



# JEFFTRAN

## Comprehensive Operations Analysis Draft Final Report and Recommendations

October 2017





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## 1. Summary of Recommendations

This report provides the final recommendations for the JEFFTRAN Transit Comprehensive Operations Analysis (COA). **Section 2** gives an overview of the contents of this *Final Report and Recommendations*. It describes how the input documented in the *Existing Conditions Report* identified priorities for recommendations in this report.

**Section 6** of this report recommends major improvements and changes in JEFFTRAN service. The key recommendations include:

- Operate weekday evening service (last trip leaving downtown transit center at 7:20 pm) on four routes – High Street West, Business 50 East, Missouri Boulevard, and Capital Mall.
- Operate Saturday service on these same four routes between approximately 8:00 am and 5:20 pm leaving the downtown transit center.
- Modify five of the six JEFFTRAN fixed routes (High Street East, Business 50 East, Missouri Boulevard, Capital Mall, and Southwest). These improvements will accomplish the following:
  - Eliminate one way loops and provide bi-directional travel.
  - Increase two way service for ease of use and ridership opportunities.
  - Promote direction route patterns for travel time savings.
  - Provide connections to major attractions.
- Fund most of the cost of these fixed route improvements with economies in Handi-Wheels services. Key aspects of these economies include:
  - Offering free fare on fixed route service to Handi-Wheels eligible riders who chose to use it for a particular trip.
  - Recertifying all Handi-Wheels riders to ensure that only those who are eligible under ADA requirements are offered service. The peer comparison in the *Existing Conditions Report* identified that JEFFTRAN's level of Handi-Rides service is far in excess of that provided by its peers.
- Implement a \$0.25 fare increase in fixed route service.



## 2. Introduction

The JEFFTRAN Comprehensive Operations Analysis (COA) is a wide-ranging review of the routes, schedules, operations, facilities, and policies of the JEFFTRAN transit system. JEFFTRAN provides fixed route and complementary paratransit service (as required by the Americans With Disabilities Act (ADA)). A COA is a standard business practice, which should be conducted every 7 to 10 years for smaller transit systems. The prior JEFFTRAN COA was completed in 2006. The findings of the prior COA are summarized in **Section 8.5** of the *Existing Conditions Report* for this COA.

This *Final Report and Recommendations* (hereinafter cited as the *Final Report*) is the second of two reports for this JEFFTRAN COA. The other report (cited in the previous paragraph) is the *Existing Conditions Report*, published in August, 2017. The *Existing Conditions Report* provided baseline data and analyses of JEFFTRAN's existing routes and services. Its major components included (Section references in the bulleted points below are to the *Existing Conditions Report*):

- Overview of JEFFTRAN's fares and services (**Section 2**).
- Peer system comparison for JEFFTRAN's fixed-route and ADA paratransit service (Handi-Wheels) (**Section 2.4**).
- Operating cost model for use in costing service changes (**Section 3**).
- Detailed assessment of each fixed route (**Section 4**). This assessment included ridership by route segment, ridership by time of day, transfer activity, and running time assessments.
- Evaluation of JEFFTRAN's bus fleet and procurement practices (**Section 5**).
- Review of JEFFTRAN's bus operator scheduling practices (**Section 6**).
- JEFFTRAN managerial assessment (**Section 7**).
- Documentation of wide-ranging public input activities (**Section 8**). These activities included six group stakeholder interviews, on general public meeting, on line survey of the general public, and bus operator and dispatcher interviews, and a review of recent planning documents from other studies.

**Section 3** of this *Final Report* presents the key findings of the *Existing Conditions Report* for both fixed-route and Handi-Wheels service. **Section 4** of this *Final Report* summarizes the public input from the *Existing Conditions Report*. These elements are the basis for the recommendations provided in **Section 5** of this *Final Report*. There are five categories of recommendations in **Section 5**, as follows:

- Expanded service hours weekday evenings and Saturday (**Section 5.1**)
- Route modifications to better serve existing riders (**Section 5.2**)
- Strategies to attract choice riders (**Section 5.3**).
- Handi-Wheels service economies (**Section 5.4**)
- Recommended fare increase and fare increase policy (**Section 5.5**)

**Section 6** of this *Final Report* provides financial forecasts for the recommendations contained in **Section 5**. The basic assumption in these forecasts is that there is "no net change" in local, state or federal operating funds. This section also identifies some of the recommendations in **Section 5** as "illustrative," meaning that implementing them requires that additional funding becomes available.



### 3. Existing Conditions Findings

#### 3.1. Fixed Route

##### 3.1.1 Peer System Comparison

**Section 2.4** of the *Existing Conditions Report* used the Federal Transit Administration's (FTA) Urban iNTD tool<sup>1</sup> to evaluate JEFFTRAN's fixed-route service compared with its peer systems. This tool includes a database of all urban transit system submittals to the National Transit Database (NTD)<sup>2</sup>. It also has extensive analytic capabilities to compare relevant transit performance measures among comparable systems. These analytic capabilities include calculating a "likeness score" to identify which transit systems are the most appropriate to use for a peer comparison.

The five peer systems for JEFFTRAN are:

- Flint Hills Area Transportation – Manhattan, Kansas
- Greater Mankato Transit System – Mankato, Minnesota
- Jonesboro Economical Transportation System – Jonesboro, Arkansas
- Jump Around Carson – Carson City, Nevada
- Pine Bluff Transit – Pine Bluff, Arkansas

**Section 2.4.2** of the *Existing Conditions Report* compares JEFFTRAN's fixed route performance with its peers for five following performance measures. This comparison is summarized in **Table 3-1** below. This table is identical to **Table 2-7** in the *Existing Conditions Report*.

**Table 3-1: Fixed Route Ridership and Operating Ratios – 2011 to 2015 NTD Average**

Transit System	Farebox Recovery	Revenue/ Passenger Trip	Passenger Trips/ Revenue Hour	Cost/ Passenger Trip	Passenger Trips/ Capita
JEFFTRAN (MO)	10.7%	\$0.52	16.23	\$4.93	6.51
Peer System Average	6.5%	\$0.40	13.98	\$6.75	4.03
Flint Hills Area Transportation (KS)	4.3%	\$0.09	12.75	\$2.47	1.92
Greater Mankato Transit System (MN)	7.6%	\$0.16	32.30	\$2.24	11.83
Jonesboro Economical Transportation System (AR)	7.4%	\$0.65	5.65	\$8.42	1.44
Jump Around Carson (NV)	8.9%	\$0.36	12.74	\$4.06	3.32
Pine Bluff Transit (AR)	4.4%	\$0.73	6.47	\$16.58	1.63

JEFFTRAN's fixed route operations compare favorably with its peer systems. It outperforms the average of its peers systems in all five categories and has the best or second best performance in three of the five categories. This indicates that JEFFTRAN's management provides effective management and cost control for fixed route operations. The higher-than-average performance on

<sup>1</sup> [http://www.ftis.org/urban\\_iNTD.aspx](http://www.ftis.org/urban_iNTD.aspx)

<sup>2</sup> FTA requires any transit agency receiving federal funding to report operating, ridership and financial data annually, using a uniform system of accounts. The data for all reporting systems is compiled into the National Transit Database.

passenger trips/revenue hour suggests that there may be significant latent demand for added fixed route transit service.

### 3.1.2 Individual Route Assessments

JEFFTRAN provides weekday service on five routes leaving the downtown transit center between 6:30 am and 5:20 pm weekdays. A sixth route (Capital Mall) provides weekday service leaving the Menards transfer center between 7:00 am and 5:00 pm weekdays. Three tripper routes provide one trip weekday afternoons beginning at approximately 3:00 pm. The tripper routes primarily serve school travelers, although they are available for use by the general public. **Figure 3-1** and **Figure 3-2** show the six regular routes and three tripper routes, respectively.

**Table 3-1** provides a summary ridership comparison of the six fixed routes, and **Table 3-2** provides a summary comparison of route-level operating statistics. **Table 3-3** provides route-level ridership both on the actual days when complete on-off counts were taken (March 29 and 30, 2017), as well as for a typical weekday in 2016.

**Table 3-2: JEFFTRAN Route Ridership Comparison**

Route	Length (miles)	Count Date	Day of Count		Average 2016 Weekday	
			Daily Passenger-Miles	Daily Ridership	Daily Passenger-Miles	Daily Ridership
<b>Business 50 East</b>	11.6	3/29	636	131	845	174
<b>Capital Mall</b>	13.8	3/30	604	93	825	127
<b>High Street East</b>	11.3	3/29	408	78	518	99
<b>High Street West</b>	11.1	3/29 & 3/30	448	121	485	131
<b>Missouri Boulevard</b>	9.1	3/30	1,006	294	1,163	340
<b>Southwest</b>	10.4	3/30	224	51	404	92

**Table 3-3: JEFFTRAN Route Level Performance Statistics**

Route	Daily Vehicle Miles	Daily Operating Cost	Cost/ Passenger	Passengers/ Hour	Passengers/ Route Mile	Passengers/ Vehicle Mile
<b>Business 50 East</b>	197	\$920.07	\$5.29	15.1	15.0	0.88
<b>Capital Mall</b>	228	\$926.56	\$7.30	11.5	9.2	0.56
<b>High Street East</b>	192	\$914.00	\$9.23	8.6	8.8	0.52
<b>High Street West</b>	189	\$909.95	\$6.95	11.4	11.8	0.69
<b>Missouri Boulevard</b>	155	\$869.49	\$2.56	29.6	37.4	2.20
<b>Southwest</b>	177	\$895.79	\$9.74	8.0	8.8	0.52

Missouri Boulevard is by far the heaviest used route, followed by Business 50 East. Missouri Boulevard serves more than twice the number of riders than any other route. Southwest is the least used route, both in terms of ridership and passenger-miles served. Missouri Boulevard has the lowest cost per passenger as well as the highest number of passengers per hour. Southwest has the highest cost per passenger as well as the lowest passengers per hour, route mile and vehicle mile.



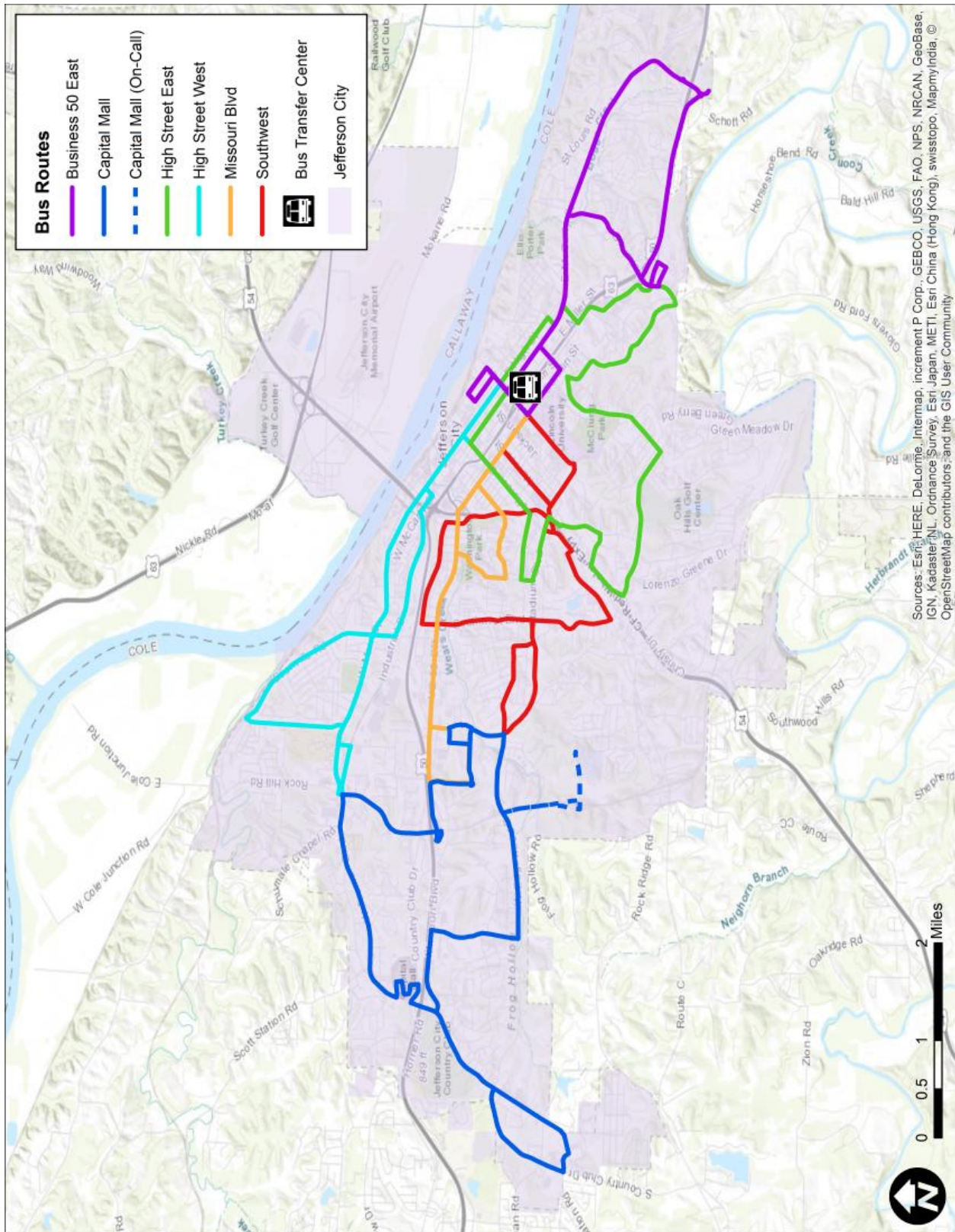
**Section 4.2** of the *Existing Conditions Report* includes route assessments for each JEFFTRAN route, including the three tripper routes. These profiles provide the following data. Data for *italicized* items are not provided for tripper routes:

- *Route map with ¼ and ½ mile buffer around route bus stops*
- *Detailed demographic data for both buffer areas*
- Ridership by route segment
- *Maps highlighting stops which are high passenger boarding locations*
- Ridership by individual trip
- Comparison of actual and scheduled bus running time by route segment
- Transfers by route transferring from

These individual route assessments, along with public input (**Section 4** of this report) are the basis of recommendations provided in **Section 5** of this report.



Figure 3-1: JEFFTRAN Regular Fixed Routes





**Legend:**

- Southside (Red line)
- High Street East (Blue line)
- Hutton Lane (Orange line)
- Bus Transfer Center (Bus icon)
- Jefferson City (Purple shaded area)

**Scale:** 0 0.5 1 2 Miles

**Map Details:**

- Routes:**
  - Southside (Red):** Starts near the Callaway Golf Club, travels south through the city center, and ends near the Jefferson City Country Club.
  - High Street East (Blue):** A loop route starting near the Callaway Golf Club, traveling east through the city center, and ending near the Jefferson City Country Club.
  - Hutton Lane (Orange):** A route starting near the Callaway Golf Club, traveling east through the city center, and ending near the Jefferson City Country Club.
- Transfer Center:** Located at the intersection of I-50 and I-64, near the Jefferson City Memorial Airport.
- Geographic Features:** The map shows the city's layout, including major roads like I-50 and I-64, and various landmarks like the Jefferson City Memorial Airport and the Callaway Golf Club.

**Sources:** Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swissstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

## 3.2. Handi-Wheels

### 3.2.1 Peer System Comparison

**Section 2.4** of the *Existing Conditions Report* used the Federal Transit Administration’s (FTA) Urban iNTD tool<sup>3</sup> to compare JEFFTRAN’s demand-response service (Handi-Wheels) with services operated by its peer systems. This tool includes a database of all urban transit system submittals to the National Transit Database (NTD)<sup>4</sup>. It also has extensive analytic capabilities to compare relevant transit performance measures among comparable systems. These analytic capabilities include calculating a “likeness score” to identify which transit systems are the most appropriate to use for a peer comparison.

The five peer systems for JEFFTRAN are:

- Flint Hills Area Transportation – Manhattan, Kansas
- Greater Mankato Transit System – Mankato, Minnesota
- Jonesboro Economical Transportation System – Jonesboro, Arkansas
- Jump Around Carson – Carson City, Nevada
- Pine Bluff Transit – Pine Bluff, Arkansas

**Section 2.4.3** of the *Existing Conditions Report* compares JEFFTRAN’s Handi-Wheels performance with its peers for five following performance measures. This comparison is summarized in **Table 3-4** below. This table is identical to **Table 2-9** in the *Existing Conditions Report*.

**Table 3-4: Demand Response Ridership and Operating Ratios – 2011 to 2015 NTD Average**

Transit System	Farebox Recovery	Revenue/ Passenger Trip	Passenger Trips/ Revenue Hour	Cost/ Passenger Trip	Passenger Trips/ Capita
JEFFTRAN (MO)	6.4%	\$1.04	3.79	\$16.37	1.31
Peer System Average	11.3%	\$2.06	2.30	\$19.37	0.24
Flint Hills Area Transportation (KS)	17.7%	\$1.90	3.44	\$10.75	0.42
Greater Mankato Transit System (MN)	11.7%	\$2.75	2.22	\$23.66	0.19
Jonesboro Economical Transportation System (AR)	8.8%	\$2.15	1.93	\$25.05	0.17
Jump Around Carson (NV)	9.2%	\$1.69	2.43	\$18.46	0.33
Pine Bluff Transit (AR)	9.3%	\$1.81	1.48	\$18.93	0.08

JEFFTRAN’s Handi-Wheels route operations compare very unfavorably with its peer systems. It has the highest per-capita use of demand response service. It is over **five times** the per capita use of its average peer system and over **three times** the per capita use of its next-highest peer system. An evaluation of

<sup>3</sup> [http://www.ftis.org/urban\\_iNTD.aspx](http://www.ftis.org/urban_iNTD.aspx)

<sup>4</sup> FTA requires any transit agency receiving federal funding to report operating, ridership and financial data annually, using a uniform system of accounts. The data for all reporting systems is compiled into the National Transit Database.



Jefferson City's demographic makeup indicates that there is not a significant difference between its percentages of elderly or disabled persons, compared with those of its peer systems.

Our conclusion is that this extremely high use of demand response service by JEFFTRAN riders is a reflection of its eligibility policies. JEFFTRAN management has acknowledged that its Handi-Wheels eligibility determinations have been broadly interpreted.

The Handi-Wheels eligibility application allows any of the following professionals to determine that a rider is unable to use JEFFTRAN's fixed route services: registered nurse, physician, social worker, psychologist, physical therapist, chiropractor, occupational therapist, speech pathologist, nurse practitioner, physician's assistant, mental health counselor, respiratory therapist, vocational rehabilitation counselor or recreation therapist employed by a medical facility. Many of these professionals lack medical qualifications to identify passenger eligibility under the Americans with Disabilities Act (ADA). It is our conclusion that these current eligibility determination policies allow many riders who do not satisfy ADA requirements for alternative service to use Handi-Wheels service. As a result, a large number of customers who could use fixed route service (at a cost of \$4.93 per trip) instead are determined eligible to use Handi-Wheels service (at a cost of \$16.37 per trip).

This use of Handi-Wheels by many more riders than JEFFTRAN's peer systems explains other trends. Serving additional riders causes JEFFTRAN's demand response operating expense to be significantly higher, resulting in the lowest farebox recovery among its peers.

### 3.2.2 Fixed Route/Demand Response Breakdown

**Section 2.4.4** of the *Existing Conditions Report* evaluates JEFFTRAN's allocation of operating budget and resources (revenue hours) to fixed route and Handi-Wheels services. **Table 3-5** compares JEFFTRAN's allocations to those of its peer systems.

**Table 3-5: JEFFTRAN Summary Statistics for 2016**

Transit System	Revenue Hours		Total Operating Expenses	
	Fixed Route	Demand Response	Fixed Route	Demand Response
	32,227		\$2,296,394	
	53.7%	46.3%	60.0%	40.0%
	23,065		\$1,269,865	
	68.8%	31.2%	76.9%	23.1%
	37,155		\$1,210,696	
	54.4%	45.6%	50.1%	49.9%
	23,956		\$1,834,736	
	81.4%	18.6%	87.2%	12.8%
	17,513		\$878,485	
	74.4%	25.6%	75.4%	24.6%
	21,527		\$1,070,569	
	66.0%	34.0%	68.2%	31.8%
	15,177		\$1,354,839	
	81.5%	18.5%	94.6%	5.4%



Most operating costs are driven by vehicle hours of service. JEFFTRAN allocates about 46% of its revenue hours to Handi-Wheels service. This is nearly 50% more than the average of the other peer systems' allocation (31%) to demand response service.

JEFFTRAN's operating costs are split 40/60 between demand response and fixed route services. Its average peer system has a 23/77 operating expense split. This variance is very significant. The additional operating expense is due largely to use of Handi-Wheels service by riders who may have some level of mobility limitation, but do not satisfy ADA eligibility requirements for alternative service. We recommend (see **Section 5.4**) recertifying those currently eligible for Handi-Wheels' service to ensure that those who use Handi-Wheels service satisfy ADA criteria. This allows funds now used for Handi-Wheels service to be available to improve fixed route services for the general population.



## 4. Input Summary

The JEFFTRAN COA has an extensive input process to gather information from all stakeholders. **Section 8** of the *Existing Conditions Report* describes this process in detail. The public input process has five separate components. These bullet points briefly describe each. Section references are to the *Existing Conditions Report*.

- **Stakeholder Interviews (Section 8.1).** Six stakeholder meetings were conducted the week of March 27 to 29, 2017. Each was about an hour in length, and had a structured interview format. Invited participants included representatives of education, healthcare/social service organization, public officials, JEFFTRAN's Transit Advisory Committee, employment/business organizations. One general meeting also was held. All meetings were held at the John G. Christy Municipal Building.
- **Public Meeting (Section 8.2).** A three-hour public meeting was held the afternoon of March 28, 2017. It also was held at the Christy Municipal Building. It had an open-house format with displays. Project staff was available to receive input. Many attendees submitted written comments.
- **Online Survey (Section 8.3).** People were invited to take an online survey via Facebook posts, public notices, and promotional events. The survey was available between Friday, June 9 and Tuesday, June 11, 2017. CAMPO staff also distributed some surveys in person at promotional events. Different versions of the survey were provided depending upon whether the respondent already used JEFFTRAN service, or whether they were a Jefferson City resident.
- **Operator and Dispatcher Interviews (Section 8.4).** Several JEFFTRAN bus operators and dispatchers were interviewed on March 8 and 27, 2017.
- **Review of Existing Planning Documents (Section 8.5).** CAMPO provided seven planning documents (dated between 2006 and 2016) which related to this COA.

The discussions in **Section 4.1** through **Section 4.3** describe the major input received grouped by three overall topics. It synthesizes input received during the various input processes.

### 4.1. Days and Hours of Service

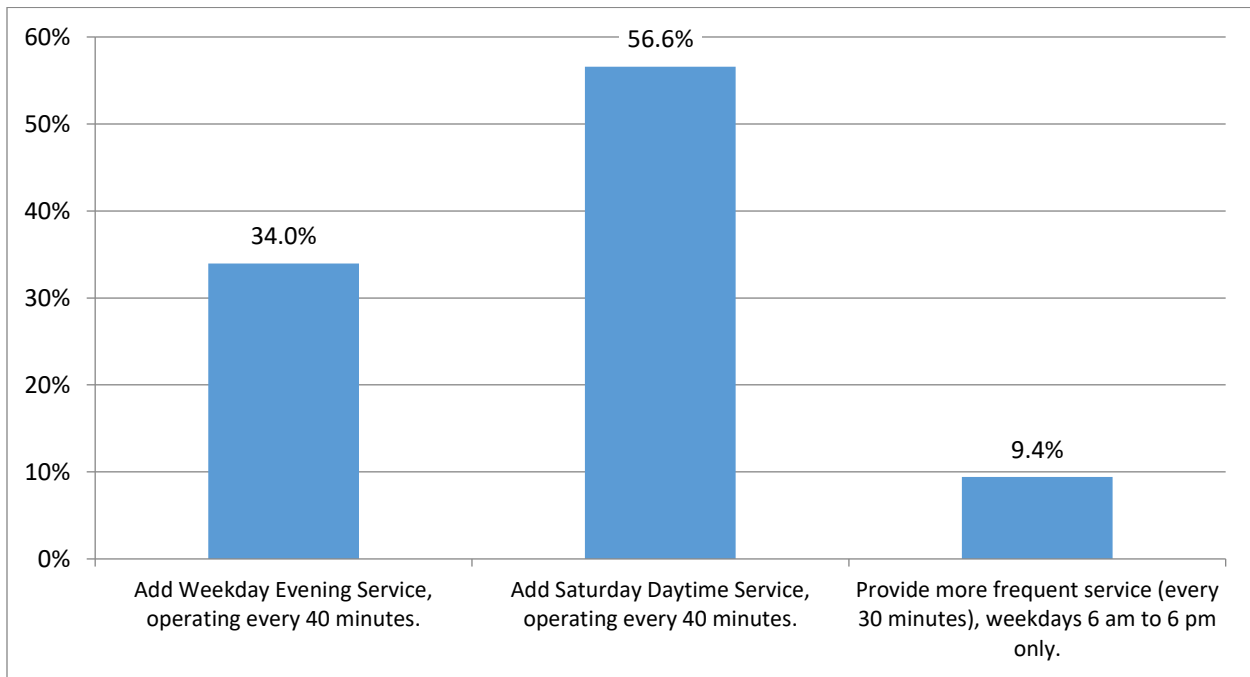
The online survey provided key input about the need for extended hours of service. **Figure 4-1** shows respondents preferences. Respondents were required to choose only one response as their "most desired" improvement.

- 57% of respondents stated that Saturday service was the most desired improvement.
- 34% of respondents stated that weekday evening service was the most desired improvement.
- Only 9% of respondents stated that more frequent weekday service was the most desired improvement.

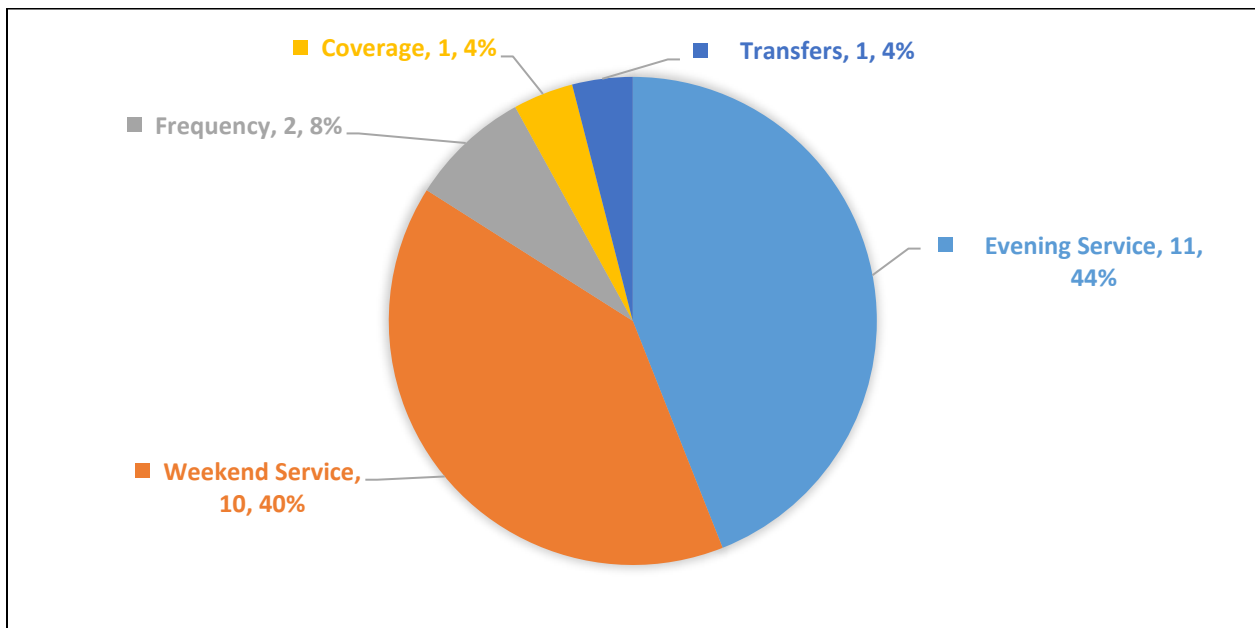
By comparison, input received at the general public meeting showed relatively equal support for later evening and weekend service. **Figure 4-2** shows that 44% of responses (11 individuals) supported later evening service as one their two top priorities. By comparison, 40% of responses (10 individuals) supported weekend service as one of their two top priorities. Only 8% of responses (2 individuals) supported more frequent service as one of their two top priorities. It should be noted that the number providing input at the public meeting (25 in total) is only a fraction of the hundreds of individuals who responded to the online survey.



**Figure 4-1: Online Survey – If JEFFTRAN expanded service, which option would you most like to see?**



**Figure 4-2: Public Meeting Input - Improvement Priorities**



Input received during other forums cited the need for both evening and weekend service without expressing a preference for either one. Such input was received from stakeholders (educational institutions, public officials, Public Transit Advisory Committee, and the general meeting) and the general public meeting. Only the employer stakeholders cited the need for evening service without mentioning the desire for Saturday service.

The need and desire for extended hours of service both during weekday evenings and Saturdays is widespread. As a point of comparison, **Table 4-1** gives days and hours of service for JEFFTRAN's peer



systems. This information is taken from the public information web site of each system, as of September 27, 2017. Three of the five peer systems provide Saturday service, while one of the five peer systems operates weekday evening service. No peer systems provide Sunday service.

**Table 4-1: Peer Systems, Days and Hours of Service**

System	Hours of Service		
	Weekdays	Saturday	Sunday
<b>Flint Hills Area (KS)</b>	7 am to 6 pm	8 am to 7 pm	No service
<b>Greater Mankato (MN)</b>	6:30 am to 6:00 pm	10 am to 5:30 pm	No service
<b>Jonesboro Economical (AK)</b>	5:15 am to 6:15 pm	No service	No service
<b>Jump Around Carson (NV)</b>	6:30 am to 7:30 pm	8:30 am to 4:30 pm.	No service
<b>Pine Bluff (AK)</b> <sup>5</sup>	6:00 am to 6:00 pm	No service	No service

**Section 5.1** recommends both weekday evening and Saturday service be implemented on four of JEFFTRAN's six fixed routes. It does not assign relative priorities to these two recommended expansions of hours and days of service.

## 4.2. Service Frequency

JEFFTRAN's 40 minute service interval is very atypical. Standard transit practice is to operate fixed route service at clock-face intervals, such that buses are scheduled at the same number of minutes "after the hour" throughout much or all of the day. For example, if service is operated every 30 minutes, service at a given stop could be at 12 and 42 minutes after the hour, every hour. Such practices are referred to as "memory schedules." A regular user can plan his/her travel without having to consult written schedules or check schedule information posted on line.

Until 2008, JEFFTRAN operated routes with the same basic geographic coverage as at present, but with service scheduled every 30 minutes. It was not possible to maintain these scheduled intervals while maintaining the route structure. Service intervals were lengthened to every 40 minutes. This addressed the schedule adherence issues. However, it requires additional effort for customers to plan their travel.

The *Existing Conditions Report* found that some routes (High Street East, Southwest) may have more running time than needed to operate on schedule. Generally, running time is appropriate. It would not be possible to operate service more frequently than every 40 minutes without a major capital investment in new buses.

**Figure 4-1** and **Figure 4-2** show that only 9% and 8% of respondents (respectively) cited minute service as an important priority. None of the stakeholder groups supported the desire for more frequent service. The need for more frequent service was not cited in driver and dispatcher interviews.

## 4.3. Potential New Markets

A wide range of input was received identifying travel destinations which JEFFTRAN should serve, but does not serve at present. **Table 4-2** enumerates potential new service locations for JEFFTRAN which are "high" and "medium" priorities. This grouping is based both upon the number of times these potential new service locations were mentioned, as well as the variety of venues in which they were mentioned.

<sup>5</sup> Hours of service confirmed by telephone call to transit operator.



This listing is not comprehensive. Some locations were mentioned only once, or very infrequently. While those are not listed here, all such locations are documented in **Section 8** of the *Existing Conditions Report*.

Within the high and medium categories, potential new destinations are listed alphabetically. They are not assigned a priority within the high or medium groupings.

**Table 4-2: Potential New Markets Identified in Input Processes**

<b>Location</b>	<b>Venues Where Identified</b>
<b>High Priorities</b>	
Holts Summit	Public Officials, Employer Stakeholders, Public Meeting, On Line Survey
Scholastic – East Side Employment	Heath/Social Services Stakeholders, General Stakeholders, Public Meeting (multiple times)
<b>Medium Priorities</b>	
Boys/Girls Club & Wellness Center	Educational Stakeholders, General Stakeholders
Lincoln University	Educational Stakeholders, General Stakeholders, Public Meeting
Westview Heights	Health/Social Service Stakeholders, On Line Survey

These priorities were considered in planning route extensions and modifications. These are further discussed in **Section 5.2**.



## 5. Recommendations

The following sections provide recommended improvements and modifications to JEFFTRAN fixed-route and demand responsive service. It is based upon a detailed analysis of the findings of the *Existing Conditions Report*, as well as consideration of input. There are five categories of recommendations provided in the pages which follow. They are enumerated below.

- **Section 5.1** documents recommendations for expanded service hours weekday evenings and Saturdays. Extended service hours during both time periods are recommended on Business 50 East, High Street West, Missouri Boulevard, and Capital Mall Routes.
- **Section 5.2** recommends several fixed route modifications. Many of the recommendations call for replacing one-way loop routes with bi-directional service. Some also provide for discontinuance of low-performing route segments.
- **Section 5.3** presents additional recommendations to attract new, choice riders to JEFFTRAN. The recommendations in **Section 5.1** and **Section 5.2** can be implemented without an increase in funding. The recommendations in this section require added local, state or federal funding.
- **Section 5.4** recommends significant economies in Handi-Wheels service. As documented in the *Existing Conditions Report* (and summarized in **Section 3.2** of this report) Handi-Wheels generous eligibility policies have resulted in its use being 3 to 5 times that of comparable systems. These economies are the primary source of funding for recommendations in **Section 5.1**.
- **Section 5.5** recommends a \$0.25 increase in the fixed route fare (from \$1.00 to \$1.25). The added fare revenue will be used to fund a portion of the improvements in **Section 5.1**. The recommendations also provide for adoption of a policy of periodic fare increased tied to the cost of living.

### 5.1. Expanded Service Hours

The following sections provide recommended improvements and modifications to JEFFTRAN fixed-route and demand responsive service. It is based upon a detailed analysis of the findings of the *Existing Conditions Report*, as well as consideration of input. There are five categories of recommendations provided in the pages which follow. They are enumerated below.

The two key needs expressed in many venues is the need for weekday evening and Saturday service. This section recommends implementing Saturday service and weekday evening service on High Street West, Business 50 East, Missouri Boulevard and Capital Mall routes. These routes have the highest passengers/mile, passengers/hour, and passengers/route mile. They also provide geographic coverage throughout JEFFTRAN's service area.

In the on line survey, respondents identified the High Street West, Missouri Boulevard and Capital Mall routes as three of the four most-recommended routes for both weekday evening and Saturday service. This same respondents were more favorable to evening and Saturday service on High Street East as compared to Business 50 East. Both of these routes serve Jefferson City's east side, and Business 50 East's performance measures are 70 to 75% better than those for High Street East (*Existing Conditions Report*, **Table 4-1**).

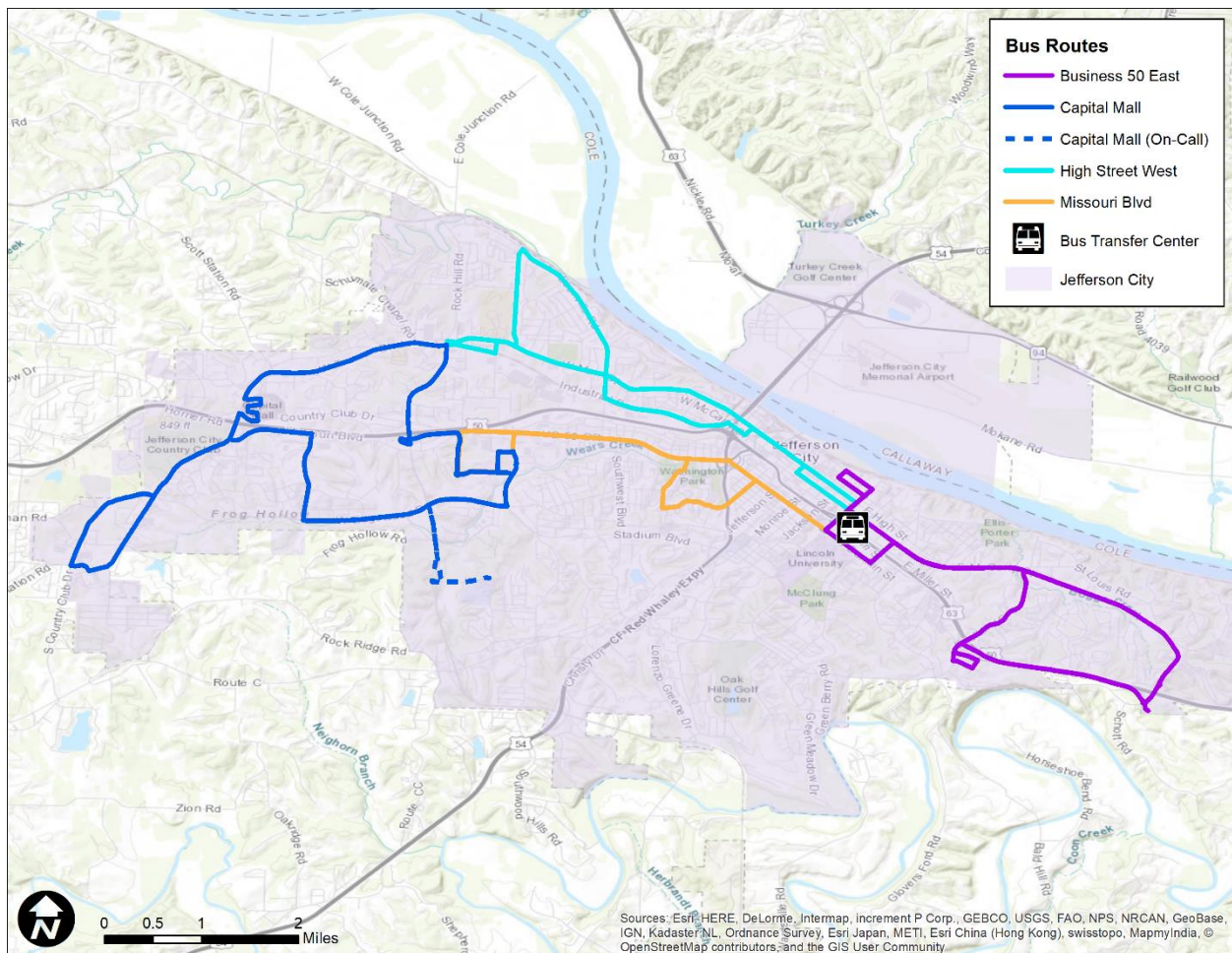
We consider both Saturday and weekday evening service to be comparable needs. Our recommendations do not assign a higher priority to either one.

The following operating cost calculations are used for all recommendations in **Section 5.1** through **Section 5.4**. The total costs per vehicle hour and vehicle mile are shown in **Table 5-1**. The derivation of these is documented in the *Existing Conditions Report* (Section 3 – Operating Cost Model). These costs allocate all JEFFTRAN operating costs either to vehicle hours or vehicle miles of operation. As such, they include costs of management and administration, in addition to direct operating costs for bus operators, fuel and maintenance. Using a fully-allocated cost model acknowledges that JEFFTRAN will incur additional managerial, dispatching and administrative costs to operate extended hours of service.

**Table 5-1: JEFFTRAN Operating Cost Model**

	<b>Fixed Route</b>	<b>Handi-Wheels</b>
<b>Cost/Revenue Hour</b>	\$59.60	\$55.52
<b>Cost/Revenue Mile</b>	\$1.19	\$0.55

**Figure 5-1: Routes recommended for weekday evening and Saturday service**



**Figure 5-1** shows the four routes recommended for weekday evening and Saturday service. The routes shown here are the existing routes, and do not reflect potential modifications described in Section 5.2.

### 5.1.1.1. Saturday Service

Saturday service is recommended to operate between approximately 8:00 am and 5:20 pm (leaving Miller Street Transfer Center). **Table 5-2** shows forecasted changes in annual revenue, ridership and



operating costs. The following assumptions were made to provide providing the ridership and revenue forecasts.

- Riders/vehicle hour are based upon average weekday ridership/hour for 2016 (*Existing Conditions Report, Table 4-2*).
- Based upon national averages, Saturday ridership/hour is forecasted as two-thirds weekday ridership/hour.
- Average fare/passenger on Saturday is unchanged from weekdays.

**Table 5-2: Estimated Annual Cost, Ridership and Revenue, Saturday Service**

Route	Operating Cost	Ridership	Fare Revenue	Net Cost Increase
<b>Business 50 East</b>	\$ 41,000	5,300	\$ 3,000	\$ 38,000
<b>Capital Mall</b>	\$ 43,000	4,000	\$ 2,000	\$ 41,000
<b>High Street West</b>	\$ 41,000	4,000	\$ 2,000	\$ 39,000
<b>Missouri Blvd.</b>	\$ 39,000	10,200	\$ 5,000	\$ 34,000
<b>Subtotal, Fixed Route</b>	\$ 164,000	23,500	\$ 12,000	\$ 152,000
<b>Handi-Wheels Service</b>	\$ 66,000	1,600	\$ 3,000	\$ 63,000
<b>Total All Services</b>	\$ 230,000	25,100	\$ 15,000	\$ 215,000

### 5.1.2. Weekday Evening Service

Weekday evening service is recommended to operate at 40 minute intervals for three additional trips. Added weekday evening service would operate with trips leaving the Miller Street transit center at 6:00 pm, 6:40 pm, and 7:20 pm. **Table 5-3** shows forecasted changes in annual revenue, ridership and operating costs. The following assumptions were made to provide the ridership and revenue forecasts.

- Ridership/trip is forecasted to be the same as adjusted ridership (see next point) on the last three weekday trips, as counted on the March, 2017 on-board counts. This accounts for added trips which will be made at other times of the day. For example, there will be new riders using morning or early afternoon service because they now can make their return trip at 7:00 pm.
- Ridership/trip from the ride counts is adjusted to reflect typical 2016 weekday ridership. The *Existing Conditions Report (Table 4-1)* documented that route-level ridership on a typical weekday in 2016 was lower than the days that the counts were conducted. The route-level adjustment factors used ranged from 1.08 to 1.37.
- The new riders' average fare/ride is unchanged from existing service.

**Table 5-3: Estimated Annual Cost, Ridership and Revenue, Weekday Evening Service**

Route	Operating Cost	Ridership	Fare Revenue	Net Cost Increase
<b>Business 50 East</b>	\$ 40,000	6,800	\$ 3,000	\$ 37,000
<b>Capital Mall</b>	\$ 43,000	8,500	\$ 4,000	\$ 39,000
<b>High Street West</b>	\$ 40,000	7,300	\$ 4,000	\$ 36,000
<b>Missouri Blvd.</b>	\$ 38,000	11,500	\$ 5,000	\$ 33,000
<b>Subtotal, Fixed Route</b>	\$ 161,000	34,100	\$ 16,000	\$ 145,000
<b>Handi-Wheels Service</b>	\$ 63,000	2,300	\$ 5,000	\$ 58,000
<b>Total All Services</b>	\$ 224,000	36,400	\$ 21,000	\$ 203,000

## 5.2. Route Modifications

This section presents proposed service modifications for each route. Routes are listed individually, with a brief description of the existing route service characteristics and proposed service changes. The service recommendations have been prepared after completion of the following project tasks:

- Fieldwork of service operations
- Completion of a ridecheck of weekday bus service
- Extensive public outreach efforts including interviews with various stakeholder groups, JEFFTRAN staff, on-line survey and public meetings.

### Planning Principles

JEFFTRAN has a significant amount of one way loop routes which are generally inefficient and promote out of direction travel. This directly correlates to lower ridership and longer travel times. Because of this the following planning principles are applied to the proposed route recommendations:

- Eliminate one way loops and provide bi-directional travel.
- Increase two way service for ease of use and ridership opportunities.
- Promote direction route patterns for travel time savings.
- Provide connections to major attractions.

The revised system will allow current passengers to reduce their total travel times for their daily travels and allow more access to more job opportunities with increased service levels. Existing route performance characteristics, route strengths and weaknesses were discussed with JEFFTRAN/CAMPO staff. Service recommendations were based on those discussions.

The following descriptions and tables describe the proposed changes. They also include forecasts of annual changes in ridership, fare revenue, operating cost, and net cost. As was documented in Section 4 of the *Existing Conditions Report*, the March 2017 ride counts show, overall, somewhat lower total weekday ridership than on a typical weekday in 2016. The ridership totals in **Tables 5-4** through **Table 5-8** have been adjusted from the raw counts to reflect typical weekday ridership in 2016. Full size maps of the proposed route alterations are provided in the Appendix.

#### 5.2.1. Business 50 East Route

##### Existing Service Characteristics

This route serves a mix of trip generators including Hamilton Tower, Samaritan Center, Gerbes Superstore and Walmart.

A detailed evaluation of this route identified the following key service characteristics and issues:

- Opportunity for additional ridership on St. Louis Road.
- The on-call portion of the route is served by the first trip of the day and is then “on call” for the remainder of the day.

##### Proposed Service Changes

Eliminate service on East McCarty between Cherokee and Landwehr Roads. Replace with current on call route on St. Louis Road. A map of the adjusted route is provided in **Figure 5-2**. This service change is forecasted to result in:

- Annual ridership increase of 8,800
- Annual fare revenue increase of \$4,000





- Annual operating cost increase of \$2,000
- Net annual cost **decrease** of \$2,000

Figure 5-2: Business 50 East Route Modification

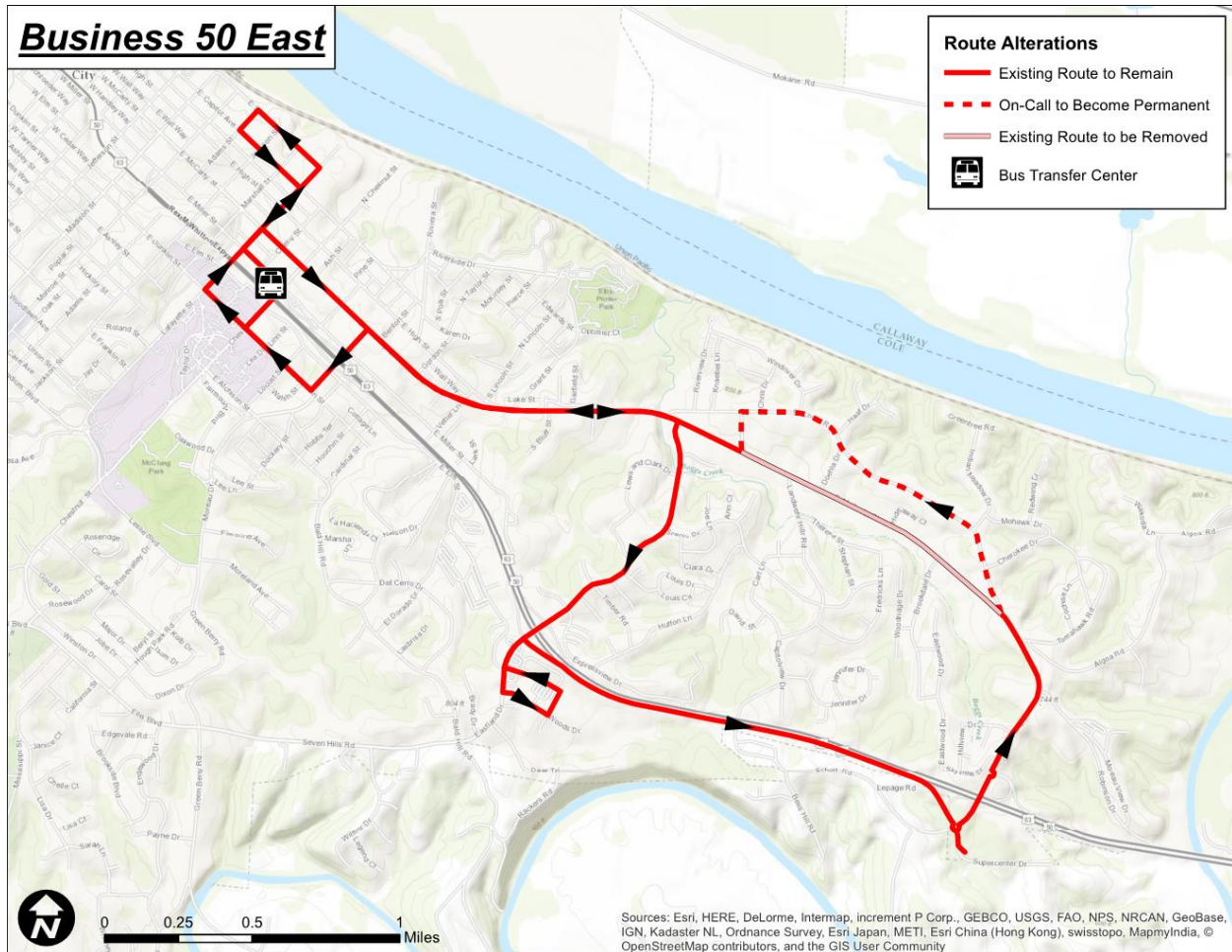


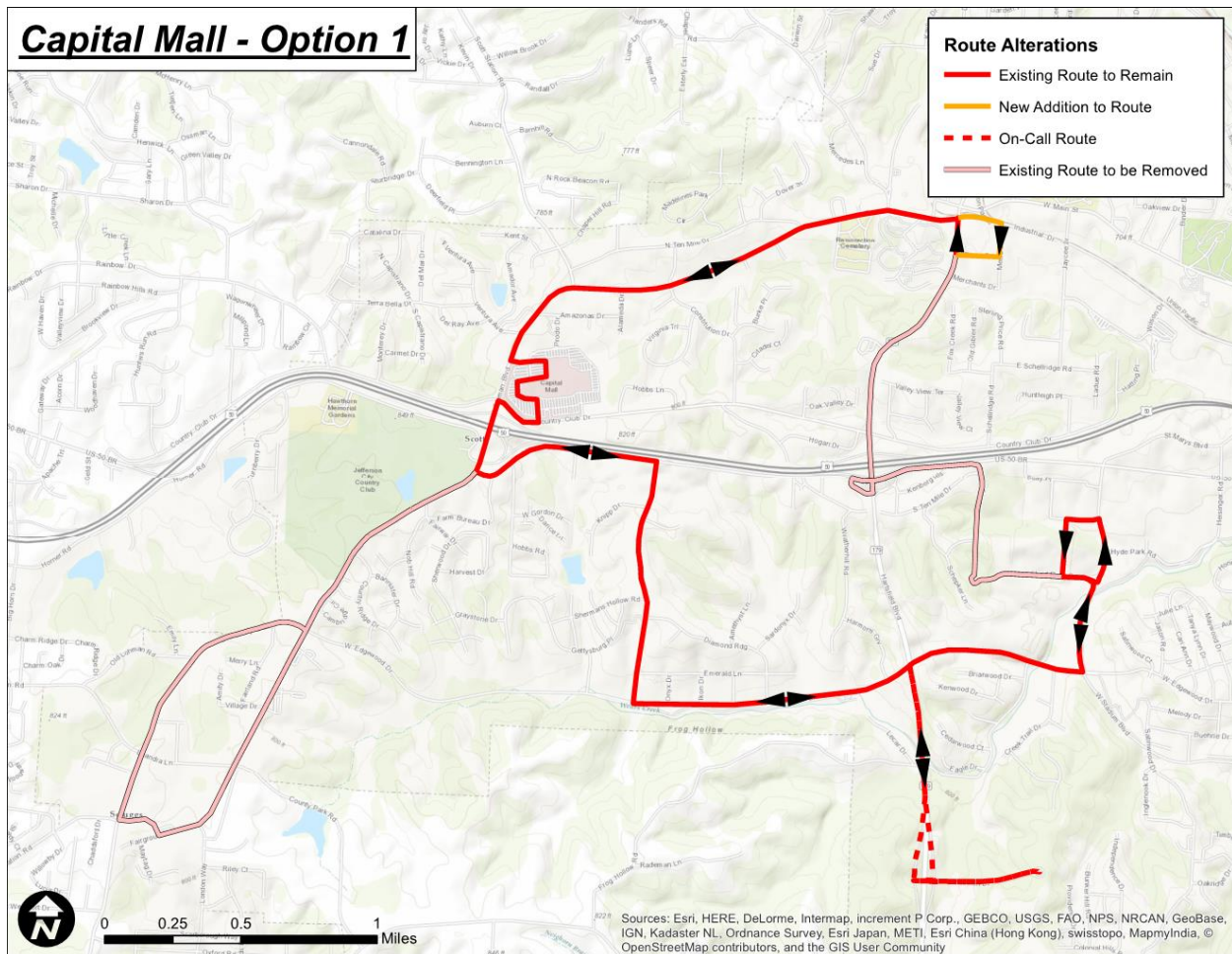
Table 5-4: Business 50 East Route Modification Statistics

Route	Road Trip Mileage		Portion of Route		Existing Route Ridership	
	Existing	Proposed	With 2 - way Service Added	With 1-way Service Removed	With 2 - way Service Added	With 1-way Service Removed
<b>Business 50 East</b>	11.6	11.9	Replace with current on call route on St. Louis road	Eliminate service on East McCarty between Cherokee & Landwehr	7	0

### 5.2.2. Capital Mall Route

Major stops include Menards, St. Mary's Hospital, Veterans Clinic, Capital Mall, Hy-Vee and Community Health Center.

**Figure 5-3: Capital Mall Route Modification – Option 1**



A detailed evaluation of this route identified the following key service characteristics and issues:

- This route does not begin and end at the transfer station. The on-call portion of the route (serving St. Mary's Health Center) is served by the first trip of the day and is then "on call" for the remainder of the day.
- The route has a one way loop pattern with portions of route having very low ridership. Ridership survey does not justify all day service in Westview Heights area.

A detailed evaluation of this route identified the following key service characteristics and issues:

- This route does not begin and end at the transfer station. The on-call portion of the route (serving St. Mary's Health Center) is served by the first trip of the day and is then "on call" for the remainder of the day.
- The route has a one way loop pattern with portions of route having very low ridership. Ridership survey does not justify all day service in Westview Heights area.

### Proposed Service Changes

There are two proposed options for this route as shown in **Figures 5-3 and 5-4**:

Option 1. Turn bus around near Gerbes on Truman Parkway (via Metro, Plaza, Hwy 179) back to Truman for bi-directional travel. Eliminate portion on Hwy 179 south, MO Blvd, Stoneridge, Hard Rock, back to

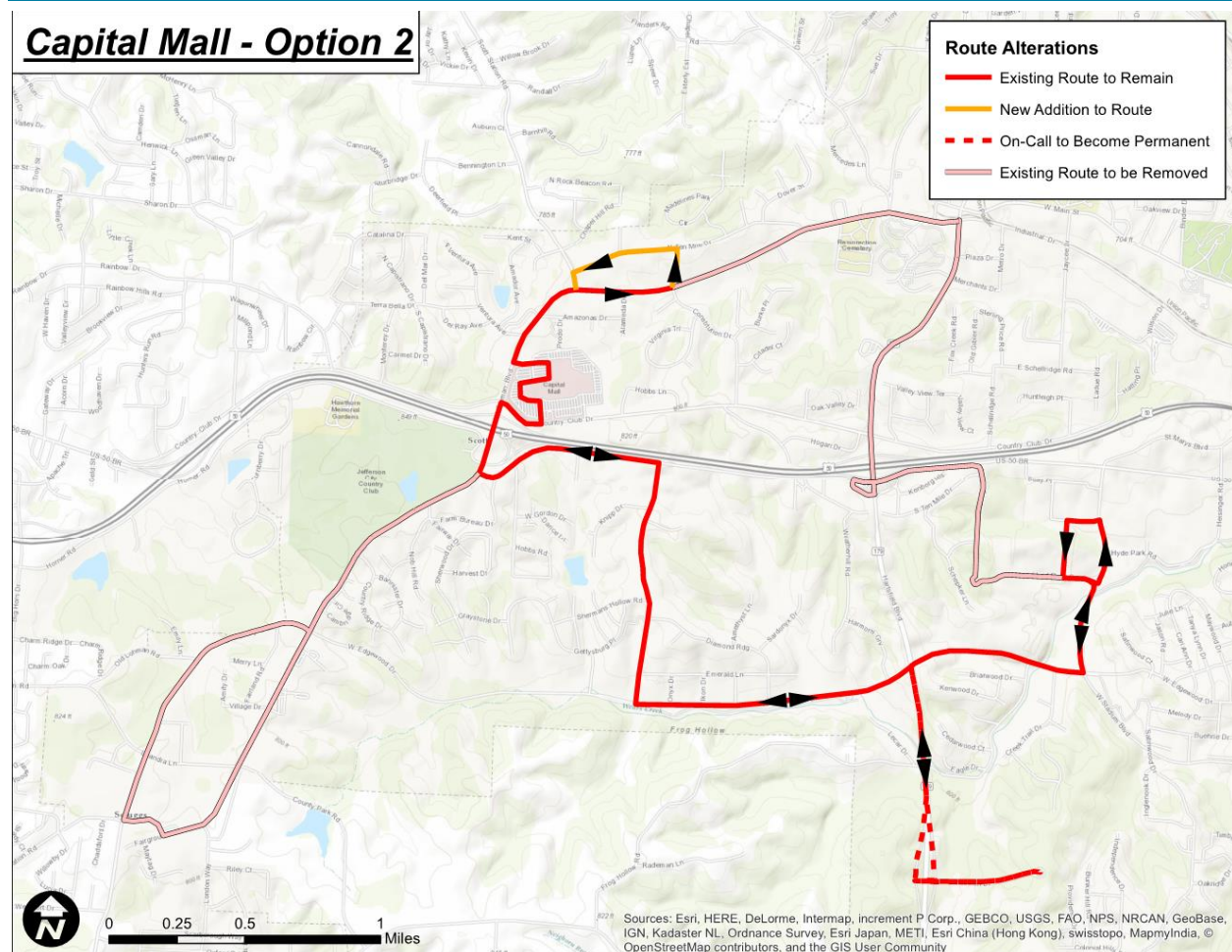




Menards/Wal-Mart. Keep current on call route to St. Mary's. Eliminate Service on Georgetown, Country Club and Fairgrounds Road. Keeps linkage with the High Street West route on Metro Drive. This service change is forecasted to result in:

- Annual ridership increase of 7,400
- Annual fare revenue increase of \$4,000
- Annual operating cost increase of \$2,000
- Net annual cost **decrease** of \$2,000

Figure 5-4: Capital Mall Route Modification – Option 2



Option 2. Turn bus around near Community Health Center (via Constitution, Ten Mile, Scott Station Road) back to Truman. Makes current on call route to St. Mary's permanent part of route. Eliminate Service on Georgetown, Country Club and Fairgrounds Road. This option could also serve the future new High School located off Highway 179 near Mission Drive. This service change is forecasted to result in:

- Annual ridership increase of 5,400
- Annual fare revenue increase of \$3,000
- Annual operating cost increase of \$3,000
- No net annual cost change

Additionally it is recommended for either option that a morning and afternoon tripper route be implemented to cover Westview Heights and the surrounding area.

**Table 5-5: Capital Mall Route Modification Statistics**

Route	Road Trip Mileage		Portion of Route		Existing Route Ridership	
	Existing	Proposed	With 2 - way Service Added	With 1-way Service Removed	With 2 - way Service Added	With 1-way Service Removed
<b>Capital Mall – Option 1</b>	13.8	14.1	Turn bus around near Gerbes on Truman Parkway back to Truman for bi-directional travel	Eliminate portion on Hwy 179 south, MO Bld, Stoneridge, Hard Rock, back to Menards/Walmart. Eliminate Service on Georgetown, County Club and Fairgrounds Road	107	27
<b>Capital Mall – Option 2</b>	13.8	14.3	Turn bus around near Community Health Center via Constitution, Ten Mile, Scott Station Road back to Truman. Makes current on call route to St. Mary's permanent part of route	Eliminate portion on Hwy 179 south, MO Bld, Stoneridge, Hard Rock, back to Menards/Walmart. Eliminate service on Georgetown, County Club and Fairgrounds Road	99	36

### 5.2.3. High Street East Route

Major stops include the Department of Family Services and Jefferson City Administration Offices.

A detailed evaluation of this route identified the following key service characteristics and issues:

- High Street East is one of JEFFTRAN's lower-performing routes in regard to ridership.
- It has a circuitous alignment with most ridership occurs at stops along western part of route.
- There is an opportunity to increase transit circulation with a revised downtown routing pattern and provide an additional level of service to the employees of the State of Missouri along with other citizens and tourists.

#### Proposed Service Changes

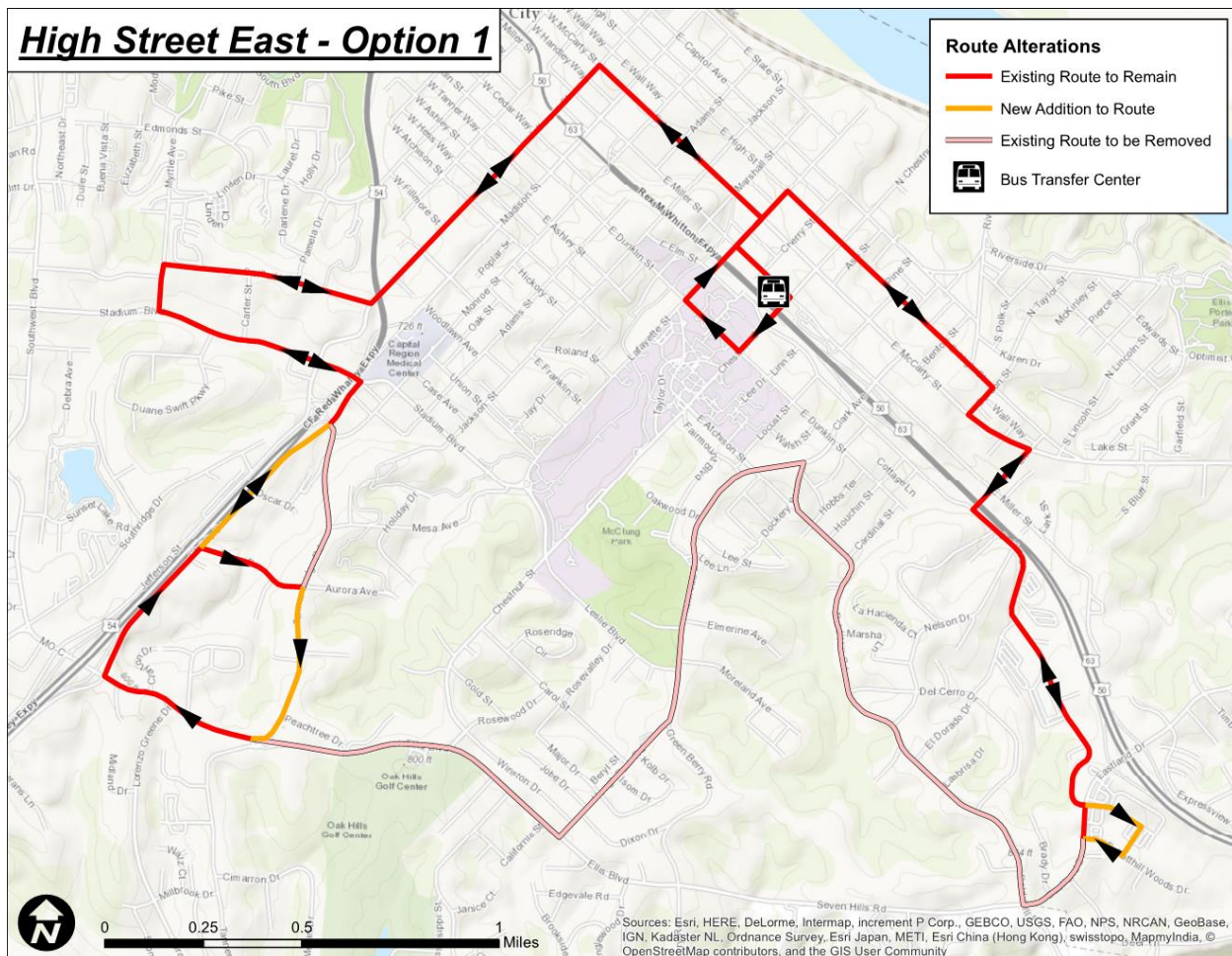
Option 1. Turn back at Gerbes via Eastland Drive to connect to the Business 50 West Route.

Western end turn around: Bi-directional on Christy Drive, via on Flora, Tanner Bridge, Ellis, Christy as shown in **Figure 5-5**. This service change is forecasted to result in:

- Annual ridership increase of 7,100
- Annual fare revenue increase of \$4,000
- Annual operating cost increase of \$16,000
- Net annual cost increase of \$12,000



Figure 5-5: High Street East Route Modification – Option 1



Option 2. From Jefferson: McCarty, Lafayette, Miller, Cherry, Dunklin, Layette, Capitol back to Jefferson for bi-directional service. Western end turn around: Bi-directional on Christy Drive, via on Flora, Tanner Bridge, Ellis, Christy as shown in **Figure 5-6**.

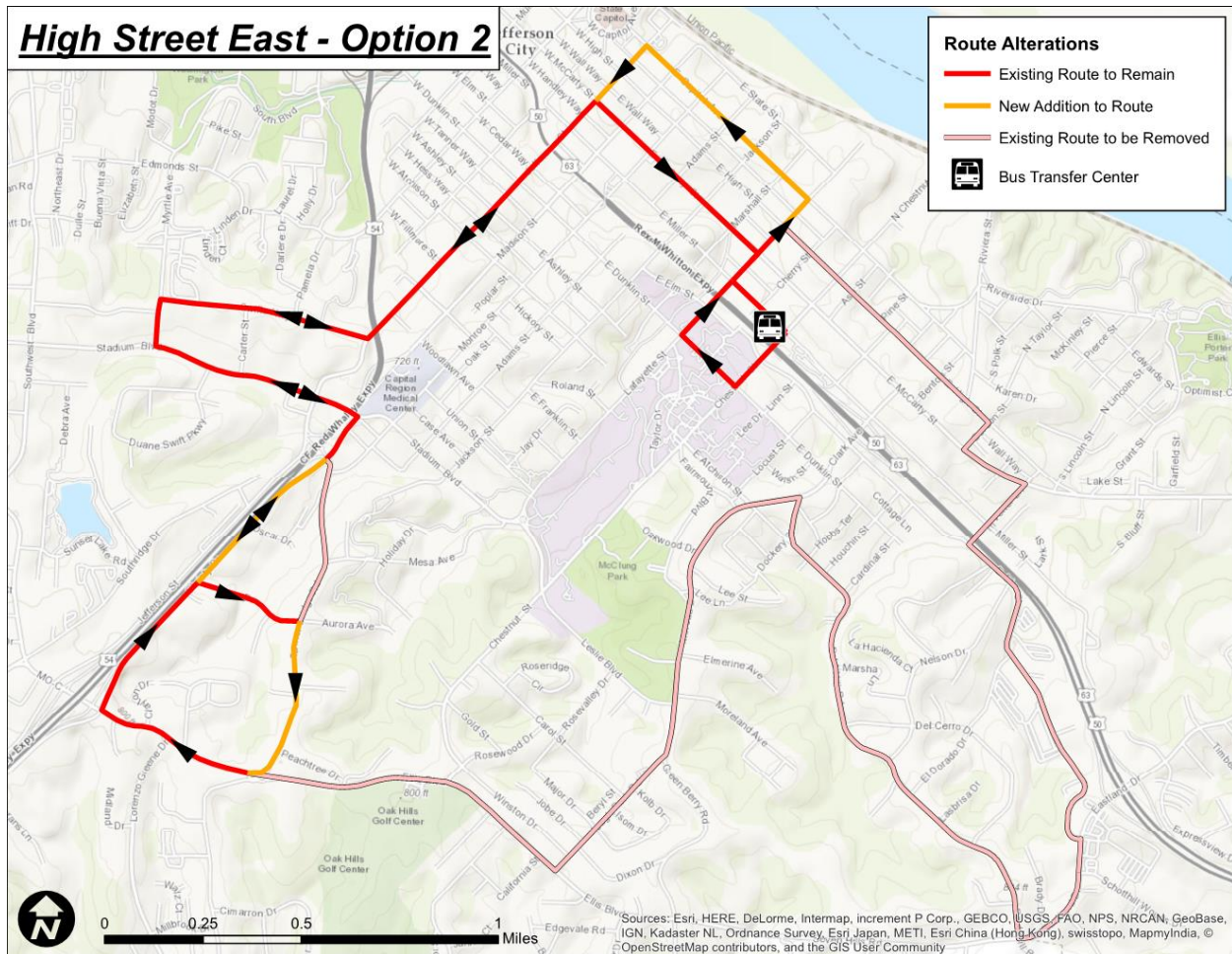
Circulator is an opportunity to serve downtown and the developing Missouri State Penitentiary near of Lafayette Street and Capitol Avenue. This service change is forecasted to result in:

- Annual ridership increase of 2,900
- Annual fare revenue increase of \$1,000
- Annual operating cost **decrease** of \$9,000
- Net annual cost **decrease** of \$10,000

**Note:** These conservative estimates consider only ridership changes due to riders affected along existing route. It does not reflect likely additional ridership increases in downtown circulator portion of route.



**Figure 5-6: High Street East Route Modification – Option 2**



**Table 5-6: High Street East Route Modification Statistics**

Route	Road Trip Mileage		Portion of Route		Existing Route Ridership	
	Existing	Proposed	With 2 - way Service Added	With 1-way Service Removed	With 2 - way Service Added	With 1-way Service Removed
<b>High Street East – Option 1</b>	11.3	14.4	Turn back at Gerbes via left on Eastland Drive. Western end turn around: Bi-directional on Christy Drive, via on flora, Tanner Bridge, Ellis, Christy	Gerbes to Christy near YMCA	94	19
<b>High Street East – Option 2</b>	11.3	9.6	From Jefferson: McCarty, Lafayette, Miller, Cherry, Dunklin, Layette, Capitol back to Jefferson for bi-directional service. Western end turn around: Bi-directional on Christy Drive, left on Flora, Right on Tanner Bridge, Right on Ellis	On current route everything east of Jefferson would be eliminated	65	29



#### 5.2.4. High Street West Route

Major stops include Cole County Health Department, Probation/Parole, and Truman State Office Building.

A detailed evaluation of this route identified the following key service characteristics and issues:

- This route functions relatively well and has stable ridership.
- Provides direct service to downtown and the western corridor of High Street.

#### Proposed Service Changes

No change in service is proposed. There is a potential opportunity to provide a linkage to the proposed Capital Mall- Option 1 at the Gerbes shopping area. If this is implemented, bus stop coordination will need to be implemented.

#### 5.2.5. Missouri Boulevard Route

Major stops include Menards, Sam's Club, Walmart, and Clark Senior Center.

A detailed evaluation of this route identified the following key service characteristics and issues:

- Missouri Boulevard has a direct alignment and serves numerous shopping attractions.
- Ridership information from the ridecheck survey shows it has the highest ridership in the system.
- Transit amenities and street crossing safety measures could be improved.

#### Proposed Service Changes

Make whole route bi-directional for ease of use and a consistent route pattern. Add two way service on Broadway-Linden-Myrtle-Kansas with the inbound trip using Waverly, St. Marys, and Kansas. Also, inbound trip takes Myrtle to Linden and not drive through Clarke Senior Center drive. Eliminate service on Missouri Boulevard between Broadway & Kansas, as shown in **Figure 5-7**. This service change is forecasted to result in:

- Annual ridership increase of 4,800
- Annual fare revenue increase of \$2,000
- Annual operating cost increase of \$5,000
- Net annual cost increase of \$3,000

Upgraded transit amenities such as super shelters at the transfer point near Menards/Walmart are recommended.

**Figure 5-7: Missouri Boulevard Route Modification**

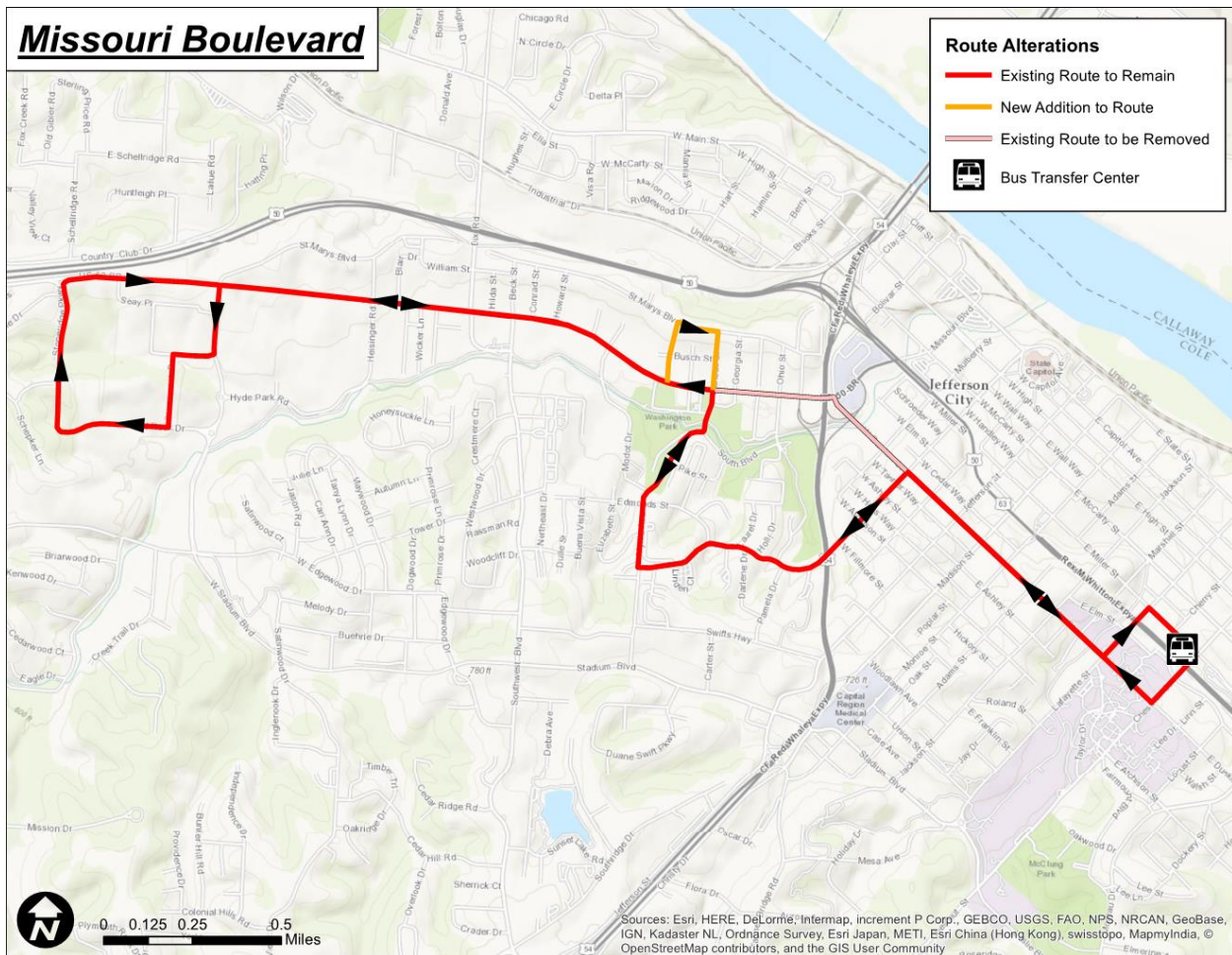


Table 5-7: Missouri Boulevard Route Modification Statistics

	Road Trip Mileage		Portion of Route		Existing Route Ridership	
Route	Existing	Proposed	With 2 - way Service Added	With 1-way Service Removed	With 2 - way Service Added	With 1-way Service Removed
<b>Missouri Blvd</b>	9.1	10.0	Broadway-Linden-Myrtle-Kansas. Inbound trip using Waverly, St. Mary's, Kansas	Missouri Blvd. between Kansas and Broadway	58	8

### 5.2.6. Southwest Route

Major stops include Capital Region Medical Center, Department of Motor Vehicles, and Jefferson City Medical Group.

A detailed evaluation of this route identified the following key service characteristics and issues:

- It is the poorest performing route based on low ridership.
- Ridecheck survey data does not strongly support service that is currently provided on St. Mary's and Route 54.





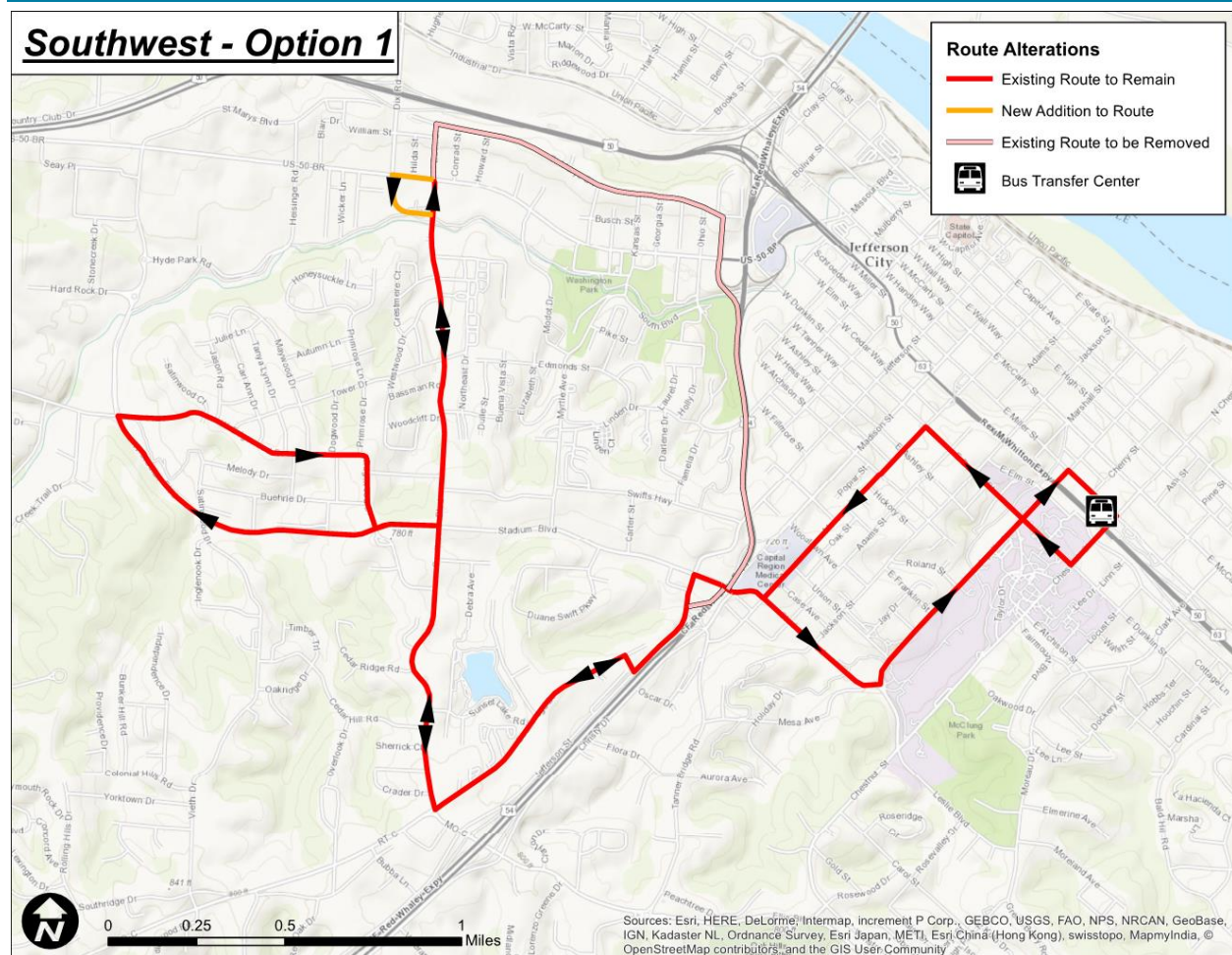
- Inefficient one way loop pattern creates backwards travel.

### Proposed Service Changes

Option 1- Turn bus around near Schnucks (Missouri Blvd., Dix Road, Southwest) to make bi-directional. Eliminate portion on Southwest, St. Marys, and Route 54. Stops along St. Marys are within ¼ mile of the Missouri Boulevard route, as shown in **Figure 5-8**. This service change is forecasted to result in:

- Annual ridership increase of 4,100
- Annual fare revenue increase of \$2,000
- Annual operating cost increase of \$17,000
- Net annual cost increase of \$15,000

Figure 5-8: Southwest Route Modification Option - 1



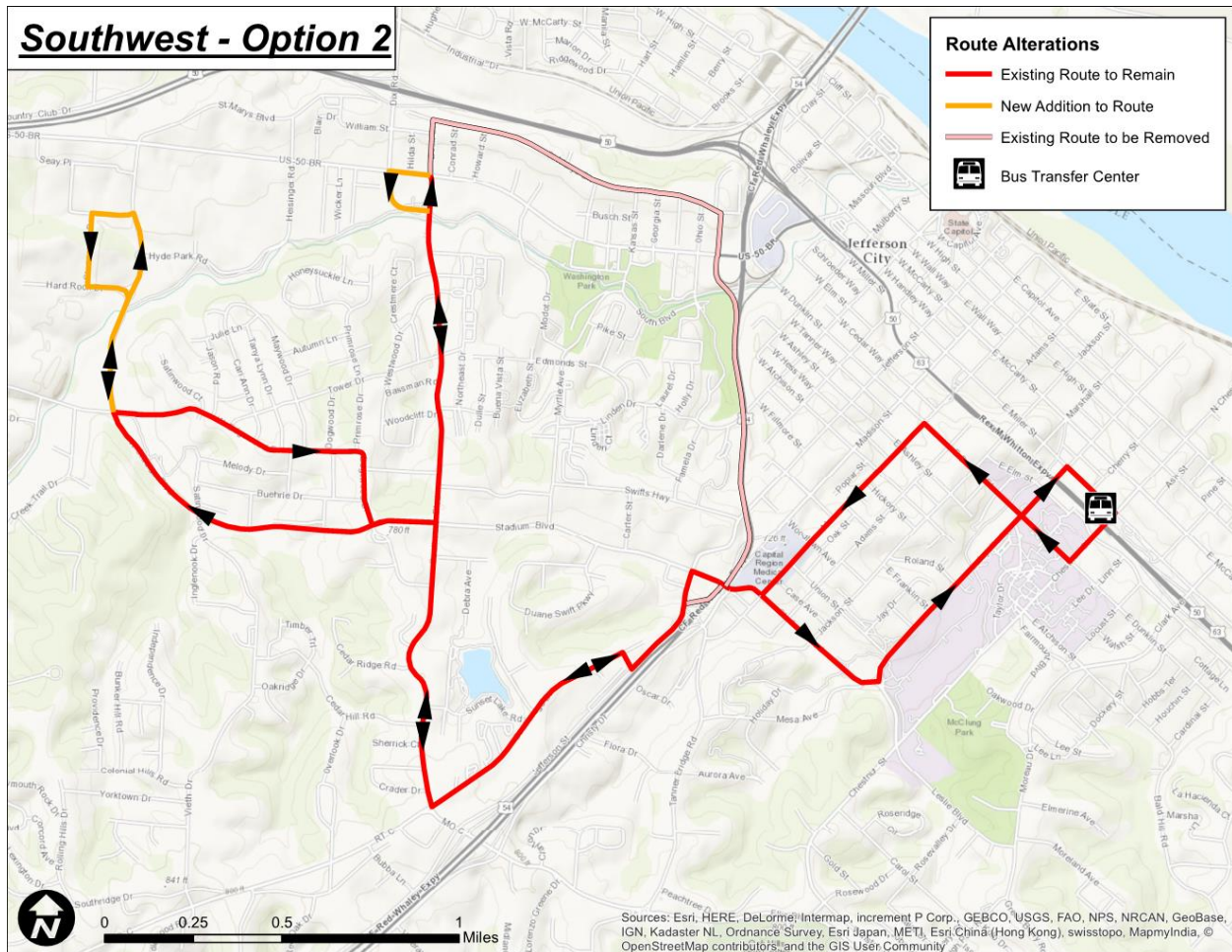
Option 2- Turn bus around near Schnucks (Missouri Blvd., Dix Road, Southwest) to make bi-directional. Eliminate portion on Southwest, St. Marys, and Route 54. This option has one way service to JCMG and Walmart, as shown in **Figure 5-9**. This service change is forecasted to result in:

- Annual ridership increase of 3,200
- Annual fare revenue increase of \$2,000



- Annual operating cost increase of \$13,000
- Net annual cost increase of \$11,000

**Figure 5-9: Southwest Route Modification Option - 2**



**Table 5-8: Southwest Route Modification Statistics**

Route	Road Trip Mileage		Portion of Route		Existing Route Ridership	
	Existing	Proposed	With 2 - way Service Added	With 1-way Service Removed	With 2 - way Service Added	With 1-way Service Removed
<b>Southwest</b>	10.4	13.7	Turn bus around near Schnucks on Mo Blvd (via Mo Blvd, Dix Road, SW to make bi-directional)	Eliminate portion on SW, St. Mary's and Rte 54.	92	41
<b>Southwest Option 2</b>	10.4	12.9	Add one way trip to Walmart with bi-directional travel on all of Southwest	Eliminate portion on SW, st. Mary's and Rte. 54	83	41



### 5.2.7. Summary of Route Modification

The proposed route modifications are designed to allow current passengers to reduce their total travel times for their daily travels and allow more access to more job opportunities with increased service levels. Providing two-way service wherever possible better serves riders using sections of routes which already are well-patronized. Recommendations are provided for modifying five of the six JEFFTRAN routes; no modifications to the High Street West route is recommended. Three of the five routes have two recommended options. Depending upon the options chosen, they offer the following range of forecasted changes in ridership, fare revenue, operating cost, and total cost:

- Annual ridership increase of 25,100 to 32,200
- Annual fare revenue increase of \$12,000 to \$16,000
- Annual operating cost increase of \$13,000 to \$43,000
- Net annual cost increase of \$0 to \$28,000

## 5.3. Choice Rider Plan

The Choice Rider Plan assumes that new funding sources would be implemented, which would permit a higher level of bus service. This plan would improve service frequencies and add more new service. These investments attract choice riders who often have other alternatives and are not transit dependent. Providing transportation alternatives to private automobiles creates a possible demand for transit.

### 5.3.1. New services- Holts Summit, Alcoa

There are a variety of approaches that could improve the efficiency and effectiveness of the overall service network. Innovative services can also expand coverage and better serve new developments. These may be most applicable in the less dense sections of Jefferson City and could be considered to the degree that they meet identified needs.

Based on previous plans, demographics and public input, there is an opportunity for new transit markets. Service to Holts Summit has been identified in the ***Holts Summit Preliminary Long Range Transportation Plan 2009 and Holts Summit Bicycle, Pedestrian, and Transit Plan 2014***. A large portion of Holt Summit residents commute to Jefferson City for employment and there is a strain on automobile parking areas near downtown.

Additionally, the far eastern part of Jefferson City is also has new market potential. There are several employment centers and industries that could benefit from increased transit service. During the public input process, this area was identified as needing increased access to employment.

The financial forecasts in Section 6 describe a “no new funding” assumption. See **Section 6.1**. Under this assumption, these services should be considered as illustrative improvements. They would require additional funding in addition to existing local, state and federal operating assistance.

## Proposed Service

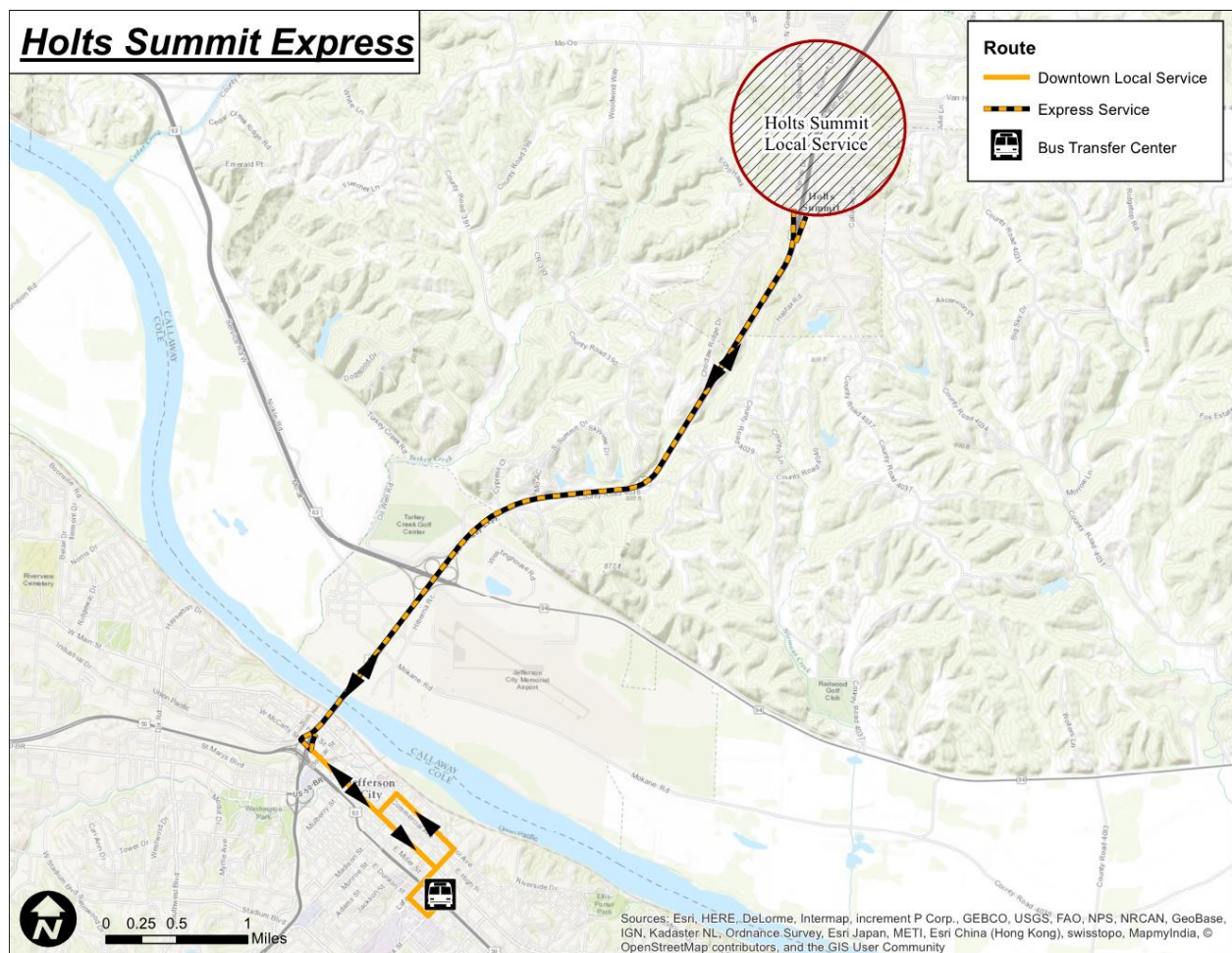
### Holts Summit Express

A peak hour limited stop service from 200 Summit Drive and 300 Karen Drive in Holts Summit via Route 54 into downtown Jefferson City terminating at the downtown transfer facility. <sup>6</sup> A map of the proposed service is provided in **Figure 5-10**.

There would be 3 trips during the weekday peak period and it is assumed the base fare would be \$2. Jurisdictional and cost sharing agreements would need to be implemented between Jefferson City and Holts Summit. This new service is forecasted to result in:

- Annual ridership increase of 15,000 (60/weekday)
- Annual fare revenue increase of \$30,000
- Annual operating cost increase of \$55,000
- Net annual cost increase of \$25,000

Figure 5-10: Holts Summit Express Proposed Service



<sup>6</sup> These stop locations were identified in the *Holts Summit Bicycle, Pedestrian, and Transit Plan 2014*. These are illustrative, subject to modification.



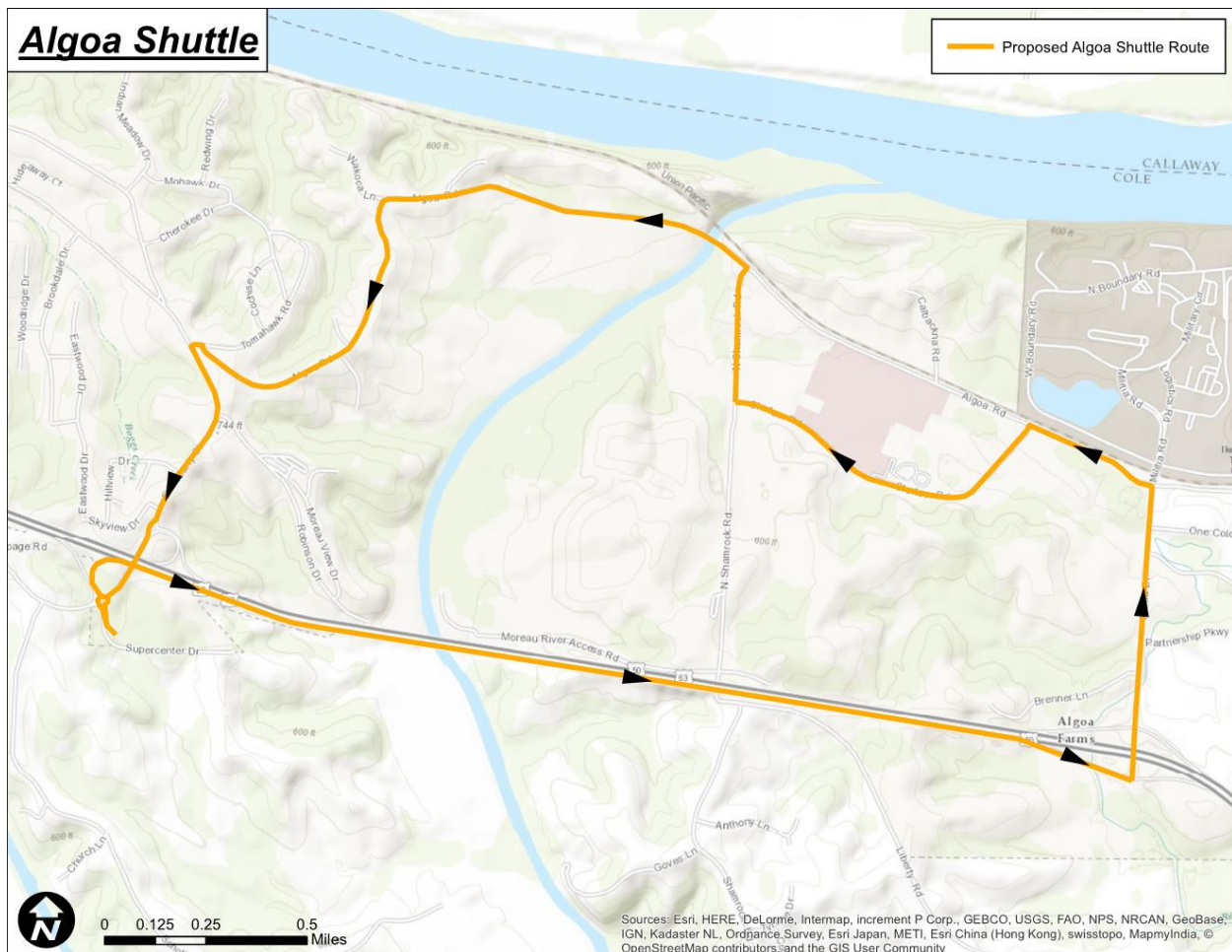


## Algoa Shuttle

Additionally, a shuttle route between the Walmart and eastern Jefferson City can be investigated. A new Algoa shuttle route that starts at Walmart East gets on US 50 to Militia Drive serves Scholastic, ALPLA, and other businesses then back to Walmart East. It would provide a connection to Business 50 East at Walmart. This would be an all-day service, however, it could be instituted as a pilot project with only peak service or a subscription service with smaller Handi-Wheels vans. The peak period service would focus around employment shift times. A map of the proposed route is provided in **Figure 5-11**. This new service is forecasted to result in:

- Annual ridership increase of 30,100 (120/weekday)
- Annual fare revenue increase of \$15,000
- Annual operating cost increase of \$221,000
- Net annual cost increase of \$206,000

Figure 5-11: Algoa Shuttle Proposed Service



### 5.3.2. Partnerships- Unlimited Access

Jefferson City has an opportunity to increase strategic investments in transit by implementing an Unlimited or Universal Access program. Targeted marketing activity will have the greatest return for the

time invested. Decisions on using transit typically are based on time and cost. Reducing the cost of service to targeted consumers will reduce one impediment. Service improvements will reduce the other. Unlimited Access (UA) opens up ridership potential to a wide variety of non-transit riders. By negotiating agreements with strategic partners such as the State of Missouri and Lincoln University among others, an untapped market can be developed.

It gives unlimited access to the transit system at a reduced cost to the customer. This is accomplished by establishing a base cost that the State or University will pay. If this happens there needs to be an agreement stating the funding is going to more service, not just to reduce the city share of transit. The State or University should pay for a portion of new service, not all. The transit system loses nothing, just gets more riders. City residents will benefit from more service, either in frequency or longer span of service.

Another partnership to be investigated involves ridesharing services. Transportation Network Companies (TNC) such as Uber and Lyft are becoming more visible and accessible. These companies are rapidly evolving and there is a strong market for first mile/last mile service with cars positioned near outlying bus stops for short trips. TNC drivers are evolving into neighborhood drivers allowing them to respond quickly to immediate travel needs. It also provides private sector solutions and that complements the fixed route network.

### 5.3.3. Increased Frequency

If additional operating funds can be obtained, there are a number of enhancements to the bus plan that should be considered including improved service levels. It would be desirable to improve headways to 20-minute service on the Missouri Boulevard route to induce ridership demand with high frequencies.

The frequency upgrades for the Missouri Boulevard will make it a transit intensive corridor. High capacity and frequency services would offer key opportunities for growth and branding of the system. This would capture choice riders by offering expanded services and amenities.

The advantage of a high frequency route is that service will very frequent and coordinate better with start/end times of workers who work at locations. This coordination will attract new passengers to the system. The route will also save current passengers significant amounts of time that they spend waiting for buses that are operating on 40-minute intervals for trips that have an unpredictable finish time, such as medical appointments or shopping trips. Current riders will be able to make more trips in less time and have a higher level of mobility.

Implementation of improved frequencies on the Missouri Boulevard route can be accomplished without expanding the JEFFTRAN fixed route fleet. Implementation of improved frequencies system-wide (providing 20-minute service on all routes) would require an increase in the JEFFTRAN fixed route fleet. The existing JEFFTRAN fleet has 12 fixed route coaches. Nine buses are required to serve peak route requirements (including tripper routes). Implementing more frequent service system-wide would bring peak bus requirements to 15. This would require a fixed route fleet of at least 18 buses (with spares).

Eight of JEFFTRAN's 12 fixed route vehicles were delivered in 2005 and 2006, and are nearing the end of their useful lives. Implementing improved frequencies would require purchase of approximately 14 full-size transit coaches. This would allow replacement of the 2005/2006 vehicles, as well as provide for fleet expansion to support improved frequencies.





In addition to this significant capital expense for added fixed-route vehicles, an assessment would need to be made of the potential need for increased storage and maintenance capacity to serve a larger fleet. These should be a consideration in finalizing plans for a new operating and maintenance facility. The 2010 **JEFFTRAN Feasibility Study** made recommendations for a new facility with 10 bus bays. At the time this report was prepared, JEFFTRAN operated 29 vehicles (pp. 12-13; see Table 1). This fleet (in 2010) was composed:

- 8 Gillig transit coaches
- 11 Ford Van/Mini Buses and
- 10 Freightliner cutaway vehicles.

The basis for the report's recommendations was the assumption that the JEFFTRAN fleet would grow to 35 vehicles by the year 2025. The assumed fleet makeup in the year 2025 was:

- 10 Gillig transit coaches
- 12 Ford Van/Mini Buses and
- 13 shuttle buses

The present makeup of the JEFFTRAN fleet is:

- 12 Gillig transit coaches
- 10 Ford/Elkhart Van/Mini Buses

Any consideration of expanding service to 20 minute intervals systemwide needs also to consider whether the planned facility expansion would accommodate a fixed route fleet of 18 transit coaches, plus the fleet necessary to provide Handi-Wheels service. The total number of transit vehicles under the increased frequency scenario would be less than the 35 assumed in the 2010 study. However, the fleet would have 80% more transit coaches (18 vs. 10), compared to what was assumed in the study.

There are very significant capital requirements for expanding JEFFTRAN's fleet and (potentially) planned operating facility to accommodate more frequent service. Our study identifies this as a future illustrative project.

#### 5.3.4. Route Color Scheme

Branding is another way to increase choice ridership and make the make the system more understandable. It is recommended that the system implement a new route color scheme. Below are suggested route name changes:

- Business 50 East - Purple Route
- High Street East - Green Route
- Southwest - Red Route
- Capital Mall - Blue Route
- Missouri Boulevard - Gold Route
- High Street West - Teal Route

### 5.3.5. Additional Funding Requirements

This plan reflects a range of potential funding conditions. The route modification plan assumes that the operating budget will still be constrained. Therefore, it attempts to economize on bus service wherever possible, by eliminating non-productive service and by redistribute resources.

The Choice Rider Plan assumes that new funding sources would be implemented, which would permit a higher level of bus service.

If Unlimited Access is implemented, there could be the potential transit system from one that serves a transit dependent customer base to a transit system that meets the enhanced travel needs of its core ridership while attracting demographic groups that are not currently using transit service.

By attracting new ridership, JEFFTRAN could examine new funding mechanisms. Specifically, FTA Small Transit Intensive Cities (STIC) funding. The STIC program is based on six criteria:

- Passenger Miles per Vehicle Revenue Mile
- Passenger Miles per Vehicle Revenue Hour
- Vehicle Revenue Mile per Capita
- Vehicle Revenue Hour per Capita
- Passenger Miles per Capita
- Passenger Trips per Capita

Jefferson City can capture additional funds if it can meet some of the required thresholds. By attracting additional ridership, this funding is plausible.

In developing a strategic investment in improved services, different demographic groups will be attracted to the bus system. Improved service on routes that connect residential locations with large employers, at frequencies that connect with work times, will make the transit system a strong, viable transportation option.

## 5.4. Handi-Wheels Service Modifications

**Section 3.2.1** of this report summarized the findings of the *Existing Conditions Report* regarding the comparative performance of Handi-Wheels service with ADA demand-response service provided by JEFFTRAN's peer systems. The full findings regarding Handi-Wheels performance is in Sections 2.4.3, 2.4.4, and 2.4.6 of the *Existing Conditions Report*. This section builds upon these findings to recommend a reallocation of resources (operating budget) from Handi-Wheels service to fund fixed-route service improvements described in **Section 5.2** and **Section 5.3**.

In **Section 5.4.1** a proposal for a recertification process of Handi-Wheels riders so that those who are offered service are those eligible for such service under the Americans with Disabilities Act (ADA).

**Section 5.4.2** recommends an additional strategy to reduce Handi-Wheels operating expenses through a "win-win" transaction with the customers. Those who are eligible for Handi-Wheels service, but who are able and choose to make a particular trip on JEFFTRAN fixed route, would be able to do so without payment of fare. This would represent a cost savings to the customer, as well as an operating efficiency for JEFFTRAN.



#### 5.4.1. Eligibility Determination

The peer system analysis in the *Existing Conditions Report* summarized JEFFTRAN's NTD data submission for reporting years 2011 through 2015. During this period, JEFFTRAN's total operating expenses averaged \$2,296,000 (Table 2-11). Of this total, 40% (\$919,000) was used for Handi-Wheels service (Table 2-8). During this same period, JEFFTRAN's five peer systems spent an average of 23% of their operating budgets on ADA service. If JEFFTRAN's allocation of operating expenses were at its peer average, it would have additional \$390,000 available annually for fixed route service.

The comparison of per capital use of Handi-Wheels service with JEFFTRAN's peer systems is more striking. During the analysis period of 2011 to 2015, each of Jefferson City's 43,186 residents made (on average) 1.31 trips per year (**Table 3-4**). The average rides/capita on ADA service for JEFFTRAN's peers was 0.24; the system with the next-highest rides/capita after JEFFTRAN (Flint Hills Area Transportation System) averaged 0.42 rides/capita between 2011 and 2015.

We recognize that most trips made on Handi-Wheels are probably made by riders who satisfy the eligibility requirements under the ADA. It also is clear that JEFFTRAN's historically liberal eligibility policies have resulted in significant amounts of service provide to those who could use fixed route service.

Allocating operating resources is a local decision. There is no regulatory requirement that restricts a locality from extending door-to-door demand response service to those who do not satisfy the ADA's eligibility requirements. At the same time, this study has identified significant needs to expand JEFFTRAN's fixed-route service to the general public. These needs include Saturday service, weekday evening service, modifications to existing routes, and additional service to attract choice riders (see **Section 5.1** through **Section 5.3**). Accordingly, we recommend that JEFFTRAN review and recertify the eligibility of all Handi-Wheels riders, and use the operating cost savings to serve the significant needs for added fixed-route service.

In fiscal 2016, JEFFTRAN reported Handi-Wheels operating cost of \$980,930 on its NTD submittal. It reported annual Handi-Wheels ridership of 50.464, making the Handi-Wheels cost/rider \$19.44. We assume that even a significant portion of existing Handi-Wheels customers could be serve on fixed route service at no increase in operating costs.

This 2016 Handi-Wheels ridership equates to about 200 riders per day. We assume that the recertification process reduces the number of riders making these by twenty to thirty percent. This would provide a significant reduction in Handi-Wheels operating expense. At the same time, the percentage of operating expenses for Handi-Wheels service remain significantly above the 23% average for JEFFTRAN's peers. The added 65 to 70 customers a day on fixed route service could be accommodated with no meaningful increase in fixed route operating cost.

The net effect on "bottom line" expenses for this change is forecasted in combination with another proposed change in JEFFTRAN policy, described in **Section 5.4.2** below.

#### 5.4.2. Free Fixed Route Service

Lochmueller Group interviews<sup>7</sup> with the management of The Rapid (Grand Rapids Michigan transit operator) of its significant success with offering "free fare" on fixed route services to its ADA-eligible

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<sup>7</sup> Interviews conducted as part of Lochmueller Group's COA for the Evansville, Indiana transit system.

customers. Under this plan, its ADA-eligible customers who chose to use fixed-route service for a given trip could rider the fixed route service with no payment of fare. The ADA service always remained available; the choice to use the fixed-route service for a particular trip was the choice of the customer. The Ride found that ridership on its ADA service was reduced by at least 20% by this initiative. Further, it provided The Ride with significant favorable publicity. Many in the ADA community appreciated the added flexibility of being able to travel spontaneously, without the reservation requires for ADA service.

We recommend that JEFFTRAN also implement this initiative. We believe it would be well-received by its customers, while at the same time providing a further decrease in Handi-Wheels operating expenses.

The calculations in **Table 5-9** forecast the result of implementing both the proposals described above. This is presented as a joint calculation because a larger reduction in the number of ADA-eligible trips (due to the recertification process) would result in a smaller diversion of the remaining eligible ADA riders (and vice versa. It presents forecasts which assume the following:

- A reduction in the number of ADA trips of 20% to 30% due to the recertification process.
- A further reduction of 20% of the remaining ADA ridership due to offering “free fare” on fixed route service.

This combination of economies provides between \$302,000 and \$376,000 in funds annually, which can be used to provide increased fixed route service.

**Table 5-9: Handi-Wheels Service Economies**

Reduction in Handi-Wheels Eligible Trips	Handi-Wheels		Fixed Route Revenue Gain	Added Available Funds (Net)
	Operating Cost Savings	Revenue Loss		
20%	\$330,000	\$34,000	\$6,000	\$302,000
30%	\$410,000	\$42,000	\$8,000	\$376,000

## 5.5. Fare Increase

As public officials noted during the input phase of this project, fare increases may be acceptable if they are connected with benefits to JEFFTRAN users. They also noted that budget constraints make added local funding unlikely (See *Existing Conditions Report*, Section 8.1). Given the significant needs for added service identified in this study, it is appropriate to consider a fare increase as part of the funding package.

We propose a \$0.25 fare increase as part of the funding package for the service improvements. This would make JEFFTRAN’s base fare \$1.25. The Handi-Wheels fare would be set at \$2.50. The following assumptions were used to forecast the ridership and revenue impacts of this increase.

- The elasticity of ridership with respect to fare increases are -0.2 for fixed route service, and -0.33 for Handi-Wheels service.<sup>8</sup>
- The changes in revenue and ridership are calculated using as the baseline the 2016 ridership of 248,944 for fixed route service, and 50,646 for Handi-Wheels service.

<sup>8</sup>An elasticity is a measure of the percent change of demand for a product or service with respect to a 1% change in the price. The higher negative elasticity for Handi-Wheels service anticipates that its riders are more sensitive to price increases.



The forecasted new annual revenue and ridership resulting from a \$0.25 fare increase are shown in **Table 5-x**. Forecasts are rounded to nearest 1,000 riders and \$1,000. Total JEFFTRAN ridership is forecasted to decrease by 15,000 riders, while fare revenue is forecasted to increase by \$34,000.

**Table 5-10: JEFFTRAN Service - Forecasted Effects of \$0.25 Fixed Route Fare Increase**

Service	Annual Ridership		Annual Revenue	
	Pre-Fare Increase	Post-Fare Increase	Pre-Fare Increase	Post-Fare Increase
Fixed Route	248,944	236,000	\$ 131,627	\$ 156,000
Handi-Wheels	50,464	48,000	\$ 52,938	\$ 63,000
Total	299,408	284,000	\$ 184,565	\$ 219,000





## 6. Financial Forecasts

This concluding section compares the needs for improved JEFFTRAN services with available and potential funding sources. **Section 6.1** uses reasonable assumptions to identify improvements, which can be implemented within reasonably anticipated funding. **Section 6.2** identifies other potential illustrative improvements. These illustrative improvements address legitimate needs for expanded transit service, but require additional funding which is not presently anticipated.

### 6.1. Recommended Service Plan – Funding

The recommended service plan implements the improvements in **Section 5.1** and **Section 5.2** of this report. These are restated in the bullet points below. **Table 6-1** summarizes the forecasted annual ridership, revenue and operating cost changes for these service improvements.

- Provide weekday evening service – High Street West, Business 50 East, Missouri Boulevard, Capital Mall routes
- Provide Saturday service - High Street West, Business 50 East, Missouri Boulevard, Capital Mall routes
- Modify Business 50 East, High Street East, Capital Mall, Missouri Boulevard, Southwest routes

**Table 6-1: Forecasted Revenue, Ridership, Costs – Recommended Plan**

Improvements	Ridership	Fare Revenue	Operating Cost	Cost, Net of Added Revenue
Added Saturday Service	25,100	\$ 15,000	\$ 230,000	\$ 215,000
Added Weekday Service	36,400	\$ 21,000	\$ 224,000	\$ 203,000
Route Modifications (High)	32,200	\$ 16,000	\$ 43,000	\$ 28,000
Route Modifications (Low)	25,100	\$ 12,000	\$ 13,000	\$ -
<b>Total - High</b>	<b>93,700</b>	<b>\$ 52,000</b>	<b>\$ 497,000</b>	<b>\$ 446,000</b>
<b>Total - Low</b>	<b>86,600</b>	<b>\$ 48,000</b>	<b>\$ 467,000</b>	<b>\$ 418,000</b>

The potential Handi-Wheels economies require recertifying Handi-Wheels riders to reduce the number of trips provided to those do not satisfy ADA eligibility requirements. They Handi-Wheels cost reduction also assumes a reduction in demand by offering free fixed route service to those certified for Handi-Wheels service.

**Table 6-2** summarizes the funding for the recommended service plan. The key unknown is the level of reduction in Handi-Wheels usage which will result from the recertification process. The amount of added local funding needed to implement the service improvements ranges from small (\$8,000 annually) to significant (\$110,000 annually).

To manage the cash flow for implementing the service improvements, we assume the Handi-Wheels recertification must be well underway prior to implementing the fixed route service improvements. The Handi-Wheels economies are the major funding source for fixed-route improvements. As the recertification proceeds, JEFFTRAN will have a more accurate assessment of the level of added local funding required to implement the plan.



Table 6-2: Funding for Recommended Plan

Funding Source	Low	High
Handi-Wheels Economies	\$ 302,000	\$ 376,000
Fare Increase	\$ 34,000	\$ 34,000
Added Local Funding	\$ 110,000	\$ 8,000
Total	\$ 446,000	\$ 418,000

## 6.2. Choice Rider Plan

Three specific elements were identified in the choice ridership plan. These added services require added funding which has not been identified. Details of these recommendations are provided in **Section 5.3**. The three recommendations are summarized below.

### Holts Summit Peak Period Express

There would be 3 trips during the weekday peak period and it is assumed the base fare would be \$2. Jurisdictional and cost sharing agreements would need to be implemented between Jefferson City and Holts Summit. This new service is forecasted to result in:

- Annual ridership increase of 15,000 (60/weekday)
- Annual fare revenue increase of \$30,000
- Annual operating cost increase of \$55,000
- Net annual cost increase of \$25,000

### Alcoa Shuttle

A new Alcoa shuttle route that starts at Walmart East gets on US 50 to Militia Drive serves Scholastic, ALPLA, and other businesses then back to Walmart East. It would provide a connection to Business 50 East at Walmart. The forecasts below assume service is provided 12 hours per day on weekdays.

- Annual ridership increase of 30,100 (120/weekday)
- Annual fare revenue increase of \$15,000
- Annual operating cost increase of \$221,000
- Net annual cost increase of \$206,000

### More Frequent Service (Operating Every 20 Minutes, Weekdays)

**Section 5.3.3** describes in details the significant capital expenses for added fleet which would be required to implement more frequent service. It also notes that JEFFTRAN's existing plans for a new operating facility needs to be evaluated in this context. It is not clear whether the planned new operating facility on Miller Street near the present facility would be adequate for an expanded fixed route fleet.



# Appendix

# Business 50 East

## Route Alterations

- Existing Route to Remain
- On-Call to Become Permanent
- Existing Route to be Removed
- Bus Transfer Center



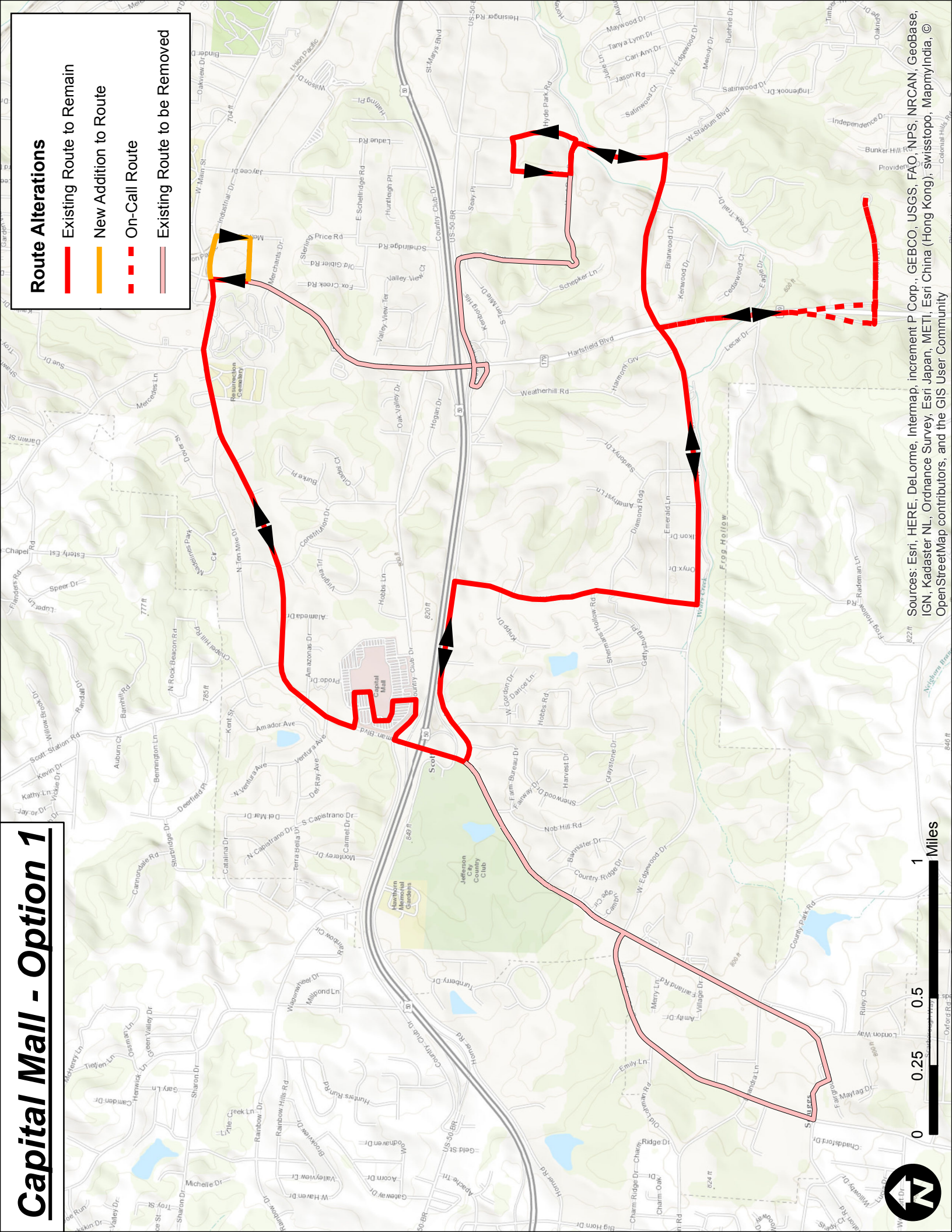
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



# Capital Mall - Option 1

## Route Alterations

- Existing Route to Remain
- New Addition to Route
- On-Call Route
- Existing Route to be Removed

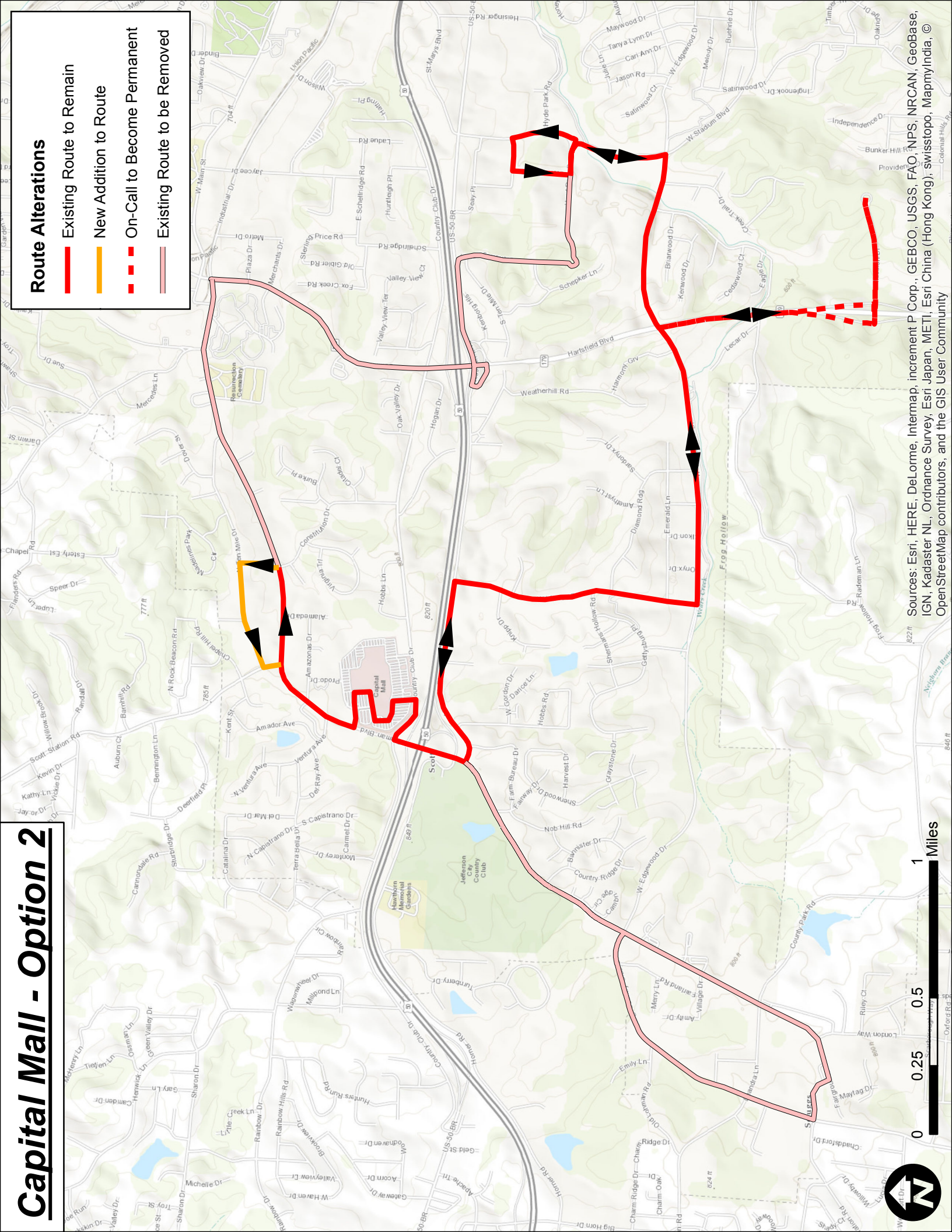




# Capital Mall - Option 2

## Route Alterations

- Existing Route to Remain
- New Addition to Route
- On-Call to Become Permanent
- Existing Route to be Removed



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



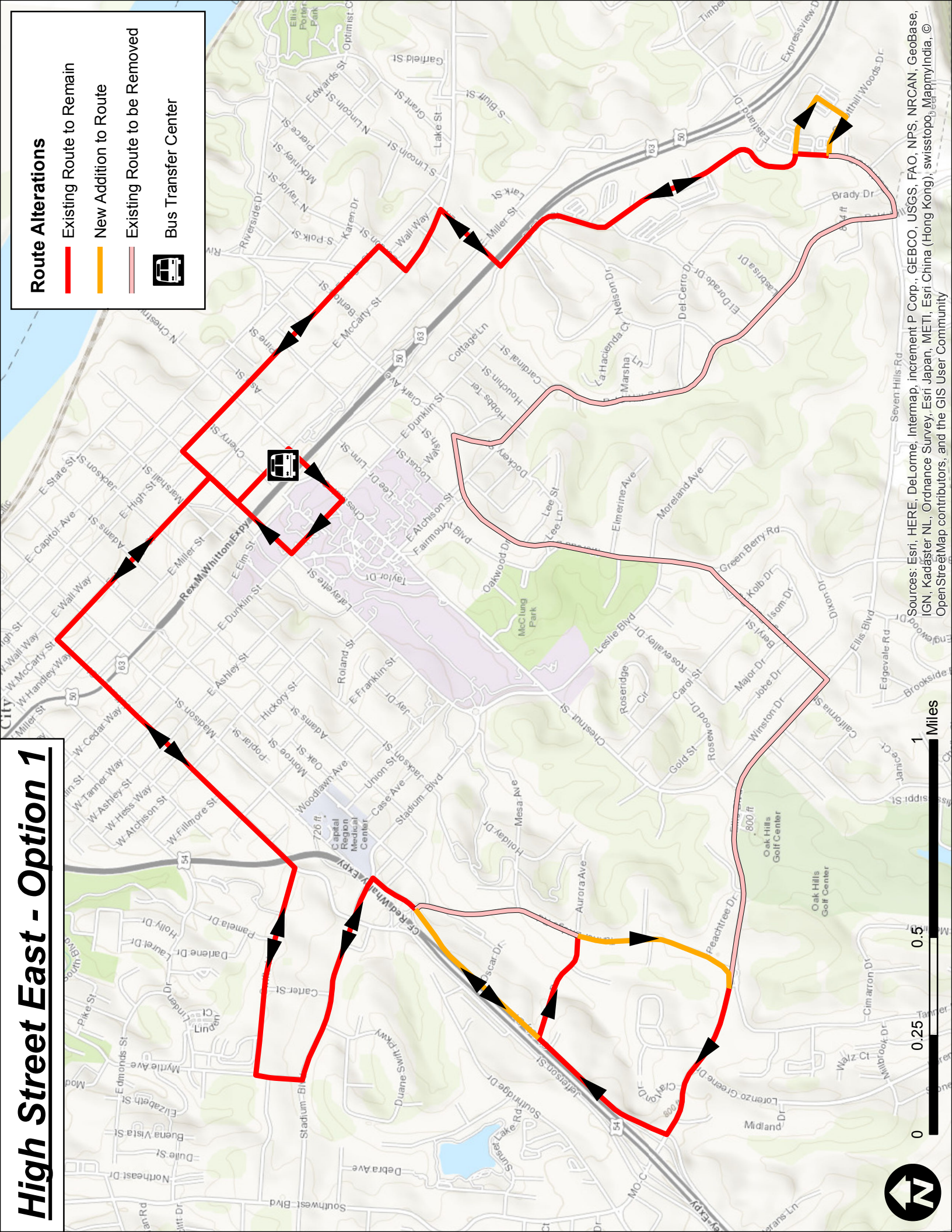
## High Street East - Option 1

## Route Alterations

Existing Route to Remain

## New Addition to Route

Existing Route to be Removed







Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

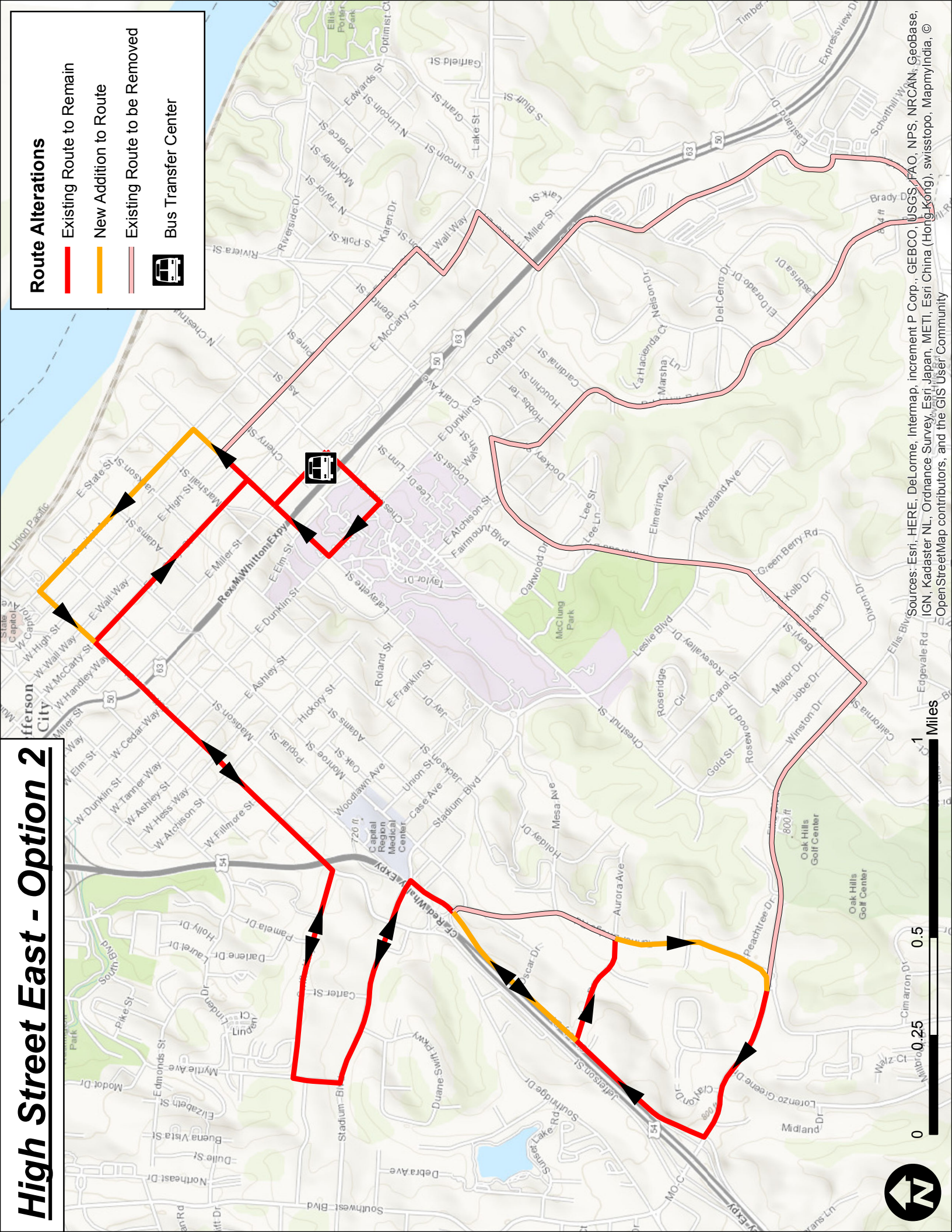




## High Street East - Option 2

## Route Alterations

-  Existing Route to Remain  
 New Addition to Route  
 Existing Route to be Removed  
 Bus Transfer Center



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community





# Missouri Boulevard

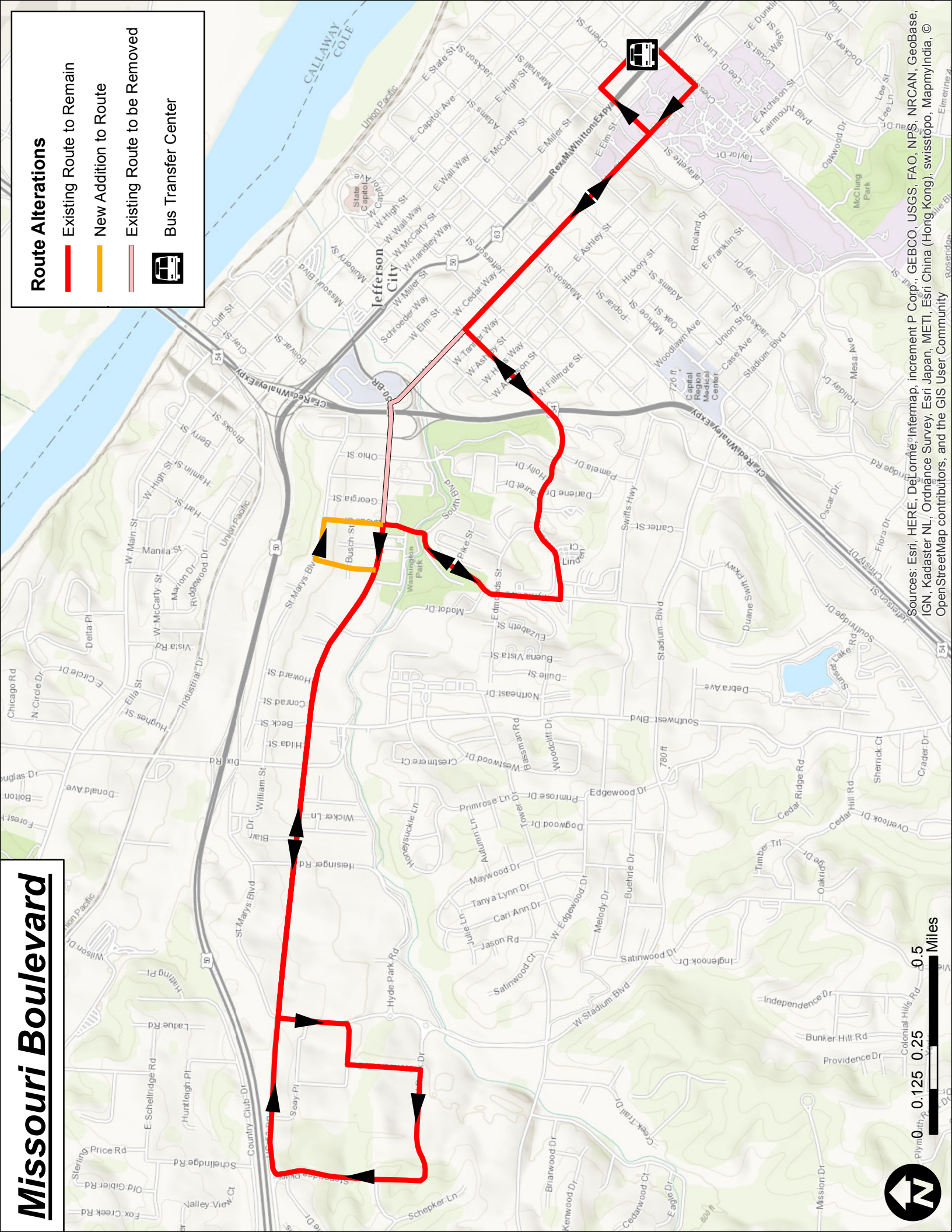
## Route Alterations

- Existing Route to Remain
- New Addition to Route
- Existing Route to be Removed
- Bus Transfer Center



0 0.125 0.25 0.5 Miles





Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community





## Southwest - Option 1

## Route Alterations

-  Existing Route to Remain  
 New Addition to Route  
 Existing Route to be Removed  
 Bus Transfer Center



1 Miles

05

0.25

C



Sources: Esri, HERE, DeLorme; Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, Swisstopo, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



# Southwest - Option 2

## Route Alterations

- Existing Route to Remain
- New Addition to Route
- Existing Route to be Removed
- Bus Transfer Center






Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community





# Holts Summit Express

## Route

-  Downtown Local Service
-  Express Service
-  Bus Transfer Center

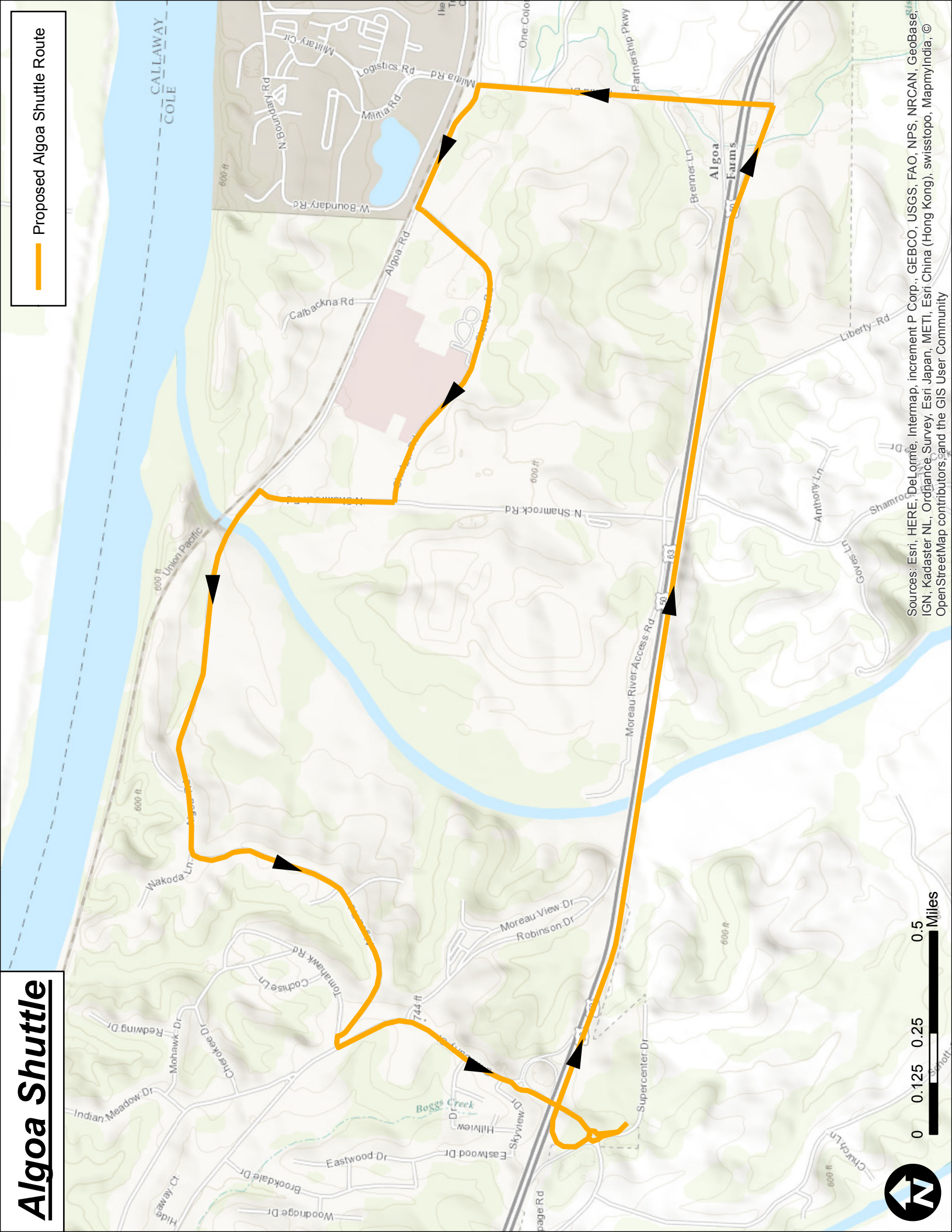
Holts Summit  
Local Service





# Algoa Shuttle

Proposed Algoa Shuttle Route



0 0.125 0.25 0.5 Miles

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community









411 N 10th Street, Suite 200  
St. Louis, Missouri 63101

5650 Mexico Road, Suite 2  
St. Peters, Missouri 63376

[lochgroup.com](http://lochgroup.com)