service can also be provided by on-demand or flexible services in areas where expected ridership is very low.

We estimate that LTD's existing network dedicates about 65% of metro area service to maximizing ridership, while 35% is oriented to extending coverage to as many places as possible.

On March 20, 2019, following public consultation, **the LTD Board directed the project team to design a network where 80-85% of metro area service is oriented toward ridership, and 15-20% is oriented toward coverage.** In addition, the Board directed the project team to design up to 5% of the network for non-fixed route solutions.

Added Service vs. Lower Fares

Following the passage of the Keep Oregon Moving act in 2017², LTD has started to receive new revenue from the Statewide Transportation Improvement Fund (STIF).

STIF funds can be used to increase transit service, reduce fares, and purchase low-emission vehicles. LTD is planning to make significant upgrades to its fleet in the next two years, leaving approximately \$4 million per year to improve service and/or reduce fares.

If LTD focused the remaining new resources only on increasing service, it would be possible to increase weekend service levels by 50%. This would make it possible to operate most bus routes at the same frequency, seven days per week. If that were the case, fares would need to remain at current levels with no new discounts.

If LTD focused those resources only on reducing fares, it would be possible to reduce the average cost of fares and passes by 50%. This could be achieved through a wide variety of fare discounts to students, older adults, people with low incomes, and people with disabilities, and a reduction in regular fare. But to achieve this, there could be no increase from current service levels.

Following public consultation, and through the STIF project approvals process, the LTD Board has directed that:

- **\$1 million per year should be dedicated to fare programs**, creating a new discounted youth pass program, and expanding LTD's existing low-income pass program.
- \$3 million per year should be dedicated to increasing service. LTD staff have determined that:
 - » **\$2.3 million is available for improvements in service frequency, particularly on weekends and evenings.**
 - » \$0.7 million should be reserved for increased weekday peak hour service to handle expected increases in K-12 student ridership to access schools.

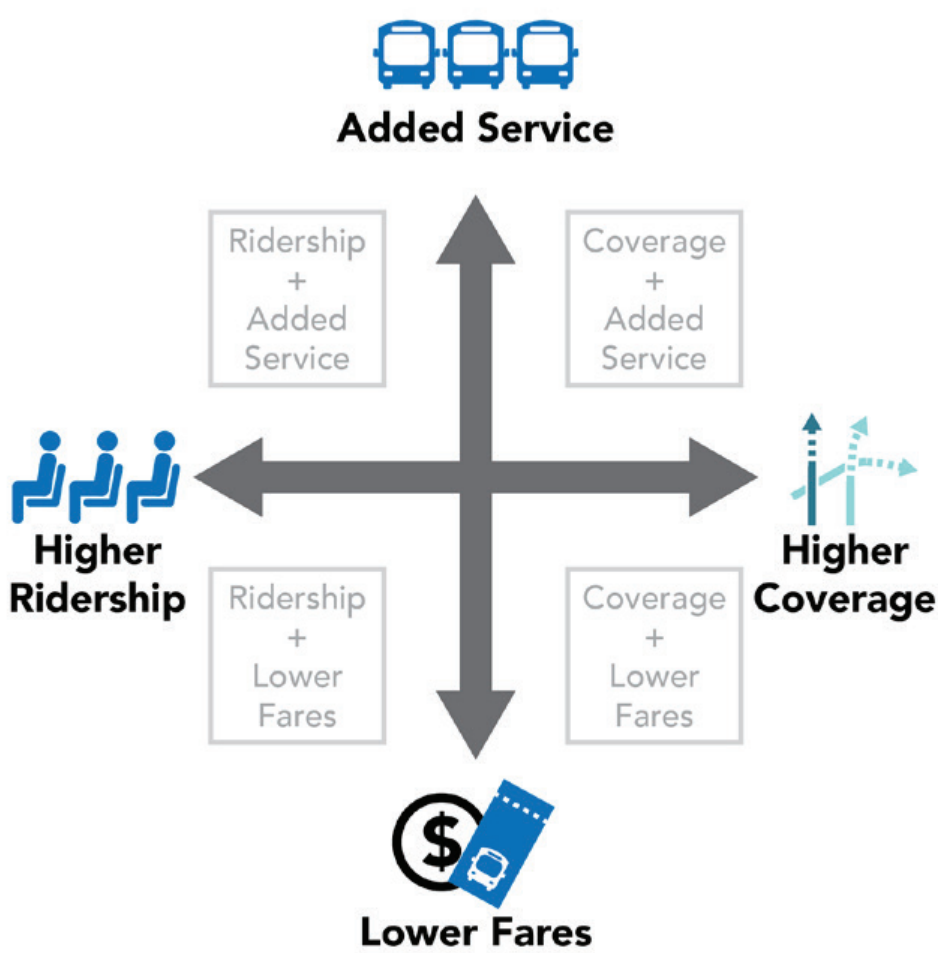


Figure 3: Trade-offs. Where should LTD focus its resources? Is it more important to provide frequent service in a few places, or a little bit of service everywhere? Is it more important to increase service, or to make service more affordable?

² Also known as House Bill 2017, or HB 2017.

How is the draft network different?

A Simpler and More Frequent Network

The draft network would dramatically simplify bus service in Eugene and Springfield: **the network would go from 26 routes today to 10 proposed new routes.** This is mostly achieved by combining existing bus routes into longer and straighter paths.

Seven of the 10 proposed routes would operate every 15 minutes or better on weekdays. Several of the new routes combine main streets on opposite sides of Downtown Eugene, allowing for faster travel across the metro area and reducing the need for transfers. All of this would make the network far easier to learn, use and navigate.

Despite this, the majority of people in the metro area would remain within walking distance: transit would be available within 1/2 mile of 82% of residents and 91% of jobs (compared to 87% of residents and 91% of jobs today).

At the same time far more people would live and work near frequent service, coming every 15 minutes or better. **57% of residents and 70% of jobs would be located within 1/2 mile of a transit stop with frequent service** (compared to 22% of residents and 42% of jobs today).

These changes reflect the shift toward more ridership-oriented service: slightly fewer people would live near a bus route overall, but most people would have access to much more frequent and useful service.

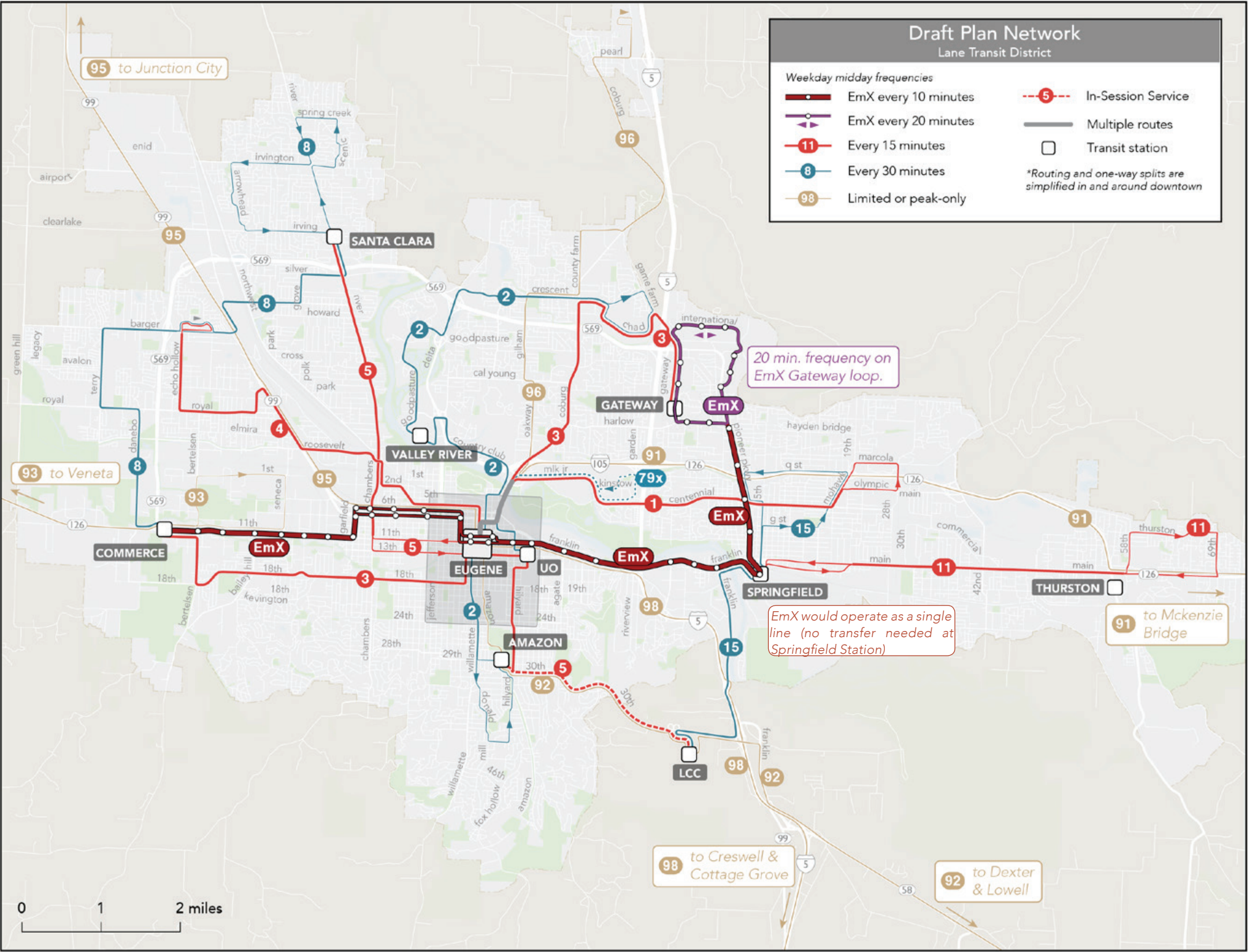


Figure 4: Draft Network Map. This map shows the draft network redesign, including the new routes and their frequency on weekdays, in the middle of the day. The draft network represents a significant shift of resources in the direction of higher ridership. As a result, most of the service would be provided as frequent routes on main streets, and fewer routes serve outlying low-density neighborhoods.

More Evening and Weekend Service

Outside EmX and Route 11, LTD has always provided much less service on weekends than on weekdays. Existing service levels are also very low after 7 PM on weekdays.

Public input in Phase 1 made it clear that there was a strong desire across the community for improvements to frequency, and especially improvements in evening and weekend frequency.

For evening and weekend frequency, this was further reinforced by public input in Phase 2, which showed far more people preferring the scenarios that improved evening and weekend service over the scenarios that would lower fares.

In the short term, Transit Tomorrow would respond to this desire by:

- Continuing **service every 30 minutes or better until 10 PM on weekdays and Saturdays** on all but one route; and
- Ensuring that **all routes would run every 30 minutes or better on Sundays**.

If LTD revenues continue to improve over the next three years, this Draft Plan recommends implementing frequent service every 15 minutes on Saturdays from 8 AM to 8 PM, and on Sundays from 10 AM to 7 PM, on Routes 1, 3, 4 and 5. This would be in addition to EmX and Route 11, which already operate at or near this level of service today.

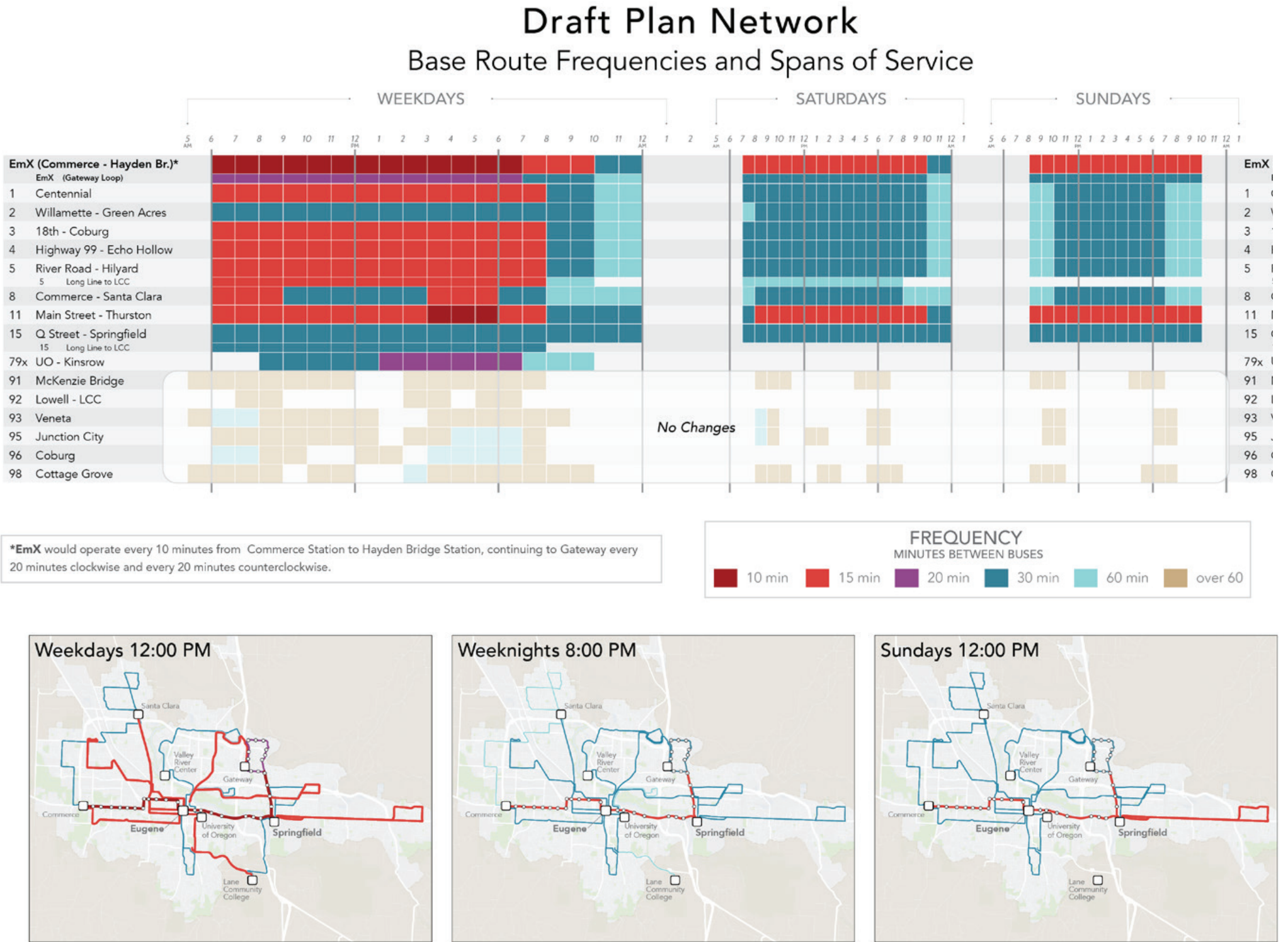


Figure 5: Draft Network Frequencies. These graphic and miniature maps shows how much bus service is anticipated on each proposed route at different times on weekdays, Saturdays and Sundays. Red indicates service coming every 15 minutes or better; dark blue indicates service every 30 minutes; and light blue indicates service every 60 minutes.

Faster Travel and More Access to Opportunity

It is inconvenient for most people to structure their day around a bus that only comes every 30 or 60 minutes. So one of the most effective ways to make transit more useful is to make the bus come more often.

The more frequent a bus route becomes, the less time you are likely to wait, and the sooner you'll get to where you're going. For example, the average wait for a bus that comes every 30 minutes is 15 minutes; but the average wait for a bus that comes every 15 minutes is 7.5 minutes. So higher frequency means people save time.

The draft network would save people time in two distinct ways:

- Most routes would operate more frequently, going from service every 20 to 30 minutes, to service every 15 minutes.

- **Some routes would be combined to run across the city. This would also save time by reducing the need for many transfers.**

- » West 18th Avenue (Routes 36, 78) would be combined with Coburg Road (Routes 66, 67), into a single Route 3.
- » River Road (Routes 51, 52) would be combined with service to UO, most of Hilyard Street and LCC (Routes 28, 81, 82) into a single Route 5.
- » EmX in Springfield would be re-combined with EmX in Eugene.

Because the draft network would offer significant time savings in most locations, it would be possible to reach far more places and opportunities in a reasonable amount of time on transit. On weekdays, we estimate that **the average resident of the Eugene-Springfield metro area could access 20% more jobs on transit in 45 minutes or fewer, door-to-door.**

Areas where job access by transit would improve (i.e. most trips by transit would take less time) are shown in the maps below in green. This includes most, but not all of the metro area. Some areas would be further from service or would have service at lower frequencies, and as a result job access by transit would decrease. These are shown in pink.

We measure access to jobs because that is the data available to us. But this is not just a measure of convenience for employment and commuting.

Places where many jobs are located often have other interesting features. Offices, shopping centers, social services, and even schools and houses of worship all are employers in themselves, in addition to being near or in employment centers. So calculating access to jobs helps us understand opportunity more broadly.

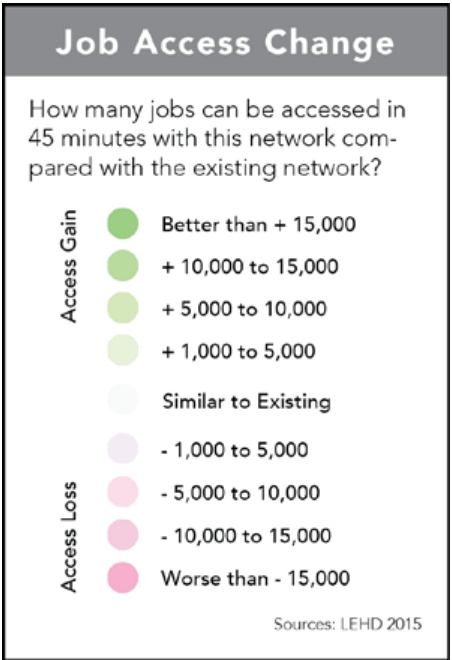
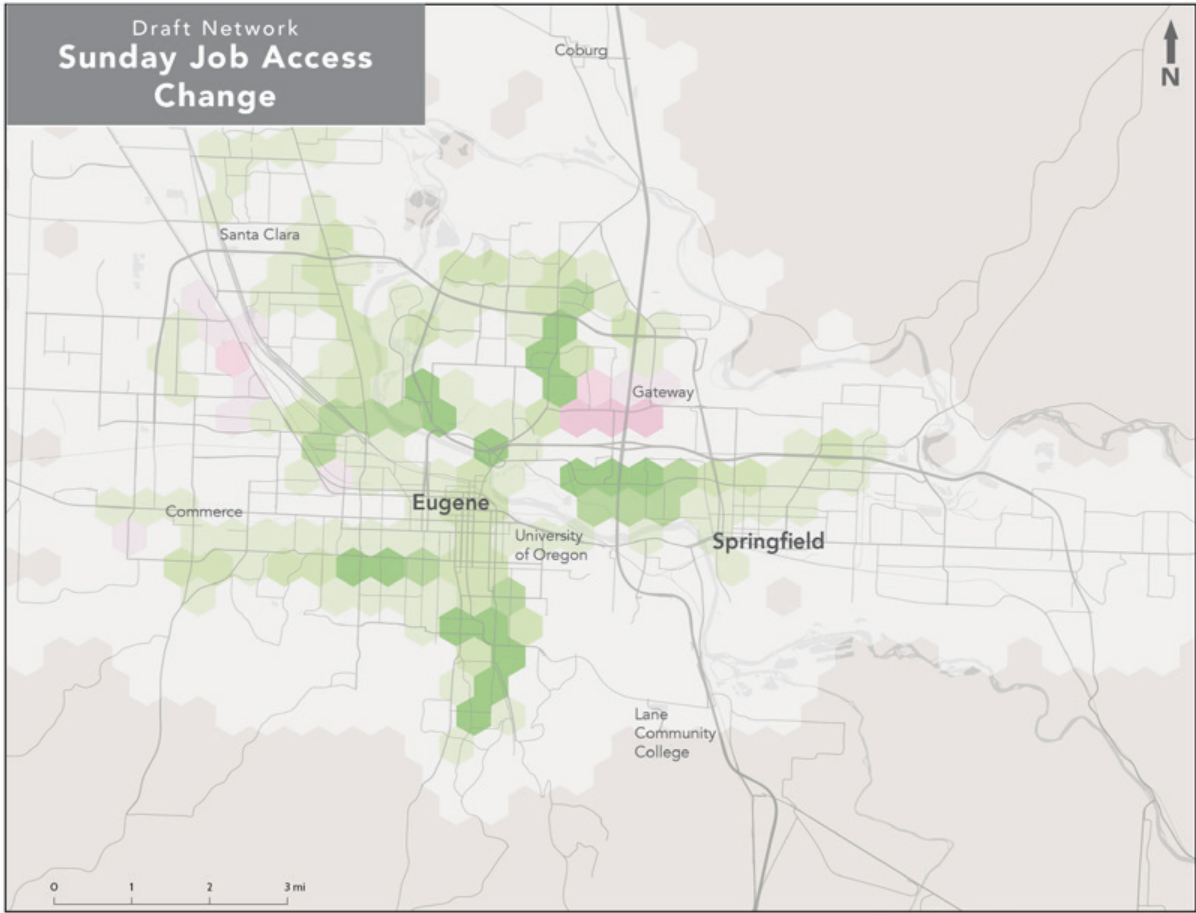
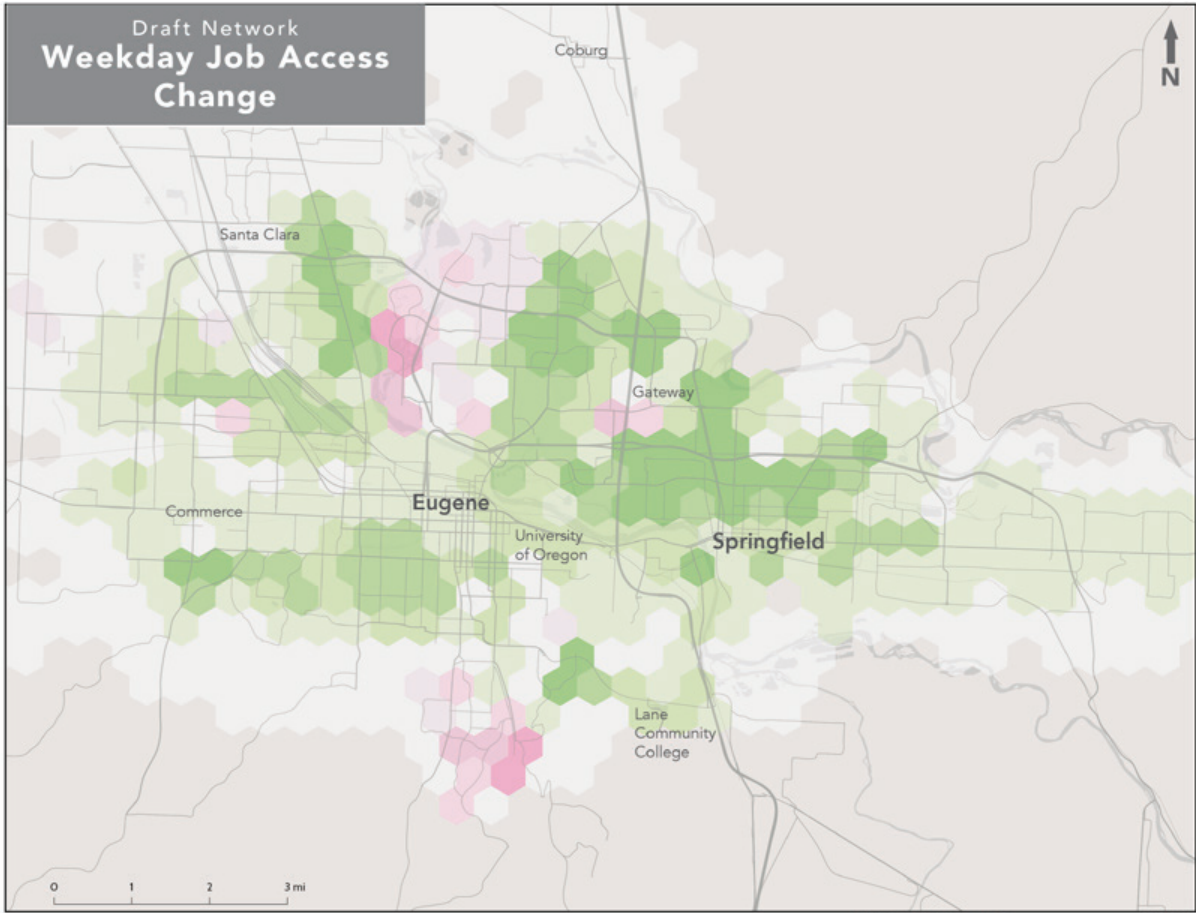


Figure 6: Job Access Change Maps, on weekdays and Sundays. Green areas indicate areas where the draft network would make it possible to access more jobs in 45 minutes (door-to-door) on transit. Pink areas indicate areas where you could reach fewer jobs in 45 minutes. These maps are mostly green, because most parts of town would receive more frequent and direct service, enabling faster travel. In pink areas, transit trips would mostly become longer.

Positive Impacts Across Demographics

The draft network would ensure that far more people and jobs would be located near frequent service. Whereas 19% of residents and 42% of jobs are located within 1/2 mile of a bus stop with frequent service today, those numbers would jump to 57% of residents and 70% of jobs after services were changed.

This improvement wouldn't be limited to any one class or type of people; the benefits would be even more striking among low-income and minority populations, as well as older adults:

- 63% of people of color would live near frequent service, compared to 22% today.
- 71% of people in poverty would live near frequent service, compared to 31% today.
- 49% of people aged 65 and over would live near frequent service, compared to only 13% today.

Less Service in Some Areas

At the same time, some areas would receive less service. Many people would need to walk further to access transit than they do today, and some areas that currently receive service would see fewer buses or none at all. Overall, the percentage of residents living within 1/2 mile of a bus stop would drop from 87% to 82%.

This is a direct consequence of the policy choices that drive the draft network's design. Re-orienting service toward higher ridership means focusing on frequent routes on main streets, and steering away from some lower-density, outlying and isolated neighborhoods.

LTD is studying different ways to continue providing lifeline service in areas where the draft network no longer includes a fixed bus route. If revenues continue to improve, LTD may be able to restore some coverage, either as a fixed or on-demand service. However, this would need to be balanced against the improvements that could be achieved by further improving weekend and evening frequencies.

Nonetheless, this would not disproportionately impact any one class or type of people. Approximately 5% of metro area residents would no longer be located within 1/2 mile of transit in the draft network; this includes only 3% of people of color, 2% of people in poverty, and 5% of seniors.

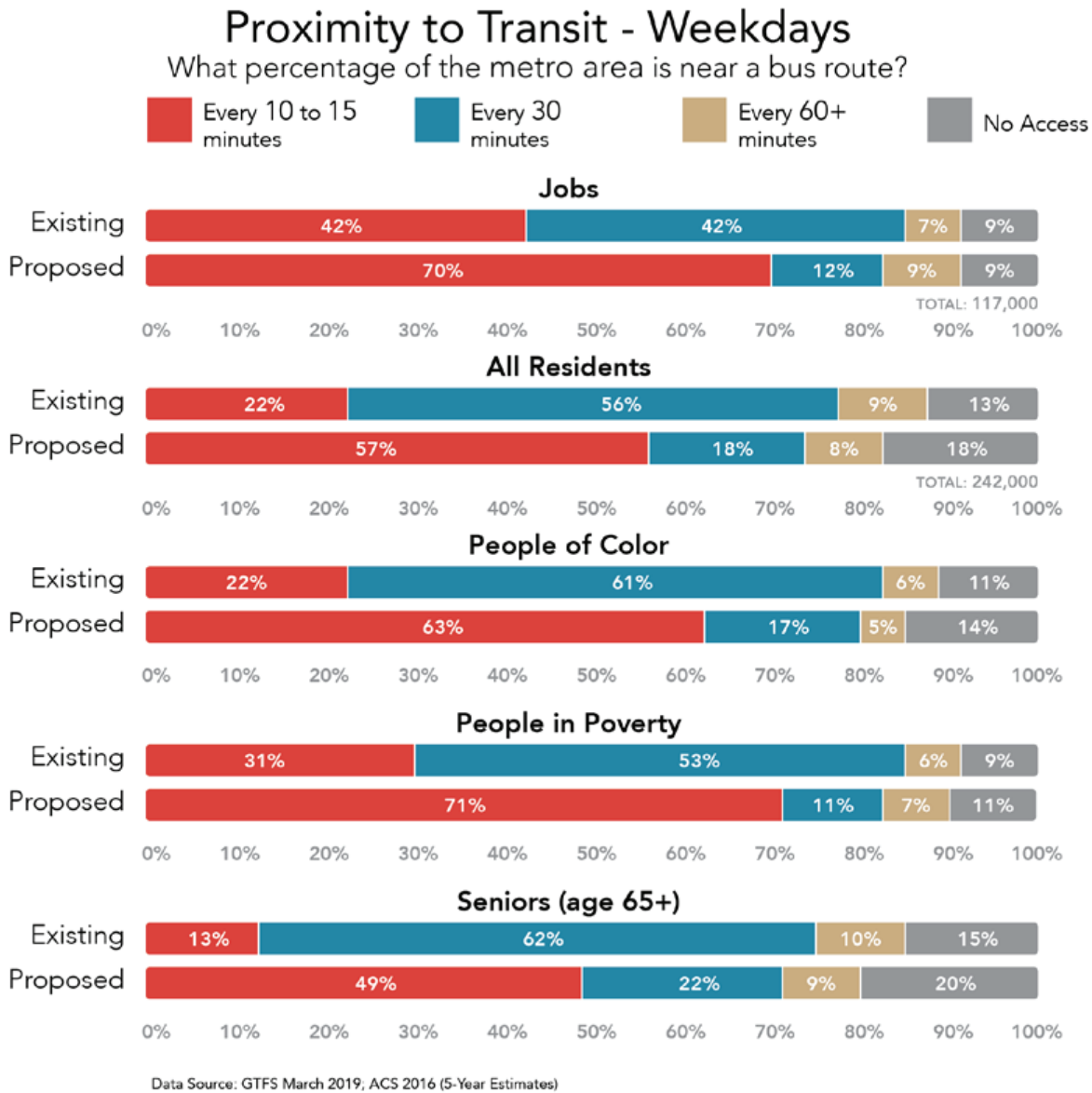


Figure 7: Proximity Analysis Chart. This graphic shows the percentage of residents and jobs within 1/2 mile of a bus stop on an LTD route, in the existing network, and if the draft network were implemented.

What happens next?

Full Report

For more information on the Draft Plan, please consult the full report. In it you'll find:

- **Chapter 1: How did we get here?** explains the process and public conversations that have led to this plan, including how different trade-offs and priorities were considered.
- **Chapter 2: What's in the Draft Network?** describes the bus routes and service levels in the Transit Tomorrow draft network, and the ways in which these would be similar or different from existing service.
- **Chapter 3: Network Outcomes** compares the Draft Network with existing service, in the following terms:
 - » Proximity. How many people and jobs would be located near transit service?
 - » Job Access. How many jobs could you typically access in 45 minutes from anywhere in the metro area?
 - » Travel Time Maps. From selected locations, where could you get to in 45 minutes?
- **Chapter 4: Costs, Considerations and Next Steps** details considerations in future planning, including:
 - » Potential impacts on paratransit demand and users.
 - » Considerations to take into account in future service improvements, including:
 - ◇ Future priorities in expanding frequency and span.
 - ◇ Goals and methods for expanding service coverage, including restoration of fixed routes and/or new on-demand mobility services.

Next Steps

Transit Tomorrow has combined technical analysis and broad-based community input to develop a draft proposal for a public transit network for the future. The next steps in the process are the following:

- **August 2019: Approval to Proceed.** The LTD Board of Directors will review this Draft Network Plan to determine whether it meets the policy direction they have provided. If the Board approves of the plan as proposed, project staff will pursue steps leading to a Final Network Plan.
- **Fall 2019: Public Review.** Upon Board approval, LTD staff will present the Draft Network Plan to the community and gather public input. This may include presentations to community groups, tabling at community events, and an online and in-person surveying effort.
- **Late 2019: Final Network Plan.** Project staff will review public input and make appropriate adjustments to the draft network. At this point, project staff will also develop a proposed strategy for the timing and roll-out of the Network Plan.
- **Early 2020: Board Adoption.** The Board will be asked to adopt the 3-year Final Network Plan and give direction about the strategy for implementation.
- **Early 2020: Public Review of Fall 2020 Service changes.** LTD Staff will present detailed scenarios for service changes that would take place in the fall 2020. This will likely be the first phase of implementation of the Final Network Plan. LTD Staff will gather feedback on the changes from the community and making refinements as necessary.
- **2020 - 2022: Service Changes.** LTD will make normal seasonal adjustments to service throughout this process. Significant service changes as part of plan implementation could occur as early as Fall 2020, but may not be complete until 2022. Service changes will be assessed over the course of the 3-year period as the network plan is implemented. This assessment would determine possible adjustments to the network plan based on conditions in the year of implementation (economic conditions, shifts in development along key corridors, feedback from riders, etc.).

Learn More

For the full story on Transit Tomorrow, we encourage the reader to start with two earlier reports:

- The **Choices Report**, released in June 2018, available at the project home page: <https://www.ltd.org/transit-tomorrow/> or directly from [this link](#).
- The **Scenarios Report**, released in January 2019, available at the project home page: <https://www.ltd.org/transit-tomorrow/> or directly from [this link](#).

Members of the public are encouraged to attend public meetings and submit comments online, in response to this Draft Network Plan during the Fall 2019 public review phase. To find public meetings and other opportunities for input, visit: <https://www.ltd.org/transit-tomorrow/>.

To provide direct comment on this report at any time, members of the public can also e-mail transit-tomorrow@ltd.org.

Transit Tomorrow

Draft Network Plan

Lane Transit District

JARRETT WALKER + ASSOCIATES

August 14, 2019

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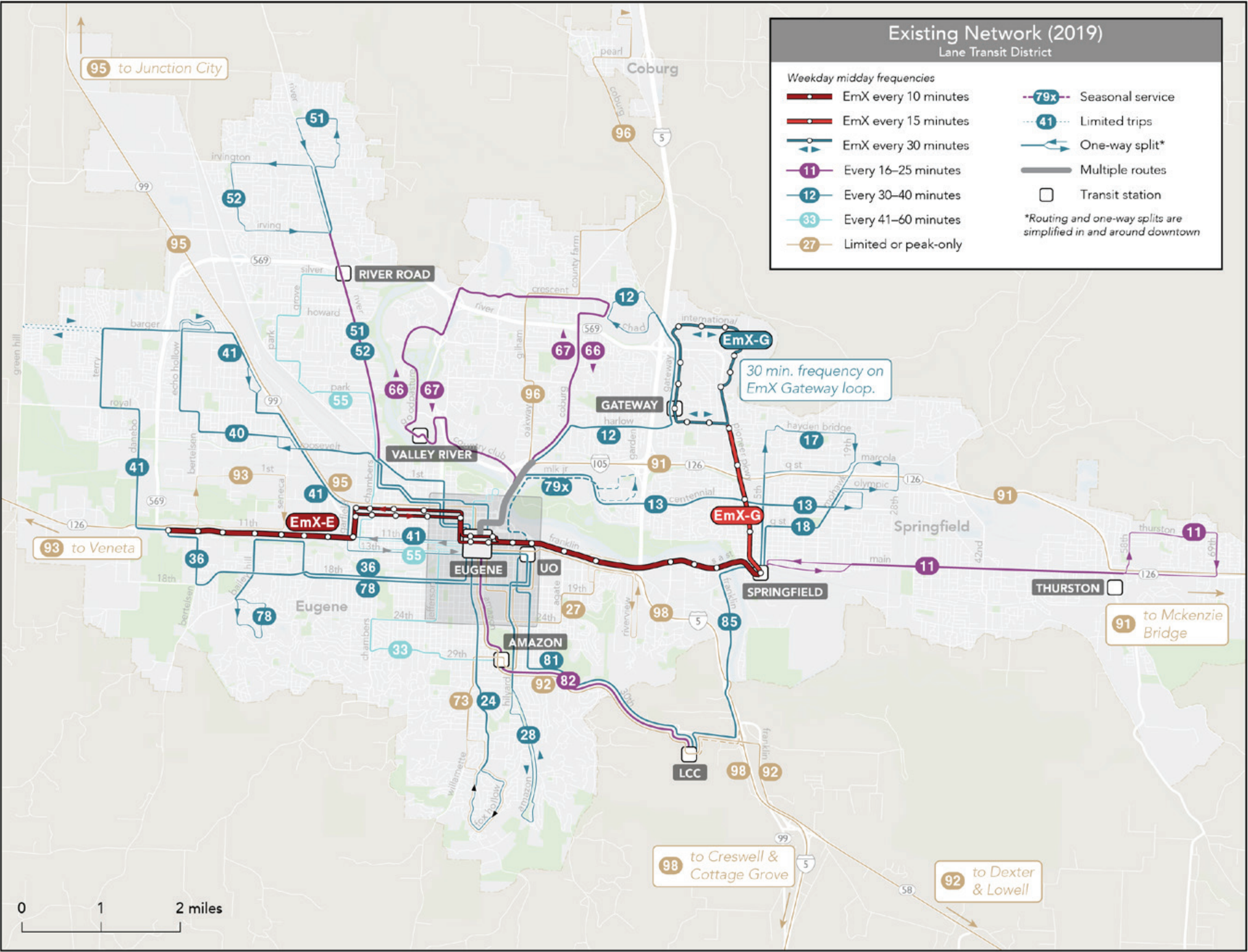


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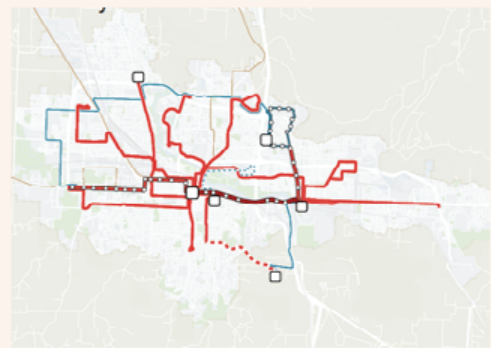
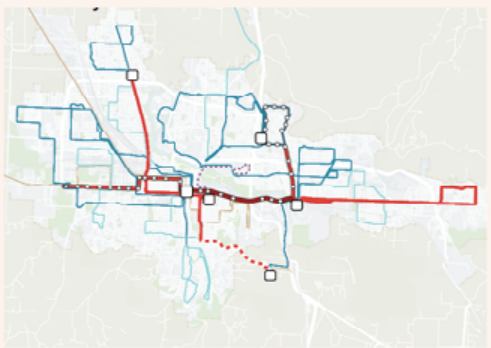
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- Doesn't provide a convenient transportation option for many trips.

Coverage service often takes the form of infrequent bus routes serving low-density or isolated areas. Coverage service can also be provided by on-demand or flexible services in areas where expected ridership is very low.

We estimate that LTD's existing network dedicates about 65% of metro area service to maximizing ridership, while 35% is oriented to extending coverage to as many places as possible.

On March 20, 2019, following public consultation, **the LTD Board directed the project team to design a network where 80-85% of metro area service is oriented toward ridership, and 15-20% is oriented toward coverage.** In addition, the Board directed the project team to design up to 5% of the network for non-fixed route solutions.

Added Service vs. Lower Fares

Following the passage of the Keep Oregon Moving act in 2017², LTD has started to receive new revenue from the Statewide Transportation Improvement Fund (STIF).

STIF funds can be used to increase transit service, reduce fares, and purchase low-emission vehicles. LTD is planning to make significant upgrades to its fleet in the next two years, leaving approximately \$4 million per year to improve service and/or reduce fares.

If LTD focused the remaining new resources only on increasing service, it would be possible to increase weekend service levels by 50%. This would make it possible to operate most bus routes at the same frequency, seven days per week. If that were the case, fares would need to remain at current levels with no new discounts.

If LTD focused those resources only on reducing fares, it would be possible to reduce the average cost of fares and passes by 50%. This could be achieved through a wide variety of fare discounts to students, older adults, people with low incomes, and people with disabilities, and a reduction in regular fare. But to achieve this, there could be no increase from current service levels.

Following public consultation, and through the STIF project approvals process, the LTD Board has directed that:

- **\$1 million per year should be dedicated to fare programs**, creating a new discounted youth pass program, and expanding LTD's existing low-income pass program.
- \$3 million per year should be dedicated to increasing service. LTD staff have determined that:
 - » **\$2.3 million is available for improvements in service frequency, particularly on weekends and evenings.**
 - » \$0.7 million should be reserved for increased weekday peak hour service to handle expected increases in K-12 student ridership to access schools.

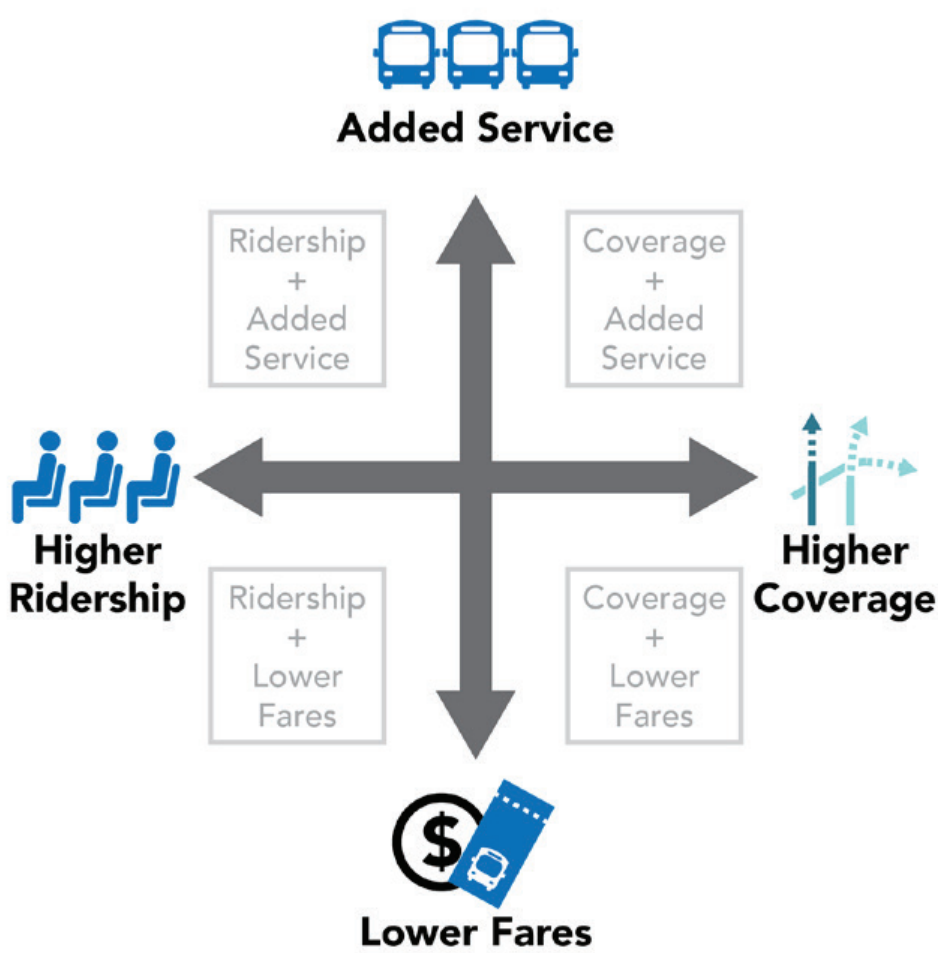


Figure 3: Trade-offs. Where should LTD focus its resources? Is it more important to provide frequent service in a few places, or a little bit of service everywhere? Is it more important to increase service, or to make service more affordable?

² Also known as House Bill 2017, or HB 2017.

How is the draft network different?

A Simpler and More Frequent Network

The draft network would dramatically simplify bus service in Eugene and Springfield: **the network would go from 26 routes today to 10 proposed new routes.** This is mostly achieved by combining existing bus routes into longer and straighter paths.

Seven of the 10 proposed routes would operate every 15 minutes or better on weekdays. Several of the new routes combine main streets on opposite sides of Downtown Eugene, allowing for faster travel across the metro area and reducing the need for transfers. All of this would make the network far easier to learn, use and navigate.

Despite this, the majority of people in the metro area would remain within walking distance: transit would be available within 1/2 mile of 82% of residents and 91% of jobs (compared to 87% of residents and 91% of jobs today).

At the same time far more people would live and work near frequent service, coming every 15 minutes or better. **57% of residents and 70% of jobs would be located within 1/2 mile of a transit stop with frequent service** (compared to 22% of residents and 42% of jobs today).

These changes reflect the shift toward more ridership-oriented service: slightly fewer people would live near a bus route overall, but most people would have access to much more frequent and useful service.

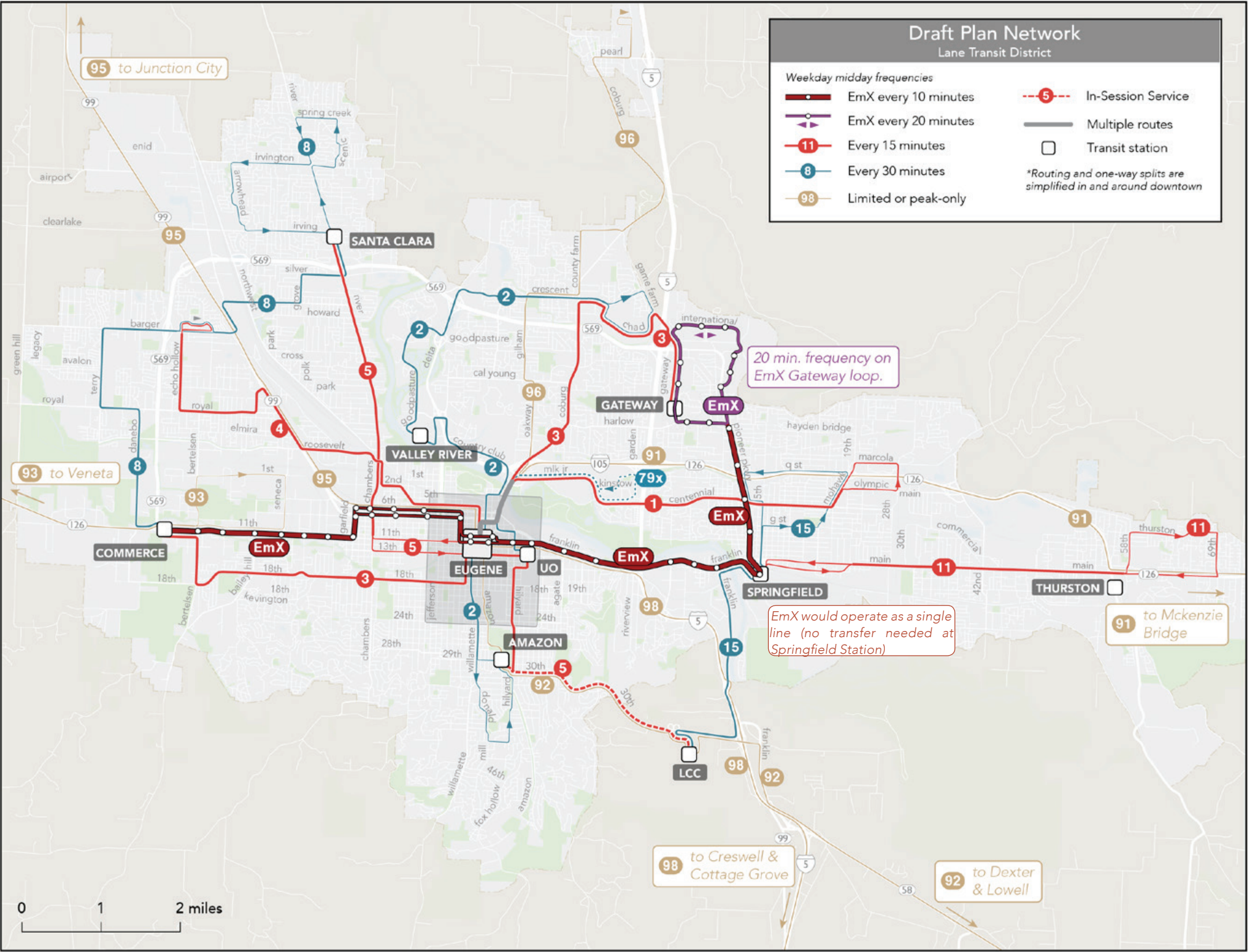


Figure 4: Draft Network Map. This map shows the draft network redesign, including the new routes and their frequency on weekdays, in the middle of the day. The draft network represents a significant shift of resources in the direction of higher ridership. As a result, most of the service would be provided as frequent routes on main streets, and fewer routes serve outlying low-density neighborhoods.

More Evening and Weekend Service

Outside EmX and Route 11, LTD has always provided much less service on weekends than on weekdays. Existing service levels are also very low after 7 PM on weekdays.

Public input in Phase 1 made it clear that there was a strong desire across the community for improvements to frequency, and especially improvements in evening and weekend frequency.

For evening and weekend frequency, this was further reinforced by public input in Phase 2, which showed far more people preferring the scenarios that improved evening and weekend service over the scenarios that would lower fares.

In the short term, Transit Tomorrow would respond to this desire by:

- Continuing **service every 30 minutes or better until 10 PM on weekdays and Saturdays** on all but one route; and
- Ensuring that **all routes would run every 30 minutes or better on Sundays**.

If LTD revenues continue to improve over the next three years, this Draft Plan recommends implementing frequent service every 15 minutes on Saturdays from 8 AM to 8 PM, and on Sundays from 10 AM to 7 PM, on Routes 1, 3, 4 and 5. This would be in addition to EmX and Route 11, which already operate at or near this level of service today.

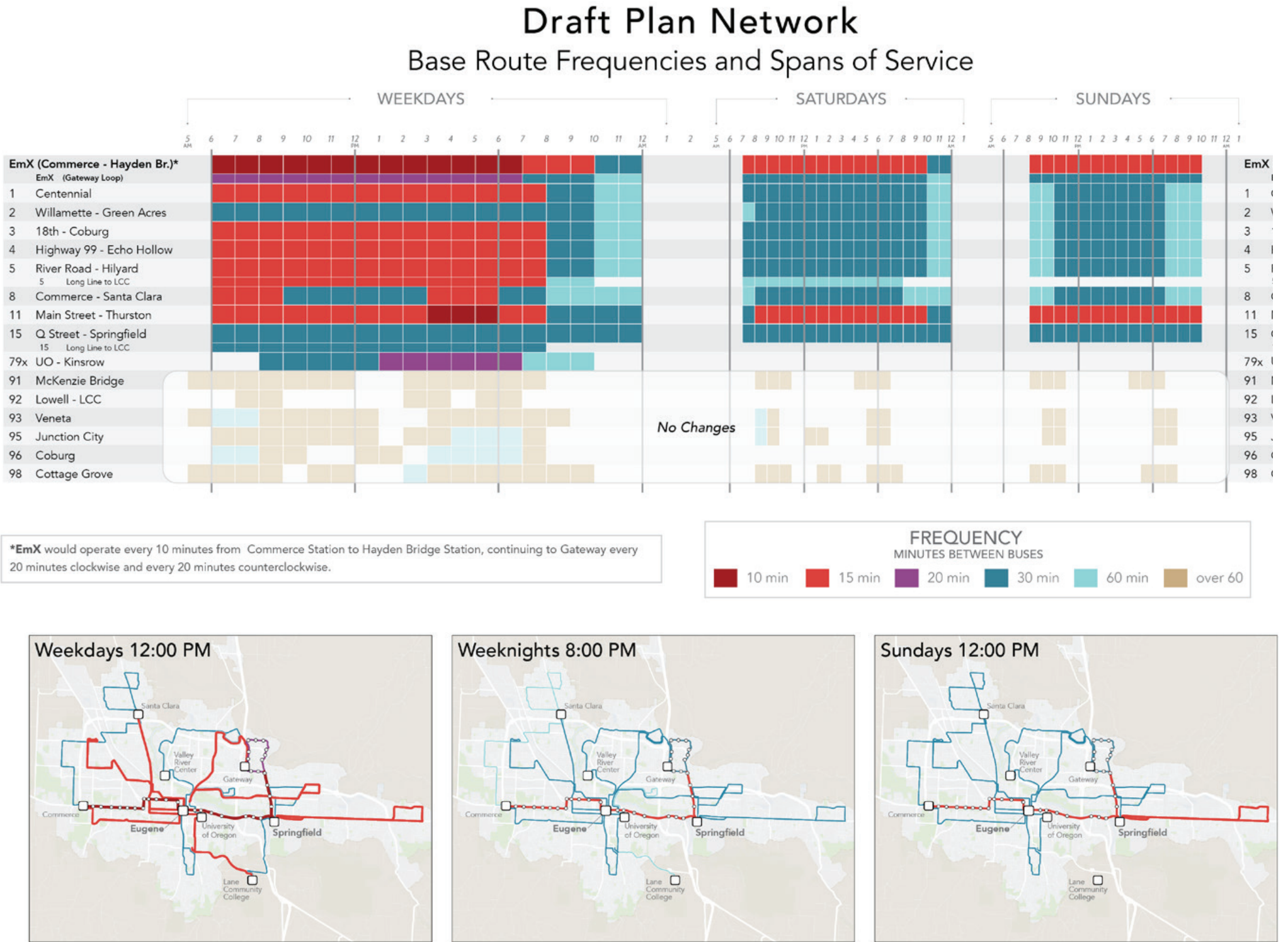


Figure 5: Draft Network Frequencies. These graphic and miniature maps shows how much bus service is anticipated on each proposed route at different times on weekdays, Saturdays and Sundays. Red indicates service coming every 15 minutes or better; dark blue indicates service every 30 minutes; and light blue indicates service every 60 minutes.

Faster Travel and More Access to Opportunity

It is inconvenient for most people to structure their day around a bus that only comes every 30 or 60 minutes. So one of the most effective ways to make transit more useful is to make the bus come more often.

The more frequent a bus route becomes, the less time you are likely to wait, and the sooner you'll get to where you're going. For example, the average wait for a bus that comes every 30 minutes is 15 minutes; but the average wait for a bus that comes every 15 minutes is 7.5 minutes. So higher frequency means people save time.

The draft network would save people time in two distinct ways:

- Most routes would operate more frequently, going from service every 20 to 30 minutes, to service every 15 minutes.

- **Some routes would be combined to run across the city. This would also save time by reducing the need for many transfers.**

- » West 18th Avenue (Routes 36, 78) would be combined with Coburg Road (Routes 66, 67), into a single Route 3.
- » River Road (Routes 51, 52) would be combined with service to UO, most of Hilyard Street and LCC (Routes 28, 81, 82) into a single Route 5.
- » EmX in Springfield would be re-combined with EmX in Eugene.

Because the draft network would offer significant time savings in most locations, it would be possible to reach far more places and opportunities in a reasonable amount of time on transit. On weekdays, we estimate that **the average resident of the Eugene-Springfield metro area could access 20% more jobs on transit in 45 minutes or fewer, door-to-door.**

Areas where job access by transit would improve (i.e. most trips by transit would take less time) are shown in the maps below in green. This includes most, but not all of the metro area. Some areas would be further from service or would have service at lower frequencies, and as a result job access by transit would decrease. These are shown in pink.

We measure access to jobs because that is the data available to us. But this is not just a measure of convenience for employment and commuting.

Places where many jobs are located often have other interesting features. Offices, shopping centers, social services, and even schools and houses of worship all are employers in themselves, in addition to being near or in employment centers. So calculating access to jobs helps us understand opportunity more broadly.

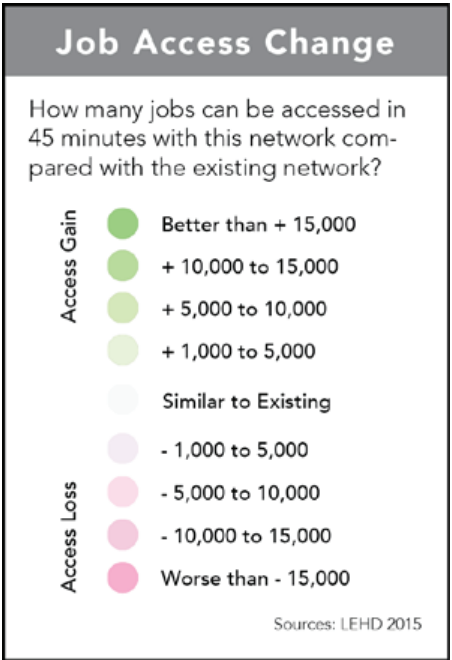
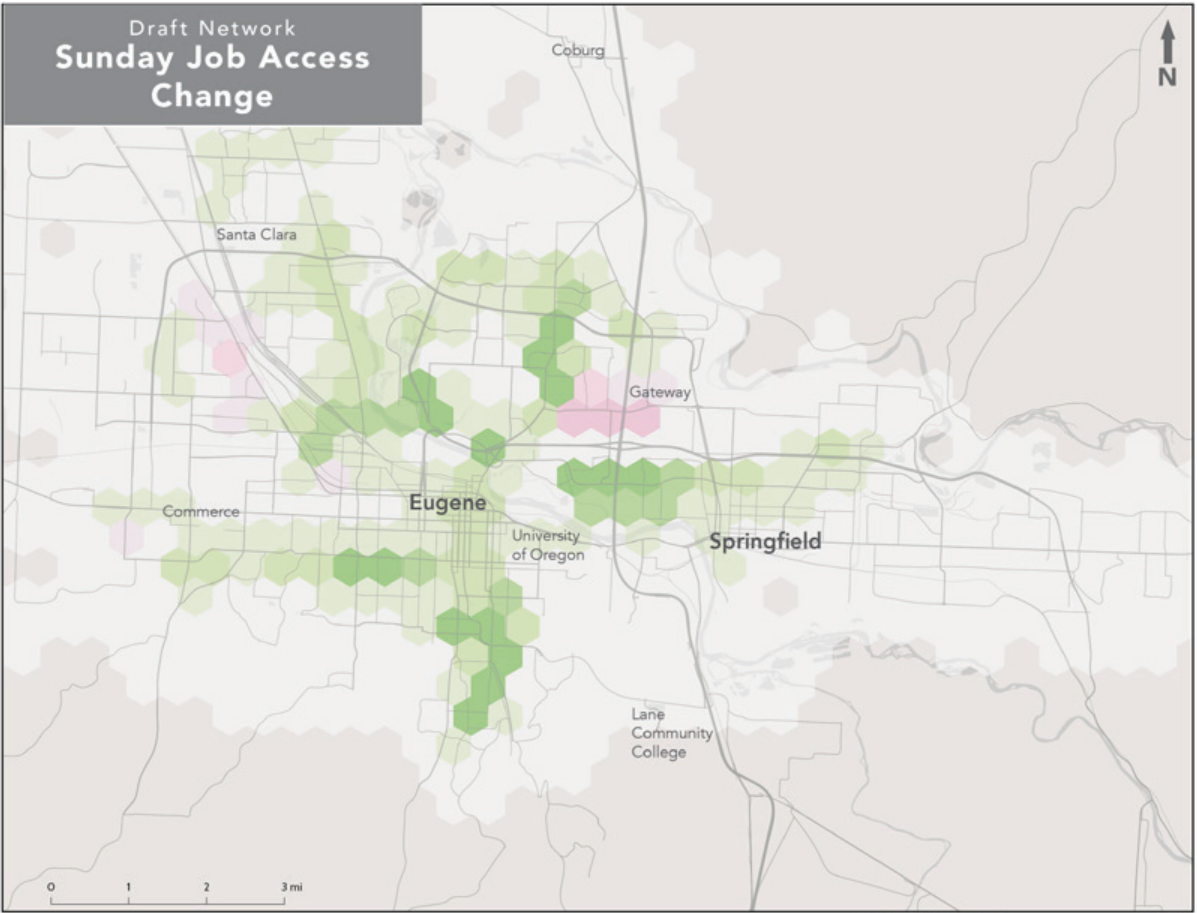
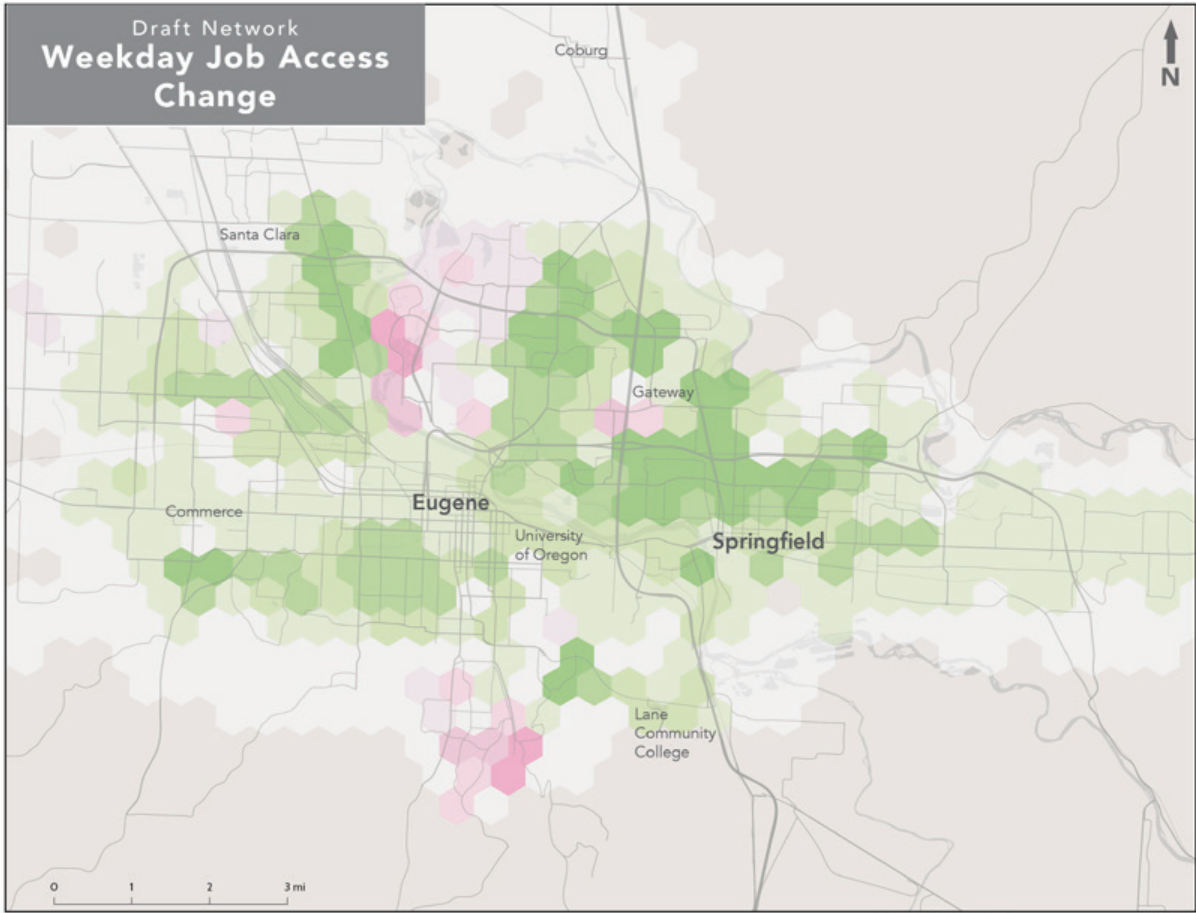


Figure 6: Job Access Change Maps, on weekdays and Sundays. Green areas indicate areas where the draft network would make it possible to access more jobs in 45 minutes (door-to-door) on transit. Pink areas indicate areas where you could reach fewer jobs in 45 minutes. These maps are mostly green, because most parts of town would receive more frequent and direct service, enabling faster travel. In pink areas, transit trips would mostly become longer.

Positive Impacts Across Demographics

The draft network would ensure that far more people and jobs would be located near frequent service. Whereas 19% of residents and 42% of jobs are located within 1/2 mile of a bus stop with frequent service today, those numbers would jump to 57% of residents and 70% of jobs after services were changed.

This improvement wouldn't be limited to any one class or type of people; the benefits would be even more striking among low-income and minority populations, as well as older adults:

- 63% of people of color would live near frequent service, compared to 22% today.
- 71% of people in poverty would live near frequent service, compared to 31% today.
- 49% of people aged 65 and over would live near frequent service, compared to only 13% today.

Less Service in Some Areas

At the same time, some areas would receive less service. Many people would need to walk further to access transit than they do today, and some areas that currently receive service would see fewer buses or none at all. Overall, the percentage of residents living within 1/2 mile of a bus stop would drop from 87% to 82%.

This is a direct consequence of the policy choices that drive the draft network's design. Re-orienting service toward higher ridership means focusing on frequent routes on main streets, and steering away from some lower-density, outlying and isolated neighborhoods.

LTD is studying different ways to continue providing lifeline service in areas where the draft network no longer includes a fixed bus route. If revenues continue to improve, LTD may be able to restore some coverage, either as a fixed or on-demand service. However, this would need to be balanced against the improvements that could be achieved by further improving weekend and evening frequencies.

Nonetheless, this would not disproportionately impact any one class or type of people. Approximately 5% of metro area residents would no longer be located within 1/2 mile of transit in the draft network; this includes only 3% of people of color, 2% of people in poverty, and 5% of seniors.

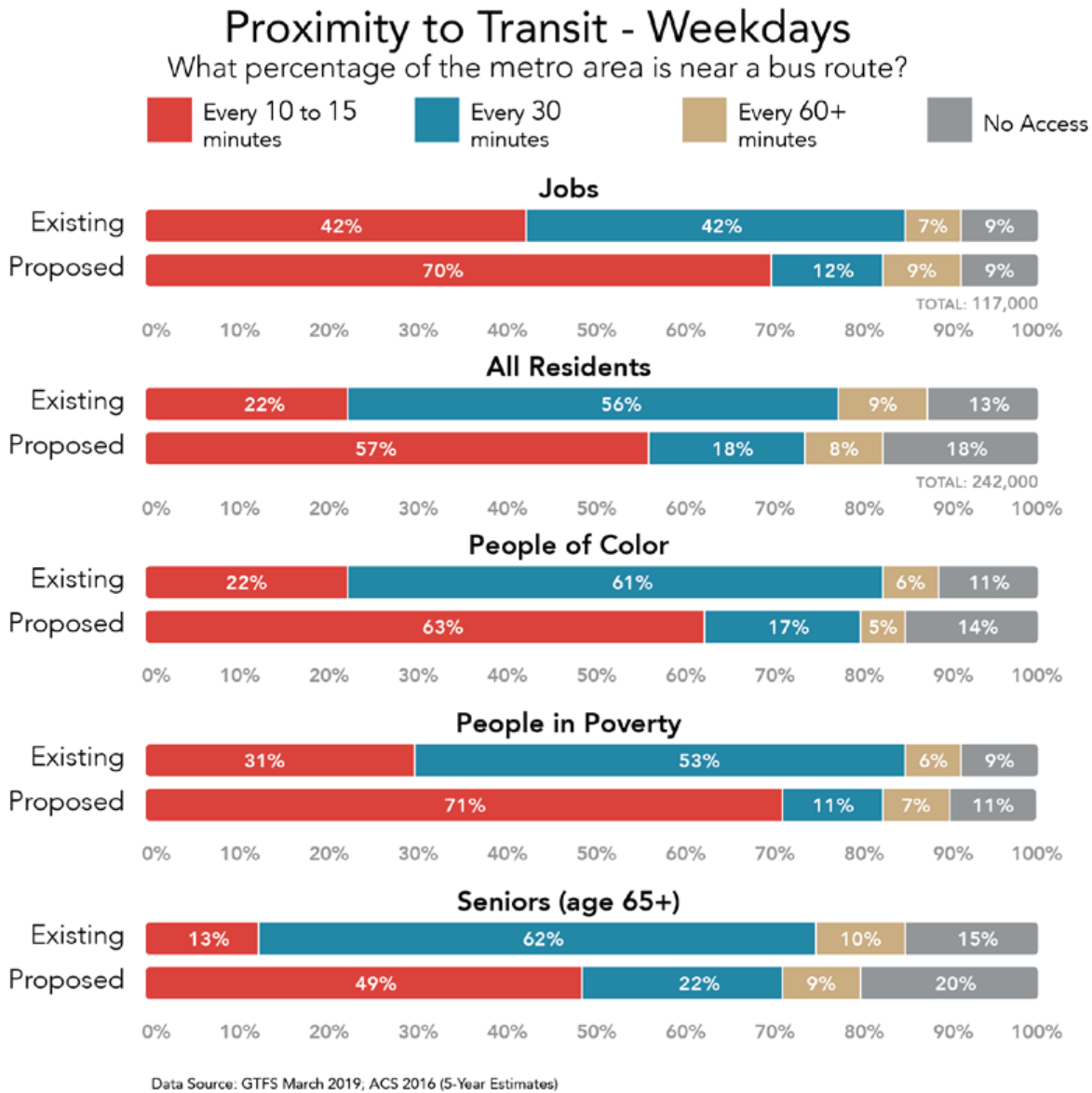


Figure 7: Proximity Analysis Chart. This graphic shows the percentage of residents and jobs within 1/2 mile of a bus stop on an LTD route, in the existing network, and if the draft network were implemented.

What happens next?

Full Report

For more information on the Draft Plan, please consult the full report. In it you'll find:

- **Chapter 1: How did we get here?** explains the process and public conversations that have led to this plan, including how different trade-offs and priorities were considered.
- **Chapter 2: What's in the Draft Network?** describes the bus routes and service levels in the Transit Tomorrow draft network, and the ways in which these would be similar or different from existing service.
- **Chapter 3: Network Outcomes** compares the Draft Network with existing service, in the following terms:
 - » Proximity. How many people and jobs would be located near transit service?
 - » Job Access. How many jobs could you typically access in 45 minutes from anywhere in the metro area?
 - » Travel Time Maps. From selected locations, where could you get to in 45 minutes?
- **Chapter 4: Costs, Considerations and Next Steps** details considerations in future planning, including:
 - » Potential impacts on paratransit demand and users.
 - » Considerations to take into account in future service improvements, including:
 - ◇ Future priorities in expanding frequency and span.
 - ◇ Goals and methods for expanding service coverage, including restoration of fixed routes and/or new on-demand mobility services.

Next Steps

Transit Tomorrow has combined technical analysis and broad-based community input to develop a draft proposal for a public transit network for the future. The next steps in the process are the following:

- **August 2019: Approval to Proceed.** The LTD Board of Directors will review this Draft Network Plan to determine whether it meets the policy direction they have provided. If the Board approves of the plan as proposed, project staff will pursue steps leading to a Final Network Plan.
- **Fall 2019: Public Review.** Upon Board approval, LTD staff will present the Draft Network Plan to the community and gather public input. This may include presentations to community groups, tabling at community events, and an online and in-person surveying effort.
- **Late 2019: Final Network Plan.** Project staff will review public input and make appropriate adjustments to the draft network. At this point, project staff will also develop a proposed strategy for the timing and roll-out of the Network Plan.
- **Early 2020: Board Adoption.** The Board will be asked to adopt the 3-year Final Network Plan and give direction about the strategy for implementation.
- **Early 2020: Public Review of Fall 2020 Service changes.** LTD Staff will present detailed scenarios for service changes that would take place in the fall 2020. This will likely be the first phase of implementation of the Final Network Plan. LTD Staff will gather feedback on the changes from the community and making refinements as necessary.
- **2020 - 2022: Service Changes.** LTD will make normal seasonal adjustments to service throughout this process. Significant service changes as part of plan implementation could occur as early as Fall 2020, but may not be complete until 2022. Service changes will be assessed over the course of the 3-year period as the network plan is implemented. This assessment would determine possible adjustments to the network plan based on conditions in the year of implementation (economic conditions, shifts in development along key corridors, feedback from riders, etc.).

Learn More

For the full story on Transit Tomorrow, we encourage the reader to start with two earlier reports:

- The **Choices Report**, released in June 2018, available at the project home page: <https://www.ltd.org/transit-tomorrow/> or directly from [this link](#).
- The **Scenarios Report**, released in January 2019, available at the project home page: <https://www.ltd.org/transit-tomorrow/> or directly from [this link](#).

Members of the public are encouraged to attend public meetings and submit comments online, in response to this Draft Network Plan during the Fall 2019 public review phase. To find public meetings and other opportunities for input, visit: <https://www.ltd.org/transit-tomorrow/>.

To provide direct comment on this report at any time, members of the public can also e-mail transit-tomorrow@ltd.org.

1 How did we get here?

Phase 1: Choices Report and Community Input

Two Phases of Input

Transit Tomorrow has made a deliberate effort to reach beyond the technical sphere and allow the broader public a voice in deciding where and how often buses should run in Eugene and Springfield.

This has been facilitated through two distinct phases of input:

- Phase 1 followed the Choices Report, a comprehensive review of transit network issues in LTD's service district. At this stage, we asked the community to provide answers to conceptual questions about what the transit network should be trying to achieve.
- Phase 2 followed the Scenarios Report, which presented four distinct directions the metro area transit network could go, and showed what the network and service would look like in each case. In this phase we asked the public which direction(s) best matched their values and priorities, based on this more concrete evidence.

Both phases gathered data using similar questions in a stakeholder forum, in-person public events, and an online open house.

The stakeholder forums gathered representatives from a broad swath of organizations active in Eugene and Springfield. This included major institutions, social service agencies, the business community, neighborhood associations and other advocacy groups. These forums were used as a launching point to help promote in-person and online efforts targeted at the general public.

Complete public input summaries for both phases are available online:

- Full Phase 1 public input summary: [click here](#).
- Full Phase 2 public input summary: [click here](#).

Phase 1 Input

Phase 1 of public input was carried out from late June to August 2018. At that time, we asked conceptual questions about key transit trade-offs, and asked people to generally express their level of interest or priority for different types of service.

These questions were asked at a high level, without specific explanations of the consequences of different choices, as a way of capturing a first impression of the community's values and preferences.

Ridership vs. Coverage (Phase 1)

When transit agencies concentrate their service into fewer, and more frequent routes, particularly when service is focused on the places and corridors where there are the most people and jobs, higher ridership is the typical result.

Yet, within a fixed budget, this means less service can be spread out to cover everyone. So there is a natural tension between planning for high ridership (or high frequencies) and planning for extensive coverage.

A majority (65%) of the persons present at the stakeholder forum indicated a preference for a shift toward a higher ridership system with higher frequencies. Only 20% tended toward increasing coverage.

Among the broader public the answer to this question was similar, but with a smaller majority. 52% of online open house respondents indicated that higher frequencies were more important than reaching more places, while 36% were more interested in reaching more places. Frequent riders and metro-area residents were most likely to prefer frequency over coverage. Rural residents and people aged 60 and over were most likely to favor coverage.

These results suggested a strong interest in the community in exploring a more ridership-oriented transit network, but also some reservations.

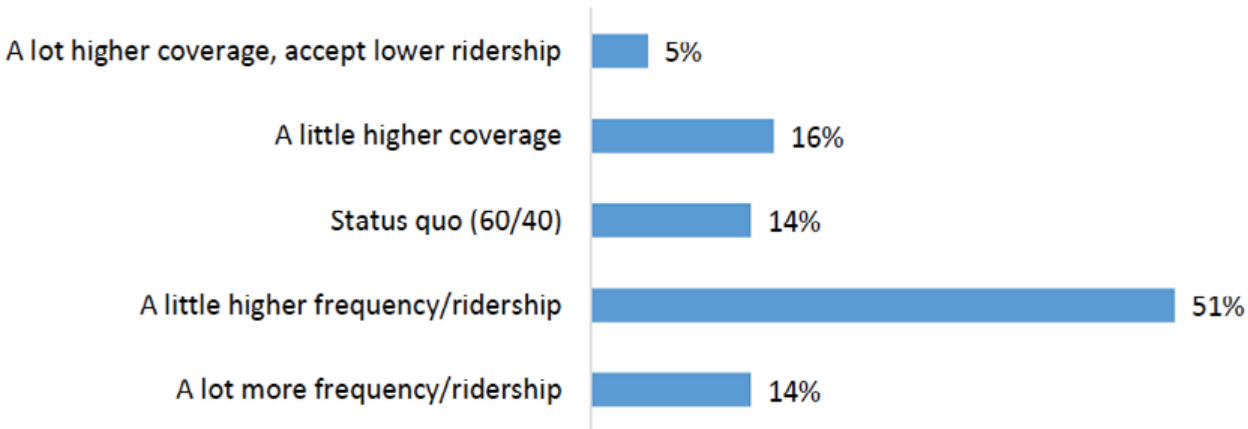


Figure 8: Ridership vs. Coverage, Phase 1 stakeholder forum input. In concept, most stakeholders favored shifting toward higher ridership, even if that means losing some coverage.

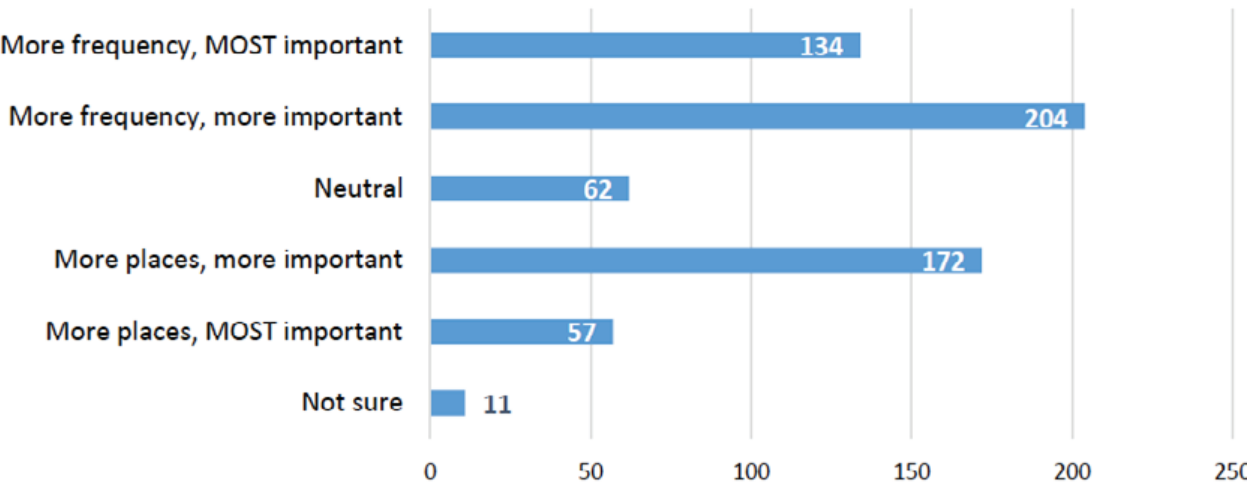


Figure 9: Ridership vs. Coverage, Phase 1 online open house input. Most surveyed members of the public thought achieving higher frequencies was a higher priority than covering as many places as possible. However, this preference was not as clear among the broader public as with the stakeholders.

Walking vs. Waiting

Another way to think about the question of ridership and coverage is to think specifically about how far a person should have to walk to reach a bus stop, and how long they should have to wait, on average, before the next bus comes.

Walking and waiting are important to consider on their own, because both of these activities add time and inconvenience to any transit trip, and different people have a wide variety of preferences regarding each.

For example, a young and fit person in a hurry might have no problem walking over a half-mile to a bus stop if the bus is always coming soon. Older adults or people with disabilities might prefer to have a bus stop much closer to their front door, even if it means they need to pay attention to the bus schedule or risk waiting a long time.

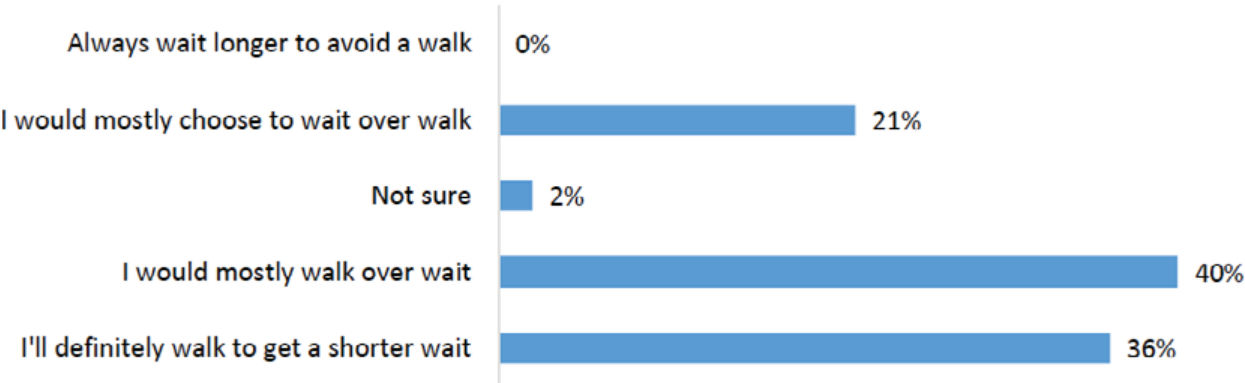


Figure 10: Walking vs. Waiting, Phase 1 stakeholder forum input. In concept, most stakeholders favored designing service with shorter waits (i.e. higher frequency), even if it requires them to walk further to reach a bus stop.

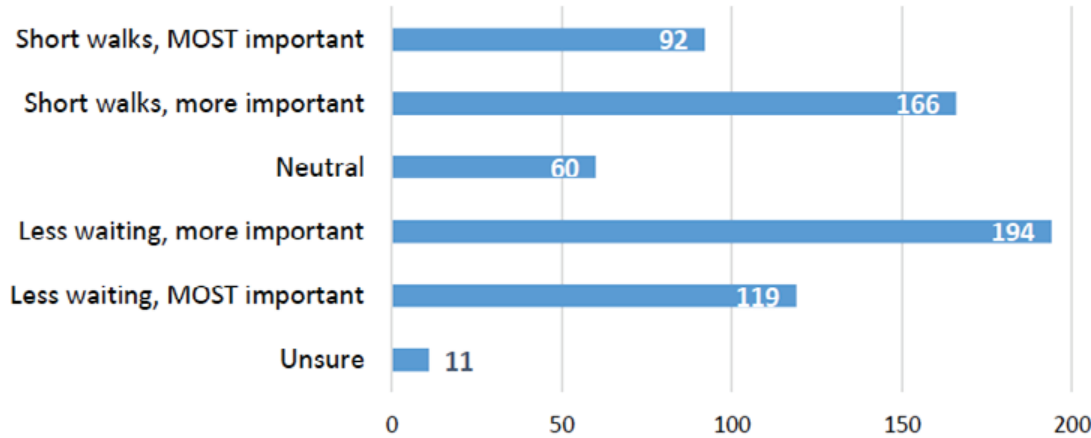


Figure 11: Walking vs. Waiting, Phase 1 online open house input. More respondents preferred service with shorter waits (i.e. higher frequency) over service very nearby (i.e. short walks), but there was not a clear majority.

A large majority (76%) of persons present at the Stakeholder Workshop said they would prefer to walk further to a higher-frequency service. Only 21% would rather wait longer for a service closer to their door.

The result was more ambiguous among respondents to the online open house. A plurality of 49% said they preferred shorter waits (i.e. would walk further to a higher frequency service). 40% said they would prefer a shorter walk. Eugene residents were most likely to favor short waits. Rural residents, people aged 60 and over and people with disabilities were most likely to favor short walks.

These results did not show a clear preference in the community for shorter walks or shorter waits.

Adjustments vs. Redesign

We also wanted to understand the public's appetite for change. The bigger a service change, the more disruption it produces in riders' lives. On the other hand, a bigger change can make it possible to achieve much greater benefits. Small service changes are less disruptive, but they can also achieve less to address deficiencies or attract new riders.

A majority (76%) of people at the stakeholder forum said they would prefer a blank-slate redesign, understanding that any existing services that make sense would be retained. Only 12% said they would prefer a process limited to small adjustments.

In contrast, 53% of online open house respondents preferred a path of small adjustments; only 28% favored a full redesign. This may have been because the online question did not explain that existing services that make sense would be retained. People in more vulnerable groups (especially low-income and people with disabilities) were most likely to prefer an incremental approach.

These results suggested some reservations about significant change, but clear interest in exploring higher-frequency service, and expanding weekend and evening service (see Service Priorities).

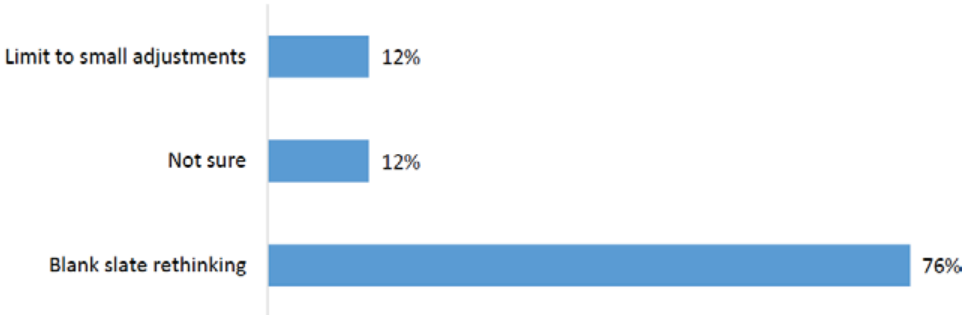


Figure 12: Adjustments vs. Redesign, Phase 1 stakeholder forum input. Stakeholders expressed strong interest in a redesign of the transit network.

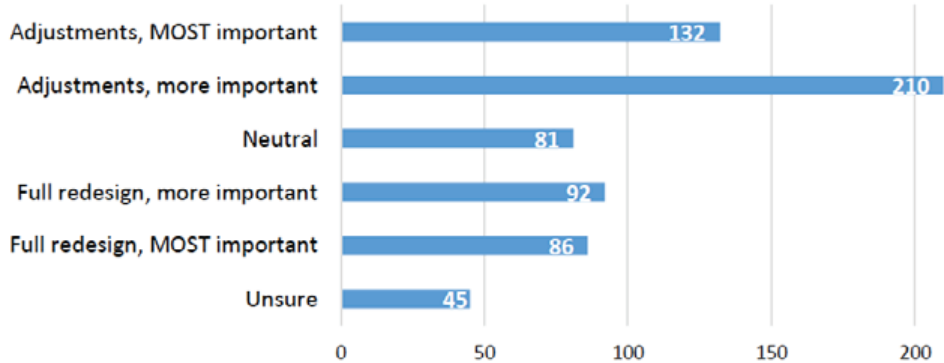


Figure 13: Adjustments vs. Redesign, Phase 1 online open house input. In contrast, most respondents preferred a path of incremental adjustments.

Service Priorities

In addition to the questions about trade-offs, we also directly asked online open house respondents to rate their level of interest in a variety of different service improvement types, including:

- More frequent daytime service
- More evening service (after 7 PM)
- More weekend service
- Late night service (after midnight)
- Extra service at rush hours
- Service to more places in Eugene/Springfield
- More service to small towns and rural areas

Respondents had a total of 21 “points” they could divide among these priorities, and they could not assign more than 7 points in any one category.

Although there is interest in all of these types of service, the strongest expressed priorities were for increases in service and frequency; specifically, more weekend service (2435 points), more evening service (2308 points), and higher daytime service frequencies (2290 points).

The interest in increased weekend service was the most unambiguous: it was a high priority for all demographic groups. Increased evening service and added daytime frequency were a higher priority for frequent riders and metro area residents, as well as low-income and people aged 60 and over.

There was somewhat less interest in extending service to more places in the metro area (1874 points), although support was stronger among certain groups. People aged 60 and over, people with disabilities, and infrequent and non-riders were most likely to prioritize expanding metro area coverage over other possibilities.

Rural service (1535 points), special rush hour service (1486 points) and late night service (1106 points) were the lowest priorities. Rural service was mostly a priority for residents outside the metro area. Rush hour service was most likely to be prioritized by infrequent and non-riders. Late night service was a high priority for a few individuals, but overall was a low priority for all groups.

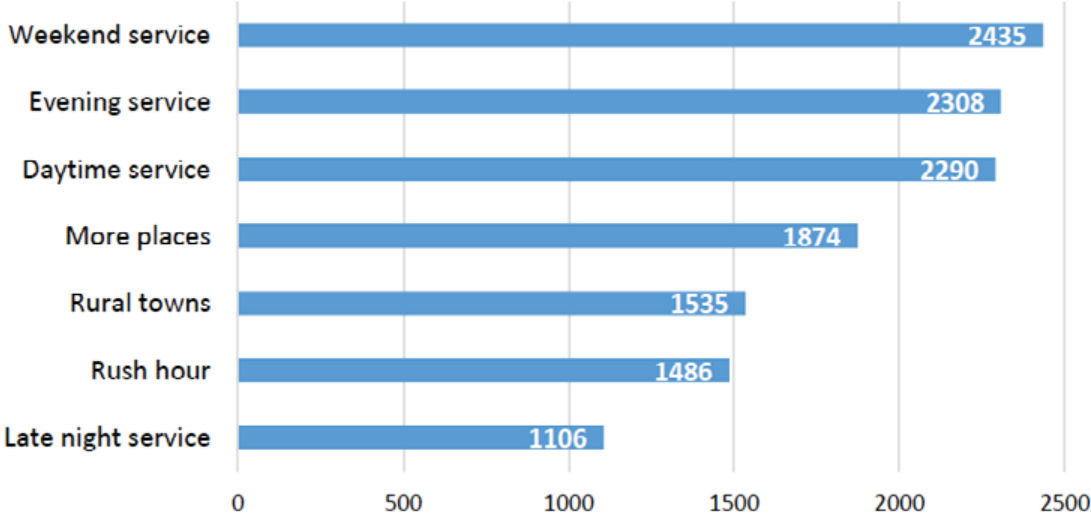


Figure 14: Service Priorities, Phase 1 online open house input. In aggregate, surveyed members of the public placed the highest priorities on increased weekend service, increased evening service, and increased daytime frequency.

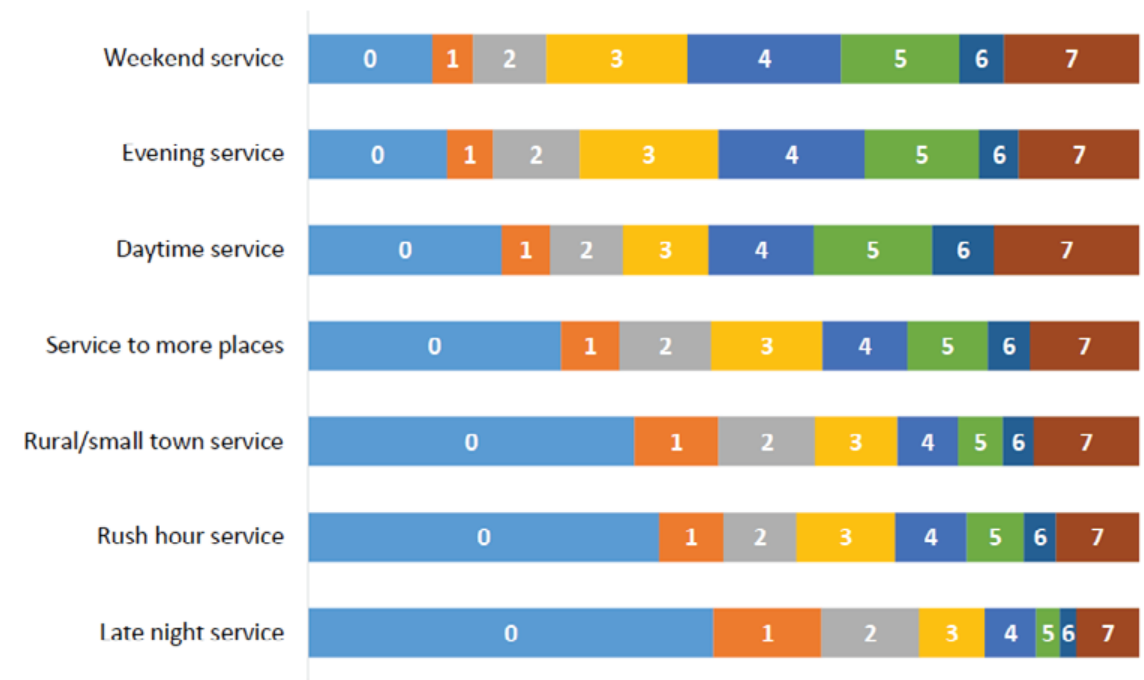


Figure 15: Service Priorities, Phase 1 online open house input. This chart shows how participants distributed “points” among priorities. For example, far more people gave 3 or more points to increasing evening or weekend service than to increasing late night service.

Phase 2: Scenarios Report and Community Input

Phase 2 Input

Community input in Phase 1 clarified many peoples’ conceptual preferences, but without reference to specific examples of how the bus network might change.

Following Phase 1, the LTD Board directed project staff and consultants to develop four scenarios building off of two trade-offs:

- **Ridership vs. Coverage:** Is it more important to provide frequent service in places that will attract the most riders, or to provide a little bit of service to as many places as possible?
- **Added Service vs. Lower Fares:** Is it more important to use LTD’s resources to provide as much service as possible, or to reduce the cost of getting on the bus?

The four scenarios provided a more concrete image of the consequences of orienting service as far as possible in the different directions suggested by the trade-offs. As a result, stakeholders and the public had the tools to evaluate some of the real-world consequences of available choices, think about how those consequences aligned with their values, and provide a more informed opinion about the best path forward.

Given the significantly different needs, trade-offs and resources available for rural and small town service, the scope of Phase 2 was targeted specifically at the metro area. This does not determine or preclude future changes and improvements to service outside Eugene and Springfield. However, any future changes would take place in the context of the final metro area network.

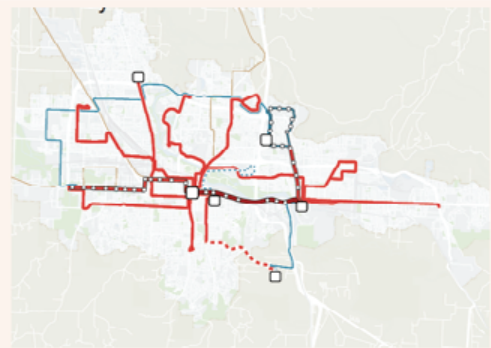
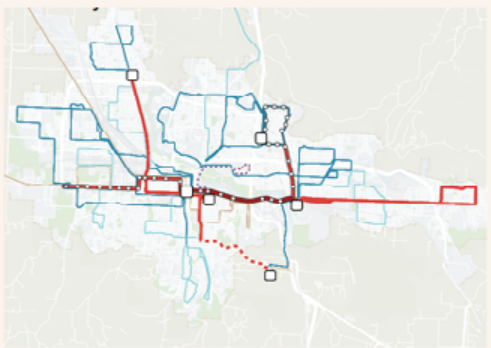
Network Concept	Ridership	Coverage
	 High frequency service on main streets. Connections enable faster travel across the metro area. Some areas lose service.	 Service in as many places as possible. Based on existing network, but more areas covered and lower frequencies in some areas.
Added Service	Scenario 1 Ridership + Added Service Most routes operate: Every 15 mins weekdays Every 15 mins weekends Every 30 mins after 8 PM No change in fares.	Scenario 3 Coverage + Added Service Most routes operate: Every 30 mins weekdays Every 30 mins weekends Every 60 mins after 7 PM No change in fares.
	Scenario 2 Ridership + Lower Fares Most routes operate: Every 15 mins on weekdays Every 30 mins on weekends Every 30 mins after 8 PM Fares up to 50% lower.	Scenario 4 Coverage + Lower Fares Most routes operate: Every 30 mins on weekdays Every 60 mins on weekends Every 60 mins after 7 PM Fares up to 50% lower.
Lower Fares		

Figure 16: Scenarios. These four scenarios illustrate the far ends of how much LTD’s metro area network could change in the next three years. They were developed for the Scenarios Report, released in January 2019. In the second round of public consultation, LTD asked the public which of these scenarios provided outcomes that were better aligned with their values and priorities. The draft network falls somewhere in between these scenarios (see Figure 4 on page 7),

Ridership vs. Coverage (Phase 2)

We illustrated the trade-off between High Ridership and High Coverage with two contrasting networks:

- The High Ridership network dedicated 90% of metro area service to maximizing ridership, and only 10% to providing coverage. As a result, it was almost entirely constituted of frequent routes on main streets.
- The High Coverage network dedicated 65% of metro area service to maximizing ridership, and 35% to providing coverage. This is similar to the existing network, but the High Coverage network spread coverage resources out thinner, extending the reach of lifeline service.

Reactions to the Ridership vs. Coverage trade-off in Phase 2 were notably polarized. Stakeholder forum attendees came out clearly in favor of a network redesign that would tend in the direction of higher ridership.

In contrast, online open house respondents tending in favor of ridership only narrowly outnumbered those in favor of coverage (44% vs. 38%) and neither group received a majority of responses.

Added Service vs. Lower Fares

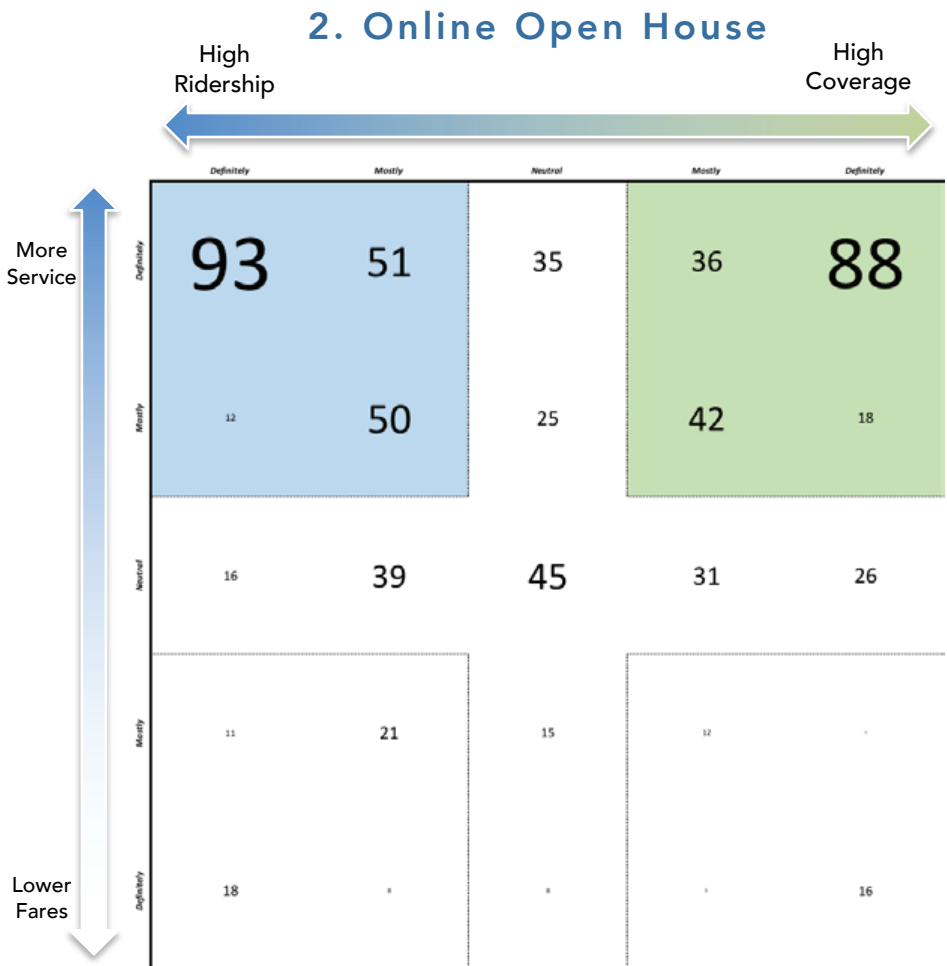
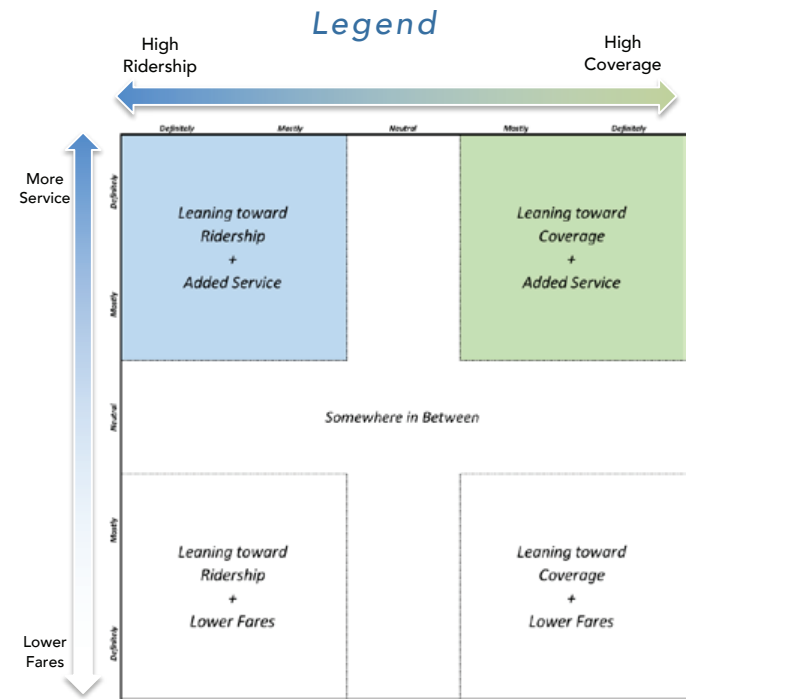
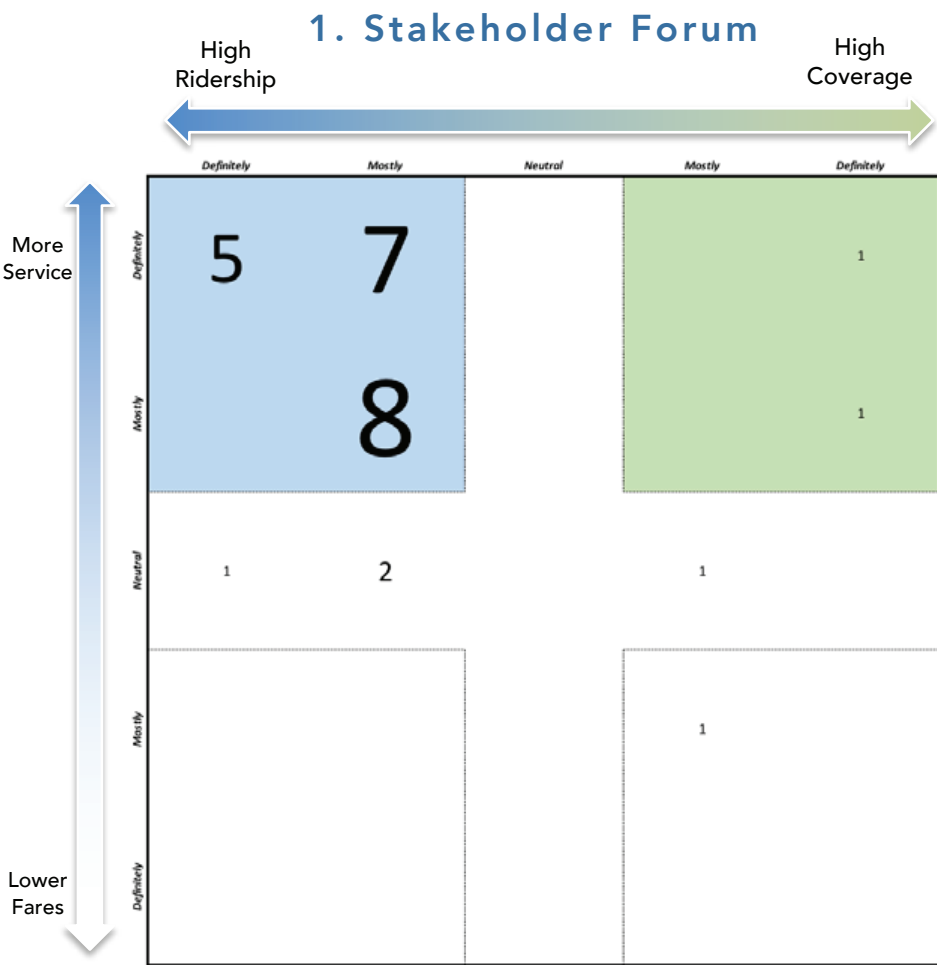
The Added Service vs. Lower Fares trade-off emerged from a separate discussion regarding re-introduction of an LTD school student pass. This discussion was made possible by new STIF funds, which will increase LTD’s operating resources starting in late 2019.

The LTD Board convened an Ad-Hoc Fare Policy Committee, which recommended creating a new discounted youth transit pass and expanding an existing low-income pass partnership with social service agencies. In the context of Transit Tomorrow, the consultation on the Added Service vs. Lower Fares trade-off allowed the LTD Board to assess the public appetite for further fare discounts and reductions beyond those recommended by the Ad Hoc Committee.

Both stakeholder forum attendees and surveyed members of the public expressed much stronger interest in added service than fare reductions. 65% of online open house respondents tended in favor of using STIF funds for added service, while only 18% tended in favor of lower fares.

Because added service was framed mostly as significant increases to weekend service, this further confirmed what we heard in Phase 1, that improvements to weekend service should be a high priority for LTD.

Figure 17: Phase 2 community input from the stakeholder forum (bottom left) and the online open house (bottom right). Both the stakeholder forum and online open house responses leaned heavily in the direction of adding service, as seen by the higher number of responses in the top half of the charts. Stakeholder forum input was also very tilted toward focusing on higher ridership. Online open house respondents were more divided and polarized with regards to ridership vs. coverage. Slightly more tended toward ridership than coverage, by a narrow margin of 44% to 38%.



Board Direction

Following the results of these public consultations, the LTD Board has directed that:

- The project team should develop a draft network that orients 80-85% of metro area service toward ridership, and 15-20% toward coverage. In addition, the Board directed the project team to design up to 5% of the network as services other than fixed routes.
- With the portion of STIF funding available for metro area operations (approximately \$4 million per year starting in 2020):
 - » **\$1 million per year should be dedicated to fare programs,** corresponding to the Ad Hoc Fare Policy Committee's recommendations on the youth pass and low-income pass program.
 - » **The remainder (about \$3 million) per year should be dedicated to increasing service.** LTD staff have determined that:
 - ◊ \$2.3 million is available for improvements in service frequency, particularly on weekends and evenings.
 - ◊ \$0.7 million should be reserved for increased weekday peak hour service to handle expected increases in K-12 student ridership to access schools.

2 What's in the Draft Network?

Design Principles

In this chapter, we present maps of the draft network, and information about how it differs from the existing network. This network was developed collaboratively with a team of technical experts from Lane Transit District, the City of Eugene, the City of Springfield, the Lane Council of Governments, the Oregon Department of Transportation (ODOT) and the University of Oregon. Better Eugene and Springfield Transportation (BEST) also participated in the network design process.

The policies that guided the design are based on public input and Board direction on key choices, as described in the previous chapter. In implementing these choices, we followed the principles described below. As explained in Chapter 4, the resources available for the draft network are similar to LTD’s 2019 operating budget, with an extra \$3 million per year from STIF funds making it possible to operate about 8% more service.

1. Frequent Service on Main Streets

Many existing routes operate at relatively low frequencies, every 30 to 60 minutes. This makes it possible for transit to reach many neighborhoods. But because the service is infrequent and sometimes circuitous, it’s only convenient for a small percentage of the people in each area. The draft network takes a different approach, focusing resources onto fewer routes along main streets. This makes it possible to offer more frequent service (every 15 minutes or better), and in some cases to make those routes more direct.

This means some people may have to walk further to reach transit, but their overall travel times would likely be shorter, since they would benefit from shorter waits and more direct travel paths. Additionally, because higher-density residential development and businesses are more likely to be located near main streets, this draft network would bring frequent service within a short walk of many people.

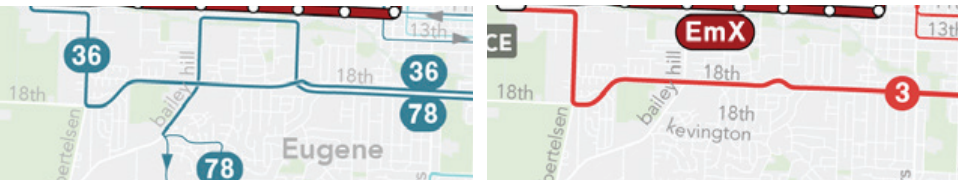


Figure 18: At left, Route 78 in the existing network meanders off of West 18th Avenue in order to provide more geographic coverage. At right, the draft network consolidates service along West 18th Avenue into a single frequent and reliable Route 3. This route continues across Downtown Eugene, to provide direct service to Coburg Road and Gateway.

2. Frequent Connections

Existing System : The “Pulse”

Most current LTD bus routes begin and end at either Eugene Station or Springfield Station. Anyone travelling across town must change buses; this induces some passenger delay. The delay is often minimized by the “pulse” system: many buses arrive and leave from Eugene Station at the same time. Ideally, the pulse makes it possible to travel anywhere with only a short wait between buses.

But in reality, it’s impossible to schedule pulses perfectly. Some routes are too long and can’t make it on time. On others, the schedule is slower than traffic would allow, to ensure the bus will reach the station on time, every time. Even on routes that schedule correctly, there’s an element of chance: when occasional congestion causes a bus to miss the pulse, every connecting passenger has to wait up to a half hour at the station.

In existing service, many people who travel across town end up waiting for a long time; and many people avoid transit because they can’t afford the delay.

Frequent Connections

Because the draft network would provide frequent service on seven out of 10 bus routes on weekdays, pulsing would only be necessary on weekends and in the late evening.

Higher frequencies would mean that the next bus is always coming soon. The average wait between two buses would just be half the frequency. Since most routes would operate every 15 minutes, that means the average wait would be 7.5 minutes. Many people would end up waiting less time than that. On most routes, the worst case scenario would halve from a 30 minute wait to a 15 minute wait between buses.

3. Through-Routing

In addition, the draft network includes several routes that would operate through (rather than to) Eugene Station and Springfield Station. **Many cross-town passengers wouldn’t have to change buses in the first place.** There would still be a delay at the station to facilitate transfers, but it wouldn’t exceed 3 to 5 minutes. That’s the time it takes for the bus to pull in, change drivers if necessary, board new passengers and pull back out.

Specifically, the draft network would potentially combine the following paths together:

- The full EmX line, from West Eugene to Gateway, would be reconnected into a single route operating every 10 minutes on weekdays and every 15 minutes on weekends.
- Route 3 would combine service on West 18th Ave with service on Coburg Road, with service every 15 minute on weekdays and every 30 minutes on weekends.
- Route 5 would combine service on River Road with service on Hilyard Street and to Lane Community College (LCC), with service every 15 minutes on weekdays and every 30 minutes on weekdays.
- Route 2 would combine service on Willamette Street with service to Valley River Center, Goodpasture Island Road, Crescent Avenue and the VA Healthcare Center, with service every 30 minutes on weekdays and weekends.
- On weekdays, Route 15 would combine service between LCC and Springfield Station, with service on G street and Q street.

These specific combinations of service were made because it’s usually most effective to combine service where:

- The bus continues going in a similar direction. That creates faster and more direct paths. So, for example, it makes more sense for a bus coming from River Road to Downtown Eugene to continue southward to LCC than to turn back north to Highway 99.
- Residential areas are connected to employment, services, shopping and other opportunities So, for example, it makes more sense for a bus coming from W 18th Ave to continue onto Coburg Rd than MLK/Centennial because there are more opportunities to connect to on Coburg Rd.

Draft Network Map

4. Higher Evening & Weekend Frequencies

One weakness of LTD’s current network is that most routes operate at hourly frequencies on evenings and weekends. Only people with lots of time or flexible schedules can mold their day or their evening around a bus that comes once an hour. For most trip needs, transit (beyond EmX and Route 11) is very inconvenient after 7 PM, for most of Saturday, and all of Sunday.

Consistent with public feedback and Board direction, the draft network would address this by significantly increasing weekend and evening service frequency. Specifically:

- All frequent routes would operate every 15 minutes or better until at least 8 PM on weekdays.
- All but one route would operate every 30 minutes or better until 10 PM on weekdays and Saturdays.
- All routes would operate every 30 minutes throughout most of the day on Sunday.

5. Prioritizing Coverage Areas

The draft network would continue providing nearly 15% of service to cover to low-density, outlying or isolated areas. Different priorities matter in allocating bus service to places where we would expect relatively low ridership in any network; we asked the following questions:

- **How many people** live in this area?
- How many people are of **communities of concern**, i.e. people with low-incomes or no vehicles, older adults, or people of color?
- **How far** would people have to walk to reach high-ridership service?
- Can we readily extend a route to this location¹?

In places that best met these criteria, the draft network extends service every 30 minutes. At the ends of lines, we have proposed service as one-way loops to reach a broader area.

¹ An example of this problem is Route 33 in Southwest Eugene, which is not included in the draft network. Although several thousand people live in the area uniquely served by Route 33, there is no simple way to append service on 24th, Chambers or 28th onto proposed Route 2 or 3. The expense of an entire additional route was deemed a lower priority than other coverage investments, particularly in the context of the local travel time and job access outcomes (see Chapter 3). Higher frequencies on Route 3, and through-routing of Routes 2 and 3 mean job access by transit within 45 minutes would increase from this area, despite longer initial walking distances.

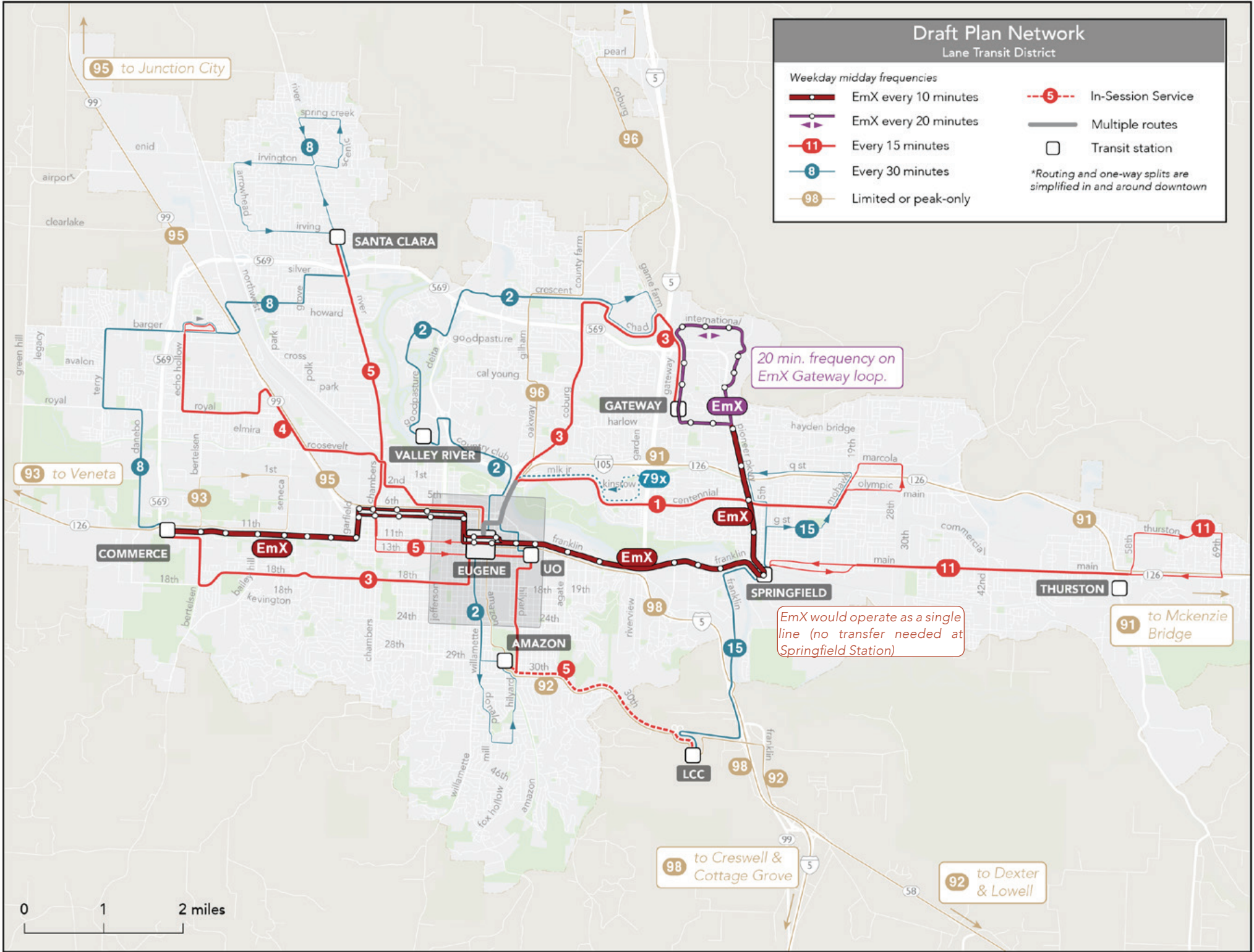
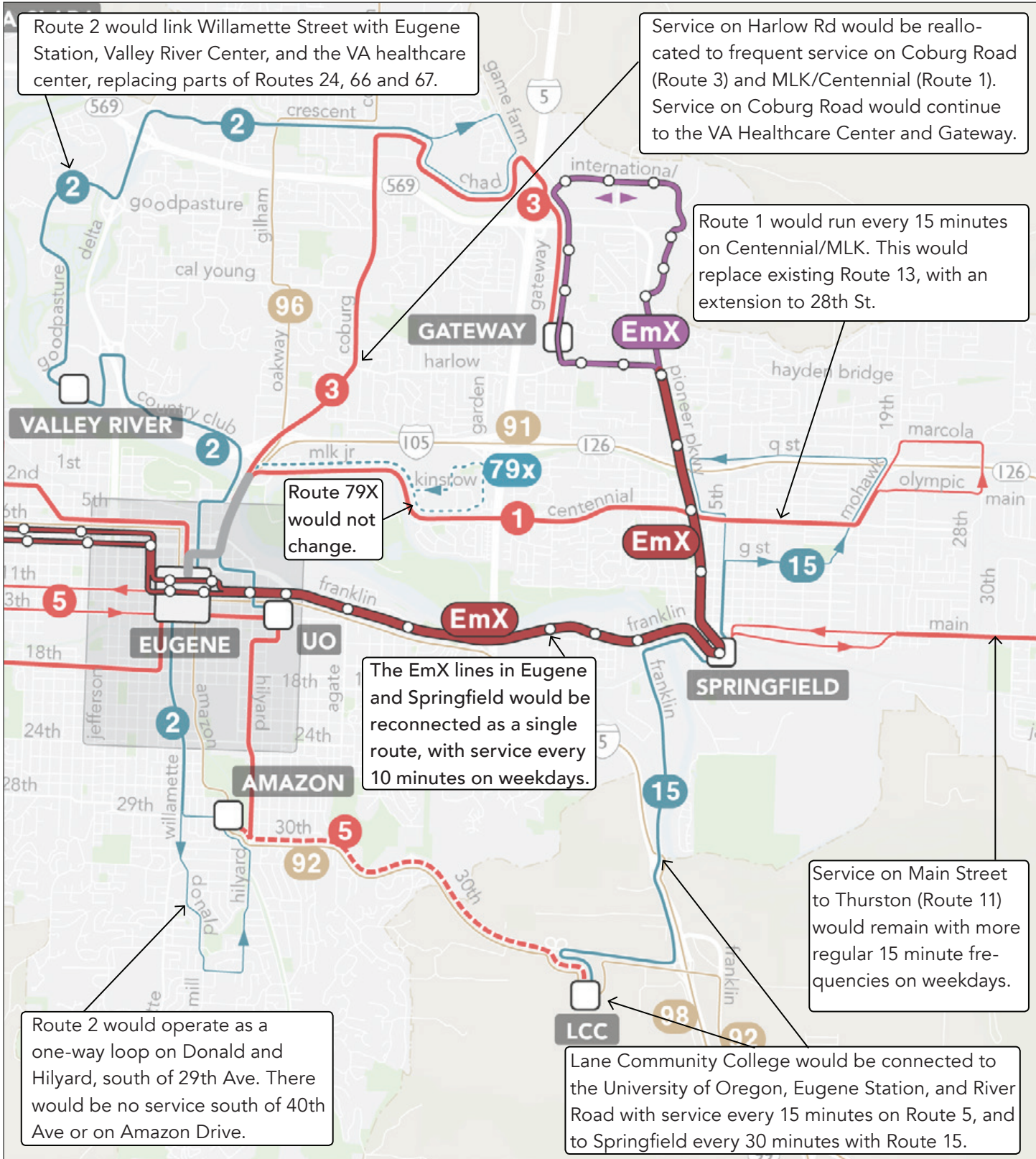
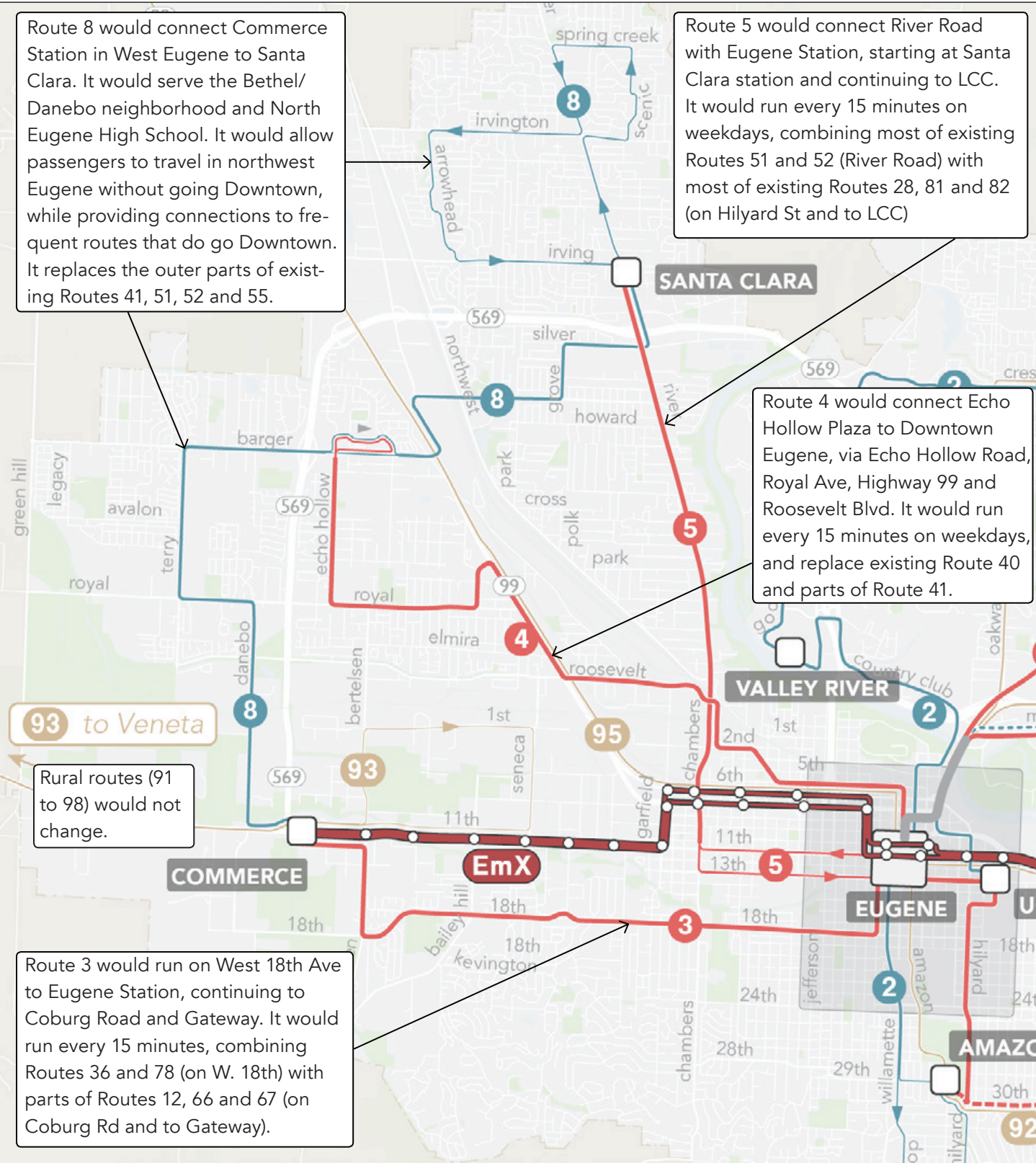
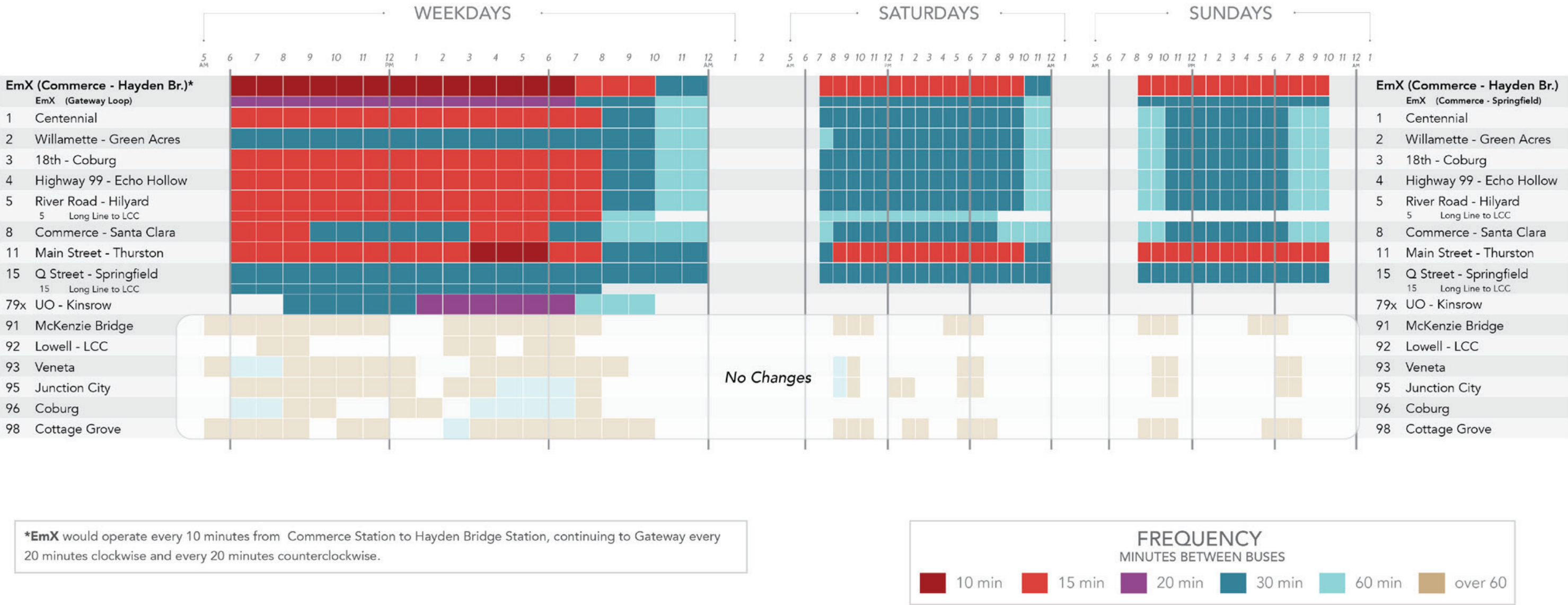


Figure 19: Draft Network Map. The draft network would allocate about 85% of resources towards services that are designed to maximize ridership, and about 15% of resources towards services that exist to provide coverage in lower-ridership areas. It would consist of a network of high-frequency routes converging at Eugene Station and Springfield Station, with several less frequent routes (every 30 minutes) serving areas of lower demand.

Draft Network Explained



Draft Plan Network
Base Route Frequencies and Spans of Service



Comparing the Existing and Draft Network: Weekday Service

The maps on this and following pages compare the level of service that would be offered in the draft network to existing service at different times of the day and week.

Weekdays

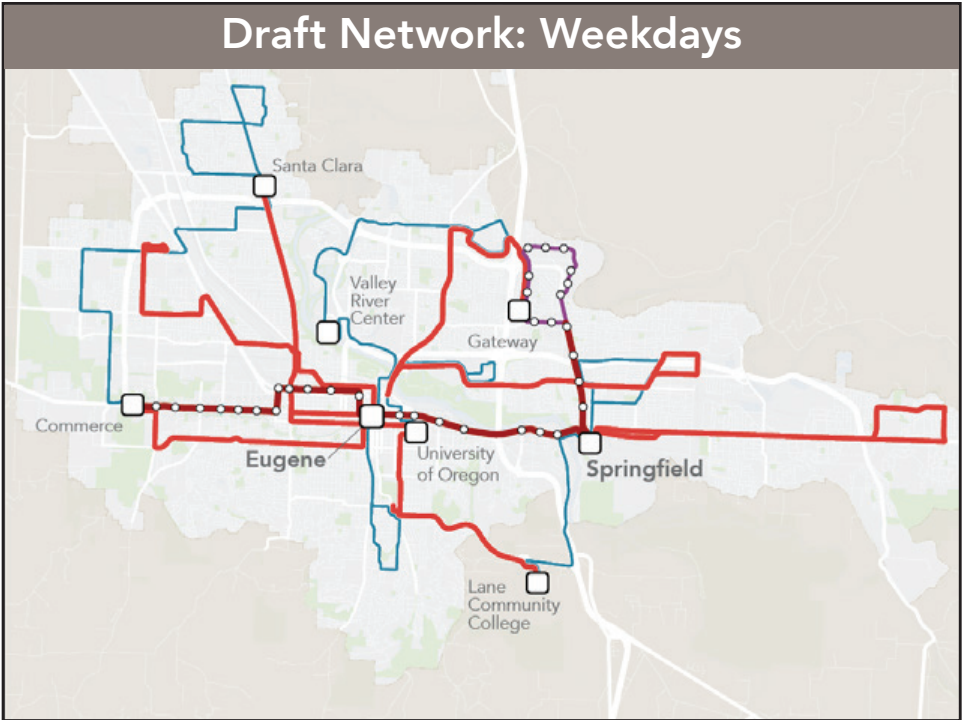
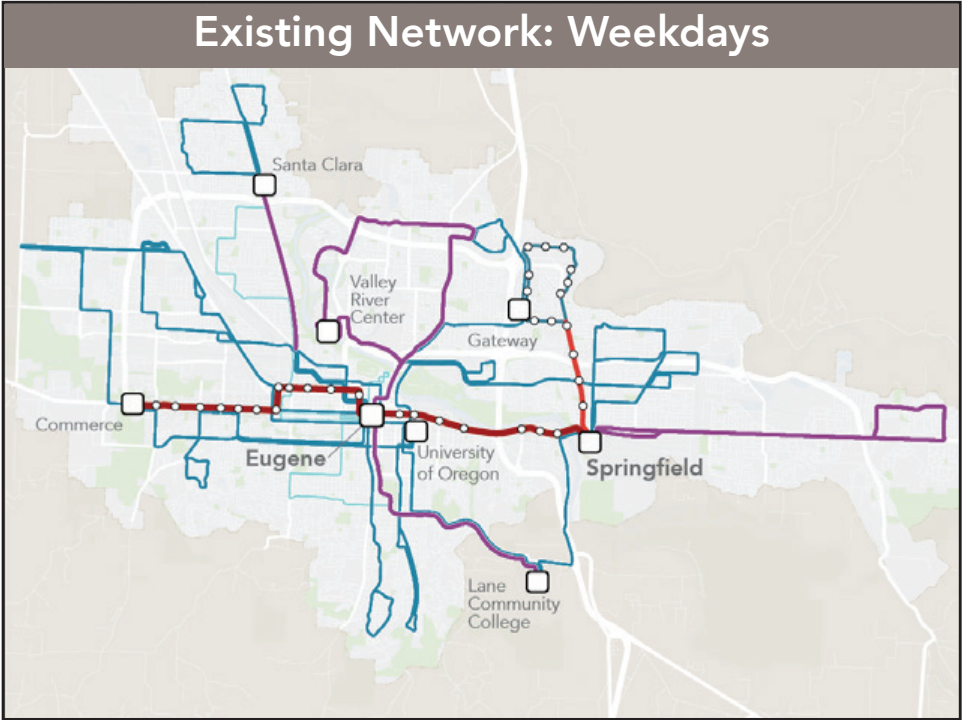
In the Existing Network:

- Most routes operate every 30 minutes and feed into Eugene Station or Springfield Station.
- A few routes operate even less frequently, hourly or less. Some of these routes operate every 30 minutes during peak hours.
- The exceptions are several routes that run every 20 minutes (purple), and the two EmX lines, that run every 10 or 15 minutes (maroon and red).
- On River Road between Eugene Station and Santa Clara, two overlapping routes are scheduled for staggered departures at a frequency of 15 minutes (outbound) to 20 minutes (inbound).
- Where possible, today's routes are timed to "pulse" at Eugene Station and at Springfield station, allowing for quick transfers. However, "pulse" timing is not possible on every route.

In the Draft Network:

- Weekday service consists almost entirely of routes that operate every 15 minutes or better from 6 AM to 8 PM. This means the bus is always coming soon, and you don't need to know the schedule to plan your trip.
- Going across town, it would be relatively fast to connect from one bus to another at Eugene Station or Springfield Station, even without a timed connection.
- Some routes, serving areas of lower ridership potential, have service every 30 minutes, indicated by blue lines.
- Some routes will operate at higher frequencies during peak hours, such as Route 11 which will operate every 10 minutes in the afternoon.

Figure 20: Mini-Maps, Existing Network and Draft Network on Weekdays at Noon. Red lines indicate service every 15 minutes or better, and dark blue lines indicate service every 30 minutes. Light blue lines indicate hourly service.



Comparing the Existing and Draft Network: Weekday Evenings

Weekday Evenings

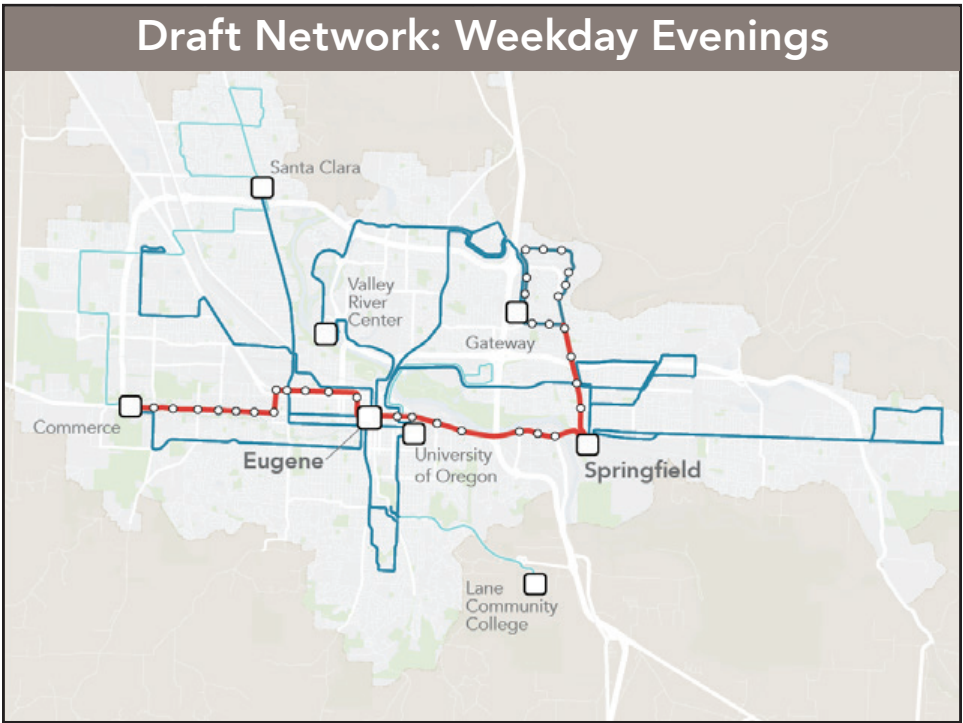
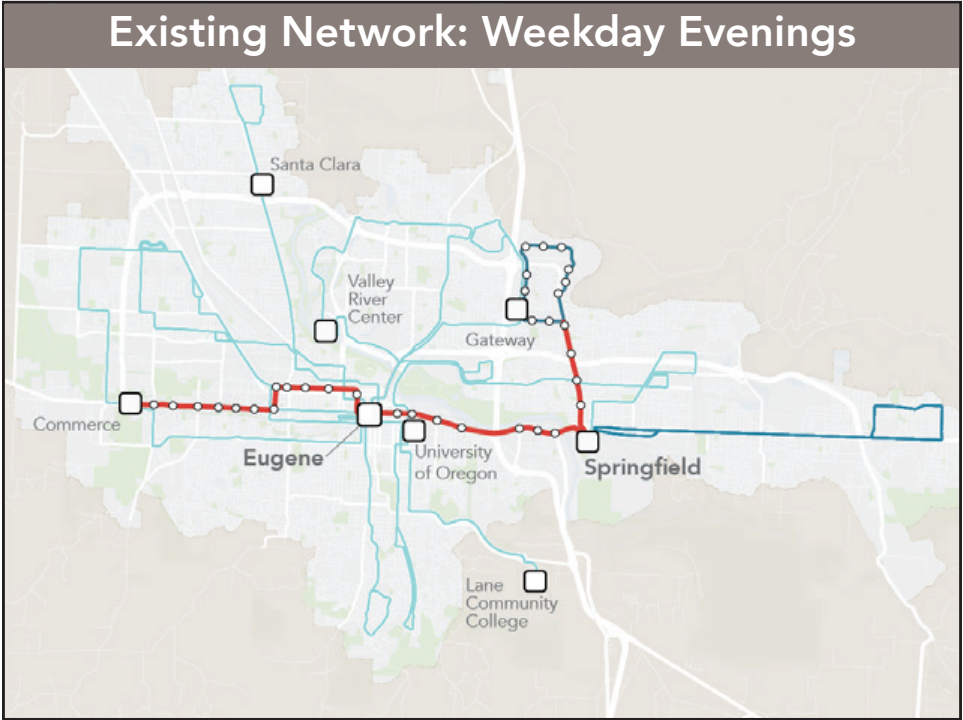
In the Existing Network:

- Almost the entirety of the network drops to 60 minute frequencies at 7 PM.
 - » This means trips are much longer than in the daytime, and very few people are likely to find transit useful or convenient. Nearly all trips require advance planning. Spontaneous, unplanned trips in the evening are likely to result in very long waits.
- EmX is the only route retaining any frequency, operating every 15 minutes (and as a single line, unlike in the daytime) until 10 PM, and every 30 minutes from 10 PM until the end of service.
- Route 11 operates every 30 minutes until the end of service.

In the Draft Network:

- Most of the network would switch to service every 30 minutes at 8 PM. Service would remain at every 30 minutes until 10 PM, and then drop to every 60 minutes until the end of service.
 - » This is still much lower than what would be available during the day, but a marked improvement compared with the existing network in the evening until 10 PM.
 - » More frequent evening service is useful not just for socializing and shopping, but also for service industry workers whose shifts may end far later than 6 PM.
- EmX would continue to operate every 15 minutes until 10 PM, dropping to every 30 minutes from 10 PM until the end of service.
- Route 11 would continue to operate every 30 minutes until the end of service.
- The draft network's frequencies on Weekday evenings also roughly represent what it would be like on Saturday evenings, when most routes would operate every 30 minutes instead of every 60 minutes on between 6 and 10 PM.

Figure 21: Mini-Maps, Existing Network and Draft Network on Weekday Evenings. Red lines indicate service every 15 minutes or better, and dark blue lines indicate service every 30 minutes. Light blue lines indicate hourly service.



Comparing the Existing and Draft Network: Sundays

Sundays

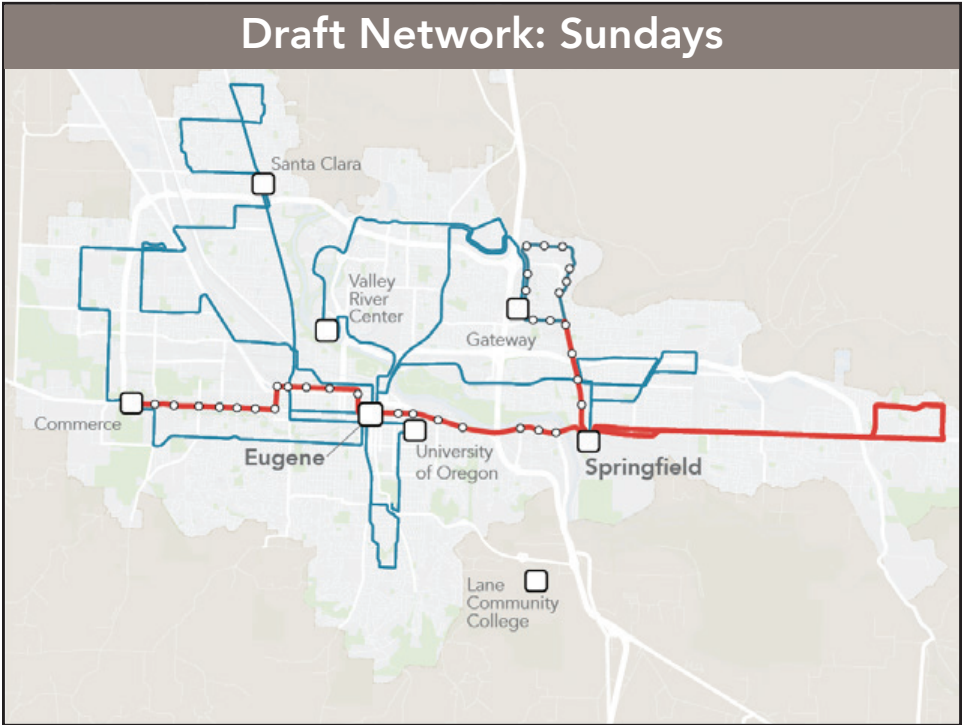
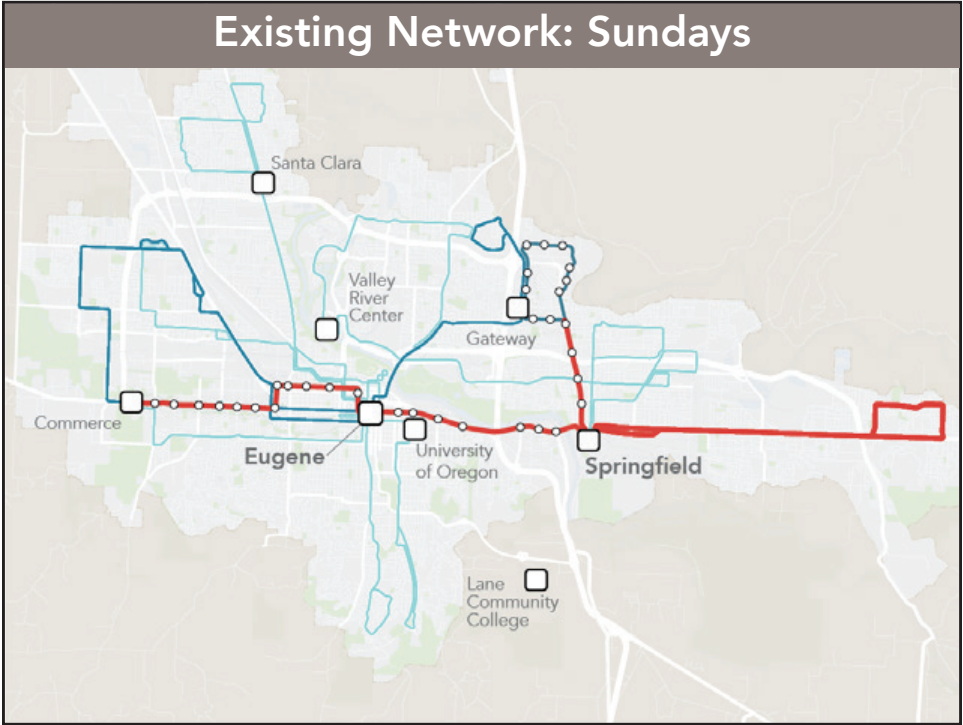
In the Existing Network:

- Most routes operate every 60 minutes from 8 AM to around 9 PM.
 - » This means trips are much longer than on weekdays, and very few people are likely to find transit useful or convenient. The majority of trips require advance planning. Spontaneous, unplanned trips on Sundays are likely to result in very long waits.
 - » This also means that The Shoppes at Gateway and Wal-Mart and Target on West 11th Ave are the only regional retail destinations with better-than-hourly service on Sundays.
- Routes 12 and 41 operate every 30 minutes for 6-7 hours in the middle of the day.
- EmX and Route 11 operate every 15 minutes all day until the end of service. As a result, they account for over 52% of Sunday boardings.

In the Draft Network:

- Service would operate from 8 AM to 10 PM on all routes. All routes would operate every 30 minutes or better from 10 AM to 7 PM, providing a more consistent level of service across the metro area.
 - » This is still much lower than what would be available on weekdays, but a marked improvement compared with the existing network. Travel times by transit would improve in almost all parts of the metro area as a result.
- The EmX and the Main Street Corridor in Springfield would continue to operate every 15 minutes from 7 AM all day until the end of service.

Figure 22: Mini-Maps, Existing Network and Draft Network on Sundays at Noon. Red lines indicate service every 15 minutes or better, and dark blue lines indicate service every 30 minutes. Light blue lines indicate hourly service.



3 Network Outcomes

Comparing Outcomes

This chapter reports on three different ways of measuring the potential outcomes of the draft network. These measurements are not forecasts, and they do not rely on any assumptions about how culture, technology, prices or other factors will change in the next few years.

Instead, we measure distance to service, travel times, and the most recent data on population and jobs to give an idea of how well each scenario would serve people living and working in Eugene and Springfield. We calculate all of these outcomes at two key times:

- **Weekdays at Noon.** This represents the level of service experienced by the majority of existing transit trips. This is because people take most of their trips during the daytime, and most bus routes in Eugene and Springfield do not require peak frequency increases.
- **Sundays at Noon.** This time represents the baseline for weekend service. Existing Sunday service is almost all hourly outside of EmX and Route 11. Yet most people travel around town on weekends as well as weekdays. This can be due to nontraditional work schedules, but people also travel for a variety of other purposes such socializing, or access to shopping and retail. Service on Sundays at noon also shares many similarities with Weekday evenings, when the existing network provides mostly hourly service.

Proximity

The first measure reported, on the next page, is very simple: **How many residents and jobs are near transit?**

Specifically, we measure how many people and jobs would be located within 1/2 mile of a bus stop in each scenario. This does not tell us whether people will find transit useful, only that it is available nearby.

To provide some idea of usefulness, we distinguish between how many people and jobs are near frequent service (every 15 minutes or better), service every 20 to 30 minutes, or any service at all.

A 1/4 mile is a distance sometimes used to determine whether someone is “close enough” to transit; however, many people are willing to walk farther to reach more frequent service.

Since the draft network offers many high-frequency services, coming every 15 minutes or better, we focus on the number of people and jobs within 1/2 mile of service in this report.

Job Access

One of the primary functions of transit is to provide access to jobs. And, because retail and services also account for jobs, access to jobs is also a good indicator of the usefulness of transit for many other purposes.

So, we ask the question: **Can we design a transit network that helps more people access more jobs (and other opportunities) by transit, in less time?**

To answer this question, we first measure how far a person could go in 45 minutes on transit (door-to-door, including walking, waiting and riding) from anywhere in Eugene and Springfield, and then calculate how many jobs are located in that area. We use 45 minutes as a representative travel time for two reasons:

- 45 minutes is about the travel time at which transit provides the most potential benefit to a customer. Due to the initial walk and wait time, job access on transit within 30 minutes is mostly limited to places that are close-in and very near high-frequency service.
- A 60 minute transit trip is rarely competitive with other modes in the Eugene-Springfield metro area. It is possible at almost any time to drive from the west end of Eugene to the east end of Thurston within 45 minutes.

Travel Time Maps

To understand the benefits of a network change, consider this simple question: **Where could I get to, in a reasonable amount of time, from where I am?**

If you can get to more places in a reasonable amount of time, you will have more opportunities, and your life may well feel more free.

The travel time maps in this chapter cover how far one could travel in 45 minutes – door-to-door, on foot and transit – from nine locations in Eugene and Springfield.

We have deliberately included a mix of central and less-central locations, as well as locations that illustrate the full range of possible outcomes.

That means most of these locations show significant expansions in where you can go, but some (especially central locations) don’t show much change at all, and a couple show mixed or negative outcomes.

Appendix A to this report provides further travel time maps for 16 locations of interest throughout the metro area.

Summary of Outcomes

Faster Travel and More Access to Opportunity

By providing service at high frequency throughout the densest parts of the district, the draft network would shorten travel times and allow people to access more opportunities in less time. On weekdays, we estimate that **the average resident of the Eugene-Springfield metro area would be able to access 20% more jobs on transit in 45 minutes, door-to-door.**

Increased Access Across Demographics

The draft network would ensure that far more people and jobs would be located near frequent service. Whereas 19% of residents and 42% of jobs are located within 1/2 mile of a bus stop with frequent service today, those numbers would jump to 57% of residents and 70% of jobs after services were changed.

And that impact wouldn’t be limited to any one class or type of people; the benefits would be even more striking among low-income, minority and senior populations:

- 49% of people aged 65 and over would live near frequent service, compared to 13% today.
- 63% of people of color would live near frequent service, compared to 22% today.
- 71% of people in poverty would live near frequent service, compared to 31% today.

Less Service in Some Areas

The new network provides widespread benefit, but by concentrating resources to provide high frequencies, some areas would receive less service. Overall, **the percentage of residents living within 1/2 mile of a bus stop would drop from 87% to 82%.** This is the direct consequence of a policy choice to re-orient service toward higher ridership, and steer away from some lower-density, outlying and isolated neighborhoods.

LTD is studying different ways to continue providing lifeline service in areas where the draft network no longer includes a fixed bus route. If revenues continue to improve, LTD may be able to restore some coverage, either as a fixed or on-demand service. However, this would need to be balanced against future potential improvements in weekend and evening frequencies.

Proximity to Transit Service: All Residents and Jobs

The bar charts at right show how many residents and jobs would be near service on weekdays and Sundays with the existing and draft networks¹, compared to the population and jobs of the Eugene-Springfield metro area.

This measure does not necessarily reflect that any specific person would be “close enough” to use transit. These charts assume that someone is near transit service if they are within 1/2 mile of a bus stop as the crow flies. Walking 1/2 mile over flat ground takes the average adult about 10 minutes, but actual walk times vary depending on the street network.

On weekdays:

- The draft network would provide frequent transit (every 15 minutes or better) within a half-mile of 57% of residents and 70% of jobs in the metro area. This is a significant increase compared to the existing network (+35% residents, +28% jobs), where only those near EmX have access to an all-day frequent service.
- However, the draft network would decrease the number of residents within a half-mile of any transit stop from 87% to 82%. The draft network would also reduce the number of Jobs and Residents near service that comes every 30 minutes or better (-2% residents, -3% jobs).
 - » This reflects the basic geometric trade-off: given limited resources, if LTD concentrates its service for higher frequencies and shorter travel times in areas that benefit the most people, it cannot also serve areas with lowest densities and ridership potential.

On Sundays:

- The percentage of people near frequent service would remain the same, because EmX and Route 11 would remain the only routes with service every 15 minutes on Sunday.
- By this measure, the biggest difference between existing service and the draft network would be in the percentage of jobs and residents near service every 30 minutes or better. 75% of residents and 81% of jobs would be within a 1/2 mile of this type of service (+33% residents, +23% jobs).
- However, the number of jobs and residents near any service would decrease slightly, by about -2% each.

¹ In the existing network, Saturday service is less than on weekdays, and more than on Sundays. In the draft network, Saturday service would be the same as Sunday service. As a result, we show charts for Sundays to represent the entire weekend.

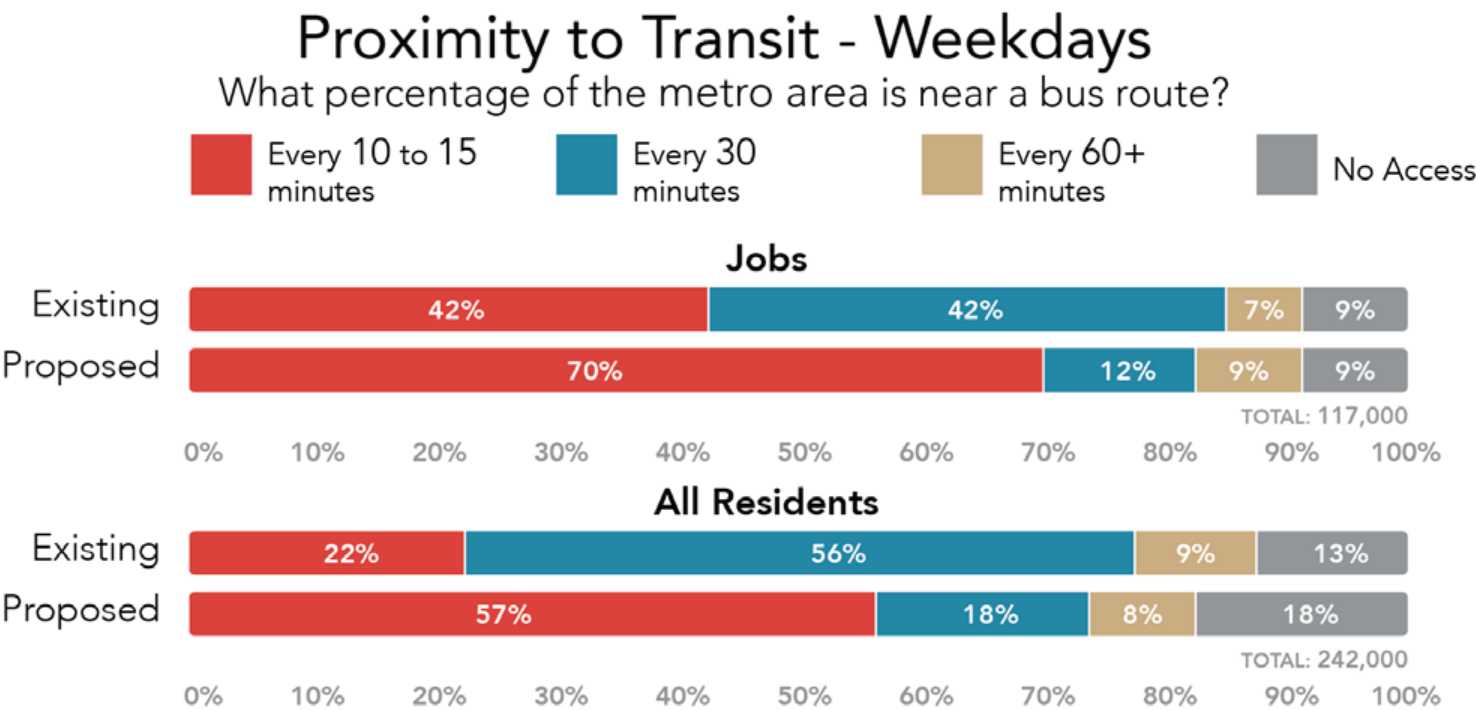


Figure 23: Proximity Analysis Chart, weekdays. What percentage of people and jobs in the metro area are within 1/2 mile of transit?

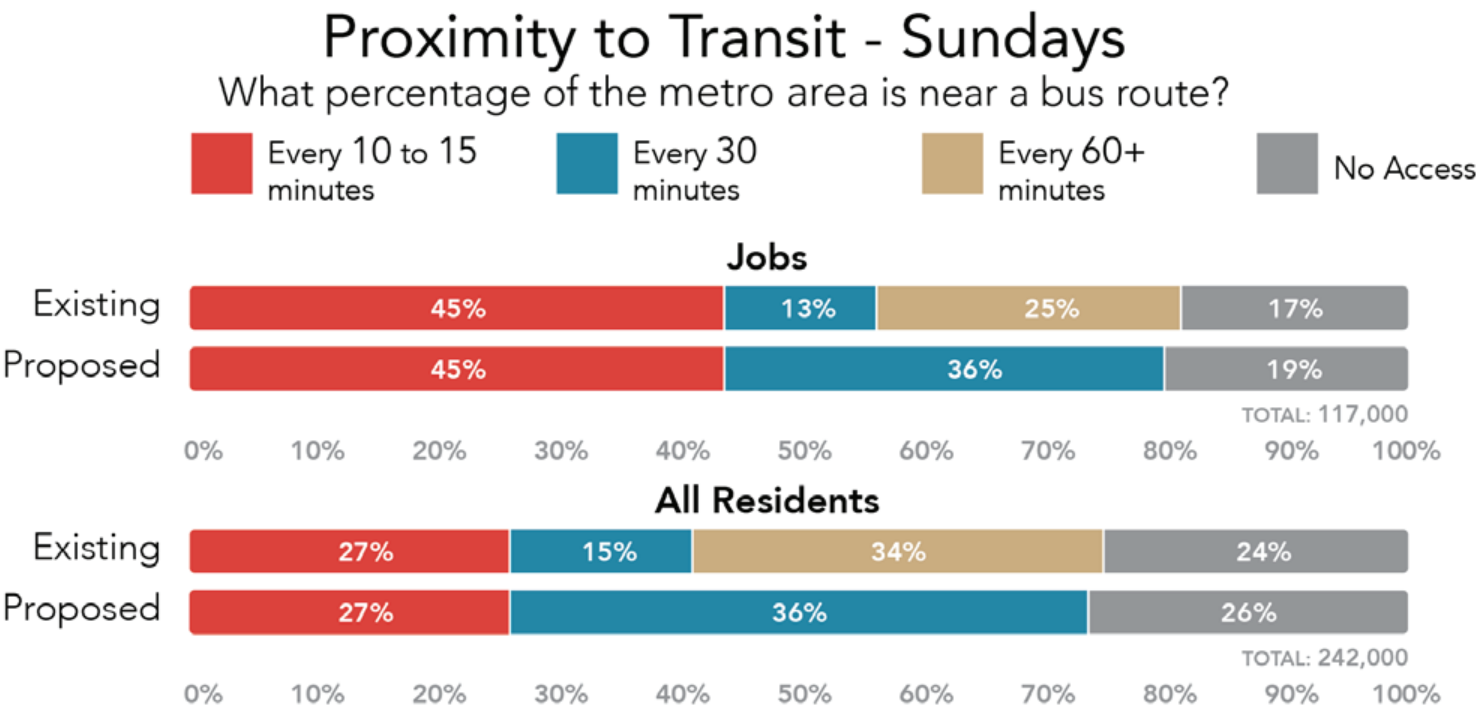


Figure 24: Proximity Analysis Chart, Sundays. What percentage of people and jobs in the metro area are within 1/2 mile of transit?

Proximity to Transit Service: Communities of Concern

The draft network would ensure that far more people would be located near frequent service. At the same time, slightly fewer people would be located near transit service in general.

But would those outcomes be distributed fairly? Are people in situations of disadvantage unduly impacted by the concentration of service on main streets? Do they receive a sufficient share of the benefit of massively expanding frequent service?

Our analysis suggests that the communities of concern tracked by LTD would be well served by the draft network.

On weekdays:

- 49% of people aged 65 and over would live near frequent service, compared to only 13% today.
- 63% of people of color would live near frequent service, compared to 22% today.
- 71% of people living below the federal poverty line would live near frequent service, compared to 31% today.
- All three groups would see a reduction in the number of people within a 1/2 mile of any service, but these reductions are smaller than or equal to the same change for all residents (-5%).

On Sundays:

- 70% of people aged 65 and over would live near service every 30 minutes or better, compared to only 35% today.
- 79% of people of color would live near service every 30 minutes or better, compared to just 48% today.
- 81% of people living below the federal poverty line would live near service every 30 minutes or better, compared to 51% today.
- All three groups would see a reduction of -1% to -2% of people within a 1/2 mile of any service, similar to the -2% change for all residents.

The difference in the outcomes between these different groups comes down to where people live. In the Eugene-Springfield metro area, people of color and people with lower incomes are more likely than the general population to live in areas that are relatively central or near to main streets. In contrast, older adults are more likely to live in outlying and suburban areas.

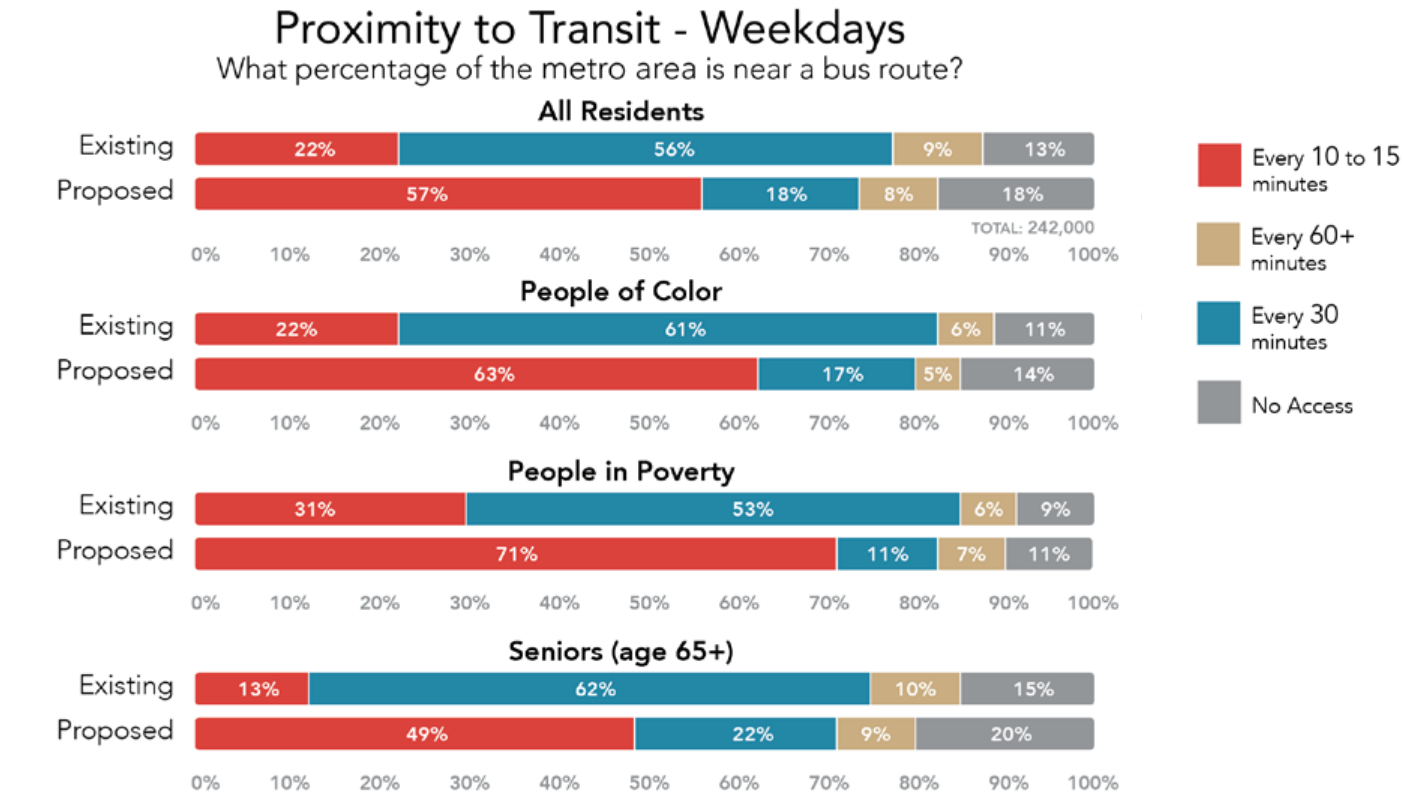


Figure 25: Proximity Analysis Chart, weekdays for communities of concern. What percentage of older adults, people of color and people in poverty are within 1/2 mile of transit?

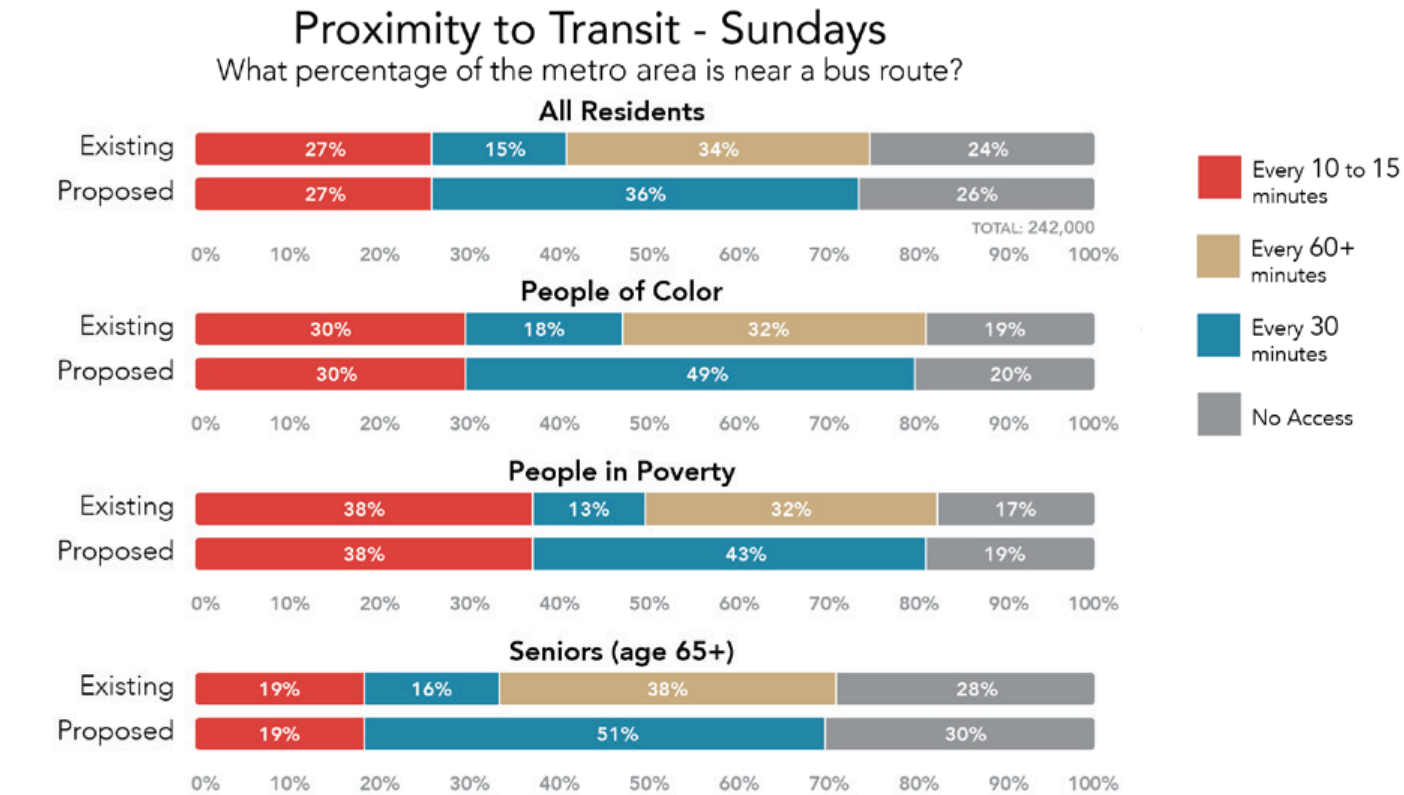


Figure 26: Proximity Analysis Chart, Sundays for communities of concern. What percentage of older adults, people of color and people in poverty are within 1/2 mile of transit?

Access to Jobs: Weekdays

Providing transit, even at high frequency, is not enough to attract many people to actually ride. Transit needs to go *where* people want to go. To describe the kind of access that becomes possible on a complete and connected transit network, we ask: **how many useful places could you reach in a reasonable amount of time, from anywhere else?**

There’s no perfect definition of “useful places”: different things are useful to different people. But we can calculate something useful to many people: access to jobs.

- Access to many jobs means more people can access their job by transit. In the long term, how well a transit network provides access to jobs will impact what jobs people will consider, and compete for.
- Places where many jobs are located often have other interesting features. Offices, shopping centers, social services, even schools and houses of worship all are employers in themselves, in addition to being near or in employment centers. So calculating access to jobs helps us understand opportunity more broadly.
- This all points to one key fact: **more access means more opportunity.**

Weekdays At Noon

The map to the right shows how many more (or fewer) jobs could be reached in 45 minutes on transit on weekdays at noon, from anywhere in the metro area (door-to-door, including walking, waiting, and riding).

- All areas where service frequency would increase to every 15 minutes or better would see improved job access.
- The biggest job access gains appear around routes that are not only frequent but go across town. For example:
 - » In a 1 mile radius around Pioneer Parkway & Centennial Blvd in Springfield (EmX more frequent and reconnected to Eugene).
 - » On West 18th Ave and Coburg Rd (proposed Route 3).
 - » On River Road and toward LCC (proposed Route 5).
- Not all areas that “lose” service would see a loss in job access by transit. Higher frequency on main streets would often reduce wait times so much that it would compensate (in time) for longer walks. This is clearest in the following areas:
 - » Southwest Eugene, south of 18th & Bailey Hill (existing Route 78).
 - » Southwest Eugene, Friendly neighborhood (existing Route 33).

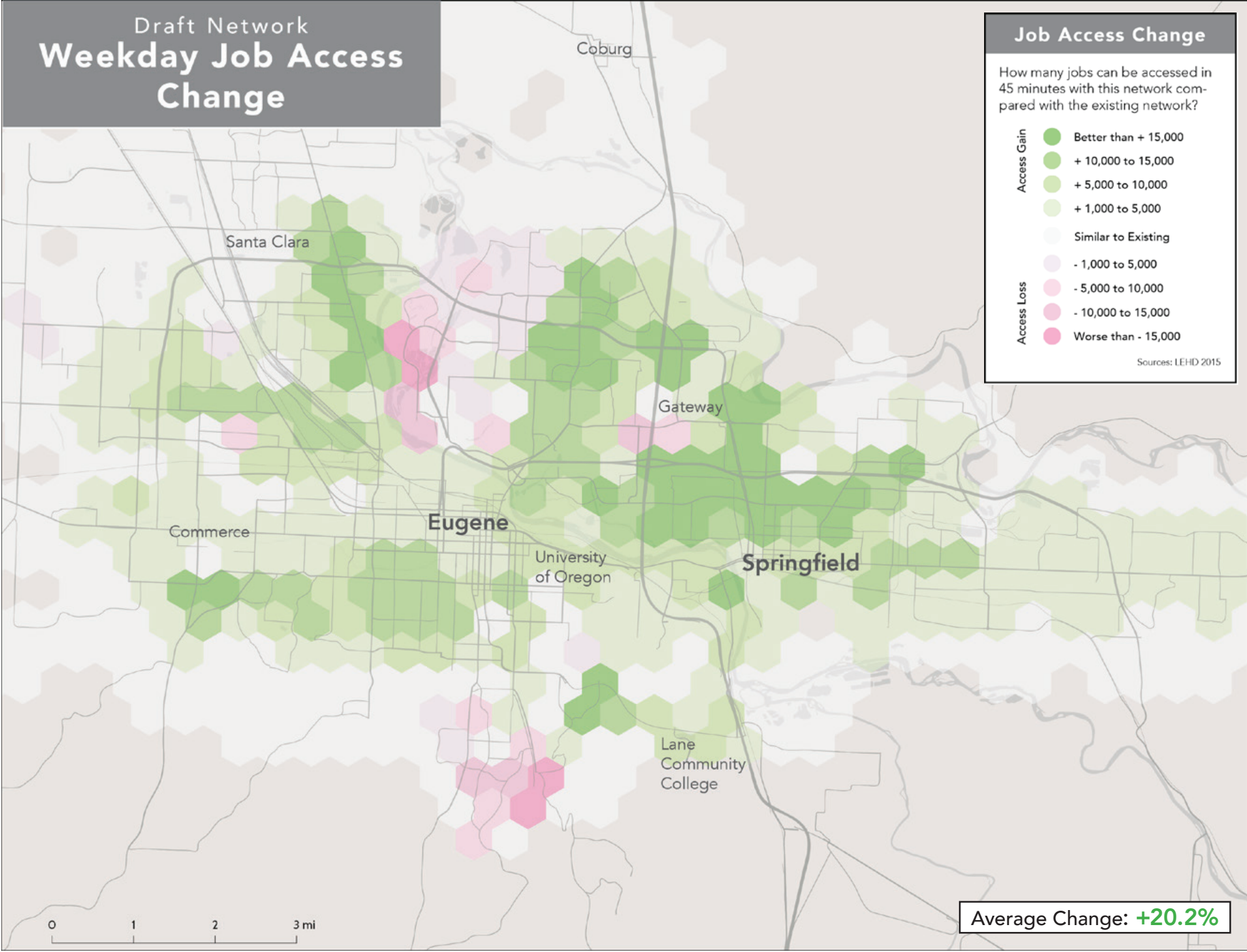


Figure 27: Job Access Change Map, weekdays. Green areas indicate areas where the draft network would make it possible to access more jobs in 45 minutes (door-to-door) on transit. Pink areas indicate areas where you could reach fewer jobs in 45 minutes. The map is mostly green, because most parts of town would receive more frequent and direct service, enabling faster travel. In pink areas, transit trips would mostly become longer.

Access to Jobs: Weekends

- » North Eugene, near Park Ave (existing Route 55).
- However, some areas would see overall reductions in job access by transit. The most notable examples include:
 - » Far south Eugene, south of 40th Street, where existing service on Routes 24 and 28 would not be replaced in the draft network. As a result, transit trips to and from this area would require very long walks and some existing trips may no longer be viable.
 - » Goodpasture Island Road, where service every 20 minutes would be replaced with service every 30 minutes. As a result, the average wait for a bus would go from 10 to 15 minutes, so the average transit trip to and from this area would take 5 minutes longer.

Sundays at Noon

The map to the right shows how many more (or fewer) jobs could be reached in 45 minutes on transit on Sundays at noon, from anywhere in the metro area (door-to-door, including walking, waiting, and riding).

- The switch from existing service every 60 minutes on most routes to service every 30 minutes produces would improve job access by transit almost everywhere in the metro area.
- However, on average, these gains would be less than on weekdays, because service every 30 minutes still requires an average wait of 15 minutes per bus. This means trips that require transfers would remain significantly longer on weekends than weekdays.
- Negative impacts would mostly occur in two areas that currently receive 30 minute service on Sunday, but would not in the draft network:
 - » The vicinity of Harlow Road in northeast Eugene and northwest Springfield, on existing Route 12. Route 12 would not be replaced in the draft network.
 - » The vicinity of Highway 99 north of Royal Ave in northwest Eugene, on existing Route 41. In the draft network, Route 4 service on Highway 99 would turn onto Royal Ave instead of continuing on Highway 99.

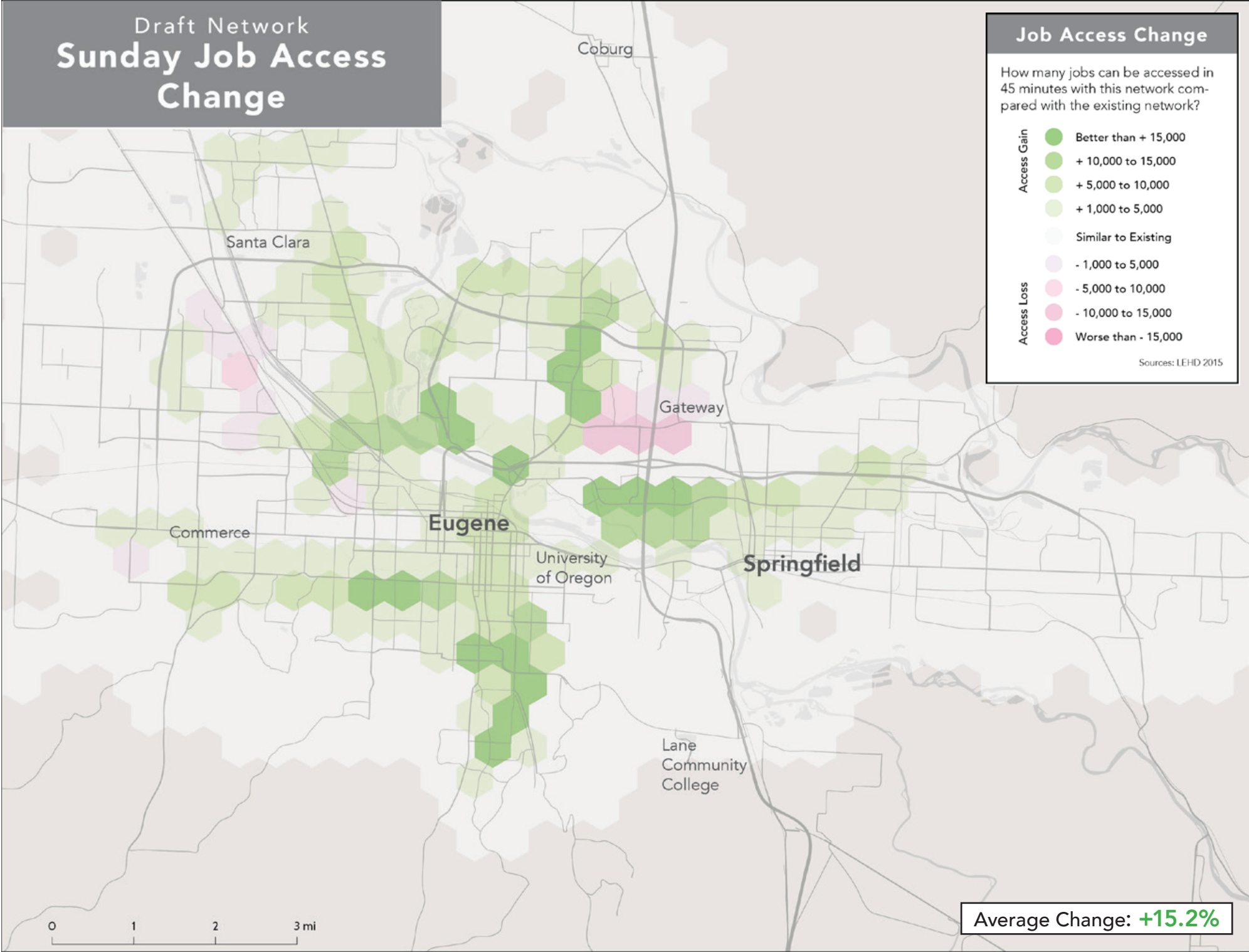


Figure 28: Job Access Change Map, Sundays. Green areas indicate areas where the draft network would make it possible to access more jobs in 45 minutes (door-to-door) on transit. Pink areas indicate areas where you could reach fewer jobs in 45 minutes. The map is mostly green, because most parts of town would receive more frequent and direct service, enabling faster travel. In pink areas, transit trips would mostly become longer.

Travel Time Maps: Eugene Station

The travel time maps on this and following pages show where you could get to, on average¹ in 45 minutes door-to-door (including walking, waiting and riding) from various places. On these maps:

- **Dark blue shows no change.** It denotes areas that can usually be reached in 45 minutes on the existing network, and could still be reached in 45 minutes if the draft network were implemented.
- **Light blue shows improvement.** It denotes areas that could usually be reached in 45 minutes under the draft network, but would take longer to reach with existing service.
- **Gray shows losses.** It denotes areas that can be reached in 45 minutes in the existing network but would take longer to reach in a scenario.

This chapter shows 45-minute transit travel time maps for nine locations, selected either for being very central, or to illustrate the draft network’s benefits and drawbacks. Appendix A contains these maps for 16 locations. When reviewing these maps, remember that:

- Waiting time counts!²
- In most cases, a longer walk to a high-frequency route can get people farther, faster, than a shorter walk to an infrequent route.
- Some of the access shown in these maps isn’t reached on a single route, but requires a transfer.
- It’s not just about the size of the area, but also what’s inside. For this reason, we’ve shown the change in the number of people and jobs that can be reached, in addition to the areas on the maps.

Eugene Station

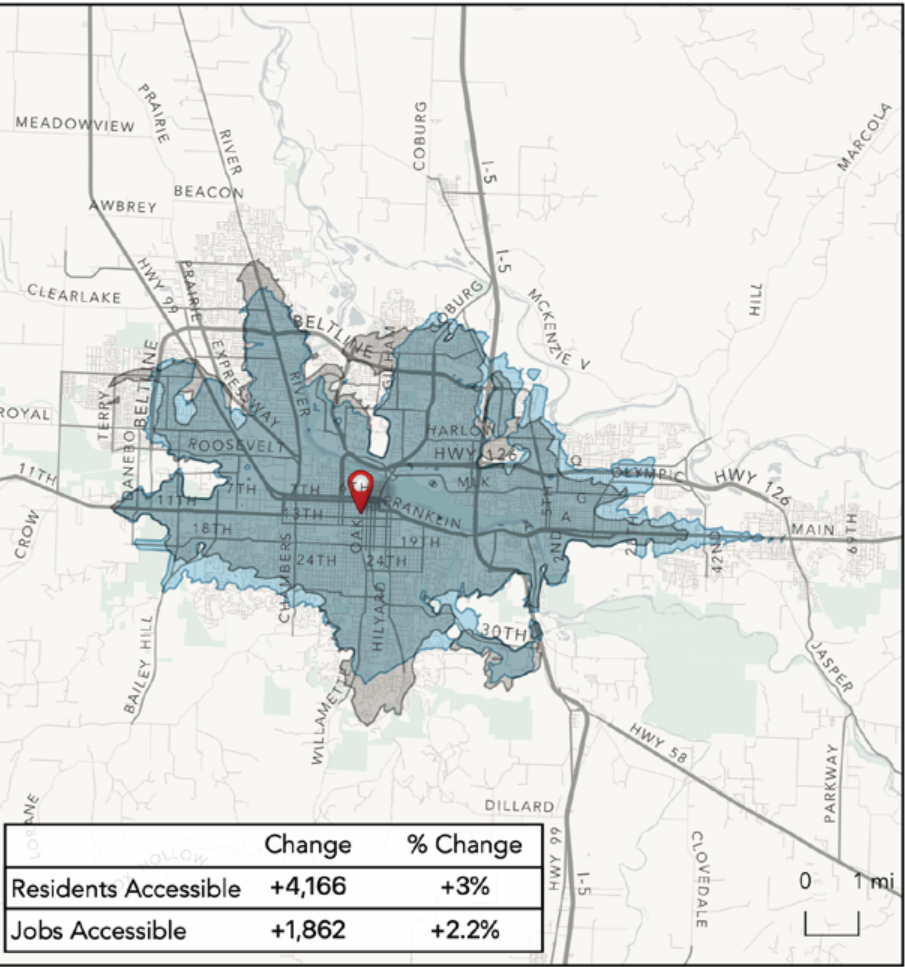
On weekdays at noon:

- Because Eugene Station lies at the center of the existing network, and would lie at the center of the draft network, there is limited change in the places you could reach in 45 minutes on weekdays.
- Improvements are mostly tied to higher frequencies, e.g. one could reach further in Southwest Eugene because service on West 18th Ave would be more frequent.

¹ On any trip, you may be lucky and catch your bus right on time, but you may also have just missed a bus, so we look at the average trip. By “on average”, we mean the time it takes to walk to the stop, wait half the headway of the bus you’ll take, ride, transfer, and walk to your destination.

² Even if you time your departure right and don’t wait at the bus stop, a less frequent route often makes you wait at your destination because it can force you to arrive early (rather than be late). Very few people have the liberty of arriving when they please for all their trips, or control the end of something like an appointment or social call at exactly the right time to catch the bus home. Riding transit means waiting *somewhere*. The more frequent the transit, the shorter the wait.

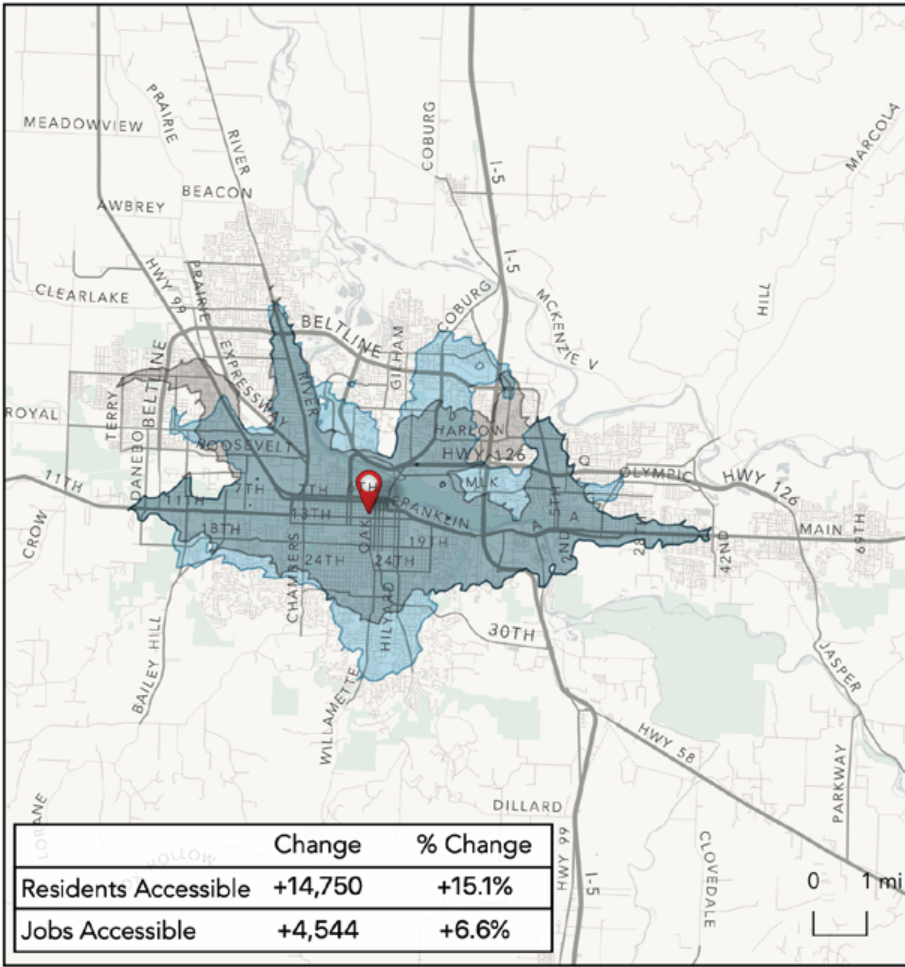
How far can I travel in 45 minutes from Eugene Station at noon on a... Weekday?



- Areas far south in Eugene would become less accessible since the proposed Route 2 would turn around at 40th Ave.
- Other losses are mostly due to the change in route structure. For example, proposed Route 5 would terminate at Santa Clara Station, and service on Coburg Road would go to Gateway instead of Crescent Ave.



Sunday?



On Sundays at noon:

- Almost all areas would see improvements in access because of frequencies going from every 60 minutes to every 30 minutes.
- Losses come from areas that currently receive service every 30 minutes but wouldn’t in the draft network: the vicinities of Harlow Road, and parts of Highway 99 and Barger Drive.

Travel Time Maps: University of Oregon

The University of Oregon is perhaps the single most important destination in LTD's transit network. As of Fall 2017, at least 17% of all weekday trips on LTD started or ended within one block of the UO campus. As a result, it's important to consider how any changes to LTD's network will affect access to this location.

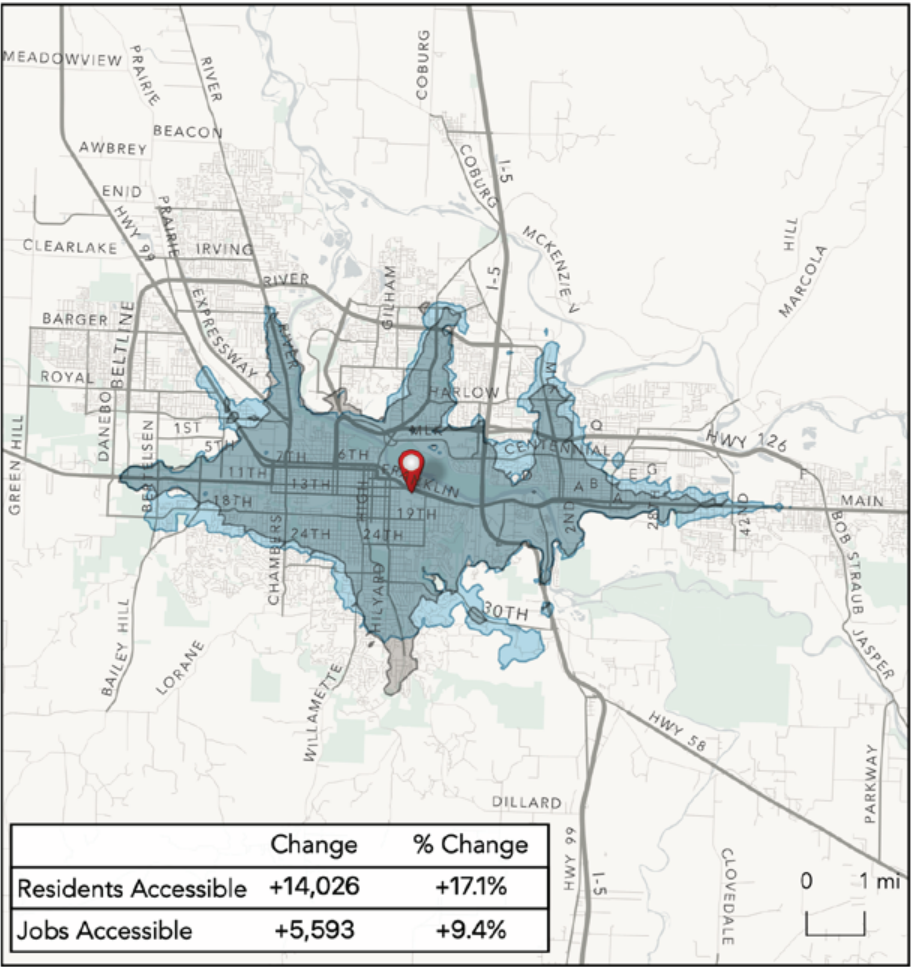
On weekdays at noon:

- Access to and from the University of Oregon would generally improve, with 17% more area residents able to reach the campus within 45 minutes on transit.
- Improvements come mostly from the following:
 - » Access along the Springfield portion of the EmX would improve because the re-connected EmX route would no longer split at Springfield Station.
 - » Frequent service along West 18th Ave (proposed Route 3) would extend the areas accessible despite trips from the University of Oregon now requiring a transfer.
 - » Access towards Lane Community College would improve because of Route 5 linking UO to LCC every 15 minutes. This would also increase future opportunities for collaboration between the two educational institutions.
- Areas far south in Eugene would become less accessible because the proposed Route 2 would turn around at 40th Ave.

On Sundays at noon:

- With most other routes requiring transfers, the dominant factor in transit access to and from the University of Oregon on weekends would remain the frequency and directness of EmX service.
- We are not proposing changes to the EmX weekend frequencies, so there would be little change in the areas accessible from this location on Sundays.

How far can I travel in 45 minutes from
13th Ave at University St
at noon on a...
Weekday?



Travel Time Maps: Springfield Station

Springfield Station would remain a central point in the network, as the focal point for EmX in Springfield as well as proposed Routes 11 and 15.

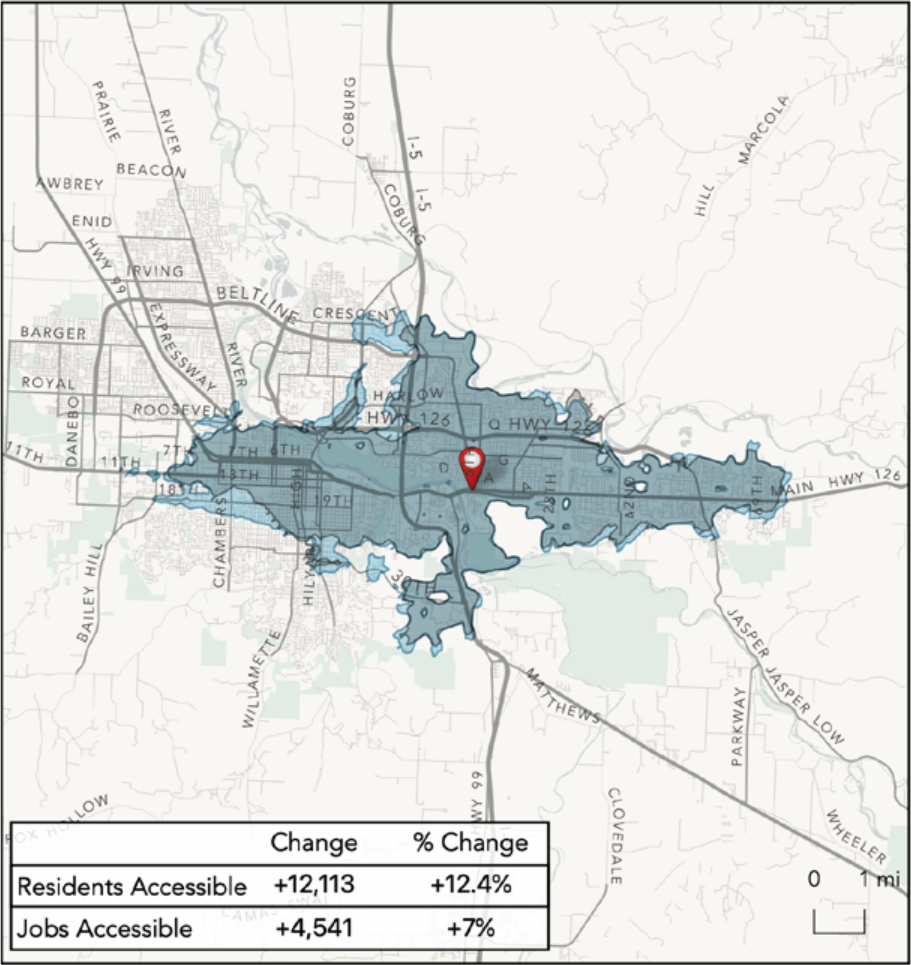
On weekdays at noon:

- Overall access from Springfield Station would improve slightly, with 12% more residents and 7% more jobs accessible within 45 minutes.
- The most visible improvements would come from:
 - » The VA healthcare center would become reachable in less than 45 minutes, due to more frequent EmX service to Gateway, combined with more connecting frequency on proposed Route 3.
 - » Improved access to parts of Eugene, due to frequent connecting service at Eugene Station. This is especially visible on West 18th Ave and lower Coburg Road, also on proposed Route 3.

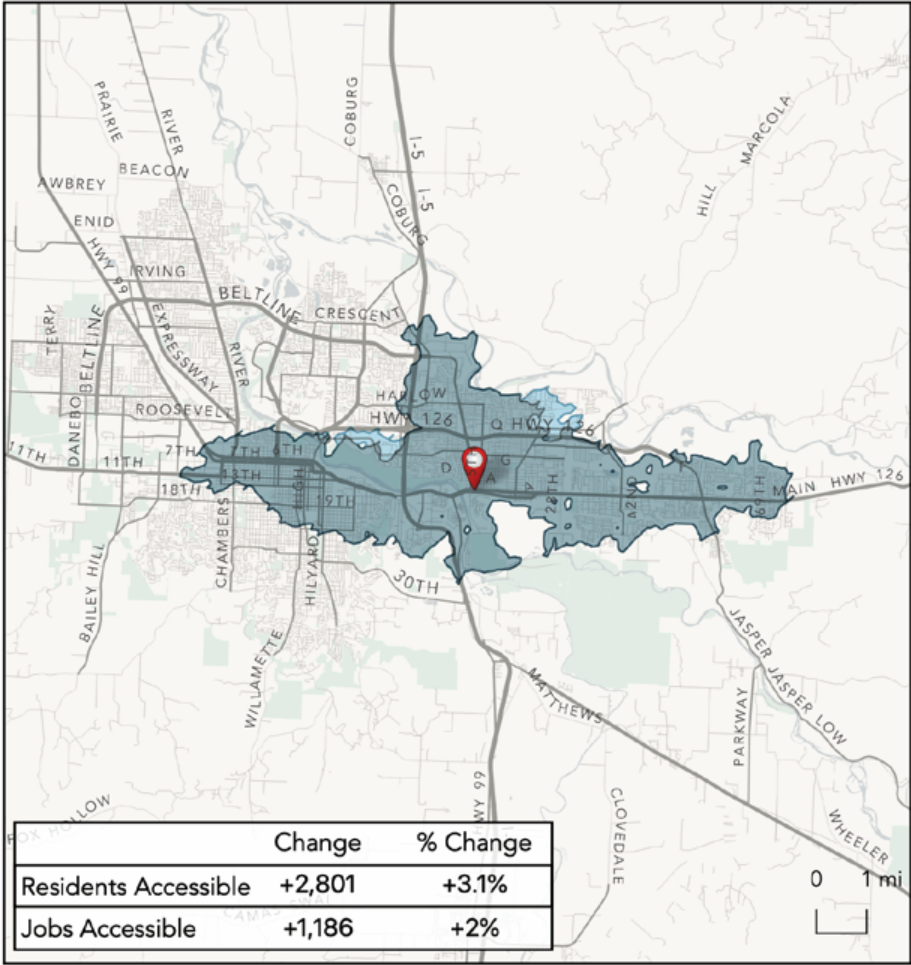
On Sundays at noon:

- There would be little overall change in the areas accessible from the Springfield Station. This is because most weekend access to and from Downtown Springfield on transit come from EmX and Route 11, which already operate every 15 minutes on Sundays in existing service.

How far can I travel in 45 minutes from
Springfield Station
at noon on a...
Weekday?



Sunday?



Travel Time Maps: Coburg Rd at Cal Young Rd

Coburg Road is an example of a location where the draft network would significantly restructure service and increase frequency. As a result, access to most of the metro area by transit would improve greatly.

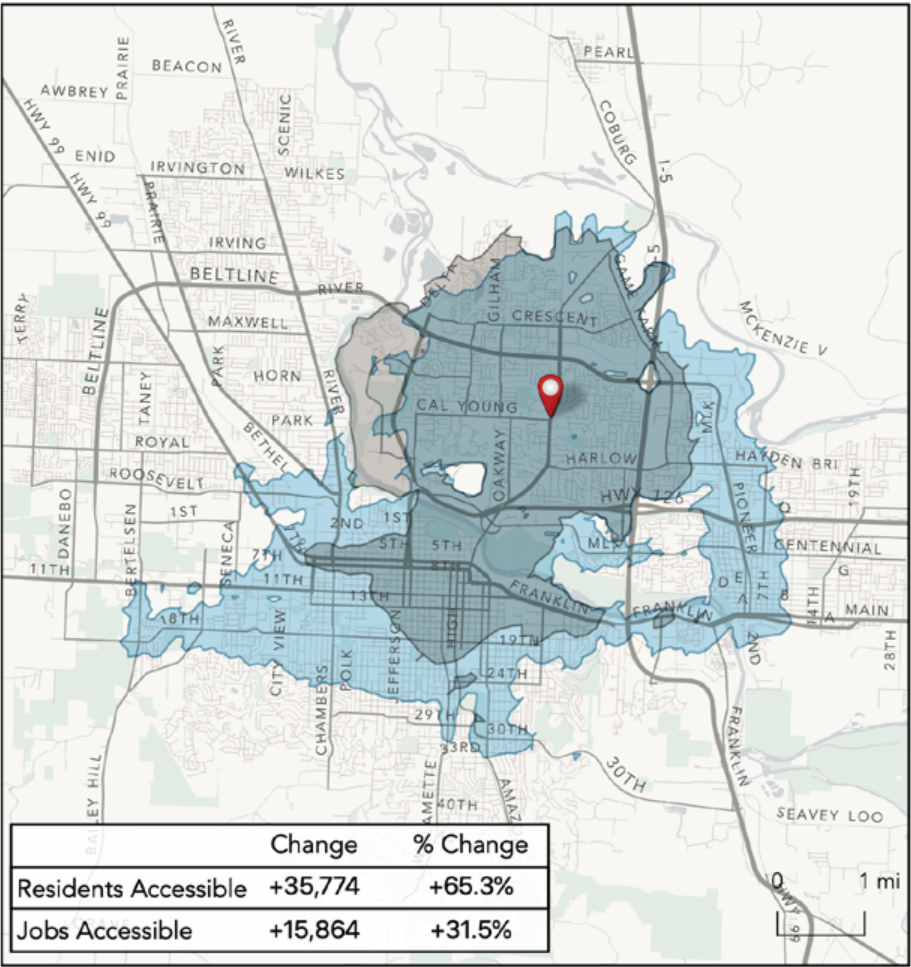
On weekdays at noon:

- Frequent service along Coburg Road (proposed Route 3) would continue through Eugene Station onto West 18th Ave , significantly expanding access in that direction.
- Frequent connections could be made at Eugene Station to EmX, as well as Routes 1, 4 and 5, opening up other parts of Eugene as well.
- Furthermore, the new Route 3 would also provide a high frequency connection to the EmX at Gateway Station, expanding access toward Springfield as well.
- The only loss of access from Coburg Road is in the direction of Valley River Center and Goodpasture Island Road. This is for two reasons:
 - » At the north end of Coburg Road, Route 3 would continue to Gateway rather than toward Goodpasture Island Road.
 - » At the south end, service to Valley River Center (Route 2) would operate every 30 minutes instead of the existing service every 20 minutes.

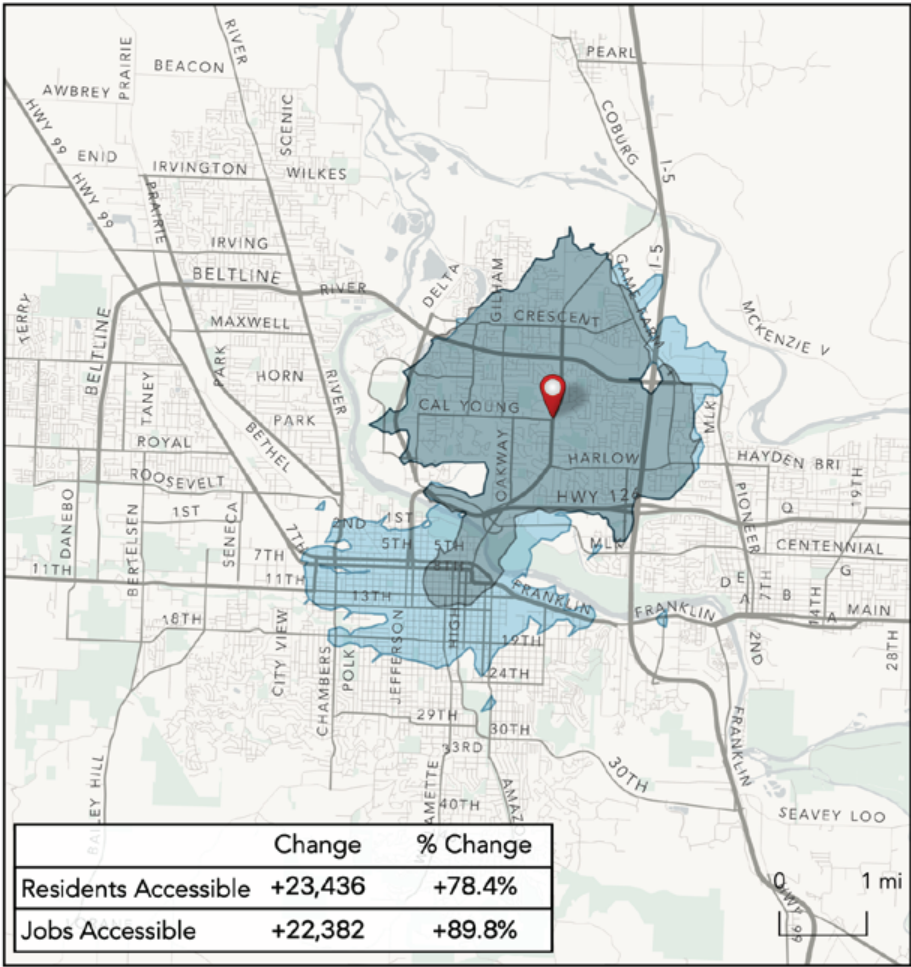
On Sundays at noon:

- The re-structure of this area would allow for quicker access into downtown, even on Sundays, when it would only operate every 30 minutes. Since downtown is so much denser than the rest of the district, the expanded area downtown would yield significant job and residential access gains.

How far can I travel in 45 minutes from
Coburg Rd at Cal Young Rd
at noon on a...
Weekday?



Sunday?



Travel Time Maps: Centennial Blvd at Mohawk Blvd

The draft network would significantly increase access by transit to and from areas near MLK/Centennial Blvd. The intersection of Centennial Blvd and Mohawk Blvd in Springfield is one example.

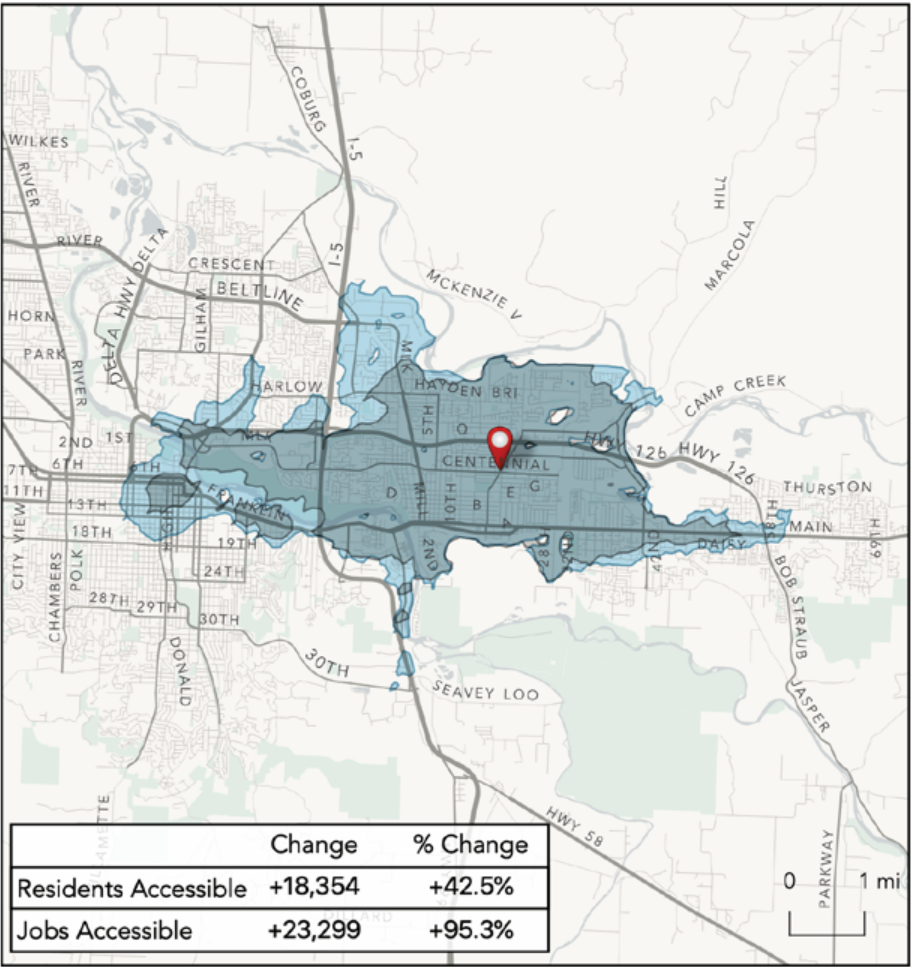
On weekdays at noon:

- Frequent service on Centennial Blvd (proposed Route 1), combined with higher frequency on EmX would make it possible to reach the Gateway and Riverbend Hospital areas within 45 minutes from this location.
- Increased frequency on Centennial Blvd would also improve access into downtown Eugene, as well as connections to Coburg Road.
- Because Route 15 would offer service every 30 minutes with no transfers to LCC, it would also become possible to reach LCC by transit in just beyond 45 minutes from this location.

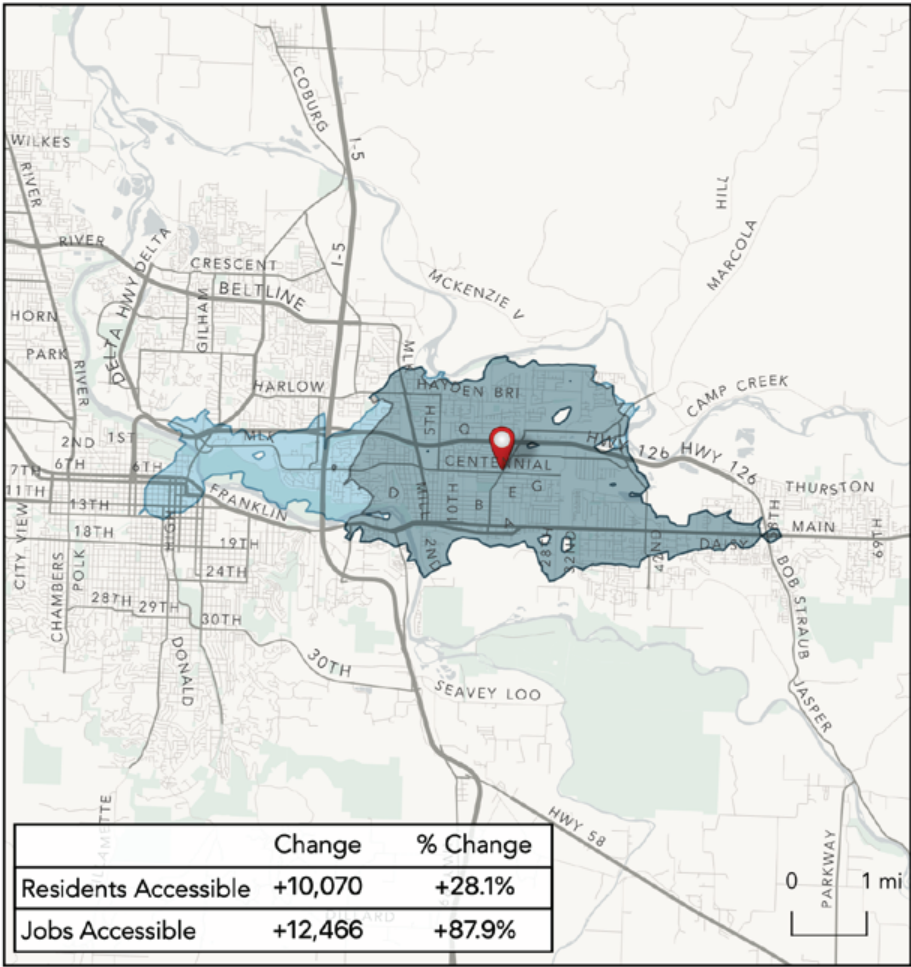
On Sundays at noon:

- Service every 30 minutes along Centennial Blvd would make it possible to reach Downtown Eugene in less than 45 minutes, even on weekends.

How far can I travel in 45 minutes from
Centennial Blvd at Mohawk Blvd
at noon on a...
Weekday?



Sunday?



Travel Time Maps: Gateway Station

The draft network’s impact at Gateway Station would be more ambiguous than that shown in prior locations.

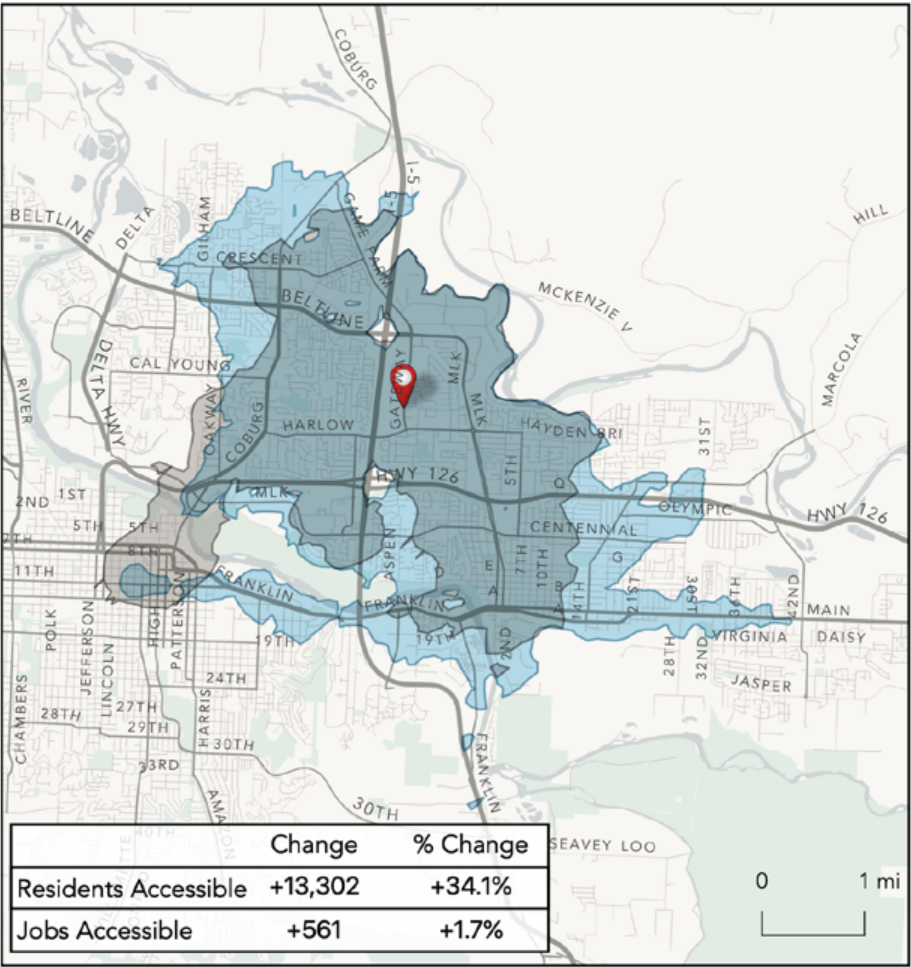
On weekdays at noon:

- On weekdays, Gateway would become accessible to far more residents within 45 minutes (+34%).
- There would be a little change (+2%) in the total number of jobs accessible in 45 minutes. However, those jobs would not necessarily be in the same location; trips to Downtown Eugene would take a few minutes longer on average because they could only be done on EmX.
- Much of the expansion in access comes from increased frequency and directness of the EmX.
 - » The draft network would restore EmX service as it existed before September 2017, meaning there would be service every 20 minutes in each direction on the Gateway loop. Furthermore, EmX buses would continue to Downtown Eugene.
 - » The higher frequency on EmX, combined with increased frequency on Centennial/MLK (Route 1) and on Main Street (Route 11) would mean Gateway would become accessible by transit to far more people in Springfield.
- Gateway would also be served by the proposed Route 3, which would provide frequent service to the VA Healthcare Center and Downtown Eugene via Coburg Road.
- At the same time, travel times to Downtown Eugene would become longer, because Gateway would no longer be connected to Eugene Station via Harlow Road (existing Route 12). This is the primary reason why fewer jobs would be accessible in 45 minutes.

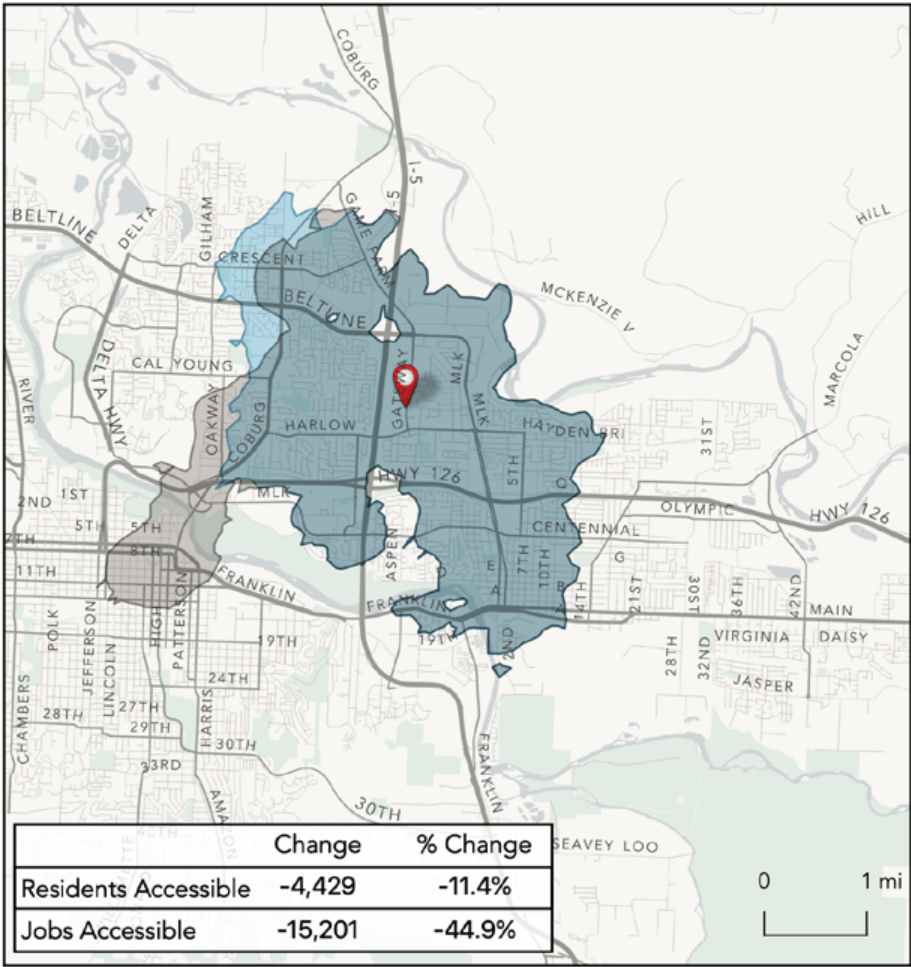
On Sundays at noon:

- On weekends, access to Gateway would remain basically unchanged from Springfield.
- However, access to Downtown Eugene would be significantly curbed, as a result of eliminating service on Harlow Road. Existing Route 12 has the distinction of being one of the only current routes that operate every 30 minutes on Sundays, so this would have a significant impacts on weekend trips between Eugene and Gateway.

How far can I travel in 45 minutes from
Gateway Station
at noon on a...
Weekday?



Sunday?



Travel Time Maps: Valley River Center

Valley River Center would generally see a reduction in access on week-days before 7 PM, and improvements in access on weekdays evenings and weekends. This mostly reflects differences between existing and proposed service frequency at different times.

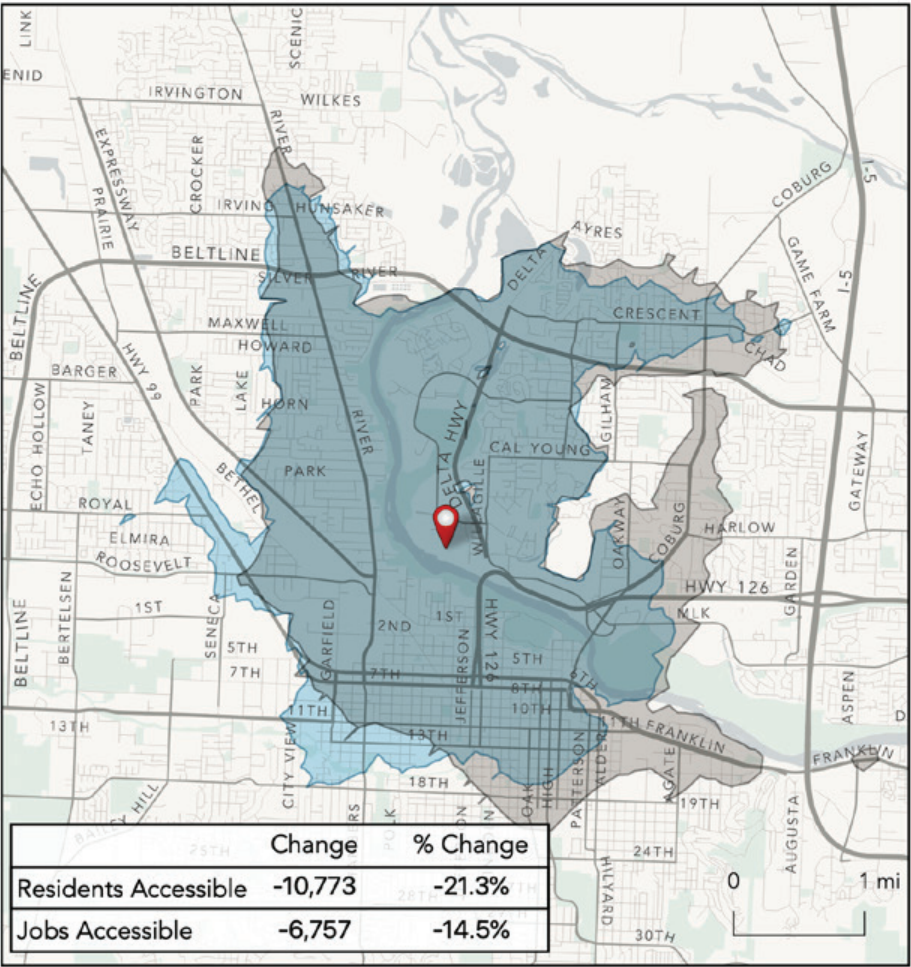
On weekdays at noon:

- Proposed service on Route 2 would operate every 30 minutes, compared to service every 20 minutes on existing Routes 66/67. As a result, trips to Downtown Eugene and points beyond would take 5 minutes longer on average. This is the main source of the reduction in the number of jobs accessible within 45 minutes (-15%).

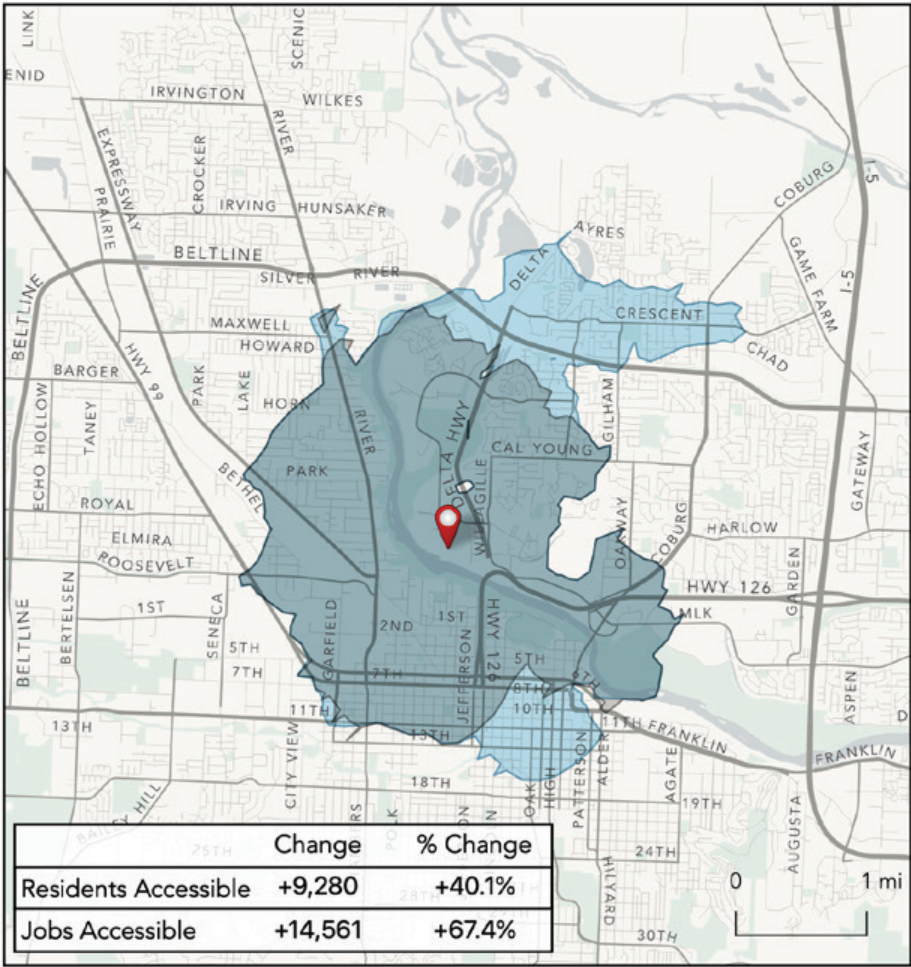
On Sundays at noon:

- In contrast, Route 2 would continue operating every 30 minutes on weekday evenings and throughout the weekend, compared to service every 60 minutes on existing Routes 66/67. So trips to Downtown Eugene (and trips from areas on Goodpasture Island Road and Crescent Ave) would take 15 minutes less on average than they do now. This significantly increases both the number of residents (+40%) and jobs (+67%) that could reach Valley River Center in 45 minutes on weekends.

How far can I travel in 45 minutes from
Valley River Center at Goodpasture Island Rd
at noon on a...
Weekday?



Sunday?



Travel Time Maps: Barger Drive and Echo Hollow Rd

The draft network would re-structure service on and near Highway 99 and Barger Drive, combining service on existing Routes 40 and 41 into a single frequent Route 4. Outer parts of Route 41 would become part of a new Route 8, connecting Commerce Station, Bethel/Danebo and Santa Clara. This would have significant and mostly (but not entirely) positive consequences for this area.

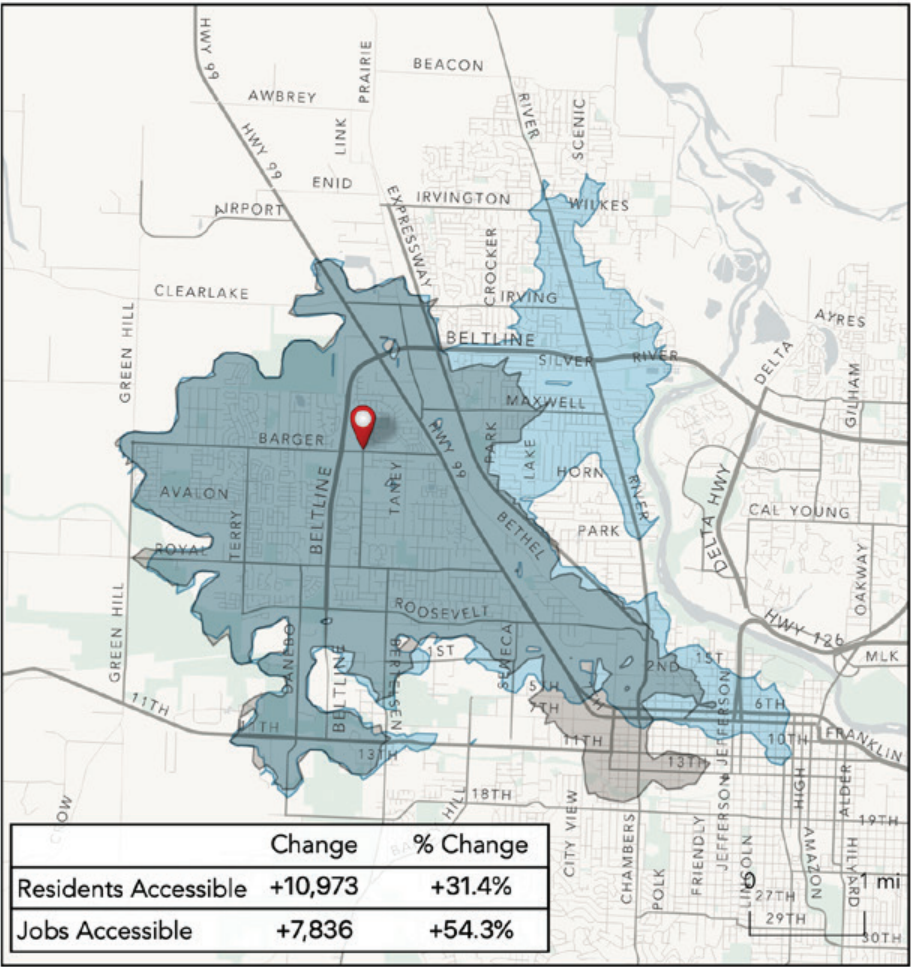
On weekdays at noon:

- Overall access to jobs and residents within 45 minutes would improve greatly (+31% residents, +54% jobs).
 - » The greater number of residents who could reach this area is mostly due to the connection to the River Road/Santa Clara areas on the new Route 8.
 - » The greater number of jobs is due to the higher and more regular frequency of service to and from Downtown Eugene on Route 4.
- However, some areas on the way to Downtown Eugene along existing Route 41 (esp. south of 6th Ave) would no longer be accessible within 45 minutes.

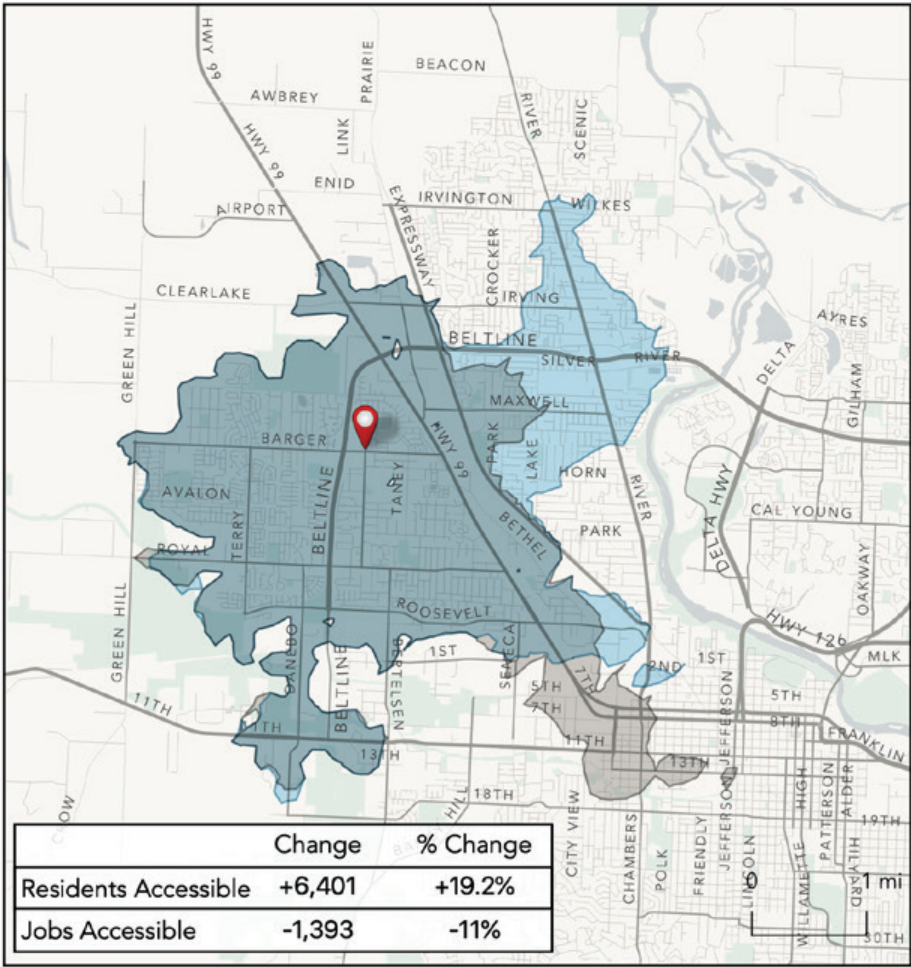
On Sundays at noon:

- There would still be an improvement in the number of residents who can reach this location in 45 minutes (+19%), still related to the presence of the proposed Route 8.
- However, trips to Downtown Eugene would take longer than they do now, with a net reduction in job access of -11%. This is for two reasons:
 - » The existing path to Downtown Eugene via Route 41 is slightly faster than via Route 40.
 - » Route 41 is one of the only routes in the existing network to provide service every 30 minutes on Sundays, so Sunday frequencies wouldn't improve from this area.

How far can I travel in 45 minutes from
Barger and Echo Hollow
at noon on a...
Weekday?



Sunday?



Travel Time Maps: Willamette Street and 29th Ave

The draft network would effect relatively little change to transit service on Willamette Street north of 33rd Ave. However, there would be less service further south.

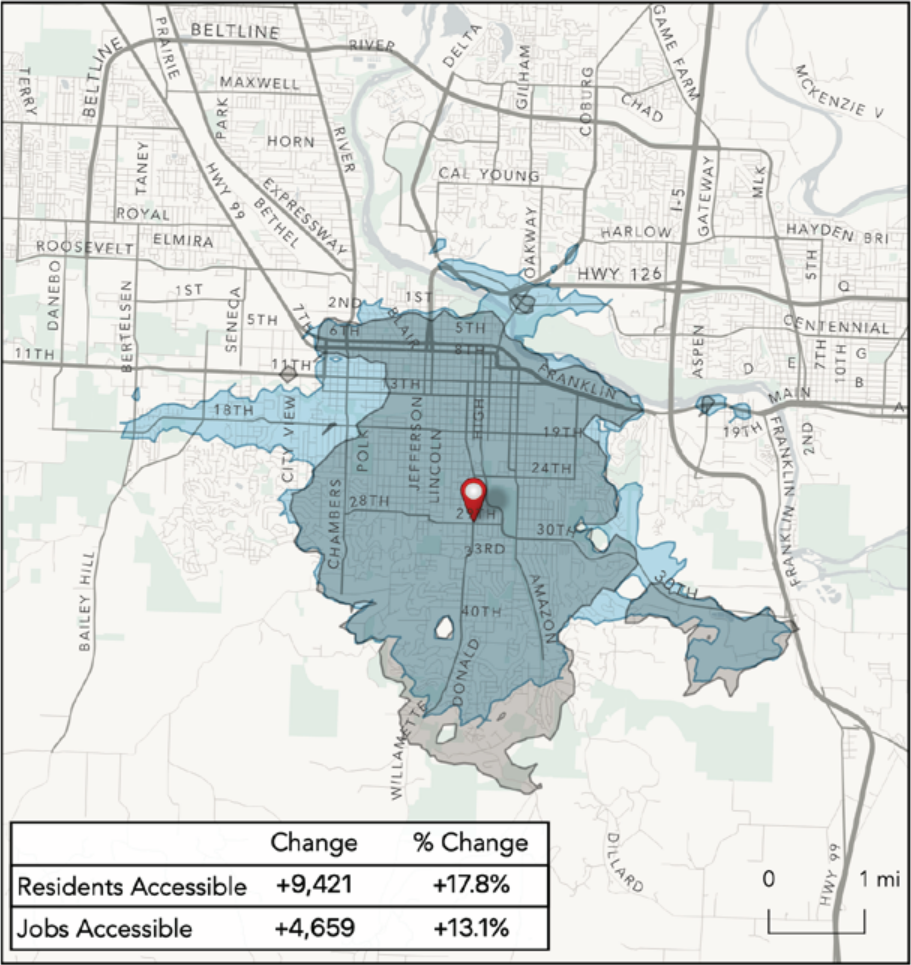
On weekdays at noon:

- Overall access to jobs and residents within 45 minutes would improve slightly (+18% residents, +13% jobs).
- The proposed Route 2 would retain the frequency of existing Route 24. So access improvements from this area are mostly related to the ability to transfer to other, more frequent routes. For example, it would be possible to transfer to the frequent Route 3 at West 18th Ave, improving access to and from much of southwest Eugene.
- However, access to areas further south would mostly be reduced, because the proposed Route 2 would operate as a one-way loop south of 33rd Ave, and there would be no service south of 40th Ave.

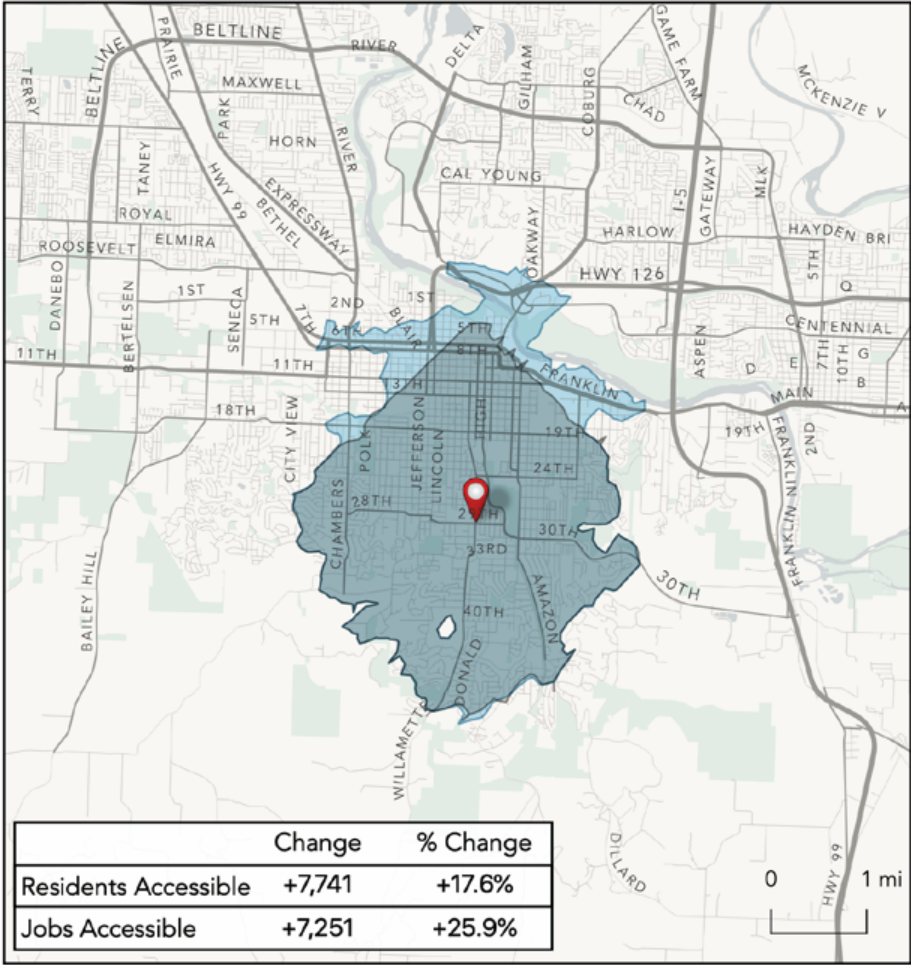
On Sundays at noon:

- Providing service every 30 minutes rather than every 60 minutes would make it slightly quicker to reach places to the north of this location.
- Access would not change much going south; existing Sunday service does not make it faster (on average) to take transit than to walk.

How far can I travel in 45 minutes from
Willamette St at 29th Ave
at noon on a...
Weekday?



Sunday?



4 Costs, Considerations and Opportunities for Improvement

Recommended Plan - Service Levels and Costs

Budget Assumptions

In developing this Draft Plan, we have made the following assumptions about the available operating and capital resources:

- LTD's baseline operating budget for fixed route will remain constant in 2020-2021. This is a preliminary estimate, which assumes that:
 - » 2018-2019 service levels are maintained, and
 - » LTD makes cost control efforts such that the costs of providing service will remain stable in the next 2-3 years.
- LTD's operating budget will expand by approximately \$3.0 million per year coming from the Statewide Transportation Improvement Fund (STIF). **In other words, the operating budget for transit will increase by 8%.**
- LTD will continue making ongoing capital investments in fleet, technology, fare collection and other areas as previously planned. This Draft Plan does not in itself result in additional capital investments by LTD. However, the service proposed in the draft network may serve as a guide for the best places to target capital investments in the long-term, through parallel efforts such as MovingAhead and the Main Street Safety Project.

Service Levels

This Draft Plan calls for the expanded operating budget to be invested in increased service, specifically:

- The total service budget envisioned by the draft network described in Chapters 2 and 3 would be \$40.8 million. A further \$0.7 million is set aside for increases in peak-hour service targeted at avoiding overloads around school bell times.
- **Annual in-service vehicle hours would increase by 8.5%** to approximately 306,000 hours per year. The bulk of this service increase would be on evenings weekends:
 - ◊ Weekday in-service hours would expand by 5%, reflecting frequent service until 8 PM and 30 minute service until 10 PM on most routes.
 - ◊ Saturday in-service hours would expand by 15%, reflecting up to 6 more hours of service every 30 minutes on most routes.
 - ◊ Sunday in-service hours would expand by 25%, reflecting the conversion of all service (other than EmX and Route 11) to run every 30 minutes instead of every 60 minutes.
- **Annual in-service vehicle miles would increase by 6.3%** to approximately 3.7 million miles per year. It is normal for in-service miles to increase less than in-service hours in a network planned for higher ridership, as more service will be provided on busier routes, where buses are slowed down by longer boarding times and often heavier traffic.
- **The number of vehicles required to operate the network would not increase.** We anticipate 71 buses operating at peak hours; this number may increase as a result of school-hour runs but would not exceed the existing peak of 83 buses. The reduction in peak-hour buses is largely a result of shifting service away from low-ridership coverage routes, several of which have higher levels of service at peak hours.

Paratransit Impacts and Considerations

If the draft network were implemented, this would have an impact not just on transit service, but also on paratransit services provided by LTD’s RideSource division.

Paratransit Service Area

The draft network would consolidate bus service in Eugene and Springfield in routes spaced further apart. In addition, it would remove service entirely from certain outlying segments (e.g. Barger Drive west of Terry Lane). This would reduce the area where LTD is legally required to provide ADA complementary paratransit service.

By law, LTD must provide paratransit trips to all eligible customers with disabilities living within 3/4 mile of any all-day fixed route, at a fare no more than twice the cost of a one-way bus ticket. These trips must take customers from their origin to their destination, if necessary door-to-door. So reducing the area served by fixed routes would mean that disabled people who live in or travel to places farther than 3/4 mile of a proposed bus route would no longer have a legal guarantee that LTD would serve their trips by paratransit. The difference in the area served is shown in the maps at right.

In practice, LTD’s RideSource program provides significantly more flexibility:

- Eligible customers within the 3/4 mile area can get a paratransit ride for \$3.50.
- Eligible customers outside but within 5 minutes of the 3/4 mile area can get a paratransit ride for \$5.50 (paratransit fare plus an extra \$2.00).
- Many trips made by ADA-eligible customers are for medical and social service purposes, and qualify for reimbursement through the Oregon Health Plan or social service agencies.

LTD has not yet formulated a policy for paratransit trips that would no longer be located with 3/4 mile of a fixed route, but will need to do so before this Draft Plan can become a Final Plan. Possibilities include:

- Trips to and from those areas might no longer be eligible for paratransit. In this case, some current

customers might remain eligible for other types of on-demand trips, such as those reimbursed by Medicare, but there would be a reduction in the amount of service provided. In the short term, LTD’s ADA paratransit costs would be reduced in proportion to the decline in paratransit trips.

- Some or all of those trips could become subject to the extra \$2.00 for trips outside the 3/4-mile area. In this case, some customers might no longer choose to use a more expensive service, or might be dissatisfied at the higher cost per trip. Paratransit trips might reduce slightly, which would slightly reduce LTD’s ADA paratransit costs in the short term.
- LTD might decide to continue providing paratransit service to those areas at the regular paratransit fare. This outcome would result in the least impact on existing paratransit customers. LTD’s ADA paratransit costs would remain similar to existing in the short term.

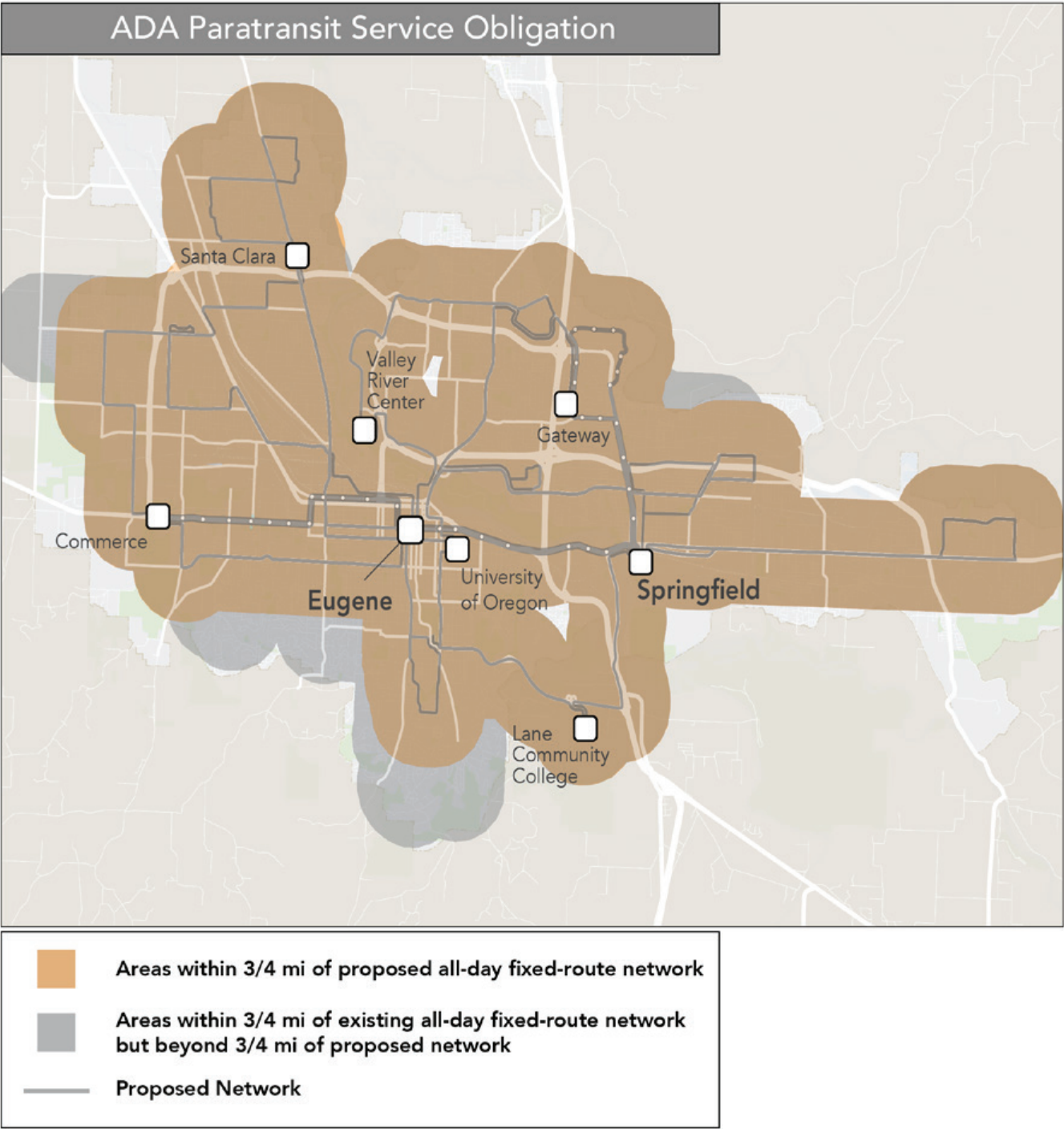


Figure 29: Map showing areas within 3/4 mile of all-day fixed-route transit in existing service vs. in the draft network. If the draft network were implemented, areas in gray would no longer be located within 3/4-mile of a fixed route. As a result, LTD would no longer be obligated by law to provide paratransit to those areas. LTD would have to make a choice about whether and how to continue providing paratransit to those areas; no decision has been taken on this topic yet.

Paratransit Demand and Cost

The second consequence of a redesigned fixed route network is that the number and origins of trips made by paratransit will shift.

It is not possible to tell at this stage whether the net effect will be a higher or lower number of ADA paratransit trips on RideSource. Existing methods of estimating paratransit trips (see Appendix B) underestimate the number of paratransit trips made in Eugene and Springfield. Modeling future demand with these methods does not give a clear image of future paratransit demand.

Any increase in paratransit trips is an increase in costs, and paratransit is ultimately funded out of the same budget as fixed-route service. **If paratransit trips increase significantly, LTD may be forced to reduce fixed-route service.**

Although the net change in paratransit trips caused by implementing the draft network is unknown at this time, the following factors are expected to have a significant impact:

- **Increased frequencies on regular bus routes - fewer paratransit trips, lower costs to LTD.**

- » For certain trips made by paratransit customers with some physical ability, transit can be more convenient than paratransit, because wait times may be shorter, there is no need for an advance booking, and LTD vehicles are wheelchair accessible.
- » As the transit network becomes more frequent, it will become more convenient for persons living near transit routes; some paratransit customers living near fixed route service are likely to take more transit trips and fewer paratransit trips than they do now.
- » Paratransit trips are usually booked with a 30 minute pick-up window. That is almost comparable to waiting for a bus that comes every 30 minutes, but it's longer than waiting for a bus that comes every 15 minutes.
- » The impact of this shift will be limited by the physical difficulty of the transit trip. If one leg of the trip requires a long walk, or the transit trip requires a transfer (among other factors), that makes it less likely paratransit customers will shift to the bus.

- **Some RideSource customers farther from bus routes - more paratransit trips, higher costs to LTD.**

- » Many paratransit customers live or travel to places that would be located farther from a bus route in the draft network. It's possible that added difficulty due to longer walks would cause those customers to call RideSource for trips where they currently use transit.

- **If some RideSource customers are charged higher fares - fewer paratransit trips, lower costs to LTD.**

- » If customers in newly outlying areas are required to pay \$5.50 rather than \$3.50 for paratransit, some of them will make fewer trips, but it's not clear how many.

In any case, it is fiscally responsible for LTD to take steps to limit paratransit trip growth. The RideSource program already makes significant efforts in this direction through eligibility screening, travel training, and other measures.

One measure LTD could study to contain growth in paratransit trips would be to offer free fares on fixed routes for ADA-eligible customers. Free fares for customers with disabilities can save transit agencies more money than they cost, because paratransit trips are so much more expensive to provide than transit trips (on average, \$30 vs. \$5).

Even small shifts from paratransit to fixed routes can significantly contain the growth of paratransit costs. Data from TCRP Report 163 suggests that the break-even point for establishing a free-fare program on fixed routes for ADA customers is in the range of 1,000-2,000 boardings per year, or 3 to 6 boardings per day. Even agencies with in-person eligibility screening like LTD can see shifts of several times more riders than that¹.

In LTD's case, this would need to be weighted against the fact that many eligible customers with disabilities already use the fixed-route network, approximately 15,000 wheelchair boardings per month. These customers pay a discounted half fare. An analysis of the lost fare revenue would be required to determine LTD's break-even point.

¹ Transit Cooperative Research Program, 163. Strategy Guide to Enable and Promote the Use of Fixed-Route Transit by People with Disabilities, Chapter 7. Available at: https://nacto.org/wp-content/uploads/2016/05/2-9_Thatcher-et-al-Strategy-Guide-to-Enable-and-Promote-the-Use-of-Fixed-Route-Transit-by-People-with-Disabilities-TCRP-Report-163_2013.pdf

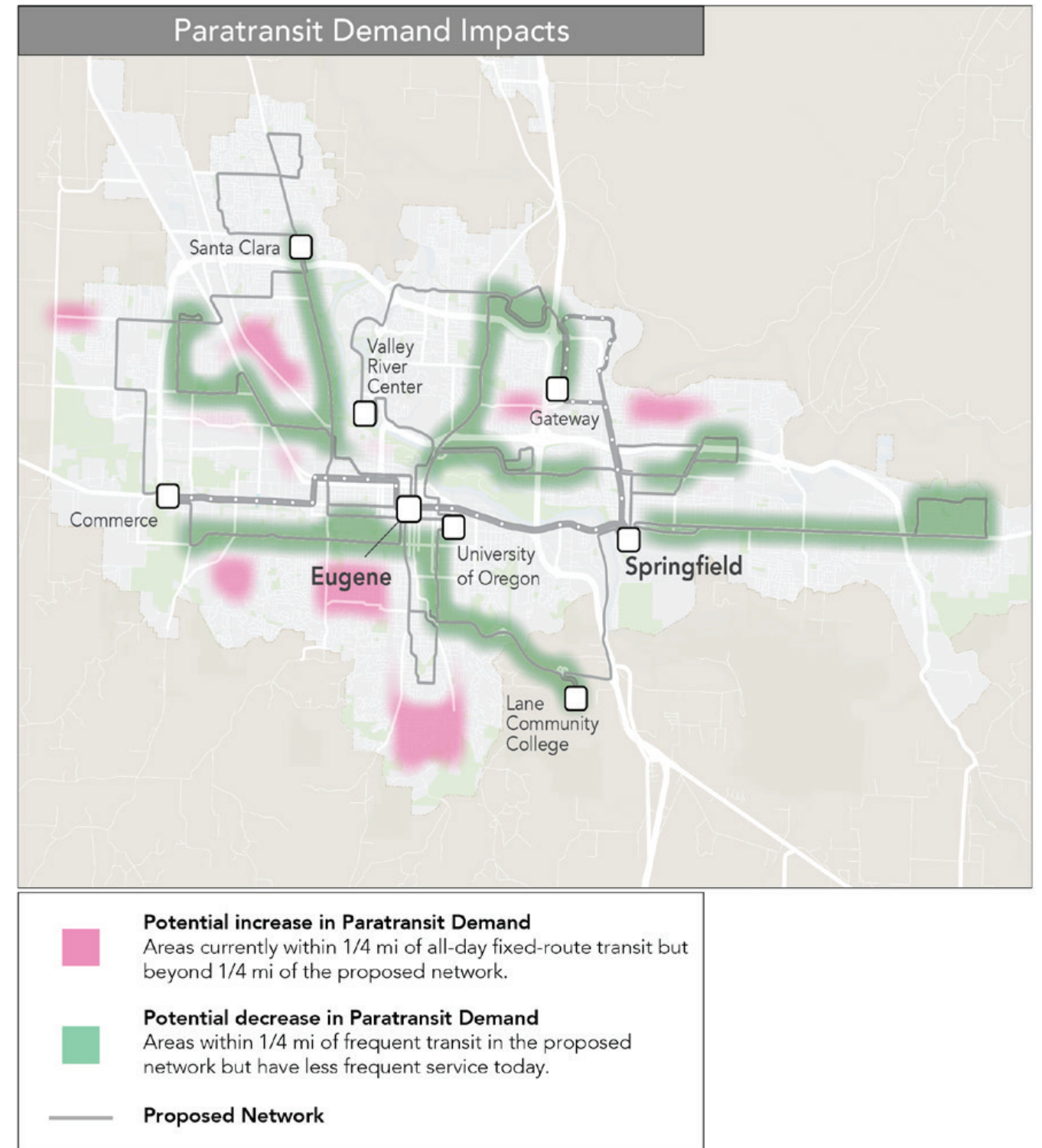


Figure 30: Map showing areas where implementing the draft network would likely increase paratransit demand (in pink, where fixed routes would be further away) and areas where paratransit demand might decrease (in green, areas newly close to more frequent transit). However, it's not possible to reliably estimate how many more or fewer paratransit trips might be requested as a result of these shifts.

Next Steps - Frequency and Span

Frequency and Span

At the available budget levels, the draft network could operate most routes at frequencies of 15 minutes or better on weekdays until 8 PM, but only every 30 minutes on evenings and weekends. At some times, service would still be hourly, such as weekdays after 10 PM, and Sundays before 10 AM and after 7 PM.

Community input from both phases of public outreach has shown a strong appetite for further improvements to evening and weekend service, regardless of people’s preferences with regard to Ridership vs. Coverage. In line with this input, LTD should consider the following improvements to the draft network as funds become available, in the following order.

1. Saturday Frequent Service.

This would involve bringing Saturday service very close to weekdays. Specifically:

- Routes 1, 3, 4 and 5 would run every 15 minutes from 7 AM to 8 PM.
- Routes 2 and 8 would start running every 30 minutes at 7 AM instead of 8 AM.

This would require LTD to operate 8,300 more annual service hours, a 2.7% increase on what is included in this Draft Plan. We estimate the service cost to be in the range of \$1.4 million².

2. Sunday Frequent Service on Routes 1, 3, 4 and 5.

This would involve raising the frequency on all routes except EmX and Route 11 for all of Sunday. Specifically:

- Routes 1, 3, 4 and 5 would run every 15 minutes from 10 AM to 7 PM. They would run every 30 minutes from 8 AM to 10 AM, and from 7 PM to 10 PM.
- Routes 2 and 15 would run every 30 minutes from 8 AM to 10 PM.
- Route 8 would operate every 30 minutes from 8 AM to 8 PM, and every 60 minutes from 8 PM to 10 PM.

This would require LTD to operate 7,000 more annual service hours, a 2.3% increase on what is included in this Draft Plan. We estimate the service cost to be in the range of \$1.2 million.

3. 30-minute Late Evenings

This would involve raising the frequency on most routes at times when they would otherwise only operate every 60 minutes. Specifically:

- On weekdays and Saturdays:
 - » EmX would continue to run every 15 minutes (every 30 on the Gateway loop) until midnight.
 - » Routes 1, 2, 3, 4, 5, 8 and 15 would continue to run every 30 minutes until midnight.
- On Sundays, Route 8 would continuing to run every 30 minutes until 10 PM.

This would require LTD to operate 9,000 more annual service hours, a 3.0% increase on what is included in this Draft Plan. We estimate the service cost to be in the range of \$1.5 million.

² Cost estimates listed on this page are based on LTD’s average fixed-route operations cost of \$155.06 per revenue hour in 2017 (as reported to NTD), with 3% annual escalation applied through 2020, i.e. \$169.43 per revenue hour in 2020 dollars.

Next Steps - Coverage

If the draft network were implemented, a number of areas would be located farther from transit than they are know. Areas that currently receive service but would be located more than 1/4 mile from service in future are shown in Figure 31.

With existing resources and the amount available for coverage, LTD cannot extend service to these areas without reducing frequency somewhere else. This would be inconsistent with the Board’s policy direction of maintaining 80-85% of resources dedicated to generating the highest possible ridership.

However, as new resources become available, the LTD Board may want to restore some form of transit service to some or all of the areas shown. In doing so, the following questions should be considered:

- What level of new resources can be made available, while not exceeding 20% of total service dollars spent on coverage?
- What are the objectives that drive expanding coverage? For example, is it more important to:
 - » Restore some service to previously-served areas, or restore the type of service that riders previously used?
 - » Provide service near the largest number of people possible, or target service near communities of concern (like people with low incomes, people of color, and older adults)?
 - » Provide service to the largest area possible, or serve the highest number of actual trips possible?

Having considered this, there are essentially two types of coverage service that LTD could provide:

- **Infrequent fixed routes.** These routes would operate at best every 30 minutes, but in some cases they might be hourly or only available at specific times of day.
- **Mobility on demand.** This would be a new type of service allowing people in areas not served by fixed routes to access transit by requesting a ride to the nearest bus stop or transit station.

Ultimately, LTD could choose to expand coverage to any part of the metro area. However, it is likely in the short-term that the strongest demands will come from the areas shown in Figure 31.

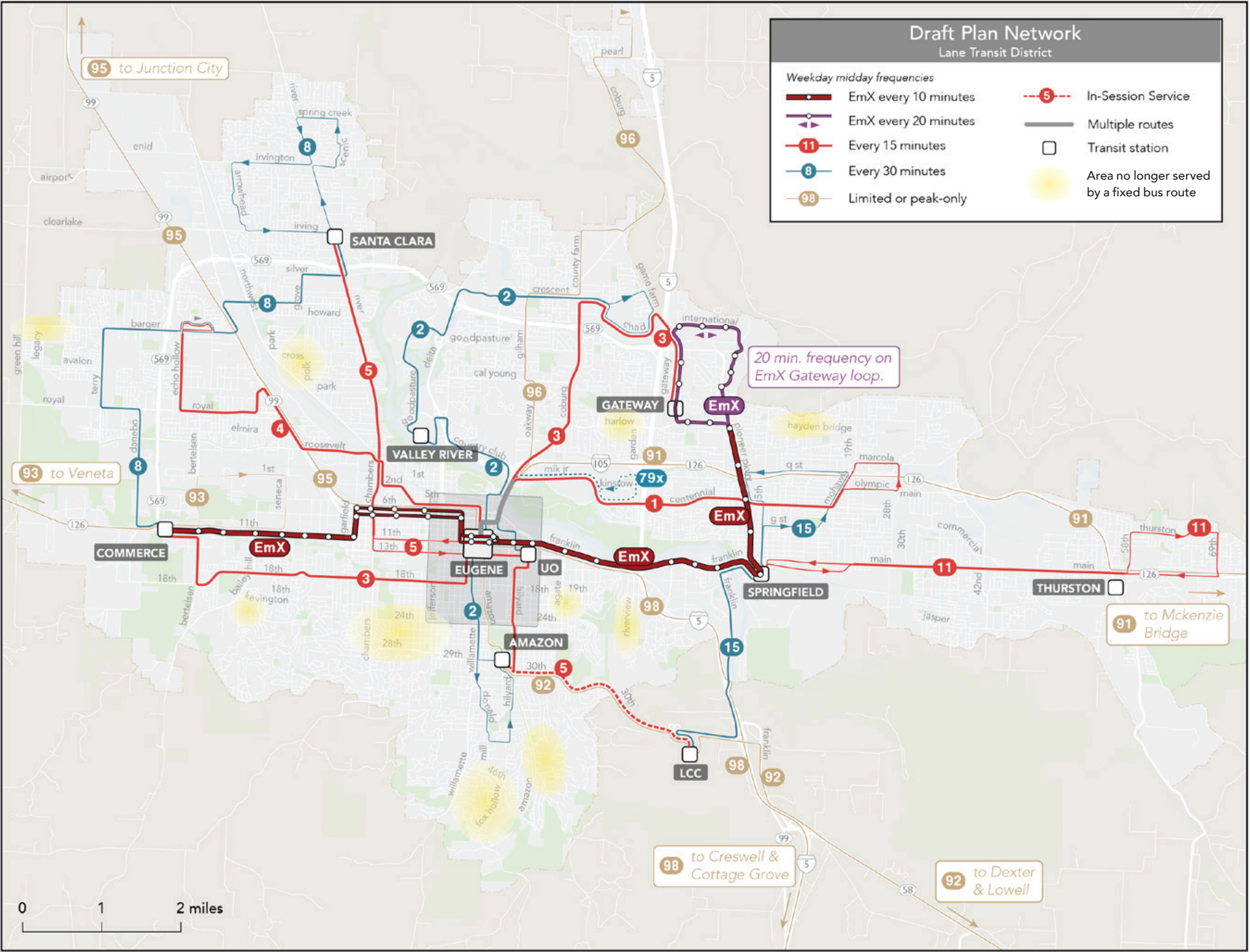


Figure 31: Draft Network Map, with areas of coverage loss highlighted in yellow.

Coverage as Fixed Routes

It makes most sense to restore or expand coverage as fixed routes to respond to the following objectives:

- **Serve the highest number of trips possible.** Even in areas that generate relatively low ridership, a fixed-route can serve far more people than an on-demand service. Even LTD’s least efficient existing routes serve nearly 20 boardings per vehicle hour in service. In contrast, the most efficient on-demand shared-ride services typically do not exceed 5 to 6 boardings per vehicle hour. The LTD Connector pilot service in Cottage Grove serves nearly 5 boardings per hour.
- **Restore service to previous riders.** Existing riders have demonstrated that they find current fixed routes to be useful for their needs. In most cases those existing routes provide an infrequent but relatively direct path to Eugene Station, Springfield Station or the University of Oregon. Providing something similar would best meet this need.
- **Target communities of concern.** People with lower incomes or who lack access to a personal vehicle are among the most frequent existing users of public transit in the Eugene-Springfield metro area. Because they sometimes lack alternatives, they are also among the most likely users of transit to areas that are isolated or hard to reach. So serving the highest number of trips and restoring service to previous riders are both actions likely to benefit those members of communities of concern who would lose service if the draft network were implemented³.

3 At the same time, it’s important to note that the draft network also significantly improves service near the majority of members of communities of concern, as noted on page 30.

Coverage as Mobility On Demand

There is considerable interest in the emergence of new on-demand mobility options, often branded as “microtransit” and modelled on ride-hailing services that use smartphone apps like Uber Pool and Lyft Line. This interest is reflected in the Board’s direction to design up to 5% of the network as services other than fixed routes.

Although the draft network does not include any on-demand zones, there may be good reasons to implement them in future, particularly if the primary objective is to **provide lifeline service to the largest area possible**.

Appendix C to this report develops a possible service model for mobility -on-demand in the Eugene/Springfield metro area. Under this model:

- LTD would identify zones located more than 1/4 mile from service in the draft network. Those zones would be prioritized according to the coverage criteria presented in Chapter 1.
- On weekdays from 6 AM to 9:30 PM, anyone in these zones could call or use an app to get service to the nearest LTD bus stop, or to the nearest LTD Station (Eugene or Springfield Station). This is to match hours during which LTD would provide the vast majority of service. After 10 PM, bus service would become hourly, making it very impractical to connect to and from an on-demand service.
- Fares would be modelled on either standard LTD fares or the slightly higher RideSource fares.
- There would be a promised maximum wait time of 60 minutes to receive service from the moment a ride is requested. The real wait times may often be shorter, but the promised time is deliberately long for the following reasons:
 - » **The service would be intended as a lifeline for people who would otherwise lack any mobility.** It would not be intended to compete with taxi or ride-hailing services. Providing a competitive service at a subsidized fare would be deeply costly to LTD, and would be unsustainable without large cuts to fixed-route service.
 - » This is because the more attractive an on-demand service becomes, the more trips it will attract. Because an on-demand vehicle cannot usually serve more than 5 trips per hour, more trips mean more vehicles and drivers which result in higher costs.
 - » In essence, the only fiscally sustainable way to provide an on-demand service while charging transit or paratransit fares is to

limit the demand to people who are willing to wait a long time.

Fixed Route vs. On-Demand Costs and Benefits

Given these service parameters, we preliminarily estimate the annual operating cost of this on-demand service model to be approximately \$310,000 for a zone of one square mile, or approximately 0.8% of the operating budget associated with the draft network.

Each on-demand zone would also require the purchase of 1 to 2 ADA-accessible shuttle buses, at approximately \$95,000 per vehicle. Restoring service to all areas that would be more than 1/4 mile from a fixed route in the draft network would require 8 to 10 similar zones.

In some ways, this compares favorably to the cost of fixed-route service. The annual operating cost of an LTD bus route requiring a single vehicle, on weekdays only for 16 hours per day, is approximately \$600,000. And the cost of a new 40-foot bus is also over \$500,000, though it is unlikely LTD would need to purchase a new bus to add one or even several new coverage routes⁴.

But remember that the least efficient LTD fixed routes in the metro area currently carry 18 passengers per hour, and on-demand service has never exceeded 6.5 passengers per hour in any context. So even in the most favorable scenario for on-demand, the average trip would cost 1.5 times more to provide using an on-demand service (\$12 per trip) than with a bus on a fixed route (\$8 per trip).

While on-demand services may be able to serve larger areas at lower costs than fixed routes, the cost per trip will always be higher for on-demand services in urban and suburban contexts. For this reason, future discussions about restoring coverage will need to clarify whether it is more important to reach a large area, or to serve more trips in a smaller area at the same cost.

4 The draft network would reduce the number of buses required at peak by 5 to 10 vehicles. So if the network were to expand geographically and require new infrequent routes, it’s likely that several of these could be accommodated before any vehicle purchases were required.

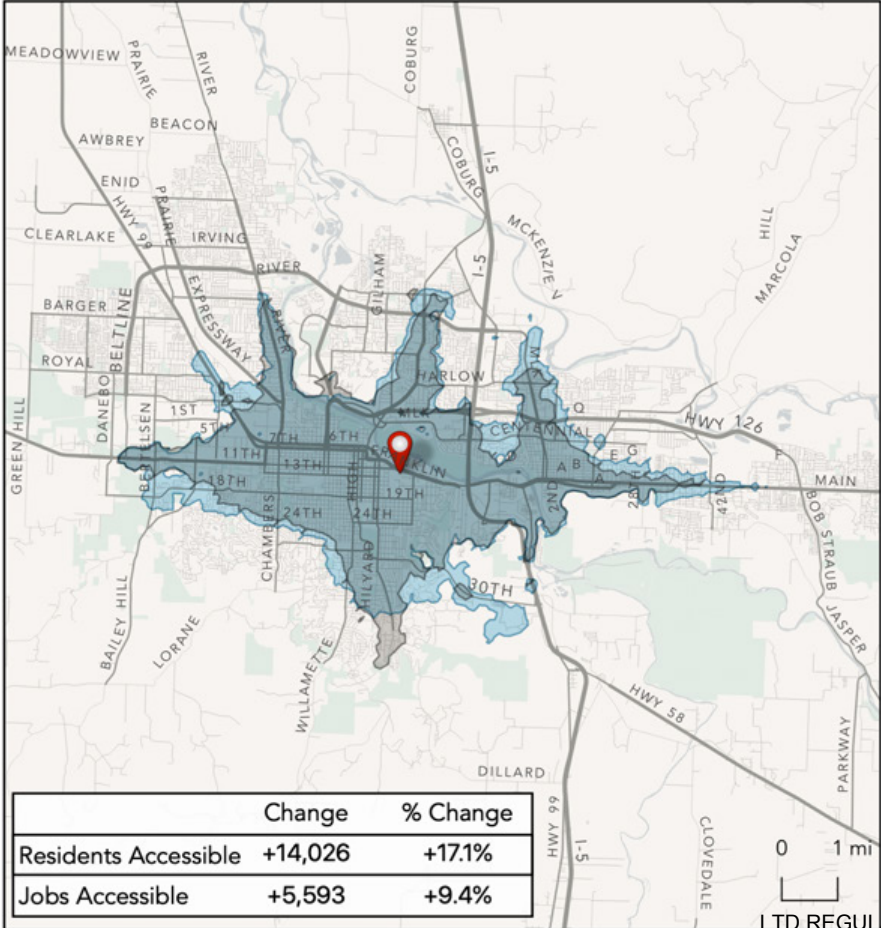
A Travel Time Maps from 16 Locations

B ADA Paratransit Demand Estimates

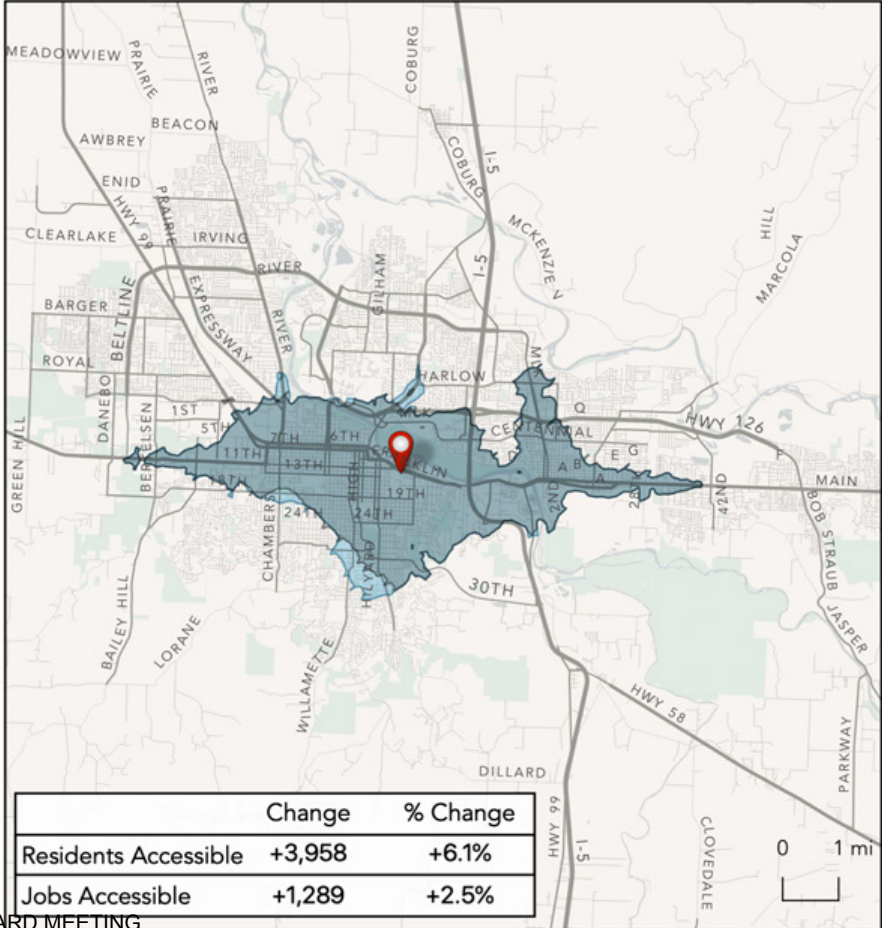
C Considerations in Designing Mobility on Demand Services

A Travel Time Maps from 16 Locations

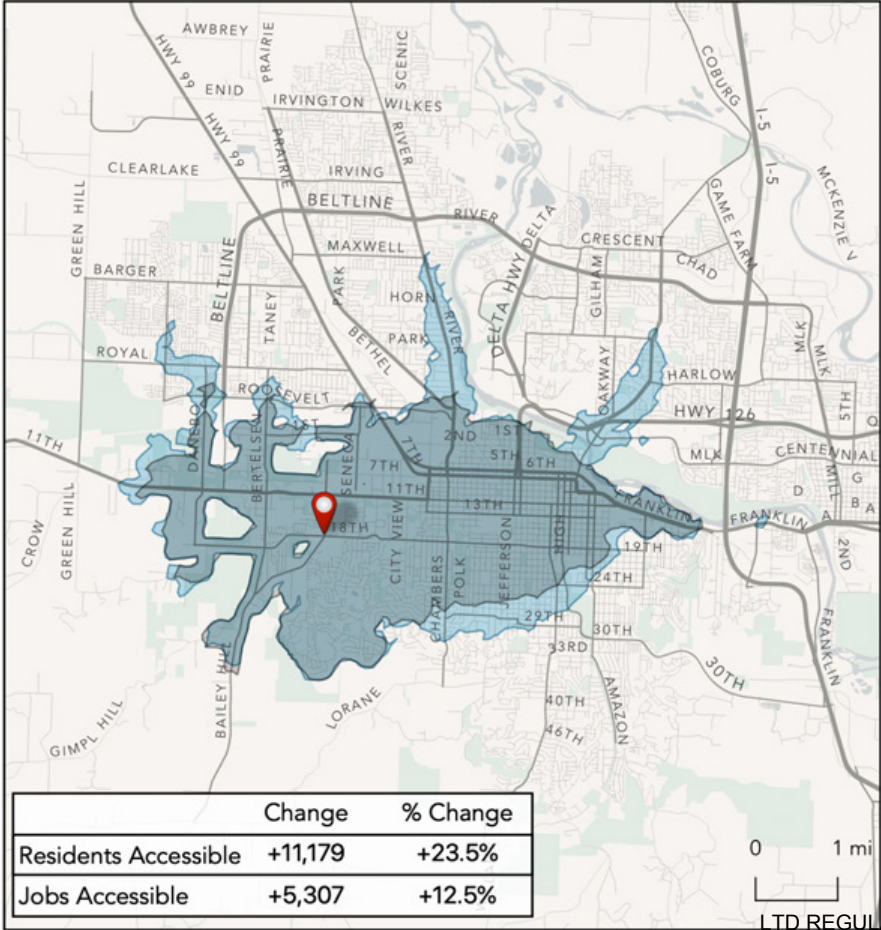
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 13th Ave at University St
 at noon on a...
 Weekday?



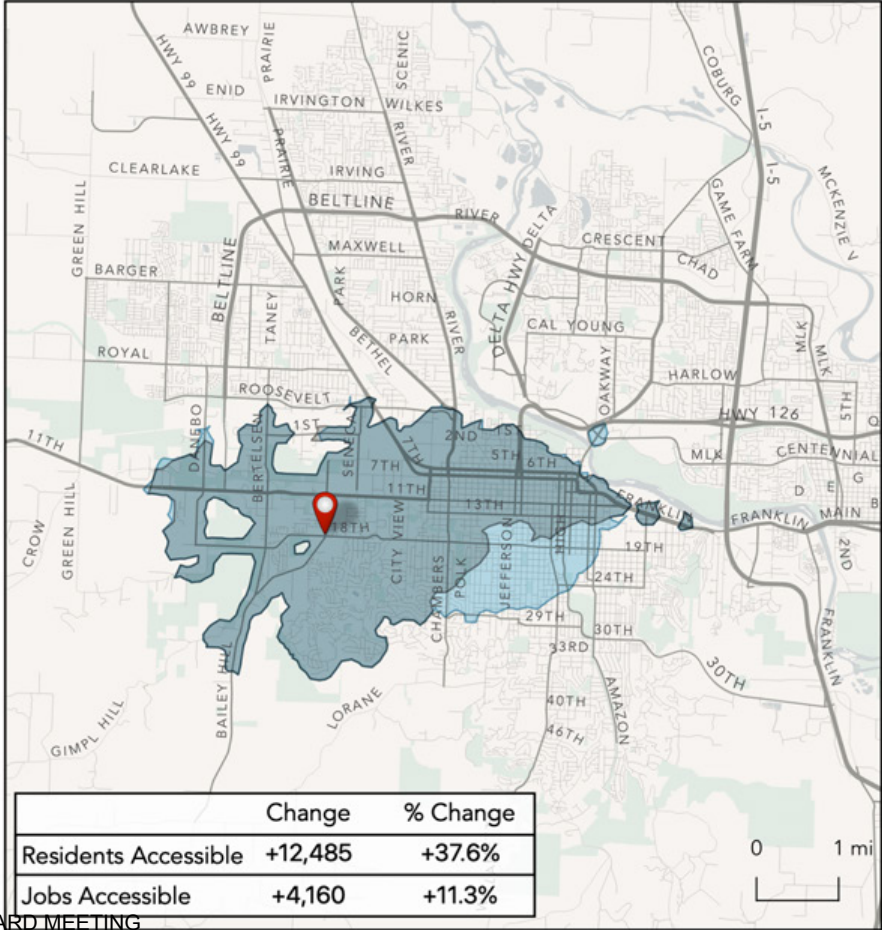
Sunday?



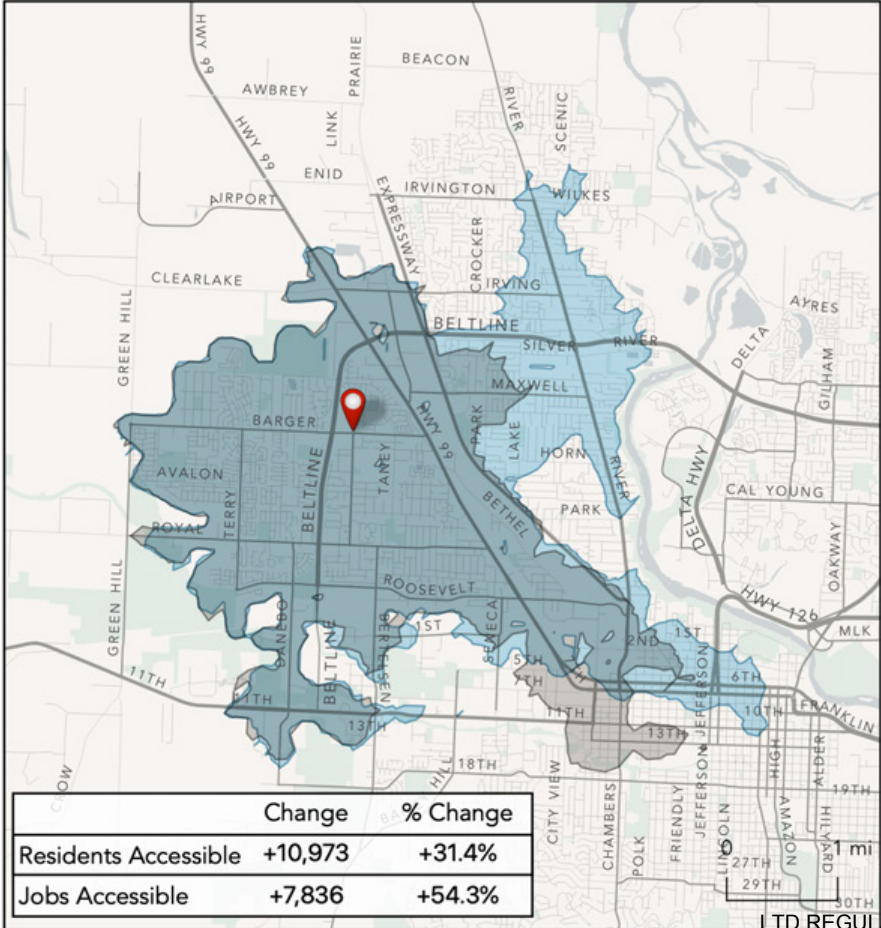
How far can I travel in 45 minutes from
 18th at Bailey Hill
 at noon on a...
 Weekday?



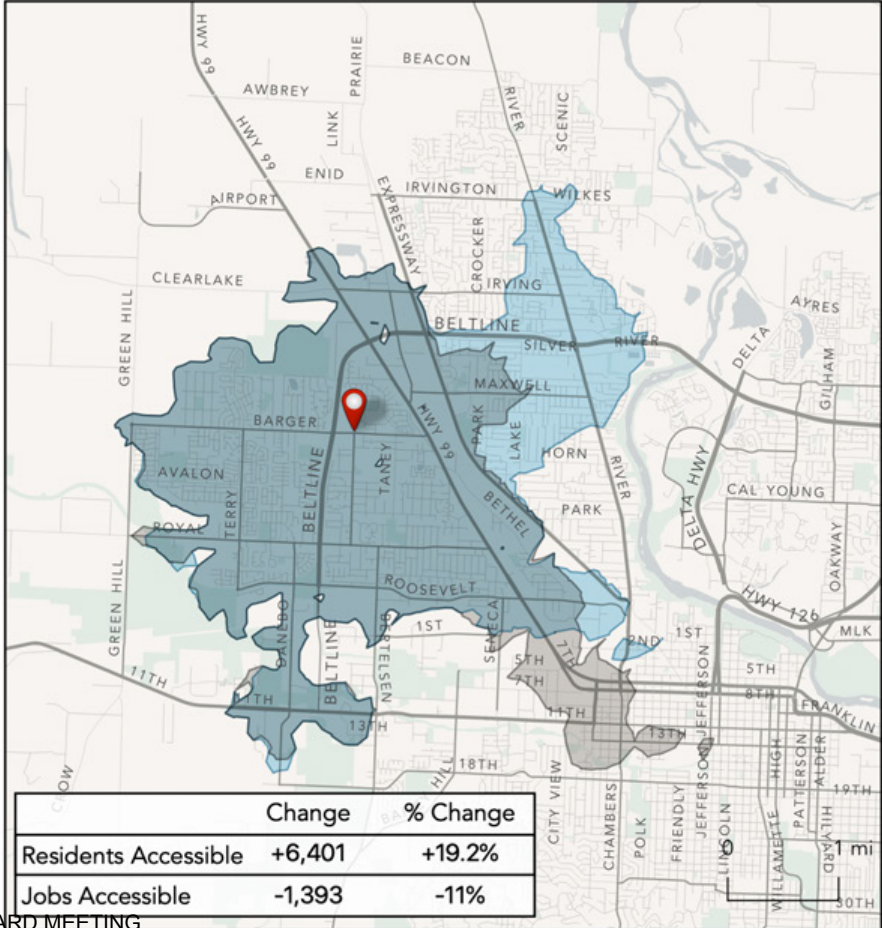
Sunday?



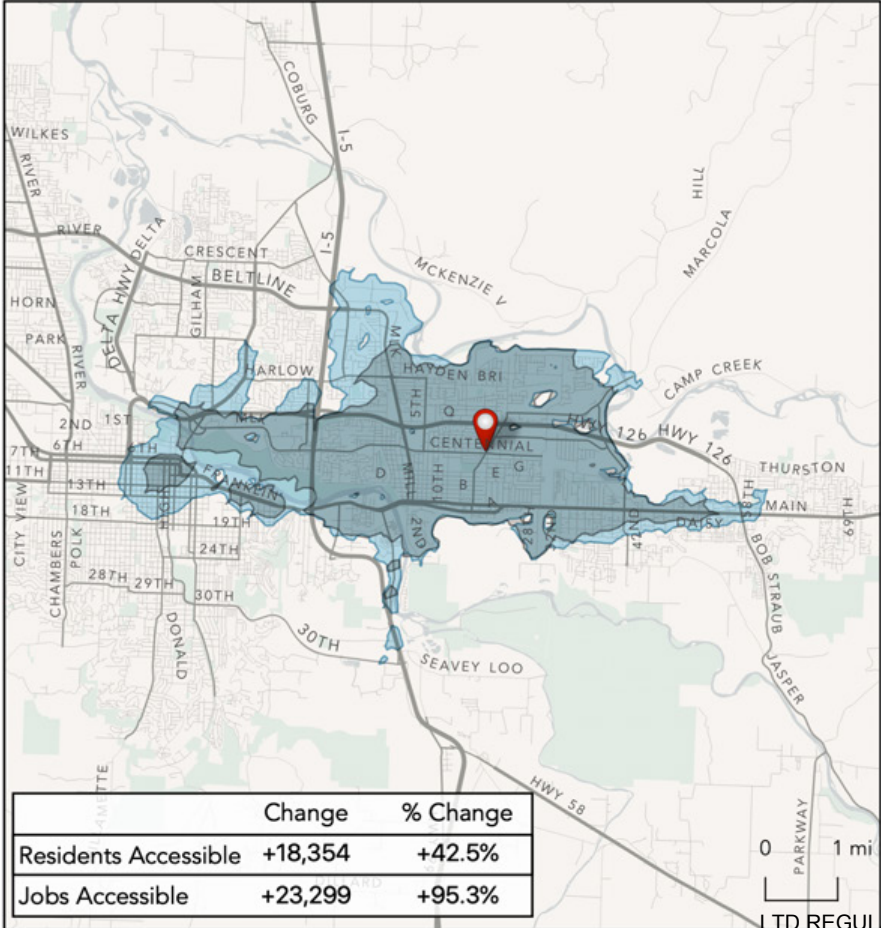
How far can I travel in 45 minutes from
 Barger and Echo Hollow
 at noon on a...
 Weekday?



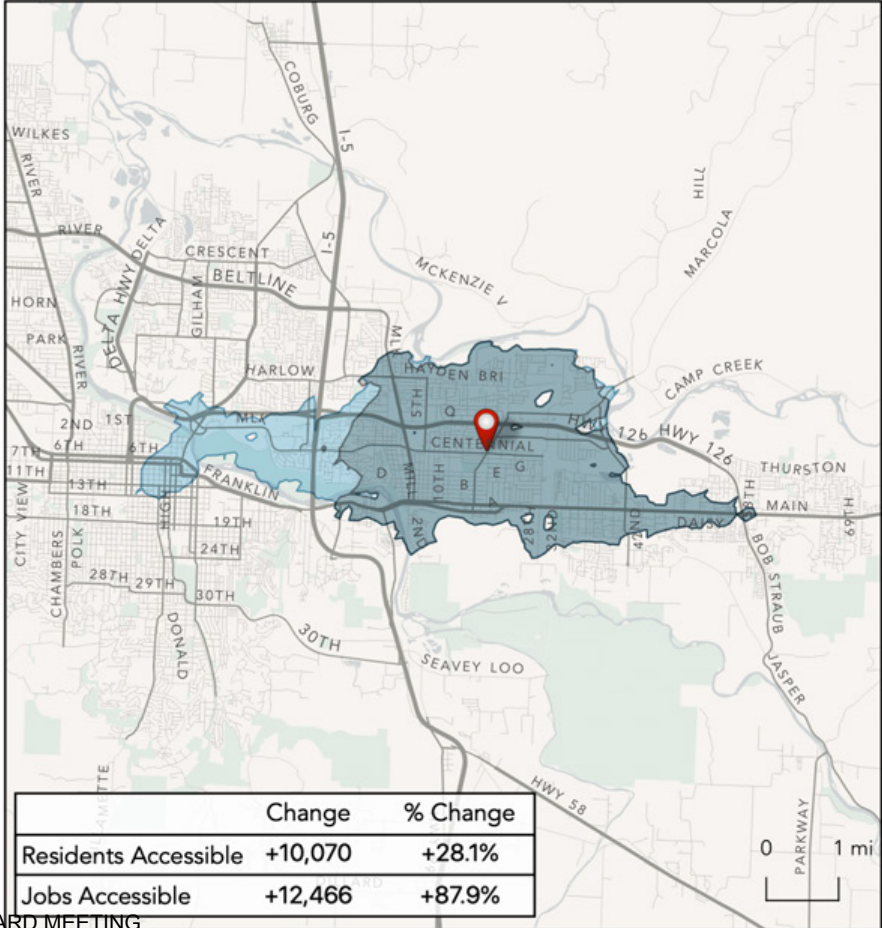
Sunday?



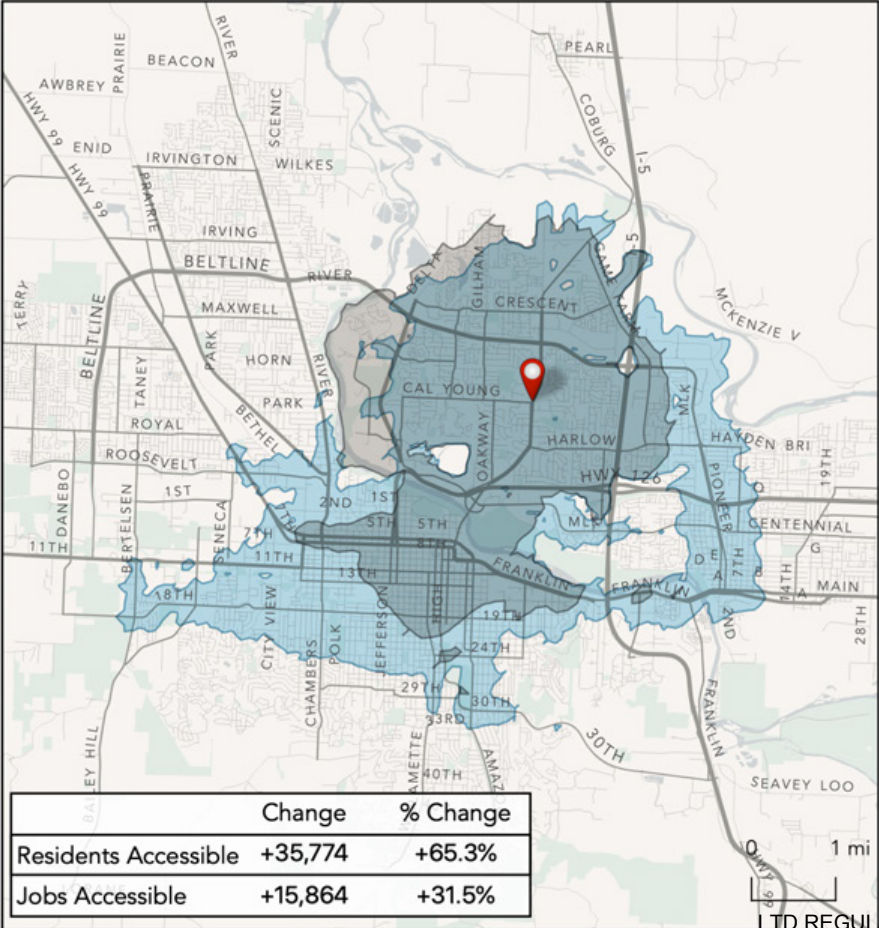
How far can I travel in 45 minutes from
 Centennial Blvd at Mohawk Blvd
 at noon on a...
 Weekday?



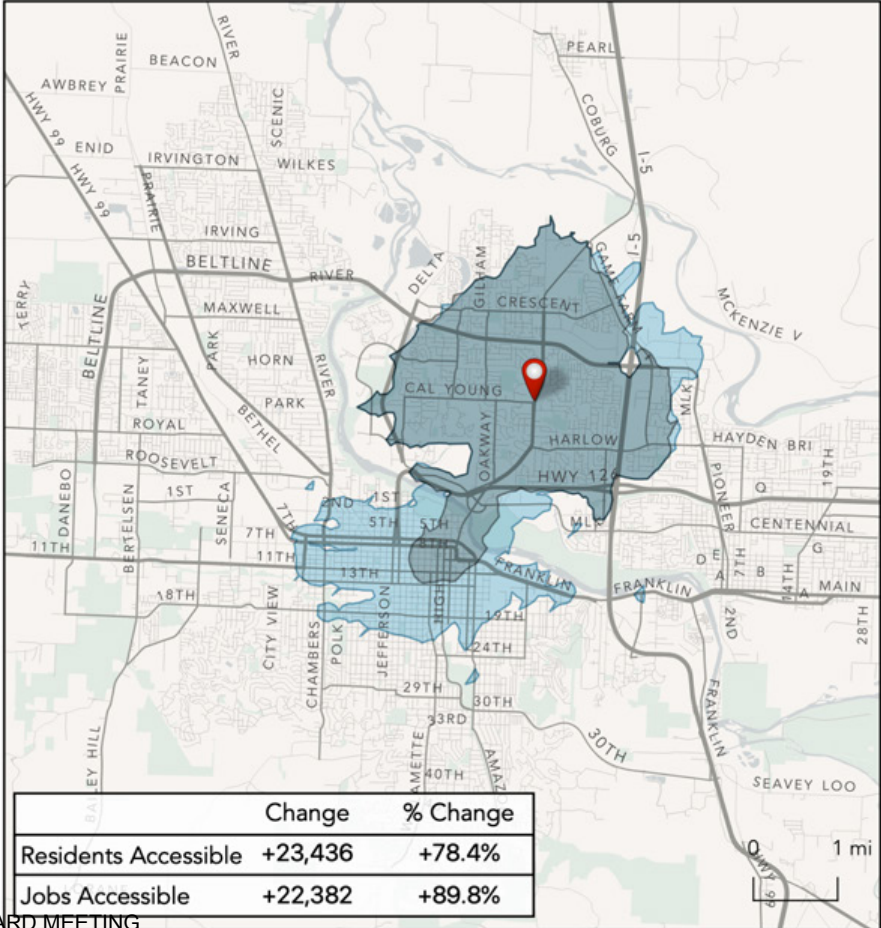
Sunday?



How far can I travel in 45 minutes from
 Coburg Rd at Cal Young Rd
 at noon on a...
 Weekday?



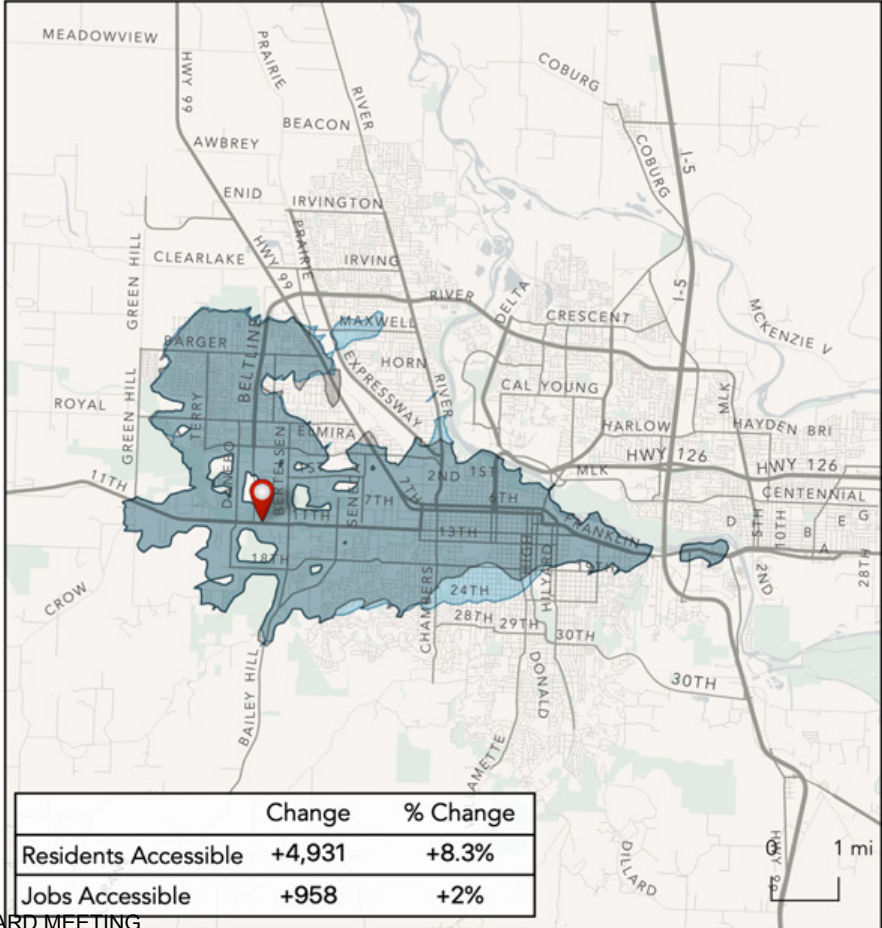
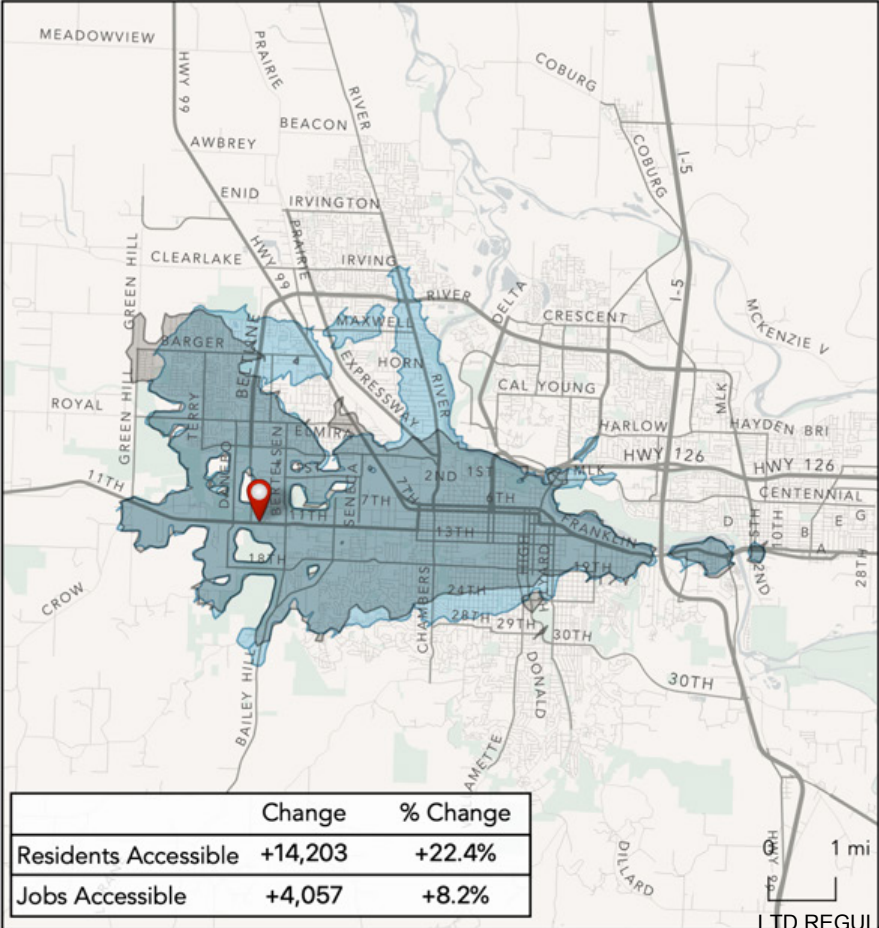
Sunday?



How far can I travel in 45 minutes from
 Commerce Station
 at noon on a...
 Weekday?



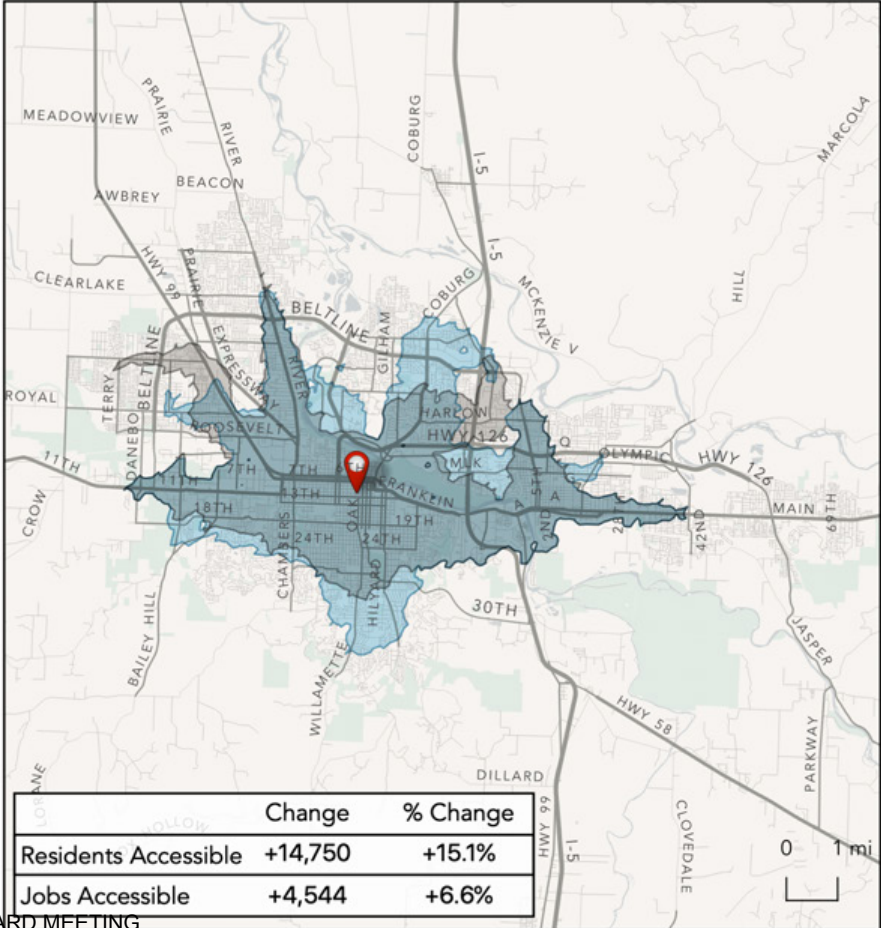
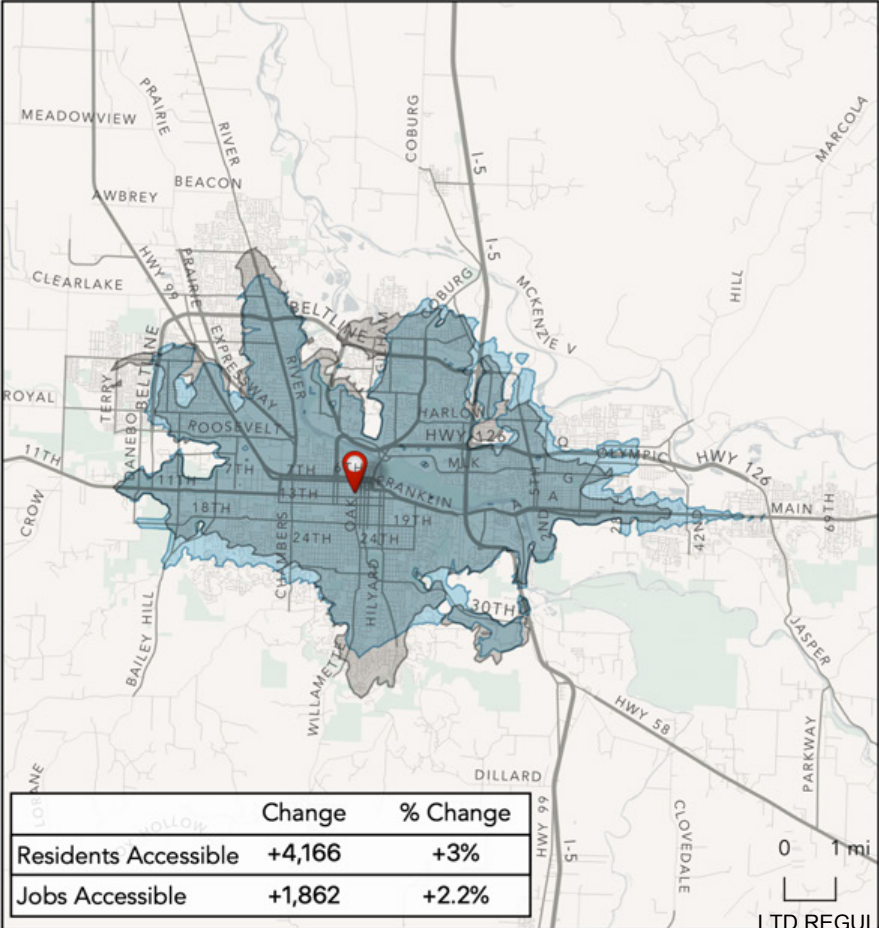
Sunday?



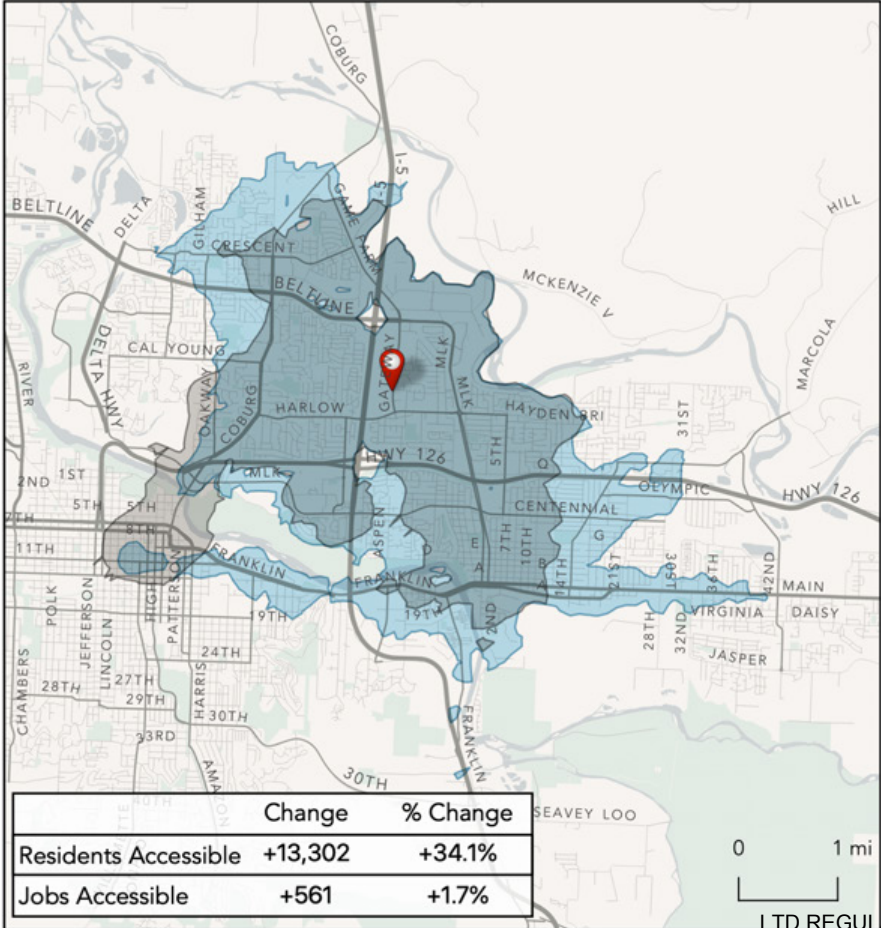
How far can I travel in 45 minutes from
 Eugene Station
 at noon on a...
 Weekday?



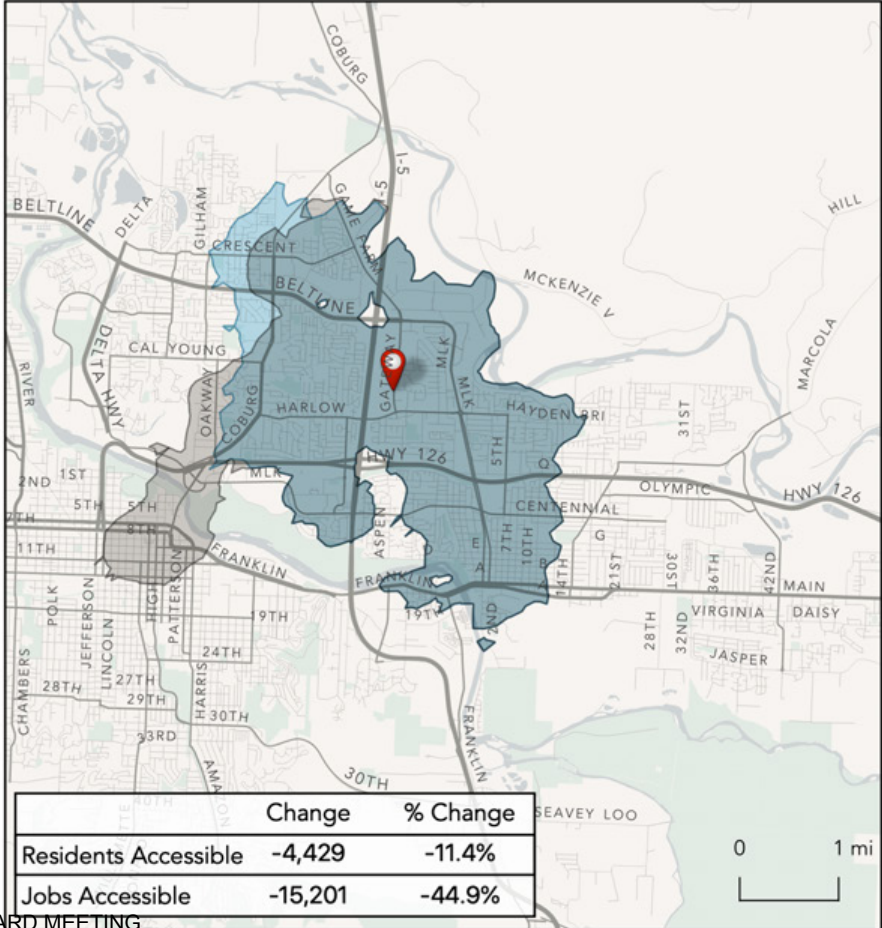
Sunday?



How far can I travel in 45 minutes from
 Gateway Station
 at noon on a...
 Weekday?



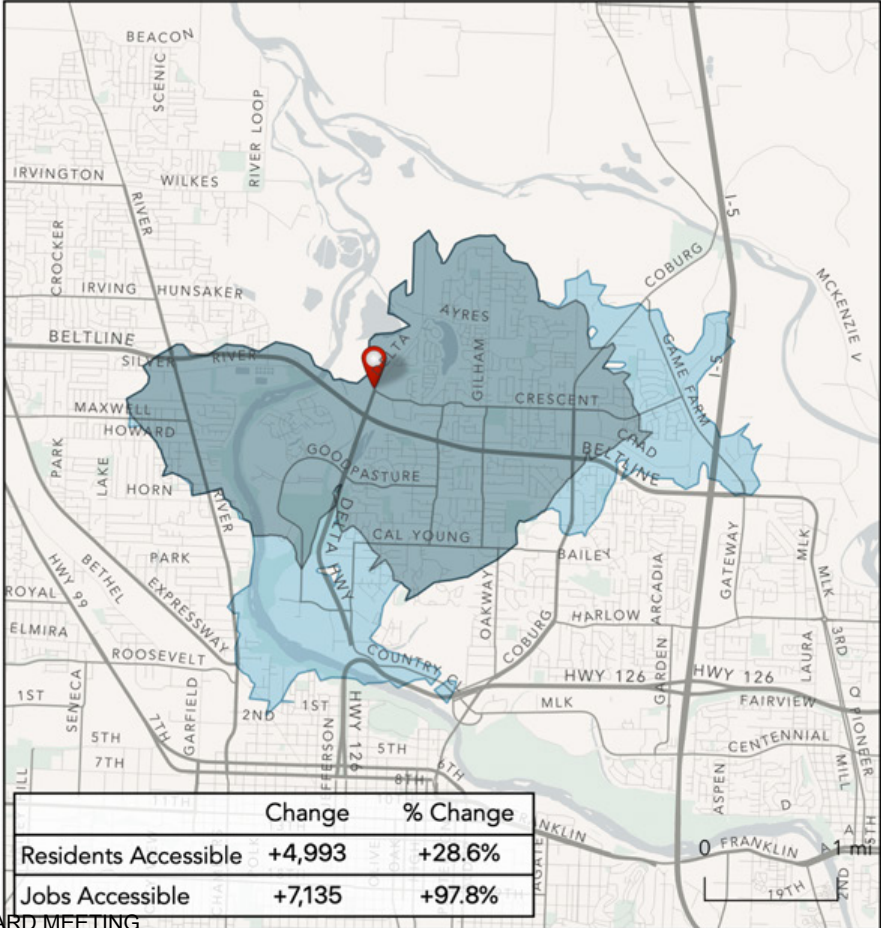
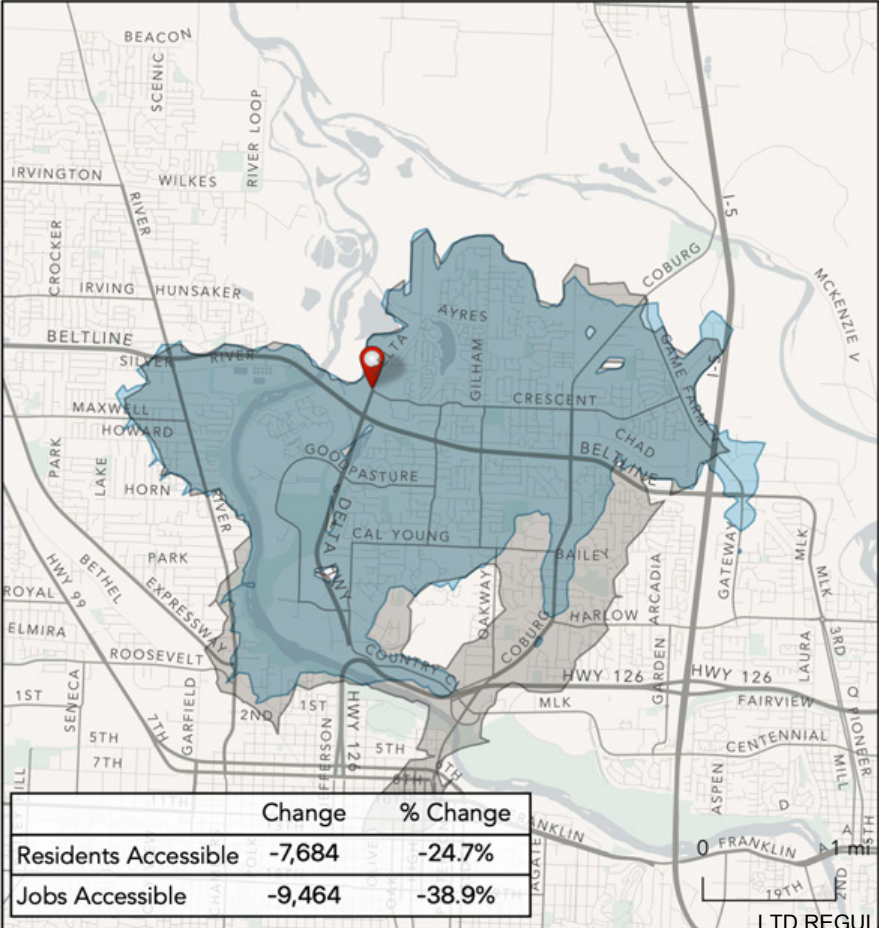
Sunday?



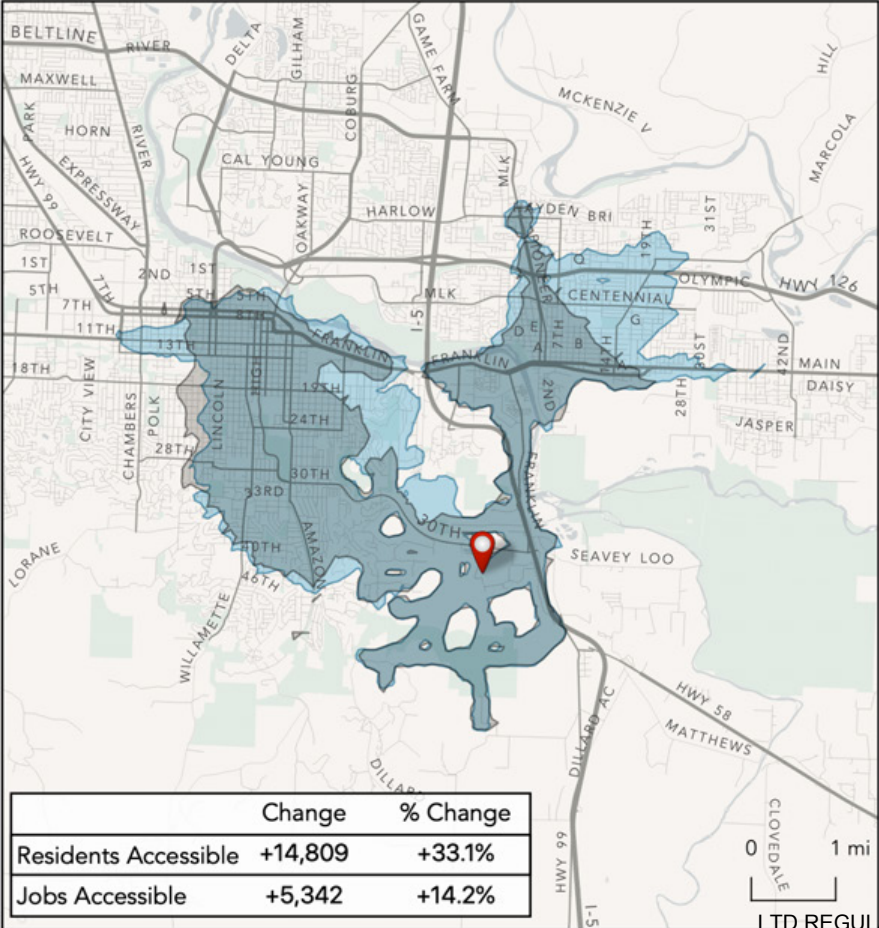
How far can I travel in 45 minutes from
 Green Acres Rd at N Delta Hwy
 at noon on a...
 Weekday?



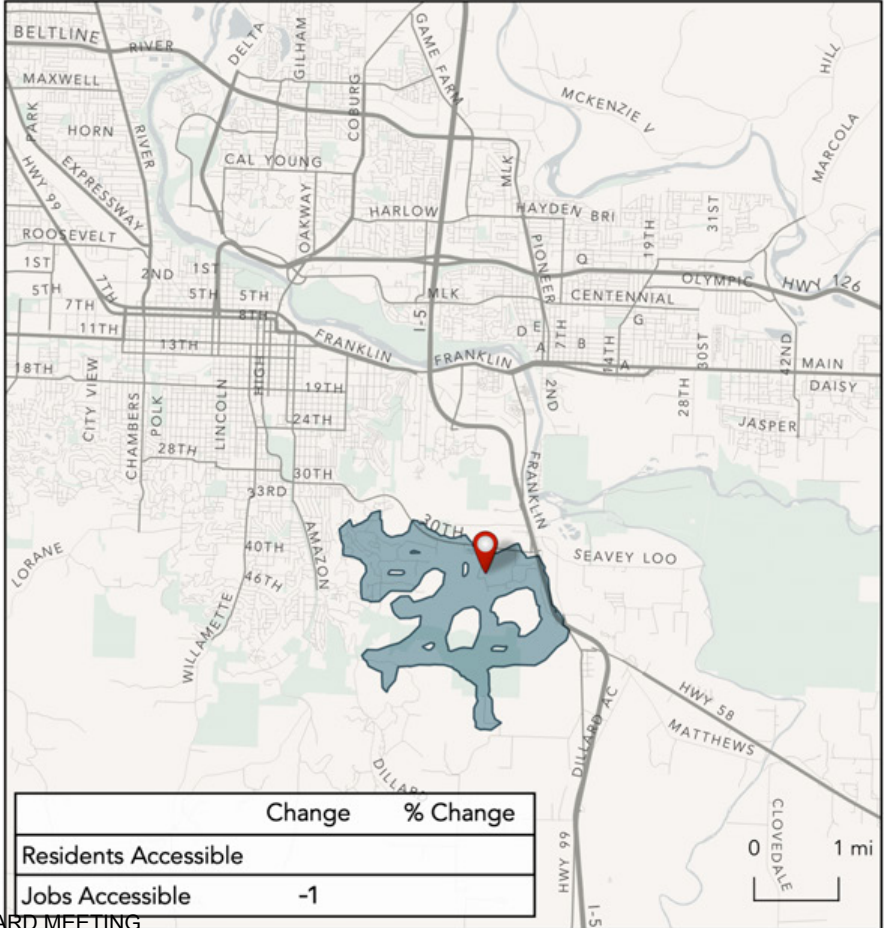
Sunday?



How far can I travel in 45 minutes from
 Lane Community College
 at noon on a...
 Weekday?



Sunday?

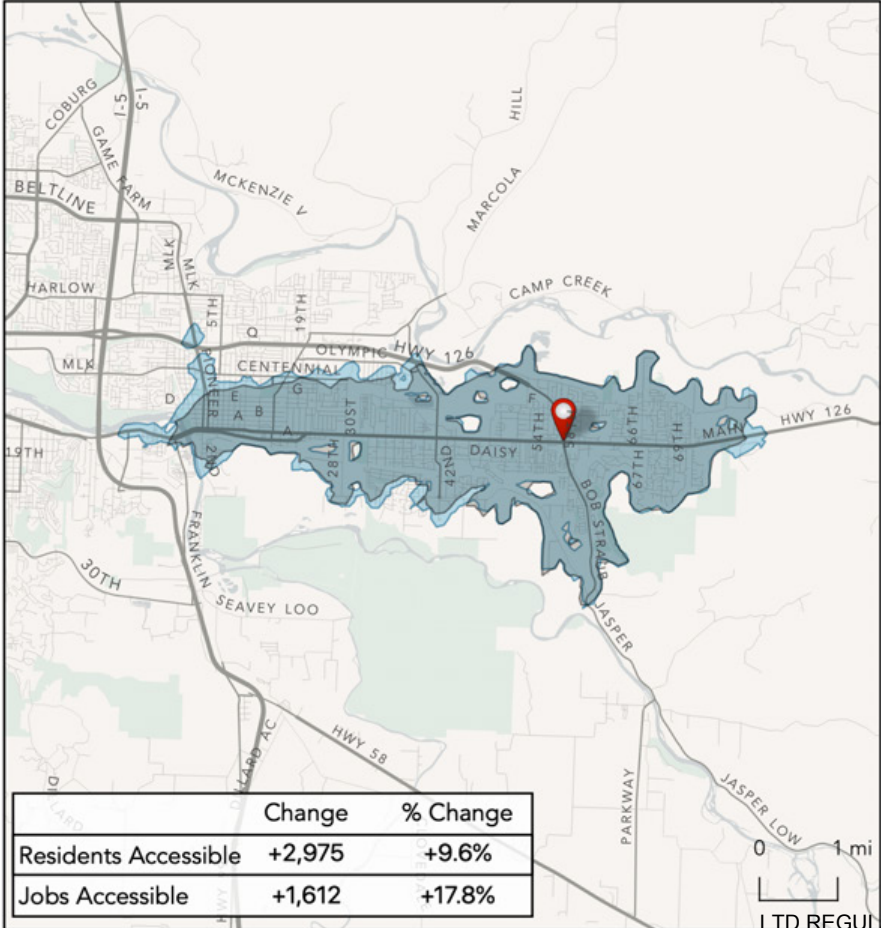


How far can I travel in 45 minutes from

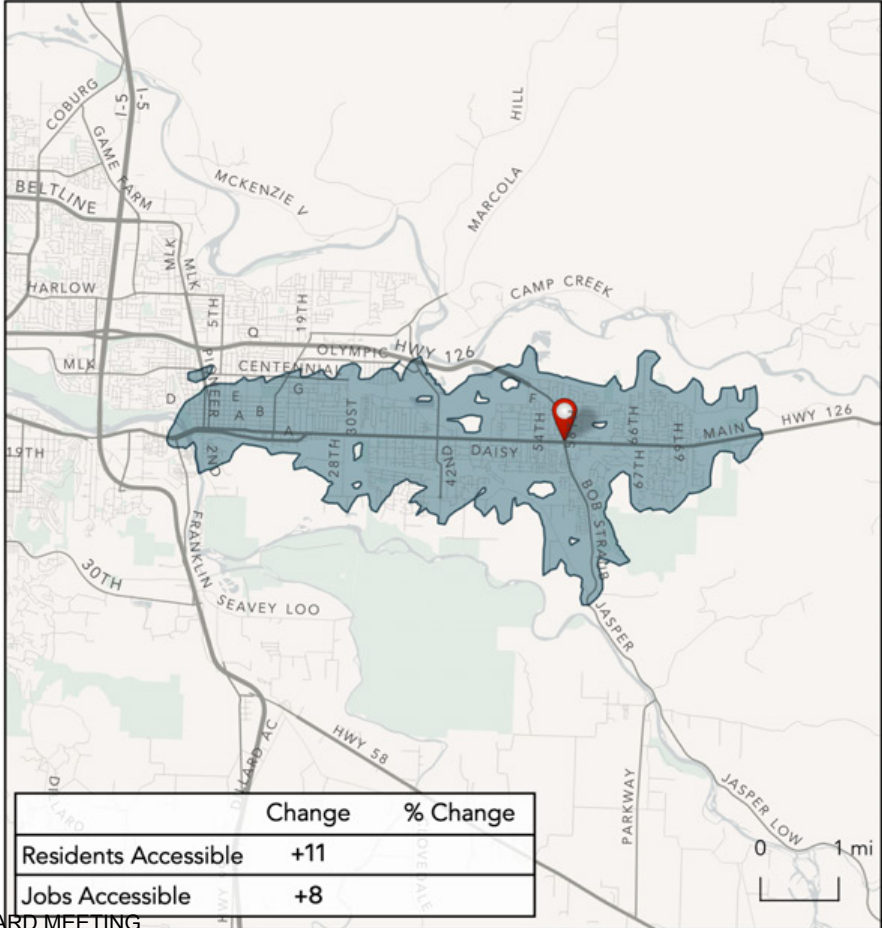
Main St at Bob Straub Pkwy

at noon on a...

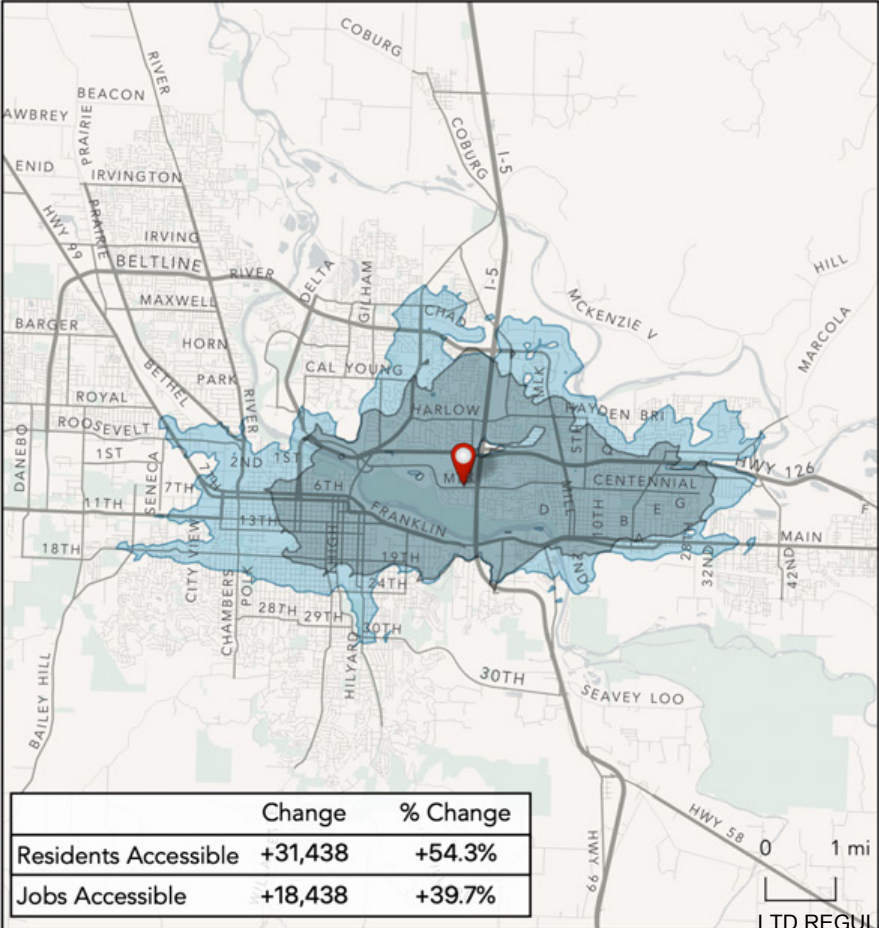
Weekday?



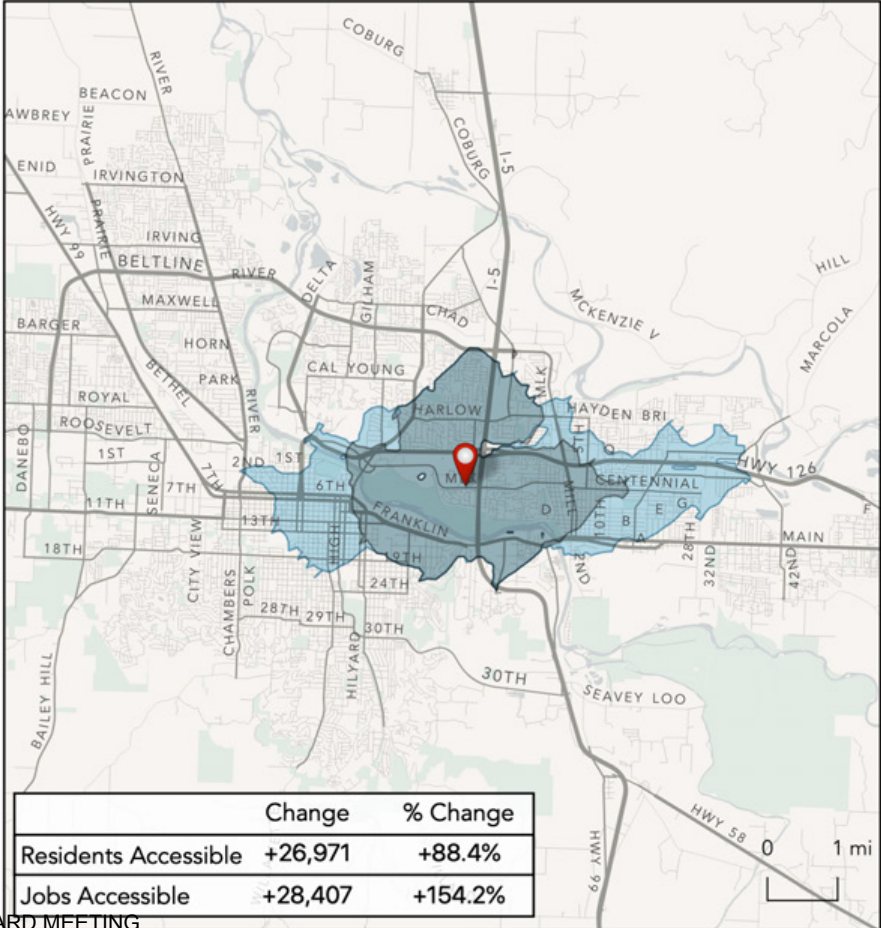
Sunday?



How far can I travel in 45 minutes from
 Martin Luther King Jr Blvd at S Garden Way
 at noon on a...
 Weekday?



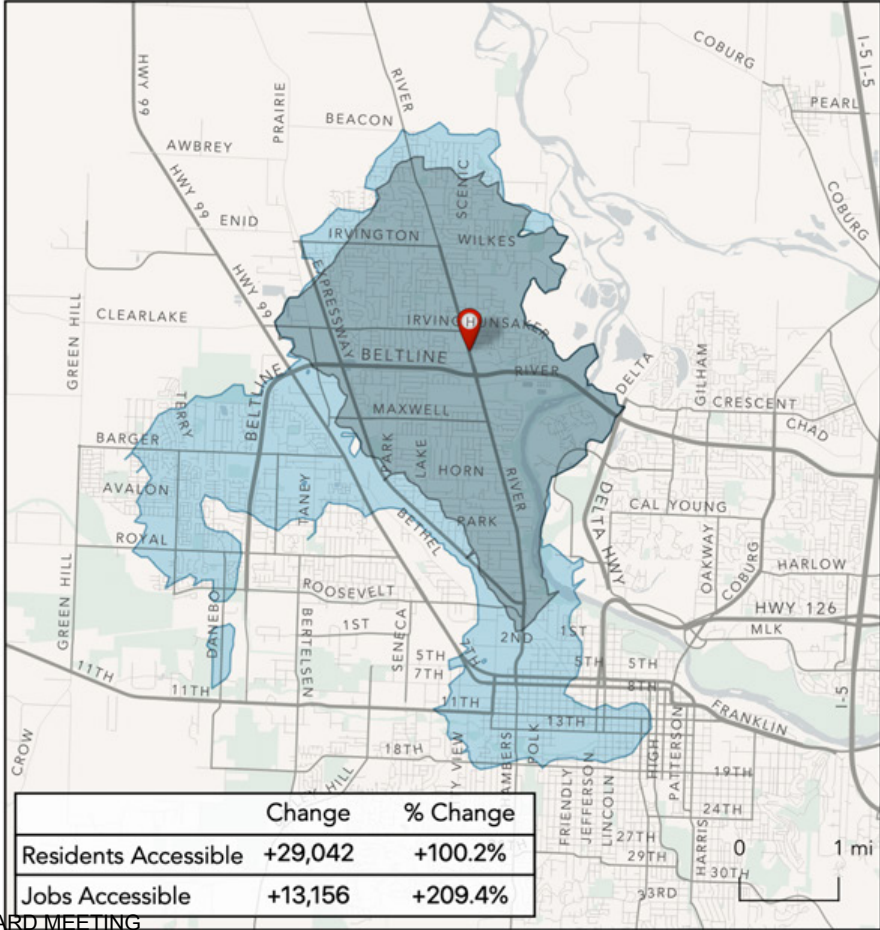
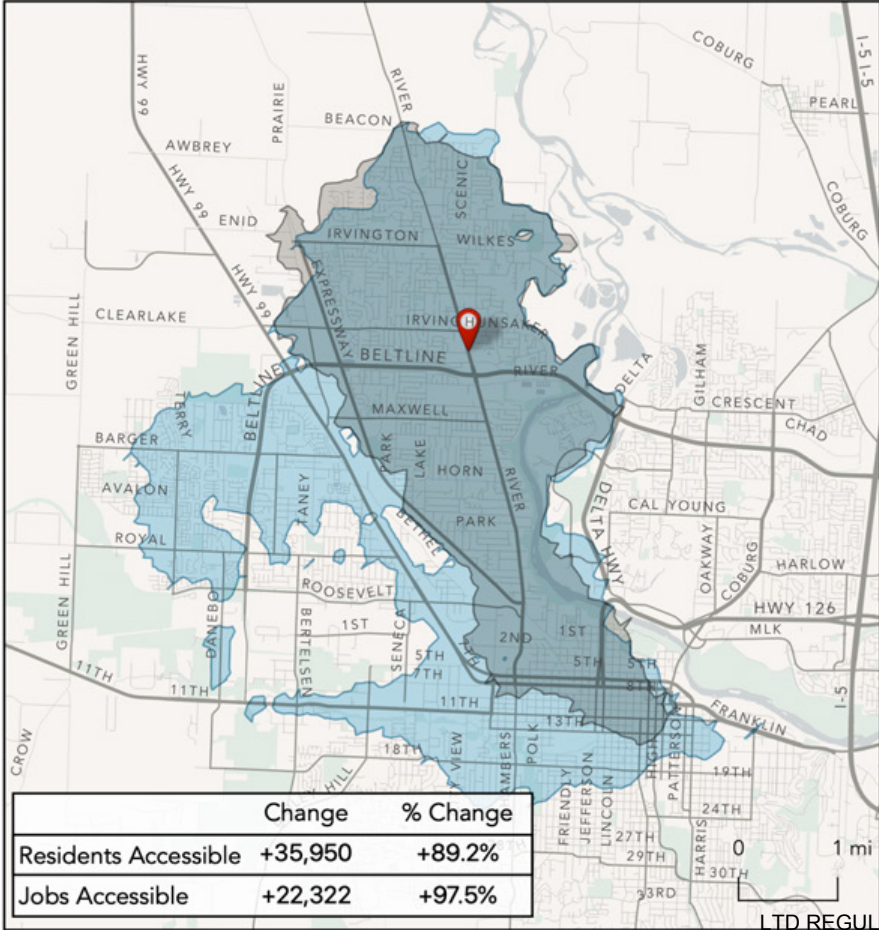
Sunday?



How far can I travel in 45 minutes from
 River Road at Santa Clara Ave
 at noon on a...
 Weekday?



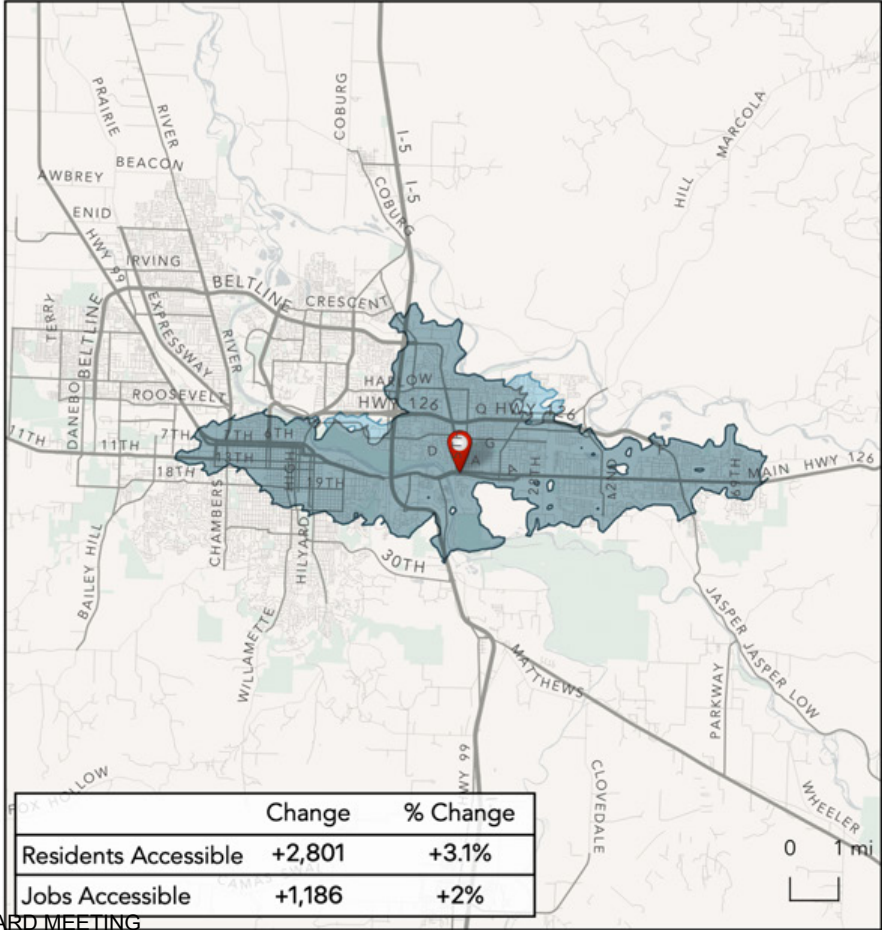
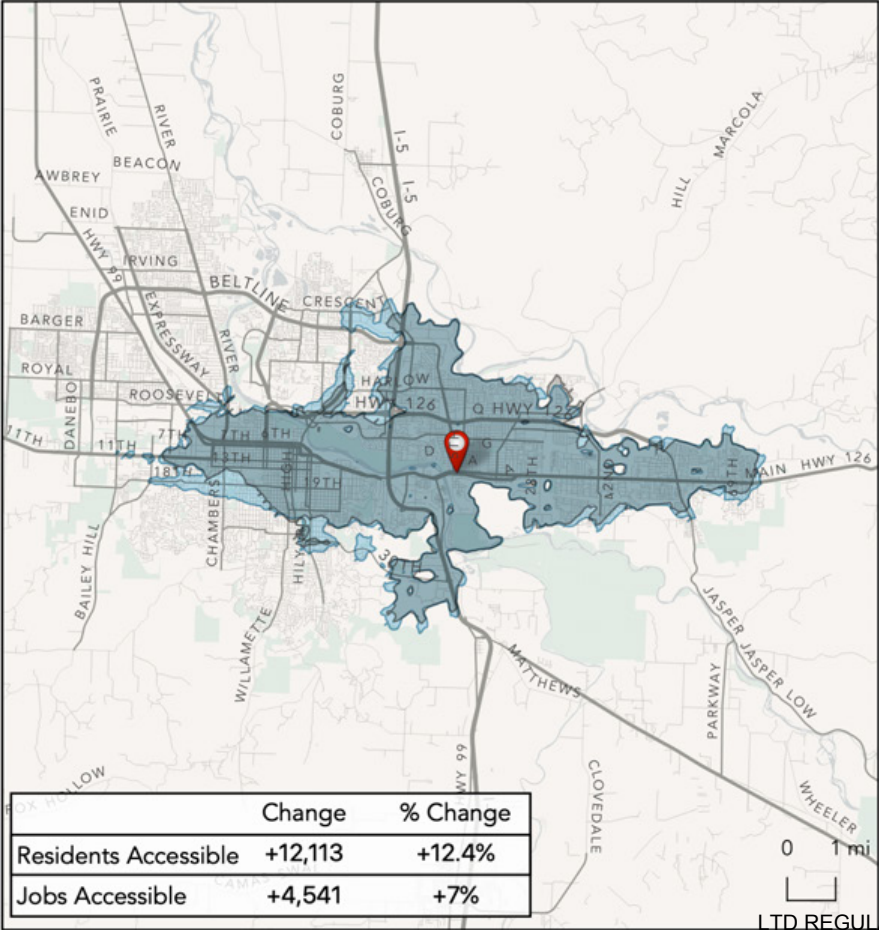
Sunday?



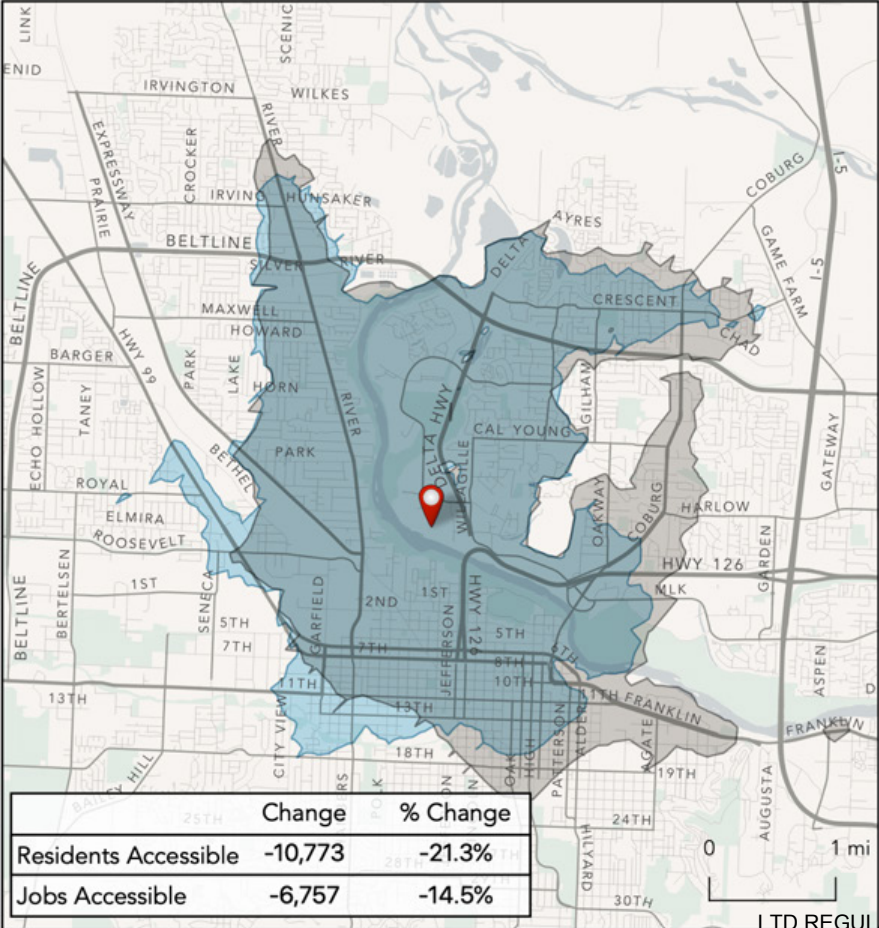
How far can I travel in 45 minutes from
 Springfield Station
 at noon on a...
 Weekday?



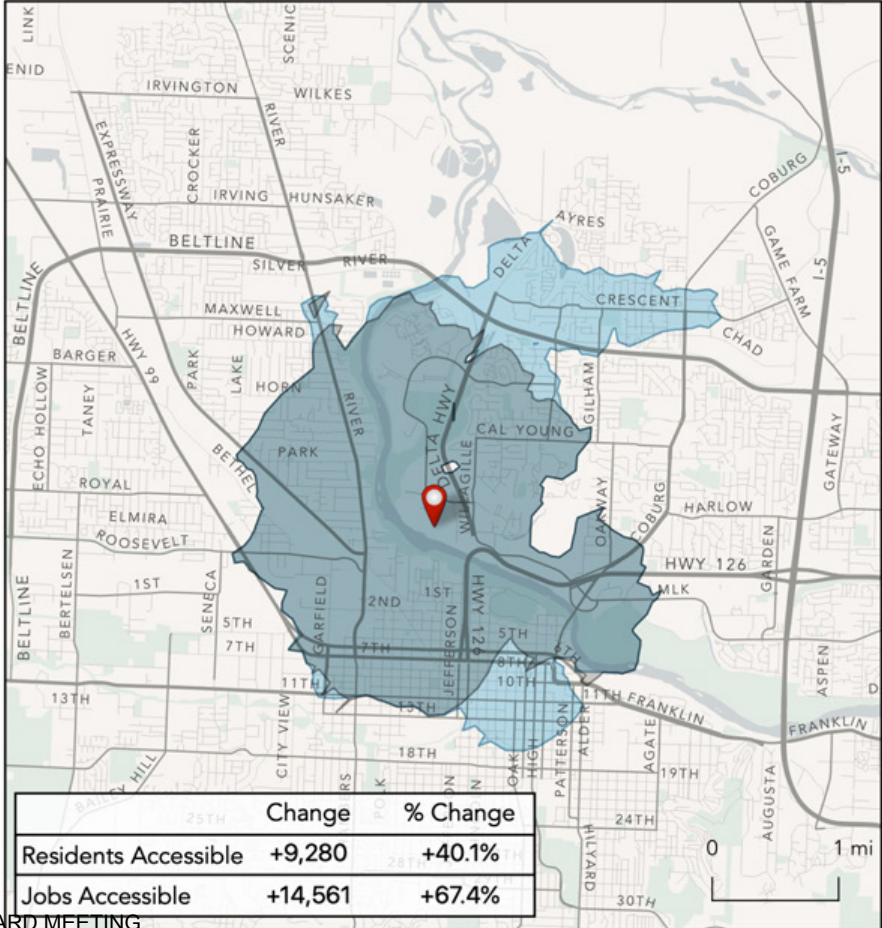
Sunday?



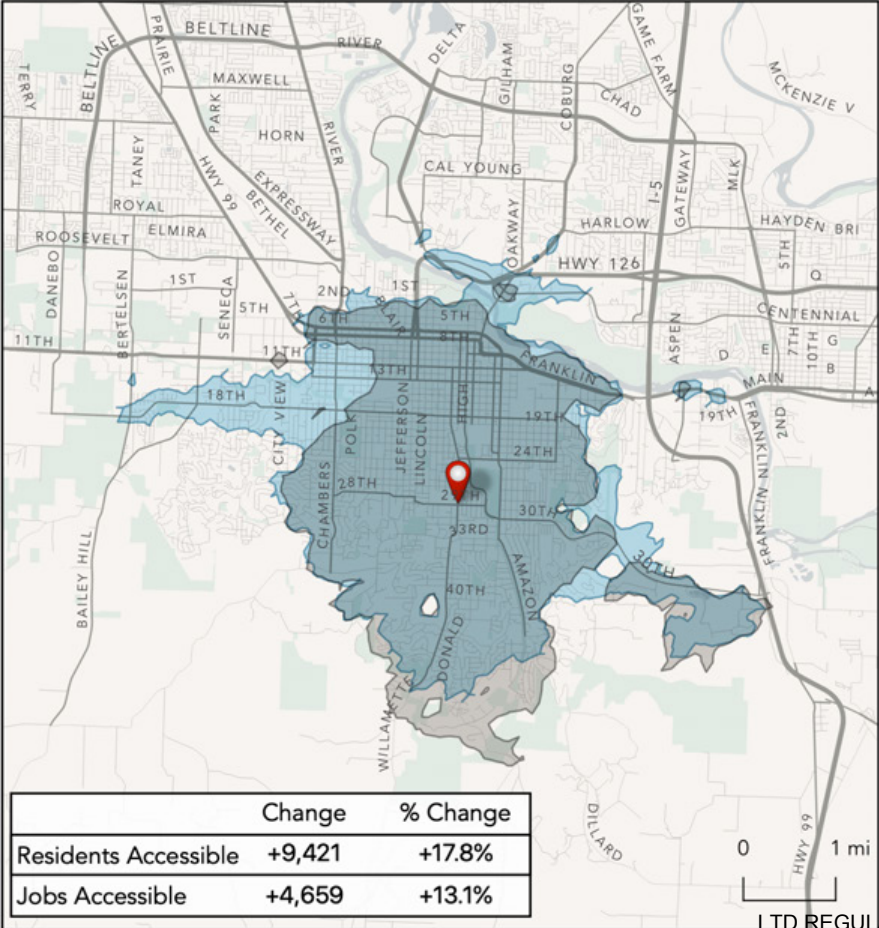
How far can I travel in 45 minutes from
 Valley River Center at Goodpasture Island Rd
 at noon on a...
 Weekday?



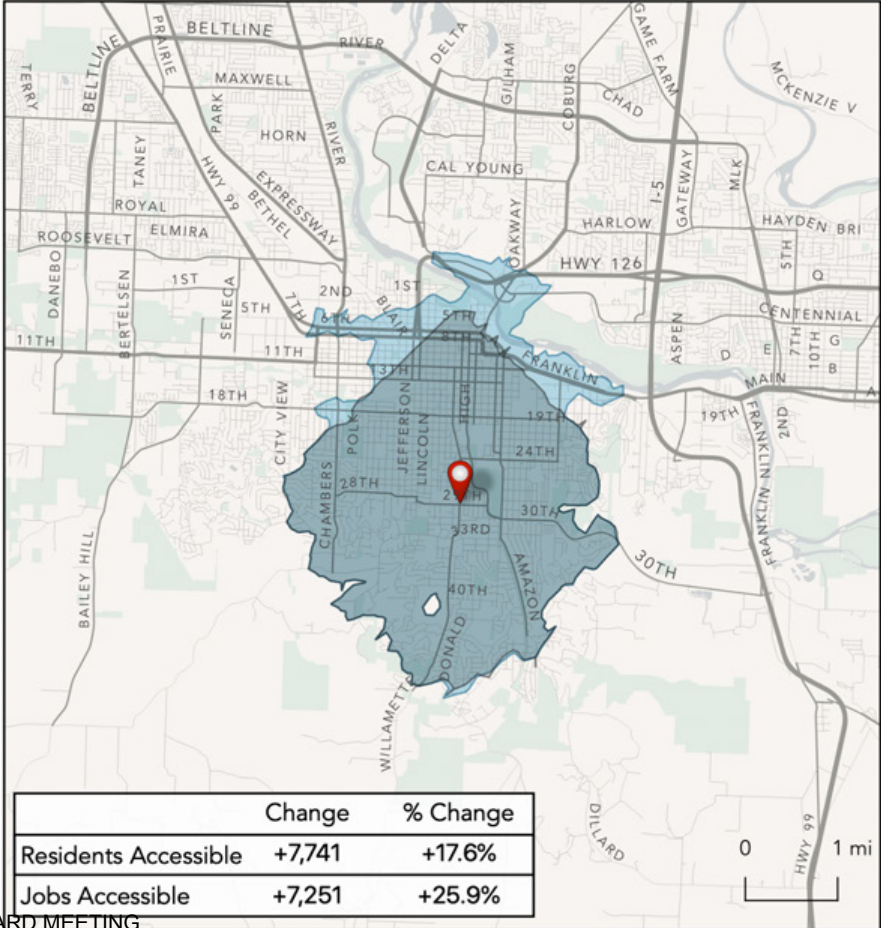
Sunday?



How far can I travel in 45 minutes from
 Willamette St at 29th Ave
 at noon on a...
 Weekday?



Sunday?



B ADA Paratransit Demand Estimates

Impact of Transit Tomorrow Network on Americans With Disabilities Act Compliance

INTRODUCTION

With LTD's Transit Tomorrow network re-design, it is expected that there will be some impact on the District's requirements in complying with the Americans with Disabilities Act (ADA) of 1990, the federal civil rights legislation that provides for transportation for people with disabilities who are unable to use fixed-route transit. The Transit Tomorrow network changes LTD's footprint in the community and therefore the number and distribution of persons for whom LTD may bear responsibility to provide the complementary paratransit called for in the ADA (49 CFR § 37).

This section presents a quantitative analysis of the "potentially ADA eligible persons" and trips they take within LTD's current network and within the anticipated Transit Tomorrow network, building upon work that was performed and documented in the JWA CHOICES REPORT, RIDESOURCE TECHNICAL APPENDIX, March 2019.

CURRENT NETWORK VERSUS NEW NETWORK

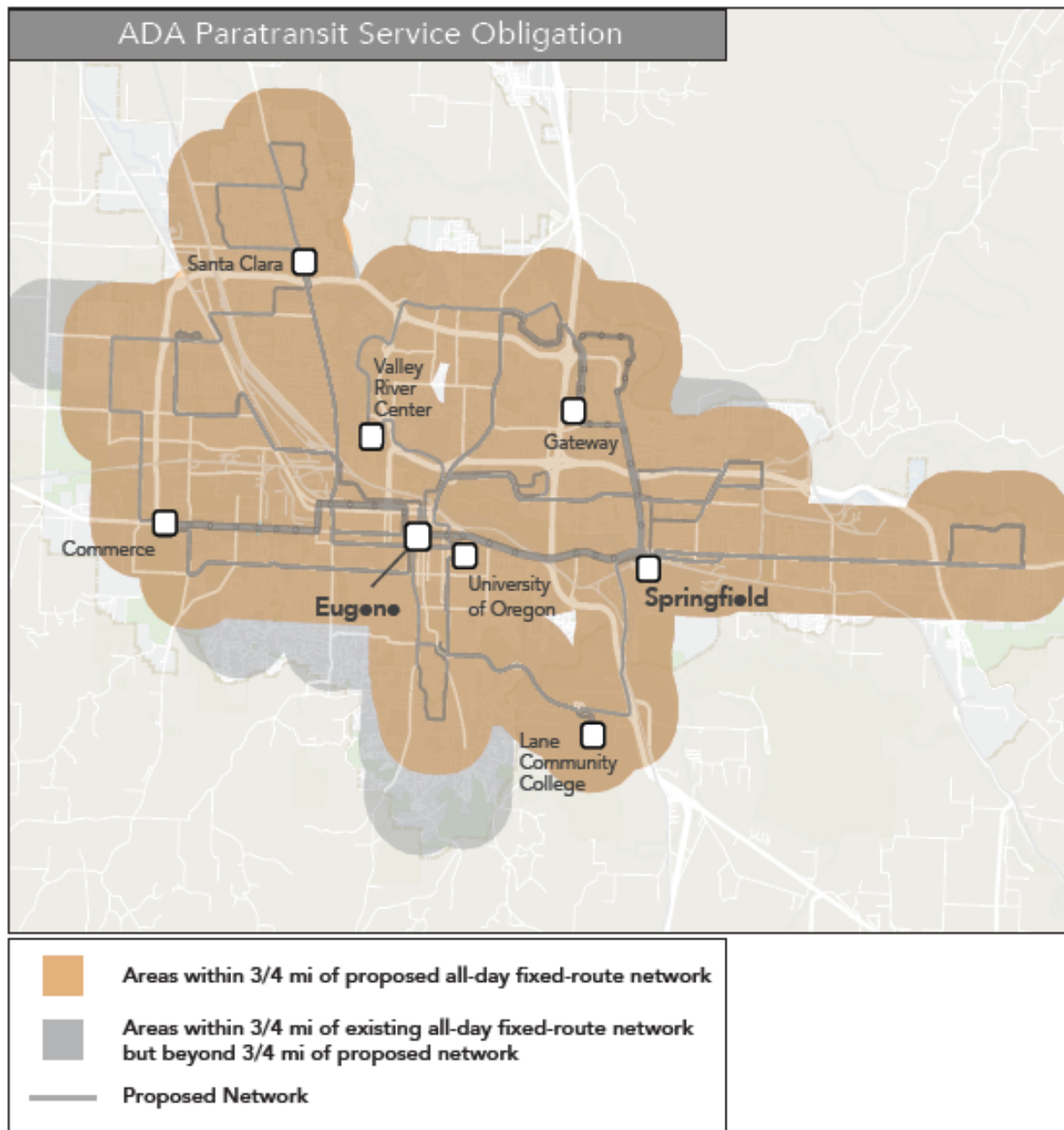
The existing LTD network and the draft Transit Tomorrow network are presented in Figure 1, depicting the footprint represented by each of the ¾ mile buffer surrounding each LTD route. This ¾ mile buffer is set forth in ADA regulation FTA Circular 4710.1 and establishes the service area within which ADA complementary paratransit must be provided. Public transit operators are responsible for providing origin-to-destination trips to ADA paratransit eligible persons within this envelope, often as a shared ride service. Figure 1 shows:

- In grey, the ¾ mile area around the existing network encompasses 245,559 residents of Eugene and Springfield, based on block group data from the 2010 census, the most recent period for which the necessary level of population information is available.¹
- In brown, the ¾ mile area around the draft network, home to 234,306 people and not including the grey areas which are part of the existing network service area.

This is a difference of 11,253 persons, or 4.6%, between the existing and proposed networks' service area populations. These individuals reside largely in south Eugene, and small edge areas in northwest Eugene and northeast Springfield.

¹ Per the U.S. Census data, the City of Eugene grew by 9.5% and the City of Springfield by 5% between 2010 and 2017. American Community Survey, July 2018 population for the cities of Eugene is 171,245 and for Springfield is 62,979, for a combined total of 234,224. For 2010, the comparable number was 215,588 persons, 8.6% less suggesting that the model may slightly under-represent population impacts.

Figure 1



ESTIMATING ELIGIBLE ADA RIDERS AND TRIPS

This analysis of impacts of the new transit network on LTD's complementary paratransit program, operated through the RideSource brokerage, is based on the ADA demand estimation tool developed through the Transportation Research Board's Transit Cooperative Research Program.

Introduction to the Model - Demand Estimation Methodology, TCRP Report 119 (Project B-28)

To develop a demand estimate for the Transit Tomorrow network and LTD's re-defined service area, this analysis applies modeling from TCRP Report 119, "Improving ADA Complementary Paratransit Demand Estimation."² The Transit Cooperative Research Program (TCRP) recognized the need for standardized, statistically reliable methods of estimating trip demand for Americans with Disabilities complementary paratransit programs and so commissioned this effort. Predictions for ADA complementary paratransit service by the Report 119 process, assume that demand...

"...is not capacity constrained by significant numbers of denials, unreliable service, or excessive telephone wait times to reach a reservations agent. To the extent possible, demand is predicted only for trips that ADA-eligible individuals are unable to make by fixed-route services (p. H-1)."

The Report 119 analysis, and the regression modeling research that lies behind it, identifies six factors that affect demand. These are drawn from an initially from a much larger base of variables. The six variables ultimately used in the model are:

Population: Demand increases directly in proportion to the total population of the area served.

Base Fare: Demand is highly sensitive to fares; possibly more sensitive than general public transit demand.

Conditional Eligibility: Systems that have higher percentages of applicants found conditionally eligible (rather than 'fully eligible' or eligible without conditions) tend to have lower demand.

Conditional Trip Determination: Systems that conduct trip-by-trip determination based on conditions of eligibility tend to have much lower demand.

Poverty Level: High levels of poverty in a service area significantly depress demand.

Effective Window: Demand is highly sensitive to standards for on-time pick-ups. Systems that define on-time" for pick-ups using a wider window have lower demand.

The data applied to the Report 119 resultant model is built up from RideSource trip information compiled for December 2018 for analysis in the JWA CHOICES REPORT, in order to develop the necessary dis-aggregated estimates of the ridership demand for ADA paratransit services. This analysis is presented 1) for the baseline, existing LTD service, and 2) for the proposed Transit Tomorrow network.

The model's strength lies in the fact that it is using reliable information from six variables that have been shown to meaningfully influence demand for ADA paratransit trips. The model was built from regression analyses of data from 28 representative transit properties whose ADA programs. These data sets were carefully vetted through the research process to ensure they were both representative, standardized and providing reliable data.

The Report 119, Project B-28 model's output still has a high degree of inherent uncertainty. It presents a wide band of potential demand. The six factors identified here explain only 74% of the variation in ADA paratransit trips per capita among the 28 representative systems. Other factors that influence demand are not captured in this model. These may include: population in older age groups, incidence of

² Transit Cooperative Research Program Report 119 "IMPROVING ADA COMPLEMENTARY PARATRANSIT DEMAND ESTIMATION." D. Koffman, D. Lewis, D. Chia, J. Burkhardt, M. Bradley. Washington DC, 2007.

disability, availability of human service transportation, availability and quality of fixed-route transit, telephone access and ethnicity and language groups. The researchers determined, however, that these variables did not have the statistically significant – or measurable - levels of impact that might have been expected, and so these variables were not included in the Project B-28 demand estimating tool. The model therefore does not capture all variables that impact demand but can still provide a useful planning tool to support policy discussions.

Adapting to the Estimation Tool to the Lane Transit Environment

Of the six variables utilized in the Project B-28 tool, all are applicable to the LTD environment with the exception of “conditional trip determination”. In light of the diverse programs through which Ridesource provides trips to riders, its determination of conditional eligibility does not have the same impact that it does in other systems where there are not transportation alternatives.

As described in the JWA CHOICES REPORT, the ADA trips per capita rate calculated at 1.7 paratransit trips per capita, places it as the second-highest trip-making provider among peers. Only Salem Area Transit had a higher rate and nine other peer transit providers had rates of 1.1 ADA trips per capita and below. LTD’s comparatively high trips per capita rate reflects the breadth of RideSource programs available to provide trips to callers, something that is not common in other public transit environments.

Given this, the conditional eligibility variable is made neutral in the estimates below by using a zero percent conditional eligibility, although in fact RideSource makes a determination of conditional eligibility in 25% to 30% of cases. It appears that RideSource call takers seek to find an alternative to ADA complementary paratransit for those individuals or those particular trips, contributing to its high trips per capita rate.

ADA Ridership Estimations for Lane Transit District

The model is applied to the existing and proposed networks to generate information about the impact on ADA demand that it predicts. The two tables immediately following use the Report 119, Project B-28 demand estimation process to calculate ADA trip demand for two scenarios:

- 1) the baseline, existing service area (Table 1); and,
- 2) the new scenario, Transit Tomorrow (Table 2).

This model – with its modified focus and limited variables – predicts a difference of about 11,500 trips or 3.6% of the annualized FY 17/18 trips of 318,000 derived from December 2018 Ridesource trip data. In other words, this modeling effort predicts a small impact on demand of less than 4% fewer trips between the existing and the proposed networks. The discussion following the model outputs details this more thoroughly and a graphic at the end presents the demand estimations with ranges, to aid the comparison of ADA impacts upon the existing and planned LTD services.

Table 1

TCRP Project B-28 Estimation Tool for ADA Complementary Paratransit Demand Baseline - Existing LTD RideSource ADA Experience				
Input Values				
ADA service area population (2010 Census)	245,559	persons		
Base fare for ADA paratransit (Dollars)	\$3.50	per one-way trip		
Percent of applicants for ADA paratransit eligibility found conditionally eligible	0	%		
Conditional trip determination	0	where 0 = none		
Percent of the population in the ADA service area in households with income 150% below the poverty line (2017 ACS 5-Year Estimates)	0.33	%		
Effective on-time window for ADA paratransit (minutes)	30	minutes		
		Estimation Tool Results	RideSource Trips (ADA + 40% Health Care Trips) Ridership \1	Percent Difference
Predicted Annual Ridership per Capita		1.02	1.29	
Predicted Annual Ridership [Predicted Mean]		250,164	317,954	21%
Confidence Intervals for Mean Value for Systems with the Characteristics Entered				
		Predicted		
		Trips per Capita	Annual Ridership	
Upper 95% confidence limit		1.87	459,665	
Upper 90% confidence limit		1.69	413,993	
Lower 90% confidence limit		0.62	151,167	-110%
Lower 95% confidence limit		0.55	136,147	
\1 Note: Annualized from December 2018 RideSource trip data.				

Table 2

TCRP Project B-28 Estimation Tool for ADA Complementary Paratransit Demand Transit Tomorrow Scenario - Projected LTD's RideSource ADA Experience				
Input Values				
ADA service area population (2010 Census)	234,306	persons		
Base fare for ADA paratransit (Dollars)	\$3.50	per one-way trip		
Percent of applicants for ADA paratransit eligibility found conditionally eligible	0	%		
Conditional trip determination	0	where 0 = none		
Percent of the population in the ADA service area in households with income 150% below the poverty line (2017 ACS 5-Year Estimates)	0.33	%		
Effective on-time window for ADA paratransit (minutes)	30	minutes		
		Estimation Tool Results	RideSource Trips (ADA + 40% Health Care Trips) Ridership \1	Percent Difference
Predicted Annual Ridership per Capita		1.02	1.36	
Predicted Annual Ridership [Predicted Mean]		238,700	317,954	25%
Confidence Intervals for Mean Value for Systems with the Characteristics Entered				
		Predicted		
		Trips per Capita	Annual Ridership	
Upper 95% confidence limit		1.87	438,600	
Upper 90% confidence limit		1.69	395,021	
Lower 90% confidence limit		0.62	144,239	-120%
Lower 95% confidence limit		0.55	129,908	
\1 Note: Ridership annualized from December 2018 RideSource trip data.				

Baseline - Existing LTD RideSource Experience

Table 1 presents the model's calculations for LTD's current baseline experience, using the base population of the existing service area that falls within ¾ miles of the existing LTD route network. Table 1 works from a ridership estimate that is based upon the December 2018 dis-aggregated ridership analysis presented in JWA's CHOICES REPORT, RIDE SOURCE TECHNICAL APPENDIX (March 2018). The annualized ridership total of 317,954 trips is likely to differ somewhat from FY 2018/2019 RideSource ridership totals. However, in order to get to the proportion of RideSource trips that are ADA trips or are likely taken by ADA eligible persons, the December 2018 trip totals were necessary, enabling us to specifically calculate ADA trips for use in the model. This total includes all ADA paratransit eligible trips provided, and 40% of the trips provided under the Medicaid program.

This service area population used in the model was developed through the GIS analysis and depicted in Figure 1. The other variables include the RideSource base fare of \$3.50 per one-way trip, the poverty-level percentage of the base population and the RideSource thirty minute on-time window that is experienced by a majority of riders, where riders can expect the on-time vehicle to show-up within 15-minutes before and up to 15-minutes after the promised pick-up time.

These input values generate an Estimation Tool result that is presented in the first two blue lines in Table 1, below the input values. According to these inputs, annual trip demand for the baseline, current experience, is a predicted mean of 250,154 one-way trips. This reflects a trips per capita level of 1.02. RideSource existing ADA baseline ridership of 317,954 achieves a higher trips per capita rate of 1.29 and is 25% above the model's predicted ridership of 250,154 trips. This is consistent with the peer analysis documented in the JWA CHOICES REPORT that showed LTD's RideSource brokerage providing a level of trip-making and trips per capita that was well above most of its peers.

The fact that RideSource is providing trips at a rate of 25% above the predicted mean points to LTD's success with its array of RideSource programs, including its partnership with the Oregon Health Plan which pays for Medicaid trips.

Transit Tomorrow Scenario

Table 2 presents the scenario reflected by the contracted service area of the Transit Tomorrow Network. This has a slightly reduced service area population, removing about 11,250 persons from the base population of 245,559 to a new service area population of 234,306. The Table 2 Estimation Tool results for this Transit Tomorrow scenario suggests that ridership decreases modestly, from a predicted median of 250,164 trips to a predicted median of 238,700 trips, a difference of 11,464 passenger trips. **The trips per capita rate does not change**, staying at 1.02 trips per capita for the predicted mean in both the baseline and the Transit Tomorrow scenarios. Importantly, the current LTD RideSource ridership is between the predicted mean and the 90th percentile, reinforcing the model's findings.

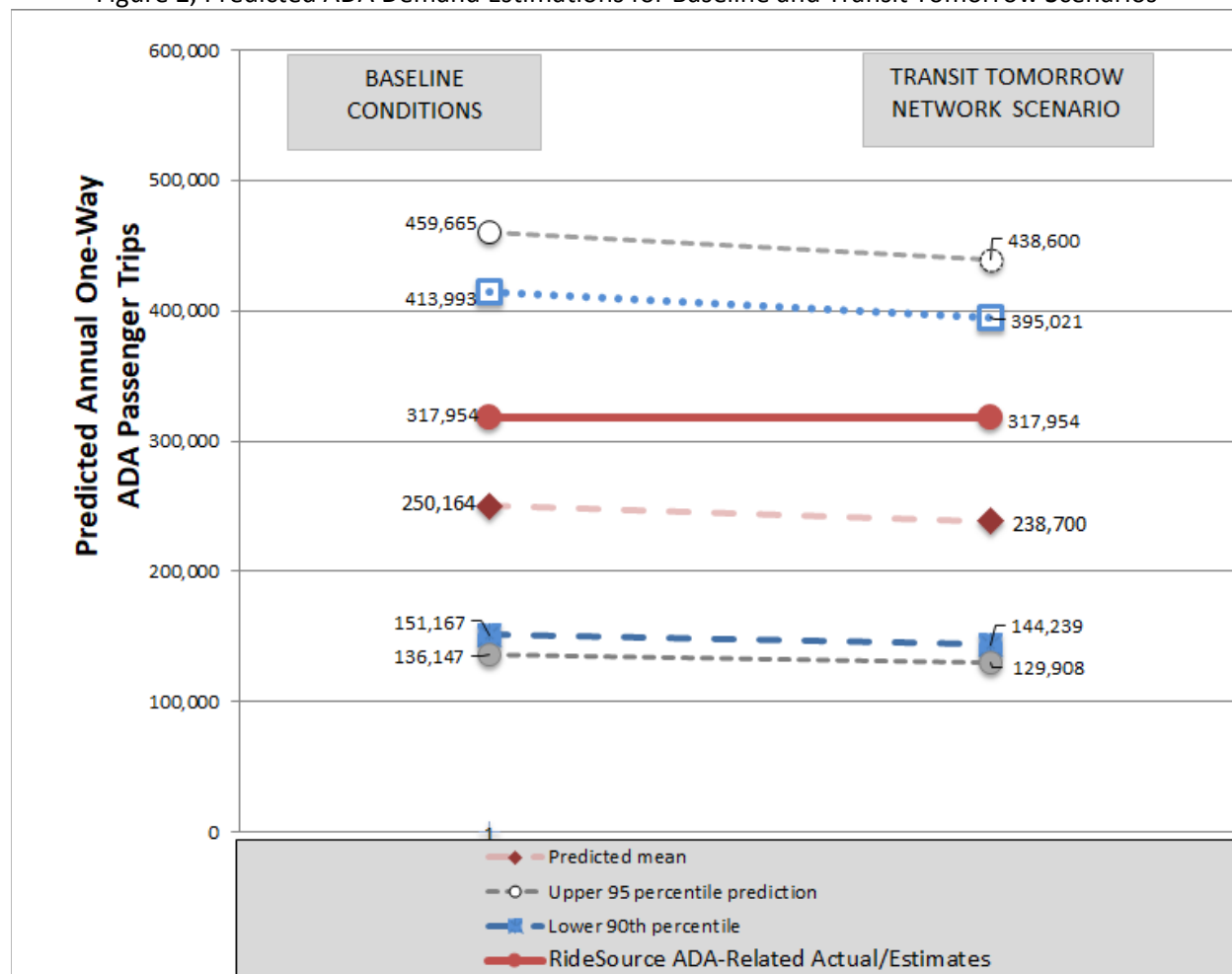
Comparing the Scenarios and the Projected Ranges

Figure 2 following presents the demand estimations as ranges, depicting the model outputs for the two scenarios of existing Baseline Conditions and for Transit Tomorrow. The **red dots** and **solid red line** are the FY 17/18 estimated actual ADA ridership levels for both the Baseline conditions scenario and in the Transit Tomorrow scenario. The **red diamond** and its **dashed line** represents the predicted mean values

for the scenarios, and showing the actual solidly above the predicted means. The **blue dashed** and **grey dashed lines** represent the lower 90th and 95th percentiles of the predicted values. In every case -- except for actual ridership -- the projected ridership levels drop slightly, in proportion to the 4.6% decrease in population served between existing LTD services and the Transit Tomorrow network.

LTD's actual experience will likely lie somewhere between the values suggested by the red solid line that is associated with current estimated RideSource ADA ridership and those reflected in the Demand Estimation tool predictions of Table 2. Notably, the Transit Tomorrow predicted ridership decreases, at each confidence level interval, are quite small.

Figure 2, Predicted ADA Demand Estimations for Baseline and Transit Tomorrow Scenarios



Other Factors Impacting ADA Demand and Trips Presenting To RideSource

In addition to this demographics-based analysis of ADA demand, which relies heavily upon selected population and program characteristics, there are other confounding factors that could impact demand. These involve fare policies and riders' behaviors that are difficult to measure quantitatively. The first is the LTD policy, Out-of-Area Ticket, that allows for a \$5.50 trip to ADA paratransit eligible rider (base fare

of \$3.50 plus \$2) where one leg of their trip of either the origin or the destination ***is outside (but within 5 minutes) of the existing ¼ mile “bubble”*** that surrounds the routes.

As a result of the new route structure, there may be some increase in the number of requests for these Out-of-Area trips. Analysis in the JWA CHOICES REPORT determined that 96% of ADA-related trips fell within the ¼ mile envelope of which the largest numbers of trips outside the buffer were to the north and west of the core area. The average trip length was 5.2 miles per trip for Metro ADA trips. Both of these indicators could rise slightly with the new route structure. However, the authors of TCRP Report 119 note that ADA riders are very sensitive to fares and the expenditure of that additional \$2 may well limit the number of these extended trip requests.

Secondly, some ADA paratransit eligible riders might now find themselves at a greater distance from an LTD route, as a consequence of the Transit Tomorrow restructuring. The greater distance locations are more likely to be home pick-up addresses, rather than for destinations, given the care the core design team took to ensure that routes traveled by or near common trip generators for medical and human service trip purposes. These individuals might request more ADA demand response trips where previously they had been able to use the fixed-route network for some trips.

Finally, given the increased speed and more frequent buses of the Transit Tomorrow network there may in fact be greater desire on the part of ADA paratransit eligible riders who can use fixed route buses for some trips, to do so more frequently. Current LTD policy encourages this by allowing for ½ priced fare for qualifying persons with disabilities, and free fare for people aged 65 or older, or individuals participating in LTD’s travel training program. It may be advantageous to expand these programs further, to encourage paratransit eligible riders to explore the possibility of taking trips on the Transit Tomorrow fixed-route network.

These factors of fare policy and riders’ behaviors will all impact the numbers of trips by ADA paratransit eligible riders that present for RideSource service or fixed-route service. It will be important for administrators to actively monitor RideSource utilization to track actual experience in response to the Transit Tomorrow network and to make future budget predictions based upon that experience.

SUMMARY

The Transit Tomorrow network modestly contracts LTD’s reach to the populations of Eugene and Springfield, with 4.6% of the population, about 11,250 persons, living more than ¼ of a mile from an LTD fixed route who currently live within that area. LTD’s existing focus on coverage is traded for a new, faster network that provides more frequent service and therefore presumably will provide more trips.

ADA ridership projections for the new network ***reflect modest change in ADA trip demand***. There is ***no change in the median trips per capita at 1.02 trips for capita*** for both the existing and the new network. There is a decrease of 3.6% in the projected median trip-making level, estimating 11,500 trips fewer will be taken by ADA paratransit eligible persons. However, the median trip rates sit below the RideSource program’s current experience, further suggesting the limited impact of the new network’s changes to the LTD environment.

Other factors could result in some modest new demand, possibly increased use of LTD’s Out-of-Area Ticket which allows riders to pay an additional \$2, or \$5.50 a trip for service outside the ¼ mile ADA

envelope. Or ADA paratransit eligible persons now living farther from the fixed-route network might make trips on RideSource demand response vehicles that previously did use fixed-route for some trips. However, the faster network, coupled with LTD's ½ fare policy for persons with disabilities anticipates that the Transit Tomorrow lines will attract new trips, from ADA paratransit eligible persons as well as others.

C Considerations in Designing Mobility on Demand Services

Mobility on Demand Service Approaches and Recommendations for the LTD Service Area

INTRODUCTION

In light of development of LTD's Transit Tomorrow network re-design, this section describes potential service options presented by "mobility on demand" services, summarizes the performance of LTD's current Cottage Grove pilot project, identifies two opportunities in the LTD service area to explore mobility on demand service alternatives to complement the new network, presents key performance indicators and comments on marketing and promotion.

Mobility on demand (MOD) is a transportation service type that seeks to serve low-density areas with on demand vehicle operations that are technology-enabled and cost-effectively provide needed trips. MOD opportunities directly respond to the LTD Board of Directors' explicit direction to improve mobility for areas seeing reduced geographic coverage due to the proposed Transit Tomorrow fixed-route network. Mobility on demand services, also called "microtransit" by some, can be defined as:

MOD is a transportation option that uses a smartphone application and special vehicles to provide a service that has no fixed schedules, no fixed routes, and an infinite number of on-demand stops. Passengers share their ride and save money.

TransLoc, LTD's Partner on its Cottage Grove MOD Pilot

Mobility on demand is both a new service concept and one that builds upon long-standing demand response service approaches. Mobility on demand services seek to provide general public riders with relatively immediate service, providing a trip when the rider requests that trip through an "app" on his or her phone, resulting in a trip that is likely to be a shared-ride with others and travels more or less directly between the rider's pick-up point and his or her destination. They can cost-effectively serve low-density areas, where there is still a sufficient density of trip-demand that a vehicle can over the course of a service day reasonably pick up three to four passengers per service hour.

This discussion recommends an initial LTD pilot for mobility on demand services within the Eugene / Springfield area, to be evaluated and subsequently modified, and potentially expanded based upon actual experience. Given the high degree of uncertainty around these services, a conservative approach to test demand and develop LTD experience makes good sense. A concluding discussion provides comparative performance information from Denver's RTD which has been providing similar services in almost two dozen areas of greater Denver for a number of years.

MOBILITY ON DEMAND SERVICE APPROACHES

Several approaches to MOD services are possible and provide a frame of reference for recommendations for the Eugene/ Springfield area, including the model currently being piloted in Cottage Grove. Four service approaches are summarized here:

- Dedicated vehicle(s) only;

- Dedicated vehicle(s) with supplemental taxi trips;
- A taxi company or transportation network company operating under contract to LTD;
- A user-side subsidy program with transportation network companies.

Four Models, Their Characteristics, Strengths and Weaknesses

1. Dedicated vehicles operated by contractor

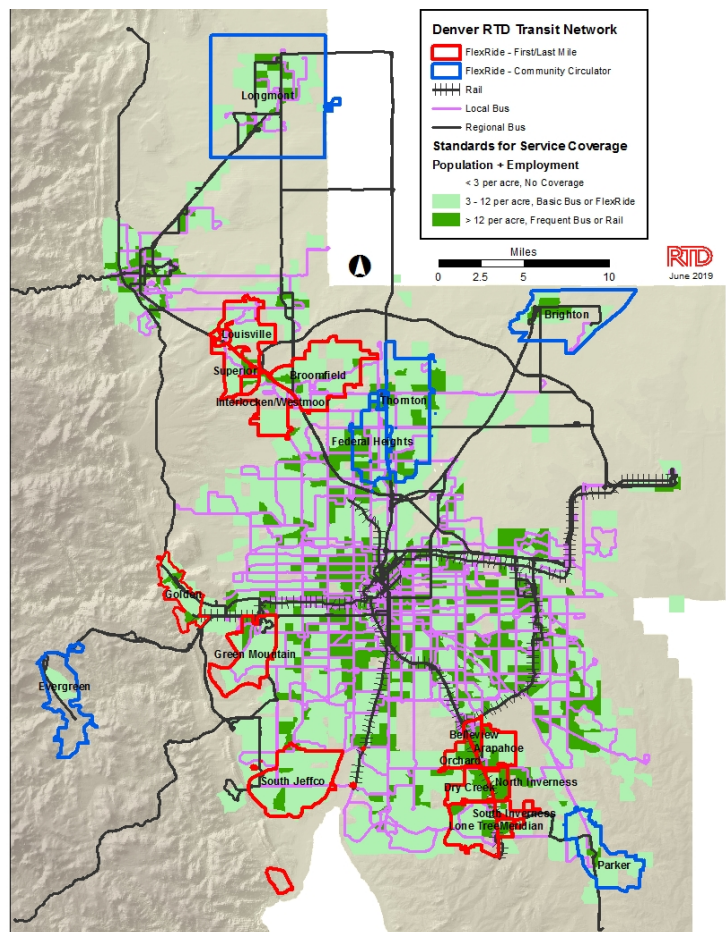
Under this service approach, as is being operated in the Cottage Grove pilot, a contractor provides on-demand trips on vehicles that may be owned by either the contractor or LTD.

Benefits and Liabilities: An important benefit of dedicated vehicle service only is that it is straightforward to budget. A downside is that high demand, or during peak periods, can overwhelm dedicated vehicle service hours and result in long passenger wait times. It can become difficult to meet wait time standards during peak periods, when vehicles capacity is stretched.

Operations: Trips are provided under contract to the long-time demand response operator in Cottage Grove, the non-profit organization South Lane Wheels. The trip dispatching function is smart phone enabled, so that trip requests principally happen through the software platform, under a contract that LTD holds with its MOD vendor. Separate arrangements were made for trip requests that come via telephone by individuals without smart phone access. The operations contractor's dispatch at South Lane Wheels had served this function of handling the Cottage Grove telephone trip requests. Trip requests have continued to come through on both the app and via the contractor's dispatch in the early months of this pilot; at some point at 50% as app requests and 50% as telephone requests.

Denver's FlexRide (formerly Call n Ride) is the gold standard example of this shared ride model. Operating since the early 2000s, it provides on-demand service in tightly defined areas around multiple light rail stations (Figure 1). Dedicated vehicles serve passenger trip requests to and from light rail and BRT connections. The smart phone application and software interacts directly with in-service vehicles.

Figure 1, Denver RT FlexRide Service Areas



Service Parameters: Within its contract for service, LTD would define MOD service parameters likely to include:

- operating days of the week
- operating hours and the number of revenue hours the contractor will field daily (or monthly);
- service area, to define the area within or destinations to and from which MOD trips are provided;
- fares and how these will be handled between LTD and the contractor;
- possibly trip purpose if there is such a limitation or direction;
- maximum wait time standard assuring the requesting rider that they'll not be forgotten.

Most of these service parameters would be reflected in customer service information that communicates to riders and prospective riders where the service travels, when it operates and how much it costs and how to pay the passenger fares. To maintain compliance with Americans with Disabilities Act provisions, arrangements for transporting passengers in wheelchairs or other mobility devices are presumably the responsibility of the operations contractor.

Contractor Reimbursement: LTD payment to the contractor would likely be on a formula involving reimbursement of fixed costs and payment for variable costs based on revenue hours.

2. Dedicated vehicle operated by contractor supplemented by taxi trips

In this service approach, LTD would hold a primary contract for dedicated vehicle capacity similar to that described above, supplemented by additional trips from a taxi vendor when the dedicated service is at capacity. The taxi companies with whom RideSource has existing contract relationships could be providers of these supplemental trips.

Benefits and Liabilities: The benefit of dedicated vehicles supported by supplemental taxis is that trips can be added-in as needed without committing to a full driver's shift and dedicated vehicle operating expense. The obligation for capital expense is limited, important in the early phase of a pilot when there is uncertainty about demand. The downside is the unpredictable budget and potentially the need to "cap" supplemental trips when trips taken exceed budget levels. This approach, common in the Los Angeles basin, works well with existing, strong taxi networks. Orange County, CA. is initiating this model for low-density south county Metrolink train station locations.

Operations: As with the first service approach, trip requests come in through a smart phone app to the software platform and are dispatched to the dedicated vehicles so long as there is capacity. When needed to meet trip demand, dispatch would send trip requests to the supplemental taxi provider for service.

Service Parameters: Service parameters would be much the same as the dedicated vehicle service model, established in the operations contract language and communicated to passengers through a variety of mediums. To maintain compliance with Americans with Disabilities Act provisions, arrangements for transporting passengers in wheelchairs or other mobility devices would presumably be the responsibility of the operations contractor.

Contractor Reimbursement: Again, LTD defines the quantity of revenue hours to be provided by the dedicated vehicles as well as the number of trips available to be purchased from the supplemental provider. These supplemental trips could be capped for budgetary purposes on a daily or monthly basis. Communicating such caps to the passengers, and in real-time, is a significant operational complexity. Trip quantities provided must be closely monitored in the pilot's early implementation to determine what volume of supplemental capacity is needed, at what times and when it becomes cost-effective to schedule additional dedicated service.

3. A taxi or TNC program under contract to LTD

Under this service approach, on-demand service is provided exclusively by taxi providers and/or transportation network companies (TNCs) with all trips provided using non-dedicated vehicles.

Benefits and Liabilities: The benefit of this taxi/TNCs "under contract" is that this establishes an entirely other provider and takes LTD out of operations' responsibility, except perhaps for travelers who need lift-equipped vehicle trips that the contractor cannot provide. Where contract arrangements can be developed, LTD can ensure compliance with local and federal rules regarding driver qualification, fingerprinting and drug testing. The downside relates to monitoring demand and determining how or if to cap demand if it is difficult to meet trip requests within budgeted funding levels.

Operations: The taxi or TNCs would operate under contracts with LTD that incorporate standard FTA contracting clauses and requirements related to driver background checks and drug testing. As with existing RideSource taxi operators, an example of a TNC service under contractor is UZURV (UZURV.com) whose drivers receive special training to transport passengers with disabilities. Phoenix, AZ., Nashville, TN and Sacramento, CA. are using versions of this model.

Trip requests would come through a smart phone app to the MOD software platform provided under an LTD agreement with its MOD software contractor. Telephone requests for trips may or may not be allowed and, if allowed, the mechanics of accepting them would need to be determined.

Service Parameters: Service parameters parallel the dedicated vehicle service model, established in the operations contract and communicated to passengers. To maintain compliance with Americans with Disabilities Act provisions, arrangements for transporting passengers in wheelchairs or other mobility devices would be the responsibility of the contracted providers, using their own accessible vehicles.

Contractor Reimbursement: Reimbursement to the provider(s) would likely be on a cost-per-trip basis.

4. A user-side subsidy using "coupon codes" with TNCs

Traditional user-side subsidy models are being adapted to work with transportation network companies like Uber and Lyft who won't execute traditional contracts with public transit operators. In this model, eligible riders are provided with a code that is given to the driver, thereby discounting the trip or paying for it outright. "Geofencing" enables trip service areas to

be very tightly proscribed. Pinellas, Florida, and Monrovia, California, are two communities using this approach.

Benefits and Liabilities: A key benefit is that the public likes the “immediacy” of TNC services and its typically short wait times. Liabilities include when that appreciation pressures budgets and demand increases too quickly, as well as the fact that Uber and Lyft ride-hailing companies are resisting contracts with their encumbrances of federal rules that govern the public transportation industry.

Operations: Trip requests come through the smart phone apps of the TNCs and mechanisms to provide eligible users with the coupon code(s) would need to be developed by LTD in partnership with the operators. Service is generally provided at higher performance levels, trips provided, for example, within ten minutes of the request.

Service Parameters: Specific trip characteristics would be applied to identify where and for which trips the coupon code could be applied. The “geofencing” dimension of the software can provide the passenger with information as to whether this is or is not an eligible trip for the coupon code subsidy. It is possible that for some trips, the subsidy would apply to the trip length within the defined service area and that the passenger pays the additional portion of the trip cost, for longer trips.

To maintain compliance with Americans with Disabilities Act provisions, where passengers require a lift-equipped or accessible trip, it a likely arrangement is that RideSource provides this trip as TNCs, Lyft and Uber, do not reliably have accessible vehicles among their private contractor fleets.

Contractor Reimbursement: Reimbursement would be made to the provider on a per-trip basis, for eligible trips as defined by the service parameters and possibly at a not-to-exceed level on the numbers of total trips (or trips per day).

Recommended Approach

This discussion considered four models of operating on-demand services that vary by who is providing the trips, how the operator is paid and what information and trip parameters, including fares, are in place.

Not recommended at this time are the last two models, either a formal contract with shared-ride, ride hailing companies or the user-side subsidy model.

Recommended is to proceed with the solely dedicated vehicles at this time, establishing initial levels of capacity and potentially expanding them with added dedicated vehicle revenue hours or even supplemental taxi trips, if demand grows and additional budget exists. Evaluation of service experience and of demand that presents is critical to any sort of expansion beyond the baseline level-of-service proposed here.

The next section describes how the proposed initial approach can provide pilot, life-line levels of mobility on demand services in Eugene and in Springfield.

Cottage Grove On-Demand Experience

A Pilot Opportunity to Test the MOD Concept

LTD's recent experience in Cottage Grove is of direct relevance to this discussion. LTD developed a partnership with TransLoc, a software company affiliated with Ford Motor Company, to test the capabilities of a mobility on demand service. This pilot, termed the *LTD Connector*, is operated exclusively within City of Cottage Grove and was originally approved for as an initial pilot (Figure 2).

The *LTD Connector* service was intended to connect to Route 98, the long trunk line service that runs eight times daily between Eugene Station and the Cottage Grove Wal-Mart Park and Ride.

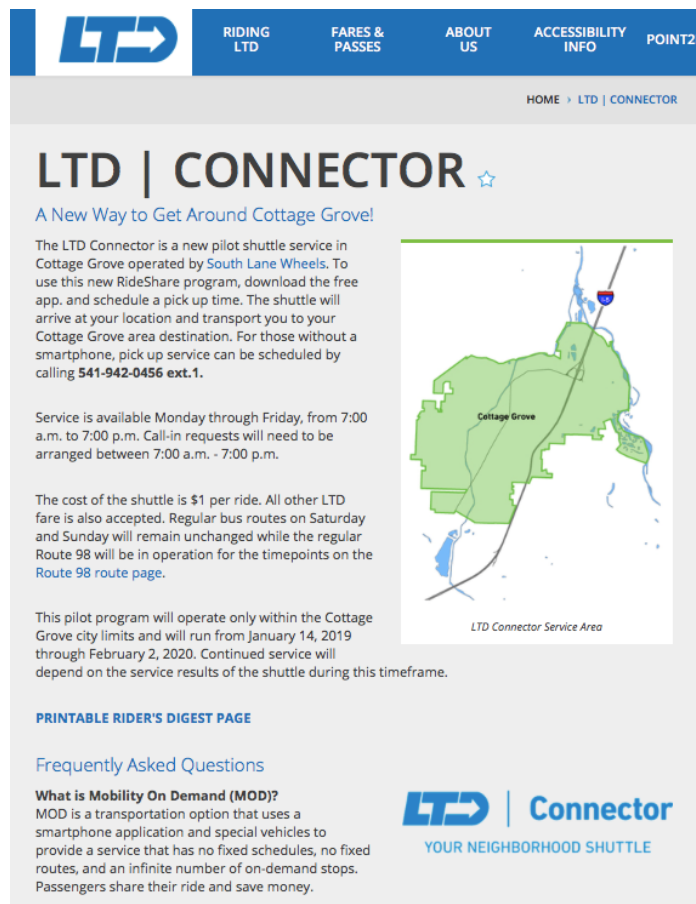
For this "new way to get around Cottage Grove", TransLoc provides the mobile app at a monthly lease cost to LTD to enable customers to request a ride and receive an on-demand ridesharing trip by using their smart phones. South Lane Wheels, which operates the vehicles that provide the trips, is a Cottage Grove non-profit organization that has been under contract to LTD to provide demand response transportation to local residents for some years. The model adopted was intended to use the existing contracting relationships and capital resources.

The *LTD Connector* service was designed as a loose figure-eight loop operating with one vehicle, connecting residential areas with downtown Cottage Grove on weekdays between 7 a.m. and 7 pm. This city is 3.76 square miles and passengers pay a \$1 fare for a trip anywhere within the city limits with a promised pick-up time provided by the "app" or the dispatcher. For a \$3 fare, riders can be afforded a guaranteed arrival time. Prospective travelers can download the smart phone app and request the trip from their smart phones or can call South Lane Wheels to book the trip through dispatch.

Cost and Performance

As of Spring 2019, the *LTD Connector* was averaging about 70 trips per day, for an annualized trip rate of almost 18,000 passenger trips at an annual cost of about \$180,000. Productivity, passengers per hour, on the service was 4.89 for April 2019. Service during February was increased from a single vehicle in service to an added four to five hours daily of a second vehicle, to help manage peak demands. Figure 3 shows daily ridership for April and May 2019 and reflects a slightly downward trend over the course of this two-month period. This would need to be monitored to see if this is a continuing trend or just the

Figure 2, LTD Connector Web Home Page



experience of something new being tried and then finding its level with recurring riders. It is also common for demand response services to experience higher ridership levels at the beginning of each month when monthly checks are received and that may be another dimension of slowing ridership growth.

Of the approximately 1,570 trips provided in April 2019, 13% (203 trips) were connections

to the Route 98 service and 22% (350 trips) were trips home from LTD Route 98 drop-offs at any of its six stops in Cottage Grove. There had been hope that there would be higher levels of these first-mile, last-mile trips made to connect with Route 98. April experience shows just about a third of trips (35%) were these, traveling either to or from Route 98 bus stops. Notably there is a higher rate of trips home, making the less time-sensitive trips on the LTD Connector after being dropped off by Route 98.

Trips are of moderate length – averaging 3.8 passenger miles in length in this April and May experience, although solidly within a five-mile radius of home or destination.

The May 2019 experience of trips by time-of-day shows an interesting pattern of a morning peak during the 9 o'clock and 10 o'clock morning hours and an afternoon peak during the 3 o'clock and 4 o'clock hours, each about 15 trips above other high demand periods during the day. Of 300 trips provided, about 47% of trips are provided during those four hours, two in the morning and two in the afternoon. Somewhat more than half (53%) of these May trips were provided outside of those peak hours, during the eight other operating hours of the day.

With the exception of the high ridership in the 7:00 – 8:00 a.m. hour, this travel pattern matches that found in traditional community demand response services, suggesting that the *LTD Connector* may be tapping an unserved market for almost seven out of ten trips of travel in and around Cottage Grove and secondarily aiding travelers connecting to the Eugene/Springfield area on Route 98.

Figure 3, LTD Connector Passenger Trips per Day, April and May 2019

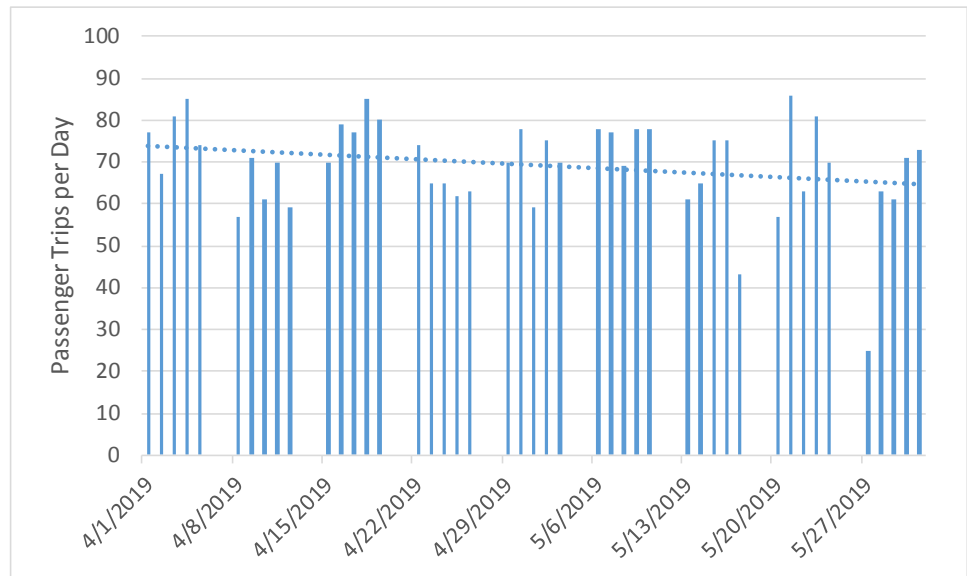
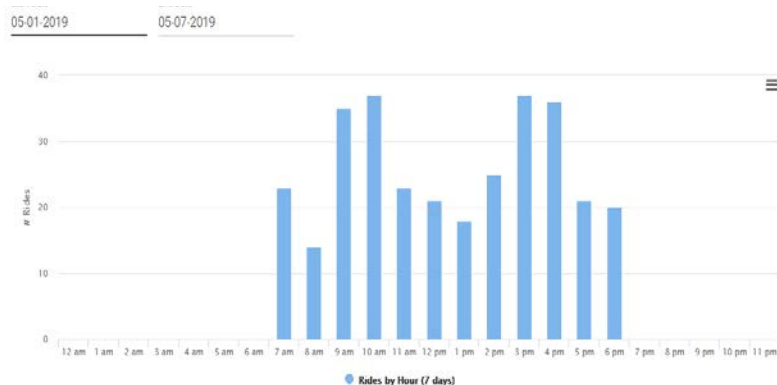


Figure 4, LTD Connector Trips by Hour of Day, May 2019



While high levels of connecting trips to Route 98 were anticipated – or hoped for – staff have observed high levels of trip-making to downtown local eateries, for shopping and other trips that are not time sensitive. Staff reported that some riders expressed concern about the potential wait of 60 to 70 minutes, which meant they could not count on making their connection to Route 98. However, riders are reporting that being able to track the vehicle through the TransLoc app does seem to minimize riders’ perception that it is a relatively long wait for the trip. And, as noted, wait times may improve with the added 6 revenue hours each day.

About Booking and Delivering the LTD Connector Trip

Notably, about half of requested trips are booked through the TransLoc smart phone app and half through South Lane Wheels dispatch facility. Riders can pay for their ride through the app or by cash at the time the trip is provided.

When riders request a trip, they are guaranteed only to be picked up within a specified time period of generally not more than 60 minutes although reportedly a high proportion of trips are provide within fifteen minutes – data on passenger wait times was not available. They are not provided with a specific arrival or drop-off time, as some trips are shared rides and travel times can be uncertain. When riders are uncertain as to their drop-off time, it will not be regularly used for commute trips “meeting the bus.” As seen in the April experience, a higher proportion of Route 98 travelers did take the bus home, 22%, while a smaller proportion, 13%, used the LTD Connector as a first-mile connection from home.

Locating Mobility on Demand Services in the Greater Eugene/Springfield Area

Criteria for Selection

In considering potential of mobility on demand services to augment LTD’s Transit Tomorrow network, several geographic areas were considered. Attributes of locations under consideration included the following questions and concerns for areas where existing LTD service may be reduced:

1. **How many people** would be farther from transit service under the proposed network?
2. Are there **communities of concern** among this group – older adults, persons of low-income, persons with limited English proficiency?
3. What are the **physical attributes and the geography** of the potential area(s) and do these areas lend themselves to a viable mobility on demand solution?
4. Is there a logical **cluster of useful destinations** worth connecting to or from the identified areas?
5. Could mobility on demand provide an **effective solution for life-line service levels** for transit dependent populations, to strike a balance between managing demand and operating costs.

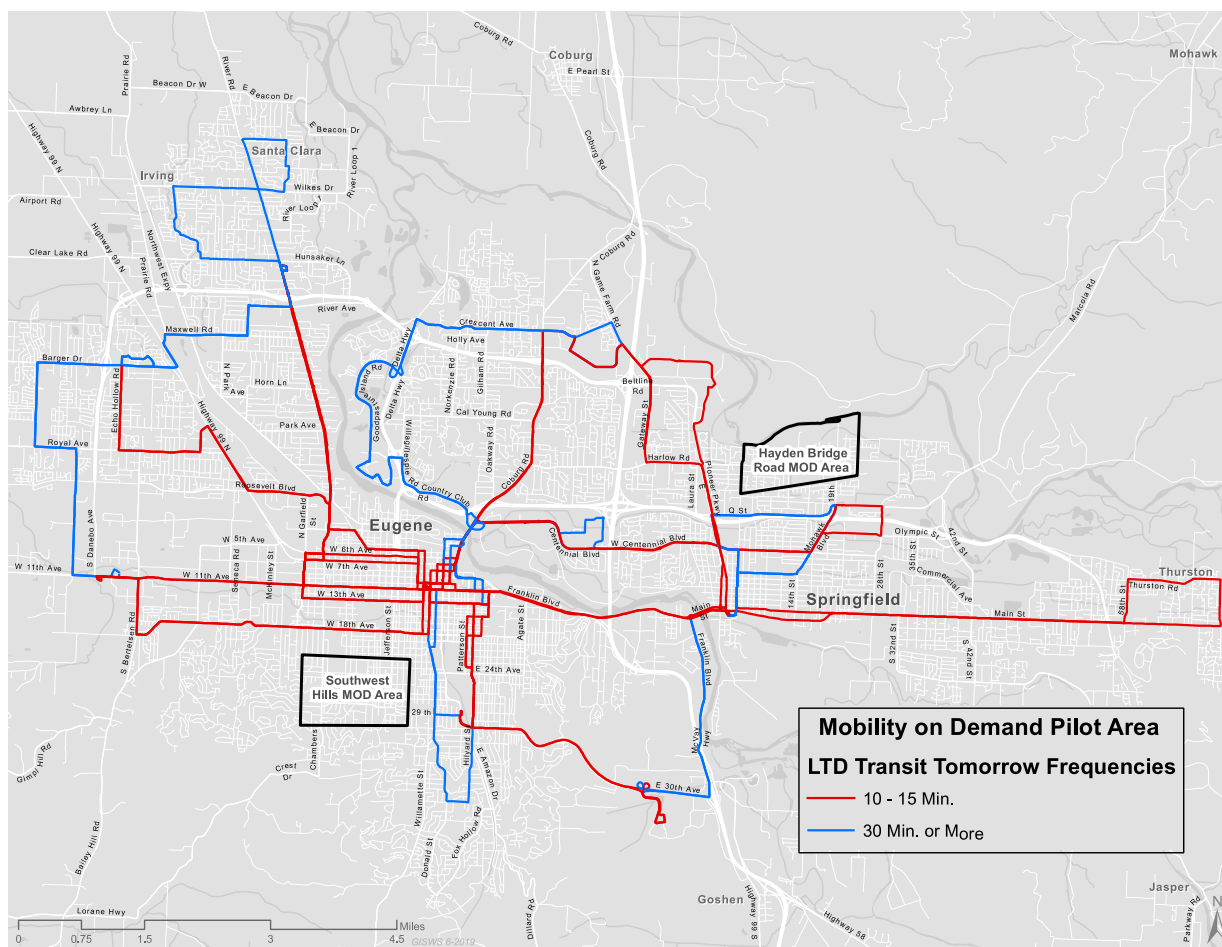
In terms of the scale of a potential mobility on demand program for Eugene / Springfield, we are anticipating a total budget level, annually, between \$400,000 to \$800,000 for these pilot services, approximately 1 to 2% of the fixed-route operating budget¹.

¹ Variable operating costs excluding agency overhead and other fixed costs are around \$40 million per year.

Two Proposed Areas for MOD Service

Given the assessment factors identified above, two areas were selected from about a half-dozen considered throughout the LTD Eugene/ Springfield service area. LTD staff and the consultant team explored various areas that might be appropriate for testing mobility on demand service. The two proposed areas are: 1) the Southwest Hills area of Eugene, and 2) the Hayden Bridge Road area of Springfield area (Figure 5).

Figure 5, Two Proposed Mobility on Demand Service Areas within the LTD Transit Tomorrow Network



Area 1. Southwest Hills MOD Area

The existing LTD Route 33 typically operates every 60 minutes on weekdays, increasing to every 30 minutes in peak service and serves a unique area in southwest Eugene. This route is not replicated in the Transit Tomorrow draft network. Route 33 currently operates from 6:15 a.m. to 8:00 p.m. with average daily boardings exceeding 20 passengers per hour throughout the day especially during peak and mid-day non-peak periods.

The area under consideration for a MOD pilot is from between 22nd Ave. to the north, 28th and 29th Ave to the south, and between Lincoln Street to the east and Garfield Street to the west (Figure 5). At 1.04

square mile in area, its 2010 resident population was almost 4,200 of whom 13.9% are age 65 and older, below the statewide average of 17.1% age 65 and older.² An estimated 19.6% of residents living in the MOD service area are low-income. Low-income is defined as within 150% of current Federal poverty guidelines. Within this MOD service area, an estimated 10.2% of persons are Limited English Proficient (LEP). Finally, an estimated 4.2% of households/persons have no access to a personal vehicle. Taken together, these population demographics suggest some level of transit dependency, as shown by the steady ridership throughout the day on Route 33.

Table 1, Southwest Hills- MOD Service Area Characteristics

<u>Variable</u>	
Area Size:	1.04 square miles
Block level total population:	4,182
Block level age 65+:	582 (13.9%)
Percent Limited English Proficient:	10.2% ¹
Percent < 150% of Federal Poverty Level:	19.6% ²
Percent Zero Vehicle Households:	4.2% ³
Route 33 – percent of revenue hours where average daily boardings exceed 20 boardings/hour:	
	46%
Total jobs (block group):	591
Distance to Eugene Station, mid-point:	2.3 miles

Notes:

¹ LEP is determined calculating block group data within the MOD service area.

² Federal Poverty level is determined calculating block group data within the MOD service area.

³ Zero vehicle households is determined calculating block group data within the MOD service area.

Among the trip generators, aside from area jobs of almost 600, is a retail, shopping area at Willamette and 29th and Amazon Station to the East. Eugene Station is located 2.3 road miles from the center of this Southwest Hills area.

Area 2. Hayden Bridge Road MOD Area

Part of the area served by the existing LTD Route 17, 5th Street to Hayden Bridge Rd. in Springfield is the focus of Area 2 for an MOD pilot project. The segment from Hayden Bridge Road south to State Highway 126 is not included in the draft Transit Tomorrow network. It is currently served one-way every 30 minutes from about 6:15 a.m. to 9:30 p.m. on weekdays.

Specifically, the area under consideration for the MOD is south of Hayden Bridge Road along the multi-use path, north to the limits of development at the McKenzie River, east to 19th Street and west to 5th

² Block group data, necessary for this small-area analysis, is only available from the 2010 U.S. Census. The Eugene city population **grew by 9.5%** between 2010 to 2017 – growing from 156,506 to 168,915 residents. It is assumed, therefore, that there is some increase in the population in this Eugene square mile service area but highly unlikely that there has been decrease.

Street (Figure 3). This is an area of 0.98 square miles, with about 2,500 residents of whom just 7% are age 65 and older.³

Area 2 is all of one and part of a second Census block group. Low-income households at 150% of Federal Poverty guidelines are between 7.6% and 10.6% of households. Persons of Limited English Proficiency are between 6.7% and 8.4% of residents. The area supports about 600 jobs.

The Hayden Bridge Road MOD is approximately 0.98 square miles with a 2010 resident population of over 2,500. Of this population 6.9% are age 65 and older, well below the statewide average of 17.1% age 65 and older.⁴ An estimated 24.9% of residents living in the MOD service area are low-income. Low-income is defined as within 150% of current Federal poverty guidelines. Within this MOD service area, an estimated 8.4% of persons are Limited English Proficient (LEP). And an estimated 4.5% of households/persons have no access to a personal vehicle. Similar to Southwest MOD service area, the population demographics indicate a level of transit dependency and supported by steady boardings throughout the day on Route 17.

The distance to the Springfield Station from the area's center point is 2.1 to 2.4 road miles.

Table 2, Hayden Bridge Road MOD Service Area Characteristics

<u>Variable</u>	
Area Size:	0.98 square miles
Block level total population:	2,562
Block level age 65+:	179 (6.9%)
Percent Limited English Proficient:	8.4% ¹
Percent < 150% of Federal Poverty Level:	24.9% ²
Percent/number Zero Vehicle Households:	4.5% ³
Route 17 – percent of revenue hours where average daily boardings exceed 20 boardings/hour:	
	56%.
Total jobs (block group):	611
Distance to the Springfield Station:	2.1 to 2.4 miles

Notes:

¹ LEP is determined calculating block group data within the MOD service area.

² Federal Poverty level is determined calculating block group data within the MOD service area.

³ Zero vehicle households is determined calculating block group data within the MOD service area.

When examining the different demographic characteristics of the two proposed MOD service areas, the Hayden Bridge Road MOD Area has a slightly higher transit dependent market in terms of people living in poverty. The number of average daily boardings exceeding 20 passengers per revenue hour suggests the potential for higher utilization compared to the Southwest Hills MOD.

³ Block group data, necessary for this small-area analysis, is only available for the 2010 U.S. Census. The Springfield city population **grew by 5%** between 2010 to 2017 – growing from 59,411 to 62,353 residents. It is assumed, therefore, that there is some increase in the population in this square mile service area and highly unlikely that there has been decrease.

PROPOSED SERVICE APPROACH FOR EUGENE/ SPRINGFIELD MOD PILOTS

Basic Life-line Level Service Design

To establish life-line level pilots for mobility on demand services commensurate with the election criteria presented previously, the dedicated vehicle service approach is proposed for two areas:

Area 1 - Southwest Hills; and

Area 2 - Hayden Bridge Road.

Pilot service will have an initial phase of a single dedicated vehicle to provide the core capacity for each service area. If demand builds and passenger wait times grow too long, an additional six (6) hours of revenue service is budgeted for peak period service in each area. The supplemental service can provide this added peak period capacity when demand exceeds capacity, as measured by increasing numbers of trips with wait times in excess of 70 minutes. Table 3 presents basic characteristics for both areas.

Table 3, MOD Operating Characteristics for Two Pilots

	Southwest Hills Area	Hayden Bridge Road Area
Operating Hours	6 a.m. to 9:30 p.m.	6 a.m. to 9:30 p.m.
Operating Days	weekdays only	weekdays only
Trips ordered via the Smart Phone app	yes	yes
Phone requests to RideSource for those without smart phones		
Dedicated Vehicles in Service at Peak	1	1
Supplemental Taxi Trips	yes	yes
Maximum Promised Wait Time	60 minutes	60 minutes
<u>Fare Option A – LTD Transfer Model</u>		
Fare – Trips to Nearest LTD Bus Stop With free transfer	\$1.75	\$1.75
<u>Fare Option B – RideSource Model</u>		
Fare - Trips to the Nearest LTD Bus Stop ¹	\$3.50	\$3.50
<u>Fare Option C - LTD Connector Model</u>		
Fare - Trips to the Nearest LTD Bus Stop ¹	\$1	\$1
<u>Fare Option D – Transit Stations Model</u>		
Fare – Trips to Nearest LTD Station With free transfer	\$5	\$5

Fare Policy

Developing a fare policy for MOD can be difficult as it is uncertain what fare sensitivities exist. Keeping fares too low can increase demand thereby reducing operational cost efficiencies while pricing fares too high can result in low productivity and ultimately eliminating transit access for users that relied upon existing fixed-route service. Several fare approaches are offered, anticipating it ultimately becomes an LTD policy decision as to the MOD fare policy to be implemented. MOD fare options include:

Option A – LTD Transfer Model, Using LTD Base Fare

This proposes to use the LTD base fare as the MOD fare, with transfers free. This departure from existing LTD transfer policy works on the assumption that this first-mile, last-mile service is making possible the fixed-route trip, hence the free transfer.

Option B - RideSource Model, reflects RideSource fare policy:

Given that these are demand response trips picking up passengers directly at home/ work addresses – a higher level of service than walking to the bus stop – this option proposes the \$3.50 RideSource fare between the pick-up address and the nearest bus stop. Again, the free transfer for fixed-route service would serve to encourage longer trips on the network.

Option C – LTD Connector Model, fare policy mirrors Cottage Grove MOD fares:

The LTD Connector model is to charge a single \$1 fare. This model would use the \$1 Cottage Grove fare for the immediate service area pick-up trips. Riders would pay the \$1.75 fare when connecting to a fixed-route bus line. The total \$2.75 fare would be less than Option B, the \$3.50 RideSource fare and LTD's transfer policy would remain consistent.

Option D – LTD Day-Pass Fare Model, for trips to Eugene Station or Springfield Station

LTD's day-pass fare is proposed for the home-to-station or reverse trip from the Eugene Station or to the Springfield Station. The inclusion of a transfer fare or not is a separate decision.

Discussion

Managing demand is a primary objective of the MOD fare structure. In the demand-response world, costs of a demand response service increase as demand builds simply because there are more miles to travel and more time required. Therefore, pricing plays an important role in effectively managing demand.

For the initial startup the existing RideSource fare structure could be an appropriate guide to apply with the pilot service. Currently, the LTD day pass fare is \$3.50, parallel to the RideSource fare. One approach would be to charge the first leg of a MOD trip at the cost of a day pass. This rationale for charging MOD riders this amount, akin to the RideSource rider, is that the MOD pilot is a premium service providing curb-to-curb service. In addition, the day pass fare will allow for a free transfer, either onto their next fixed-route connection and/or on through the day. Providing MOD riders with a day pass approach encourages use of the fixed-route and acknowledges that a first-mile or last-mile connection can be made on a MOD leg. Notably, this is a somewhat expensive trip if traveling only within the MOD service area; however, with the fare the same as that of a RideSource rider, it is not out-of-the-question.

Recommended Approach

Where trips can be taken within, adjacent and beyond the immediate MOD service area, becomes a critical policy choice for the LTD organization with significant budgetary implications. Of the alternatives related to the size and extent of the service area – from the riders' perspective - two are recommended, but to be implemented in a phased manner in order to better understand how demand for MOD services will present within Eugene and Springfield. Both pilots assumes that the MOD service area is clearly delineated.

Pilot Phase I – Both legs of every trip are within the service area:

Trips from one's pick-up point within the service area ***to/from the nearest LTD bus stop*** –

This recognizes the fundamental purpose of the service, namely to connect to the LTD network; with a service area of about 1 square mile, it is expected that there are few immediate destinations for which one can't simply walk and so it is unlikely travelers would only travel within the service area on the MOD service.

Pilot Phase II – At least one leg of every trip is within the service area:

If Phase I is successful and Phase II is deemed practical and economically feasible, this expanded service option could be tested. Trips from one's pick-up point within the service area ***to/from the nearest LTD transfer station***. Riders picked up anywhere within the area could be transported to the LTD's Eugene Station for the Southwest Hills service and to the Springfield Station from the Hayden Bridge Road area for an appropriate fare. For reverse trips, from the stations into either of the two service areas, there would need to be an identified, signed MOD pick-up location at the stations to minimize confusion.

A phased approach, considering these as pilots to build upon makes the most sense given the high degree of uncertainty about the public acceptance of and use of an MOD service, whether it provides shorter or longer trips.

Estimated Costs

Operations Costs

Costs are presented in terms of the actual cost experience for the Cottage Grove Mobility on Demand pilot and are projected for the two areas proposed here. Operations costs reflect dedicated vehicles for weekdays with base and extra capacity service and for Saturdays, base levels only (Table 4).

Costs for the two new pilots, Southwest Hills and Hayden Bridge Road, are identical, each projected at almost \$309,000 and 58% above Cottage Grove Mobility on Demand operations expense. This is largely because of the significantly larger number of revenue hours operated coupled with a slightly higher cost per revenue hour. Weekday revenue hours are projected at 5,483 annually with an additional 624 hours if Saturday service is added, a total of just over 6,000 revenue hours for each pilot area.

Operating costs are built from a cost per revenue hour that has a basis in the current MTM contract revenue hour expense with an added escalation factor and a contingency factor to accommodate some unknowns. The projected revenue hour cost of \$50.56 is 26% above the Cottage Grove revenue hours cost of \$40.

Table 4, Estimated Operations Costs for Three MOD Service Areas

MOBILITY ON DEMAND PILOT AREAS	OPERATIONS EXPENSE Dedicated Vehicle Operation Costs								Estimated Annual Total Operating Costs Weekday Base + Extra Capacity + Saturday
	Dedicated Vehicle Operations Cost per Revenue Hour	WEEKDAYS - Projected # of Revenue Hours per Day/ Base Vehicle	WEEKDAYS - Projected # of Revenue Hours per Day/ Extra Capacity	WEEKDAYS - # of Operating Days	WEEKDAYS - Annual Revenue Hours Base Plus Extra Capacity	SATURDAYS - Projected # of Operating Hours per Day/ Base Vehicle	SATURDAYS - # of Operating Days	SATURDAYS - Annual Revenue Hours	
Cottage Grove MOD Pilot	\$40	12	6	255	4,590	n/a	n/a	n/a	\$180,000
Area 1 - Southwest Hills	\$50.56 ^{\1}	15.5 ^{\2}	6	255	5,483	12	52	624	\$308,745
Area 2 - Hayden Bridge Road	\$50.56 ^{\1}	15.5 ^{\2}	6	255	5,483	12	52	624	\$308,745
TOTALS									\$797,489

\1 - Operating costs per hour are calculated based upon current RideSource contractor (MTM) revenue hour cost of \$38.69 per revenue hour plus a \$10 per hour contingency, escalated to 2020 to \$50.56. This is a calculated cost, removing ADA-specific costs such as assessment expenses.

\2 - Operating from 6 to 9:30 p.m. daily; base dedicated vehicle 6 a.m. to - 9:30 p.m.; extra capacity -12 p.m. - 6 p.m.

The assumptions used to develop Table 4 are as follows:

- **Dedicated Vehicle Operations Costs Per Revenue Hour** reflects the MTM contract rate of \$38.69 plus a \$10 contingency plus a 2020 escalation rate for a total of \$50.56. This is calculated to exclude costs that are specific to ADA paratransit trips, such as assessment costs.
- **Weekday operating hours** of both MOD service areas will be 6 a.m. to 9:30 p.m. and the base dedicated vehicle will operate those 15.5 hours, presumably with two driver shifts.
- **Additional weekday capacity** of six (6) hours is budgeted if demand builds and erodes wait times; the proposed standard is that 90% of trip pick-ups are within 60 minutes of the promised pick-up time. Additional capacity may be added during different timeframes for each of the services, depending upon how excess demand presents.
- **Weekdays** of 255 annually are used.
- **Annual weekday revenue hours** equals the base plus excess capacity times the number of weekdays.
- **Saturday operating hours** assumes LTD operating hours between 8 a.m. until 8 p.m.
- **Saturdays** of 52 annually are used.
- **Saturday annual revenue hours** equals the Saturday base revenue hours times the number of weekdays.
- **Estimated annual total operating costs** equal the sum of weekday and Saturday revenue hours time the

Capital Costs

Capital costs for the three MOD Service areas are presented in Table 5. Capital costs include both revenue vehicles and dispatch hardware and software.

Vehicle size can vary depending on the expected demand and LTD will want to determine what is the appropriate sized vehicle for its operation. For MOD service, vehicle are proposed to cost approximately \$80,000 to \$100,000 each for an 18-passenger gasoline vehicle. Should LTD choose to use an electric vehicle, the cost will increase to approximately \$140,000, with additional charging infrastructure required.

Dispatch equipment is included as part of the capital costs. Real-time scheduling will be required for the MOD service. A total cost of \$55,000 is estimated to equip LTD with dispatching hardware and software as well as tablets for each of the four (4) vehicles in the MOD fleet.

Table 5, Estimated Capital Costs for Three MOD Service Areas

MOBILITY ON DEMAND PILOT AREAS	CAPITAL EXPENSE			TOTALS
	Annual Mobility on Demand Software Costs	Dispatch hardware, including tablets for each vehicle	Shuttle bus/up to 18 passengers - 2 per service area ^{\4}	TOTAL CAPITAL BY SERVICE APPROACH
Cottage Grove MOD Pilot	\$12,000 ^{\3}	n/a	\$200,000	\$212,000
Area 1 - Southwest Hills	\$12,000 ^{\3}	\$55,000	\$200,000	\$294,500
Area 2 - Hayden Bridge Road	\$12,000 ^{\3}		\$200,000	\$239,500
TOTALS				\$746,000

\3 - TransLoc MOD software platform: \$500 monthly per vehicle.

\4 - Cost estimate for 18-passenger gasoline revenue vehicles. Capital costs can increase from \$80,000 per gasoline-powered vehicle to \$140,000 per electric bus plus charging infrastructure expense.

Ridership, Performance Measurement and Evaluation

Ridership and key performance indicators are projected in Table 6 building from various conservative assumptions. It is anticipated that ridership totals on these proposed mobility on demand pilots could approach 100 passengers per day, somewhat higher than Cottage Grove given a greater population base and density.

Table 6, Projected MOD Ridership and Potential Performance Measures

MOBILITY ON DEMAND PILOT AREAS	PERFORMANCE INDICATORS						
	Estimated Riders per Day per Service Area (Assuming Base + Extra Capacity)	Projected Riders Per Dedicated Vehicle Revenue Hour	Projected Annual Ridership	Cost Per Passenger Boarding	Percent Trips Picked-Up No Later Than 60 Minutes	Median Wait Time, In Minutes	Average Trip Length
Cottage Grove MOD Pilot	70	4.9	17,850	\$10.08	99.4%	9.5 min.	3.8 miles
Area 1 - Southwest Hills	86	4.0	21,930	\$14.08	98%	15 min.	unknown
Area 2 - Hayden Bridge Road	86	4.0	21,930	\$14.08	98%	15 min.	unknown
TOTALS	242		61,710				

Productivity, passengers per revenue hour, is estimated at a somewhat lower levels of 4.0 trips per hour versus Cottage Grove's 4.89 riders per hour. A lower productivity level is projected for the service start-up period given a modest level of trip generators within these areas and uncertainty as to the levels at which riders would use this service to connect to the LTD network. At this level, ridership would approach 22,000 passenger trips annually in each pilot area.

Key performance indicators include, at a minimum, cost per passenger trips and the proportion of trips picked up within the on-time performance window of 60 minutes, as well as the median wait time for a vehicle. These indicators provide insight into service cost effectiveness and the quality of service provided. Monitoring average trip length will provide insight into trip distances and trip lengths. Within that, it will be important to track trips to adjacent LTD route bus stops versus longer trips to connect at the transfer stations, Eugene Station or Springfield Station.

The MOD service described for these two service areas has a long operating day. Achieving reasonable productivity levels, namely above four passengers per hour, over the full span could prove challenging. However, the ridership on the relevant routes currently operating within these areas, showed significant proportions of the day with fixed-route productivities of 20 passengers per hour. It is hoped that these MOD service area can exceed the conservative 4.0 passenger per hour productivity level of service across the day in light of this steady fixed-route transit use.

Marketing and Promotion

The introduction of these pilots must be accompanied by substantive marketing and public education and awareness activities. For each MOD service, it will be necessary to pay particular attention to the marketing and promotion aspects of these services and its first-mile, last-mile connections. Alternatively, this service risks being "invisible", just one more option but one of which the targeted riders are unaware.

A marketing plan is strongly recommended, to ensure that all relevant customer information tools are tapped. A modest marketing budget will be necessary to communicate the intricacies of MOD and how users can best utilize the service. Although not quantified in the operations budget, it could be as little as \$10,000 and be effective. A technology plan is recommended as well, to ensure that new transit connections at each stop are entered into the General Transit Feed Specification - Flex (GTFS-flex) information is appropriately provided to ensure that accurate information is available to Google Transit Trip Planners, among others.

Marketing efforts for the MOD service are the responsibility of LTD, at a minimum to include:

- Development of a simple marketing and promotion plan, with targeting of residents of the pilot areas through localized mailers and other media.
- Consideration of and then design of branding that is unique but complements other relevant LTD initiative, while giving a special “look” to these pilots.
- Preparation of marketing collateral that can be used to promote the service, including printed riders’ guide, service map, website content, social media content, and bus stop/bus shelter signage and information.

Implementation of the marketing and promotion campaign could include some type of “launch” event to bring visibility to the MOD service and on-going promotion to continue to inform the potential riders of this new service and local connections.

In addition, it will be important to ensure that all technological information tools are employed and provide accurate information so that potential riders in these communities can “discover” this new service and then feel confident in “using” it. More importantly, with improved technology, the opportunity to create a seamless environment to connect between modal options will become the norm. Because of the nature of MOD, many riders will access the service via the internet, and it will be necessary to ensure that LTD bus schedule information is accurate and current GTFS information is provided to Google Transit and other trip planners.

Technology-related passenger information activities should include, but are not limited to:

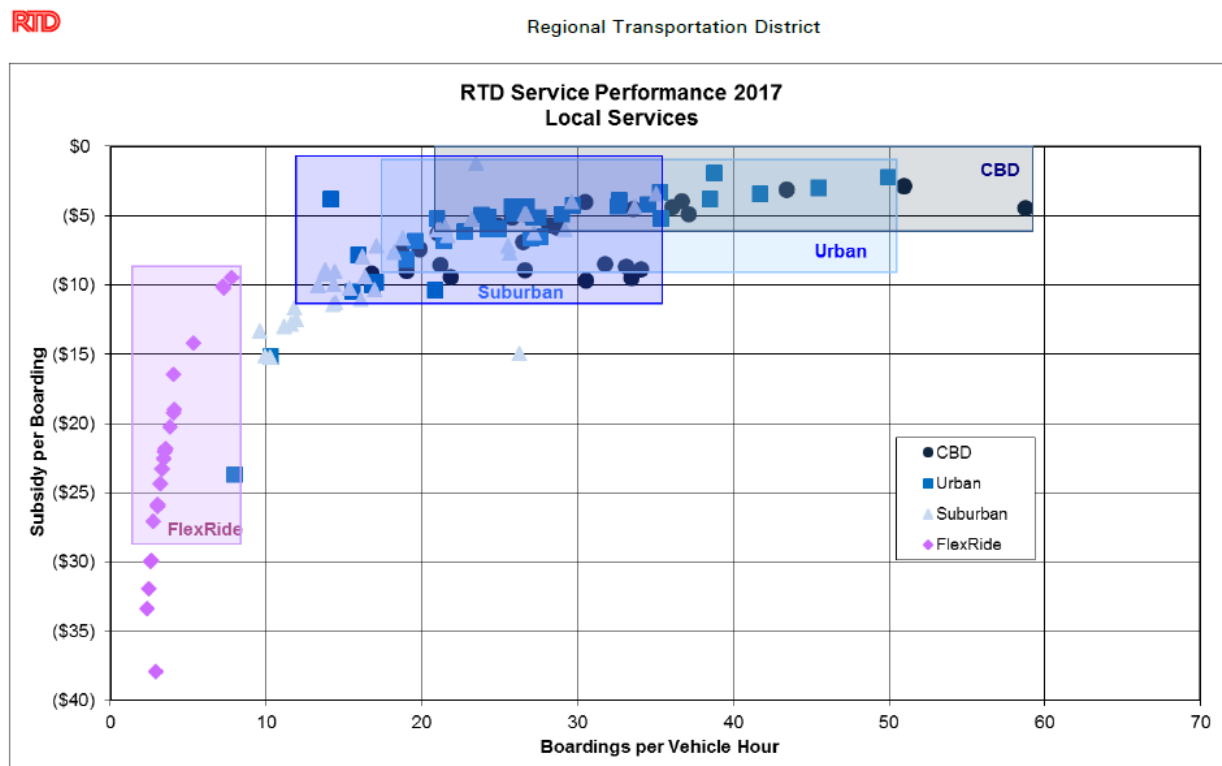
- Monitor the development of GTFS-Flex tools and deployment and modify the LTD trip planner as appropriate.
- Ensure that procedures are in place to provide current GTFS information and current schedule information for connecting busses;
- Regularly update GTFS information when there is any change in the routing or scheduling of local fixed-route bus connections.
- Ensure that LTD’s website prominently reflects this new MOD service.

Case Study: Denver RTD’s Flex Ride Experience

As noted previously, the gold standard in operation of mobility on demand services is Denver RTD’s FlexRide, formerly the Call n Ride program. Figure 6 presents the productivity and cost per trip of the 21 FlexRide services in operation around greater Denver at the end of FY 17/18. The pink squares in Figure 6 to the far left depict reflect the range of operating experiences of these 21 FlexRide services, in relation to other Denver RT regional and local bus services. FlexRide services’ productivity, measured in

passengers per hour, had a mean of 4.03 and ranged from 2.46 to 7.78 boardings per hour. Cost per passenger had a mean value of \$19.11 and ranged from a high of \$37.88 to a low of \$9.44 per boarding.

Figure 6, Denver RT Family of Services, Including its Flexride Programs



Denver RT's experience has been characterized by careful and ongoing assessment and monitoring of its individual mobility on demand services, to pull some out of service and to start new ones as conditions warrant. The individual communities' experiences are widely different, as demonstrated in Figure 6, and yet they provide a low-density complement to other more efficient, high speed mass transit programs of this regional provider. While mobility on demand services are potentially more costly than fixed route, in the right service environment and with the right ingredients of demand and trip attractors, it can be an excellent complement to a region's overall mobility program.

With LTD's long-standing experience in the management and operation of its RideSource program, it has the potential to become an effective provider of mobility on demand services, if all the right conditions present.