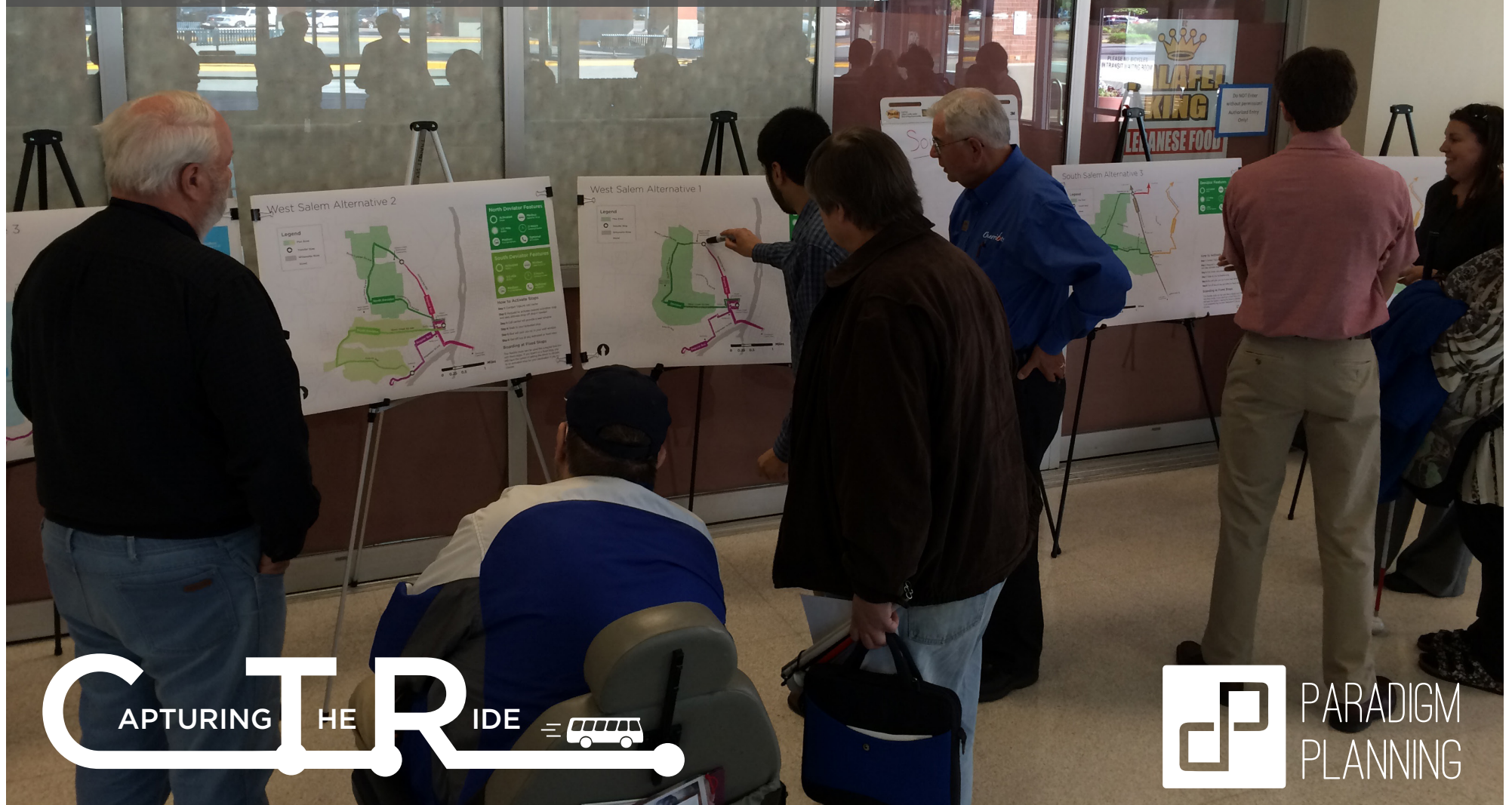
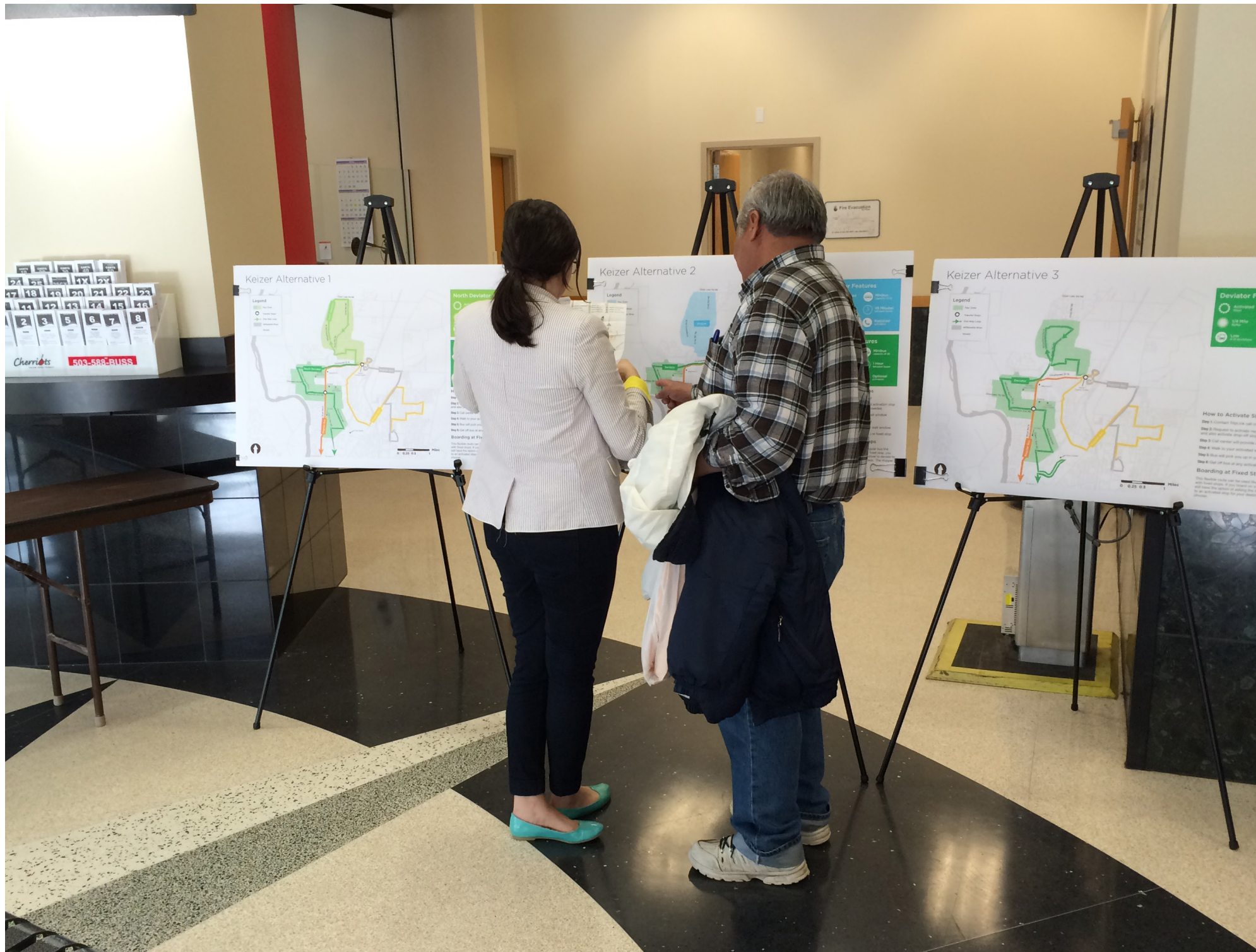


# Appendix D

## Alternatives Report













# Table of Contents

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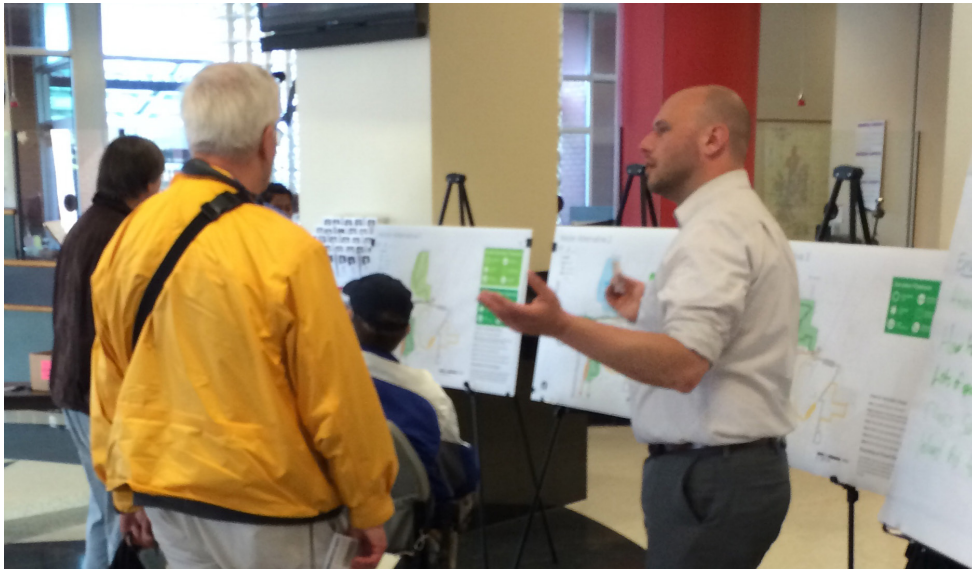
	Introduction	D3
	Methodology	D3
	Flexible Transit Types	D7
	Keizer	D11
	South Salem	D17
	West Salem	D23

# Alternatives Process

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## Introduction

In this document is an explanation of the flexible transit types and the draft alternatives for what flexible transit could look like in each of the neighborhoods of Keizer, South Salem, and West Salem. These drafts were used at the Flexible Transit Open House to help illustrate the alternative proposals for each study area to the public and Salem-Keizer Transit Staff. Members of the public and staff then provided feedback on these alternatives to help further inform the creation of the final recommendations.



Flexible Transit Open House attendees discussing the Keizer alternatives.

## Methodology

Each alternative was derived from the findings of the Existing Conditions Report, Best Practices Report, and the community outreach that had been conducted. Each alternative explores route options as well as six features of flexible transit that compliment each route. These features are stop type, number of deviations, planning ahead, vehicle type, flexible zone size (or buffer size), and frequency.

The stop types feature fixed stops on Deviator routes, and activated stops in Deviator and Hopper flexible transit zones. The activated stops, which act as collection points, would be spread throughout the flex zone. Activated stops were chosen over door-to-door service in response to the desire residents expressed during our community outreach efforts to have smaller wait windows and more timely routes in exchange for walking up to five minutes.

The vehicle type used would be a minibus much like what is used for CherryLift services. Using a car, van, and a full size bus were the other options that were explored. A full size bus would not be ideal for this type of system given the narrow streets that may be used for deviations. Additionally, through our community outreach we learned that a larger group of community members were comfortable with a minibus than a van or car. A minibus would also allow for a

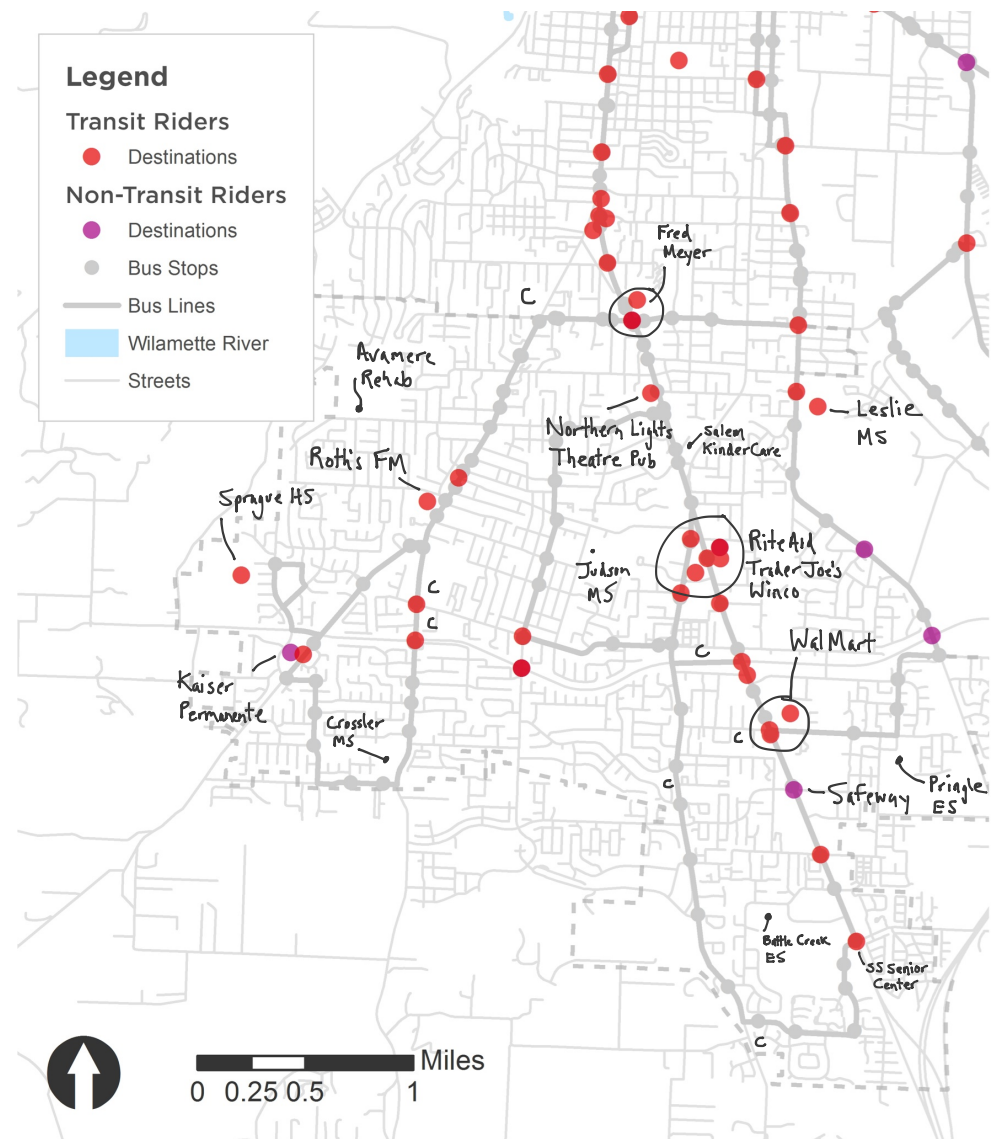


greater capacity than a van, which could limit the ability of the flexible transit service to grow.

Planning ahead would be optional for the Deviator service at fixed stops but necessary if the bus needs to deviate to an activated stop. Planning ahead is always required for the Hopper service. A reservation for activating a stop should be made at least one to two hours in advanced. A subscription service could also be used for regularly occurring deviations. As the final recommendations are chosen, the details of a subscription service and amount of time needed for planning ahead will be further defined.

The routing of each alternative was determined through a multi-step process. First, a map was created of all the trip start and end points that were reported through at our workshops and on our surveys. Then, key commercial, school, and community resources in each neighborhood to add to these maps. Large multi-family housing developments were also mapped. Using a combination of information regarding riders' values, travel patterns, and existing conditions data, Paradigm Planning created feasible route options. Figure 1 shows an example of a map of destinations in South Salem.

Figure 1. Destinations in South Salem



# Alternatives Process

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## Methodology

Once the alternatives were developed, they were tested to determine how long each route would take with varying numbers of deviations and buffer sizes. Each alternative was tested with zero to seven deviations at buffer sizes of a quarter mile, half mile, and three-quarters of a mile. The following equation was used to calculate the time of each route:

$$T = (D + n * 2L) * (60 / 17)$$

where

T = time of the route in minutes

D = distance of the route in miles without deviations

n = number of deviations

L = length of the deviation in miles (buffer size)

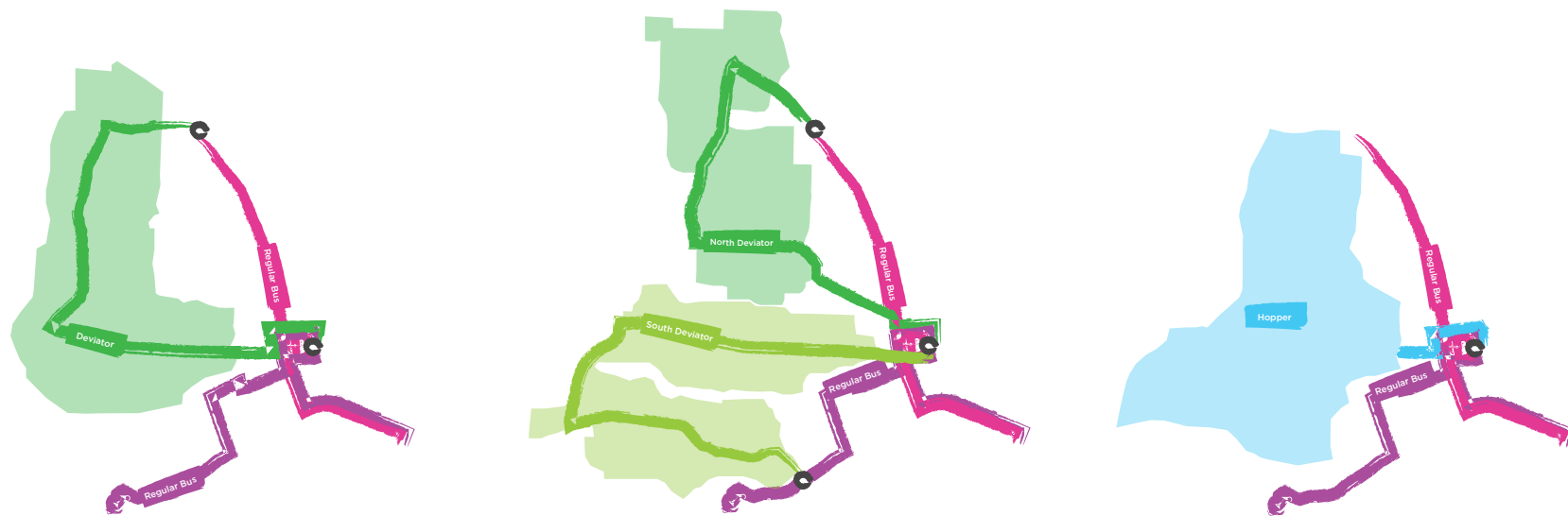
The equation assumes that the bus travels at 17 MPH. This number was provided by Salem-Keizer Transit and represents the average speed of buses along Cherriots routes including stops and traffic lights. Additionally, the formula assumes that each deviation will be to the edge of the buffer zone. Thus, these calculations represent the maximum time the route would take with  $n$  number of deviations.

After all of the route timings were calculated, Paradigm Planning was able to use this information to analyze trade-offs between coverage (the buffer size) and number of deviations that would be possible in order to meet the time goals for each route.

Once the number of deviations was determined, it was divided by the length of each route to determine the number of deviations per mile. Each value was then classified as either a low, medium, or high number of deviations. (Note that these are not standardized classifications, but are based on this study's numbers relative to each other). Up to 0.7 deviations was considered low, between 0.7 and 1.2 deviations was considered medium, and above 1.2 deviations was considered high. These classifications were used only as a way of helping the public understand the trade-offs between the different alternatives.

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The frequencies, or how often the buses run, were chosen to create trade-offs between the different alternatives, while ensuring there was not an increase from current level of frequency provided in each of these areas today, since flexible transit is meant to use relatively the same amount of resources to provide more expansive coverage and service.



# Flexible Transit Types

## Overview

Flexible transit combines features of fixed-route transit with dial-a-ride service to create a customized system. The service is flexible in the sense that the bus route can be altered to best respond to the demand of the community on an as-needed basis. There are many types of flexible transit with variations in the area they cover, where they pick up and drop off riders, what type of scheduling is used, the size of vehicles, and the cost of the system. Each flexible transit service is unique because there needs to be the right balance between efficiency and flexibility. There is not a single type of flexible transit service that would work in every community. The key to making flexible transit work is to cater a system for each community to help meet each of those community's needs.

## Flexible Transit Characteristics

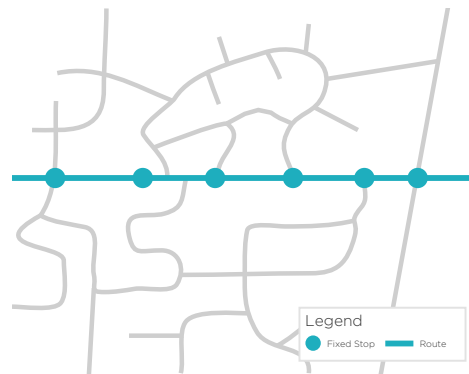




# Flexible Transit Spectrum

## Fixed Route

Cherriots is the good old-fashioned bus service that everyone is familiar with. The bus follows the same route and makes the same stops each day. If you want to ride the bus, you can show up at the nearest stop and expect it to arrive at a scheduled time.



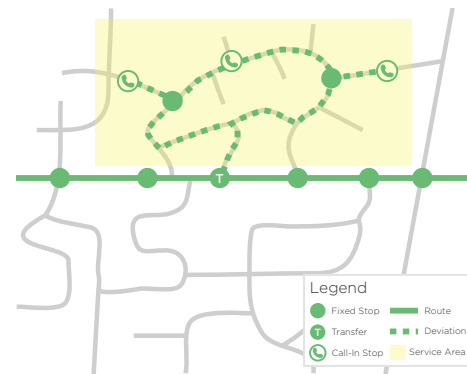
## The Deviator

The Deviator is the most like fixed-route service. The bus goes on the same route and makes similar stops. The biggest difference is that it will go off of the normal street when needed or requested to pick people up and drop people off.



## The Hopper

The Hopper is less like a fixed route and more like dial-a-ride service (a shared taxi). There are fewer regular bus stops for jumping on and off, but the bus can go anywhere in the neighborhood or any defined area with some kind of notice.



## Dial-a-Ride

Not as well known because it's restricted to seniors and people with disabilities. CherryLift buses are a lot like shared taxis, in that they will pick you up (and anyone else along the way) and take you anywhere you want to go in Salem or Keizer. There are no bus stops or schedules, instead you have to call in advance to make reservations.



**Cherriots**  
SALEM-KEIZER TRANSIT

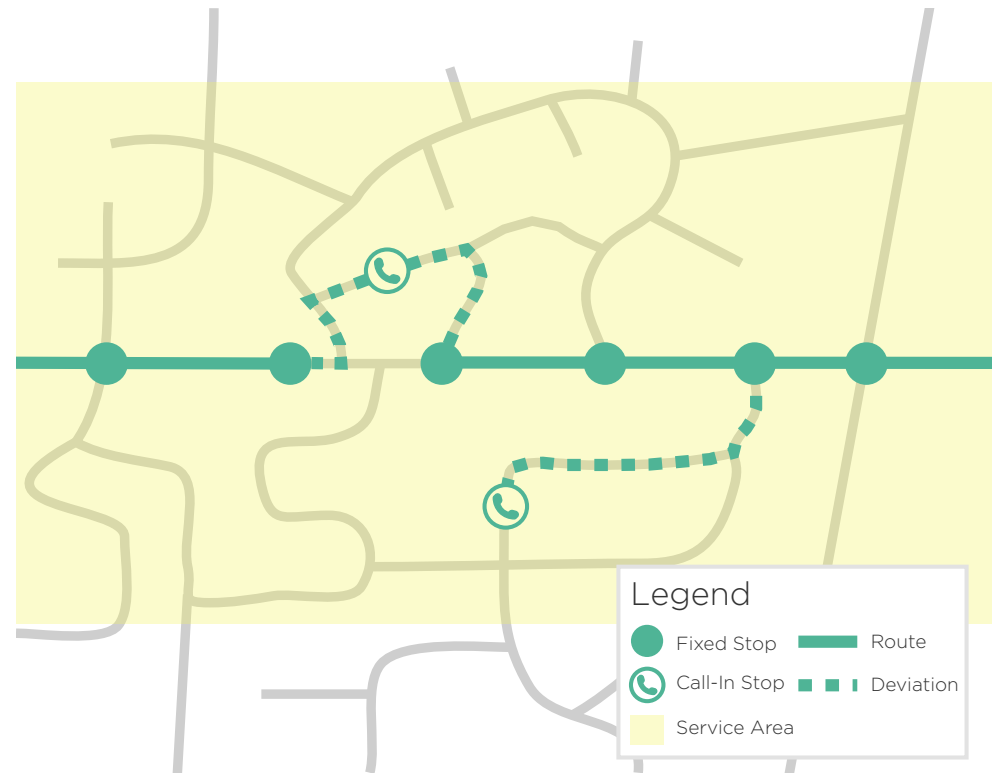


Salem - Keizer Transit  
**CherryLift**

# Flexible Transit Types

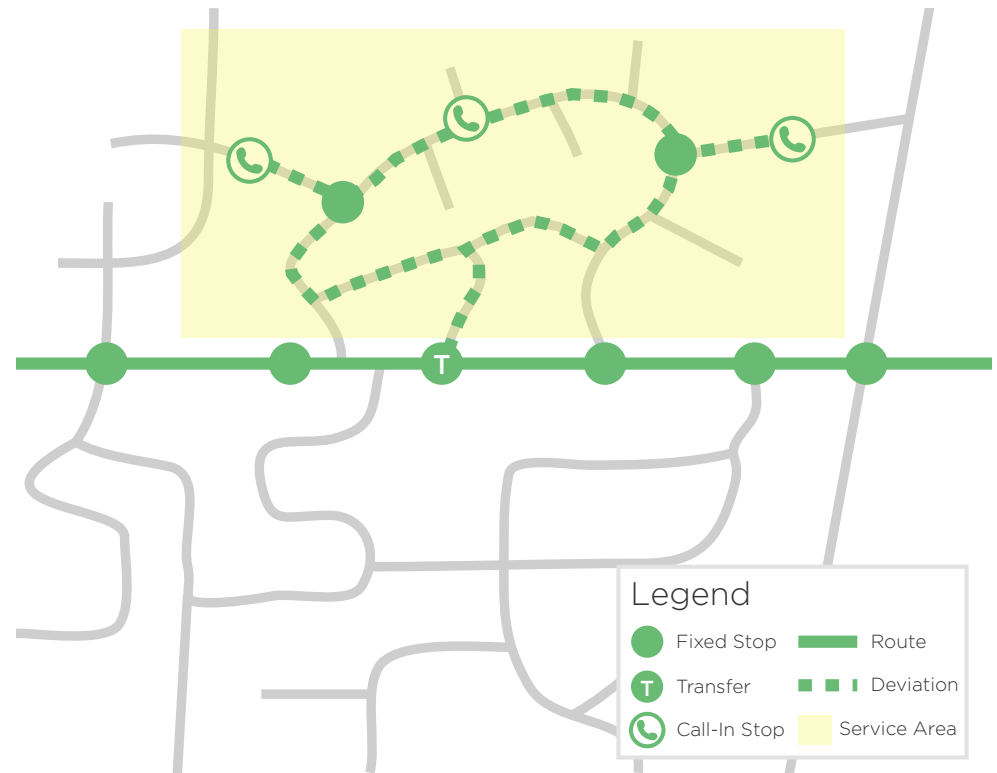
## The Deviator

The Deviator is a form of flexible transit that is the most like fixed-route service. The bus has a predetermined route and scheduled stops much like a regular bus. The biggest difference is that it will go off of the normal route when requested to pick people up and drop people off. The bus can deviate anywhere within the designated service area. Contacting a call center would be required to request a deviation. Riders can request drop-off destinations ahead of time or when they are on the bus. The “Call-In Stop” markers in the picture to the right represent homes or designated collection points where people have requested a deviation. After a deviation to pick up or drop off a rider, the bus will return to its normal route. A deviator would always pick up and drop off at regular bus stops.



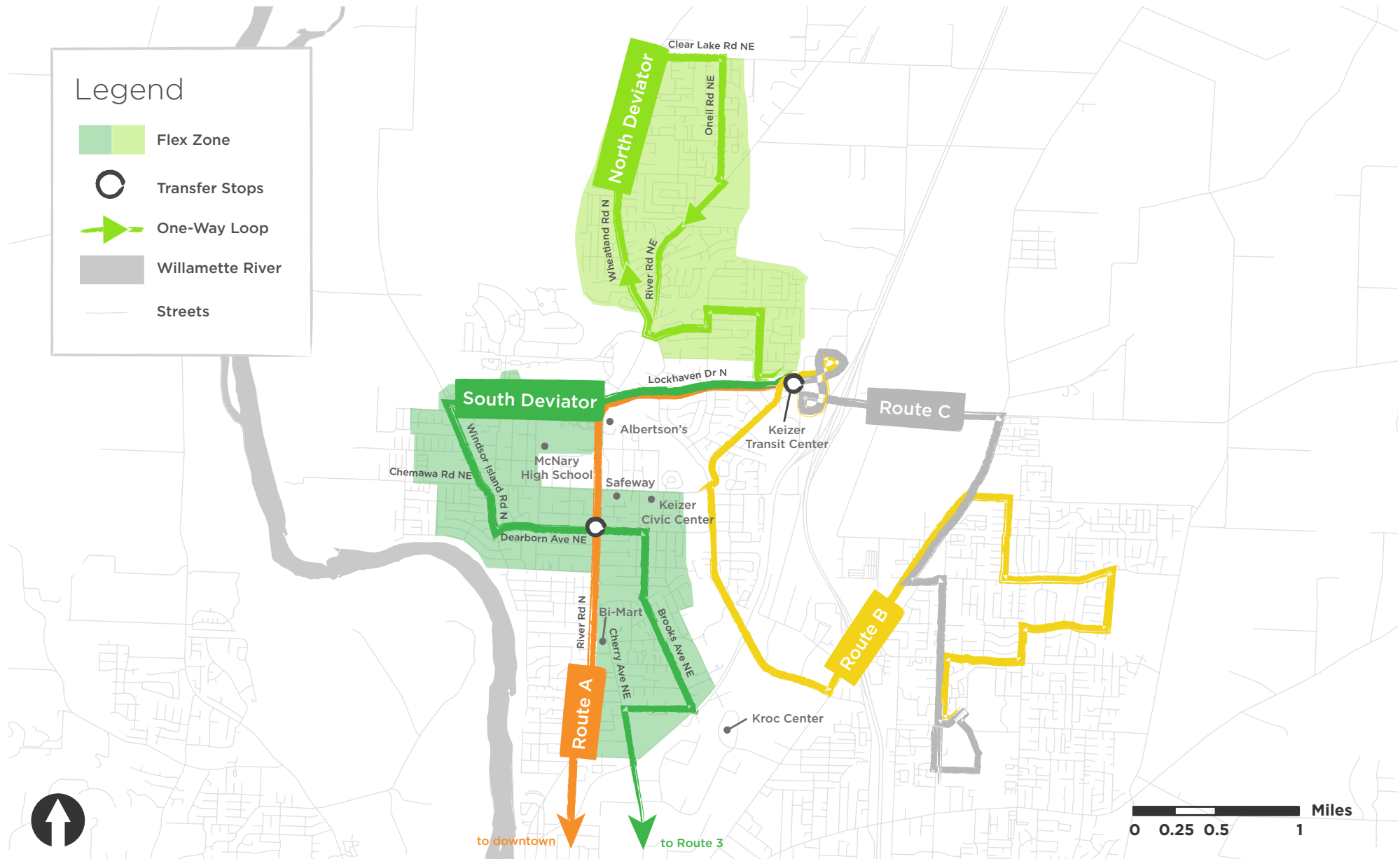
# The Hopper

The Hopper is a form of flexible transit that is more like dial-a-ride service (i.e. shared taxi). The Hopper also has a zone for pickups and drop-offs much like a Deviator, except in this case there is no regular bus route. The Hopper “hops” around the zone, picking people up from homes or designated bus stops. This service can be used to travel anywhere within the zone or to a bus transfer point in order to leave the zone by bus. Reservations may need more advanced notice than the Deviator due to the greater flexibility of the route. Requests to be dropped off may be made ahead of time or once on the bus. The “Call-in Stop” markers in the picture to the right represent homes where people get picked up curb-side. The fixed stops along the Hopper’s route are places the Hopper travels to each time where riders can get on and off without reservations. Such stops might be placed at primary destination points such as shopping centers.





# Keizer Alternative 1



## Overview

The first alternative in Keizer has two Deviators—the North Deviator (7 miles), and the South Deviator (6.9 miles).

The North Deviator would have 45-minute headways starting at the Keizer Transit Center, collecting people within a quarter-mile buffer zone of River Road N and Wheatland Road N before heading back to the transit center. A medium number of deviations would be available on this route. The North Deviator would be seven miles long.

The South Deviator would run from the Keizer Transit Center, west to Chemawa, then use Dearborn Avenue NE to get to Brooks Avenue NE, where it would start heading south to connect to a transfer point on Route 3. The South Deviator would have a quarter-mile buffer for deviations, one-hour headways, and a low number of deviations due to the length of the route. The intersection with Route A would allow people to transfer to this frequent service route to head downtown.

## Features

### North Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/4 Mile**  
Buffer



**45 Minutes**  
between buses



**Medium**  
# of deviations



**Optional**  
activation

### South Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/4 Mile**  
Buffer



**1 Hour**  
between buses

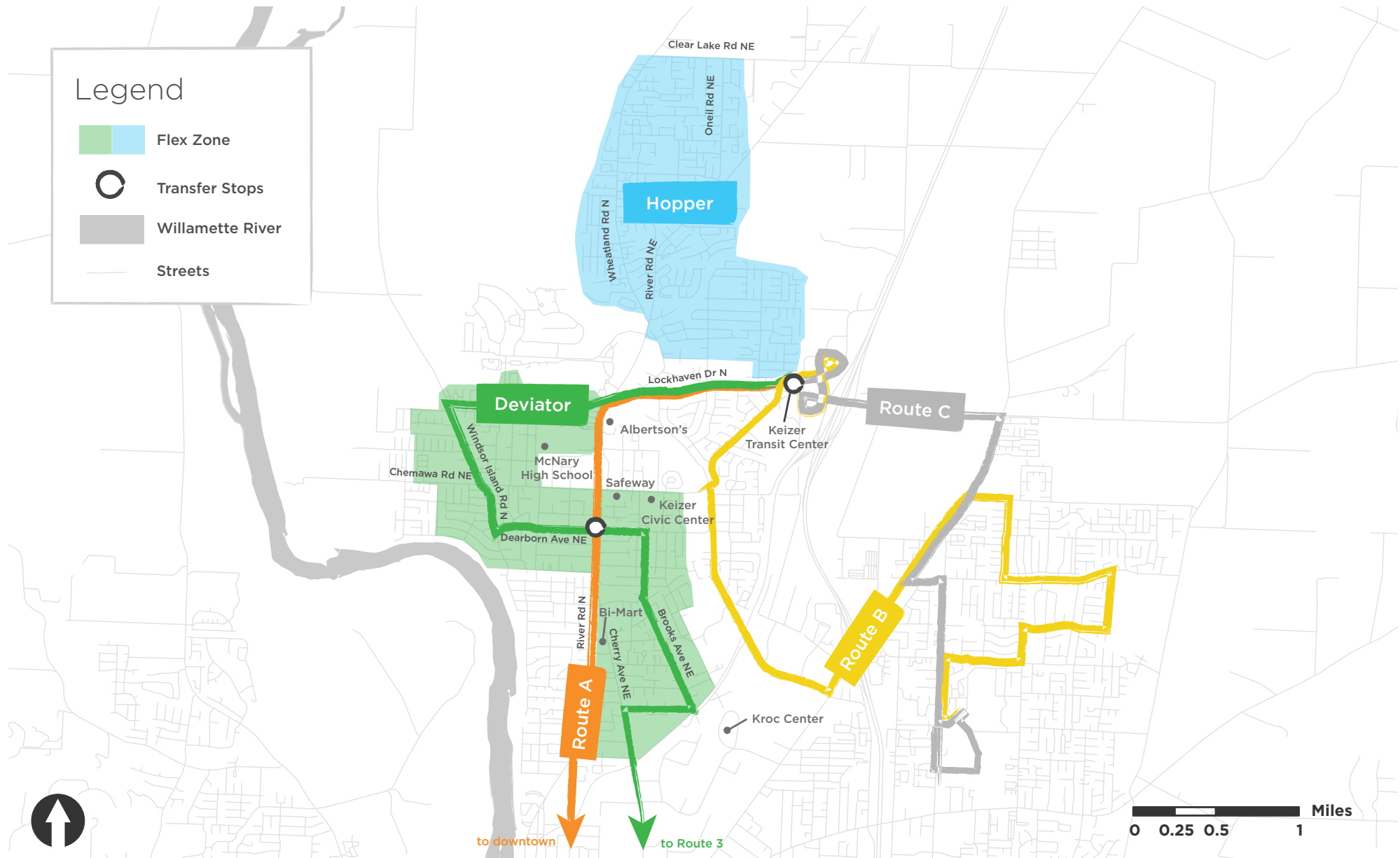


**Low**  
# of deviations



**Optional**  
activation

# Keizer Alternative 2





## Overview

The second alternative has the same South Deviator as the first alternative. However, in this alternative the North Deviator is replaced with a Hopper. This Hopper service would allow for stops to be activated anywhere in the zone, and people would be picked up and dropped off without having to follow a fixed route. The bus will start and end every 45 minutes at the Keizer Transit Center. This alternative allows for greater flexibility of traveling within the neighborhood and could allow for more efficient travel to Keizer Transit Center if not many people are using the service within the hour.

## Features

### Hopper



**Activated**  
Stops



**Zone**  
Coverage



**Medium**  
# of deviations



**Minibus**  
capacity of 22



**45 Minutes**  
between buses



**Required**  
activation

### Deviator



**Activated**  
Stops



**1/4 Mile**  
Buffer



**Low**  
# of deviations



**Minibus**  
capacity of 22

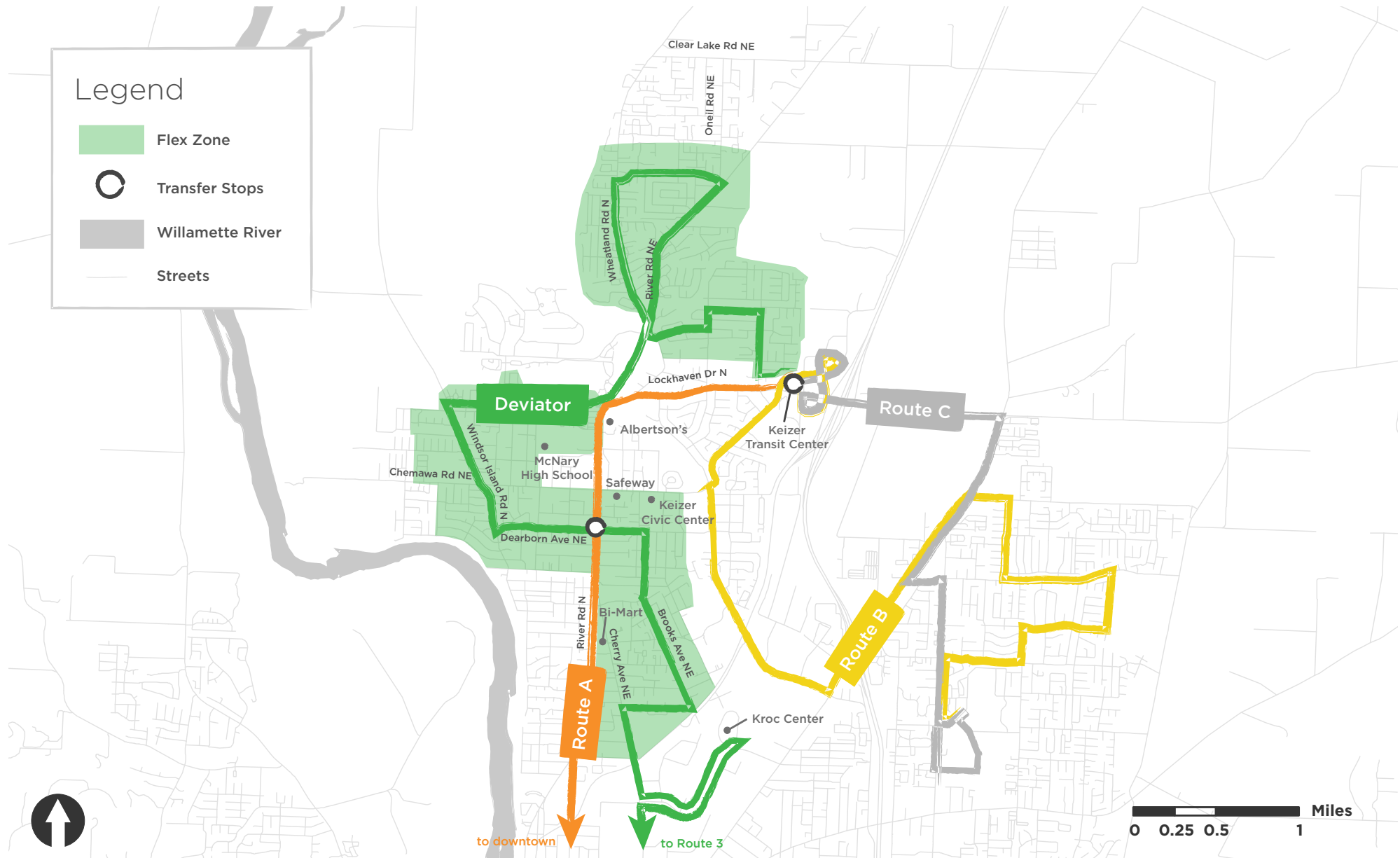


**1 Hour**  
between buses



**Optional**  
activation

# Keizer Alternative 3



## Overview

This alternative combines the North and South Deviator from Alternative 1 into one long Deviator route (12.6 miles). Here, the Deviator will have a quarter-mile buffer with a low number of deviations in order to still run on a one-hour headway given the larger distance it is covering. Two buses would run in opposite directions on this route in order to serve this route. This alternative would also have a fixed stop at the Kroc Center, which would not be served by Alternatives 1 or 2.

## Features

### Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/4 Mile**  
Buffer



**1 Hour**  
between buses



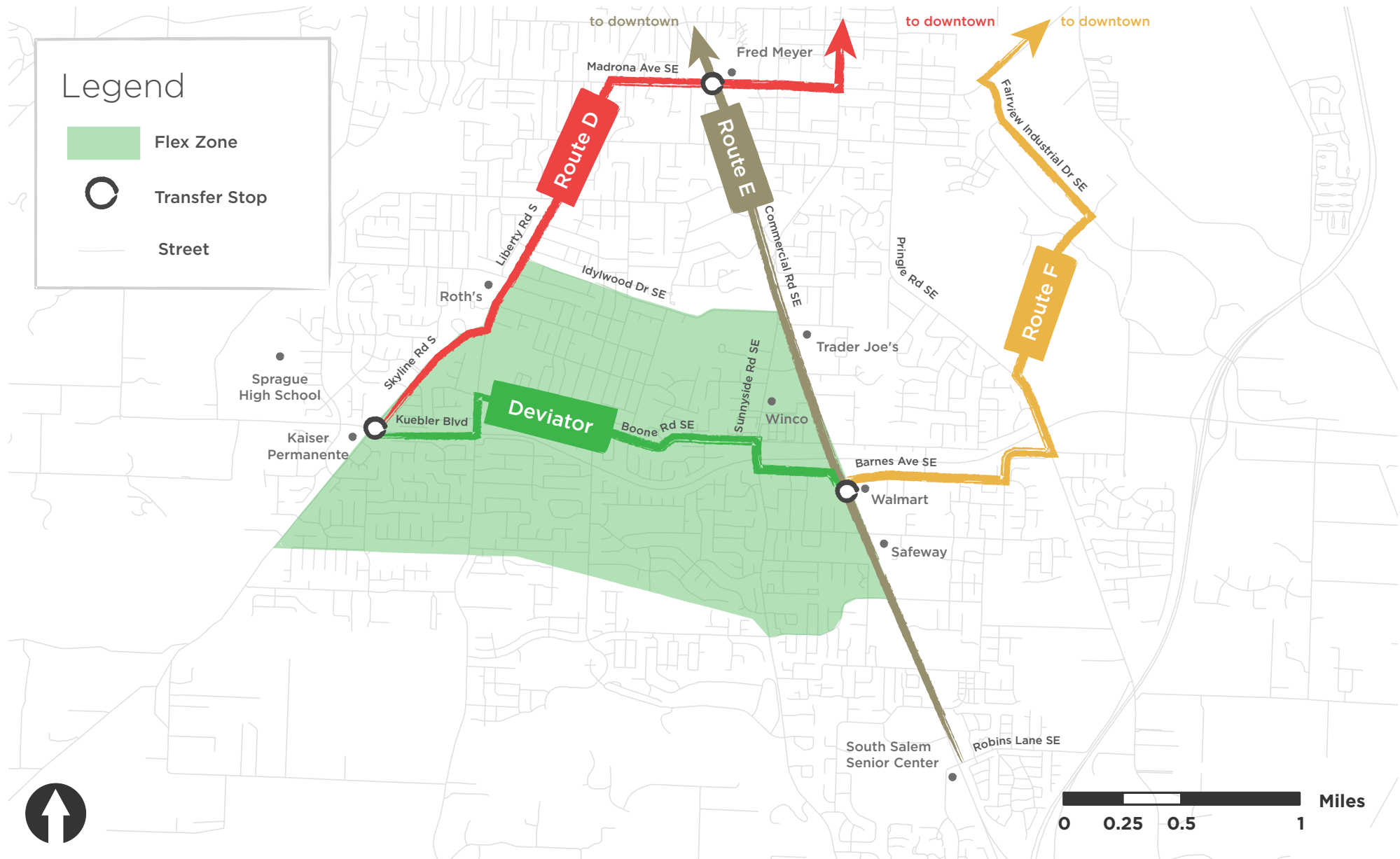
**Low**  
# of deviations



**Optional**  
activation



# South Salem Alternative 1



## Overview

South Salem Alternative 1 provides a short Deviator service between Routes D and E (2.6 miles). The fixed-route portion of the bus would travel on Kuebler Boulevard and Boone Road SE. Since the distance covered is fairly short, this route would be able to deviate up to three-quarters of a mile off the route with a high number of deviations while still maintaining one-hour headways. This service would allow for a connection between the two major bus lines that get South Salem residents downtown.

## Features

### Features



**Activated**  
Stops



**Minibus**  
capacity of 22



**3/4 Mile**  
Buffer



**1 Hour**  
between buses

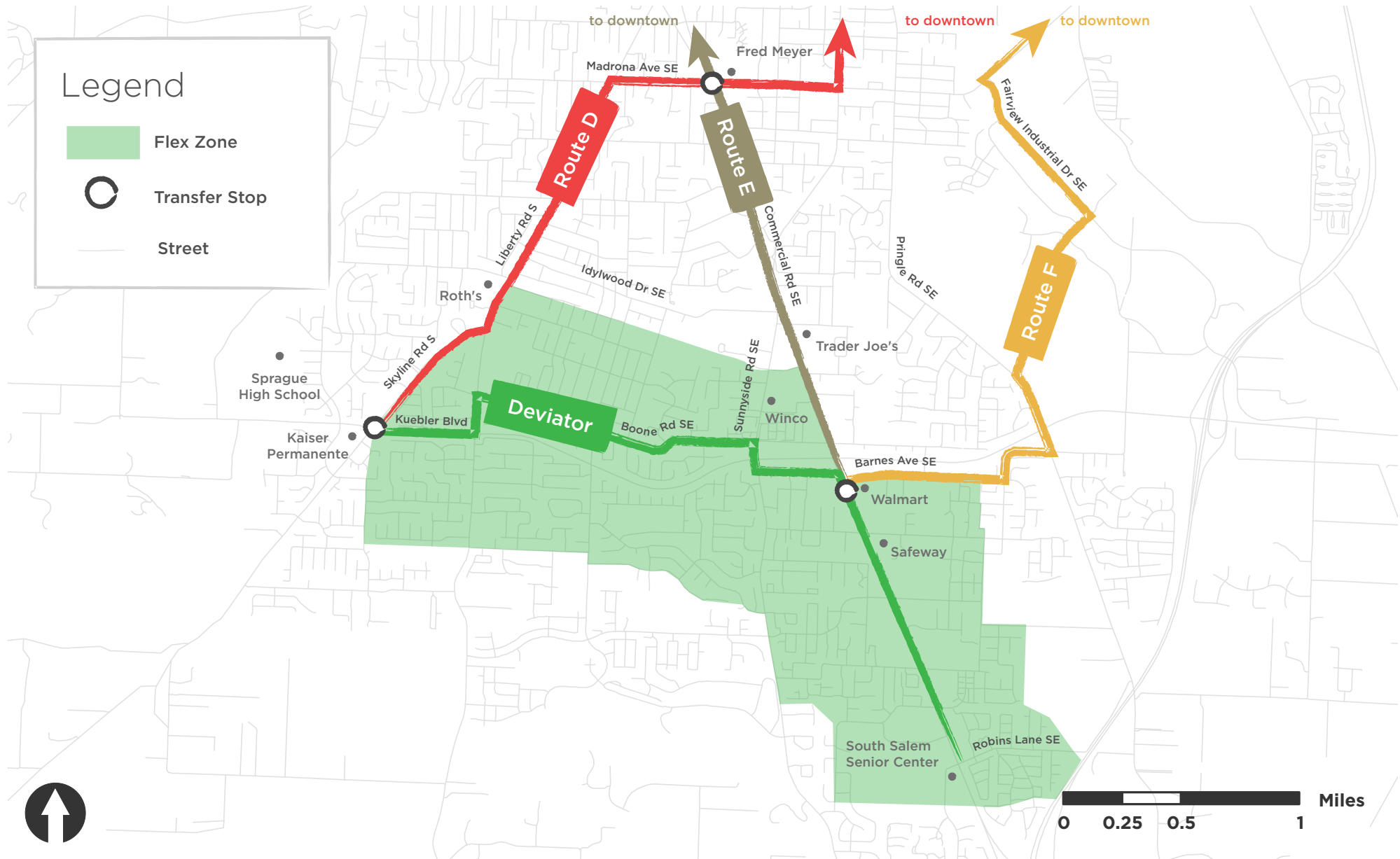


**High**  
# of deviations



**Optional**  
activation

# South Salem Alternative 2





## Overview

The second alternative for South Salem extends the Deviator in Alternative 1 to also cover the segment of Commercial Road SE south of the Walmart shopping center (Barnes Avenue SE) all the way to South Salem Senior Center (3.8 miles). This segment of Commercial Road SE has lower ridership than the fixed route portion to the north, so running a Deviator here would allow for greater coverage for more of suburban outer South Salem. The trade-off for this expanded coverage would be that this bus would run with a half mile buffer zone for deviations instead of the three-quarter mile buffer zone provided in Alternative 1. A high number of deviations would still be available.

## Features

### Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/2 Mile**  
Buffer



**1 Hour**  
between buses

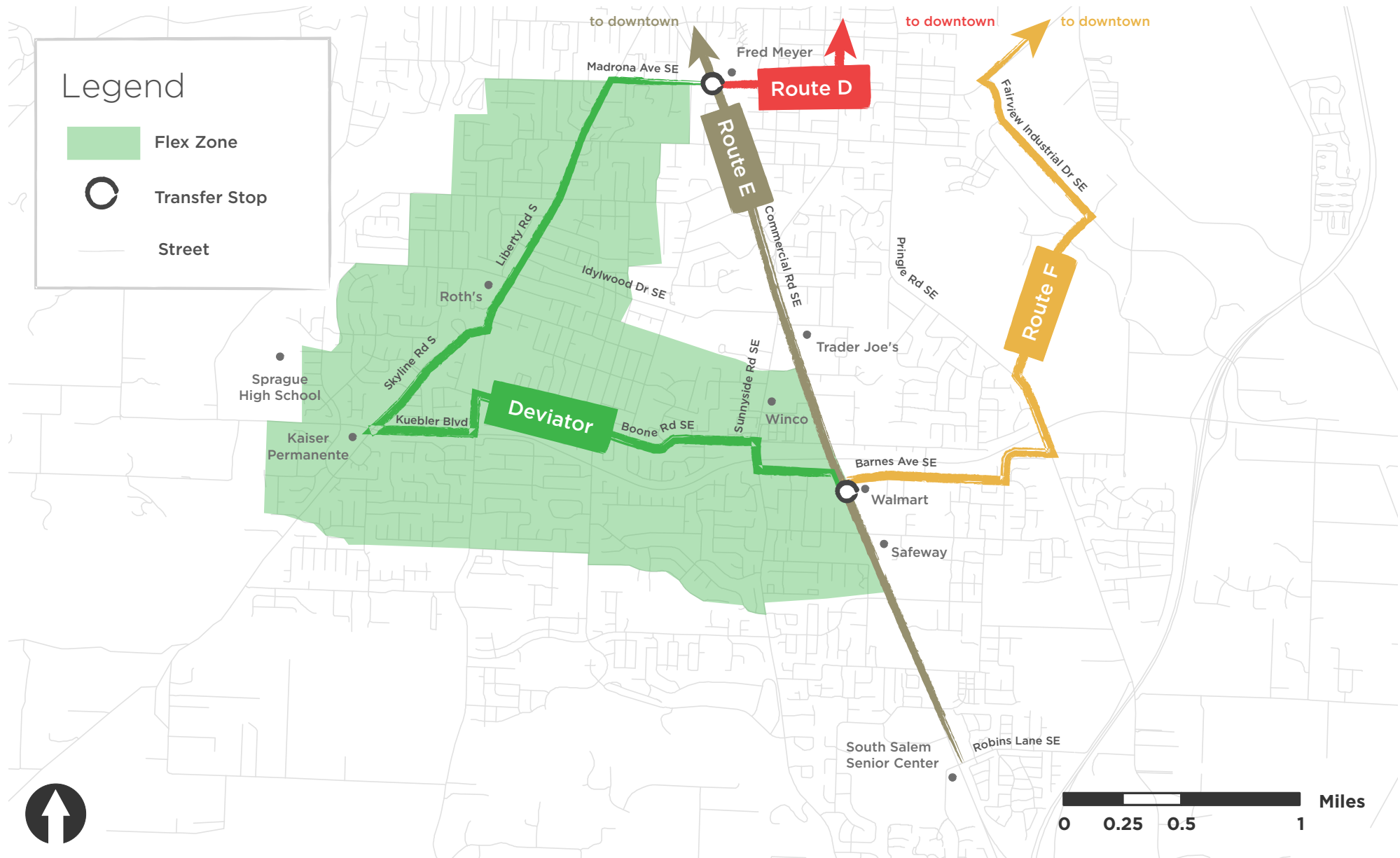


**High**  
# of deviations



**Optional**  
activation

# South Salem Alternative 3



## Overview

The third alternative for South Salem adds Deviator service (five miles) for the residents of western South Salem, including Sprague High School. Much like the concept in Alternative 2, this service extends the Deviator from Alternative 1, this time up Skyline Road S and Liberty Road S instead of down Commercial Road SE, in order to expand coverage. This also has a half mile deviation zone much like Alternative 2, however a low number of deviations per hour are possible given the longer length of the route.

## Features

### Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/2 Mile**  
Buffer



**1 Hour**  
between buses

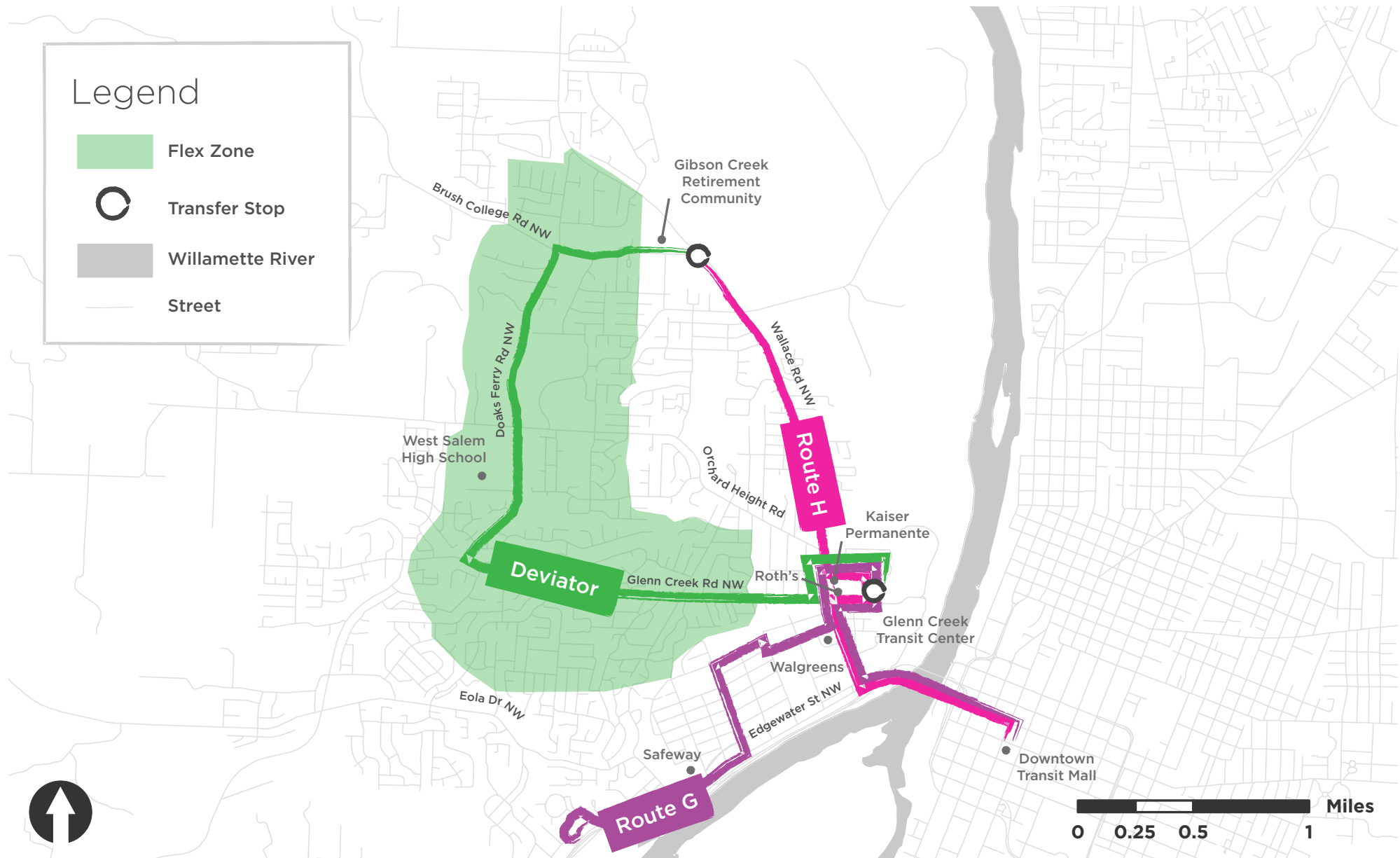


**Low**  
# of deviations



**Optional**  
activation

# West Salem Alternative 1



## Overview

The first alternative in West Salem provides a Deviator (3.9 miles) that starts from Glen Creek Transit Center, and travels to Gibson Creek Retirement Community where it connects to a transfer point for Route H on Wallace Road NW. West Salem High School would have a fixed stop in this alternative, along with a few other fixed points along the line. The deviation zone for this line is half a mile with a high number of deviations being possible due to the short length of the line. This bus would run on one-hour headways, meaning it would take one hour from when it leaves the Glenn Creek Transit Center, connects to Route H, and then comes all the way back. This alternative provides efficient service while covering the majority of central West Salem.

## Features

### Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/2 Mile**  
Buffer



**1 Hour**  
between buses



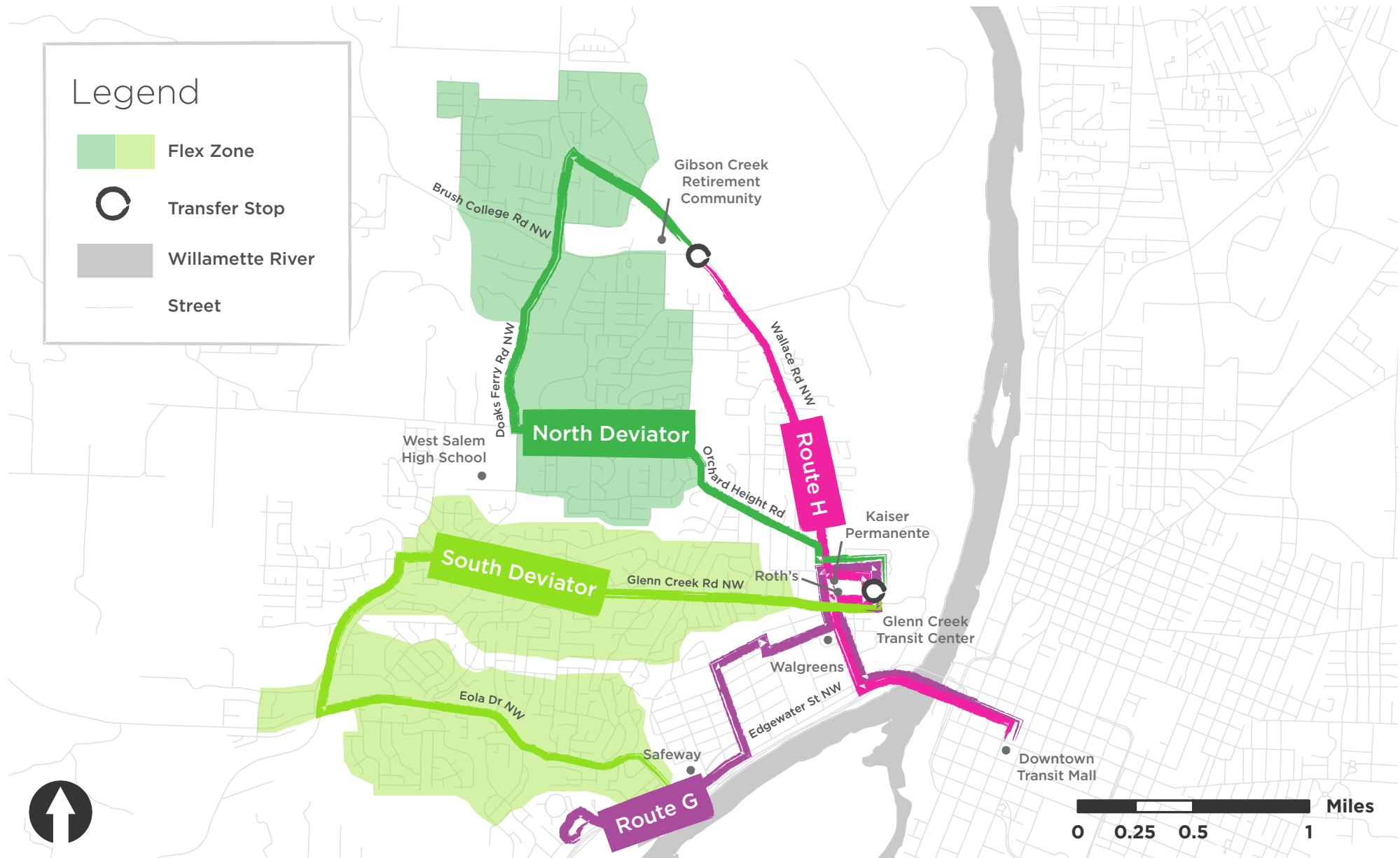
**High**  
# of deviations



**Optional**  
activation



# West Salem Alternative 2



## Overview

The second alternative in West Salem provides two Deviators (North Deviator, 3.8 miles; South Deviator, 4.6 miles) with half-mile buffers, providing nearly complete coverage of West Salem. The trade-off to the added coverage here compared to Alternative 1 is that this bus would have to run on two-hour headways. This alternative would provide service to the Eola Drive area, including Eola Heights apartments, which does not currently have any service.

## Features

### North Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/2 Mile**  
Buffer



**2 Hours**  
between buses



**Medium**  
# of deviations



**Optional**  
activation

### South Deviator



**Activated**  
Stops



**Minibus**  
capacity of 22



**1/2 Mile**  
Buffer



**2 Hours**  
between buses

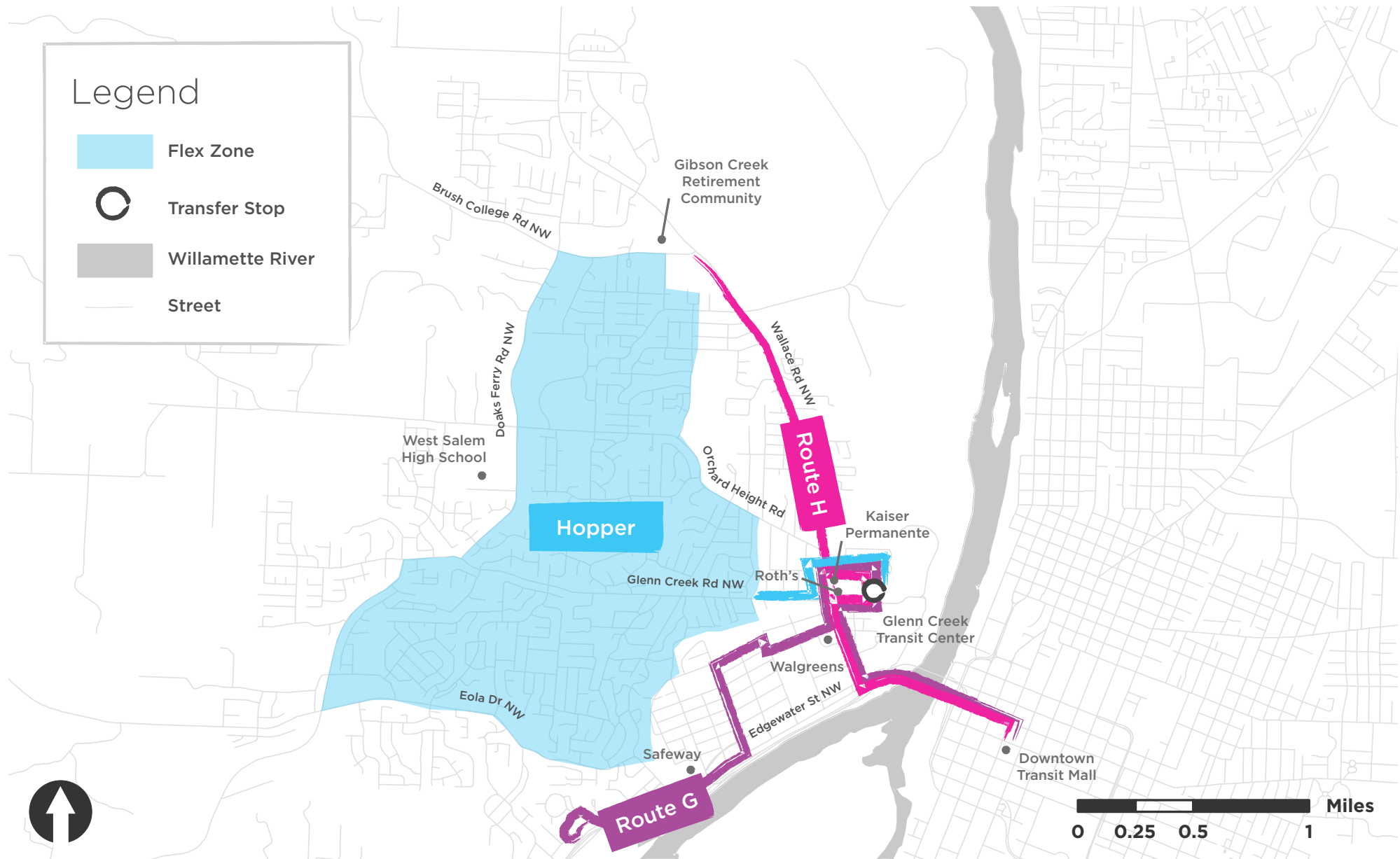


**Medium**  
# of deviations



**Optional**  
activation

# West Salem Alternative 3



## Overview

The third alternative is a Hopper service. The way the Hopper works in this example is that stops could be activated anywhere in the zone, and people will be picked up and dropped off every hour. The bus will start and end on the hour at the Glenn Creek Transit Center as a transfer point. This alternative allows for greater flexibility of traveling within the neighborhood. If not many people are using the service in a given hour, this service could also prove to be faster since a Hopper does not need to follow a defined route. The coverage for this service is slightly less than Alternative 2, and would allow for a medium amount of deviations.

## Features

### Hopper



**Activated  
Stops**



**Zone  
Coverage**



**Medium  
# of deviations**



**Minibus  
capacity of 22**



**1 Hour  
between buses**



**Required  
activation**