



Transit Service Alternatives

INTRODUCTION

The basis for any short-range transit plan is the careful consideration of realistic transit service alternatives and vehicle types. The capital requirements, financial plans, and management options can then be developed to support the planned services. Each alternative must be evaluated using the locally established goals and objectives. Only alternatives that support the mission statement of public transportation and the corresponding goals and objectives should be considered for implementation.

The main purpose of Chapter IX is to develop a basic level of understanding of the different types of transit services that are used by transit providers and the way that various transit services function. This information—along with the vehicle types, goals, and objectives—was used in the selection of the preferred transit service.

TYPES OF TRANSIT SERVICE

The term “transit service” encompasses a wide range of alternatives. Traditionally, people think of transit service as buses operating on a strict schedule. A number of other transit service alternatives exist, such as demand-response service, fixed route, flex route, and commuter transportation.

Regional and Commuter Service

With regional and commuter service, the route is primarily designed to link different communities together for employment purposes, instead of linking all areas adjacent to the route. These communities may be within the same geographic area. In urban areas, this type of service is commonly known as express or limited express service. In rural areas, the service links communities across the study area and with the communities outside the study area.

Fixed-Route Service

Fixed-route transit service fits the popular description of a bus system, with transit vehicles operating on specified routes and following set schedules. Specific bus stops are typically identified for the locations where passengers will be picked up and dropped off. Routes are usually laid out in either a radial or grid pattern.



Fixed-Route Service

Fixed-route service is particularly convenient for passengers without disabilities. Research has shown that fixed-route passengers are willing to walk up to one-quarter mile to reach the bus stop. Therefore, a fixed-route service pattern may be efficiently laid out with routes having one-half-mile spacing. However, individuals with mobility impairments may have difficulty in accessing the fixed-route system.

The advantages of fixed-route service are that it can be provided at a relatively low cost on a per-passenger-trip basis, schedule reliability is high since buses do not deviate from their routes, service does not require advance reservations, and service is easy to understand.

Fixed-route transit service is seldom attractive for people with automobiles in smaller communities and rural areas. A private automobile offers flexibility compared to the rigid schedule of a fixed-route system. The need to walk even a few hundred feet to a bus stop, wait for the vehicle, and the comparatively slow travel time make the option of a private automobile an easy choice. Where there are significant congestion issues or limited parking availability, fixed-route transit service becomes a more attractive alternative. The low cost of transit as compared to owning and operating a private automobile can also be attractive, especially to young working couples who may be able to use the bus rather than own two vehicles.

The Americans With Disabilities Act (ADA) requires that communities with fixed-route transit service also provide complementary paratransit service that operates, at a minimum, in a three-quarter mile radius of each fixed route. Paratransit service is typically much more costly to operate than fixed-route service because of

the characteristics of the service. Fixed routes are established to meet the highest demand travel patterns, while paratransit service must serve many origins and destinations in a dispersed pattern. Therefore, fixed-route operations lack the flexibility to meet the needs of passengers with any special requirements in low density areas.

Service Routes

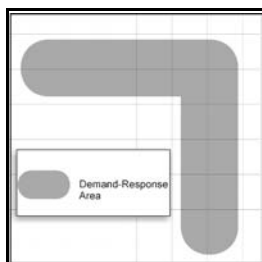
One concept that is being implemented in some communities as an alternative to traditional fixed-route or demand-response service is the service route. A service route is essentially a fixed route specifically designed to serve the elderly and disabled. Typically, a service route winds through residential neighborhoods with high concentrations of elderly and disabled persons in a pattern that passes within a block or two of all houses. It also directly serves important destinations, such as senior centers and commercial areas. The service provides a higher in-vehicle travel time and a longer wait for the bus than would normally be acceptable to the general public. The Bus (operating in Butte, Montana) and MET (in Billings, Montana) provide successful service routes to their residents.

Demand-Response Service

Demand-response transit service, frequently termed dial-a-ride, is characterized as door-to-door transit service scheduled by a dispatcher. With demand-response service, advance reservations are typically required, although some immediate requests may be filled if time permits and if the



Demand-Response Service in small communities



Demand-Response Service

service is particularly needed. The general public transit service operated by the Dawson County Urban Transportation District (located in Glendive, Montana) and by STAR in Rock Springs/Green River are examples of successful demand-response services.

The concept of demand-response was originally developed in the early 1970s as an alternate form of public transportation for the general public. The original efforts proved to be more expensive than envisioned and did not attract the ridership that was forecast. As a result,

demand-response transit has been used almost exclusively in this country for elderly and disabled passengers. However, many communities are beginning to recognize the advantages of demand-response service for low density areas with low levels of transit demand. Improved technology has led to improvements in dispatching and scheduling, which has increased the efficiency of demand-response service and allows for real-time dispatching.

Flexible Routes

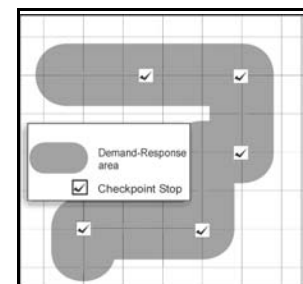
Another alternative is flexible routes, such as route-deviation or checkpoint service. With flexible routes, vehicle dispatching and scheduling must be done carefully to ensure that vehicles are available to serve the designated stops at the scheduled times. To provide a reasonable amount of flexibility, a lenient definition of on-time performance is typically used. A reasonable policy for route-deviation or checkpoint service within the study area is a 10- to 15-minute window at each designated stop.

Route Deviation

With route deviation, transit vehicles follow a specific route, but leave the route to serve demand-response origins and destinations. The vehicles are required to return to the designated route within one block of the point of deviation to ensure that all intersections along the route are served. The passengers on the bus may have a longer travel time than for fixed-route service and the service reliability is lower. However, the ADA-mandated complementary paratransit service is therefore not necessary, since the bus can deviate from the route to pick up disabled passengers.

Checkpoint Service

Under checkpoint service, the vehicles make periodic scheduled stops at centers of activity (such as program sites, shopping areas, or residential communities). The specific routes are not established between checkpoints, allowing the vehicles to provide demand-response service, again alleviating the need for the ADA-mandated complementary paratransit service. Riders are picked up, typically



Checkpoint Service

at a reduced fare, at the checkpoints and taken either to another checkpoint or to a demand-response specific destination. Service between the checkpoints does not require advance reservations. However, service from any other location on a demand-response basis requires an advance reservation so that the vehicles can be scheduled for pickup and drop-off.

Checkpoint service offers an advantage over route deviation because there is no specified route for the vehicles to use. Checkpoint service requires only that the vehicle arrive at the next checkpoint within the designated time window.

Vanpool Service

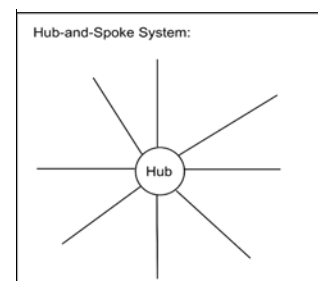
Vanpool service operates more of a point-to-point function. The vanpool gathers riders within a community and then travels directly to a major employment center (such as Rock Springs). Normally an agency owns and maintains the vehicle and allows individuals who join the vanpool program to ride on the vehicles. Individuals using the vanpool share the cost and may even share the driving responsibilities. The schedule and route of the service depends upon the individuals participating in the vanpool service. Vanpool service is limited to individuals within the program and has limited service for medical or shopping trips. Vanpool service is primarily for employment trips for non-disabled individuals since there are liability issues with disabled individuals riding on vanpool service.

SYSTEM STRUCTURE

This section reviews the different ways that transit services function together within a study area or community to create a system. The system/route structures include radial, grid, loop, suburban service, and hybrid.

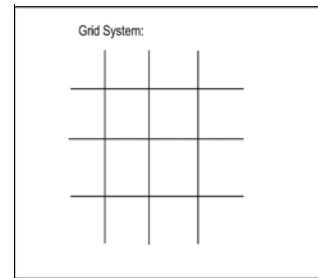
Radial Route Structure

In a radial route structure, all of the routes originate from a common point and extend to outlying areas. The central location serves as a transfer point and is frequently located at a destination with high transit activity. In many communities, this is the central business district or downtown area.



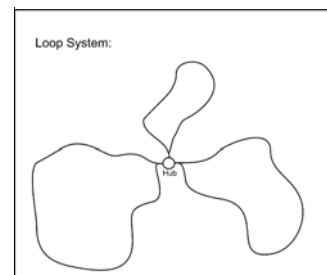
Grid Route Structure

In a grid route structure, all of the routes function along a two-way direction (either north/south or east/west). The routes are normally spaced at equal distances if the roadway structure permits. This structure has no center transfer location. The transfers are conducted at the intersections of the routes. This type of service is mainly used in urban areas where population density is greater and equally distributed across the area.



Loop Route Structure

In a loop route structure, all of the routes function along a one-way direction that circles around a portion of the community. This structure has one central transfer location. A loop route structure is mainly used in smaller communities where there is lower population density in order to provide transit service across a large area with fewer routes. This reduces the overall cost, but increases the running time of the bus to complete the route.



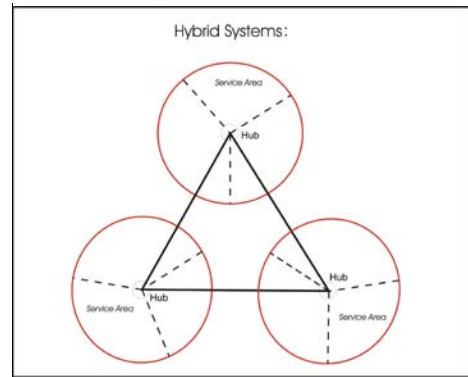
Suburban Service Route Structure

In suburban areas, fixed-route service may be provided between major communities with connections to local services that operate within the communities. In many urban and suburban areas, this type of service will be either express or limited express routes. In rural areas, commuter service will be used to link rural communities together or link rural areas with urban areas.

Hybrid Route Structure

A hybrid route structure combines elements of the radial, grid, loop, and suburban service route structures into a single interconnecting network. The hybrid route structure has transit vehicles that operate by different methods. First

are vehicles that operate on a fixed route in the grid, radial, or loop structure. These vehicles stop at every transit stop along a fixed route. The function of this tier of service is to collect transit riders along the route. The next tier of the hybrid network is the transit buses that function for regional service. These vehicles will have transit stops at major destinations. The function of the regional service route structure is to move transit riders quickly across a community or region. The hybrid type of service is many times called a hop, skip, and jump system. The main purpose of the hybrid service structure is to allow transit users to travel more like individuals in automobiles.



TRANSIT ALTERNATIVES

The following discussion evaluates the potential for new transit services and the modification of existing services. LSC has developed demand estimates for each transit service alternative for the evaluation process.

Maintain Status Quo

A good starting point for the evaluation of transit service alternatives is the consideration of the “status quo.” The status quo alternative involves no change in the service provided by STAR. This alternative is a viable option which may be appropriate when the current service meets the community’s needs and satisfies the goals and objectives for public transportation services.

The existing demand-response service operates up to 12 vehicles per day. The annual cost is estimated at \$588,800. The total number of revenue-hours is 12,950. The total number of annual passengers is 47,300. This results in a cost per passenger of \$12.44 for the existing service. Table IX-1 presents the level of service for the status quo alternative. The above amounts for the status quo system include the \$100,000 in contract service that STAR provides for CDC and the senior centers.

**Table IX-1
Level of Service - Status Quo**

Options		# of Veh.	Total Daily		Total Annual		Operating Days	Annual Ridership	Pass. per Hour	Operating Cost Annual	Cost per Passenger
			Vehicle-Miles	Vehicle-Hours	Vehicle-Miles	Vehicle-Hours					
Status Quo	6:00 am - 6:00 pm M-S	10	718	51	183,049	9,000	255	28,712	3	\$488,784	\$17.02
Contract Services		2				3,951		18,600	5	\$100,000	\$5.38
Total/Average			718	51	183,049	12,951		47,312		\$588,784	\$12.44

Note: Costs based on LSC analysis, 2007.

The cost of the demand-response service has increased over the past few years. Since 2004, the annual service cost has increased from \$400,000 to over \$588,000 (a 10 percent increase). Ridership has stayed stable over the same time period. The cost per passenger-trip has been increasing with the operating costs.

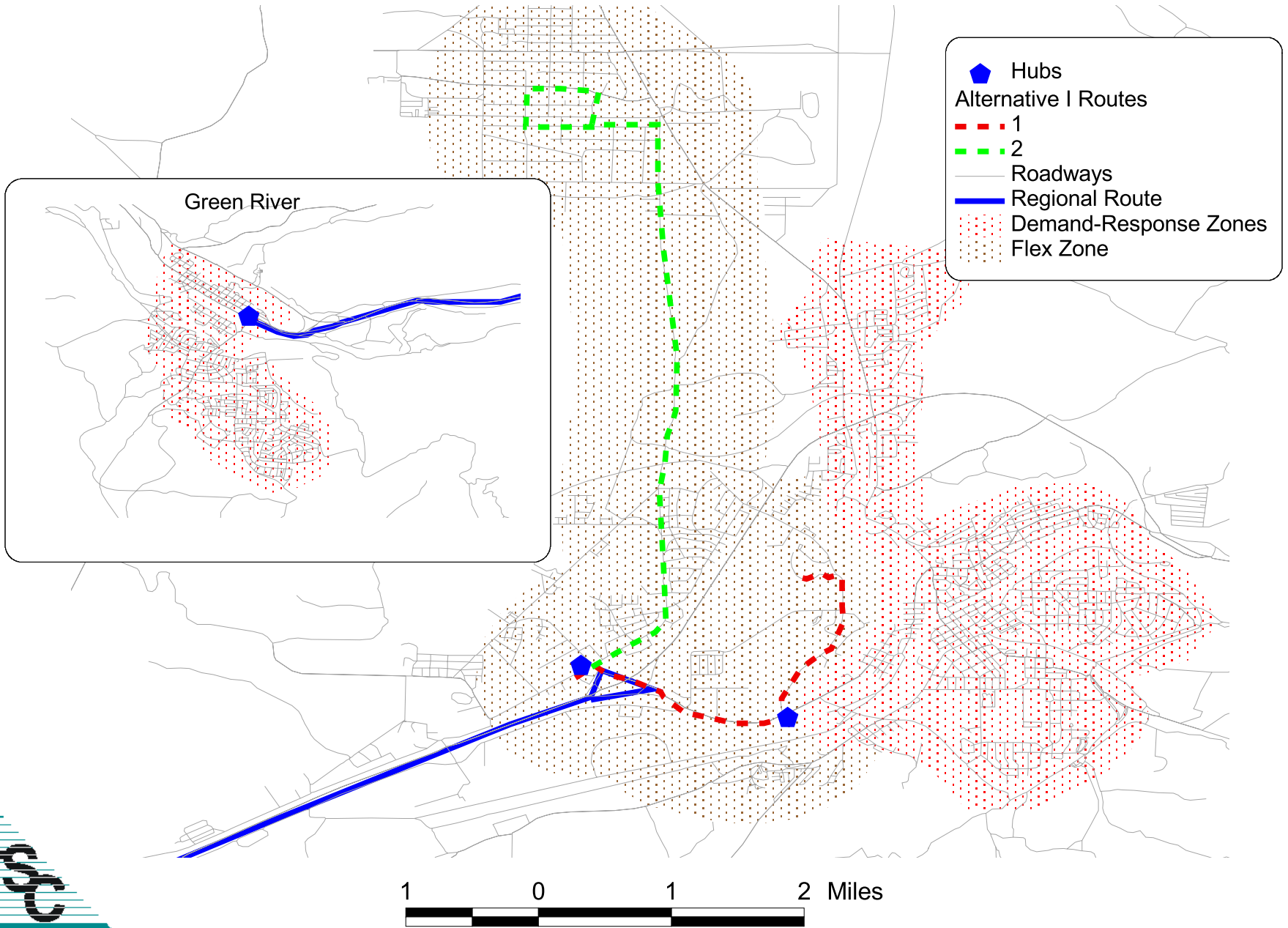
Chapter V presented the results for the existing demand. The results show there is a very good level of service with over 47,000 annual trips. The largest single factor that can be expected to impact the Sweetwater County communities over the next 10-year planning period is population growth, which will result in increased demand for transit services.

Based on the information presented earlier in this report, the status quo alternative will not meet the needs, goals, and objectives of the community or the stakeholders. The existing transit service is very expensive and inefficient when compared to other transit service options, as presented later in this chapter.

Alternative I: Limited Flex-Route Service

Alternative I is a limited flex-route service, which is based on two flex routes and demand-response service that link the major transit destinations together to improve connectivity and mobility. As presented in Figure IX-1, the flex routes will be linked to the demand-response service areas by transfer stations located at the White Mountain Mall and the Plaza Mall in Rock Springs. Rock Springs will be served by two flex routes on the west side and a demand-response zone on the east side. Green River will be served by a demand-response system. The two communities will be linked by a regional or express bus. Table IX-2 presents the level of service for the limited flex-route service.

Figure IX-1
Alternative I Limited Flex-Route Service



**Table IX-2
Level of Service - Alternative I**

Options		# of Veh.	Total Daily		Total Annual		Operating Days	Annual Ridership	Pass. per Hour	Operating Cost Annual	Cost per Passenger
			Vehicle-Miles	Vehicle-Hours	Vehicle-Miles	Vehicle-Hours					
Demand-Response Service	7:00 am - 5:00 pm (M-F)	3	270	30	68,850	7,650	255	17,433	2.3	\$281,144	\$12.82
Flex Route - Green	7:00 am - 5:00 pm (M-F)	1	120	10	30,600	2,550	255	4,276	1.7	\$98,534	\$23.04
Flex Route - Red	7:00 am - 5:00 pm (M-F)	1	100	10	25,500	2,550	255	7,941	3.1	\$95,321	\$12.00
Regional Route	AM - Mid - PM	1	294	6	74,970	1,530	255	6,120	4.0	\$92,282	\$15.08
Contract Service		2				3,951		18,600	4.7	\$100,000	\$5.38
Total/Average			784	56	199,920	18,231		54,370	2.98	\$667,281	\$12.27

Note: Costs based on LSC analysis, 2007.

Red Route

The red route starts at the White Mountain Mall transfer station, travels east on Dewar Drive to College Drive, ends at the Western Wyoming College, and returns to the White Mountain Mall transfer station via the reverse route. Since the red route is a route-deviation service, the bus will be able to deviate off the route to serve the ADA requirement. The red route will deviate up to three-quarters of a mile to pick up passengers who scheduled rides 24 hours in advance. The red route will operate one bus 255 days per year on a 30-minute headway from 7:00 a.m. to 5:00 p.m. The estimated cost of the red route is \$95,300 annually. The estimated ridership is 7,900 passengers annually.

Green Route

The green route starts at the White Mountain Mall transfer station, travels north along Foothill Boulevard to Gannett Drive, runs west on Granite Drive, turns back along Mesa Drive and Meadow Drive, and returns to the White Mountain Mall transfer station via the reverse route. Since the green route is a route-deviation service, the bus will be able to deviate off the route to serve the ADA paratransit requirement. The green route will deviate up to three-quarters of a mile to pick up passengers who scheduled rides 24 hours in advance. The green route will operate one bus 255 days per year on a 60-minute headway from 7:00 a.m. to 5:00 p.m. The estimated cost of the green route is \$98,500 annually. The estimated ridership is 4,300 passengers annually.

Demand-Response Service

Alternative I contains three demand-response zones. Each zone is designed to cover six to seven square miles, and will be linked to the flex-route service at the transfer stations. The buses will provide curb-to-curb service for passengers who schedule rides 24 hours in advance. Passengers traveling from zone to zone will need to transfer to the flex-route service or another demand-response bus at the transfer stations. Each demand-response zone operates one bus on 255 days per year from 7:00 a.m. to 5:00 p.m. The cost of each demand-response zone is estimated at \$93,700 annually, for a total cost of \$281,100 annually. The estimated ridership is 17,400 passengers annually.

Regional Service

Alternative I implements regional service between Green River and Rock Springs along Interstate 80 (I-80). The route begins at the Green River transfer station near the railroad yard, travels to the White Mountain Mall transfer station in Rock Springs, and returns to the Green River transfer station via the reverse route. The regional service will operate one bus 255 days per year for six revenue-hours per day, with two round-trips each in the morning, midday, and afternoon peak times. The estimated cost of the regional service is \$92,300 annually. The estimated ridership is 6,120 passengers annually.

Contract Service

Currently, STAR contracts with the Child Developmental Center (CDC) to provide demand-response transportation service. It is assumed the contract service will not change for any of the alternatives. The estimated cost of the contract service is \$100,000 annually. The total hours of operation are 3,950 annually. The estimated ridership is 18,600 passengers annually.

Capital Needs

The first infrastructure required to implement Alternative I will be the installation of transit stops. The number and spacing of the transit stops will vary based on density. In more dense urban areas, the transit stops will be spaced 800 to 1,200 feet apart. In less dense urban areas, the transit stops will be spaced up to 2,500 feet apart. Based on the linear miles of the service routes and an average of 1,500 feet between the transit stops, the estimated number of total transit stops is about 65 for the urban area (with 32 outbound and 33 inbound transit stops).

Three transfer stations will need to be developed—one at the White Mountain Mall, one at Plaza Mall in Rock Springs, and the other near the railroad yard in Green River. Each transfer station will need to accommodate three buses at one time. Each transfer station will also need to have a shelter; lighting; signage; and improved sidewalks, curbs, and gutters.

Since Alternative I uses the existing number of transit vehicles, there will be no need to expand the fleet size.

Fixed-Route Model and Evaluation

The Appendix F tables present the fixed-route, demand-response, and ADA para-transit models that LSC used to estimate the level of service and number of trips that can be served with Alternative I. The results show that, on an average week-day, Alternative I can generate 213 trips. This equates to 54,400 trips per year based on 255 days of service. Compared to the other alternatives, Alternative I will produce the lowest level of trip production, with the trips per revenue-hour being less than the existing transit service. Also, the system structure has poor linkages between the eastern and western portions of Rock Springs. Therefore, Alternative I will not meet the needs and goals of STAR.

As presented in Table IX-7 (at the end of Chapter IX), Alternative I will result in the following estimates:










- \$12.27 cost per passenger-trip
- \$667,300 annual cost
- 2.98 passengers per hour
- 54,400 annual passengers

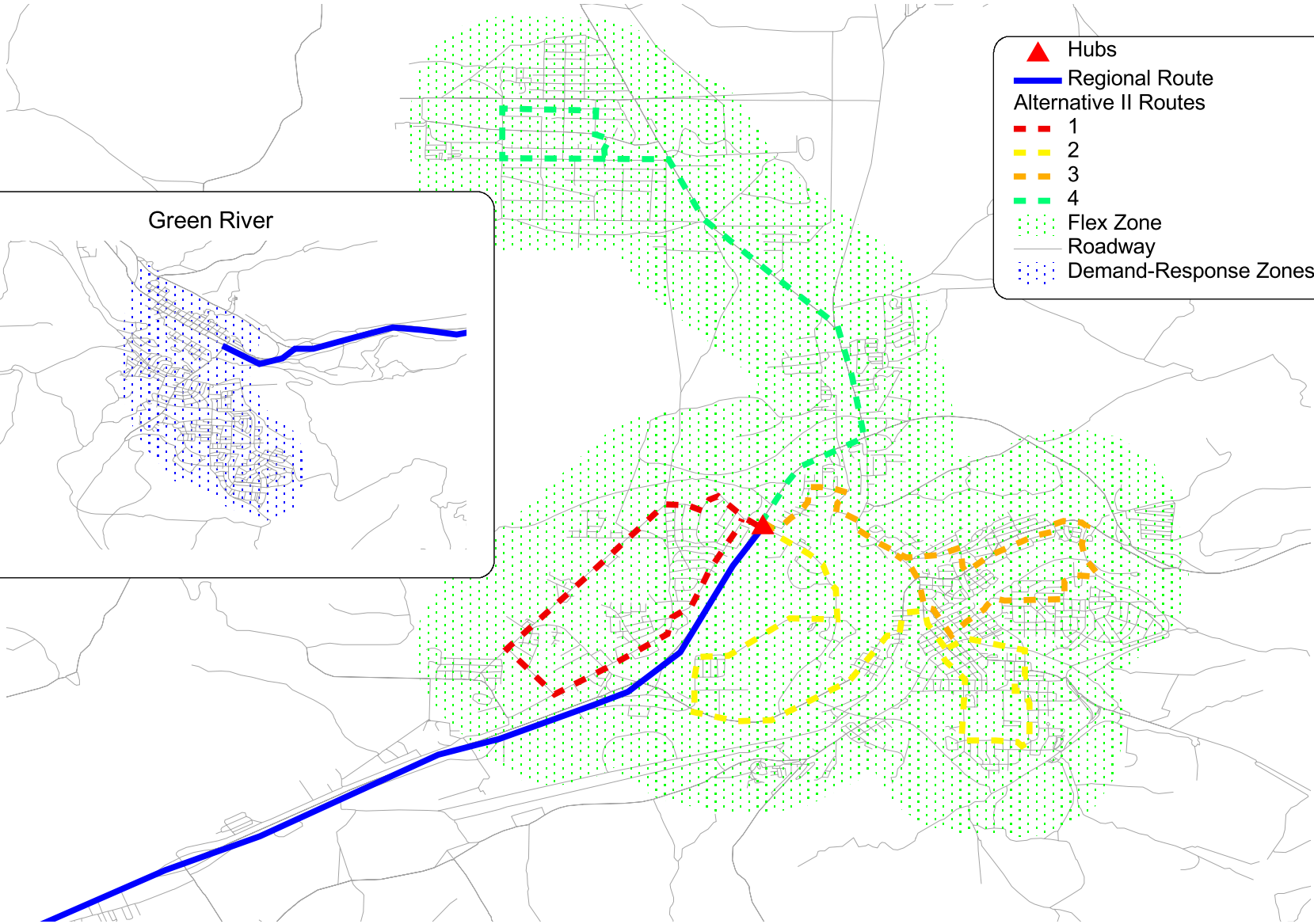
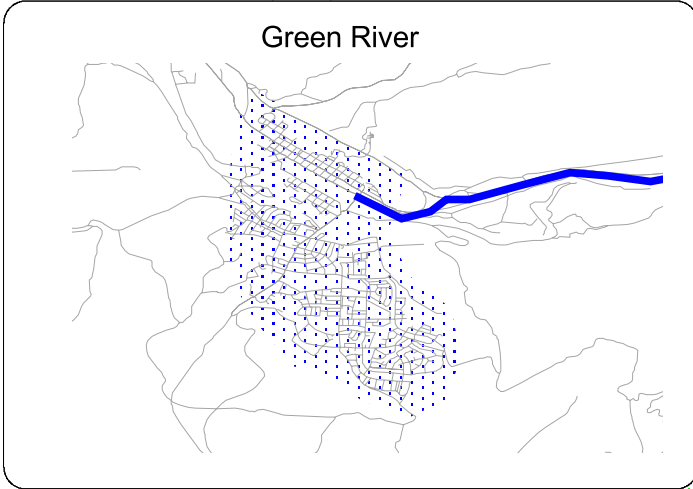
Alternative II: Hub-and-Spoke Route-Deviation Service

Alternative II is a hub-and-spoke route-deviation service which will improve transit service to the areas with the greatest transit demand by linking the routes at central locations and at regulated times (every 30 or 60 minutes). The alternative aligns the routes to function in conjunction with each other in order to increase mobility and access throughout the service area.

Figure IX-2 presents the proposed route structure of Alternative II. The alternative moves the existing transit system of demand-response service to a more urban transit system with deviated routes and a central hub to transfer from route to route. The transfer hub will be located near Western Wyoming College in Rock Springs. Four fixed routes will link at the hub and then travel outward through Rock Springs to connect with the major transit destinations. The alternative will also include demand-response service in Green River and regional service between Green River and Rock Springs. Table IX-3 presents the level of service for the alternative.

Figure IX-2
Alternative II Hub-and-Spoke Route-Deviation Service

-  Hubs
-  Regional Route
- Alternative II Routes**
-  1
-  2
-  3
-  4
-  Flex Zone
-  Roadway
-  Demand-Response Zones



**Table IX-3
Level of Service - Alternative II**

Options		# of Veh.	Total Daily		Total Annual		Operating Days	Annual Ridership	Pass. per Hour	Operating Cost Annual	Cost per Passenger
			Vehicle-Miles	Vehicle-Hours	Vehicle-Miles	Vehicle-Hours					
Flex Route - Green	7:00 am - 5:00 pm (M-F)	1	154	14	39,270	3,570	255	4,342	1.22	\$129,859	\$29.91
Flex Route - Red	7:00 am - 5:00 pm (M-F)	1	140	14	35,700	3,570	255	5,193	1.45	\$127,610	\$24.57
Flex Route - Yellow	7:00 am - 5:00 pm (M-F)	1	168	14	42,840	3,570	255	13,279	3.72	\$132,108	\$9.95
Flex Route - Brown	7:00 am - 5:00 pm (M-F)	1	112	14	28,560	3,570	255	10,731	3.01	\$123,111	\$11.47
Demand-Response Service	7:00 am - 5:00 pm (M-F)	1	90	10	22,950	2,550	255	1,939	0.76	\$89,543	\$46.18
Regional Route	AM - Mid - PM	1	294	6	74,970	1,530	255	6,120	4.00	\$92,282	\$15.08
Contract Service		2				3,951		18,600	4.71	\$100,000	\$5.38
Total/Average			958	72	244,290	22,311		60,204	2.70	\$794,513.08	\$13.20

Note: Costs based on LSC analysis, 2007.

Green Route

The green route will start from the transfer hub; travel on I-80 to Elk Street; turn onto Yellowstone Road, Gannett Drive, Summit Road, Douglas Drive, and Bannock Drive; turn back onto Gannett Drive; and return to the transfer hub via the reverse route. The green route will operate 255 days per year with two buses during peak hours on a 30-minute headway and one bus during off-peak times on a 60-minute headway. The green route will deviate up to three-quarters of a mile to pick up passengers who schedule rides 24 hours in advance. The green route will be interlined with the yellow route to increase connectivity between the north and central sections of Rock Springs. The estimated cost of the green route is \$129,900 annually. The estimated ridership is 4,300 passengers annually.

Yellow Route

The yellow route will start at the transfer hub; travel south on College Drive to Dewar Drive; turn onto Grant Street; travel along Elk Street, Walnut Street, Palisades Street, D Street, and Cedar Street; turn back onto Grant Street; and return to the transfer hub via the reverse route. The route will operate 255 days per year with two buses during peak hours on a 30-minute headway and one bus during off-peak times on a 60-minute headway. The route will deviate up to three-quarters of a mile to pick up passengers who schedule rides 24 hours in advance. The yellow route will be interlined with the green route to increase connectivity between the north and central sections of Rock Springs. The estimated cost of the yellow route is \$132,100 annually. The estimated ridership is 13,300 passengers annually.

Red Route

The red route is a one-way loop, functioning in a clockwise direction. The red route will start at the transfer hub, travel south on Foothill Boulevard, turn onto Clearview Drive, travel north to Sweetwater Drive, turn south onto College Drive by way of Foothill Boulevard and Stagecoach Boulevard, and return to the transfer hub. The route will operate 255 days per year with two buses during peak hours on a 30-minute headway and one bus during off-peak times on a 60-minute headway. The red route will deviate up to three-quarters of a mile to pick up passengers who schedule rides 24 hours in advance. The red route will be

Transit Service Alternatives

interlined with the brown route to increase connectivity between the east and west sections of Rock Springs. The estimated cost of the red route is \$127,600 annually. The estimated ridership is 5,200 passengers annually.

Brown Route

The brown route will start at the transfer hub, travel along Overland Drive to Elk Street, turn east onto North Side Belt Route to South Side Belt Route, turn west onto James Drive, travel along 2nd Street and A Street, loop back onto Elk Street, and return to the transfer station via the reverse route. The route will operate 255 days per year with two buses during peak hours on a 30-minute headway and one bus during off-peak times on a 60-minute headway. The route will deviate up to three-quarters of a mile to pick up passengers who schedule rides 24 hours in advance. The brown route will be interlined with the red route to increase connectivity between the east and west sections of Rock Springs. The estimated cost of the brown route is \$123,100 annually. The estimated ridership is 10,730 passengers annually.

Demand-Response Service

One demand-response zone will be provided in Green River covering a service area of about six square miles, with curb-to-curb service for passengers who schedule rides 24 hours in advance. The demand-response service will link with the regional service in order to provide passengers access to the transfer hub in Rock Springs, thereby providing access to employment, shopping, and medical facilities not currently in Green River. One vehicle will operate 255 days per year from 7:00 a.m. to 5:00 p.m. The estimated cost of the demand-response service is \$89,500 annually. The estimated ridership is 1,940 passengers annually.

Regional Service

Regional service will be provided between Green River and Rock Springs. The regional service route will start at the transfer station in Green River, travel along I-80 to the transfer hub in Rock Springs, and return to the transfer station in Green River via the reverse route. The regional service will operate 255 days per year for six revenue-hours per day with two round-trips in the morning, midday,

and afternoon peak times. The estimate cost of the regional service is \$92,300 annually. The estimated ridership is 6,120 passengers annually.

Contract Service

Currently, STAR contracts with CDC to provide demand-response transportation service. It is assumed the contract service will not change for any of the alternatives. The estimated cost of the contract service is \$100,000 annually. The total hours of operation are 3,950 annually. The estimated ridership is 18,600 passengers annually.

Capital Needs

The first infrastructure required to implement Alternative II will be the installation of transit stops throughout the community. The number and spacing of the transit stops will vary based on density. In more dense urban areas, the transit stops will be spaced 800 to 1,200 feet apart. In less dense urban areas, the transit stops will be spaced up to 2,500 feet apart. Based on the linear miles of the service routes and an average of 1,200 feet between the transit stops, the estimated number of total transit stops is about 100 for the urban area (with 50 outbound and 50 inbound transit stops).

A transfer hub will need to be developed near Western Wyoming College in Rock Springs. The transfer hub will need to accommodate five buses at one time. The transfer hub will also need to have a shelter; lighting; signage; and improved sidewalks, curbs, and gutters.

Since Alternative II uses the existing number of transit vehicles, there will be no need to expand the fleet size.

Estimated Demand and Evaluation

Tables in Appendix F present the fixed-route, demand-response, and ADA para-transit models that LSC used to estimate the level of service and number of trips that can be served with Alternative II. The results show that, on an average weekday, the alternative can generate 236 trips. This equates to 60,200 trips per year, based on 255 days of service. Compared to the other alternatives, Alternative II

will produce the third lowest level of trip production, with the trips per revenue-hour being less than the existing transit service. The alternative generates a large number of service hours in order to serve the community. When compared to the possible trips produced from the models for this alternative, the cost-to-benefit ratio results in a cost per passenger greater than the existing service. Therefore, even though the system structure has good linkages between all portions of the service area, Alternative II will not be the recommended alternative.

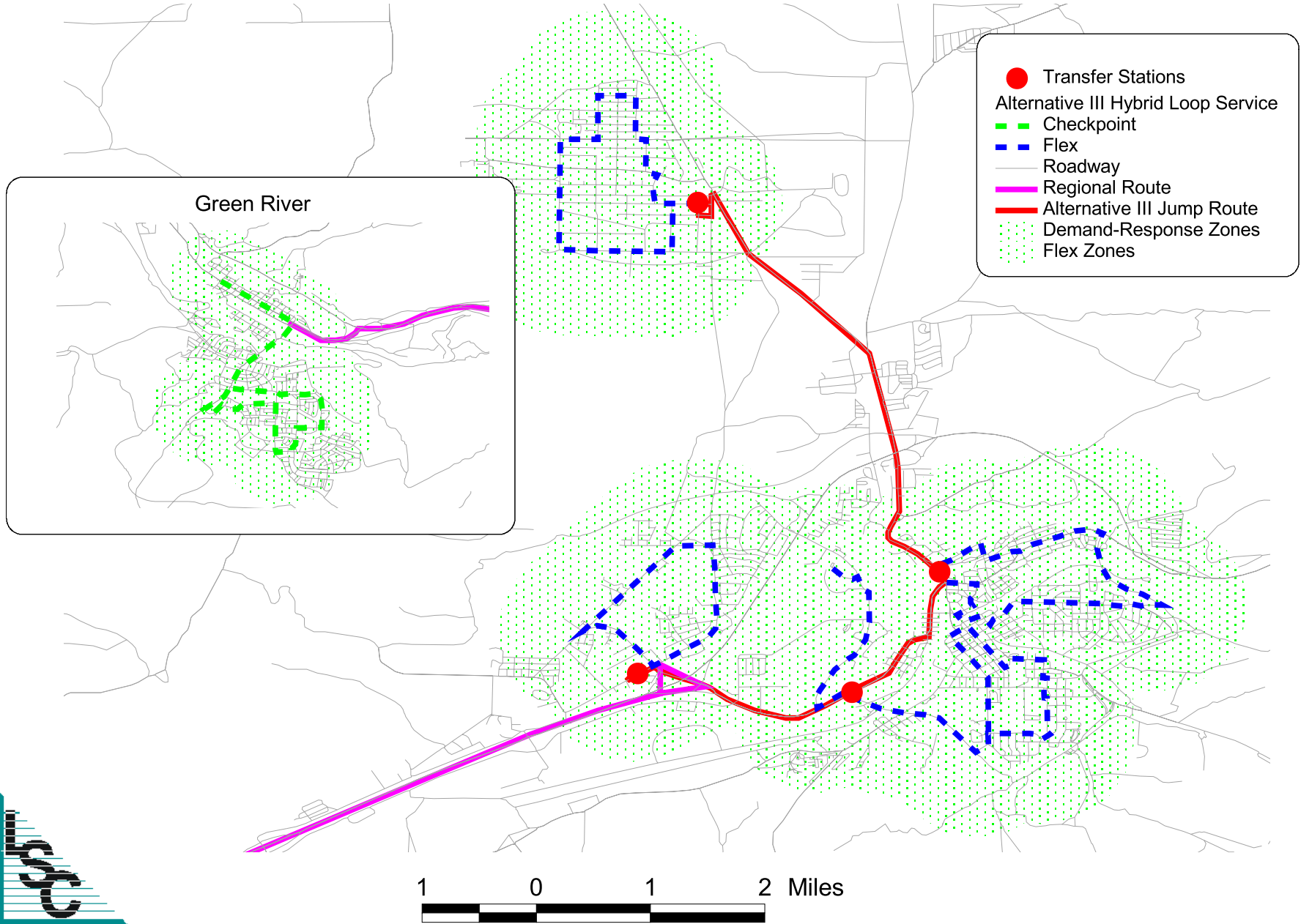
As summarized in Table IX-7 (at the end of Chapter IX), Alternative II will result in the following estimates:

- \$13.20 cost per passenger-trip
- \$794,500 annual cost
- 2.70 passengers per hour (average for entire system)
- 60,200 annual passengers

Alternative III: Hybrid Loop Service

Alternative III is a hybrid loop service designed to decrease the travel time from one end of the community to the other end by using loop and hub-and-spoke functional structures to create the benefits of a grid structure. Alternative III moves the existing transit system of demand-response service to a more urban transit system with fixed and deviated routes. Figure IX-3 presents the proposed route structure of Alternative III, which includes four loop routes and one fixed route in Rock Springs, checkpoint service in Green River, and regional service between Green River and Rock Springs. The alternative has four transfer stations along the fixed route that allow the loop routes to interconnect with the fixed route. Table IX-4 presents the level of service for this alternative.

Figure IX-3
Alternative III Hybrid Loop Service



**Table IX-4
Level of Service - Alternative III**

Options		# of Veh.	Total Daily		Total Annual		Operating Days	Annual Ridership	Pass. per Hour	Operating Cost Annual	Cost per Passenger
			Vehicle-Miles	Vehicle-Hours	Vehicle-Miles	Vehicle-Hours					
Jump Route	7:00 am - 5:00 pm (M-F)	1	150	10	38,250	2,550	255			\$99,182	
Loop Routes	7:00 am - 5:00 pm (M-F)	4	90	40	22,950	10,200	255	47,447	4.7	\$314,798	\$6.63
Checkpoint Route	7:00 am - 5:00 pm (M-F)	1	90	10	22,950	2,550	255	1,939	0.8	\$89,543	\$46.18
Regional Route	AM - Mid - PM	1	294	6	74,970	1,530	255	6,120	4.0	\$92,282	\$15.08
Contract Service		2		20		3,951		18,600	4.7	\$100,000	\$5.38
Total/Average			624	86	159,120	20,781		74,106	3.57	\$695,805	\$9.39

Note: Costs based on LSC analysis, 2007.

Loop Routes

Alternative III includes four loop routes, with each loop route serving a major portion of Rock Springs. The first loop route will serve the western portion of Rock Springs near the White Mountain Mall. The second loop route will serve Western Wyoming College and the southeast portion of Rock Springs. The third loop route will serve the downtown area and the northeast portion of Rock Springs. The fourth loop route will serve the Gannett Drive area in Rock Springs, including the fairgrounds and softball complex. Each loop route will operate 255 days per year with one bus on a 30-minute headway from 7:00 a.m. to 5:00 p.m. The loop routes will deviate up to three-quarters of a mile to pick up passengers who schedule rides 24 hours in advance. This deviation is designed to cover the ADA paratransit requirements for the entire system. The estimated cost of the loop routes is \$314,800 annually. The estimated ridership is 47,400 passengers annually.

Jump Route

The jump route will function as an express route linking the loop routes together. The jump route will start near the county fairgrounds at the first transfer station and travel south along Yellowstone Road to Elk Street. The second transfer station is located near Elk Street and North Side Belt Route. Then the jump route will travel along Center Street to Dewar Drive and the Plaza Mall. The third transfer station is located at the Plaza Mall on South Side Belt Route. The jump route will then continue along Dewar Drive to the White Mountain Mall, where the fourth transfer station will be located, and return to the county fairgrounds via the reverse route. This route will only stop at these four transfer points. The jump route will operate 255 days per year with one bus on a 60-minute headway from 7:00 a.m. to 5:00 p.m. The estimated cost of the jump route is \$99,200 annually. There is no estimated ridership for the jump route since all of the ridership will already be accounted for in the loop routes as passengers transferring from the loop routes. The loop route service described above is designed to meet the ADA requirements for the entire system.

Checkpoint Service

Checkpoint service will operate in Green River covering a service area of about six square miles, with several locations where the bus will stop multiple times per

Transit Service Alternatives

day. When the bus is not serving the checkpoints, it will operate demand-response service. When operating demand-response service, the bus will provide curb-to-curb service for passengers who schedule rides 24 hours in advance. The checkpoint service will link with the regional service in order to allow passengers to access the White Mountain Mall transfer station in Rock Springs. This will allow passengers to access employment, shopping, and medical facilities not currently in Green River. The checkpoint service will operate 255 days per year with one bus from 7:00 a.m. to 5:00 p.m. The estimated cost of the checkpoint service is \$89,500 annually. The estimated ridership is 1,940 passengers annually.

Regional Service

Regional service will be provided from Green River to Rock Springs. The regional service route will begin at the Green River transfer station near the railroad yard, travel to the White Mountain Mall transfer station in Rock Springs, and return to the Green River transfer station via the reverse route. The regional service will operate six revenue-hours per day with two round-trips each in the morning, mid-day and afternoon peak times. The estimated cost of the regional service is \$92,300 annually. The estimated ridership is 6,120 passengers annually.

Contract Service

Currently, STAR contracts with the CDC to provide demand-response transportation service. It is assumed the contract service will not change for any of the alternatives. The estimated cost of the contract service is \$100,000 annually. The total hours of operation are 3,950 annually. The estimated ridership is 18,600 passengers annually.

Capital Needs

The first infrastructure required to implement Alternative III will be the installation of transit stops throughout the community. The number and spacing of the transit stops will vary based on density. In more dense urban areas, the transit stops will be spaced 800 to 1,500 feet apart. In less dense urban areas, the transit stops will be spaced up to 2,500 feet apart. Based on the linear miles of the service routes and an average of 1,500 feet between the transit stops, the estimated

number of total transit stops is about 65 for the urban area, including the check-point stops in Green River.

Five transfer stations will need to be developed—at the county fairgrounds, Plaza Mall, and White Mountain Mall in Rock Springs; near Elk Street and North Side Belt Route in Rock Springs; and near the railroad yard in Green River. Each transfer station will need to accommodate three buses at one time. Each transfer station will also need to have a shelter; lighting; signage; and improved sidewalks, curbs, and gutters.

Since Alternative III uses the existing number of transit vehicles, there will be no need to expand the fleet size.

Estimated Demand and Evaluation

Tables in Appendix F present the fixed-route, demand-response, and ADA para-transit models that LSC used to estimate the level of service and number of trips that can be served with Alternative III. The results show that, on an average week-day, the alternative can generate 290 trips. This equates to 74,100 trips per year, based on 255 days of service. Compared to the other alternatives, Alternative III will produce the second highest level of trip production. The major advantages of this alternative are that the transit system generates more trips and has a lower cost per trip when compared to the existing transit service. The major disadvantages are that the alternative has an estimated annual cost of operations that is \$107,000 more than the existing transit service, the average number of passengers per revenue-hour is lower than the existing transit service, and it might take a passenger up to two bus transfers to get to a final destination. Due to these disadvantages, Alternative III is not the recommended transit service.

As summarized in Table IX-7 (at the end of Chapter IX), Alternative III will result in the following estimates:

- \$9.39 cost per passenger-trip
- \$695,800 annual cost
- 3.57 passengers per hour (average for entire system)
- 74,100 annual passengers

Alternative IV: Loop Route System

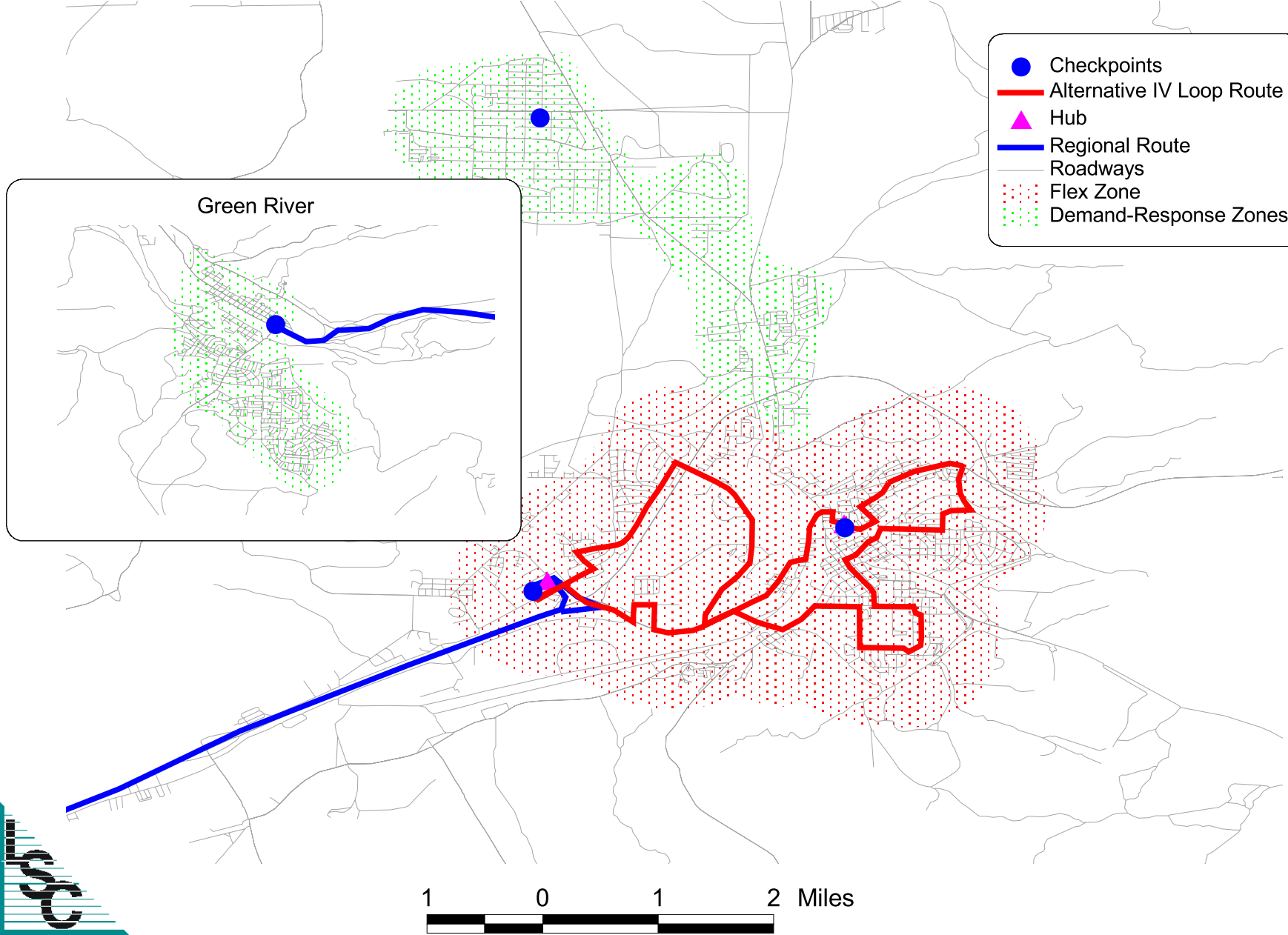
Alternative IV is a loop route system which will improve transit service to those areas with the greatest transit demand by creating one route that links the major portions of Rock Springs. Figure IX-4 presents the proposed route structure of Alternative IV which includes one loop route in Rock Springs, one demand-response zone in Green River, one demand-response zone in the area north of Rock Springs, and regional service between Green River and Rock Springs. Table IX-5 presents the level of service for this alternative.

Loop Route

The loop route begins at the White Mountain Mall transfer station in Rock Springs; travels along Foothill Boulevard; turns east on College Drive; turns onto Dewar Drive; runs south on South Side Belt Route; travels around the Rock Springs Cemetery through downtown; turns onto James Drive, South Side Belt Route, and 9th Street; accesses the Civic Center; travels to Center Street, Dewar Drive, Winston Drive, Churchhill Street, and Gateway Boulevard; turns back onto Dewar Drive; and returns to the White Mountain Mall transfer station via Dewar Drive. The loop route will operate 255 days per year with two buses on a 30-minute headway from 7:00 a.m. to 5:00 p.m. The loop route will deviate up to three-quarters of a mile to pick up passengers who schedule rides 24 hours in advance, but must return to the route within one block of the deviation. The estimated cost of the loop route is \$211,300 annually. The estimated ridership is 46,600 passengers annually.

Figure IX-4
Alternative IV Loop Route System

- Checkpoints
- Alternative IV Loop Route
- ▲ Hub
- Regional Route
- Roadways
- Flex Zone
- Demand-Response Zones



1 0 1 2 Miles



**Table IX-5
Level of Service - Alternative IV**

Options		# of Veh.	Total Daily		Total Annual		Operating Days	Annual Ridership	Pass. per Hour	Operating Cost Annual	Cost per Passenger
			Vehicle-Miles	Vehicle-Hours	Vehicle-Miles	Vehicle-Hours					
Loop Route (Deviation)	7:00 am - 5:00 pm (M-F)	2	260	20	66,300	5,100	255	46,600	9.1	\$211,337	\$4.54
Demand-Response/Checkpoint Service	7:00 am - 5:00 pm (M-F)	2	180	20	45,900	5,100	255	4,335	0.9	\$198,485	\$45.79
Regional Route	AM - Mid - PM	1	294	6	74,970	1,530	255	6,120	4.0	\$92,282	\$15.08
Contract Service		2				3,951		18,600	4.7	\$100,000	\$5.38
Total/Average			734	46	187,170	15,681		75,655	4.82	\$602,104	\$7.96

Note: Costs based on LSC analysis, 2007.

Demand-Response Service

Alternative IV includes two demand-response zones—one in Green River and one in the area north of Rock Springs. Each service area will be about six square miles. The buses will provide curb-to-curb service for passengers who schedule rides 24 hours in advance. The demand-response service in Green River will link with the regional service in order to allow passengers to access the White Mountain Mall transfer station in Rock Springs. This will provide access to employment, shopping, and medical facilities not currently in Green River. The demand-response service in the area north of Rock Springs will link with the loop route at the Senior Center and White Mountain Mall transfer stations. Each demand-response zone will operate 255 days per year with one bus from 7:00 a.m. to 5:00 p.m. The estimated cost of each demand-response zone is \$99,250 annually, for a total estimated cost of 198,500 annually. The estimated ridership is 4,300 passengers annually.

Regional Service

Regional service will be provided from Green River to Rock Springs. The regional service route will begin at the Green River transfer station near the railroad yard, travel along I-80 to the White Mountain Mall transfer station in Rock Springs, and return to the Green River transfer station via the reverse route. The regional service is estimated to operate for six revenue-hours a day, with two round-trips each in the morning, midday, and afternoon peak times. The estimated cost of the regional service is \$92,300 annually. The estimated ridership is 6,120 passengers annually.

Contract Service

Currently, STAR contracts with the CDC to provide demand-response transportation service. It is assumed the contract service will not change for any of the alternatives. The estimated cost of the contract service is \$100,000 annually. The total number of hours of operation are 3,950 annually. The estimated ridership is 18,600 passengers annually.

Capital Needs

The first infrastructure required to implement Alternative IV will be the installation of transit stops throughout the community. The number and spacing of the transit stops will vary based on density. In more dense urban areas, the transit stops will be spaced 800 to 1,500 feet apart. In less dense urban areas, the transit stops will be spaced up to 2,500 feet apart. Based on the linear miles of the loop route and an average of 1,500 feet between the transit stops, the estimated number of total transit stops is about 50 for the urban area.

Two transfer stations will need to be developed—one at the White Mountain Mall in Rock Springs and one in Green River near the railroad yard. Each transfer station will need to accommodate four buses at one time. The transfer stations will also need to have a shelter; lighting; signage; and improved sidewalks, curbs, and gutters.

Since Alternative IV uses the existing number of transit vehicles, there will be no need to expand the fleet size.

Estimated Demand and Evaluation

Tables in Appendix F present the loop route, demand-response, and ADA para-transit models that LSC used to estimate the level of service and number of trips that can be served with Alternative IV. The results show that, on an average weekday, the alternative can generate 296 trips. This equates to 75,600 trips per year, based on 255 days of service. Compared to the other alternatives, Alternative IV will produce the highest level of trip production with the trips per revenue-hour greater than the existing transit service. The system structure has good linkages between all portions of the service area. The major advantages are that this alternative has a high level of productivity and is an easy system structure to operate. The disadvantage of the alternative is that it is a loop structure, which may lead to longer travel times for passengers. The alternative does meet the goals, objectives, and needs of STAR and the community. Therefore, Alternative IV is the recommended transit service alternative.

As summarized in Table IX-7, Alternative IV will result in the following estimates:

- \$7.96 cost per passenger-trip
- \$602,100 annual cost
- 4.82 passengers per hour (average for entire system)
- 75,600 annual passengers

SUMMARY

Based on the evaluation methodology developed in Chapter VIII, Table IX-6 presents the scoring for each of the alternatives. Alternative IV has the highest overall score of 38 points based on the five categories. Alternative IV is therefore the recommended service plan to become the preferred service.

Table IX-6 Evaluation Scores				
Evaluation Criteria	Alter 1	Alter II	Alter III	Alter IV
Service Area	1	5	5	10
Cost per Passenger	1	1	10	10
Cost per Hour	1	5	10	1
Cost per Mile	1	10	1	5
Goals and Objectives	11	11	9	12
Total	11	32	35	38
<i>Source: LSC, 2007.</i>				

Chapter IX has provided information on various transit service alternatives for STAR. The alternatives include maintaining the status quo, limited route-deviation service, hub-and-spoke route-deviation service, hybrid loop service, and a loop route system. Table IX-7 provides a comparison of the transit service alternatives.

(This page intentionally left blank.)

**Table IX-7
Service Alternatives - Cost Estimates**

Options		# of Veh.	Peak Buses	Total Daily		Total Annual		Operating Days	Annual Ridership	Pass. per Hour	Operating Cost Annual	Cost (\$) per Pass.
				Vehicle-Miles	Vehicle-Hours	Vehicle-Miles	Vehicle-Hours					
Status Quo	6:00 am - 6:00 pm M-S	12		718	51	183,049	12,951	255	47,312	3.7	\$588,784	\$12.44
Alternative I - Limited Flex-Route Service												
Demand-Response Service	7:00 am - 5:00 pm (M-F)	3		270	30	68,850	7,650	255	17,433	2.3	\$281,144	\$12.82
Flex Route - Green	7:00 am - 5:00 pm (M-F)	1		120	10	30,600	2,550	255	4,276	1.7	\$98,534	\$23.04
Flex Route - Red	7:00 am - 5:00 pm (M-F)	1		100	10	25,500	2,550	255	7,941	3.1	\$95,321	\$12.00
Regional Route	AM - Mid - PM	1		294	6	74,970	1,530	255	6,120	4.0	\$92,282	\$15.08
Contract Service		2					3,951		18,600	4.7	\$100,000	\$5.38
Total/Avg				784	56	199,920	18,231		54,370	2.98	\$667,281	\$12.27
Alternative II - Hub-and-Spoke Flex Service												
Flex Route - Green	7:00 am - 5:00 pm (M-F)	1	2	154	14	39,270	3,570	255	4,342	1.2	\$129,859	\$29.91
Flex Route - Red	7:00 am - 5:00 pm (M-F)	1	2	140	14	35,700	3,570	255	5,193	1.5	\$127,610	\$24.57
Flex Route - Yellow	7:00 am - 5:00 pm (M-F)	1	2	168	14	42,840	3,570	255	13,279	3.7	\$132,108	\$9.95
Flex Route - Brown	7:00 am - 5:00 pm (M-F)	1	2	112	14	28,560	3,570	255	10,731	3.0	\$123,111	\$11.47
Demand-Response Service	7:00 am - 5:00 pm (M-F)	1		90	10	22,950	2,550	255	1,939	0.8	\$89,543	\$46.18
Regional Route	AM - Mid - PM	1		294	6	74,970	1,530	255	6,120	4.0	\$92,282	\$15.08
Contract Service		2					3,951		18,600	4.7	\$100,000	\$5.38
Total/Avg				958	72	244,290	22,311		60,204	2.70	\$794,513	\$13.20
Alternative III - Hybrid Loop Service												
Jump Route	7:00 am - 5:00 pm (M-F)	1		150	10	38,250	2,550	255			\$99,182	
Loop Routes	7:00 am - 5:00 pm (M-F)	4		90	40	22,950	10,200	255	47,447	4.7	\$314,798	\$6.63
Checkpoint Route	7:00 am - 5:00 pm (M-F)	1		90	10	22,950	2,550	255	1,939	0.8	\$89,543	\$46.18
Regional Route	AM - Mid - PM	1		294	6	74,970	1,530	255	6,120	4.0	\$92,282	\$15.08
Contract Service		2			20		3,951		18,600	4.7	\$100,000	\$5.38
Total/Avg				624	86	159,120	20,781		74,106	3.57	\$695,805	\$9.39
Alternative IV - Loop Route System												
Loop Route (Deviation)	7:00 am - 5:00 pm (M-F)	2		260	20	66,300	5,100	255	46,600	9.1	\$211,337	\$4.54
Demand-Response/Checkpoint Service	7:00 am - 5:00 pm (M-F)	2		180	20	45,900	5,100	255	4,335	0.9	\$198,485	\$45.79
Regional Route	AM - Mid - PM	1		294	6	74,970	1,530	255	6,120	4.0	\$92,282	\$15.08
Contract Service		2					3,951		18,600	4.7	\$100,000	\$5.38
Total/Avg				734	46	187,170	15,681		75,655	4.82	\$602,104	\$7.96

Note: Costs based on LSC analysis, 2007.