

Jefferson City Transit Development Plan Potential Transit Service Modifications

Prepared for



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Section 1: Introduction

The Jefferson City Transit Development Plan (TDP) was initiated to evaluate and develop recommendations for the future of transit within Jefferson City and the surrounding urbanized area.

As part of the Transit Development Plan, the TranSystems Team was charged with the assignment to consider and evaluate creative, innovative, and more cost-efficient means of providing transit services to the Jefferson City community. The process looked at alternative approaches including downtown circulator routes, cross-town routes, employer express routes, University routes, additional connector routes, and general public demand-response routes. The study also looked at the possibility of secondary transfer locations. The study considered unserved areas where there is potential demand for public transportation and opportunities for possible expansion of service in the urbanized area surrounding the City. Preliminary cost estimates were also developed as part of the service plan.

This report documents the development of various potential transit service modifications including associated assumptions and service characteristics. These alternatives have initially been developed for review by key stakeholders, including the Project Steering Committee.

This report deals primarily with fixed route services, and other services intended for the general public. Potential modifications to the Handi Wheels paratransit service are covered in another report.

Section 2: Current Services

JEFFTRAN currently operates seven regular fixed routes, four commuter school tripper routes and two state shuttle routes, which provide transportation for state employees from state parking lots. The seven fixed routes are shown in Figure 1. Figures 2 and 3 show the commuter school tripper routes and shuttle routes, respectively. An existing transfer site is centrally located within the downtown area. Six of the seven fixed routes converge at the transfer location at the same time, as the routes operate on a “pulse scheduling system.” A “pulse” operation has all routes “meeting” at a common point at the same time. Most of the routes operate in a “loop” pattern, with vehicles traversing a route in either a clockwise or counterclockwise direction.

JEFFTRAN also provides a complementary paratransit service called “Handi Wheels.” Complementary paratransit is a transportation service required by the Americans with Disabilities Act (ADA) of 1990 for individuals with disabilities who are unable to use fixed-route transportation systems. The service area for Handi Wheels is the entire city of Jefferson City.

Overall, the fixed routes have daily ridership of approximately 800. Individual route ridership is shown in Table 1. The Missouri Boulevard route has the highest ridership.

Table 1: Fixed Route Daily Ridership

Route	Ridership
Capital Mall	90
Missouri Blvd	220
Southwest	120
High Street East	120
High Street West	80
Renn Addition	120
Business 50	60
Total	810

The Truman Shuttle averages about 160 passengers per day and the Eastside Shuttle averages more than 400 passengers per day.

Handi Wheels provides about 200 trips per day.

Figure 1: Regular Transit Routes

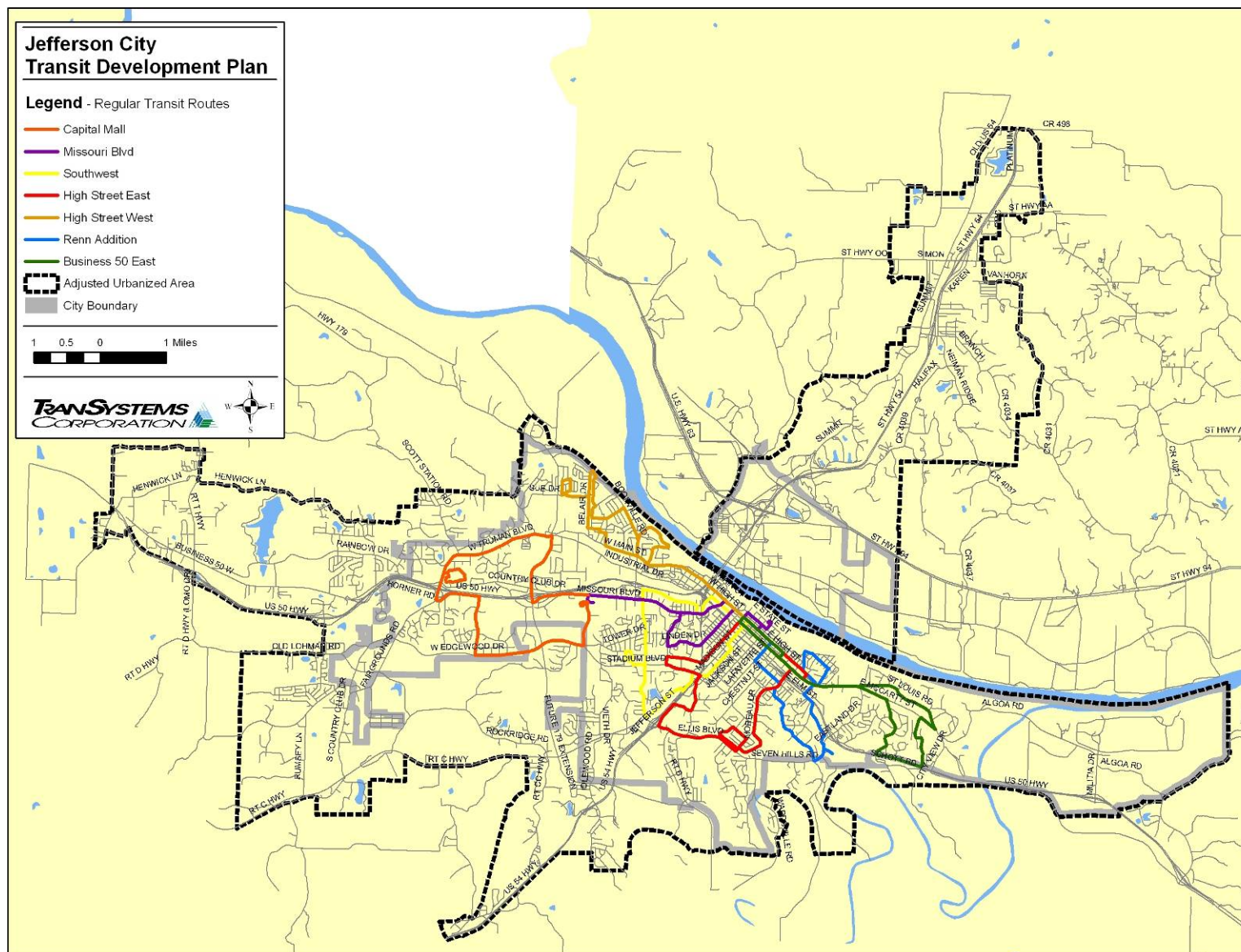


Figure 2: Commuter School Tripper Routes

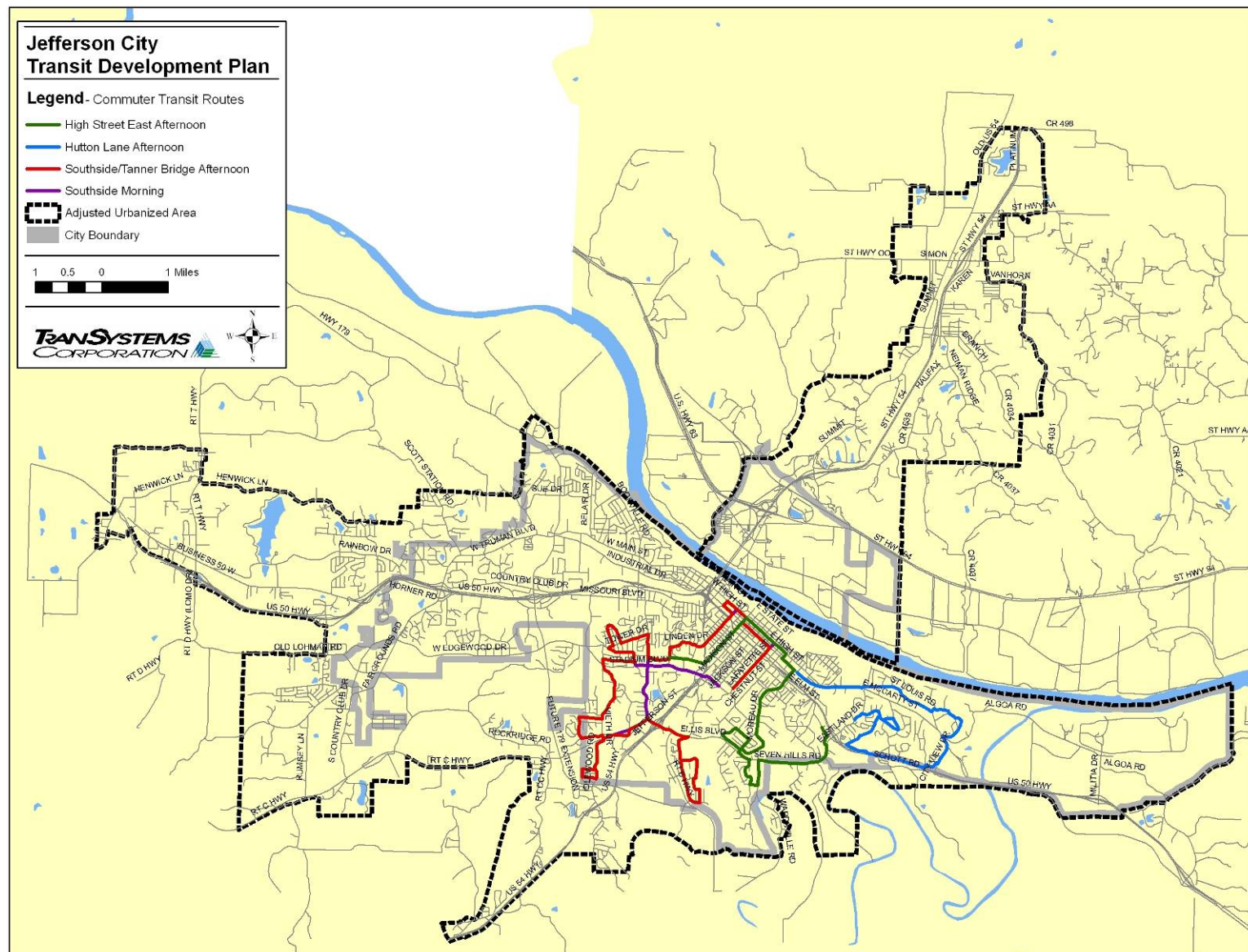
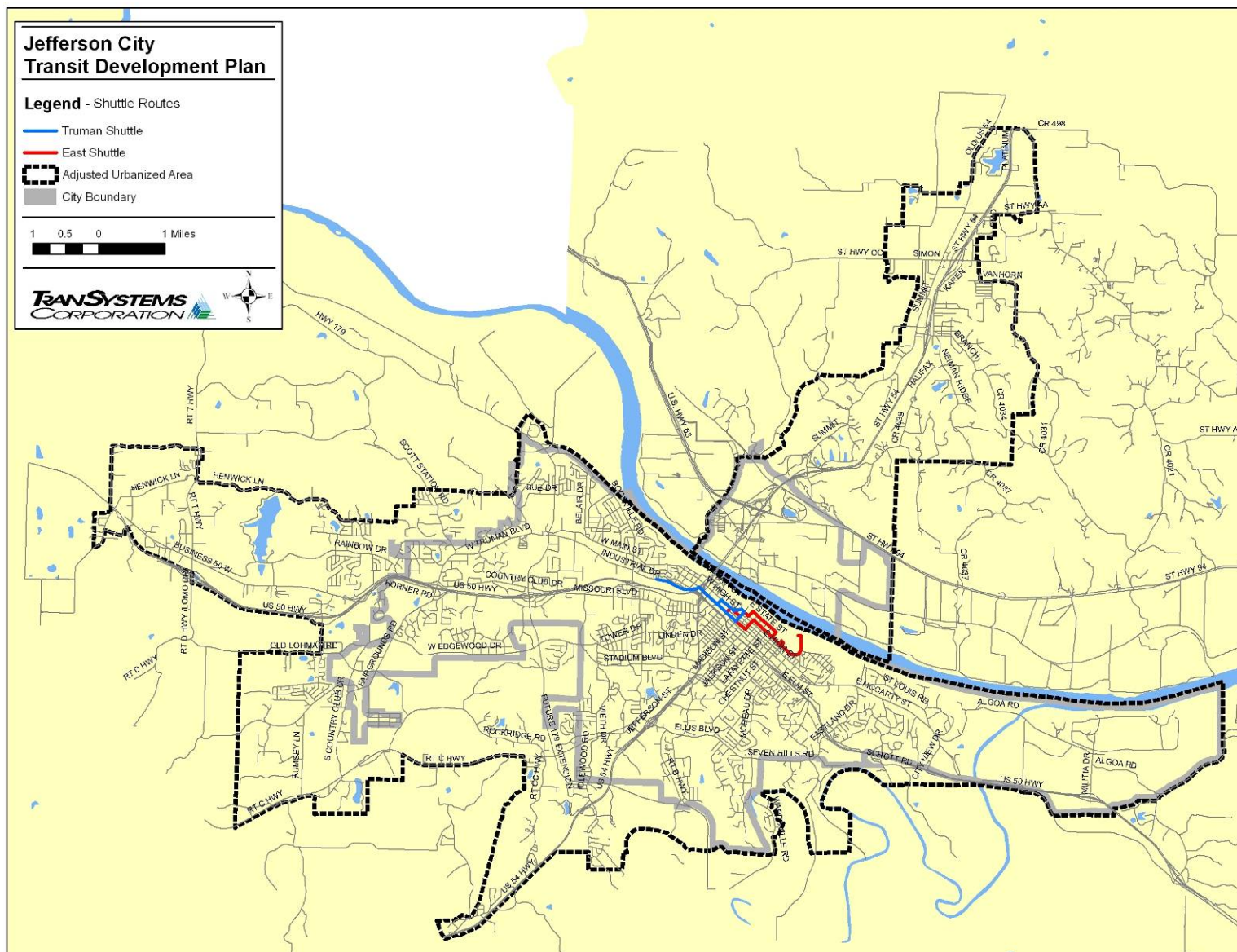


Figure 3: Shuttle Routes



2.1 Transit Service Evaluation

The fixed route services were evaluated both quantitatively and qualitatively.

Perhaps the most important indication of the JEFFTRAN routes' effectiveness is the overwhelming satisfaction expressed by users. The on-board survey found that 83% of respondents rated the service as 'excellent' or 'good'. Table 2 shows the performance of the routes expressed in terms of passengers per hour, a common productivity measure used in the transit industry.

Table 2: Fixed Route Productivity

Route	Passengers per Hour
Capital Mall	12.0
Missouri Blvd	29.3
Southwest	11.4
High Street East	16.0
High Street West	10.7
Renn Addition	16.0
Business 50	8.0
Total	14.6

The Business 50 route is significantly below the system average in passengers per hour. A route serving lower density suburban areas will typically have reduced productivity. Much of the Business Route 50's service area is in the eastern suburban part of the City.

The Business 50 route also has much of its service area in the area east of the higher density core. Ridership on this part of the route is low. The portion of the route along High Street and McCarty is partly shared with two other routes.

The productivity statistics are characteristic of small urban transit systems like JEFFTRAN.

The JEFFTRAN system does provide service in all portions of the City that have characteristics that indicate a need for transit service, areas with high population density, low incomes and low auto ownership and high senior concentrations. JEFFTRAN routes also serve the majority of the key destinations and traffic generators in the community. The Study Area Data Inventory technical report documents these conclusions.

The routes employ loops as a means of providing greater coverage than would be possible with more conventional two way routes. Transit routes using loop configuration can be deceptively ineffective because they require transit passengers to travel out of direction around the loop resulting in increased travel times and increased inconvenience. However, the JEFFTRAN system does a good job of mitigating the negative effects of loop routing.

- Missouri Boulevard actually is a two way route for most of its length and the loop is fairly tight and close to the downtown terminus.
- Southwest is a large clockwise loop, but shares service areas with both High Street East and Missouri Boulevard which provide complementary service in the opposite direction.

- High Street East is another large clockwise loop, but shares service areas with Southwest and Business 50 East.
- High Street West and Business 50 East are two way routes with a loop on the outer suburban ends.

The two other routes, Capital Mall and Renn Addition, have loop configurations that introduce significant out of direction travel, and therefore may be ineffective.

However, the routes are all short enough that the out of direction travel time is minimal.

Operationally, JEFFTRAN appears sound based on observations throughout the project with one exception. Buses are often late arriving at (and leaving from) the transfer point at Jefferson and High. This is a result of inadequate scheduled running time on several of the routes. This is an unacceptable condition for a transit system that relies on central pulse-type scheduling.

Currently JEFFTRAN does not operate service on ten City holidays, New Year's Day, Martin Luther King Day, Truman's Birthday, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day and Christmas.

It is common for transit systems to operate reduced service on holidays because of the reduced demand for work related trips. However, some of these holidays are regular working days for most individuals (e.g., Truman's Birthday) and most of these days are important retail shopping days.

It would inconvenience significantly fewer transit users if JEFTRAN did not operate service on only the following six "major" holidays, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas.

It must be noted that there is an increased cost to operate service on days that employees are allowed off for the holiday.

2.2 Conclusions

Based on the evaluation of JEFFTRAN services and the objectives of the project the following conclusions have been developed relative to potential service modifications:

1. Expand transit service hours. With service ending at 5:30 PM on weekdays many potential users are precluded from using transit if their trip purpose requires later travel. Several options will be considered:
 - Extending service further into the evening.
 - Establishing evening service on one or two days per week.
 - Establishing weekend service.
 - Establish a practice of operating service on all but the six major holidays.
2. Modify routes and schedules as necessary to relocate the transfer location from Jefferson and High to the intercity bus station at 620 West McCarty Street.

3. Modify current fixed routes to resolve the running time deficit, which results in late operation.
4. Modify current routes to achieve efficiencies and improve effectiveness. This will include consideration of alternative service delivery methods.
5. Evaluate new or expanded services to provide service in areas presently unserved.

Section 3: Transit Needs Analysis

The purpose of the Needs Analysis is to determine transit need in the portions of the Jefferson City metro area not presently served by transit. The Needs Analysis was based on both quantitative and qualitative techniques.

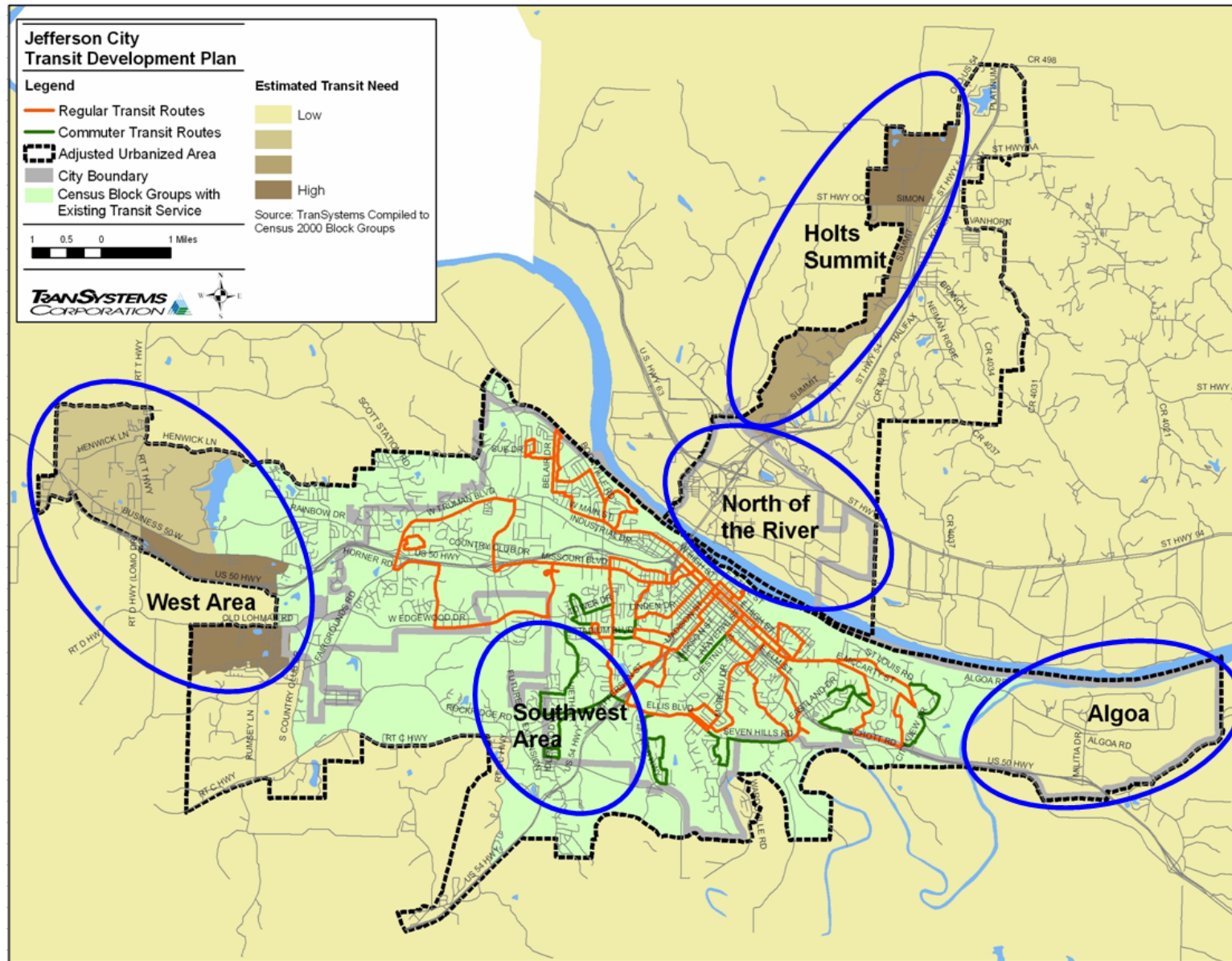
3.1 Existing Transit Service

The study team developed a method to estimate demand in the portion of the study area without existing transit service, based on an analysis of actual transit demand (i.e., ridership) in the portion of the area now served by transit. First, demographic data was compiled for each census block group in the study area, including population, population density, percent elderly, and auto ownership. Based on the on/off counts made earlier in the study, the number of people getting on the bus was compiled by census block group. An attempt was made to include only areas where people initially originate. Secondary origins such as the Jefferson and High transfer location, commercial areas along Missouri Boulevard, Gerbes Superstore and Capital Mall were excluded.

Once the data was compiled for all the census block groups with existing transit service a regression analysis was performed to determine the relationship among transit ridership and the various demographic factors including population density, elderly population, and automobile ownership. Auto ownership was found to have the strongest relationship as would be expected, since those who do not have a vehicle would likely use transit if it is available. Population density was found to be significant, while elderly population was not. A “dummy” factor was developed to account for the level of transit service available in each block group. A regression equation using the adjusted population density, auto ownership, and level of transit service was developed to predict the number of transit trips from each block group.

The regression equation was applied to those census block groups in the study area that currently do not have transit service providing an initial indication of the need for transit in Callaway County and the outlying parts of Cole County within the study area. Figure 4 shows the results of this analysis. Areas that show some potential transit demand include Holts Summit and the area southwest of Capital Mall.

Figure 4: Estimated Transit Need



3.1.1 West Area

This area includes the portion of the metro area generally north of Route 50 and south of Business 50 between Big Horn Drive and Lo Mo Drive, and the area south of Lohman Road and west of Big Horn Drive. Following is a summary of the area's statistics.

Table 3: West Area Statistics

Service Area	West Area ¹
Population	2,378
Percent No Auto	5%
Percent Elderly	4%
Journey to Work Downtown ²	680

¹Assumes that West Area is block group 204.001.

²Based on Census Tracts. Assumes downtown is census tract 101 and West Area is census tract 204.

Based on the analysis, the area does exhibit some potential for transit.

The area does not have any institutions or commercial concentrations that could be regarded as a trip generator.

Based on a 1.2 percent annual growth rate in Jefferson City, this area could be expected to have a population of 3,442 by 2030.

3.1.2 Holts Summit

This area includes the portion of the metro area generally along Route 54 north of the Missouri River. Following is a summary of the area's statistics.

Table 4: Holts Summit Statistics

Service Area	Holts Summit ¹
Population	3,047
Percent No Auto	8%
Percent Elderly	9%
Journey to Work Downtown ²	1,005

¹Assumes that Holts Summit is block groups 9708.002 and 9708.003.

²Based on Census Tracts. Assumes downtown is census tract 101 and Holts Summit is census tracts 9707 and 9708.

Based on the analysis, the area does exhibit some potential for transit.

The area does have two elementary schools, but does not have any institutions or commercial concentrations that could be regarded as a significant trip generator. The area does have some commercial areas that could represent demand areas.

Based on a 2.3 percent annual growth rate in Holts Summit, this area could be expected to have a population of 6,073 by 2030.

3.1.3 Algoa Area

This area includes the portion of the metro area generally north of Route 50 east of the urbanized portion of Jefferson City. The area is in the corporate limits of Jefferson City. Following is a summary of the area's statistics.

Table 5: Algoa Area Statistics

Service Area	Algoa ¹
Population	182 ²
Percent No Auto	2%
Percent Elderly	8%
Journey to Work Downtown³	325
Journey to Work Algoa³	345

¹Assumes that Algoa is block group 201.981.

²Only includes census blocks that are within urbanized area boundary. Total does not include approximately 3,000 prison inmates.

³Based on Census Tracts. Assumes downtown is census tract 101 and Algoa is census tract 201.98.

Based on the analysis, the area does not exhibit much potential for transit at the present time.

The area does not have retail commercial concentrations that could be regarded as a trip generator. The area does have two state corrections facilities and employment within the industrial park (Scholastic, Modern Litho Print, Command Web and Alpha) that could be generators of trips.

According to Dave Dormire, superintendent of Jefferson City Correctional Center, the Correctional Center has 700 employees and Algoa has 500. They have not had any problems hiring primarily because most of their employees do not come from Jefferson City but from the surrounding communities. Dormire has not heard much interest in transit from employees.

Dormire also has not had complaints from visitors regarding transportation. He said bus service for visitors has been proposed in the past and there certainly would be some visitors that stay in Jefferson City that may ride a bus to the prison.

Based on a 1.2 percent annual growth rate in Jefferson City, this area could be expected to have a population of 1,211 by 2030.

3.1.4 Jefferson City North of the River

This area includes the portion of Jefferson City north of the Missouri River. Following is a summary of the area's statistics.

Table 6: Jefferson City North of the River Area Statistics

Service Area	Jefferson City
	North of the River ¹
Population	25 ²
Percent No Auto	0%
Percent Elderly	8%
Journey to Work Downtown ³	---

¹Assumes that Jefferson City north of the river is block group 9708.004.

²Only includes census blocks that are within the urbanized area boundary.

³Included in Holts Summit area journey to work data.

Based on the analysis, the area does not exhibit much potential for transit at the present time.

The area does have city park facility, Katy Trail access and a commuter parking lot, but does not have commercial concentrations that could be regarded as a trip generator. The area does have the general aviation airport that could be a generator of trips.

However, activity at the airport is limited and the current operation does not appear to represent a market for transit.

Based on a 1.2 percent annual growth rate in Jefferson City, this area could be expected to have a population of 476 by 2030.

3.1.5 Southwest Area

This area includes all of the area in the study area southwest of the Southwest and High Street East routes. Following is a summary of the area's statistics.

Based on the analysis, the area does not exhibit much potential for transit at the present time.

The new St. Mary's Hospital is planned for this area adjacent to a new interchange along Route 179. Other medical, commercial and residential development is also planned for this area. Development is also planned in the area along Christy Drive where Rt. B, Rt. 179 and US 54 merge. The area does currently have any land uses that could be regarded as a trip generator.

Based on a 1.2 percent annual growth rate in Jefferson City, this area could be expected to have a population of 6,801 by 2030.

Table 7: Southwest Area Statistics

Service Area	Southwest Area¹
Population	4,699
Percent No Auto	4%
Percent Elderly	10%
Journey to Work Downtown³	2,050

¹ Assumes that Southwest Area is block groups 104.004, 107.003 and 107.004.

² Based on Census Tracts. Assumes downtown is census tract 101 and Southwest Area is census tracts 104 and 107.

Section 4: Flexible Route Transit Services

A family of transit services, generally referred to as flexible route services, has been used successfully in many cities to serve lower density markets. Flexible services include route deviation, point deviation, and general population demand response services. In each case both the route and the schedule is determined at least in part by passenger demand. Unlike fixed route services that continuously operate over a designated route with a designated time schedule, these demand response services only go to a location at a time when an individual has scheduled a trip.

Fixed route services operate most efficiently in areas with population densities of more than 3,000 persons per square mile, or more. Lower density areas, and areas with incomplete street systems, are more efficiently served with one of these flexible route services. Generally, when the demand falls below ten passengers per hour demand based services are likely to offer a more effective service than fixed route service.

The advantage of demand based services is that they can offer transit service that is more tailored to individual needs. These services can provide curb to curb service for many users, rather than requiring the individual to walk to a bus stop. Most people will not walk more than two blocks to a bus stop. The ability to operate in this manner allows flexible route service to provide more coverage in lower density areas. These services are also more efficient in certain markets. The cost of providing this service can be lower than fixed route service because the vehicle is only operating when there is demand for the service. Unlike fixed route service, flexible routes do not require the provision of complementary paratransit service under ADA regulations.

The disadvantage of demand based services are that they are more difficult to operate, requiring dispatchers to take trip requests and schedule drivers and vehicles for the demand pattern that may change from day to day. Thus, total costs can be higher when the cost of the dispatcher is considered. Also, these services require transit passengers to change and become more proactive. In many cases a daily call to dispatch is required. Some individuals are more comfortable with the predictive and repetitive fixed route services.

Flexible route services will be evaluated for possible application in the Jefferson City area. For example, an area like that served by the Capital Mall route might be better served by a point deviation service. The bus regularly runs between two primary destinations but the bus can “flex” to other intermediate destinations when a passenger makes a request. Some cities use demand response service for night service when the density of trip making is lower.

New service in lower density areas may be better suited to one of the demand based service types.

Section 5: Potential Transit Service Modifications

This section provides detail on the various service modifications that could be used to address the objectives and considerations outlined in Section 2 of this report.

5.1 Extend Transit Service Hours

Extending transit service hours was the most frequently heard suggestion from the public involvement program activities. Currently, service starts at about 7 AM and ends by 5:30 PM. This limits use of the transit system for employment purposes. Shifts that start before 7:30 AM or end after 5 PM are not served well. Transit users are therefore limited to a fairly tight timeframe.

Evening and weekend service is also an option that many people requested through the public involvement process.

Several different options were evaluated for extending service hours:

1. Expansion of the baseline service period by 1.5 hours, from 6:30 AM to 6:30 PM.
2. Establishment of evening service to 9 PM using several different approaches:
 - Extending the service period for all seven routes using the base period service pattern (60/30 minute service intervals) five days per week.
 - Extending the service period for select routes using the base period service pattern (60/30 minute service intervals) five days per week.
 - Extending the service period for all seven routes using the base period service pattern (60/30 minute service intervals) one day per week.
 - Establish evening service using demand response service five days per week.
3. Establish Saturday service from 7 AM to 5:30 PM using several different approaches:
 - Establishing Saturday service on all seven routes using the base period service pattern (60/30 minute service intervals).
 - Establishing Saturday service on select routes using the base period service pattern (60/30 minute service intervals).
 - Establish Saturday service using demand response service.

5.1.1 Baseline Service Period Expansion

The 1.5 hour service period expansion will provide significant additional flexibility for employment trips as well as for other trip purposes. The change will add to JEFFTRAN costs in two ways: 1) additional cost for bus driver labor, fuel, etc., and 2) additional overhead cost associated with extending the hours for management personnel. The change will have implication for how both drivers and supervisors are scheduled. In addition, ADA requires that Handi Wheels service hours also be expanded a like amount.

The service modification is to simply extend the current service pattern by 30 minutes in the morning and one hour in the evening. This change is estimated to increase operating costs by \$141,000 annually and attract an additional 80 daily passengers, representing a ten percent increase in ridership. The additional cost reflects additional supervisory time and additional bus drivers. The cost also includes extending Handi Wheels service hours. No additional buses would be required.

5.1.2 Establishment of Evening Service

Several options were evaluated for providing evening service (i.e., after 6:30 PM). Although evening service was requested by many individuals, the experience in other cities is that ridership during evenings is significantly reduced compared with daytime.

The options are:

Extend the service period for all seven fixed routes using the base period service pattern (60/30 minute service intervals) five days per week to 9 PM. This is the simplest way to establish evening service, but also the most expensive. In all cases an extension into the evening will have implications for JEFFTRANS' operations and manpower scheduling. Also, Handi Wheels service will have to be extended accordingly. This change is estimated to increase operating costs by \$155,000 annually and attract an additional 80 daily passengers, representing a ten percent increase in ridership. The additional cost reflects additional supervisory time and additional bus drivers. The cost also includes extending Handi Wheels service hours. No additional buses would be required.

Extend the service period for select routes using the base period service pattern (60/30 minute service intervals) five days per week. This option reduces costs by only extending service hours for routes that are likely to perform well. In this case the Capital Mall and Missouri Boulevard routes would be extended because they serve the commercial retail areas, High Street East and Southwest would be extended because they are higher ridership routes that serve the core of the city, and Renn Addition would be included for the same reason, and because the route serves Lincoln University. This change is estimated to increase operating costs by \$128,000 annually and attract an additional 70 daily passengers. The additional cost reflects additional supervisory time and additional bus drivers. The cost also includes extending Handi Wheels service hours. No additional buses would be required.

Extend the service period for all seven routes using the base period service pattern (60/30 minute service intervals) one day per week. This option would provide captive transit users an opportunity to travel in the evening on a limited basis, one evening per week, at a minimal cost. This change is estimated to increase operating costs by \$30,000 annually and attract an additional 40 daily passengers. The additional cost reflects additional supervisory time and additional bus drivers. The cost also includes extending Handi Wheels service hours. No additional buses would be required.

Establish evening service using demand response service five days per week. This option reduces the cost of providing evening service through the use of demand based flexible routes. This would involve the designation of a service zone which could be served by two vehicles operating in a demand response mode (similar to Handi Wheels). The zone would include the core of the City and the retail commercial areas to the west, including Capital Mall. Time points could be established for certain key destinations, like Capital Mall, the

transfer location and one or two key downtown bus stops. Passengers not boarding at these established stops would have to call the dispatcher to arrange for a pick up. This approach recognizes that the demand for transit in the evening is significantly lower than the daytime and utilizes a more flexible approach with fewer vehicles. This service is estimated to increase operating costs by \$66,000 annually and attract an additional 60 daily passengers. The additional cost reflects additional supervisory time and additional bus drivers. The cost does not include extending Handi Wheels service hours because it is not required by ADA. No additional buses would be required although the use of smaller buses may be warranted.

5.1.3 Establishment of Saturday Service

The establishment of weekend service was the single highest response to the question from the on board survey: "What would get you to use public transportation more often?" Transit captives particularly need access to public transportation more than just five days per week. Three options were evaluated for the provision of Saturday service.

Establish Saturday service on all seven routes using the base period service pattern (60/30 minute service intervals). This option is the simplest because it uses the current service package and adapts it to Saturday. In all cases an extension to the weekend will have implications for JEFFTRANS' operations and manpower scheduling. Also, Handi Wheels service will have to be extended accordingly. This change is estimated to increase operating costs by \$112,000 annually and attract 400 passengers. The additional cost reflects additional supervisory time and additional bus drivers. The cost also includes extending Handi Wheels service hours. No additional buses would be required.

Establish Saturday service on select routes using the base period service pattern (60/30 minute service intervals). This option reduces costs by only operating select routes that are likely to perform well. In this case the Capital Mall and Missouri Boulevard routes would be operated because they serve the commercial retail areas, High Street West and Southwest would be operated because they are higher ridership routes that serve the core of the city, and Renn Addition would be included for the same reason, and because the route serves Lincoln University. This change is estimated to increase operating costs by \$94,000 annually and attract an additional 360 daily passengers. The additional cost reflects additional supervisory time and additional bus drivers. The cost also includes extending Handi Wheels service hours. No additional buses would be required.

Establish Saturday service using demand response service. This option reduces the cost of providing Saturday service through the use of demand based flexible routes. This would involve the designation of a service zone which could be served by three vehicles operating in a demand response mode (similar to Handi Wheels). The zone would include the core of the City and the retail commercial areas to the west, including Capital Mall. Time points could be established for certain key destinations, like Capital Mall, the transfer location and one or two key downtown bus stops. Passengers not boarding at these established stops would have to call the dispatcher to arrange for a pick up. This approach recognizes that the demand for transit on Saturday is significantly lower than the weekday and utilizes a more flexible approach with fewer vehicles. This service is estimated to increase operating costs by \$73,000 annually and attract an additional 280 daily passengers. The additional cost reflects additional supervisory time and additional bus drivers. The cost does not include extending Handi Wheels service hours because it is not required by ADA. No additional buses would be required although the use of smaller buses may be warranted.

5.1.4 Summary

Table 8 summarizes these options for extending service hours into the evening period.

Table 8: Summary of Service Period Extension Options

Service Period Extension Options	Annual Operating Cost	Capital Cost	Estimated Ridership	Funding Requirement
Extend service by 1.5 hours/day	\$141,000	\$0	80	\$134,000
Night service (5 days to 9 PM)	\$155,000	\$0	80	\$148,000
Night service (5 days to 9 PM) Select routes	\$128,000	\$0	70	\$122,000
Night service (1 day to 9 PM)	\$30,000	\$0	40	\$29,000
Night service (5 days to 9 PM) Demand response	\$66,000	\$0	60	\$61,000
Saturday service - 7 routes/base service plan	\$112,000	\$0	400	\$105,000
Saturday service -select routes/base service plan	\$94,000	\$0	360	\$88,000
Saturday service - demand response	\$73,000	\$0	280	\$68,000

Any of these service expansion alternatives has significant implications for JEFFTRAN's operations and cost. JEFFTRAN is essentially a one-shift operation. Operations later in the day, or on weekends, will require realignment of employee shifts and likely the addition of manpower. The expansion affects not only drivers, but supervisory/dispatch personnel and maintenance personnel.

5.2 Modifications to Existing Routes – Relocate Transfer Center to Bus Station Extend

Three service alternatives were developed to address the travel time problems and other aspects of the current fixed routes. The alternatives were based on several planning inputs, including on/off counts, field work, discussions with the Steering Committee and established transfer patterns. All three of the alternatives assume the transfer point will be located at the intercity bus station on West McCarty Street. Two of the three alternatives maintain the current 30 minute headway. Only Alternative C adds resources (vehicles – capital costs, and operating costs) to existing operations.

It is important to note that the alternatives described in this section are conceptual in nature and therefore subject to additional refinements once the Steering Committee chooses a preferred approach. Each of the alternatives was developed based on the planning inputs and subsequently tested in the field. Schedules were developed based on running times tested with an automobile. The three alternatives are as follows:

- Alternative A
 - Move transfer point to Bus Station Transfer Center
 - Maintain 30 minute headways
 - No additional resources needed

- Alternative B
 - Move transfer point to Bus Station Transfer Center
 - Establish 40 minute headways throughout the day (peak and off-peak would both be 40 minutes)
 - No additional resources needed
- Alternative C
 - Move transfer point to Bus Station Transfer Center
 - Maintain 30 minute headways
 - Additional resources needed

5.2.1 Alternative A

The first service configuration option (Alternative A) assumes that all routes will operate on a base 30 minute headway and from the bus station. This option minimizes impacts on current riders and addresses current running time problems by eliminating unproductive portions of routes. It can be expected that some increased ridership will occur because of improved connections and transferability at the new downtown Transfer Center. Alternative A does not include any cost additions and can be operated with existing resources. These proposed service modifications could be implemented at any time once the transfer point is moved to the bus station. A brief description of changes to each route is provided below along with sample schedules and a map of Alternative A.

- Capital Mall – No changes.
- Missouri Boulevard – Hamilton/Dulle Towers is no longer served by the Missouri Boulevard route (see Business 50 description below). This eliminates running time problems on the route and makes for a more efficient interlining operation with the Capital Mall route.
- Southwest – The western loop serving Stadium, Buehrle, Dogwood, and Edgewood is eliminated on the current 5 trips in the morning and afternoon peak. Based on on/off counts, a total of 1 passenger is boarding in this segment. The elimination of the segment addresses running time problems on the route.
- High Street East – The western loop serving Winston, Rosewood, and Carol is eliminated. Based on on/off counts, a total of one passenger is boarding in this segment. The elimination of the segment addresses running time problems.
- High Street West – High Street West gains some running time with the bus station now being the terminus. This allows the route to serve the free clinic on Dix Road, between Industrial Drive and Route 50. The deviation will occur only on the outbound trip to ensure the route arrives at the pulse point in time for the meet.
- Business 50 – The Business 50 route will operate different routings during the peak and off-peak periods. During the peak, the route will serve the Hamilton/Dulle Towers (outbound trip only), and then the McCarty, Eastwood, Landwehr Hills loop. The segment along St. Louis is eliminated because no passengers board throughout the day. During the off-peak, the route will serve the Hamilton/Dulle Towers on both the outbound and inbound trips but short turn at Landwehr Lane (operating via McCarty – St. Louis – Landwehr – McCarty). The reason for the different routing is

that based on the on/off counts, no passengers are boarding on the eastern most loop between 9:00 a.m. and 3:00 p.m.

- Renn Addition – Some time savings are achieved by reversing the loop north of McCarty. This allows for the route to meet other routes at the pulse point.

Figure 5: Alternative A Map

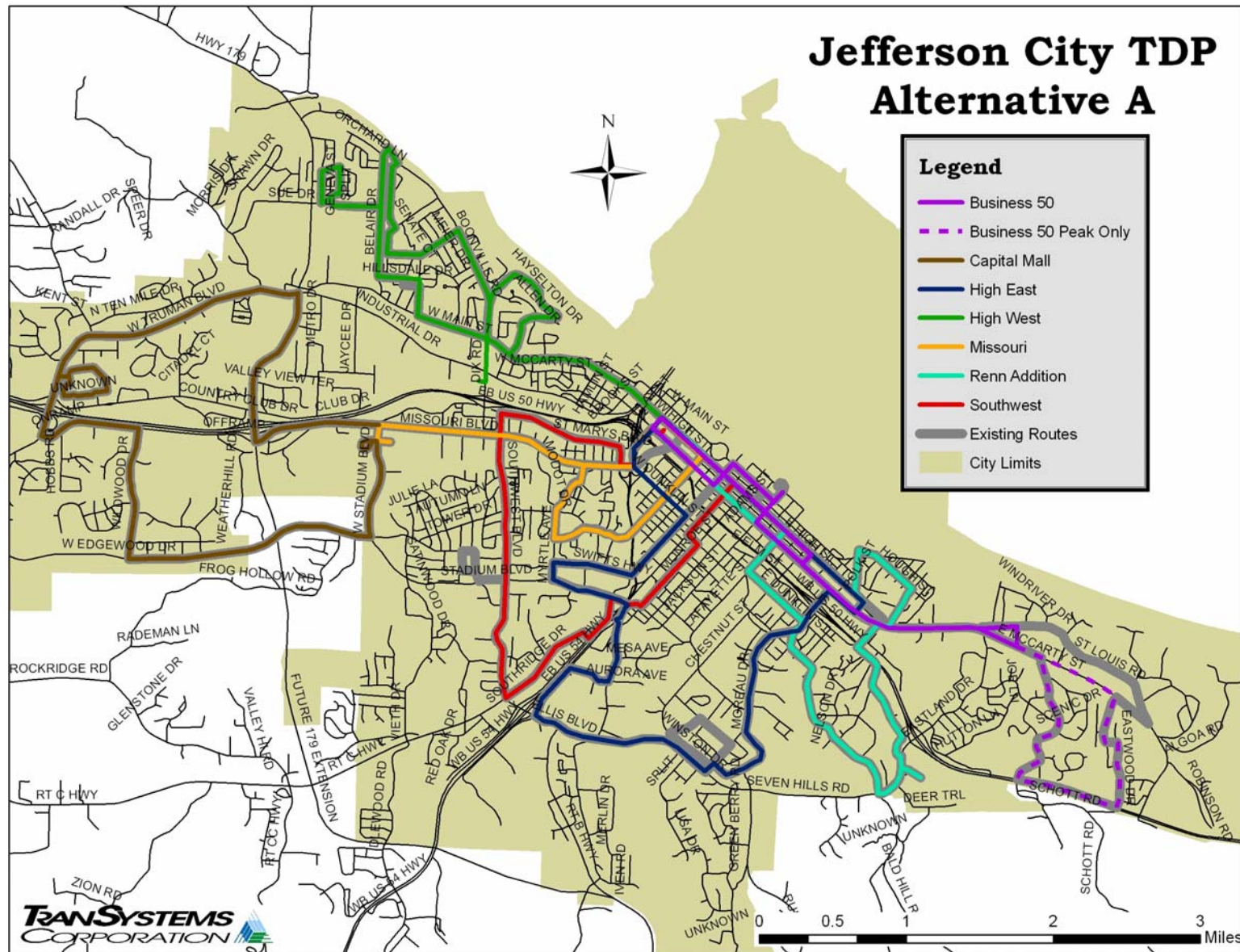


Table 9: Alternative A Route Schedules

CAPITAL MALL (ALTERNATIVE A)				MISSOURI (ALTERNATIVE A)		SOUTHWEST (ALTERNATIVE A)			HIGH EAST (ALTERNATIVE A)		
Target	Mall	Gerbes W	Greyhound TC	Target	Greyhound TC	Greyhound TC	Southwest / Ellis	Greyhound TC	Greyhound TC	Hough/Ellis	Greyhound TC
7:03 AM	6:50 AM	6:55 AM	6:45 AM	7:02 AM	7:10 AM	6:45 AM	6:57 AM	7:10 AM	6:45 AM	6:57 AM	7:11 AM
7:33 AM	7:20 AM	7:25 AM	7:15 AM	7:32 AM	7:40 AM	7:15 AM	7:27 AM	7:40 AM	7:15 AM	7:27 AM	7:41 AM
8:03 AM	7:50 AM	7:55 AM	7:45 AM	8:02 AM	8:10 AM	7:45 AM	7:57 AM	8:10 AM	7:45 AM	7:57 AM	8:11 AM
8:33 AM	8:20 AM	8:25 AM	8:15 AM	8:32 AM	8:40 AM	8:15 AM	8:27 AM	8:40 AM	8:15 AM	8:27 AM	8:41 AM
9:33 AM	8:50 AM	8:55 AM	9:15 AM	9:32 AM	9:40 AM	8:45 AM	8:57 AM	9:10 AM	9:15 AM	9:27 AM	9:41 AM
10:33 AM	9:50 AM	9:55 AM	10:15 AM	10:32 AM	10:40 AM	9:15 AM	9:27 AM	9:40 AM	10:15 AM	10:27 AM	10:41 AM
11:33 AM	10:50 AM	10:55 AM	11:15 AM	11:32 AM	11:40 AM	9:45 AM	9:57 AM	10:10 AM	11:15 AM	11:27 AM	11:41 AM
12:33 PM	11:50 AM	11:55 AM	12:15 PM	12:32 PM	12:40 PM	10:15 AM	10:27 AM	10:40 AM	12:15 PM	12:27 PM	12:41 PM
1:33 PM	12:50 PM	12:55 PM	1:15 PM	1:32 PM	1:40 PM	10:45 AM	10:57 AM	11:10 AM	1:15 PM	1:27 PM	1:41 PM
2:33 PM	1:50 PM	1:55 PM	2:15 PM	2:32 PM	2:40 PM	11:15 AM	11:27 AM	11:40 AM	2:15 PM	2:27 PM	2:41 PM
3:03 PM	2:50 PM	2:55 PM	2:45 PM	3:02 PM	3:10 PM	11:45 AM	11:57 AM	12:10 PM	3:15 PM	3:27 PM	3:41 PM
3:33 PM	3:20 PM	3:25 PM	3:15 PM	3:32 PM	3:40 PM	12:15 PM	12:27 PM	12:40 PM	3:45 PM	3:57 PM	4:11 PM
4:03 PM	3:50 PM	3:55 PM	3:45 PM	4:02 PM	4:10 PM	12:45 PM	12:57 PM	1:10 PM	4:15 PM	4:27 PM	4:41 PM
4:33 PM	4:20 PM	4:25 PM	4:15 PM	4:32 PM	4:40 PM	1:15 PM	1:27 PM	1:40 PM	4:50 PM	5:02 PM	5:16 PM
5:03 PM	4:50 PM	4:55 PM	4:50 PM	5:07 PM	5:15 PM	1:45 PM	1:57 PM	2:10 PM	5:20 PM	5:32 PM	
	5:20 PM	5:25 PM	5:20 PM			2:15 PM	2:27 PM	2:40 PM			
						2:45 PM	2:57 PM	3:10 PM			
						3:15 PM	3:27 PM	3:40 PM			
						3:45 PM	3:57 PM	4:10 PM			
						4:15 PM	4:27 PM	4:40 PM			
						4:50 PM	5:02 PM	5:15 PM			
						5:20 PM	5:32 PM				

HIGH WEST (ALTERNATIVE A)			RENN (ALTERNATIVE A)			BUSINESS 50 (ALTERNATIVE A)		
Greyhound TC	Belmont / Norris	Greyhound TC	Greyhound TC	Gerbes	Greyhound TC	Greyhound TC	Eastwood/50	Greyhound TC
6:45 AM	7:02 AM	7:12 AM	6:45 AM	6:57 AM	7:12 AM	6:45 AM	7:01 AM	7:13 AM
7:15 AM	7:32 AM	7:42 AM	7:15 AM	7:27 AM	7:42 AM	7:15 AM	7:31 AM	7:43 AM
7:45 AM	8:02 AM	8:12 AM	7:45 AM	7:57 AM	8:12 AM	7:45 AM	8:01 AM	8:13 AM
8:15 AM	8:32 AM	8:42 AM	8:15 AM	8:27 AM	8:42 AM	8:15 AM	8:31 AM	8:43 AM
8:45 AM	9:02 AM	9:12 AM	8:45 AM	8:57 AM	9:12 AM	Greyhound TC		
9:45 AM	10:02 AM	10:12 AM	9:45 AM	9:57 AM	10:12 AM	McCarty/Lndwhr		
10:45 AM	11:02 AM	11:12 AM	10:45 AM	10:57 AM	11:12 AM	9:15 AM	9:27 AM	9:39 AM
11:45 AM	12:02 PM	12:12 PM	11:45 AM	11:57 AM	12:12 PM	10:15 AM	10:27 AM	10:39 AM
12:45 PM	1:02 PM	1:12 PM	12:45 PM	12:57 PM	1:12 PM	11:15 AM	11:27 AM	11:39 AM
1:45 PM	2:02 PM	2:12 PM	1:45 PM	1:57 PM	2:12 PM	12:15 PM	12:27 PM	12:39 PM
2:45 PM	3:02 PM	3:12 PM	2:45 PM	2:57 PM	3:12 PM	1:15 PM	1:27 PM	1:39 PM
3:15 PM	3:32 PM	3:42 PM	3:15 PM	3:27 PM	3:42 PM	2:15 PM	2:27 PM	2:39 PM
						3:15 PM	3:27 PM	3:39 PM
3:45 PM	4:02 PM	4:12 PM	3:45 PM	3:57 PM	4:12 PM	Greyhound TC		
4:15 PM	4:32 PM	4:42 PM	4:15 PM	4:27 PM	4:42 PM	Eastwood/50		
4:50 PM	5:07 PM	5:17 PM	4:50 PM	5:02 PM	5:17 PM	3:45 PM	4:01 PM	4:13 PM
5:20 PM	5:37 PM		5:20 PM	5:32 PM		4:15 PM	4:31 PM	4:43 PM
						4:45 PM	5:01 PM	5:13 PM
						4:50 PM	5:06 PM	5:18 PM
						5:20 PM	5:36 PM	

5.2.2 Alternative B

Alternative B assumes that all routes will operate on a 40 minute headway. The establishment of 40 minute headways accomplishes three primary goals. First, it solves all existing running time problems. Secondly, it avoids the elimination of current route segments. And finally, it allows JEFFTRAN the ability to serve additional areas in the City as well as potential new developments in the future. The operation of 40 minute headways would occur throughout the day. In effect, this reduces the level of service during the peak periods (currently 30 minutes on all routes), but improves the level of service during the off-peak periods (most operating 60 minutes). Because new areas are served, additional ridership is expected. Alternative B does not include any cost additions and can be operated with existing resources. Every proposed service modification except for the Southwest route (see description below) could be implemented once the transfer point is moved to the bus station. A brief description of changes to each route is provided below along with sample schedules and a map of Alternative B.

- Capital Mall – No changes. During field work, serving the area south of the Mall along Country Club drive was investigated. At this point, the area appears to lack sufficient demand. However, the area should be monitored in the future and perhaps served on every other Capital Mall trip via Stadium – Edgewood – Country Club.
- Missouri Boulevard – The Missouri Boulevard route no longer serves the Hamilton/Dulle Towers (see Renn Addition description below). With the additional time afforded by the 40 minute headway, the route now serves the area further west and south of Target and picks up some of the original Southwest route.
- Southwest – Because the Missouri route picks up portions of Southwest Boulevard, the Southwest route can now be routed further west to serve the future St. Mary's development. The route would operate directly west along Southridge to reach the area. As plans are developed, exact routing through the St. Mary's development would need to be determined. In the interim, the route could be routed directly to the Capital Mall to provide express service from downtown.
- High Street East – High Street East operates the existing route with a deviation to serve Lincoln University via Clark – Dunklin – LaFayette – Atchison – Moreau. Again, the 40 minute headway allows sufficient time to serve this destination.
- High Street West – As noted in Alternative A, High Street West gains some running time with the bus station now being the terminus. This allows the route to serve the free clinic on Dix Road, between Industrial Drive and Route 50. With the additional time afforded by the 40 minute headway, the free clinic can be served on both the outbound and inbound trips. Additionally, the route is proposed to serve the Main Street / Rock Hill Road area which includes the Hoover employment site and the Department of Natural Resources.
- Business 50 – The Business 50 route will operate via McCarty to the Scholastic company located east of St. Louis Road (serving as the turnaround point). The route will then operate the Eastwood – Route 50 – Landwehr Hills loop before returning to the bus station. While limited passengers are boarding on the loop, the 40 minute headway allows for this portion of the existing route to continue.
- Renn Addition – The Renn Addition route will serve the Hamilton/Dulle Towers on both inbound and outbound trips and operate the northern loop in reverse as described in Alternative A.

Figure 6: Alternative B Map

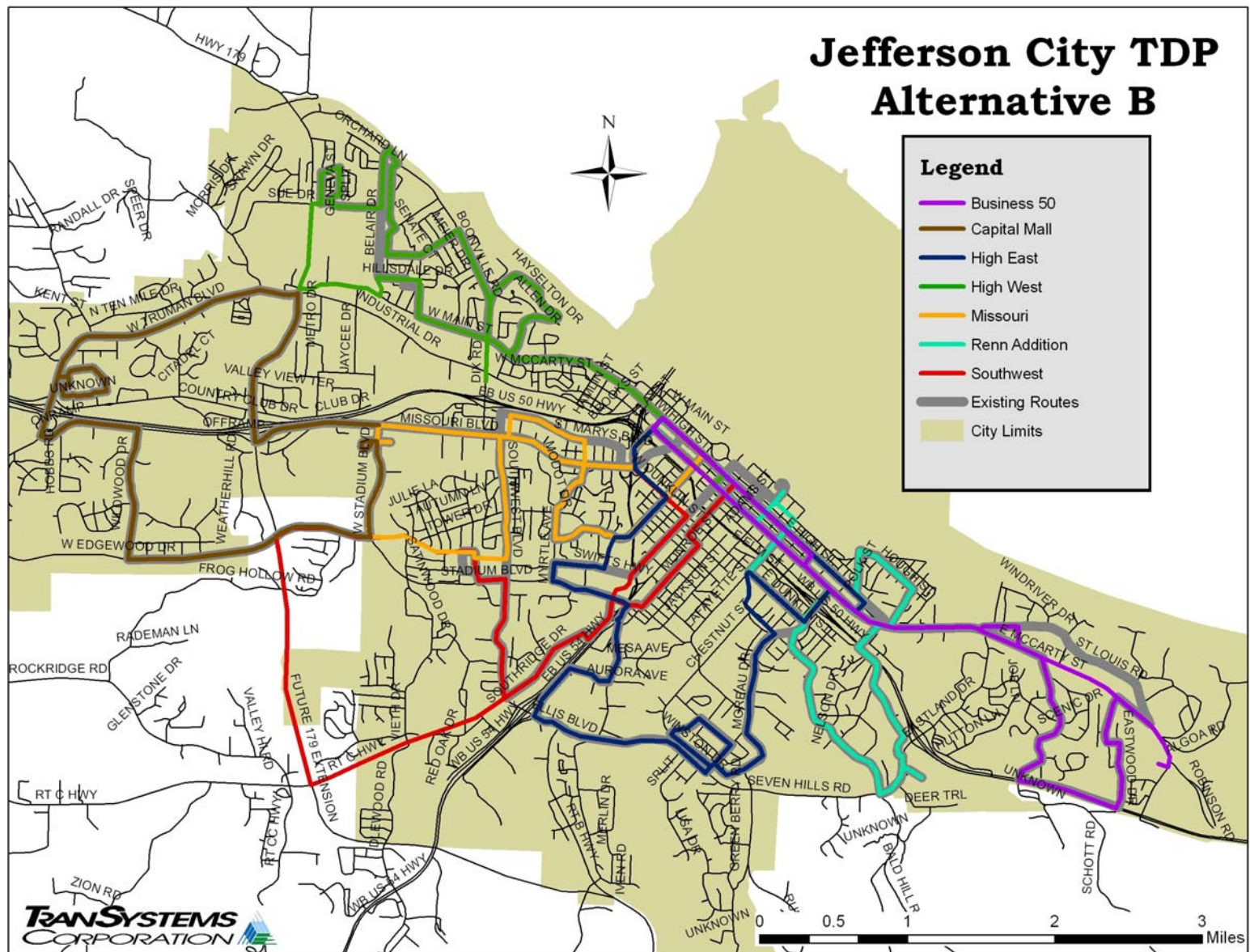


Table 10: Alternative B Route Schedules

CAPITAL MALL (ALTERNATIVE B)			MISSOURI (ALTERNATIVE B)			SOUTHWEST (ALTERNATIVE B)			HIGH EAST (ALTERNATIVE B)		
Target	Mall	Gerbés W	Greyhound TC	Target	Greyhound TC	Greyhound TC	Southridge / 179	Greyhound TC	Greyhound TC	Hough/Ellis	Greyhound TC
6:50 AM	6:50 AM	6:55 AM	6:40 AM	6:57 AM	7:15 AM	6:40 AM	6:58 AM	7:15 AM	6:40 AM	6:59 AM	7:15 AM
7:00 AM	7:17 AM	7:22 AM	7:20 AM	7:37 AM	7:55 AM	7:20 AM	7:38 AM	7:55 AM	7:20 AM	7:39 AM	7:55 AM
7:40 AM	7:57 AM	8:02 AM	8:00 AM	8:17 AM	8:35 AM	8:00 AM	8:18 AM	8:35 AM	8:00 AM	8:19 AM	8:35 AM
8:20 AM	8:37 AM	8:42 AM	8:40 AM	8:57 AM	9:15 AM	8:40 AM	8:58 AM	9:15 AM	8:40 AM	8:59 AM	9:15 AM
9:00 AM	9:17 AM	9:22 AM	9:20 AM	9:37 AM	9:55 AM	9:20 AM	9:38 AM	9:55 AM	9:20 AM	9:39 AM	9:55 AM
9:40 AM	9:57 AM	10:02 AM	10:00 AM	10:17 AM	10:35 AM	10:00 AM	10:18 AM	10:35 AM	10:00 AM	10:19 AM	10:35 AM
10:20 AM	10:37 AM	10:42 AM	10:40 AM	10:57 AM	11:15 AM	10:40 AM	10:58 AM	11:15 AM	10:40 AM	10:59 AM	11:15 AM
11:00 AM	11:17 AM	11:22 AM	11:20 AM	11:37 AM	11:55 AM	11:20 AM	11:38 AM	11:55 AM	11:20 AM	11:39 AM	11:55 AM
11:40 AM	11:57 AM	12:02 PM	12:00 PM	12:17 PM	12:35 PM	12:00 PM	12:18 PM	12:35 PM	12:00 PM	12:19 PM	12:35 PM
12:20 PM	12:37 PM	12:42 PM	12:40 PM	12:57 PM	1:15 PM	12:40 PM	12:58 PM	1:15 PM	12:40 PM	12:59 PM	1:15 PM
1:00 PM	1:17 PM	1:22 PM	1:20 PM	1:37 PM	1:55 PM	1:20 PM	1:38 PM	1:55 PM	1:20 PM	1:39 PM	1:55 PM
1:40 PM	1:57 PM	2:02 PM	2:00 PM	2:17 PM	2:35 PM	2:00 PM	2:18 PM	2:35 PM	2:00 PM	2:19 PM	2:35 PM
2:20 PM	2:37 PM	2:42 PM	2:40 PM	2:57 PM	3:15 PM	2:40 PM	2:58 PM	3:15 PM	2:40 PM	2:59 PM	3:15 PM
3:00 PM	3:17 PM	3:22 PM	3:20 PM	3:37 PM	3:55 PM	3:20 PM	3:38 PM	3:55 PM	3:20 PM	3:39 PM	3:55 PM
3:40 PM	3:57 PM	4:02 PM	4:00 PM	4:17 PM	4:35 PM	4:00 PM	4:18 PM	4:35 PM	4:00 PM	4:19 PM	4:35 PM
4:20 PM	4:37 PM	4:42 PM	4:40 PM	4:57 PM	5:15 PM	4:40 PM	4:58 PM	5:15 PM	4:40 PM	4:59 PM	5:15 PM
5:00 PM	5:17 PM	5:22 PM	5:20 PM			5:20 PM	5:38 PM	5:55 PM	5:20 PM	5:39 PM	

HIGH WEST (ALTERNATIVE B)			RENN (ALTERNATIVE B)			BUSINESS 50 (ALTERNATIVE B)		
Greyhound TC	Rock Hill / Main	Greyhound TC	Greyhound TC	Gerbés	Greyhound TC	Greyhound TC	Scholastic	Greyhound TC
6:40 AM	6:56 AM	7:13 AM	6:40 AM	6:56 AM	7:15 AM	6:40 AM	6:56 AM	7:13 AM
7:20 AM	7:36 AM	7:53 AM	7:20 AM	7:36 AM	7:55 AM	7:20 AM	7:36 AM	7:53 AM
8:00 AM	8:16 AM	8:33 AM	8:00 AM	8:16 AM	8:35 AM	8:00 AM	8:16 AM	8:33 AM
8:40 AM	8:56 AM	9:13 AM	8:40 AM	8:56 AM	9:15 AM	8:40 AM	8:56 AM	9:13 AM
9:20 AM	9:36 AM	9:53 AM	9:20 AM	9:36 AM	9:55 AM	9:20 AM	9:36 AM	9:53 AM
10:00 AM	10:16 AM	10:33 AM	10:00 AM	10:16 AM	10:35 AM	10:00 AM	10:16 AM	10:33 AM
10:40 AM	10:56 AM	11:13 AM	10:40 AM	10:56 AM	11:15 AM	10:40 AM	10:56 AM	11:13 AM
11:20 AM	11:36 AM	11:53 AM	11:20 AM	11:36 AM	11:55 AM	11:20 AM	11:36 AM	11:53 AM
12:00 PM	12:16 PM	12:33 PM	12:00 PM	12:16 PM	12:35 PM	12:00 PM	12:16 PM	12:33 PM
12:40 PM	12:56 PM	1:13 PM	12:40 PM	12:56 PM	1:15 PM	12:40 PM	12:56 PM	1:13 PM
1:20 PM	1:36 PM	1:53 PM	1:20 PM	1:36 PM	1:55 PM	1:20 PM	1:36 PM	1:53 PM
2:00 PM	2:16 PM	2:33 PM	2:00 PM	2:16 PM	2:35 PM	2:00 PM	2:16 PM	2:33 PM
2:40 PM	2:56 PM	3:13 PM	2:40 PM	2:56 PM	3:15 PM	2:40 PM	2:56 PM	3:13 PM
3:20 PM	3:36 PM	3:53 PM	3:20 PM	3:36 PM	3:55 PM	3:20 PM	3:36 PM	3:53 PM
4:00 PM	4:16 PM	4:33 PM	4:00 PM	4:16 PM	4:35 PM	4:00 PM	4:16 PM	4:33 PM
4:40 PM	4:56 PM	5:13 PM	4:40 PM	4:56 PM	5:15 PM	4:40 PM	4:56 PM	5:13 PM
5:20 PM	5:36 PM		5:20 PM	5:36 PM		5:20 PM	5:36 PM	

5.2.3 Alternative C

Alternative C assumes 30 minute headways and additional resources to operate a downtown shuttle (see cost figures in the description below). The downtown shuttle (Downtown Circulator #1) provides downtown coverage, allowing for other routes to operate more directly to destinations outside of downtown. It can be expected that some increased ridership will occur due to the higher level of service. These proposed service modifications could be implemented at any time once the transfer point is moved to the bus station. A brief description of changes to each route is provided below along with sample schedules and a map of Alternative C.

- Downtown Shuttle (Downtown Circulator #1) – The shuttle will operate throughout the day on a 30 minute headway, serving several locations on existing routes today, including Hamilton/Dulle Towers, Gerbes, the High/Jefferson area, and the new transfer station. A total of 12 revenue hours would be required each weekday, resulting in an estimated annual operating cost increase of approximately \$103,000. Capital costs for the extra vehicle are estimated at \$300,000 for an additional bus.
- Capital Mall – No changes.
- Missouri Boulevard – Hamilton/Dulle Towers is no longer served by the Missouri Boulevard route (see Downtown Shuttle above). This eliminates running time problems on the route and makes for a more efficient interlining operation with the Capital Mall route.
- Southwest – The western loop serving Stadium, Buehrle, Dogwood, and Edgewood is eliminated on the current 5 trips in the morning and afternoon peak. Based on on/off counts, a total of 1 passenger is boarding in this segment. The elimination of the segment addresses running time problems on the route.
- High Street East – Lincoln University is now served with a direct routing from the bus station made possible by the downtown shuttle picking up the High Street and Clark Avenue portions of the existing route. The route then operates similar to the existing route to the bus station.
- High Street West – High Street West will operate the same as it does today. The route gains some running time with the bus station now being the terminus, easing the current tight schedule.
- Business 50 – The Business 50 route will operate the same as it does today.
- Renn Addition – The Renn Addition route will operate as it does today with one small change. After completing the northern loop, the route will operate to the bus station via McCarty, rather than operating via Clark – Dunklin – LaFayette. This segment is now served by the downtown shuttle.

Figure 7: Alternative C Map

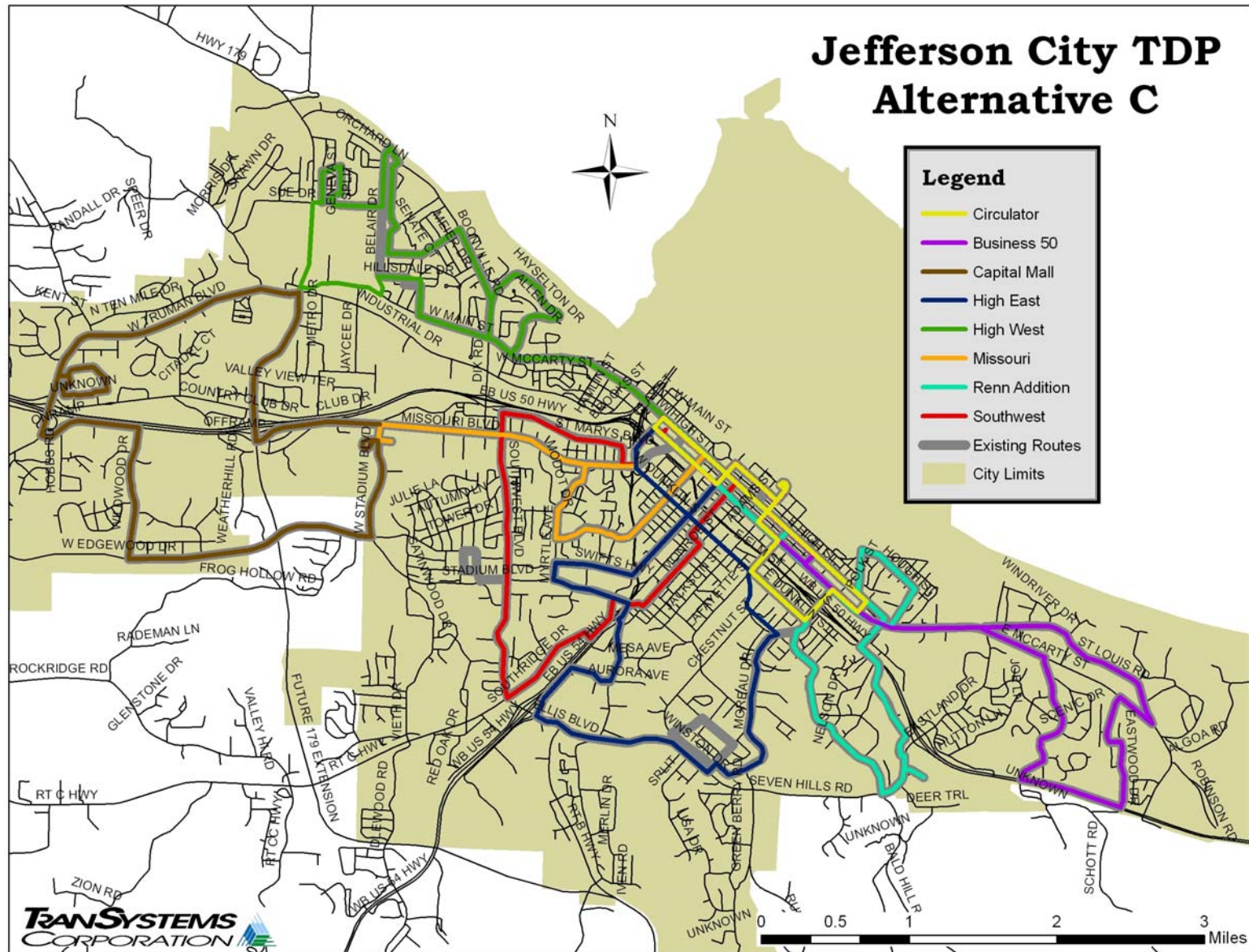


Table 11: Alternative C Route Schedules

CAPITAL MALL (ALTERNATIVE C)				MISSOURI (ALTERNATIVE C)		SOUTHWEST (ALTERNATIVE C)			HIGH EAST (ALTERNATIVE C)		
Target	Mall	Gerbes W	Greyhound TC	Target	Greyhound TC	Greyhound TC	Southwest / Ellis	Greyhound TC	Greyhound TC	Hough/Ellis	Greyhound TC
7:03 AM	6:50 AM	6:55 AM	6:45 AM	7:02 AM	7:10 AM	6:45 AM	6:57 AM	7:10 AM	6:45 AM	6:57 AM	7:11 AM
7:33 AM	7:20 AM	7:25 AM	7:15 AM	7:32 AM	7:40 AM	7:15 AM	7:27 AM	7:40 AM	7:15 AM	7:27 AM	7:41 AM
8:03 AM	7:50 AM	7:55 AM	7:45 AM	8:02 AM	8:10 AM	7:45 AM	7:57 AM	8:10 AM	7:45 AM	7:57 AM	8:11 AM
8:33 AM	8:20 AM	8:25 AM	8:15 AM	8:32 AM	8:40 AM	8:15 AM	8:27 AM	8:40 AM	8:15 AM	8:27 AM	8:41 AM
9:33 AM	8:50 AM	8:55 AM	9:15 AM	9:32 AM	9:40 AM	8:45 AM	8:57 AM	9:10 AM	9:15 AM	9:27 AM	9:41 AM
10:33 AM	9:50 AM	9:55 AM	10:15 AM	10:32 AM	10:40 AM	9:15 AM	9:27 AM	9:40 AM	10:15 AM	10:27 AM	10:41 AM
11:33 AM	10:50 AM	10:55 AM	11:15 AM	11:32 AM	11:40 AM	9:45 AM	9:57 AM	10:10 AM	11:15 AM	11:27 AM	11:41 AM
12:33 PM	11:50 AM	11:55 AM	12:15 PM	12:32 PM	12:40 PM	10:15 AM	10:27 AM	10:40 AM	12:15 PM	12:27 PM	12:41 PM
1:33 PM	12:50 PM	12:55 PM	1:15 PM	1:32 PM	1:40 PM	10:45 AM	10:57 AM	11:10 AM	1:15 PM	1:27 PM	1:41 PM
2:33 PM	1:50 PM	1:55 PM	2:15 PM	2:32 PM	2:40 PM	11:15 AM	11:27 AM	11:40 AM	2:15 PM	2:27 PM	2:41 PM
3:03 PM	2:50 PM	2:55 PM	2:45 PM	3:02 PM	3:10 PM	11:45 AM	11:57 AM	12:10 PM	3:15 PM	3:27 PM	3:41 PM
3:33 PM	3:20 PM	3:25 PM	3:15 PM	3:32 PM	3:40 PM	12:15 PM	12:27 PM	12:40 PM	3:45 PM	3:57 PM	4:11 PM
4:03 PM	3:50 PM	3:55 PM	3:45 PM	4:02 PM	4:10 PM	12:45 PM	12:57 PM	1:10 PM	4:15 PM	4:27 PM	4:41 PM
4:33 PM	4:20 PM	4:25 PM	4:15 PM	4:32 PM	4:40 PM	1:15 PM	1:27 PM	1:40 PM	4:50 PM	5:02 PM	5:16 PM
5:03 PM	4:50 PM	4:55 PM	4:50 PM	5:07 PM	5:15 PM	1:45 PM	1:57 PM	2:10 PM	5:20 PM	5:32 PM	
	5:20 PM	5:25 PM	5:20 PM			2:15 PM	2:27 PM	2:40 PM			
						2:45 PM	2:57 PM	3:10 PM			
						3:15 PM	3:27 PM	3:40 PM			
						3:45 PM	3:57 PM	4:10 PM			
						4:15 PM	4:27 PM	4:40 PM			
						4:50 PM	5:02 PM	5:15 PM			
						5:20 PM	5:32 PM				

HIGH WEST (ALTERNATIVE C)			RENN (ALTERNATIVE C)			BUSINESS 50 (ALTERNATIVE C)			CIRCULATOR #1 (ALTERNATIVE C)		
Greyhound TC	Belmont / Norris	Greyhound TC	Greyhound TC	Gerbes	Greyhound TC	Greyhound TC	Eastwood/50	Greyhound TC	Greyhound TC	Dunklin / LaFayette	Greyhound TC
6:45 AM	7:02 AM	7:12 AM	6:45 AM	6:57 AM	7:12 AM	6:45 AM	7:01 AM	7:13 AM	6:45 AM	6:57 AM	7:05 AM
7:15 AM	7:32 AM	7:42 AM	7:15 AM	7:27 AM	7:42 AM	7:15 AM	7:31 AM	7:43 AM	7:15 AM	7:27 AM	7:35 AM
7:45 AM	8:02 AM	8:12 AM	7:45 AM	7:57 AM	8:12 AM	7:45 AM	8:01 AM	8:13 AM	7:45 AM	7:57 AM	8:05 AM
8:15 AM	8:32 AM	8:42 AM	8:15 AM	8:27 AM	8:42 AM	8:15 AM	8:31 AM	8:43 AM	8:15 AM	8:27 AM	8:35 AM
8:45 AM	9:02 AM	9:12 AM	8:45 AM	8:57 AM	9:12 AM	9:15 AM	9:31 AM	9:43 AM	8:45 AM	8:57 AM	9:05 AM
9:45 AM	10:02 AM	10:12 AM	9:45 AM	9:57 AM	10:12 AM	10:15 AM	10:31 AM	10:43 AM	9:15 AM	9:27 AM	9:35 AM
10:45 AM	11:02 AM	11:12 AM	10:45 AM	10:57 AM	11:12 AM	11:15 AM	11:31 AM	11:43 AM	9:45 AM	9:57 AM	10:05 AM
11:45 AM	12:02 PM	12:12 PM	11:45 AM	11:57 AM	12:12 PM	12:15 PM	12:31 PM	12:43 PM	10:15 AM	10:27 AM	10:35 AM
12:45 PM	1:02 PM	1:12 PM	12:45 PM	12:57 PM	1:12 PM	1:15 PM	1:31 PM	1:43 PM	10:45 AM	10:57 AM	11:05 AM
1:45 PM	2:02 PM	2:12 PM	1:45 PM	1:57 PM	2:12 PM	2:15 PM	2:31 PM	2:43 PM	11:15 AM	11:27 AM	11:35 AM
2:45 PM	3:02 PM	3:12 PM	2:45 PM	2:57 PM	3:12 PM	3:15 PM	3:31 PM	3:43 PM	11:45 AM	11:57 AM	12:05 PM
3:15 PM	3:32 PM	3:42 PM	3:15 PM	3:27 PM	3:42 PM	3:45 PM	4:01 PM	4:13 PM	12:15 PM	12:27 PM	12:35 PM
3:45 PM	4:02 PM	4:12 PM	3:45 PM	3:57 PM	4:12 PM	4:15 PM	4:31 PM	4:43 PM	12:45 PM	12:57 PM	1:05 PM
4:15 PM	4:32 PM	4:42 PM	4:15 PM	4:27 PM	4:42 PM	4:50 PM	5:06 PM	5:18 PM	1:15 PM	1:27 PM	1:35 PM
4:50 PM	5:07 PM	5:17 PM	4:50 PM	5:02 PM	5:17 PM	5:20 PM	5:36 PM		1:45 PM	1:57 PM	2:05 PM
5:20 PM	5:37 PM		5:20 PM	5:32 PM					2:15 PM	2:27 PM	2:35 PM
									2:45 PM	2:57 PM	3:05 PM
									3:15 PM	3:27 PM	3:35 PM
									3:45 PM	3:57 PM	4:05 PM
									4:15 PM	4:27 PM	4:35 PM
									4:45 PM	4:57 PM	5:05 PM
									5:15 PM	5:27 PM	5:35 PM
									5:45 PM	5:57 PM	6:05 PM
									6:15 PM	6:27 PM	6:35 PM
									6:45 PM	6:57 PM	7:05 PM

5.2.4 Summary

All of the alternatives have the transfer location at the intercity bus station and each addresses the running time problems. Each alternative offers different advantages and disadvantages. Alternative A uses existing resources and maintains a 30 minute headway, but unproductive segments of routes have to be eliminated to address running time problems and to allow routes on the east side of town to get to the relocated transfer center on time. Alternative B uses existing resources and utilizes a 40 minute headway which addresses running time issues and allows service to expanded areas. Under 40 minute headways there would be less service during the peak period but more service during the midday compared to existing conditions. Alternative C uses additional resources and operates on a 30 minute headway. The added resources allow service to expanded areas. Table 12 summarizes each proposed service alternative.

Table 12: Summary of Existing Route Modification Options

Modifications to Existing Routes	Annual Operating Cost	Capital Cost	Estimated Ridership	Funding Requirement
Alternative A - 30 Minute Service	\$0	\$0	n/a	\$0
Alternative B - 40 Minute Service	\$0	\$0	n/a	\$0
Alternative C - 30 Minute Service with Downtown Circulator #1	\$103,000	\$300,000	50	\$99,000

5.3 New Service Areas

The needs analysis discussed in Section 3 of this report evaluated the potential for transit in portions of the study area not presently served. The needs analysis looked at five areas:

- West along Route 50
- Jefferson City North of the Missouri River
- Holts Summit
- The Algoa area in the eastern part of the City
- Southwest generally along US 54 and Route 179.

Of the five areas the West area and Holts Summit appear to have the most potential, however even these areas have characteristics that make for a difficult transit market. Population densities are well below the level that makes fixed route services viable, and, as expected income and auto ownership do not favor transit usage¹. The state corrections facilities at Algoa and the airport just north of the Missouri River do not appear to offer much of a transit market and neither appears to have a need for transit. The Southwest area is expected to develop, but currently does not appear to have a need for transit.

There are generally three types of services that can serve these types of areas:

1. Flexible Route service anchored by a significant traffic generator and tied into the larger system
2. Express service designed for central area employment trips
3. Paratransit service for individuals with mobility limitations

¹ This information is contained in the Study Area Data Inventory technical report.

5.3.1 West Area Service

Two types of services were evaluated: a flexible service route and an express route. These services are distinctly different in terms of service type, operation and market.

West Area Flexible Route. This type of service is described in Section 4 of this report. A service zone would be designated which could be served by one vehicle operating in a demand response mode (similar to Handi Wheels). The zone would include all of the area in the study area west of the Capital Mall route. The route would have a terminus at Capital Mall providing a connection to the JEFFTRAN transit network. The route would serve Thomas Jefferson Middle School, residential areas and commercial areas. This service is estimated to increase operating costs by \$133,000 annually and attract an additional 50 daily passengers. The additional cost reflects an additional bus driver. The cost does not include extending Handi Wheels service hours because it is not required by ADA. An additional bus would be required. A small bus, similar to a Handi Wheels vehicle is suggested.

West Area Express Route. The peak period only service would consist of one bus making two trips in both the morning and the afternoon. The schedule would be set to serve the primary shifts at the state office buildings in the downtown area. An important component of the service package would be a park and ride lot on the west end of the route allowing commuters to access the bus with a short auto trip. This service is estimated to increase operating costs by \$56,000 annually and attract an additional 40 daily passengers. The additional cost reflects an additional bus driver. The cost does not include extending Handi Wheels service hours because it is not required by ADA. An additional bus would be required. A smaller, light duty bus, similar to the Freightliner vehicles is suggested.

5.3.2 North Area Service

Holts Summit Flexible Route. A flexible route was developed to operate on a 60 minute headway from the bus station terminating at the shopping center located at Summit Drive and Simon Boulevard. The route would operate on a fixed schedule but would be permitted to deviate off the route within a $\frac{3}{4}$ mile buffer to pick up or drop off passengers. This type of service is referred to as "route deviation." The route could be operated to allow deviations to the Jefferson City Airport to provide service on a demand basis. Table 13 shows a sample schedule for the proposed route:

Table 13: Holts Summit Sample Schedule

Greyhound TC	Summit / Simon	Greyhound TC
7:00 a.m.	7:32 a.m.	7:55 a.m.
8:00 a.m.	8:32 a.m.	8:55 a.m.
9:00 a.m.	9:32 a.m.	9:55 a.m.

- Route would operate throughout the day to 6:00 p.m.
- Travel time to Summit / Simon is 17 minutes, the extra 15 minutes allows for deviations.

This service is estimated to increase operating costs by \$133,000 annually and attract an additional 60 daily passengers. The additional cost reflects an additional bus driver. The cost does not include extending Handi Wheels service hours because it is not required by ADA. An additional bus would be required. A small bus, similar to a Handi Wheels vehicle is suggested.

Holts Summit Express Route. This peak period only service would consist of one bus making two trips in both the morning and the afternoon. The schedule would be set to serve the primary shifts at the state office buildings in the downtown area. An important component of the service package would be a park and ride lot near the northern terminus of the route allowing commuters to access the bus with a short auto trip. This service is estimated to increase operating costs by \$56,000 annually and attract an additional 60 daily passengers. The additional cost reflects an additional bus driver. The cost does not include extending Handi Wheels service hours because it is not required by ADA. An additional bus would be required. A smaller, light duty bus, similar to the Freightliner vehicles is suggested.

5.3.3 Algoa Area Service

East Side Employment Shuttle – Transit service to the Algoa correctional facilities and employment sites to the east of the City could be served by an employment shuttle route operating on a 60 minute headway. The route would operate via Route 50 to the Militia Drive exit, serving the prison, Scholastic, and Modern Litho Print Company. The round trip for the route was timed at 42 minutes, leaving additional time to serve the new Wal-Mart, once built. The route would likely operate to the prison and Wal-Mart throughout the day and to the employment sites during the peak periods only. This service is estimated to increase operating costs by \$133,000 annually and attract an additional 60 daily passengers. The additional cost reflects an additional bus driver. The cost does not include extending Handi Wheels service hours because it is not required by ADA. An additional bus would be required. A smaller, light duty bus, similar to the Freightliner vehicles is suggested.

5.3.4 Southwest Area Service

Southwest Area Flexible Route. This type of service is described in Section 4 of this report. A service zone would be designated which could be served by one vehicle operating in a demand response mode (similar to Handi Wheels). The zone would include all of the area in the study area southwest of the Southwest and High Street East routes. The route would connect to the JEFFTRAN transit network at points along the existing routes. This service is estimated to increase operating costs by \$133,000 annually and attract an additional 30 daily passengers. The additional cost reflects an additional bus driver. The cost does not include extending Handi Wheels service hours because it is not required by ADA. An additional bus would be required. A small bus, similar to a Handi Wheels vehicle is suggested.

5.3.5 Summary

Table 14 summarizes the service expansion options.

Table 14: Summary of Service Expansion Options

Service Expansion - New Services	Annual Operating Cost	Capital Cost	Estimated Ridership	Funding Requirement
West Area Flex Route	\$133,000	\$80,000	50	\$129,000
West Area Express	\$56,000	\$150,000	40	\$53,000
Holts Summit Flex Route	\$133,000	\$80,000	60	\$128,000
Holts Summit Express	\$56,000	\$150,000	60	\$51,000
Algoa Area Shuttle	\$133,000	\$150,000	30	\$130,000
Southwest Area Flex Route	\$133,000	\$150,000	30	\$130,000

JEFFTRAN operates as a City department, thus operations outside the City limits may require some modifications to current practice and even policy. For one, JEFFTRAN may be limited to operation inside City limits by a council directive. This needs to be determined.

Another matter is funding. If service is provided to residents and areas outside the City's corporate limits there may need to be agreements in place to provide for funding. These agreements provide for funding from the outside jurisdiction and use some means to allocate costs and revenues between the jurisdictions.

These types of agreements are common and many municipal transit operators like JEFFTRAN operate in other jurisdictions.

5.4 Other Potential Service Modifications

A number of other service improvement possibilities were evaluated as part of the project.

Increased service levels on existing routes. The 30 minute frequency currently provided during the peak periods was concluded to be adequate for the foreseeable future. Market research conducted for the study supports this conclusion – users are generally satisfied with the service. Market research also revealed that nearly 60% of individuals who would consider using transit indicate that service intervals of 20 minutes or less are sufficient. It would take service intervals of 15 minutes or better to attract another 35% of respondents. Improving the service frequency to 15 minutes would nearly double operating costs. This is not considered a practical option.

Substitution of fixed route service with flexible routes. As explained in Section 4 of this report, fixed route services do not typically perform well in areas with population densities lower than about 3,000 persons per square mile. Most of the JEFFTRAN routes have portions of their service area with lower densities. The Capital Mall route operates totally in an area with densities less than 1,000 per square mile (although the route does serve commercial retail). One possibility is to replace the Capital Mall fixed route with a flexible route service. This would be the same as explained in Section 4 and would be similar to the West Area Flexible Route described in Section 5.3.1 of this report. In this case Capital Mall would be served by an extension of the Missouri Boulevard fixed route and the new flex route would operate in the general area, with connections to the fixed route at Capital Mall and Wal-Mart on West Stadium Boulevard. This type of service is estimated to increase operating costs by \$133,000 annually and attract an additional 40 daily passengers. The additional cost reflects an additional bus driver. An additional bus would be required. A small bus is suggested.

Downtown Area Circulator Route (Downtown Circulator #2). Some interest has been expressed in a shuttle or circulator route that would connect various attractions and destinations in the downtown area. A new downtown development referred to as the Missouri State Prison (MSP) Redevelopment area will change travel patterns in the area. This development is a mixed use development that is far enough from the City's current retail commercial core and the State Capital complex that casual walking would be discouraged. An intra downtown shuttle (Downtown Circulator #2) could link these areas and reduce reliance on auto travel and the need for parking. To be effective the shuttle would have to operate with a high service level with intervals of ten minutes or less. Some cities have found that shuttles using distinctive vehicles, such as rubber-tired vintage trolleys, are effective because they are easily identifiable and attractive to visitors and tourists. Shuttles such as these are often operated without fare to encourage spontaneous usage. Such a service would increase operating costs by \$267,000 annually and attract 450 daily riders.

5.4.1 Summary

Table 15 summarizes the service expansion options.

Table 15: Summary of Other Route Modification Options

Other Service Modifications	Annual Operating Cost	Capital Cost	Estimated Ridership	Funding Requirement
Improve Frequency to 15 min. Peak and 30 min. base	\$933,000	\$2,400,000	320	\$906,000
Downtown Circulator #2	\$267,000	\$750,000	480	\$267,000
Capital Mall Flex Route	\$133,000	\$150,000	40	\$130,000

Table 16 on the following page provides costs, ridership and performance information on each of the service modifications. Table 16 also includes very preliminary assessments of the need or priority associated with each modification.

Table 16: Summary of Alternatives

Potential Transit Service Modifications	Annual Operating Cost	Capital Cost	Estimated Ridership	Funding Requirement	Cost per New Rider	Priority	Comment
Service Period Extension Options							
Extend service by 1.5 hours/day	\$141,000	\$0	80	\$134,000	\$6.57	High	Highly recommended because the extension will make the service more attractive to choice riders.
Evening service (5 days to 9 PM)	\$155,000	\$0	80	\$148,000	\$7.25	Low	
Evening service (5 days to 9 PM)	\$128,000	\$0	70	\$122,000	\$6.83	Medium	
Select routes							Evening service should be an important priority for the near future because transit dependants have no transportation after 5:30 PM. The method used to provide the service should minimize cost.
Evening service (1 day to 9 PM)	\$30,000	\$0	40	\$29,000	\$14.22	Low	
Evening service (5 days to 9 PM)	\$66,000	\$0	60	\$61,000	\$3.99	Medium	
Demand response							Saturday service should be an important priority for the near future because transit dependants have no transportation on weekends. The method used to provide the service should minimize cost.
Saturday service - 7 routes/base service plan	\$112,000	\$0	400	\$105,000	\$5.15	Low	
Saturday service -select routes/base service plan	\$94,000	\$0	360	\$88,000	\$4.79	Medium	
Saturday service - demand response	\$73,000	\$0	280	\$68,000	\$4.76	Medium	
Modifications to Existing Routes							
Alternative A - 30 Minute Service	\$0	\$0	n/a	\$0	\$0.00	N/A	One of these options must be selected because of the impending move to the Greyhound station and to resolve the running time problem. Alternative A is recommended.
Alternative B - 40 Minute Service	\$0	\$0	n/a	\$0	\$0.00	N/A	
Alternative C - 30 Minute Service with Downtown Circulator #1	\$103,000	\$300,000	50	\$99,000	\$7.76	High	
Service Expansion - New Services							
West Area Flex Route	\$133,000	\$80,000	50	\$129,000	\$10.12	Low	Transit service in this low density area is not a priority at this time. An intergovernmental agreement would be required for funding.
West Area Express	\$56,000	\$150,000	40	\$53,000	\$5.20	Low	Not recommended unless there is a cooperative effort with the state to reduce auto commuting to the central part of the City. An intergovernmental agreement for funding would be required.
Holts Summit Flex Route	\$133,000	\$80,000	60	\$128,000	\$8.37	Low	Transit service in this low density area is not a priority at this time. An intergovernmental agreement would be required for funding.
Holts Summit Express	\$56,000	\$150,000	60	\$51,000	\$3.33	Low	Not recommended unless there is a cooperative effort with the state to reduce auto commuting to the central part of the City. An intergovernmental agreement for funding would be required.
Algoa Area Shuttle	\$133,000	\$150,000	30	\$130,000	\$16.99	Low	Not recommended unless there is a cooperative effort with the state to reduce auto commuting to the central part of the City. An intergovernmental agreement for funding would be required.
Southwest Area Flex Route	\$133,000	\$150,000	30	\$130,000	\$16.99	Low	Transit service in this low density area is not a priority at this time. Future growth, including the development of St. Mary's Hospital, would make transit service viable.
Other Service Modifications							
Improve Frequency to 15 min. Peak and 30 min. base	\$933,000	\$2,400,000	320	\$906,000	\$11.10	Low	Not recommended.
Downtown Circulator #2	\$267,000	\$750,000	480	\$267,000	\$2.18	Low	Viable as a future enhancement if it is part of downtown redevelopment.
Capital Mall Flex Route	\$133,000	\$150,000	40	\$130,000	\$12.75	Low	Should be considered as a future option to serve portions of the City currently unserved.

Section 6: Conclusions and Next Steps

The next steps to be taken include the identification of priorities for various transit improvements. The conclusions and recommendations in this DRAFT report are intended to be examples of how decisions might be made. This version of the report reflects only the consultant's evaluation. City staff, the Steering Committee and other stakeholders should provide input to the conclusions presented at the final public meeting.

The recommended priorities will be packaged into a five-year program with complete operating and capital funding requirements for final presentation.

An implementation plan will be developed based on the preferred service options. The purpose of the implementation plan is to provide information on the steps necessary to make the recommendations of the TDP a reality. The implementation plan will include project and program timing and a financing plan.

The TDP must recognize that transit is not affected only by transportation-related decisions. Transit in a community is affected by decisions and policies regarding development and land use. Development patterns can either promote or inhibit the ability to successfully provide transit in a community. Development patterns can support transit in many ways. A few examples include:

- Land uses that serve transit dependant populations, such as social service agencies, low income housing and senior centers should be located along existing transit routes.
- Higher density development should be focused near transit stops and corridors
- Compact development with a mix of uses that locates housing near jobs, shops and services, schools and other community facilities should be encouraged.
- Shops and services should be located near employment centers; infill development should be encouraged.
- Streets and sidewalks should be designed to ensure safe and convenient access for pedestrians and transit users.
- Individual development projects should be designed to provide safe, convenient pedestrian access to transit stops and nearby services