



Fixed Route Operational Analysis Study

Final Report

Prepared for

**Bloomington Public
Transportation Corporation**



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INTRODUCTION

The Bloomington Public Transportation Corporation (BPTC) provides public transportation services through a network of bus routes within the municipal boundaries. In addition, BPTC provides demand responsive service for those persons eligible under provisions of the Americans With Disabilities Act (ADA). In addition, Indiana University (IU) operates several routes oriented to the campus while other transit services are provided by Rural Transit which serves parts of Monroe County and adjacent areas.

The past several years has been a period of growth for the bus system in terms of service operated and ridership. Moreover, several years have passes since the Bloomington Transit was subject to a comprehensive and detailed evaluation. Reflecting this situation, BPTC has undertaken this review of the current system with the objective being the development of both operating and physical improvements for the bus system. The recommended plan consists of a series of proposals that will guide the transit system during the next five years.

The study has consisted of several interrelated tasks which have been documented during the conduct of the analysis. These interim reports have provided a mechanism to obtain comments at key milestones of the study. The Final Report is a compendium of these interim reports and presents the data that was current at the time. This information has been updated as necessary in the preparation of the recommend plan. The Final Report consists of six chapters as follows:

- **Existing Fixed Route Services** - An initial study step was to describe the current bus system in terms of the alignment, frequency and span of service. In addition, other service operated by BPTC, Indiana University and Rural Transit are presented. The fare structure and the relationship with IU is described along with the resources of the system. The latter includes a description of staffing, buses, administrative/maintenance facilities and other assets of the system. An important consideration in understanding the current system was a review of past trends. Trends were presented for key operating, ridership, financial and performance measures. Statistics were also compiled on funding, both operating and capital assistance, by local, state and federal governments. These data were presented for the period between 2001 and 2005 which was the latest information at the time the interim report was prepared. Data for 2006 was obtained and considered in the development of the recommended plan.

- **Community Characteristics** - An early study task was to describe the City of Bloomington in terms of population and its characteristics which influence the need and propensity to use public transportation. Much of this detailed information was compiled

from the 2000 U.S. Census which is the most reliable source of information on Bloomington residents. Items considered were density, senior citizens, youths and persons with mobility impairments. In addition, households were examined in terms of income levels and auto ownership with attention directed at persons who do not have a vehicle available for travel. Information was compiled on commuting patterns in terms of the residence, work location and mode of travel. The chapter also presents a description of major generators and planned development during the next few years. The concluding topic is an assessment of needs by geographic location within Bloomington based on a number of factors.

- **Stakeholder Interviews** - Much of the information gathered in the analysis is quantitative in that it includes statistical information on the City of Bloomington and Bloomington Transit along with results of different survey activities. To provide a valuable qualitative view of the existing conditions and opportunities for the future, interviews were conducted of community leaders to seek their perceptions and views on public transportation. Individuals were selected from a broad cross-section of the community from government, non profit and private organizations. Topics considered were the knowledge and awareness of the bus system, performance in key attributes and its image. Other issues probed were the mobility needs of the community and how well those needs were being met currently and opportunities for the future. The last topics were directed at changes anticipated during the next few years and desired improvements.

- **Route Diagnostics** – This chapter provides a detailed evaluation of each BPTC bus route utilizing several analytical techniques. The analysis was performed for the last fiscal year (i.e., 2006) which was available at the time the original interim report was prepared. With these approaches, each bus route is treated as an individual operating entity. The performance characteristics of each bus route are compared to the other bus routes as well as to the overall system. In some cases, bus routes are assigned to specific categories to contrast performance for different criteria. The route level analysis is quantitative and focuses on financial and productivity measures. The examination also ranks the bus routes, thus reflecting the competitive nature of allocating limited transit resources.

- **Service Proposals** - A wealth of both quantitative and qualitative information has been gathered on the existing bus system and the transportation setting in which it operates. Based on this input, field observations and consideration of policy parameters, a series of route and service proposals have been formulated. They include changes to the existing bus routes in terms of alignment and coverage and level of service in terms of how often and when buses operate. For example, some routes with hourly service were slated for buses operating every thirty minutes. Some proposals call for later evening service and the introduction of Sunday service for many bus routes. Other service improvements include new crosstown and radial bus routes which serve new growth areas in

Bloomington. The proposals were assigned a priority which indicates when each of the service proposals should be implemented.

- **Recommended Plan** – The concluding chapter provides the schedule during the next five years of when route changes should be implemented. For each of the planning years, the changes in revenue hours and ridership were estimated. The amount of service was converted to forecasts of annual operating costs. Based on the expected ridership and prevailing fare structure, estimates of revenue from customers were prepared. The next step was to define the capital program which consisted primarily of bus purchases and the proposed downtown terminal. These capital expenditures were estimated during the five year planning period. All financial amounts were escalated to current year dollars in the year of expenditure. Funding amounts for operating assistance and capital investment were identified by local, state and federal funding sources.

The brief summaries above provide an overview of the Final Report and the overall study process. While not presented here, an extensive survey effort was undertaken with the results provided to BPTC staff under separate cover. The survey activities included ride checks where on-board observers record the time and location of all passengers when they board and leave the bus for two weekdays, Saturday and Sunday. In addition, a survey questionnaire was issued to riders to solicit information on them, their trip and suggestions for service. Finally, a transfer matrix survey was undertaken to quantify the extent of transferring from each route to every other route when person rode two buses to complete their trip.

The recommended plan provides a staged program of service improvements during the next few years. It should serve as a blueprint to guide future changes to the bus system and their expected operating, ridership and financial impacts.

EXISTING FIXED ROUTE SERVICES

To provide a basis for subsequent planning activities, a review of Bloomington Transit's existing bus system was undertaken. This included a description of the current network of bus routes that focus on downtown Bloomington and the Indiana University campus along with a limited description of capital facilities that support operations. Since other agencies provide transportation services in the area, their services are also summarized in this interim report. To provide an indication of recent trends for Bloomington Transit, key operating and financial information was summarized.

Most of the information gathered in the analysis was taken from transit agency records. In particular, trend information was compiled from the National Transit Database form submitted annually to the Federal Transit Administration. Because Bloomington Transit is on a calendar fiscal year, information for 2006 was not yet available. Accordingly, trends are presented for 2001 through 2005. As data became available for the last year, it was incorporated in the route level analysis and forecasts with the recommended plan.

Fixed Route Network

This section provides a description of the Bloomington Transit fixed route public transportation system including the route structure, frequency and span of service. As noted previously, the primary operator is Bloomington Transit, although service is also provided by Indiana University and the Area 10 Agency on Aging, which operates Rural Transit.

Route Descriptions – Bloomington Transit provides fixed route bus service in the City of Bloomington. The current Bloomington Transit route network is focused on the two largest generators in the metropolitan area - downtown Bloomington and the Indiana University (IU) campus. Five routes are operated to and from the 4th and Washington Streets terminal (i.e., the Downtown Routes), three routes are oriented to the IU campus (i.e., the Campus Routes) and one route serves the east side of the city. Route C is operated under an agreement between IU and BPTC.

Four of the Downtown Routes (i.e., Routes 1, 2, 3 and 4) are interlined and serve two separate and distinct portions of Bloomington. For example, Route 2: West 11th Street via Showers Complex serves the area to the northwest of downtown while the other portion, Route 2: South Rogers/Country View affords transit coverage to neighborhoods to the southwest of the Central Business District. With the interlining arrangement, buses arriving downtown as Route 2: West 11th Street via Showers Complex depart Washington and 4th Streets as Route 2: South

Rogers/Country View. Conversely, buses arriving downtown as Route 2: South Rogers/Country View depart the downtown terminal as Route 2: West 11th Street via Showers Complex.

One concluding point regarding Bloomington Transit is that it is restricted by Indiana law to the Bloomington city limits. This has implications currently since many generators and new development are in outlying areas. A description of these routes in terms of their terminals and service type is presented in Table 1.

Table 1 - Route Description

Route Designation and Name	Operates Between	And
<i>Downtown Routes</i>		
1 Fee Lane/BHS North	4 th & Washington Streets	BHS North
1 South Walnut/Arbor Glen	4 th & Washington Streets	Arbor Glen/Beverly Health Care
2 West 11 th Street via Showers Complex	4 th & Washington Streets	Arlington Park Apartments
2 South Rogers/Countryview	4 th & Washington Streets	Country View Apartments
3 Highland Village/Curry Pike	4 th & Washington Streets	Wal-Mart
3 College Mall/Bradford Place	4 th & Washington Streets	Bradford Place Apartments <i>or</i> Fountain Park Apartments
4 Bloomfield Road/Heatherwood	4 th & Washington Streets	Heatherwood Mobile Home Court
4 High Street/Sherwood Oaks	4 th & Washington Streets	Allendale Drive & Walnut St. Pike
5 Sare Road	4 th & Washington Streets	Jackson Creek Middle School
<i>Campus Routes</i>		
6 Campus Shuttle	Colonial Crest Apartments	Knightridge Apartments
7 Henderson/Walnut Express	3 rd Street & Jordan Avenue	Henderson Street & Winslow Road
C Route C	Indiana Memorial Union	University Commons Apartments
<i>Other Routes</i>		
8 Eastside Local	Rogers & Sare Roads <i>or</i> Arbor Glen	3 rd Street & Morningside Drive

Frequency of Service - The level of service of Bloomington Transit bus routes in terms of frequency varies widely by service type. During weekdays the Downtown Routes operate every 30 or 60 minutes, with nearly all Downtown Routes having hourly headways on Saturday. None of the Downtown Routes operates on Sundays. The use of these common intervals between buses (i.e., clock face headways) results in a user-friendly situation. For example, persons wishing to board Route 4: Bloomfield Road at the Oakdale Square Apartments would have a bus pass this location at 50 minutes after each hour (e.g., 7:50AM, 8:50AM, 9:50AM, etc.), thereby making the schedule easier to remember. Another feature of the BPTC bus routes is that they are “pulse-scheduled” at the downtown terminal, which is more fully explained later in this interim report.

The Campus Routes operate relatively frequently on weekdays, with headways ranging from every nine minutes to every hour, depending on the time of year. Weekend service on the Campus Routes operates either every 40 or 60 minutes, depending on the bus route. As might be

expected the service levels vary depending on whether Indiana University is holding classes. Finally, Route 8 operates hourly service on weekdays and on Saturdays.

Span of Service - Equally important to how often buses operate is when service is available to the public. On weekdays, the Downtown Routes operate from about 6:00AM or 6:30AM to about 8:30PM or 9:30PM, depending on the bus route. On Saturday, the Downtown Routes tend to start service later and terminate service earlier.

The Campus Routes have longer spans of service; during the academic year with weekday service on two of these bus routes between about 7:00AM and 9:30PM (Table 2). Service on the Campus Routes during the semester breaks and on Saturdays has a slightly shorter span of service. The only Sunday service operated by Bloomington Transit is on two of the Campus Routes - Route 6 and Route C. Finally, Route 8 operates between 8:30AM and 7:00PM on weekdays and on Saturdays.

Table 2 - Level of Service (Winter 2006)

Route Designation and Name	Frequency of Service Headways in Minutes		Span of Service			
	Weekday	Saturday	Weekday		Saturday	
			Start	End	Start	End
<i>Downtown Routes</i>						
1 Fee Lane/BHS North	60	60	6:35AM	9:35PM	7:35AM	6:46PM
1 South Walnut/Arbor Glen	30	60	6:35AM	9:07PM	7:35AM	6:35PM
2 West 11 th Street via Showers Complex	30	60	6:19AM	8:36PM	7:51AM	6:36PM
2 South Rogers/Countryview	30	60	6:21AM	8:51PM	7:51AM	6:51PM
3 Highland Village/Curry Pike	30	60	6:08AM	8:38PM	7:38AM	7:06PM
3 College Mall/Bradford Place	30	30	6:35AM	9:33PM	7:35AM	7:03PM
4 Bloomfield Road/Heatherwood	60	60	6:34AM	8:50PM	8:10AM	6:28PM
4 High Street/Sherwood Oaks	60	60	6:32AM	8:32PM	8:10AM	6:27PM
5 Sare Road	60	60	7:15AM	8:15PM	8:15AM	7:15PM
<i>Campus Routes</i>						
6 Campus Shuttle Semester Service	20	60	6:50AM	12:30AM	7:30AM	7:30PM
Break Service	60	60	7:30AM	9:30PM	7:30AM	9:30PM
Campus Shuttle (All Year Sunday)	--	60	--	--	9:30AM	9:30PM
7 Henderson/Walnut Express Semester Service Only	20	--	7:00AM	9:30PM	--	--
C Route C Semester Service Only	9	40	7:25 AM	12:05AM	8:30AM	11:10PM
Semester Sundays	--	40	--	--	10:30AM	11:10PM
Break Service	40	40	7:10AM	11:10PM	9:30AM	6:10PM
<i>Other Routes</i>						
8 Eastside Local	60	60	8:30AM	7:00PM	8:30AM	7:00PM

Service Characteristics - A feature of the Downtown Routes is that they are “pulse-scheduled” in that buses arrive and depart the 4th and Washington Streets terminal at about 10 and 40 minutes after the hour. Buses layover a few minutes, which provides riders adequate time to complete their transfer as well as a break for drivers and an opportunity to maintain schedule adherence. This pulse-scheduled arrangement permits passengers to transfer between routes without a lengthy waiting time. Schedule coordination is also followed by Rural Transit, which serves residents of Monroe and other adjacent counties. (Rural Transit services will be described in a subsequent section of this report.) The connection with Rural Transit permits Bloomington residents to reach locations outside the city such as Ivy Tech State College.

As was previously mentioned, the current Bloomington Transit bus system is oriented to both downtown Bloomington and the Indiana University campus. Although four of the five Downtown Routes (i.e., Routes 1, 2, 3 and 4) are interlined, they could be considered as eight separate bus lines. For example, Route 1 has a northern leg that operates between Bloomington High School North and the Washington and 4th Streets terminal and then continues south to Willow Manor. Combined with Route 5, nine routes serve downtown Bloomington and converge at the transit terminal.

The three Campus Routes (i.e., Routes 6, 7 and C) are primarily designed to connect off-campus housing to the Indiana University campus. Route C also serves the southern portion of downtown, but does not operate to the downtown bus terminal. Finally, Route 8 connects several apartment complexes and shopping centers on the east side of the city with each other and with the other Bloomington Transit bus routes.

Other Service Providers - Two other fixed route public transportation services are also provided in the Bloomington area. They are as follows:

- **Indiana University Campus Bus Services** - Indiana University also operates several routes which primarily provide internal circulation on campus, including major parking lots. Service is free and operates seven days a week. The IU Campus Bus Service operates several bus routes, including Route A, Route B, Route E, Route X, the AM Express, the PM Express and three “Midnight Special” bus routes (i.e., East, North and South) which operate owl service overnight on the campus. Finally, there is an Auditorium Shuttle bus route which operates during scheduled Auditorium performances. As noted previously, Indiana University contracts with the BPTC to operate its Route C service.
- **Rural Transit** - Rural Transit, which is part of Area 10 Agency on Aging, provides service from outlying areas in Monroe County, Lawrence County and Owen County to Bloomington. Fares vary depending upon the service utilized as well as the distance traveled. There are four different types of Rural Transit services, as follows:

- **County Sweep** - The County Sweep services operate in each of the three counties on weekdays. Service operates at specific times and reservations must be made to schedule a trip. The Lawrence County Sweep brings people from throughout the county to Bedford; the Monroe County Sweep connects county residents with Bloomington; the Owen County Sweep 1 brings Owen County residents to Bloomington via Ellettsville, and the Owen County Sweep 2 connects county residents with Spencer.

- **County Services** - The County Services offer round trip services between specific points in certain counties on specific days of the week. Reservations must be made to schedule a trip. Monroe and Owen Counties are each divided into four regions, and Lawrence County comprises one region. Each region is offered service on a specific weekday.

- **Demand Responsive Door-to-Door Service** - This service provides door-to-door service throughout Monroe, Lawrence and Owen Counties. Reservations must again be made to schedule a trip. This service will not duplicate other Rural Transit services or Bloomington Transit services.

- **Express Service** - This is a regularly scheduled fixed route bus service operated by Rural Transit on weekdays. There are four different routes: Express 1, Express 2, Express 3 and Express 4. These routes connect Bloomington with Spencer, Ellettsville and other rural communities. As was previously mentioned, Rural Transit provides Bloomington residents with a connection to Ivy Tech State College as well as adjacent employment and shopping opportunities which are not served by Bloomington Transit. Bloomington Transit is precluded from operating beyond the city limits. For this reason, many important destinations and growth areas to the west cannot be served by the municipal bus system.

Recently, Rural Transit modified Express 4 so that it serves the front door of the Wal-Mart Supercenter. Bloomington Transit Route 4 also serves Wal-Mart, but does not serve the main entrance because it is beyond the municipal boundary. Rural Transit's Express 4 departs from downtown Bloomington at 40 minutes after the hour, while Bloomington Transit's Route 4 departs from the downtown terminal at 10 minutes after the hour. Taken together, these two bus routes provide the Wal-Mart with service every 30 minutes. This situation may preclude Bloomington Transit from increasing service on Route 4 to every 30 minutes throughout the day, which was planned prior to Rural Transit's modifications to Express 4.

Demand Responsive Service - The complementary demand responsive paratransit service mandated by the Americans with Disabilities Act (ADA) in the City of Bloomington is provided by the BPTC and is called “BT Access”. BT Access requires next day, advance reservations for trips, and is limited to people who cannot utilize the Bloomington Transit fixed route system because of a disability. The fare is \$1.50 for each one-way trip. The service is currently operated by Rural Transit under contract to BPTC.

Fare Structure - Bloomington Transit has a straightforward fare structure, with a flat fare charged for travel throughout the entire system. Several types of pre-paid fare media are also available which offer convenience to riders and a substantial discount. In addition, special fares are provided for certain groups such as senior citizens and children. The Bloomington Transit fare structure is described in Table 3.

Table 3 - Fare Structure

Fare Category	Amount
Regular Cash Fare	\$0.75
IU Students (With Valid ID Card)	Free
Monthly Passes	\$25.00
Semi-Annual Passes	\$125.00
Ten Ride Tickets	\$7.50
Transfers (including to Rural Transit)	Free
Special Fares (Require Valid Identification)	
Senior Citizens (Over Age 60)	\$0.35
Children (Ages 5 to 18)	\$0.35
Children (Under Age 4, with supervision)	Free
Reduced Fare Monthly Pass	\$12.00
Reduced Fare Ten Ride Ticket	\$3.50

As shown in the accompanying table, students at IU can ride the Bloomington Transit system by simply displaying their student identification card. This arrangement, termed U-Pass, exists at many universities. Students pay a per-semester fee which entitles them to unlimited rides on the BPTC system. This encourages transit use since riders don’t need to pay the fare when boarding the bus and it minimizes the handling and processing of cash fares.

Fixed Route Facilities

This section describes the assets the Bloomington Transit system utilizes to provide and operate the fixed route public transportation services described above.

Fleet Inventory - Bloomington Transit owns and maintains a fleet of 34 buses utilized in its fixed route services; these vehicles vary in size, with bus lengths ranging between 25 feet and 40 feet.

The current average age of Bloomington Transit's fixed route bus fleet is 7.7 years, which is slightly older than the approximate average fleet age that is typically expected (i.e., one half of the 12 year economic useful life of a transit bus). However, four new buses are on order and are due to arrive in November of 2007; they will replace four older buses presently in the fleet.

Bloomington Transit presently operates buses from only three different manufacturers. Recently the agency's bus replacement program has standardized around the purchase of Gillig Low Floor buses. All of the vehicles in its fixed route fleet utilize diesel and bio-diesel fuel; the two 2006 Gillig buses are hybrid electric buses which utilize diesel fuel to help power an electric motor, thus reducing emissions and improving fuel efficiency. All of the vehicles in the Bloomington Transit fleet are handicapped accessible. Not listed in the accompanying table are the vehicles utilized for BT Access and the service and staff vehicles owned by the BPTC. Table 4 shows the Bloomington Transit fixed route fleet at the beginning of 2007. The fleet replacement program in the Recommended Plan chapter presents the current fleet.

Table 4 - Fixed Route Fleet Inventory (As of 01/07)

Year	Manufacturer/Model	Length (Feet)	Number
1989	Orion I	35	2
1990	Orion I	35	2
1995	Gillig Phantom	35	4
1997	Gillig Phantom	30	3
1997	Gillig Phantom	35	3
1997	Nova RTS	35	2
1998	Nova RTS	35	1
2002	Gillig Low Floor	40	3
2003	Gillig Low Floor	40	5
2003	Gillig Low Floor	30	2
2005	Gillig Low Floor	40	5
2006	Gillig Low Floor	30	2
Total			34

At the present time, a total of 29 vehicles are required to provide the peak period service, resulting in a spare ratio of 17.2 percent. This value is within the accepted transit industry norms where the spares ratio is between 15 and 20 percent. Bloomington Transit has an effective Bus Replacement Program. Four new buses were delivered in late 2007 and were 35-foot Gillig low floor buses.

Administrative and Maintenance Facility – Bloomington Transit accomplishes much of the required vehicle maintenance function at its facility in Bloomington, which it shares with the Indiana University Campus Bus Service. The facility houses all of the Bloomington Transit system’s administrative functions and can accommodate the transportation functions for the buses based there, as well as virtually all of the day-to-day “running repair” maintenance functions for the fleet. Preventive maintenance inspections are also carried out at the garage, as are the more heavy repair and maintenance functions for the bus fleet. It should be noted that the facility provides covered storage by a canopy, but it does not provide indoor storage, which is typical for its climate. Also, any expansion of service and the fleet would suggest the need for additional space at the operating/maintenance base.

Bus Shelters/Passenger Facilities - Presently, the Bloomington Transit system has 44 bus passenger waiting shelters at various locations throughout the service area. There are also two benches that are not incorporated into waiting shelters. This is a relatively high number in comparison to the number of bus stops throughout the system. BPTC has maintained an aggressive shelter program which affords riders a comfortable environment while waiting for their bus.

Bloomington Transit also has a Downtown Terminal facility located at 4th and Washington Streets in central Bloomington. Although the bus berths are located on-street, the off-street building offers passengers a location to purchase fare instruments and wait for their bus. This facility was reviewed as part of a previous analysis and was rated inadequate. The space for buses and passengers is not sufficient. It lacks amenities such as air conditioning and rest rooms that are common with downtown terminals in other communities. Efforts are underway to replace the existing terminal with a modern facility.

Marketing and Advertising - Bloomington Transit produces a high-quality system map showing the route alignments of all its bus routes. Because bus route schedules may vary, the individual route schedules are not presented on this map. The individual route timetables are of a uniform design but do not always include a route map. A uniform template for the system timetables would make them more customer friendly and easier for riders to understand.

Fixed Route Trends

To provide a context for the current analysis, operating and financial information was tabulated for the last five years. The statistics include such measures as the number of revenue miles and revenue hours operated as well as the system ridership, expenses and revenue collected. The source of this information was the National Transit Database that BPTC submits annually to the Federal Transit Administration. Because Bloomington Transit is on a calendar year basis, data for FY2006 was not available at the time the interim report was prepared.

Relevant statistics were compiled for the last five years: 2001 through 2005. As noted previously, 2006 results was subsequently obtained and included in the development of the recommended plan.

Operating Statistics – In 2005, Bloomington Transit’s revenue miles were slightly more than 12 percent higher than the 2001 level. Similarly, revenue hours were more than 11 percent higher in 2005 compared to 2001. Throughout the review period, the number of vehicles required to meet peak fixed route service also increased almost 12 percent, with 29 buses being required for the peak service in 2005. The results reflect service expansion throughout the period, with both operating speed and vehicle utilization relatively stable (Table 5).

Table 5 - Operating Statistics

Criteria	2001	2002	2003	2004	2005	Percent Change	
						Total	Annual
Revenue Miles	755,549	788,144	833,352	840,513	848,934	12.36	3.09
Revenue Hours	71,967	74,060	77,520	78,484	79,933	11.07	2.77
Peak Vehicles	26	26	26	29	29	11.54	2.88

Productivity – Fixed route ridership in 2005 was 11.28 percent higher than the 2001 level. The results reflect the continued expansion of service. This represents an average annual increase of 2.82 percent. Ridership levels increased at about the same rate as revenue hours and revenue miles, with system productivity remaining approximately the same between 2001 and 2005. The accompanying table shows that the system’s productivity, measured in the number of passengers carried per revenue hour, slightly increased during the analysis period. The decrease in productivity in terms of revenue miles was also negligible as shown in Table 6.

Table 6 - Ridership and Productivity

Criteria	2001	2002	2003	2004	2005	Percent Change	
						Total	Annual
Ridership	1,930,738	1,963,858	2,041,168	2,026,895	2,148,561	11.28	2.82
Passengers Per Revenue Hour	26.83	26.52	26.33	25.83	26.88	0.19	0.05
Passengers Per Revenue Mile	2.56	2.49	2.45	2.41	2.53	(1.17)	(0.29)

Financial Efficiency and Effectiveness - To determine financial trends for the bus system during the past five years, relevant statistics were calculated for the years 2001 through 2005.

Table 7 - Financial Results

Criteria	2001	2002	2003	2004	2005	Percent Change	
						Total	Annual
Operating Cost (\$)	2,948,588	3,134,134	3,538,159	3,606,482	4,128,736	40.02	10.00
Revenue (\$)	792,097	835,109	880,359	917,195	990,883	25.10	6.27
Deficit (\$)	2,156,491	2,299,025	2,657,800	2,689,287	3,137,853	45.51	11.38
Farebox Recovery (%)	26.86	26.65	24.88	25.43	24.00	(10.65)	(2.66)

As seen in Table 7, between 2001 and 2005, Bloomington Transit’s operating costs increased by 40.02 percent and had an average annual increase of ten percent. This increase in operating costs is most likely due in a large part to labor costs; driver wages are the primary driver of operating costs for a transit provider. Also contributing to this figure is the inflation in the costs of other resources used to administer and operate the system. Most notably, inflation in the cost of fuel can greatly affect a transit provider’s overall costs. Increased costs for providing employee benefits, particularly health insurance benefits, are also a typically significant contributor to overall operating costs.

The following table shows the effect of this increase on Bloomington Transit performance on a per unit basis. The two most important measures presented in the exhibit are operating costs per passenger and operating costs per revenue hour, which indicate financial effectiveness and efficiency, respectively. The exhibit indicates that the operating deficit has risen at a faster rate than the amount of service and ridership. This trend in financial effectiveness is the result of the increase in ridership offset against even greater growth in operating costs over the five year period.

In terms of financial efficiency, operating costs per revenue hour increased by more than 26 percent over the period, with an annual average increase of more than six percent (Table 8). The prior table also showed that revenue increased over the period by more than 25 percent, with an average annual increase of more than six percent. This represents a decline in revenue relative to the growth observed in operating costs during the period, thus leading to the observed increase in the deficit. Due to this fact, the farebox recovery rate for Bloomington Transit’s fixed route system decreased from 26.86 percent in 2001 to 24.00 percent in 2005. This represents a decrease of almost 11 percent over the period and an average annual decrease of almost three percent. These trends have ramifications for two important measures presented in the accompanying table, revenue per passenger (i.e., average fare) and deficit per revenue hour.

Table 8 - Financial Measures

Criteria	2001	2002	2003	2004	2005	Percent Change	
						Total	Annual
<i>Financial Results Per Revenue Hour</i>							
Operating Cost (\$)	40.97	42.32	45.64	45.95	51.65	26.07	6.52
Revenue (\$)	11.01	11.28	11.36	11.69	12.40	12.62	3.16
Deficit (\$)	29.96	31.04	34.29	34.27	39.26	31.04	7.76
<i>Financial Results Per Revenue Miler</i>							
Operating Cost (\$)	3.90	3.98	4.25	4.29	4.86	24.62	6.15
Revenue (\$)	1.05	1.06	1.06	1.09	1.17	11.43	2.86
Deficit (\$)	2.85	2.92	3.19	3.20	3.70	29.82	7.46
<i>Financial Results Per Passenger</i>							
Operating Cost (\$)	1.53	1.60	1.73	1.78	1.92	25.49	6.37
Revenue (\$)	0.41	0.43	0.43	0.45	0.46	12.20	3.05
Deficit (\$)	1.12	1.17	1.30	1.33	1.46	30.36	7.59

Revenue per passenger increased, although overall revenue had a greater percentage increase. This is because the overall ridership increased; revenue per passenger increased more than 12 percent over the period from \$0.41 in 2001 to \$0.46 in 2005.

Funding – The concluding information reviewed as part of the trend analysis was the funding provided from local, state and federal sources to help underwrite the operating deficit. It should be recognized that BPTC collects revenue from other sources (e.g., advertising). Further, the demand responsive service provided to persons with disabilities also requires subsidies. For example, in 2005 the ADA service incurred expenditures of \$527,695 with fares of only \$52,689. Table 9 indicates the operating assistance by source for the past five years.

Table 9 - Operating Assistance (Dollars)

Criteria	2001	2002	2003	2004	2005	Percent Change	
						Total	Annual
Local	692,784	857,344	1,099,036	1,142,032	1,127,139	62.70	15.67
State	1,068,409	1,182,530	1,051,381	1,299,754	1,430,383	33.88	8.47
Federal	503,489	477,553	729,231	518,713	550,876	9.41	2.35
Total	2,264,682	2,517,427	2,879,648	2,960,499	3,108,398	37.25	9.31

The primary source of local funding are the income and property taxes which have increased substantially during the past five years. The largest contributor of operating assistance is the State of Indiana, which has increased its funding level by about one-third. Federal funding contributes the smallest share of operating assistance and has increased only modestly. With the passage of the latest transportation law (SAFETEA-LU), it is likely that BPTC's federal funding will increase. While not presented here, financial assistance is also available from the Federal Transit Administration. This includes normal funding as well as projects specifically identified

by Congress (i.e., earmarks) for funding. The proposed new bus facility in downtown is a project that has been specifically identified in SAFETEA-LU.

COMMUNITY CHARACTERISTICS

The City of Bloomington is located in southern Indiana in Monroe County, and is approximately 55 miles southwest of the Indianapolis via State Route 37. Bloomington's population makes up 57.4 percent of the population of Monroe County. Bloomington is the government center for Monroe County, and is also the central city of the Bloomington Metropolitan Statistical Area (MSA), which includes Monroe, Greene, and Owen Counties.

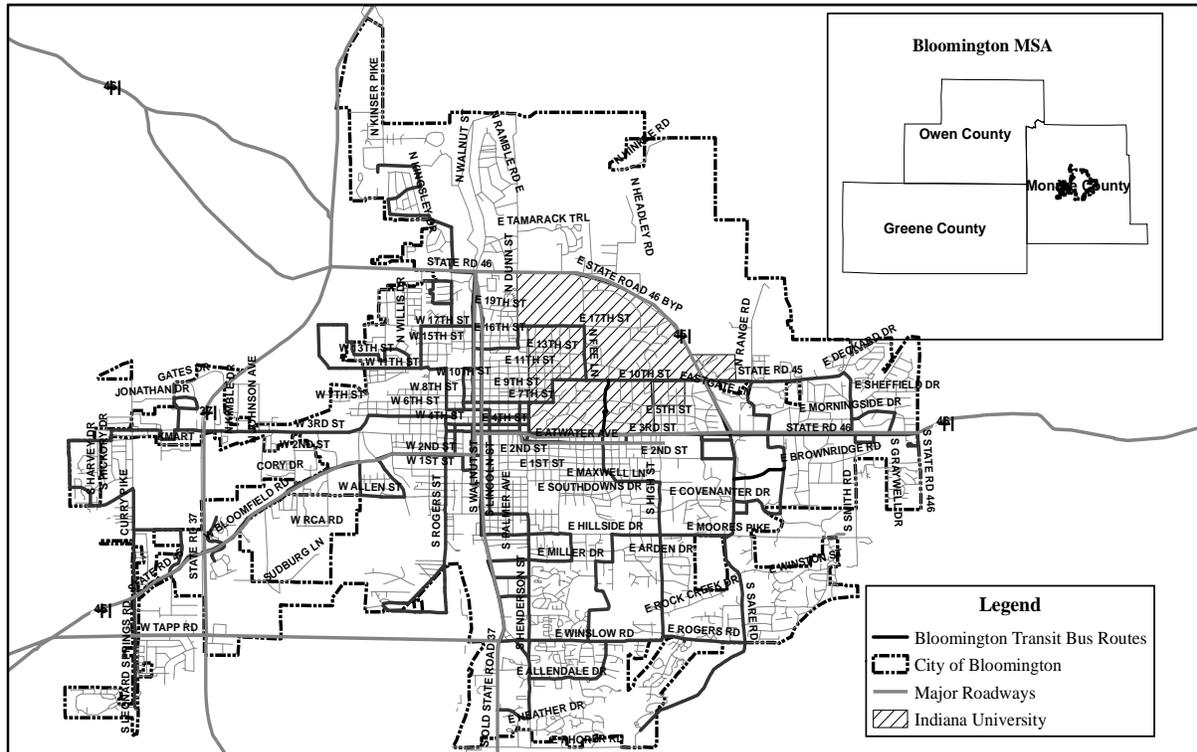
Bloomington has an estimated population of 70,642 (2003 Census Bureau estimate) and is home to the Indiana University. For the 2005-2006 academic school year, IU reported having 37,958 students and 5,196 employees (IU 2005-2006 Factbook). Bloomington continues to experience growth with a vibrant downtown. These are factors that have a positive impact on the need for transit and the likelihood of its use. A countervailing trend is that considerable development is taking place and more planned in outlying areas. In many cases, these projects are not transit friendly in terms of their design and outside the city limits which can not be served by the municipal bus system .

The Bloomington Public Transit Corporation (BPTC), known as Bloomington Transit, is the primary public transit provider in the city and provides public transportation services solely within the borders of Bloomington. Figure 1 presents a physical representation of the study area as well as shows the location of Bloomington Transit bus routes. In addition to Bloomington Transit, Indiana University operates a campus bus system which is used primarily by students, faculty, and employees of IU. Further, the Area 10 Agency on Aging operates a Rural Transit which provides public transportation service within Monroe, Owen, and Lawrence Counties.

The purpose of this chapter is to describe the setting within which the existing Bloomington Transit services are provided. It identifies major transit generators and examines information on socioeconomic characteristics within the city. It should be noted that this report only summarizes and highlights the study area. The detailed information was used to create a data base that will support subsequent efforts. This information will be used to assess how the Bloomington public transit system could most efficiently utilize their resources to address existing and future needs and to provide the background data necessary for developing service improvement proposals.

The data processed and discussed in this section is based on data collected from the 2000 United States Census, the Bloomington Economic Development Corporation, and the City of Bloomington. Where maps are used to present data in a spatial manner, census block groups are the unit of analysis.

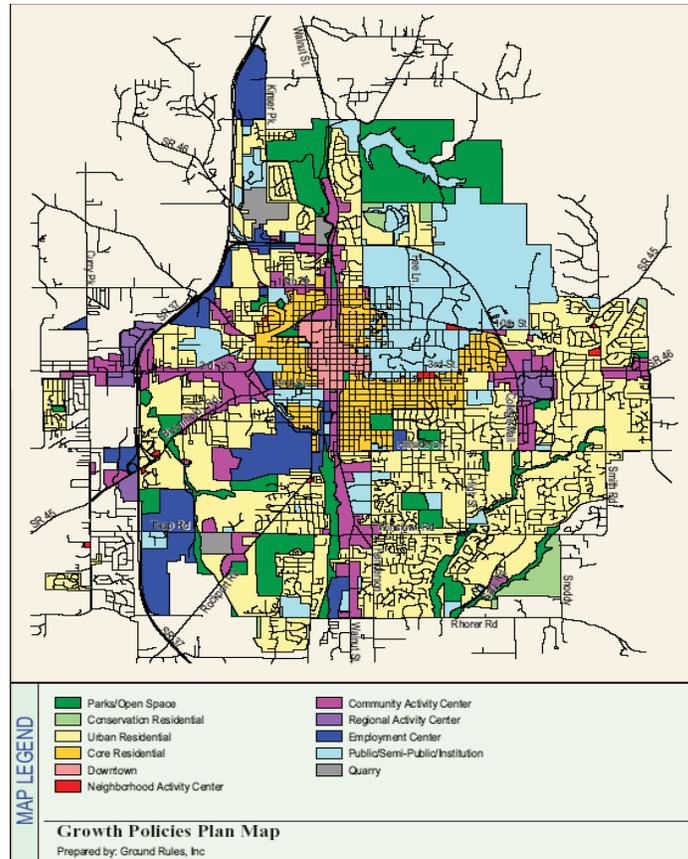
Figure 1 - City of Bloomington (Service Area)



Land Use and Major Trip Generators

As shown in Figure 2, the predominant land use type in Bloomington is urban residential with pockets of commercial and industrial uses and green spaces scattered throughout the city. The two primary nodes in the city are the downtown core and Indiana University, which together comprise a relatively dense array of commercial, residential, retail, and institutional uses

Figure 2 - City of Bloomington Land Use



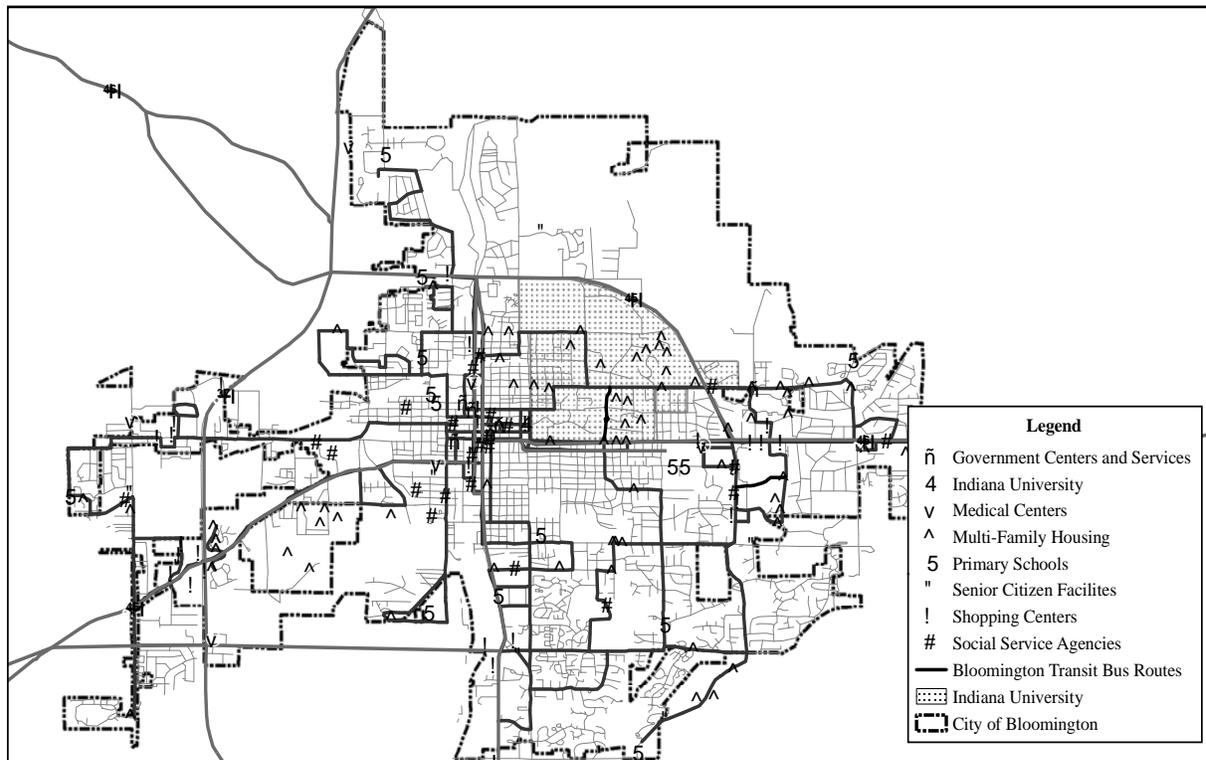
Source: City of Bloomington's Growth Policies Plan 2002

Major trip generators are locations that currently attract or have the potential to attract significant total person or transit trips. The types of major trip generators which were identified included shopping centers, hospitals, senior citizen facilities, primary, secondary and post-secondary schools, multi-family housing developments, social service agencies, and government centers. The major trip generators are shown in Figure 3. Major employers are mapped and discussed in a later section of this memorandum.

The major generators are fairly evenly dispersed throughout Bloomington, although concentrations of major generators are present in and around the downtown area of the city, along State Route 46 in the eastern portion of the city, and along State Route 45 in the western portion of the city. Overall, most of these major generators are served or are accessible to Bloomington Transit fixed route bus service. It should be noted that Figure 3 does not include

generators (e.g., Ivy Tech and the new Wal-Mart) outside Bloomington, although information was gathered on these outlying areas.

Figure 3 - Major Transit Generators

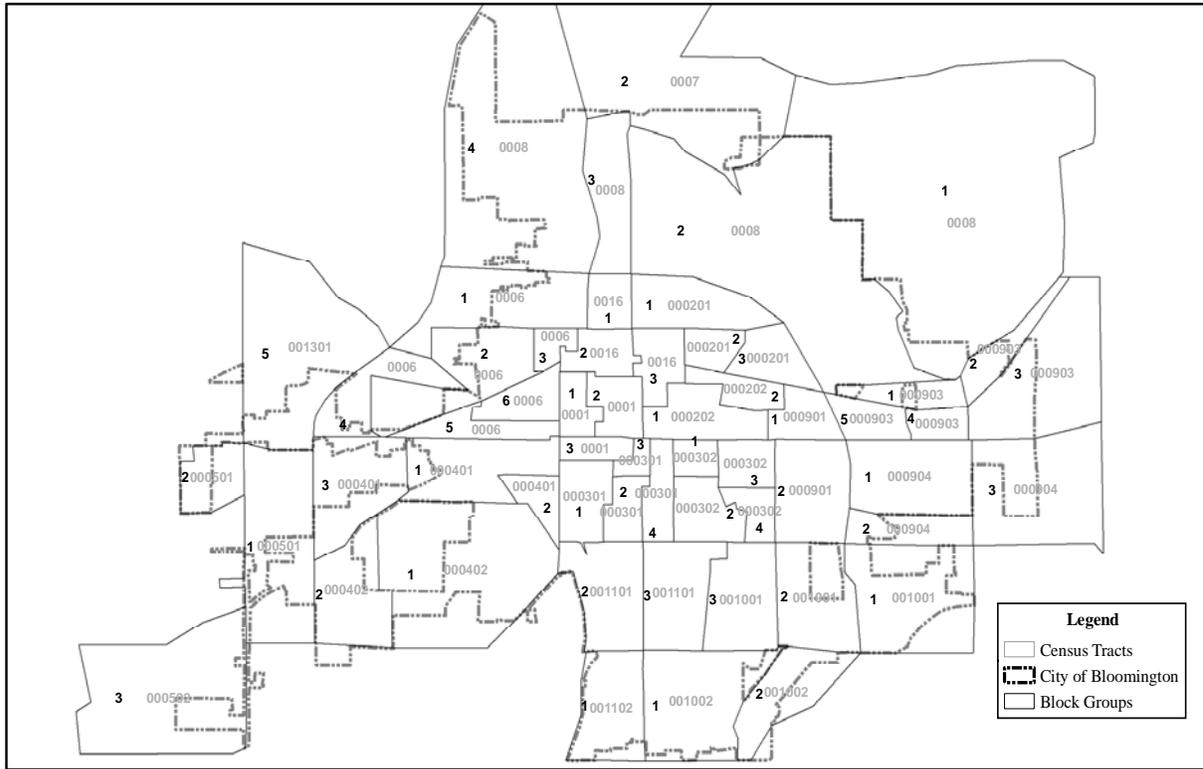


Socioeconomic Characteristics

One of the major elements of any transit analysis is an examination of the socioeconomic factors that influence overall travel and the needs for public transportation within the area served by the transit system. These factors include characteristics about the area population including population size, population density, population age, household income, mobility status, vehicle availability, employment, labor force, and bus ridership.

Socioeconomic data used for the figures in this section are based primarily on the census block level from the 2000 U.S. Census. In the current analysis, the study area is analyzed using 57 census block groups. Figure 4 graphically depicts these block groups. It should be noted that some of the census block groups located along the periphery of the city extend into Monroe County. Thus, the totals for the aggregated data will exceed the totals for Bloomington.

Figure 4 - Census Block Groups



Population and Population Density - The City of Bloomington’s population increased from 60,633 in 1990 to 69,291 in 2000, an increase of 14.3 percent. As of July 1st, 2003, the official Census Bureau population estimate for Bloomington was 70,642. At the same time, the population of Monroe County increased 10.6 percent between 1990 and 2000, with Bloomington accounting for 75 percent of the county’s growth during this period. Population projections were prepared for Monroe County by the Bloomington Metropolitan Planning organization as part of a study to develop a long range transportation plan for the region. At this time, population projections are not available for the City of Bloomington.

As shown in the chart below, the population of Monroe County is projected to increase from 120,663 persons in 2000 to 159,271 persons by 2030, an increase of 32 percent. During this time period, the City of Bloomington is not expected to experience any significant population loss to the outlying suburbs, and may in fact show a modest increase in population during the 30 year period. Overall, the increase in population in the outlying suburbs is expected to be the result of new persons moving into the area rather than people moving out of Bloomington. This shift in population has impacts on mobility since BPTC is restricted to only serving areas within the municipal boundaries.

Population Projections for Monroe County

County	2000	2010	2015	2020	2025	2030	% Change
Monroe	120,663	132,219	138,627	145,575	152,423	159,271	32.0

Source: Bloomington MPO

Table 10 below provides the population for each of the census block groups in Bloomington. As noted above, some of these census block groups include residents who reside beyond the city. The table indicates that population by census tract ranged from a high of 4,554 in the northern portion of Bloomington which includes Indiana University (CT 201, BG 2) to a low of 380 in the western portion of the city (CT 6, BG 5).

Table 10 - Census Block Groups and Population

Census Tract	Census Block Group	Location	2000 Population
1	1	Downtown Area	428
1	2	Downtown Area	1,835
1	3	Downtown Area	897
201	1	IU Campus Area	892
201	2	IU Campus Area	4,554
201	3	IU Campus Area	1,632
202	1	IU Campus Area	2,772
202	2	IU Campus Area	1,770
301	1	Central Area	926
301	2	Central Area	1,308
301	3	Downtown Area	1,094
301	4	Central Area	469
302	1	Central Area	1,094
302	2	Central Area	469
302	3	Eastern Area	904
302	4	Eastern Area	615
401	1	Western Area	1,054
401	2	Central Area	896
401	3	Western Area	1,030
402	1	Southwestern Area	1,747
402	2	Southwestern Area	833
501	1	Western Area	516
501	2	Western Area	1,636
502	3	Southwestern Area	1,115
6	1	Northwestern Area	2,826
6	2	Northwestern Area	1,967
6	3	Northwestern Area	496
6	4	Northwestern Area	396
6	5	Western Area	380

Table 10 - Census Block Groups and Population (Continued)

Census Tract	Census Block Group	Location	2000 Population
6	6	Western Area	773
7	2	Northern Area	573
8	1	Northeastern Area	1,115
8	2	Northern Area	1,737
8	3	Northern Area	702
8	4	Northern Area	1,608
9.01	1	Eastern Area	1,038
9.01	2	Eastern Area	1,376
9.03	1	Eastern Area	797
9.03	2	Eastern Area	785
9.03	3	Eastern Area	1,065
9.03	4	Eastern Area	585
9.03	5	Eastern Area	1,216
9.04	1	Eastern Area	740
9.04	2	Eastern Area	1,015
9.04	3	Eastern Area	1,239
10.1	1	Southeastern Area	1,714
10.1	2	Southeastern Area	1,492
10.1	3	Southern Area	1,217
10.2	1	Southern Area	3,015
10.2	2	Southeastern Area	1,227
11.1	2	Southern Area	1,138
11.1	3	Southern Area	2,771
11.2	1	Southern Area	1,407
13.1	5	Northwestern Area	742
16	1	Northern Area	2,472
16	2	Central Area	2,644
16	3	IU Campus Area	1,609
Total			74,363*

* Some census block groups utilized in this study extend into Monroe County.

A critical factor impacting the viability of public transportation service is the density of residential development. Transit tends to attract more riders in denser areas for many reasons, including the fact that densely populated regions tend to include a diversity of income and age groups. Also, denser development patterns make residents much less dependent on automobiles to complete their daily tasks, and the less dependent a population is on automobiles, the more likely they are to use transit. The City of Bloomington encompasses 19.9 square miles of land area and has an overall population density of 3,550 persons per square mile.

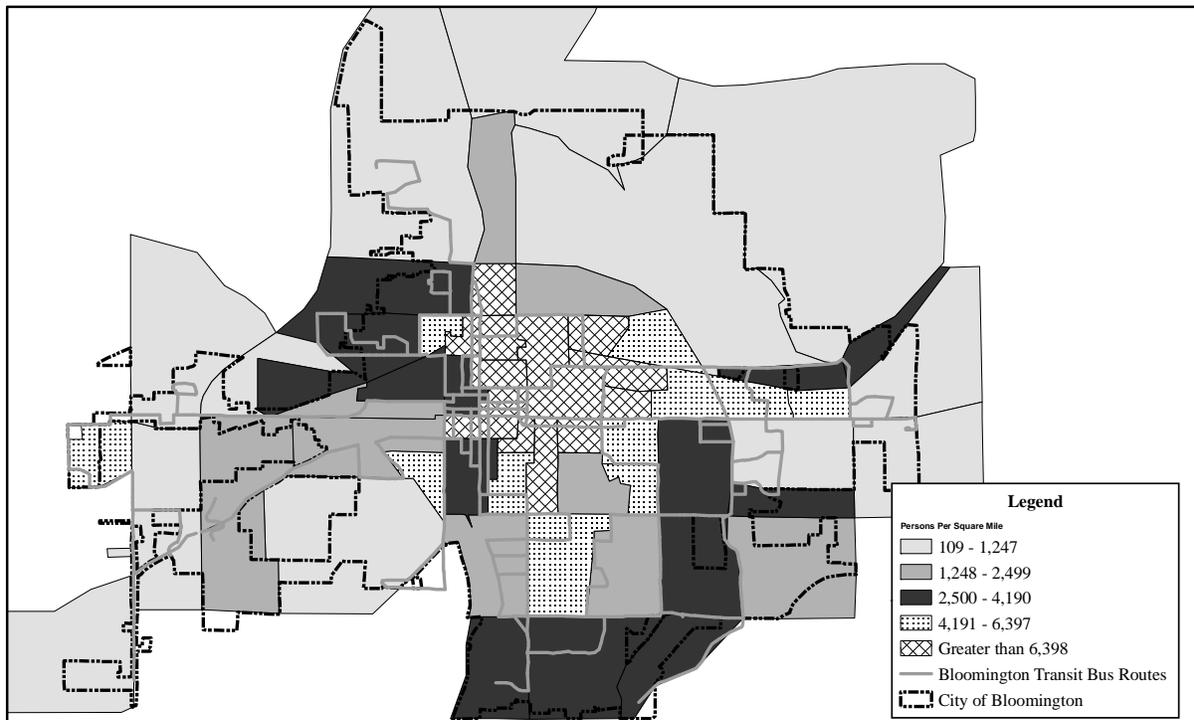
As shown in Figure 5, the census block groups with the highest population densities are primarily located in the central and northern portions of Bloomington, which together comprise of downtown business district and the main campus of Indiana University. The population density within these block groups is in excess of 6,398 persons per square mile.

The census block groups with the lowest population densities are primarily located along the periphery of the city where development is not as intensive. The population densities of these block groups is under 1,248 persons per square mile.

While no single measure exists, it is generally recognized that densities in excess of 2,500 persons per square mile are desirable to make frequent fixed route bus service viable. Lower values can be supported depending on headways, type of service, need and available funding. Also coverage is only one measure of transit availability since factors such as frequency and span must be considered in light of density.

Within the service area, 34 of the 57 census block groups have population densities greater than 2,500 persons per square mile. Presently, all 34 of the block groups with population densities above 2,500 persons per square mile are served by Bloomington Transit.

Figure 5 - Population Density



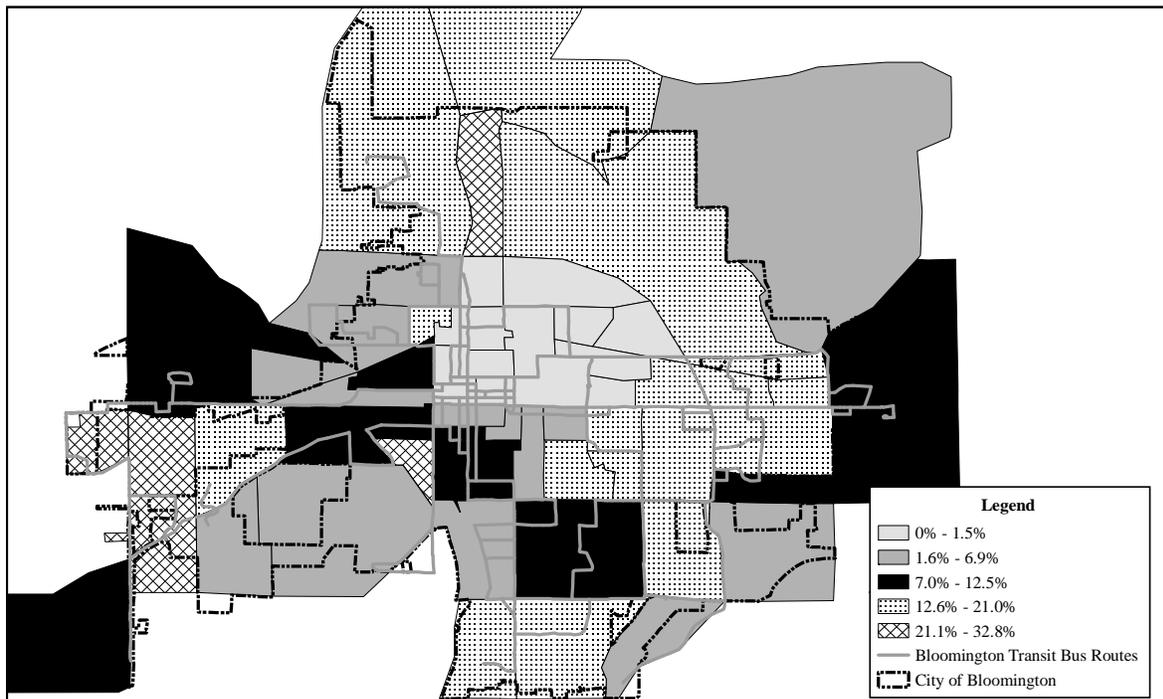
Source: 2000 U.S. Census

Senior Citizen Population - There are several “target” market groups for transit. These groups generally have limited transportation mode choices so that, in some cases, they must rely on transit services in order to travel. They are not able to either drive or do not have access to an automobile. Senior citizens (persons 65 years old and older) are one of these groups. There are 5,456 people age 65 and over in the City of Bloomington. This represents 7.9 percent of the city’s population which is a relatively low proportion in comparison to other communities. As shown in Figure 6 the largest concentrations of senior citizens are located along the northern and western peripheries of Bloomington, and in an area south of State Route 45 near the western edge of the downtown. These areas have senior citizen populations of 21.1 percent and higher.

Additionally, senior citizen populations of between 12.6 percent and 21.0 percent are evident along the peripheries of Bloomington as well as in the northwestern portion of the city south of State Route 46. The area with the lowest percentage of senior citizens is located in the central portion of the city, which includes the downtown area and Indiana University. The senior citizen population in this area is below 1.6 percent.

Bloomington 2000 Pop	Number of Persons 65 and Over	% of Population 65 and Over
69,291	5,456	7.9

Figure 6 - Senior Citizen Population (65 and Over), Percent of Total Population

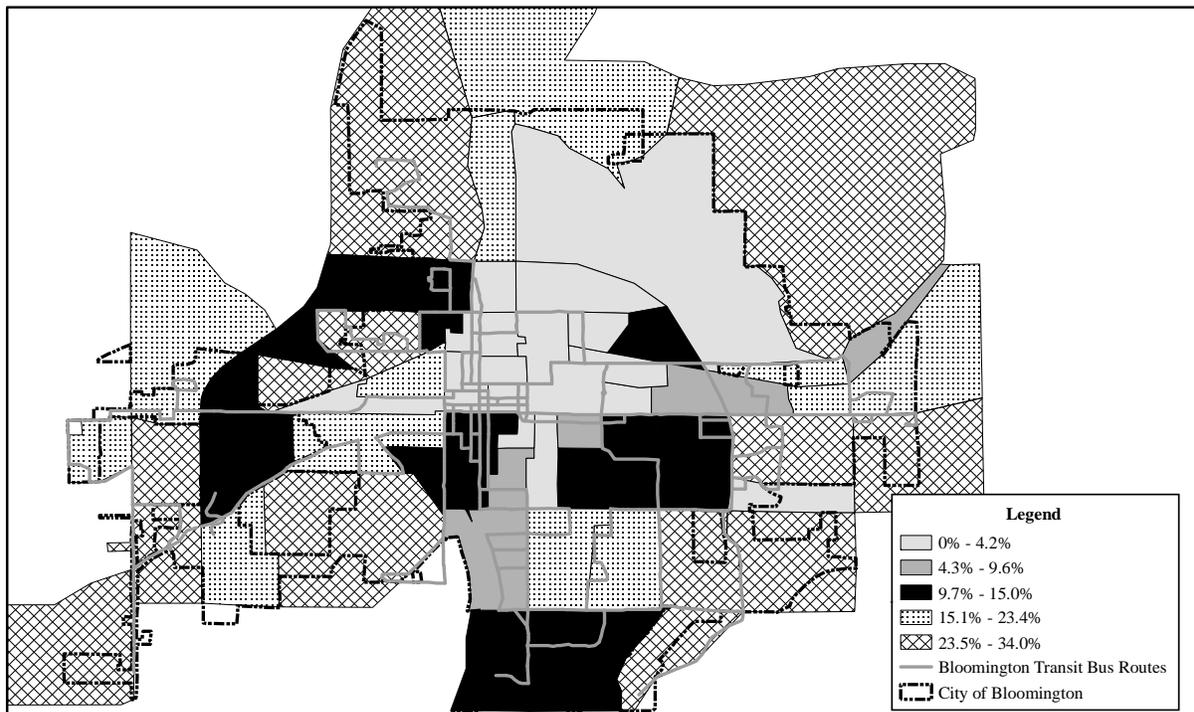


Source: 2000 U.S. Census

Youth Population - The youth population (persons under 18 years of age) is considered another captive group, as most of them are unable to drive legally. There are 8,788 persons in Bloomington under age eighteen. This represents 12.7 percent of the overall city population. As shown in Figure 7, the areas along the periphery of the city exhibit the highest concentrations of people under age eighteen. These areas have youth populations between 23.5 percent and 34.0 percent. The areas with the smallest percentage of people under the age of eighteen are primarily located in the central and northern portions of the city where the youth population is under 4.3 percent. In addition, there are two other areas in the city where the youth population is under 4.3 percent; these areas are located in the southeastern portion of the city north of East Moores Pike, and in the western portion of the city along West 3rd Street.

Bloomington 2000 Pop	Number of Persons Under 18	% of Population Under 18
69,291	8,788	12.4

Figure 7 - Youth Population (Under 18 Years of Age), Percent of Total Population



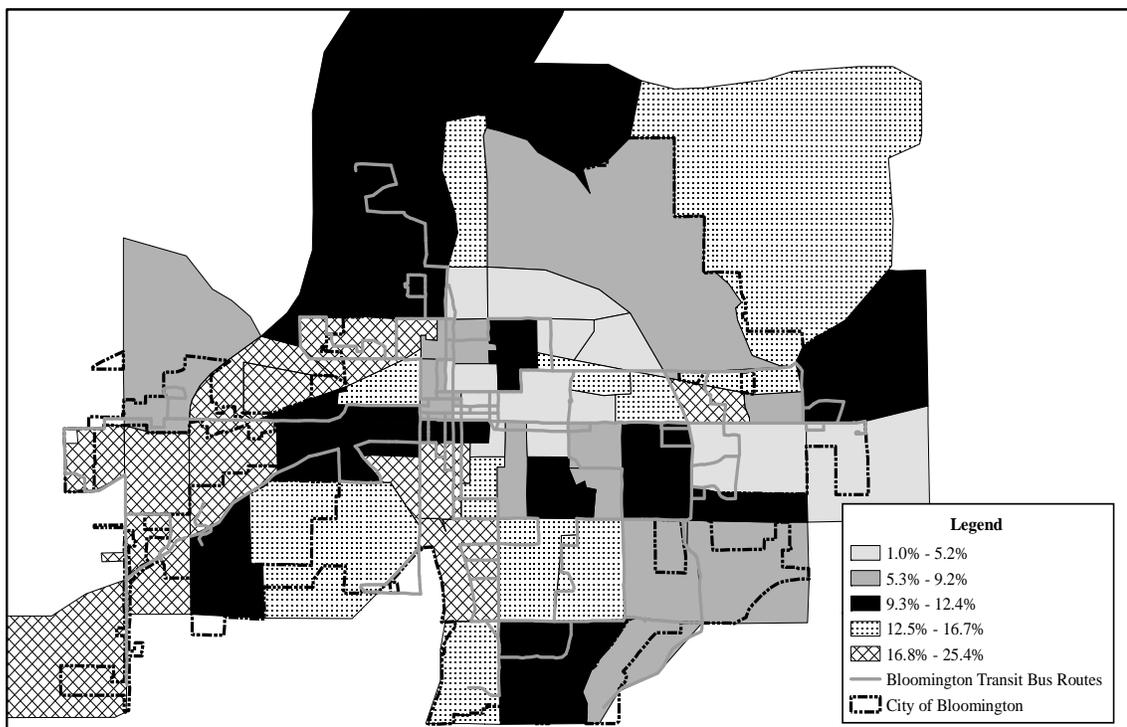
Source: 2000 U.S. Census

Mobility Status - Mobility status provides a measure of the number of non-institutionalized persons who have some type of impairment that limits their mobility. This group represents another population that is typically more dependent on public transportation

than the general public, since they often cannot drive. There are 7,004 persons in Bloomington that have some type of mobility limitation. This represents 10.1 percent of the overall city population. As shown in Figure 8, the mobility impaired population is fairly evenly distributed throughout Bloomington, but the highest concentrations are located in the southern and western portions of the city, where several census block groups have mobility impaired populations of between 16.8 percent and 25.4 percent. The areas with the lowest percentage of mobility impaired residents include the areas in and around the downtown area and Indiana University, and two census block groups located in the eastern portion of Bloomington along State Route 46.

Bloomington 2000 Pop	Number of Persons Mobility Impaired	% of Population Mobility Impaired
69,291	7,004	10.1

Figure 8 - Mobility Impaired Population, Percent of Total Population



Source: 2000 U.S. Census

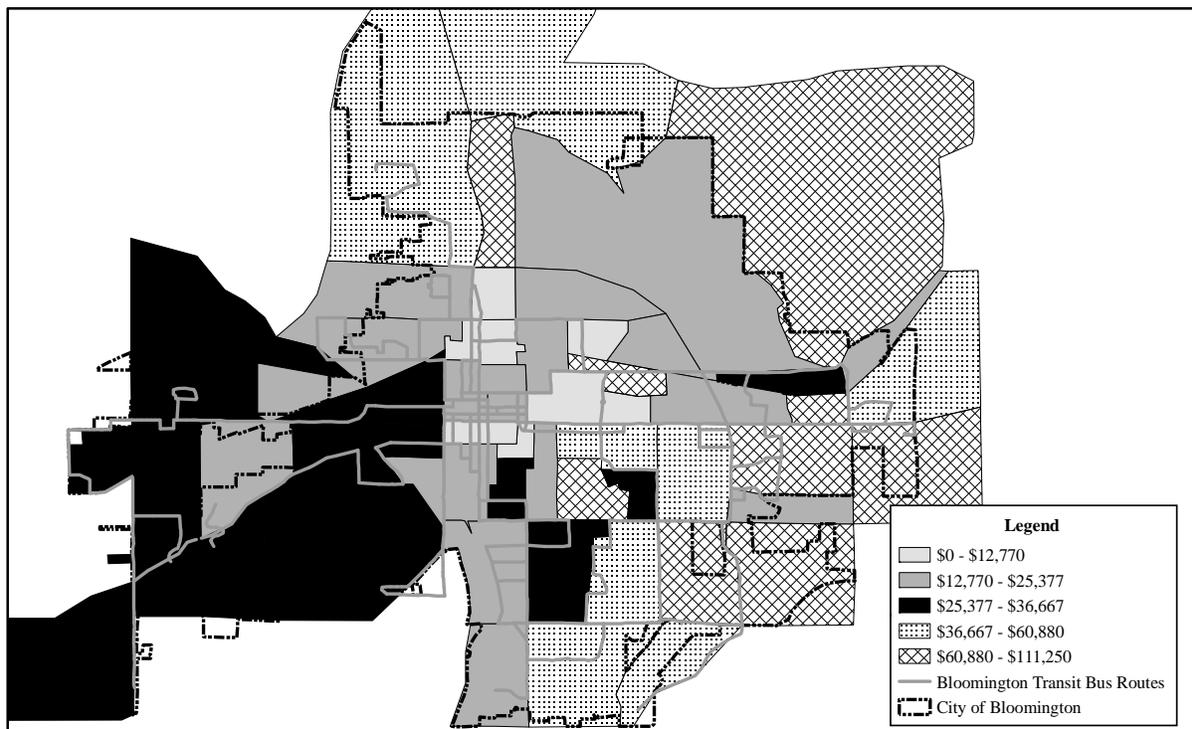
Household Income - Income is another major factor in determining transit ridership, as people with higher incomes have automobiles and typically tend to ride transit less than persons with lower incomes. The 2000 U.S. Census reported that the median household income for the City of Bloomington was \$25,377, which is much lower than the median household income for the entire State of Indiana (\$41,567). This lower figure could be attributed to the large Indiana

University student population which typically have lower annual income earnings while they attend college.

Figure 9 displays the income distribution of the census block groups in Bloomington. The figure shows that higher median incomes are located along the peripheries of the city, while the lowest median incomes are found in the central and northern portions of the city near the Indiana University campus.

Bloomington Median Income	State of Indiana Median Income
\$25,377	\$41,567

Figure 9 - Median Household Income



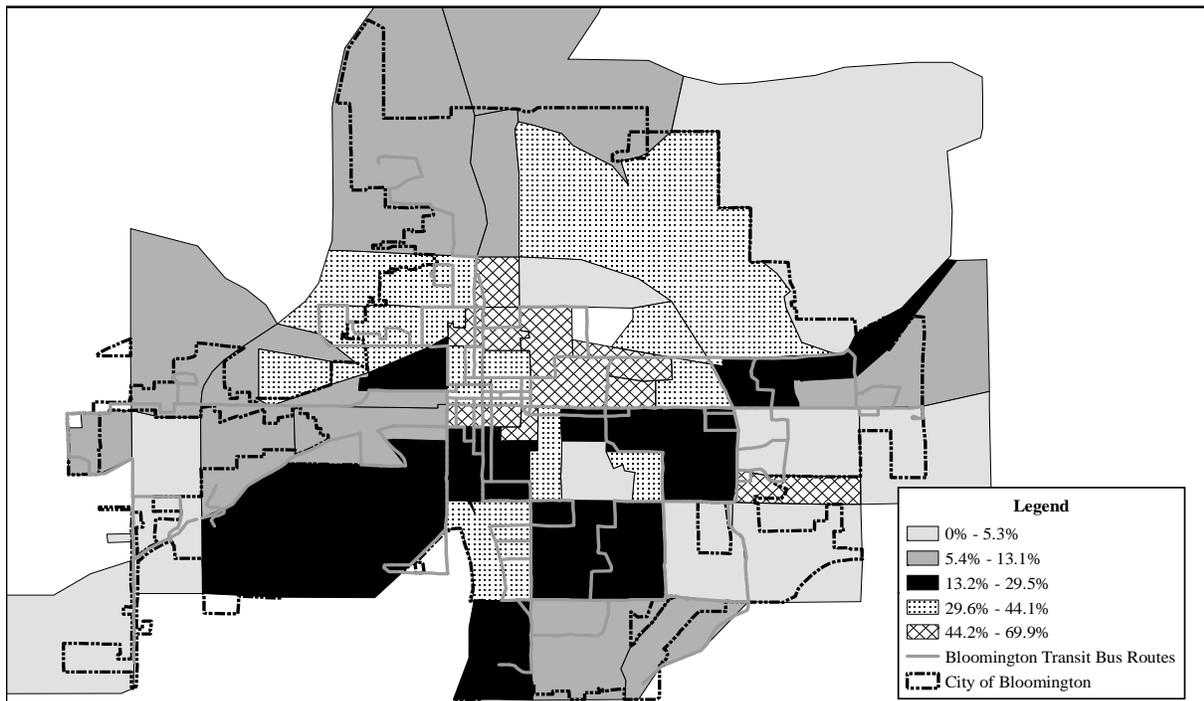
Source: 2000 U.S. Census

Another important factor impacting the viability of public transportation services is the number of households living at or below the poverty level. Low income households tend to rely more heavily on public transit service because many are unable to afford an automobile, cannot afford a second automobile for their household, or choose not to use their limited income for an

automobile. There are 5,555 households in the City of Bloomington earning less than \$10,000 per year, which represents 21.0 percent of the overall number of households in the city. As noted above, this figure also includes households of students attending Indiana University.

As shown in Figure 10, the area in and around the Indiana University campus and a small area in the southeastern portion of the city north of East Moores Pike exhibit the highest concentrations of low income households of between 44.2 percent and 69.9 percent. In fact, many areas of the city have low income household populations of at least 13.2 percent. The northeastern, southeastern, and southwestern corners of the city generally have the lowest percentage of low income households.

Figure 10 - Low Income Households, Percent of Total Households



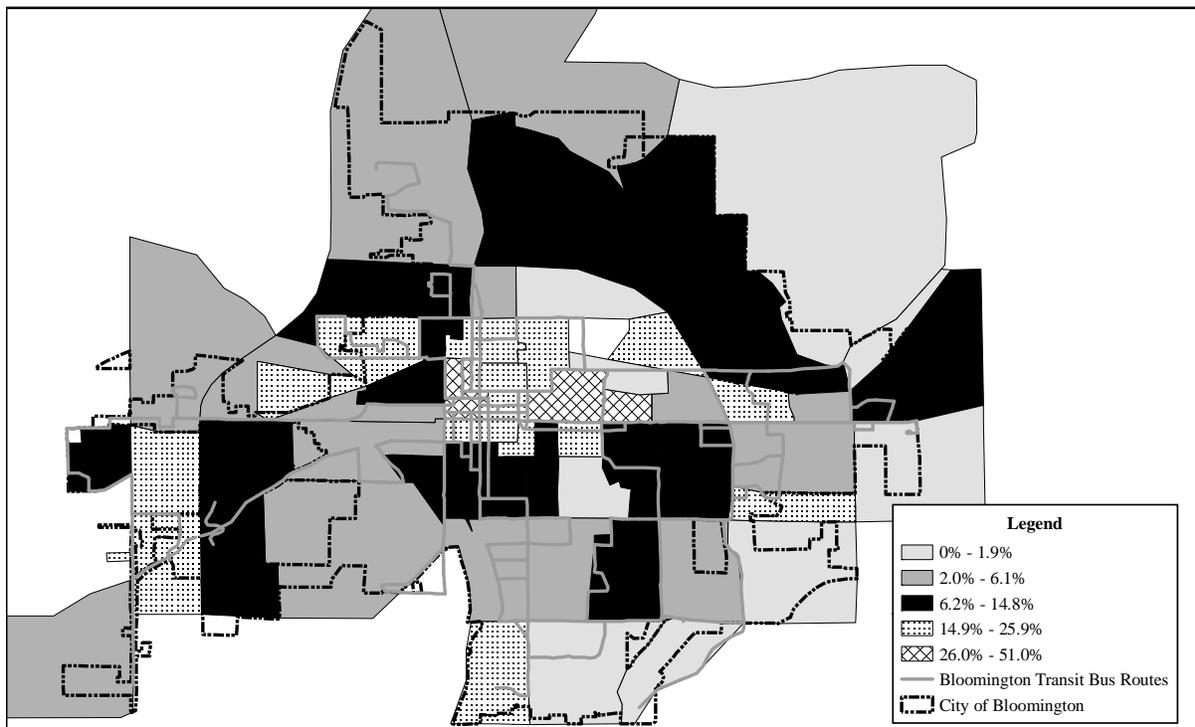
Source: 2000 U.S. Census

Automobile Ownership - Automobile ownership is a key variable in transit analysis since many persons who do not have access to a vehicle are more dependent on public transportation as a mobility option. The availability of automobiles is a good indication of how “captive” a household is to transit. Households with no automobiles are most in need of transit service for basic mobility. In this section household represents one occupied housing unit as measured by the 2000 U.S. Census. In Bloomington, 2,903 housing units or 11.0 percent of all households have no vehicle available.

Figure 11 shows that the census block groups with the highest percentage of households with no vehicle available are located in the central portion of the city, which includes the downtown area and the Indiana University campus. This area exhibits zero car household levels of between 26 percent and 51 percent. Additionally, portions of the eastern, southern, and western peripheries of Bloomington also exhibit relatively high zero car household levels of between 14.9 percent and 25.9 percent. The areas with the lowest percentage of zero car households are primarily located in the northeastern, southern, and southeastern portions of the city.

Bloomington Housing Units	Number of Zero Car Housing Units	% of Zero Car Housing Units
26,417	2,903	11.0

Figure 11 - Zero Car Households, Percent of Total Households



Source: 2000 U.S. Census

Employment

Employment is a key factor in transportation because the trip to work is the most frequent and most important trip taken by most people. In the City of Bloomington, 34,523 people were employed at the time of the 2000 U.S. Census. Bloomington is home to several major sources of

employment due to the fact that the city is home to Indiana University, is the government center for Monroe County, and is home to many of the areas largest medical and shopping centers. There are also many other major private corporations located in Bloomington such as General Electric.

Figure 12 shows the locations of the largest employers in Bloomington. Employers with more than 100 employees at a single location are shown on the map. Figure 12 indicates 15 major employers in Bloomington that meet that meet the 100 or more employee criteria. There are several other employers throughout the city that employ more than 100 people, such as the Bloomington Public School System or the Kroger grocery store chain. However, these employees are distributed throughout the city, and therefore there would not be a specific site which would generate a sufficient number of trips to warrant transit service.

The largest single employer in the service area is Indiana University, which employs almost 7,000 people. The majority of these employees work on the campus located in the central and northern portion of Bloomington.

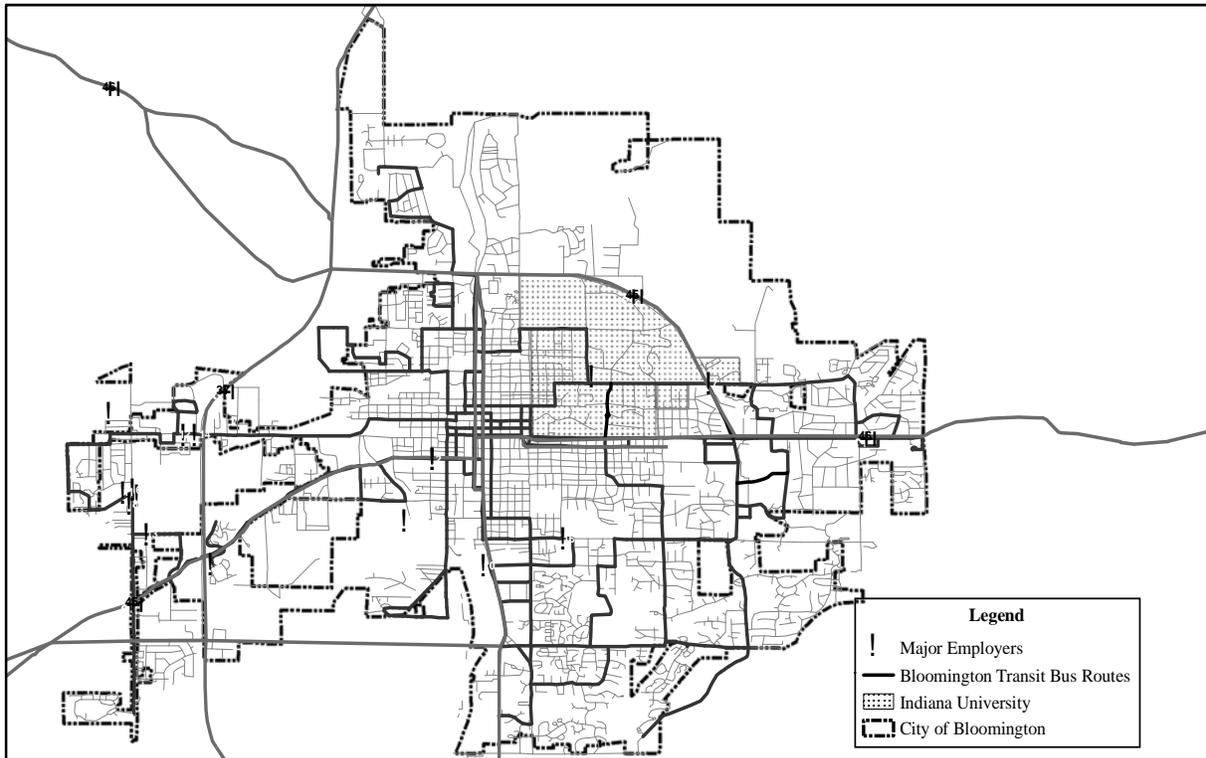
The second largest employer in the service area is Bloomington Hospital, which employs 2,585 people and is located in the downtown area of the city. Table 11 lists the major employers in the City of Bloomington as reported by the Bloomington Economic Development Corporation.

Table 11 - Major Employers

Employer	Map ID Number	Number of Employees
Indiana University	1	6,987
Bloomington Hospital	2	2,585
General Electric	3	1,750
Cook Inc.	4	1,734
PTS	5	800
Baxter	6	551
Stone Belt Industries	7	486
Otis Elevator	8	360
Wal-Mart	9	316
Herald Times	10	235
Hospitality House	11	212
K-Mart	12	186
Sabin	13	180
Lowe's	14	173
Poynter Sheet Metal	15	130
Carlisle	16	100

Source: Bloomington Economic Development Corporation

Figure 12 - Major Employers



Workers in Bloomington perform a variety of jobs. Approximately 44 percent have managerial or professional occupations; 25.4 percent work in sales and office occupations; and 20 percent work in service occupations. Table 12 lists the occupations of Bloomington workers based on the 2000 U.S. Census.

Table 12 - Occupation of Workers in Bloomington

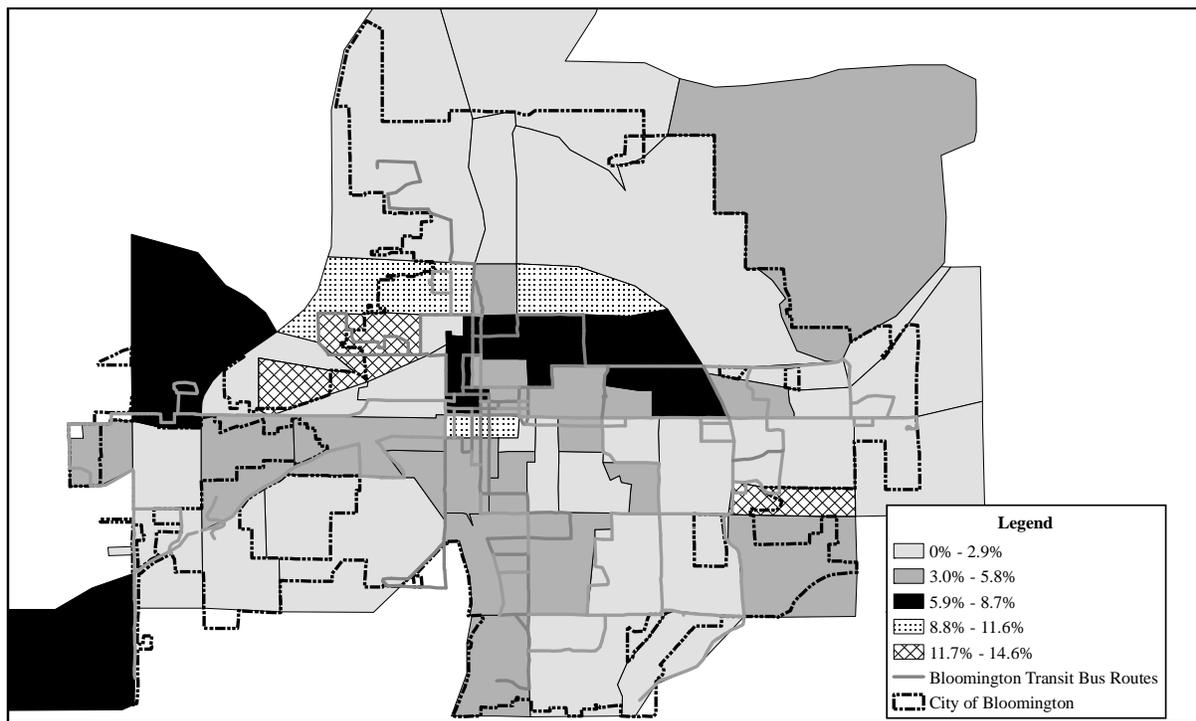
Occupation	Number of Jobs	% of Total Jobs
Management, professional, and related occupations	15,162	43.9
Sales and Office Occupations	8,774	25.4
Service Occupations	6,910	20.0
Production, transportation, and material moving occupations	2,222	6.4
Construction, extraction, and maintenance occupations	1,432	4.1
Farming, fishing, and forestry occupations	23	0.1
Total	34,523	100.0

Unemployment is also an important characteristic to consider when reviewing transit services. There should be some level of transit service available to assure that mobility does not

preclude someone from taking a job. In many cases, people who are unemployed live on low or limited incomes and often rely on public transit to go on job interviews and to visit the unemployment office. Based on the 2000 U.S. Census numbers, there were 1,750 people in Bloomington who were unemployed.

Figure 13 shows the percentage of unemployed throughout Bloomington. The census blocks with the highest percentage of unemployed workers are located in the northwestern and southeastern portions of the city. In these areas the unemployment rate is between 11.7 percent and 14.6 percent. In addition, relatively high concentrations of unemployed residents are present in downtown Bloomington and a few census blocks on the south side of State Route 46.

Figure 13 - Unemployed Workers, Percent of Total Workers



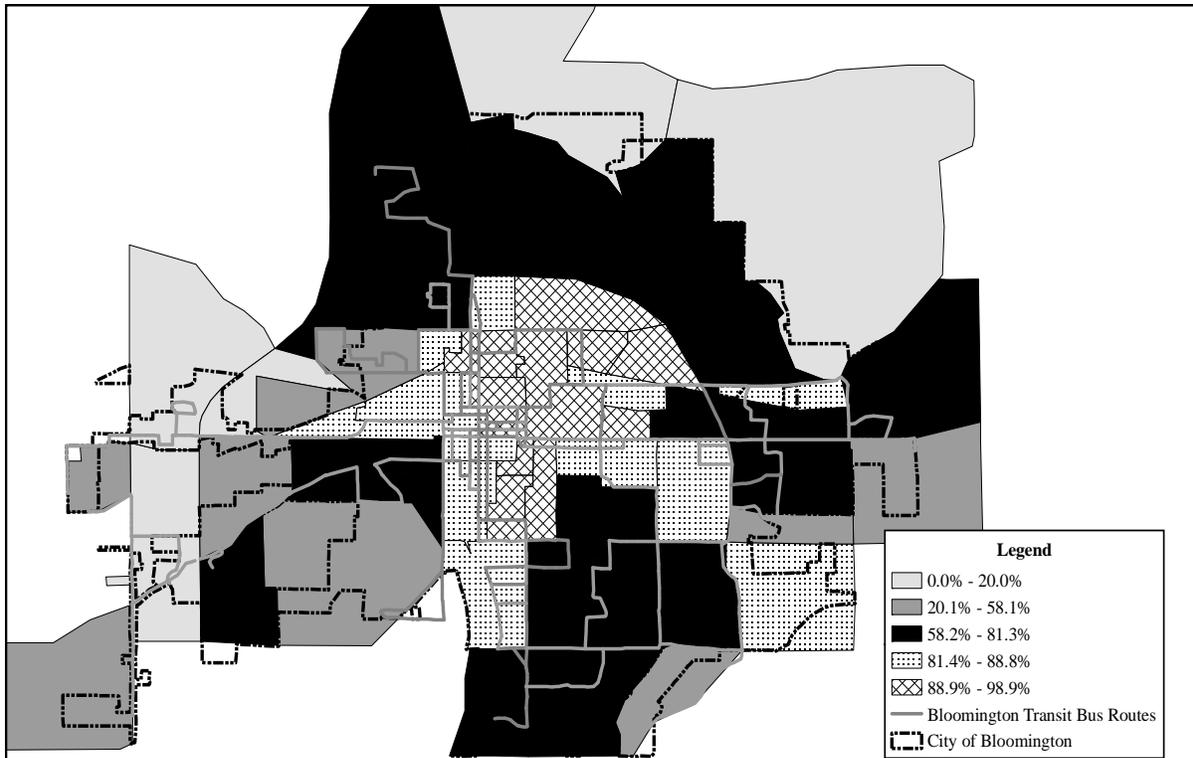
Source: 2000 U.S. Census

Commuting

As shown in Figure 14, the majority of people who live in Bloomington also work in the city. Bloomington has a large concentration of residents without extensive suburban development. Bloomington is home to 57.4 percent of the residents of Monroe County, so it is not surprising that most people who live in Bloomington also work in the city. The concern is that much of the future development taking place is in outlying areas which are difficult to serve

by transit or beyond the city limits and preclude BPTC operations. The compact nature of Bloomington is apparent since the average travel time to work in Bloomington is only 15.2 minutes. This low time makes it difficult for transit to compete with the automobile.

Figure 14 - Percentage of Commuters Who Work In Bloomington



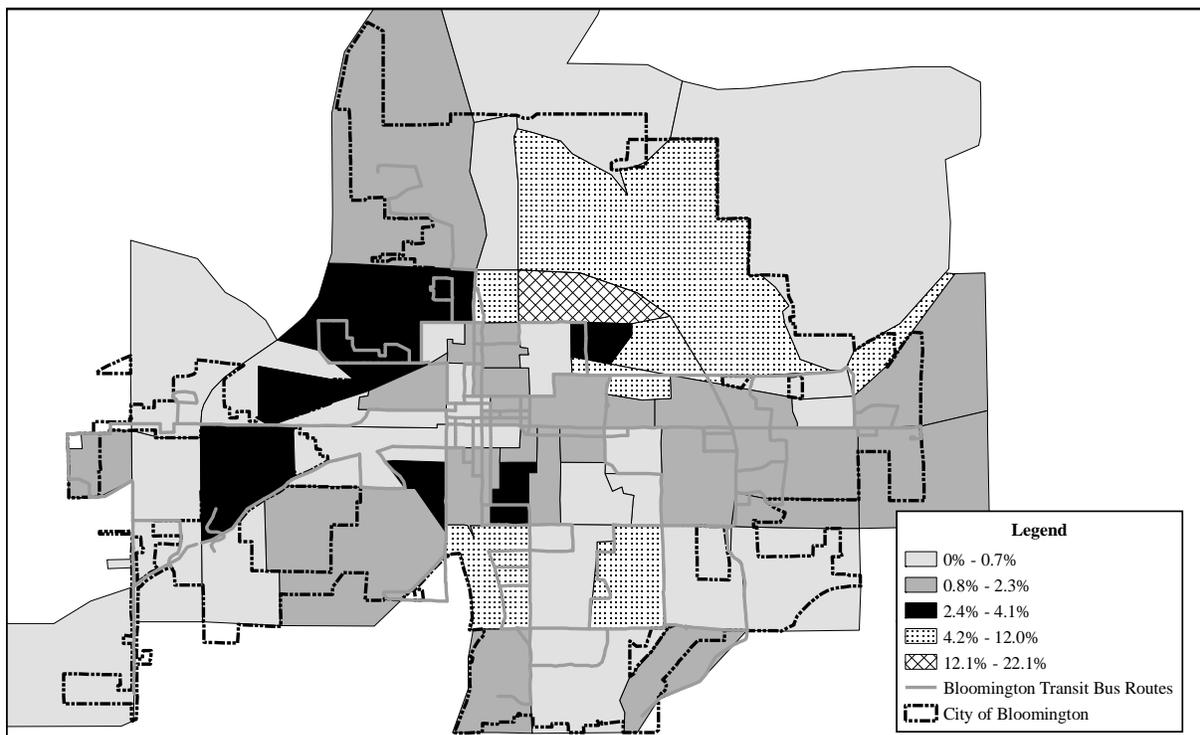
As shown in Table 13, 76 percent of Bloomington residents drive to work by themselves. A small percentage of the city’s population (3.0%), use public transportation to commute to work. More people walked to work in the city than took public transportation.

Table 13 - Journey-to-Work Mode of Travel

Occupation	Percent
Drove Alone	76.0
Public Transportation	3.0
Walked	14.5
Other Means	3.2
Worked at Home	3.3
Total	100.0

Figure 15 depicts the percentage of bus ridership within each census block group. As shown in the figure, the area in and around Indiana University exhibits the highest bus ridership levels of between 12.1 percent and 22.1 percent. Additionally, a few census blocks in the southern portion of the city also contain a relatively high percentage of commuters who ride public transportation to work. These statistics are important because people who use transit service for their work commutes are more likely to use the service for other purposes as well. The areas with the lowest ridership levels are fairly evenly distributed throughout the city in no discernible spatial pattern. These areas have rider ship levels of less than 0.8 percent.

Figure 15 - Percentage of Commuters Who Use Public Transportation



Source: 2000 U.S. Census

Future Development

Based on information provided by the Bloomington Planning Department, most of the development that is expected to occur in the city, will be in-fill in nature, and will not create any major new trip generators. The southern portion of the city has the most potential for new growth, and is currently approved for single family residential, multi-family residential, and some commercial development. In the northeastern corner of the city near State Route 37 and Tapp Road, there have been some recent subdivision approvals; future proposals for that area

include mixed use development. On Sare Road south of Rodgers Road, multi-family and single family residential units are proposed, along with a limited amount of commercial and medical office development

A recurring theme is that both residential and non residential development is planned in outlying areas. This includes expansion of existing suburban areas, such as to the west of Bloomington, as well as proposed new projects such as North Park. Typically, these developments are designed to serve the automobile with insufficient consideration of bus riders and pedestrians. Further, there is the institutional barrier related to bus service beyond the city limits.

Needs Assessment

This section presents an overview of the likelihood of transit use and a composite measure of transit need. An assessment of transit need was performed to identify those areas with the greatest need and potential demand for public transportation. More than a dozen variables were used to rate each census tract in terms of transit potential. These variables include both rate and aggregate measures of transit need. Rates, such as percentage of seniors in total population and density of senior citizens are useful in understanding the composition of an area. Aggregate measures, such as total population, indicate the absolute potential for travel in general, and transit trip-making in particular.

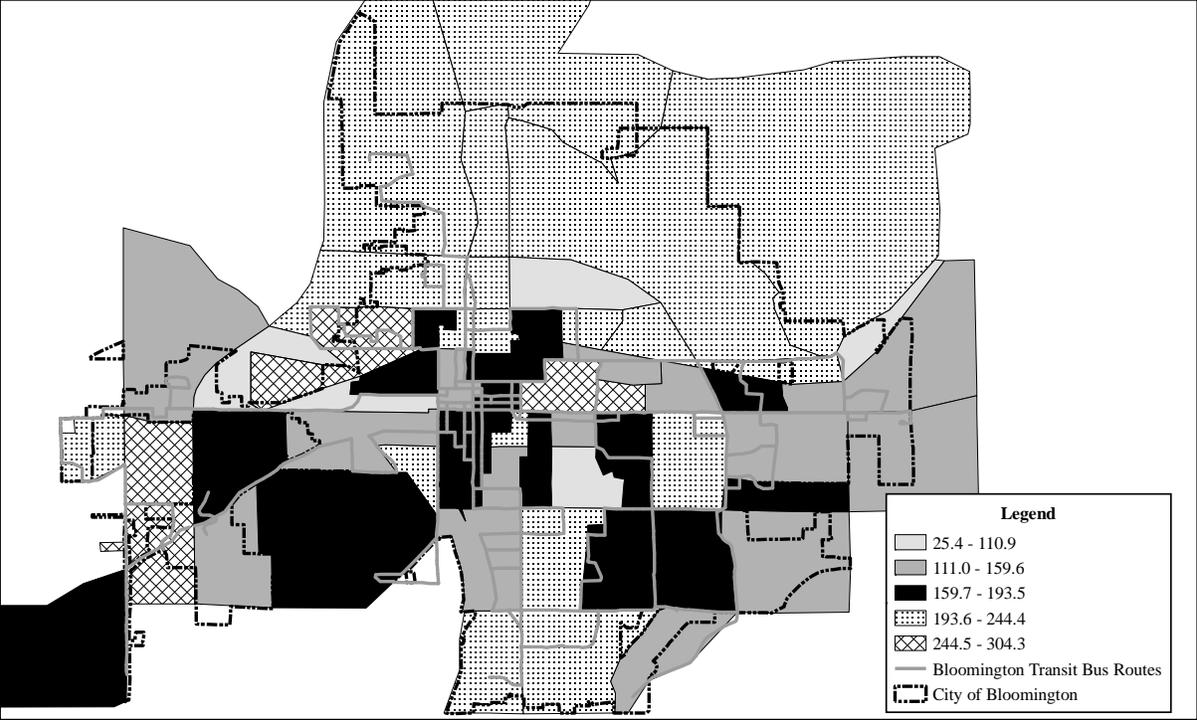
The variables used to analyze transit need for the service area are: population, population density, senior population (over 65) in terms of number, percent and density, youth population (under 18) in terms of number, percent and density, zero car households in terms of number, percent and density and low income households also in terms of number, percentage and density and percentage of trips by transit.

For all of the variables, higher values are indicative of greater need and likelihood of transit use. For example, a census block with high population density or a high number of zero car households exhibits greater mobility need and propensity for transit use. In the current analysis, a standardized score has been used to combine the different variables. With this approach for each variable, the census block with the lowest value is assigned a score of zero while the census block with the highest value is assigned a value of 100. The other areas are computed by interpolating between the maximum and minimum values. These scores can then be added for 15 variables. Accordingly, the highest possible score would be 1,500.

Figure 16 presents the Transit Needs Score by census block group for Bloomington, and illustrates that the areas attaining the highest scores (421.9 to 648.9) are located in a number of areas. These results reflect the combined impact of various measures and both aggregate and

rate indices. The Bloomington Transit fixed route bus system serves most of the areas that exhibit the greatest transit need.

Figure 16 - Transit Needs Score



Source: 2000 U.S. Census

STAKEHOLDER INTERVIEWS

Much of the information gathered in the analysis is quantitative in that it includes statistical information compiled by Bloomington Transit along with results of different survey activities. To provide a valuable qualitative view of the existing conditions and opportunities for the future, interviews were conducted of community leaders to seek their perceptions and views on public transportation. The stakeholder interview process consisted of three basic steps: (1) identification of the stakeholders, (2) preparation of a list of topics to be discussed and (3) the actual conduct of the interviews. Each of these steps and the results are presented in this interim report.

Stakeholders

The list of stakeholders was selected in consultation between the BPTC staff and the consultant team. Some of these individuals had been interviewed previously as part of a review of downtown transit facility needs. They included representatives of organizations that are directly impacted by transportation. They provide a broad cross-section of views of both appointed and elected officials as well as current and potential users of transit system as shown in Table 14.

Table 14 - Stakeholder Interview Participants

Name	Agency/Organization
Talisha Coppock	Downtown Bloomington, Inc.
Jewel Echelbarger	Rural Transit
Iris Kiesling	Monroe County Commission
Mark Kruzan	Bloomington Mayor
Jill Lesh	Monroe County Commission Former BPTC Board Member
Perry Maull	Indiana University Campus Bus
Tom Micuda	Bloomington Planning Department
Kent McDaniel	Indiana University-Institute For Urban Transportation
Valerie Pena	Bloomington Visitors and Convention Bureau
Richard Rampley	Indiana Work One
Scott Robinson	Bloomington Planning Department
Christy Steele	Bloomington Chamber of Commerce
Chris Stubaum	Bloomington City Council
Student Panel	Indiana University Transportation Advisory Committee
Sophia Travis	Monroe County Council
Steve Volan	Bloomington City Council

With the exception of the Indiana University student panel, the interviews were conducted with one or two individuals.

Findings and Results

While the stakeholder interview process provides a flexible format for soliciting views, about a dozen topics were prepared prior to the conduct of the interviews. It provided an outline of issues to be discussed and in some cases led to the discussion of other topics. The topics ranged from assessment of current services through suggested improvements. Ongoing with the current analysis, BPTC staff was preparing a white paper on a proposed downtown shuttle bus service. Because the views of the stakeholders were viewed as a valuable input to this effort, a single round of interviews were conducted to support both analyses.

It should be noted that some comments were isolated and reflected the view of a single individual, while others represented a widely held view. Another point to note is that the views are subjective and reflect attitudes and perceptions. Many of the stakeholders did not ride the bus system or were occasional users, while a few were frequent transit users. Nonetheless, the comments provide a useful and timely input to the planning process. The remainder of this interim report presents the comments of the study participants.

- **Knowledge and awareness of the current public transportation system in terms of what services are available, where and when service operates.** Most people had a general knowledge of the transit system in Bloomington, although many indicated that they were not aware of specific services in terms of where and when buses operate. Bloomington Transit was well known among the stakeholders while Rural Transit had lower recognition. Several people indicated that Bloomington residents were oriented to the private automobile, although a few cited the environmental concerns that are widely expressed in the community.
- **View of the system performance in terms of service, vehicles, operations and marketing.** There was unanimous agreement that Bloomington Transit was well run and that the agency was doing a superior job. Service was viewed as reliable and served most of the likely origins and destinations in Bloomington. Some reservations were expressed regarding trips beyond the municipal boundaries (e.g., west of Route 37). This limitation was a recurring theme in other topics. Drivers were often mentioned as being courteous and helpful. Bloomington Transit was also cited favorably as being involved and participating in community events. Some expressed concerns about schedule and route information that was difficult to follow and understand. This included both residents and visitors to the area.
- **BPTC image in the community.** Similar to the query above, Bloomington Transit was viewed favorably, with few negative comments. The bus system is very visible and most people think highly of the agency, although most people don't identify as riders. This dichotomy of views suggests that people think the transit system is a worthwhile public endeavor, but not one that they use often or at all. Some suggested that transit could help reduce congestion in some of the more heavily traveled corridors. Negative comments related to individuals that loitered in the vicinity of the downtown transit facility at 4th and Washington Streets. Some indicated that Bloomington Transit was important to downtown and the Indiana University campus. Its importance was diminished in other parts of the urban area, particularly beyond the Bloomington city limits.
- **Primary beneficiaries and users of the current system and benefits to the community of having a public transportation system.** There was wide agreement among the stakeholders as to who utilizes the bus system. Indiana students were the most frequently cited group because of income and parking restrictions on the IU campus. Others cited were people without an automobile that included low income residents and senior citizens. For many of these individuals, the lack of a car or the inability to drive makes them dependent on the bus system for meeting their mobility needs.

Interestingly, non-university students (e.g., middle and senior high school) were not mentioned by the participants. One individual cited Rural Transit and indicated that their riders were driven almost completely by need. A few stakeholders mentioned that there were other beneficiaries of the bus system. This would include non-users and the broader community who experience less congested streets and reduced environmental consequences. There was a view that providing public transportation and enhanced mobility is a positive quality of life feature of Bloomington.

- **Roles of public transportation in meeting mobility needs, particularly in relation to choice and captive markets.** It was widely recognized that many current riders utilize Bloomington Transit because an automobile is not available for their trips. The question is whether people who can drive can be encouraged to utilize the bus system. The majority view is that getting people to leave their cars for transit would be a “tough sell”.

In terms of convenience and comfort, the automobile is viewed as superior to most Bloomington residents. Buses operating at intervals of every 30 or 60 minutes is not going to divert people from their cars to transit. This is particularly the case in Bloomington, where many trips are relatively short. Also, many outlying areas are not served by Bloomington Transit. Some indicated that service would have to be expanded greatly in terms of coverage, frequency and span in order for the bus system to be a viable alternative to the automobile.

Some interviewees took a more optimistic view of Bloomington Transit’s ability to attract choice riders. An educational program would have to be oriented to environmental issues and the sustainability of the community. The effort would have to be long range in duration since it would require changes in attitudes on mode choice and their impacts on the community. Incentives and policies (e.g., parking price and availability) would have to discourage auto use and encourage transit riding.

Some indicated that there were niche markets that could attract increased transit ridership. This would include services oriented to leisure travelers as well as travel with multiple downtown destinations.

- **Responsiveness to community needs.** Once again, Bloomington Transit achieves high marks from the stakeholders. Often cited were the efforts to partner with others in the community and always being willing to listen to others, explore options and implement workable solutions. Programs such as First Friday, alternative fuel buses along with others were frequently cited. In view of the diverse set of stakeholders, these comments reinforce the high regard with which Bloomington Transit is held.

- **Viability of municipal bus system when development occurs beyond city limits.** This was viewed by most interviewees as a substantial barrier to increased ridership and mobility. Much of the new development is occurring beyond the city limits and Bloomington Transit is prevented by state law from operating in these areas. While there may be institutional barriers to the supply of bus service, there was recognition that travel is not tied to municipal boundaries. Examples cited include Ivy Tech, employment locations in the western portion of the urban area and the new Wal-Mart, as well as the proposed mixed use North Park development. Another related concern was that much of the new development reflects suburban sprawl and is not designed to be pedestrian and transit friendly. Without some remedy, this problem was expected to become a greater deterrent to transit riding and improved mobility options.

Nearly all individuals viewed the limitations on Bloomington Transit as a serious problem. Possible solutions cited were changes to state law that would permit BPTC to operate beyond the city limits. Another suggestion was that increased annexation might ameliorate this situation. The general view was that an aggressive annexation program by the City of Bloomington was not expected. Further, increased transit service alone would not seem a suitable basis to annex parcels.

Some individuals cited the need to coordinate services between Bloomington Transit and Rural Transit. The concern was that limited transit resources should not be duplicative. This is accomplished today to some extent since Rural Transit buses arrive at the downtown terminal at times when the BT buses “pulse”. There was general agreement that BPTC was better suited to meeting the transit travel needs in the outlying areas. In part this reflects the favorable view of Bloomington Transit in the community as well as the constrained funding situation of Monroe County.

- **How should public transportation respond to growth/future conditions during the next five years?** For the most part, the comments were related to proposals that might be implemented in the future. One comment was that the bus system should not follow development. The nature of sprawl and the lack of transit friendly design features suggested this strategy to some individuals. The majority opinion was that bus service should change to respond to this situation.

Frequent suggestions included service to Westside and new development projects, evening and Sunday service, along with increased coordination between the two bus carriers. Other suggestions were the need for a new and improved bus terminal in downtown and new services such as park-ride lots and services.

- **Needs or markets that should be met or met better.** A number of comments were made during the discussion of this topic. Various suggestions were made regarding

suburban destinations with reference to Ellettsville, North Park and employment and educational opportunities to the west. One concern is that these are locations beyond the city limits. Some indicated that the service would have to be geared to the pace of development, with certain markets being current or near term while others would occur 10 to 15 years hence.

In terms of geographical locations in the City of Bloomington, suggestions were made for service that defines either linear or pie-shaped corridors to the southeast and southwest. Various markets were mentioned and included Indiana University students traveling to internship positions which are not on campus. Also, late night jobs for retail and service employees are a market that is not well served by existing bus routes. Leisure travelers and the need for a downtown shuttle or circulator service was also mentioned during this portion of the interviews. Only one person mentioned high school students who might travel after school.

- **Desired transit improvements in terms of service and facilities.** A number of proposals were suggested, some of which have been mentioned previously. These transit improvements are listed below:
 - More frequent service, particularly where a route operates hourly and buses should afford half hour service.
 - Longer span of service on weekdays with general agreement on 10PM and 11PM, while some suggested late evening service.
 - Later service on Saturday.
 - Expanded Sunday service.
 - Weekend service oriented to visitors and leisure travel markets.
 - Downtown shuttle/circulator service, with some suggesting buses that have a vintage streetcar appearance.
 - Park-ride lots and services.
 - More direct route alignments with less circuitous routings.
 - Extend Bloomington Transit service beyond city limits such as Ellettsville.
 - Ivy Tech-Indiana University service.
 - Information kiosk on how to use bus system.
 - Individual route timetables and visitor guide.
 - Web page that has trip planning capabilities.
 - Fare payment by debit and/or smart cards.

- **Any additional topics or comments.** Interviewees were asked if they had any additional thoughts that they wanted to share at the conclusion of the discussions. Comments varied widely and included:
 - Smaller buses.
 - Additional funding.

- Use of JARC grants for evening service.
- Transit service oriented to special events and convention center expansion.
- Reinforce downtown as the hub for both Bloomington Transit and Rural Transit.
- Expanded marketing activities directed to Indiana University freshman class.
- Institute a U-Pass program for Ivy Tech similar to the one at Indiana University.

The discussion above provides considerable information on public transportation from a diverse cross-section of people in the community. Their comments provide useful information that will aid in the formulation of proposals to improve public transportation.

ROUTE DIAGNOSTICS ANALYSIS

This chapter of the report documents the analysis of bus service operated by the Bloomington Public Transportation Corporation (BPTC). It includes all the numbered routes whose service is available to the general public as well as Route C, which circulates on the Indiana University (IU) campus. The analysis presents overall statistics and different performance results (e.g., farebox recovery and productivity). The focus of this chapter is to delineate the characteristics of the BPTC bus routes utilizing several analytical techniques. With these approaches, each bus route is treated as an individual operating entity. The performance characteristics of each bus route are compared to the other bus routes as well as to the overall system. In some cases, bus routes are assigned to specific categories to contrast performance for different criteria. The route level analysis is quantitative and focuses on financial and productivity measures. The examination also ranks the bus routes, thus reflecting the competitive nature of allocating limited transit resources. The analysis was performed for the one year period ending December 31, 2006 (i.e., the last fiscal year).

Analysis Overview

An initial decision regarding the analysis was the time period for which data would be assembled, manipulated and analyzed with the subsequent results reported. It was felt that the analysis should be based on recent conditions at current service levels. Accordingly, data were gathered for the last fiscal year since it is a useful and recent benchmark to assess performance by individual bus route. Related to the selection of the analysis period is the route structure that is analyzed.

BPTC operates four bus lines that are interlined at the downtown terminal at 4th and Washington Streets. In essence, a bus enters the downtown from one neighborhood and then continues to another neighborhood. For example, Route 1 consists of two distinct bus lines which serve separate and different service areas. The northern portion of the route (i.e., Fee Lane/BHS North) is different from the southern leg (i.e., South Walnut/Arbor Glen). In some cases, the interlined routes have different frequencies and spans on the interlined legs. For this reason, each leg of Routes 1 through 4 was treated as two separate routes for analysis purposes. Combined with the other bus routes which are not interlined, the analysis was performed for 13 routes.

Data Assembly

The route level analysis requires considerable information on operating, financial and patronage statistics. Five statistics were input to the process and included revenue miles, revenue hours, peak vehicles assigned, farebox revenue and boardings. For the many data items, detailed information is available since BPTC compiles some of the information to monitor system performance. Because no information is maintained for the individual legs of the four interlined routes, some manipulation was required to establish data for a recent one year period. Presented below is a brief description of the key information that was compiled by service type and route.

- **Revenue Miles** - Information on revenue miles by individual route is not routinely reported and accumulated in terms of the route structure used in this analysis. Daily results by route were available for each service day - weekday, Saturday and Sunday - which is further stratified by whether Indiana University is in session. BPTC varies service levels based on the academic calendar. BPTC staff computed separate values for each segment for the four interlined routes. These daily values were multiplied by the number of days. The resulting annual values by route were summed to yield annual revenue miles.
- **Revenue Hours** - The results for this operating statistic were computed in a similar manner to that utilized for revenue miles. Values were disaggregated for the four interlined bus routes. Route values for each service day were multiplied by the appropriate number of days and then summed.
- **Peak Vehicles** - As the name implies, this statistic reflects the number of buses or vehicles in service during a typical day. It is derived from the number of vehicles operated during the peak service period on weekdays. With the exception of the interlined routes, the peak vehicles were taken directly from BPTC records. For the interlined routes, BPTC disaggregated the assigned vehicles based on cycle time (i.e., running and layover times) and headways.
- **Passengers** - BPTC registering fareboxes record passenger boardings as part of their routine monitoring of the bus system. Part of the drivers' normal responsibilities is to press the appropriate buttons on the registering farebox which indicates the type of fare and identifies specific bus trips by route. Farebox data by route for each month were summarized for January through December of 2006. Further analysis was required for the four interlined routes since the farebox data was for the entire route, rather than the individual legs. To address this situation, sample registering farebox readings were examined by time to obtain ridership information by individual leg. In addition, ridership information was reviewed from the systemwide ride checks that were conducted

a few months ago. Both the registering farebox readings and ridecheck data provided a means to proportion the ridership on each interlined route to its two legs.

- **Revenue** - The data for the registering fareboxes was used to estimate the average fare for each BPTC bus route. For the interlined routes, average fares were computed by each leg. By multiplying the route annual ridership by the computed average fare, estimates of the revenue by route for the last fiscal year were obtained. In addition, Indiana University paid BPTC approximately a quarter million dollars to operate the Route C Campus and additional service on the southern leg of Route 1: South Walnut/Arbor Glen and Route 6: Campus Shuttle. This amount was applied to each of these three routes on the basis hours of service purchased. The route revenue resulting from this two-step process was within four percent of the reported systemwide total. Accordingly, revenue for each route was proportioned upward to eliminate this difference. At the end of the process, the sum of the route revenue matches the total revenue reported for the 12 months ending December 31, 2006.

The five data items were compiled for each route and represent a recent one year period that is representative of current bus operations. One concluding point is that the route level database relies on information from a variety of sources. It is recognized that there may be some anomalies with some of the information. Nonetheless, it provides a reasonable basis to assess the performance of individual bus routes. Another point worth noting is that the current analysis disaggregated each interlined route into its component legs. Data collection and system monitoring procedures should be adjusted to permit a more detailed analysis of each route.

Diagnostic Techniques

The discussion above provides an overview of the necessary data assembly and manipulation. Five procedures were utilized to assess current route performance and provide different perspectives of gauging route level efficiency and effectiveness, as summarized below:

- **Cost Centers** - This technique establishes the revenue, cost and resulting deficit of each bus route. Emphasis is placed on farebox recovery, which is the percentage of operating costs that is covered from fares. A major element of this effort is the development of a financial model that relates operating costs to service levels. In the current analysis, a three-variable cost model was utilized in which the cost of a bus route was related to revenue hours, revenue miles and peak vehicles.
- **Contribution Analysis** - This procedure also places emphasis on the financial results of each bus route. The deficit is examined in terms of both relative amounts (i.e., farebox recovery) and absolute amounts (i.e., each route's contribution to the system deficit). This method allows each route to be assigned to one of four categories which reflect the

route's performance in each measure and whether it is better or worse than the system average.

- **Strategic Planning** - This analysis procedure gauges route performance for two criteria. The first measure is deficit per passenger, which indicates the extent of route subsidy for each boarding passenger. The second factor is the market share of each route, which has been defined as the ratio of each route's passengers to the average route for the system. Values greater than one denote routes with relatively large market shares, while values lower than one indicate routes with relatively small market shares.
- **Ordinal Ranking** - This bus route evaluation procedure numerically ranks all bus routes from best to worst for seven performance indices. Three measures relate to productivity while another four present deficit relative to operating and passenger statistics. In turn, these results are combined for each group of criteria to arrive at a combined score and overall rank.
- **Supply and Demand Review** - The concluding analytical technique is a review of the relative balance between each route's supply of service and the resulting performance. The number of weekly bus trips operated when IU is in session is compared to the passengers per revenue hour and farebox recovery. There should be a directly proportional relationship in that routes with better performance have more service while routes that have low performance operate less service.

The discussion above provides a brief summary of each technique that was utilized in the current analysis. As noted previously, the results are for a recent one year period that reflects the current route structure and service levels. Several points are worth noting at the outset. First, the techniques are diagnostic in that they indicate the need for more detailed analysis (e.g., a review of the ride check data) to remedy deficiencies and exploit opportunities. Second, they examine route level performance from a variety of perspectives to assure a comprehensive review of efficiency and effectiveness. Finally, the diagnostics review is only one input to the service development process, since issues such as need and equity must also be considered. Nonetheless, the current analysis provides a timely input to the preparation of service proposals.

Cost Centers

The primary objective of the cost centers analysis approach is that bus system operating, patronage, revenue and cost statistics can be disaggregated by individual route. Utilizing these statistics, deficit and various measures (e.g., farebox recovery) can be computed. With the exception of cost, all necessary data items can be obtained from BPTC's records, data collection efforts and manipulation activities, as noted previously. On the other hand, route-by-route costs

are more difficult to ascertain. Transit expenditures are recorded by expense accounts that “track” costs for the entire bus system.

To convert systemwide expenses to individual routes, a two-step process is required. First, a cost allocation model is quantified based on operating and financial experience. In the case of the bus system, this results in a three-variable formula that relates the cost of providing bus service to the revenue hours, revenue miles and peak vehicles. Second, each operating statistic for each bus route is multiplied by the appropriate unit cost to determine route operating costs.

Cost Allocation Model - The basic concept underlying the cost allocation model is that each operating expense is influenced or driven by one or more operating statistics or resource levels. Consideration of the nature of various operating expenses identified three major resources that “drive” each particular expense item. These resources are: (1) revenue hours; (2) revenue miles; and (3) peak vehicles. The “three-variable” model is preferred over a more complex formula including numerous other variables since it is easier to develop and apply while still maintaining a high degree of accuracy. Also, the three-variable model is superior to a single unit cost factor since it provides more accurate results and is sensitive to the different characteristics of each route. This is important at BPTC where operating speed and vehicle utilization can vary widely by route.

The model proposed for analyzing the bus system is termed a fully allocated cost formula. The method receives its name since all costs for bus service are included in the model’s development. No distinction is made between fixed and variable expenditures. This is consistent with the objective of the analysis, which is to compare financial performance by route. Most costs allocated to peak vehicles are typically fixed expenses which do not vary by the amount of service provided.

The fully allocated formula for the bus system could be readily converted to variable costs by eliminating those expenses allocated to peak vehicles. In turn, this would then result in a variable cost model with only two resource levels – revenue miles and revenue hours. This formula can be used to estimate the incremental costs of service changes.

Model Calibration - The primary source of data for the cost allocation model was the National Transit Data Base submission for the Federal Transit Administration for FY 2006. The form includes a description of expenses by function (e.g., vehicle operations) and object (e.g., wages) accounts for each mode (i.e., fixed route and demand responsive) operated or sponsored by BPTC. During this period, BPTC incurred costs of about 4.2 million dollars, which covers the cost of the entire bus system. The cost formula is calibrated by performing the following three tasks:

- Assign each individual expense in the system financial statement to one of the three selected resources that influence costs.
- Sum the costs assigned to each resource to obtain the overall cost allocated to the resource.
- Divide the overall resource cost by the quantity of the resource used by the system which are the coefficients of the cost model.

The allocation of each expense item is made on the basis of judgment, although the relationship between the expense item and variable is typically quite evident. It should be noted that some statistical analyses have been performed on the data from other transit systems that confirm the allocation process. This cost allocation process also reflects the prevailing practice within the industry where it is applied.

For example, operators’ wages are allocated to revenue hours since bus operators are hourly employees. The operating expense of their fringe benefits was also assigned to revenue hours. Some costs, such as mechanics’ compensation, fuel and replacement parts are a direct function of revenue miles operated. In addition, vehicle insurance costs are a function of accident exposure in terms of miles of service. Many of the expense accounts do not vary as a function of either revenue hours or revenue miles. For example, the cost resulting from providing an operating base and vehicle storage is determined by the number of peak vehicles in service. Also, administrative expenses vary based on the system scale as measured by the number of vehicles required to operate the bus system.

The results of this allocation process for the BPTC bus system are presented in Table 15.

Table 15 - Fully Allocated Cost Model

Basis For Allocation	Amount (Dollars)	Percent	Operating Statistics	Unit Costs (Dollars)
Revenue Hours	1,907,000	45.0	79,680	23.93
Revenue Miles	1,519,700	35.9	891,850	1.70
Peak Vehicles	809,200	19.1	28	28,899.04
Total	4,235,900	100.0		

Approximately one-half of all bus system expenses were assigned to revenue hours. This is logical since drivers’ wages and fringe benefits account for a substantial portion of bus system costs. This clearly underscores the labor intensive nature of public transportation. Revenue miles account for about 36 percent of all of the bus system expenses, with peak vehicles assigned about 19 percent of all costs. The costs attributable to revenue hours result in a cost of \$23.93 per revenue hour. The cost allocated to revenue miles of operation yields a unit cost of \$1.70 per

revenue mile, while the costs attributable to each peak vehicle over the course of a year produced a unit cost of \$28,899.

Utilizing the three-variable analysis results in the following cost allocation formula for the BPTC bus system:

$$C = 23.93 * H + 1.70 * M + * 28,899 * V$$

where:

C = Cost

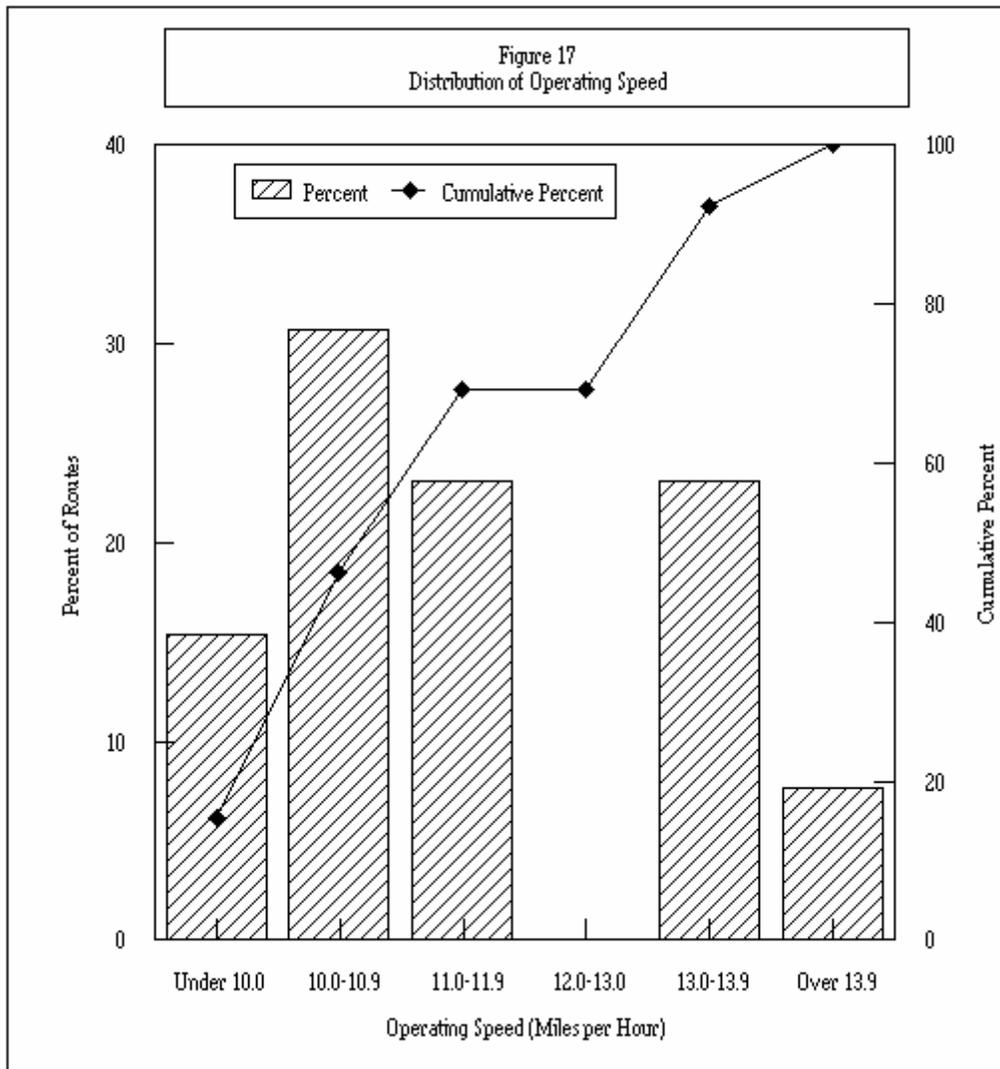
H = Revenue Hours

M = Revenue Miles

V = Peak Vehicles

The calibrated three-variable cost formula differs substantially from the traditional transit industry yardstick for measuring cost. This traditional approach is to compute a simple cost per mile or hour statistic. For the fiscal year, systemwide average unit costs for BPTC were approximately \$53.16 per revenue hour or \$4.75 per revenue mile. The use of both revenue hours and revenue miles permits the cost allocation model to be sensitive to operating speed. As shown in Figure 17, there is a range of operating speeds on BPTC bus routes. This is consistent with the different characteristics of the service types, streets traversed and development patterns operated through by each of the routes. For example, Route 6: Campus Shuttle and Route C: Campus, which operate on campus and have heavy ridership (i.e., frequent boarding and alighting) have speeds less than ten miles per hour. Some routes have speeds in excess of 13 MPH. Individual route speeds range from a low of 9.0 to a high of 14.5 miles per hour, with a system average of about 11.2 MPH. Similar variations are noted for measures such as revenue miles and revenue hours per peak vehicle, which suggests the need for the three-variable approach.

Route Financial Performance - The previous sections described the data collection procedures for establishing a database of route information and the calibration of a three-variable cost model. The next step was to apply the cost model to the route level operating statistics to establish the cost of each bus route. As noted previously, the four interlined bus routes were divided into their component parts, with a total of 13 bus routes analyzed.



The results of the cost centers analysis by individual route are presented in Table 16, which indicates the revenue, cost and necessary subsidy for the one year analysis period. The first method utilized to rate bus routes and to categorize their financial performance is to examine their farebox recovery. Overall, the PBTC bus system achieves a farebox recovery of 25.89 percent, which implies a subsidy of \$2.86 for each dollar paid in fares.

**Table 16
Financial Results By Route**

					Farebox Recovery (Percent)	Rank	Percent Better	Percent Worse
Route	Revenue	Cost	Deficit					
1S	South Walnut/Arbor Glen	85,400	369,000	283,600	23.14	3	--	10.61
1N	Fee Lane/BHS North	29,700	210,900	181,200	14.08	8	--	45.61
2S	S. Rogers/Countryview	40,400	186,300	145,900	21.69	5	--	16.24
2N	W. 11th Street/Showers	33,200	184,500	151,300	17.99	6	--	30.50
3E	College Mall/Bradford Place	98,400	437,300	338,900	22.50	4	--	13.09
3W	Highland Village/Curry Plac	54,400	410,200	355,800	13.26	10	--	48.78
4E	High Street/Sherwood Oaks	30,800	199,800	169,000	15.42	7	--	40.46
4W	Bloomfield Road	26,500	227,300	200,800	11.66	11	--	54.97
5	Sare Road	16,500	191,000	174,500	8.64	12	--	66.63
6	Campus Shuttle	228,800	717,100	488,300	31.91	2	23.24	--
7	Henderson/Walnut Express	34,200	247,600	213,400	13.81	9	--	46.65
8	Eastside Local	10,400	188,100	177,700	5.53	13	--	78.64
C	Campus	407,900	666,700	258,800	61.18	1	136.31	--
	Total	1,096,700	4,235,900	3,139,200	25.89			

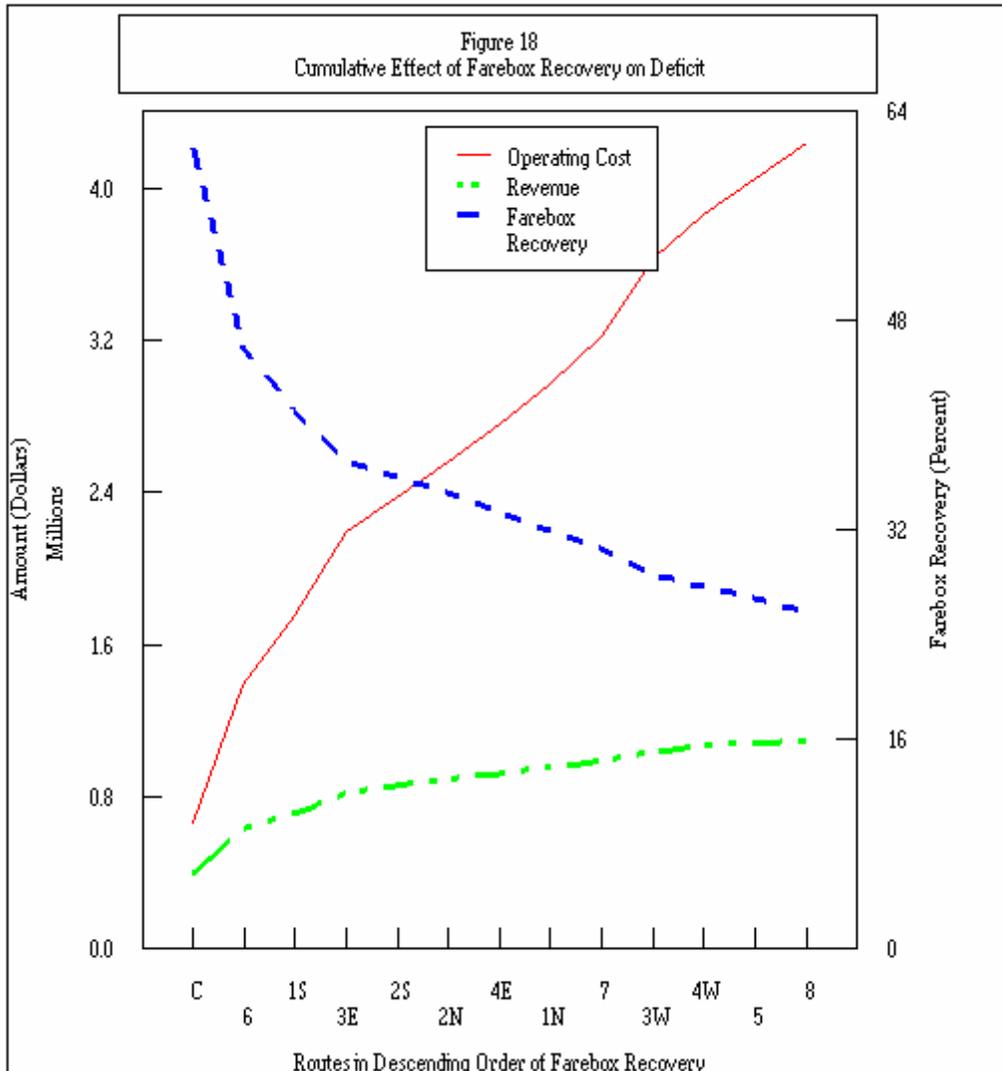
As with many of the analyses presented here, there is wide disparity between the individual BPTC bus lines. Route C: Campus has the highest farebox recovery of 61.18 percent while Route 8: Eastside Local has the lowest (i.e., 5.53 percent). The distribution of farebox recovery reflects two vastly different patterns. Route 6: Campus Shuttle and Route C: Campus are the only routes that exceed the system average. Eleven routes have results that are below the system average with most routes having values in the mid teens. Three routes (i.e., Route 1S: South Walnut/Arbor Glen, Route 2S: S. Rogers/Countryview and Route 3E: College Mall/Bradford Place) have farebox recovery values between 20 and 24 percent. The remaining routes have values in the mid teens with the exception of two bus lines (i.e., Route 5: Sare Road and Route 8: Eastside Local) that have a farebox recovery of less than ten percent.

Two concluding points are worth mentioning. First, the performance of individual bus routes is influenced by their orientation to student population and use as well as funding provided by Indiana University. The second is that the comparison of individual route performance relative to the system average is a common feature of the diagnostic techniques, although the criteria and measures differ.

Contribution Analysis

The next method utilized to rate the system’s bus routes and to categorize their financial performance is to examine both their farebox recovery rates and deficit amounts in combination. As can be seen in Figure 18, the system deficit grows larger as each bus route’s operating cost

and revenue are accounted for. By considering the bus routes in descending order of farebox recovery, the system’s operating cost continues to increase but aggregate revenue begins to “flatten out”, thus contributing to a mounting deficit.



Each bus route was rated relative to the system average. For example, as shown in Table 17, the farebox recovery rates of all of the bus routes were indicated as being either “better” or “worse” than the system average. In a similar manner, the 13 bus routes were rated with respect to their contribution to the deficit. For ease of presentation, the deficit amounts have been calculated relative to each route contributing 1/13th of the deficit. On average each bus route should contribute about 7.7 percent of the system deficit, or \$241,480. For example, Route 3E:

College Mall/Bradford Place had a deficit of \$338,900, which is 1.40 times greater than the average. However, whether a route actually contributes more or less to the cumulative deficit is reflected in Table 17.

**Table 17
Farebox Recovery And Contribution To Deficit**

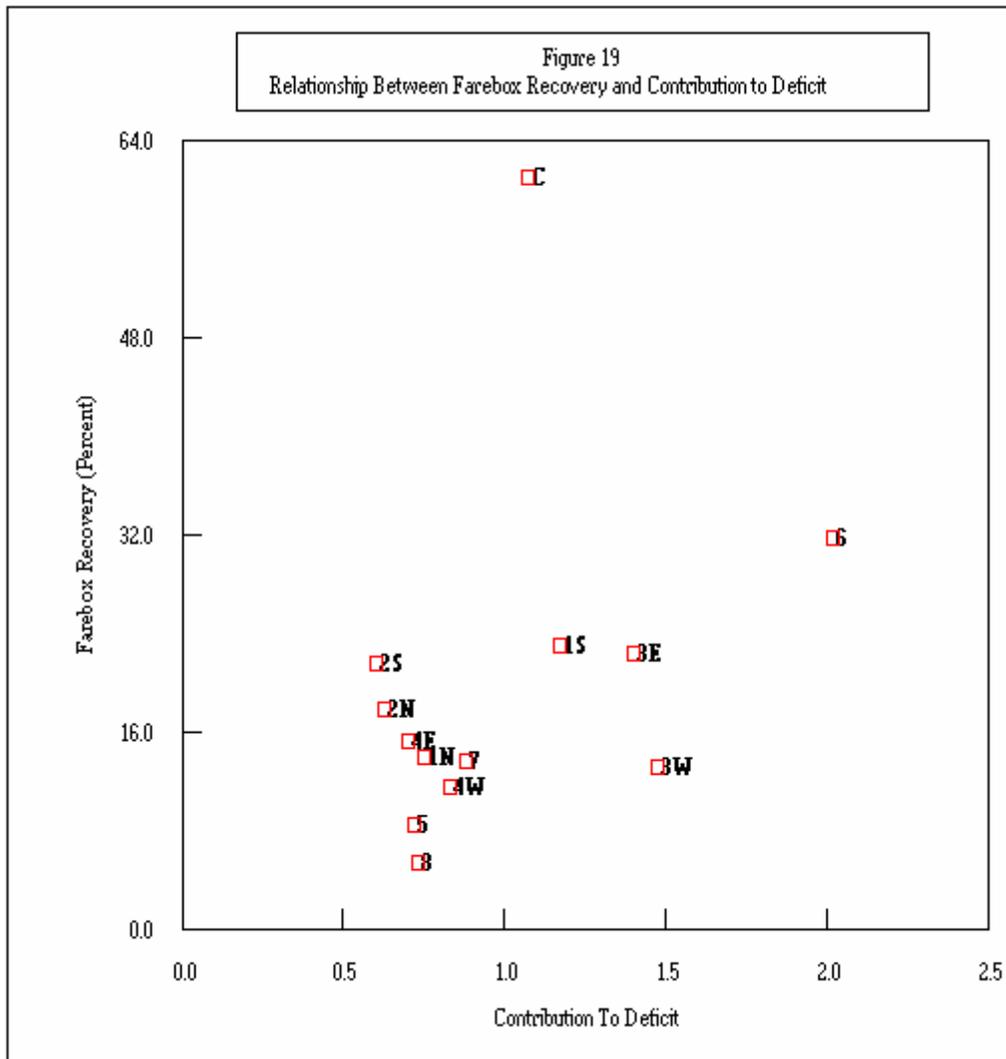
	Route	Farebox Recovery (%)		Contribution To Deficit		Category
		Value	Rating	Value	Rating	
1S	South Walnut/Arbor Glen	23.14	Worse	1.17	Worse	4
1N	Fee Lane/BHS North	14.08	Worse	0.75	Better	2
2S	S. Rogers/Countryview	21.69	Worse	0.60	Better	2
2N	W. 11th Street/Showers	17.99	Worse	0.63	Better	2
3E	College Mall/Bradford Place	22.50	Worse	1.40	Worse	4
3W	Highland Village/Curry Plac	13.26	Worse	1.47	Worse	4
4E	High Street/Sherwood Oaks	15.42	Worse	0.70	Better	2
4W	Bloomfield Road	11.66	Worse	0.83	Better	2
5	Sare Road	8.64	Worse	0.72	Better	2
6	Campus Shuttle	31.91	Better	2.02	Worse	3
7	Henderson/Walnut Express	13.81	Worse	0.88	Better	2
8	Eastside Local	5.53	Worse	0.74	Better	2
C	Campus	61.18	Better	1.07	Worse	3
	Total	25.89		13.00		

All 13 bus routes have been rated relative to their deficit contribution and farebox recovery. By utilizing this two-way stratification, four route categories were determined as follows:

Stratification System

Farebox Recovery	Contribution To Deficit	Category
Better	Better	1
Worse	Better	2
Better	Worse	3
Worse	Worse	4

There are no bus routes that have a superior rating in terms of both relative and absolute measures of deficit (Figure 19). On the other hand, three bus routes fall into the fourth category, which has poor ratings for both measures. For these bus routes, consideration should be given to changes which can more closely balance the supply and demand characteristics of the service. It should be recognized that the results are influenced by the fact that only two routes have better farebox recovery values while 11 routes have values worse than the average.



The other two categories reflect mixed results. For example, Category 2 routes have relatively low farebox recovery values, but only contribute a modest amount to the deficit. This would suggest limited service for these eight routes, which include about two-thirds of all bus lines. The results for the third category are reversed from those for the second group. While the farebox recovery is favorable, the deficit contribution is relatively high, with only two bus lines falling in this category. These routes (i.e., Route 6: Campus Shuttle and Route C: Campus) exhibit superior performance on a rate basis, but are larger routes which contribute significantly to the system deficit. The results, as graphically depicted in Figure 19, would seem to suggest a wide disparity in performance for both financial measures and the need to examine financial performance in terms of both rate (i.e., farebox recovery) and aggregate (i.e., contribution) measures.

Strategic Planning

This diagnostic tool examines each route on the basis of its deficit per passenger and each route's share of the system ridership. This is a transit adaptation of strategic planning in the private sector. As noted above, one criterion used in the analysis is route deficit on a per passenger basis. The importance of this statistic is that it represents the subsidy provided each boarding passenger. It reflects the level of service and the resulting costs as well as patronage and the present fare structure and funding arrangements.

Similar to the previous analysis, routes have been classified for two performance criteria (i.e., deficit and ridership levels) relative to the system average. The former uses deficit per passenger relative to the systemwide average deficit per passenger. This ratio indicates how well a route is performing in comparison to other routes. For example, Route 4W: Bloomfield Road has a deficit per passenger of \$2.97 while the system average was \$1.33, or a ratio of 2.24. Routes with ratios less than one have a low deficit per passenger rating, while routes with values in excess of one have a higher deficit per passenger rating.

To define a relative measure of ridership, market share has been used. It represents the ratio of each route's ridership to the average route ridership for the system. A value greater than one indicates high relative ridership, while values less than one denote low ridership.

The need for a ridership measure is apparent from the cumulative distribution of riders by route. Ridership levels typically vary between routes, and therefore this distribution is not uniform. It would suggest that portions of the bus system reflect the desire to provide service where the demand alone would not warrant these levels of service. This analytical technique attempts to classify routes in terms of ridership levels and the subsidy attributed to each patron. As shown in Table 18, all routes have been rated relative to deficit per passenger and market share. Based on this two-way stratification system, four route categories were determined as follows:

Stratification System

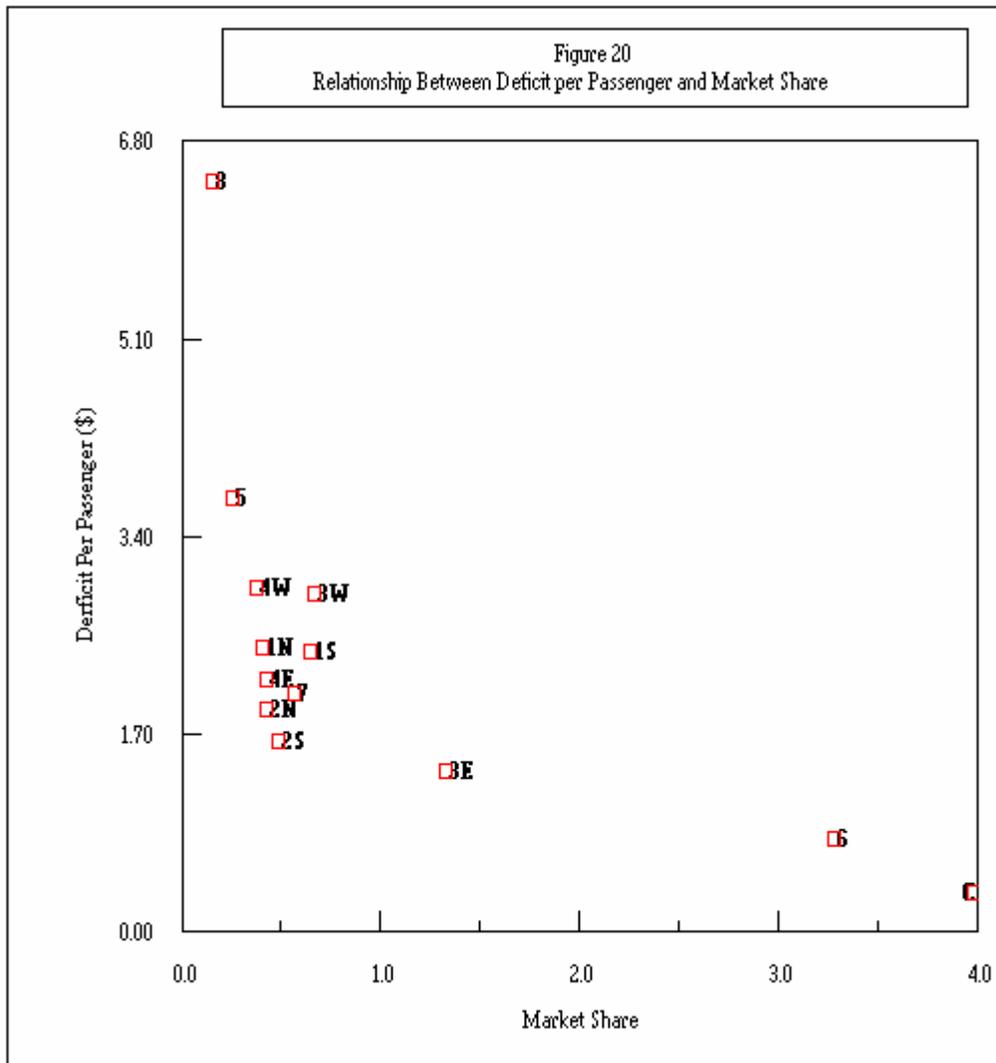
Deficit per Passenger	Market Share	Category
High	High	1
Low	High	2
High	Low	3
Low	Low	4

**Table 18
Deficit And Ridership Levels**

	Route	Deficit Per Passenger		Market Share		Category
		Value (\$)	Rating	Value	Rating	
1S	South Walnut/Arbor Glen	2.43	1.83	116,900	0.64	3
1N	Fee Lane/BHS North	2.45	1.85	73,900	0.41	3
2S	S. Rogers/Countryview	1.66	1.25	88,100	0.48	3
2N	W. 11th Street/Showers	1.93	1.45	78,300	0.43	3
3E	College Mall/Bradford Place	1.40	1.05	242,000	1.33	1
3W	Highland Village/Curry Plac	2.92	2.20	121,900	0.67	3
4E	High Street/Sherwood Oaks	2.19	1.65	77,300	0.43	3
4W	Bloomfield Road	2.97	2.24	67,500	0.37	3
5	Sare Road	3.73	2.81	46,700	0.26	3
6	Campus Shuttle	0.82	0.62	596,700	3.28	2
7	Henderson/Walnut Express	2.07	1.56	103,200	0.57	3
8	Eastside Local	6.47	4.87	27,500	0.15	3
C	Campus	0.36	0.27	723,600	3.98	2
	Total	1.33	1.00	2,363,500	13.00	

Category 1 bus routes are those which have high relative ridership levels and yet incur a large deficit for each passenger carried. The net impact is typically a relatively large deficit to operate the route. Only one bus line, Route 3E: College Mall/Bradford Place, falls into this less desirable category. A preferred situation is Category 2, where route ridership is high, but the deficit per passenger is low, with only Route 6: Campus Shuttle and Route C: Campus falling in this category. The third category, with ten routes, exhibits high deficit per passenger, but the level of service and number of passengers is low. These different performance levels offset one another. This situation may not necessarily place a significant financial burden on the transit system. Category 4 bus routes also do not place a significant financial burden on the transit system. Deficit per passenger and route ridership levels are both relatively low. None of the BPTC bus routes fall into this category.

The route classification is graphically depicted in Figure 20. As with the other classification system, the two-way stratification provides a framework for gauging performance. The results show a desirable inverse relationship between market share and deficit per passenger. Service is concentrated on those routes where deficit per passenger is relatively low. Once again, there is a dichotomy of results where routes oriented to IU and students differ from the other bus lines. This situation reflects ridership levels, average fare values which are influenced by the usage of pre-paid fare media and direct funding provided by Indiana University.



Ordinal Ranking

Another type of evaluation procedure is termed ordinal ranking since all 13 bus routes are ranked from best to worst for several performance indices. In turn, these results are combined to provide an overall assessment of route performance. The application of this route evaluation technique consists of three sequential steps. The first is the selection of measures or criteria to gauge each bus route's performance. In the current analysis, these indices have been grouped into two broad categories to assess productivity and deficit.

In all cases, the criteria are specified as rates in that they compare ridership and deficit relative to various operating statistics. This definition of each evaluation yardstick permits

routes with different service levels and requirements to be readily compared. As with other evaluation measures, these results are informative and useful inputs to the planning process.

The next step in the route diagnostic process is to rank the routes from best to worst performance for each of the seven evaluation criteria. In the case of the productivity (passenger) measures, higher route values indicate favorable performance, with these routes assigned low rankings. The route with the highest productivity value and exhibiting the best performance would be assigned a rank of one.

Conversely, routes that exhibit relatively low productivity results would denote deficient performance. For example, the route with the lowest productivity value would exhibit the worst performance and therefore would be ranked 13th. In a similar fashion, each of the routes comprising the bus system was ranked for four deficit measures. One difference is that for these measures, low values indicate better relative performance and high values denote relatively poor performance.

The concluding step in the ordinal ranking process is to combine results for the individual criteria into aggregate ratings for productivity and deficit requirements. For the two productivity measures, the ranks for each route were summed to determine a score. In turn, this score was used to establish an overall ranking for each route for both productivity measures. Similarly, scores and ranks were computed for the three deficit indices.

Productivity Results - Three distinct measures were specified which relate the ability of each route to attract patrons relative to the resources necessary to provide bus service. Consistent with factors that influence costs, the productivity measures utilized were passengers per revenue mile, revenue hour and peak vehicle.

As seen in Table 19, the three measures were calculated and each bus route was ranked. The accompanying table illustrates the range of results, which vary substantially. Table 4 also illustrates how the rankings were then combined to generate an overall score, which itself was ranked. In terms of passenger productivity, the most productive route appears to be Route C: Campus, with the least productive route being Route 8: Eastside Local.

Productivity Results By Route

Measures (Dollars)	Best	Worst
Passengers Per Revenue Mile	6.39	0.61
Passengers Per Revenue Hour	57.64	7.99
Passengers Per Peak Vehicle	120,989	27,474

The results show a fairly consistent pattern in route level productivity regardless of the performance measure. Some differences are noted, which are attributable to different speeds and

vehicle utilization. Substantial differences are also noted by the extent that the route is oriented to serving IU students.

Deficit Results - In a similar fashion, four subsidy measures were specified (Table 20). The first three record the deficit - or amount of tax subsidy - by operating statistic in which performance is related to revenue mile, revenue hour and peak vehicle. The fourth criterion is the ratio of subsidy (or deficit) per passenger. It should be recognized that the subsidy per passenger not only relates to route performance but also measures the equity in distributing funds

**Table 19
Passenger Productivity Score And Rank**

Route	Revenue Mile		Revenue Hour		Peak Vehicle		Combined	
	Value	Rank	Value	Rank	Value	Rank	Score	Rank
1S South Walnut/Arbor Glen	1.41	9	16.46	10	58,456	10	29	9
1N Fee Lane/BHS North	1.57	8	17.38	8	73,868	7	23	8
2S S. Rogers/Countryview	2.19	4	23.75	5	88,147	3	12	4
2N W. 11th Street/Showers	1.96	5	21.43	6	78,295	5	16	5
3E College Mall/Bradford Place	2.41	3	27.79	3	120,989	1	7	2
3W Highland Village/Curry Place	1.16	11	16.80	9	60,940	9	29	9
4E High Street/Sherwood Oaks	1.81	7	18.80	7	77,280	6	20	6
4W Bloomfield Road	1.17	10	16.15	11	67,513	8	29	9
5 Sare Road	1.12	12	12.25	12	46,726	12	36	12
6 Campus Shuttle	4.88	2	46.63	2	85,237	4	8	3
7 Henderson/Walnut Express	1.93	6	25.09	4	51,619	11	21	7
8 Eastside Local	0.61	13	7.99	13	27,474	13	39	13
C Campus	6.39	1	57.64	1	120,592	2	4	1
Total	2.65		29.66		84,412			

**Table 20
Deficit Score And Rank**

Route	Revenue Mile		Revenue Hour		Peak Vehicle		Passenger		Combined	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Score	Rank
1S South Walnut/Arbor Glen	3.42	4	39.94	5	141,800	4	2.426	8	21	5
1N Fee Lane/BHS North	3.84	8	42.64	8	181,200	12	2.453	9	37	10
2S S. Rogers/Countryview	3.63	6	39.30	4	145,900	5	1.655	4	19	4
2N W. 11th Street/Showers	3.78	7	41.42	7	151,300	6	1.932	5	25	6
3E College Mall/Bradford Place	3.37	2	38.92	3	169,450	8	1.401	3	16	2
3W Highland Village/Curry Place	3.39	3	49.06	11	177,900	11	2.919	10	35	9
4E High Street/Sherwood Oaks	3.97	10	41.11	6	169,000	7	2.187	7	30	7
4W Bloomfield Road	3.48	5	48.04	10	200,800	13	2.974	11	39	11
5 Sare Road	4.20	13	45.74	9	174,500	9	3.735	12	43	12
6 Campus Shuttle	3.99	12	38.16	2	69,757	2	0.818	2	18	3
7 Henderson/Walnut Express	3.98	11	51.87	13	106,700	3	2.067	6	33	8
8 Eastside Local	3.94	9	51.67	12	177,700	10	6.468	13	44	13
C Campus	2.29	1	20.62	1	43,133	1	0.358	1	4	1
Total	3.52		39.40		112,114		1.328			

to support the bus system. Consistent with the previous analyses, each route is ranked relative to each other and the results summed to attain a score which is subsequently the basis for an overall deficit ranking.

As shown in the accompanying table, and similar to the results exhibited for productivity, route performance varies substantially. Typically, routes receive similar results for many deficit measures; although some significant differences are noted.

Deficit Results By Route

Measures (Dollars)	Best	Worst
Deficit Per Revenue Mile	2.29	4.20
Deficit Per Revenue Hour	20.62	51.87
Deficit Per Peak Vehicle	43,133	200,800
Deficit Per Passenger	0.358	6.468

In the aggregate, a generally consistent pattern of route performance emerges, although some differences are noted. The variation in route performance for the deficit measures would appear greater than that observed for productivity. Typically, routes that attain a particular rating in terms of productivity achieve a similar performance level for the deficit measures. Differences are attributable to different speeds, vehicle utilization and average fare. The latter is influenced by the utilization of pre-paid fare media and the funding arrangements with IU.

Supply and Demand Review

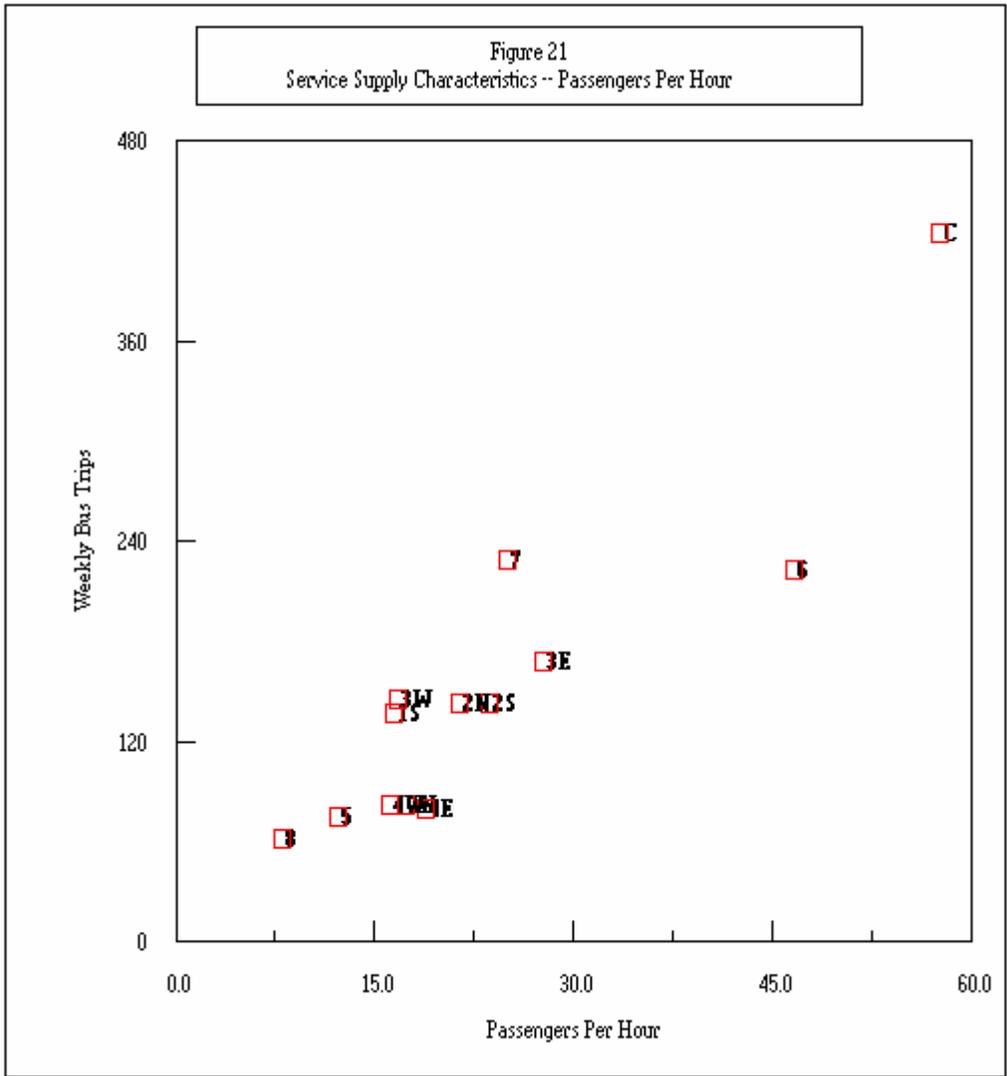
The concluding analytical technique is a review of the relative balance between the bus service provided on each route relative to its performance for certain key measures. The analysis compares the number of weekly bus trips to two performance measures - passengers per revenue hour and farebox recovery. A ratio is computed which is merely the quotient of weekly trips and either productivity or farebox recovery. This ratio is shown in Table 21 for both measures. In addition, each route was assigned to one of three categories depending on the system average. Routes with ratios less than two-thirds of the system average are rated low while routes that are one-third greater than the average are rated high. Routes with ratios that are within one-third of the system average are rated medium.

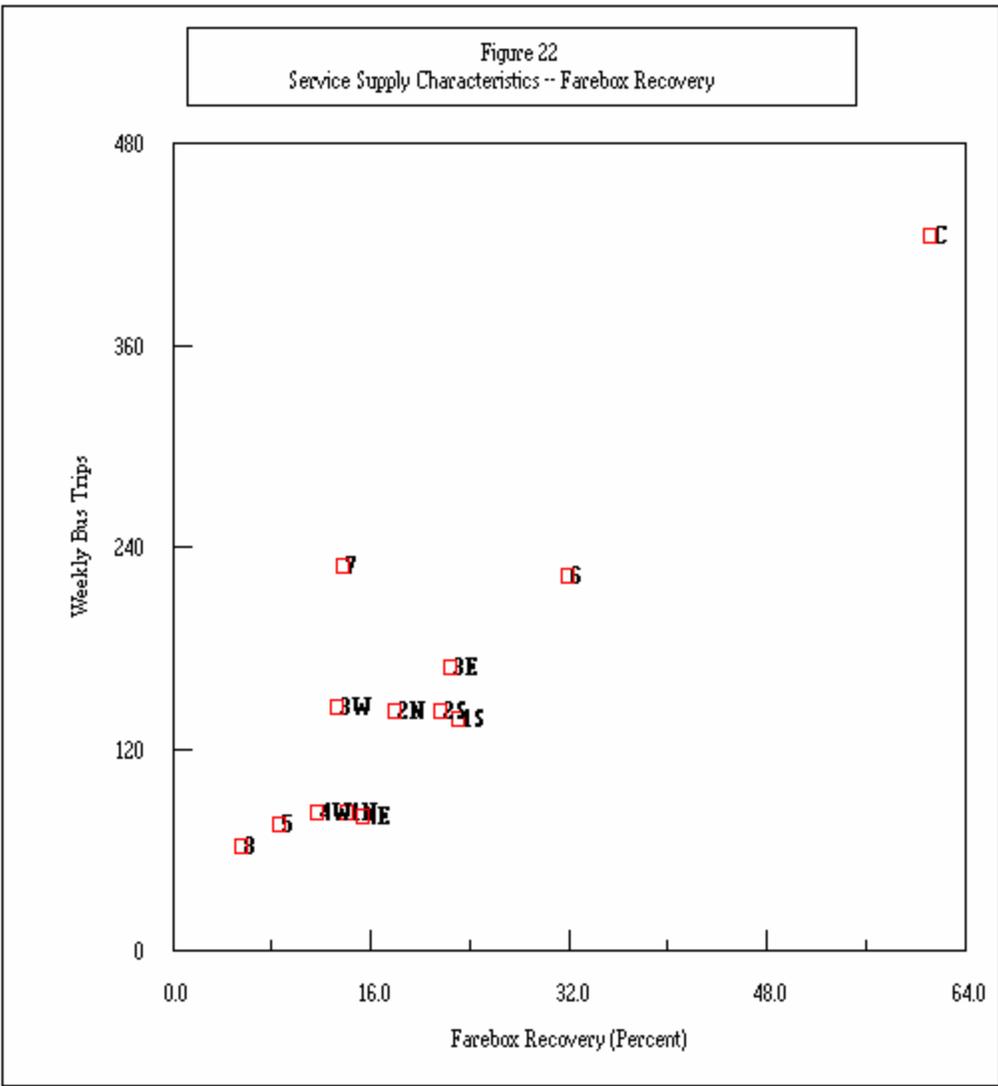
		Passengers Per Hour		Farebox Recovery	
		Ratio	Rating	Ratio	Rating
Route					
1S	South Walnut/Arbor Glen	8.41	Medium	5.98	Medium
1N	Fee Lane/BHS North	4.80	Medium	5.93	Medium
2S	S. Rogers/Countryview	6.06	Medium	6.64	Medium
2N	W. 11th Street/Showers	6.70	Medium	7.97	Medium
3E	College Mall/Bradford Place	6.10	Medium	7.53	Medium
3W	Highland Village/Curry Place	8.72	Medium	11.05	Medium
4E	High Street/Sherwood Oaks	4.28	Low	5.22	Low
4W	Bloomfield Road	5.14	Medium	7.12	Medium
5	Sare Road	6.21	Medium	8.80	Medium
6	Campus Shuttle	4.80	Medium	7.02	Medium
7	Henderson/Walnut Express	9.17	High	16.65	High
8	Eastside Local	7.89	Medium	11.39	High
C	Campus	7.39	Medium	6.96	Medium
Total (Average)		6.59		8.33	

As shown in Figure 21, the weekly trips are reviewed in relation to passenger productivity in a graphical fashion. The most desirable pattern would be weekly trips directly proportional to passengers per hour. In essence, bus routes with high passengers per hour should have a relatively high number of weekly trips. Conversely, low passengers per hour should result in fewer numbers of weekly trips.

The routes exhibit a fairly consistent linear pattern, which indicates a strong relationship between the supply of service and the passenger productivity. Moreover, a regression analysis was performed which quantitatively establishes this pattern. This suggests that system supply and demand characteristics are balanced to a considerable extent. For the two routes that are not rated in the medium category, the extent of deviation is relatively minor.

In a similar manner, the relationship between weekly trips and farebox recovery were plotted (Figure 22). This exhibit also confirms the relative balance between transit supply and demand. The regression analysis indicates a strong linear relationship between farebox recovery and weekly trips. Routes with better financial performance are provided more service with lower performing routes having less frequent service. As with productivity, the routes that are rated low (i.e., Route 4E: High Street/Sherwood Oaks) and high (i.e., Route 7: Henderson/Walnut Express and Route 8: Eastside Local) do not differ appreciably from the linear relationship.





SERVICE PROPOSALS

A wealth of information has been gathered on the existing bus system and the transportation setting in which it operates. These data have consisted of quantitative items as well as views and perceptions of people involved with transportation and development in Bloomington. Based on this input and consideration of policy parameters, a series of route and service proposals have been formulated. One observation at the outset is that the BT fixed route bus system appears well suited to the service area in which it operates and the markets which it serves. Radical changes to the network are not suggested since it could jeopardize the current high ridership levels. Accordingly, a series of proposals are presented which include revisions to existing routes and suggested new bus lines to respond to future growth. Significant changes are proposed in the frequency and span of service.

Recognizing the flexibility of bus service, revisions to the plan can be made as it is implemented. This chapter presents the input data, planning precepts that influenced the planning process and service proposals for Bloomington Transit (BT) during the next five years.

Service Development Process

The analysis was based on a rigorous review of existing services and potential future markets. As such, it delineated problem areas that warranted remedial action as well as opportunities that should be exploited. A considerable amount of information was obtained and analyses conducted, which served as vital input to the service development process. Further, planning precepts were postulated that provide policy inputs to the analysis. Each of these important considerations to the planning process is summarized in this section.

Service Inputs - A number of inputs were considered in preparing the program of public transportation options for the community. They consisted of technical analyses as well as opinions and views of riders and community representatives. Each of these inputs is briefly described below:

- **Stakeholder Interviews** - The consultant interviewed a broad spectrum of community leaders to assess their views on the current public transportation system, community needs and proposals for the future. Various topics were used to guide the discussions, but participants were free to make any suggestions or comments.
- **Service Area Characteristics** - Utilizing U.S. Census data, the BT service area was described in terms of population concentrations and the characteristics of residents. Of particular interest were communities where transit need was the greatest. The locations

of major generators (i.e., major employers, shopping centers, schools and hospitals) were identified, along with the appropriate dimensions.

- **Route Diagnostics Analysis** - Each bus route was examined in terms of key operating and financial measures with the objective of assessing relative efficiency and effectiveness. Several techniques were applied to gauge the balance between bus system supply and demand. A unique feature of the analysis was that each of the four interlined routes was broken into its component parts.
- **Rider Surveys** - An extensive data collection effort was undertaken to obtain data on current riders and their perceptions. Three separate survey techniques were used. Ride checks were conducted on four days – two weekdays, a Saturday and a Sunday. With this procedure, on-board observers record the location and time of all passenger boardings and alightings. A rider survey was conducted to solicit information on riders about the trip they were making, their characteristics and suggested improvements. Another survey was undertaken to measure transfer activity for each route pair.
- **Driver Meetings** - Meetings were held with BT drivers to provide input for the service improvement program. Given their duties, they provide a useful perspective on the current bus system and desirable changes. Various suggestions were made regarding route alignments and level of service.
- **Open House** – Two public forums were held in March to solicit comments on BT services. After a brief introduction on the current study, four stations were set up to obtain comments from participants. The purpose was to listen to suggestions and comments, rather than have a more formal meeting.
- **Customer Walk-Ups** - The views of BT riders were obtained through interviews at the downtown terminal. Riders provided a number of suggestions for improvements to specific bus routes and the overall bus system. Riders indicated the need for evening and Sunday service, along with other suggestions.
- **Steering Committee** – Various interim reports were reviewed with members of the project review team. Issues were identified, along with possible proposals that might emerge from the current analysis.
- **Field Reconnaissance** - Hundreds of miles of field trips were conducted throughout the area to gain a first-hand understanding of existing transit operating characteristics as well as the layout of present and future development. During the course of these investigations, land use, key generators and other noteworthy items were recorded.

The discussion above indicates the extensive input to the planning process. It included technical analyses that examined the existing BT bus system and the setting in which it operates. These findings were complemented with suggestions from riders, the public, drivers, the Bloomington community and BT management staff.

Planning Precepts - Having assembled the comprehensive and detailed database described previously, the next step in the process was to formulate principles that would guide the development of service proposals. They provide a policy framework for the service plan and are summarized below:

- **Transportation Setting** – Much of the existing service territory is in areas where development is sufficiently concentrated to support some level of fixed route bus service. Large tracts of vacant land exist and it is likely that much of the future development will consist of single family, detached housing. Often these developments have a single access roadway that makes it difficult to serve and achieve productive use of limited transit resources. Another concern is the continued development of apartments marketed towards IU students in outlying areas with increasing distance from the campus.
- **Municipal Boundaries** - Because of provisions of state law, Bloomington Transit is confined to operations within the city limits. Some important generators, such as Ivy Tech and areas of job growth to the west cannot be easily served under present State law which establishes the BT service area boundaries. Based on present expectations for annexation, this procedure is not a likely solution. While Rural Transit provides service beyond the municipal boundaries with some level of coordination with BT, it does not yield an acceptable transit solution in terms of convenient and acceptable levels of bus service.
- **Dual Destinations** – Most of all transit trips either originate or terminate in downtown Bloomington or on the Indiana University campus. This demand pattern is expected to continue in the future, which would suggest routes focused on each major generator in a radial pattern. This may account for duplication of some alignments to afford convenient service to each generator.
- **Character of Service** - BT fixed route service is quite extensive and provides coverage to most areas that could support fixed route bus service. Several routes focus on downtown Bloomington, which is the hub for non-university activity in the community. Other routes are oriented to the Indiana University campus, which is the single largest regional generator. A third category of service is the single crosstown route that serves the eastern portion of Bloomington. This basic network configuration is well suited to the service area and should be maintained.

- **Variety of Service Types** – Public transportation does not only imply fixed route bus service. Bloomington Transit does provide demand responsive service (i.e., BT Access) to persons with disabilities. Opportunities exist to provide similar types of service to the general public. This could be accomplished by conventional dial-a-ride or ride request services where the paratransit system connects with a bus stop on the fixed route system. Both the services can be a cost effective way of providing transit mobility where ridership levels are low and the alternative is no service.

- **Timed Transfer** - The current BT bus system is termed “pulse-scheduled” since buses arrive and depart at transfer stations at about the same time. This enables riders to transfer from one route to another without a lengthy waiting period. In view of the likely headway policy (i.e., buses every 30 or 60 minutes), an alternative arrangement for BT bus routes is not viewed as desirable. It should also be noted that given the “pulse-scheduled” nature of the BT route system, with increased traffic levels and extensions to new development, it will be more difficult to service in a cost efficient manner.

- **Terminals/Transfer Stations** – Based on the foregoing, the terminal at 4th and Washington Streets would continue to be a major hub. It is recognized that Bloomington Transit is currently exploring sites for a modern facility, but the new site would still be downtown. Another focal point of bus service would be the College Mall, which is a major retail concentration and whose adjacent area has numerous multi-family housing units.

- **Simplicity** – The current BT route structure is easy to understand in terms of schedule times and route alignments. The former reflects almost all downtown buses operating on a “clock-face” basis, with buses arriving and departing at a consistent number of minutes after the hour. The route alignments are also typically simple, with little or no variations such as branches and short turns. These desirable attributes of the current system should be continued.

- **Financial Resources** – The Indiana Department of Transportation, the Federal Transit Administration and locally levied taxes provide funding for both operating assistance and capital expenditures. While the prospects for increasing funding are positive, it would be unrealistic to expect significant new public investment in transit unless there is a dramatic change in federal state and local transportation funding policies. Accordingly, any service proposals should be consistent with anticipated funding and at the same time not be myopic.

- **Coverage and Convenience** - Currently, Bloomington Transit attempts to penetrate neighborhoods with riders only walking a short distance to reach the bus. This sometimes results in some indirect routings. The alternative approach calls for a “streamlined” design that would have buses remain on the arterial streets and have riders walk several blocks. While a balance needs to be struck between the two approaches, it is felt that greater emphasis should be placed on relatively short walking distances. This reflects the mobility limitations of many patrons and the difficulty in walking during inclement weather. Moreover, many trips are short and a walk of ten minutes would offset any time savings gained by “streamlining” and reduce the appeal of BT buses. One situation where “streamlining” may be appropriate is where running time reductions are needed to maintain the timed-transfer arrangement.

- **Network Configuration** - During the conduct of the study, some have suggested consideration of a grid network that would provide more direct service for trip origins and destinations other than downtown. For the grid network to be an attractive option and effective at gaining riders, it would be necessary to operate buses every 10 to 15 minutes, which would mandate a several fold increase in the number of buses and the cost of operations. This scenario is not consistent with the likely funding situation for Bloomington Transit during the next few years. It should also be noted that, given the nature of the BT route system, any possible time savings gained from “streamlining” the bus route network would not be sufficient to increase frequencies to such an extent.

- **Express Services** – With the exception of proposals to possibly balance demand on heavily utilized routes, there do not appear to be significant opportunities for express service. First, the current running times are relatively short (e.g., 25 to 30 minutes out and 25 to 30 minutes back). These represent maximum running times and for this reason, time savings with express service would be minimal. Second, express service would require people to walk greater distances and drive to a bus stop, which may not be a viable option for some travelers. Finally, the operation of both local and express routes would require a substantial increase in transit resources beyond reasonable expectations for funding.

- **Park-Ride Lots** – It is recognized that not all areas can be served with a bus route within a two or three block walk of a bus stop. Accordingly, park-ride lots should be designated in the outer portions of the service area. To the extent possible, existing parking lots such as retail centers and churches should be utilized.

- **Available Streets** – The streets available for bus service should be based on the geometric characteristics of the roadways and the dimensions of the vehicles comprising the BT fleet. Two other factors will influence route alignment. First, neighborhood

concern with buses on a few streets has affected the design of the current bus system. Second, in some areas slated for development, the street network has not been developed and therefore precise routings are not possible.

- **Transit Friendly Design** – Related to the point above, new development should be designed to encourage transit use. This would include roadway geometrics that permit bus operations, access to new developments by more than a single street, sidewalks that permit convenient access to bus stops, building frontages near streets where buses operate and installation of amenities (e.g. shelters). Other features would be buildings situated close to streets, rather than parking lots that must be traversed by bus riders. Clearly, development should be located in existing transit corridors.
- **Span of Service** – With the exception of routes oriented to Indiana University, the hours of operation generally end between 8:00PM and 9:00PM. Many comments have been received for later evening and Sunday service, which should be addressed in the service proposals.
- **Other Markets** - The ridership counts from farebox readings underscore the magnitude of student riders. This market should continue to be served well; however, it should not be the sole factor in service decisions. This is particularly the case if BT hopes to attract non-student riders. From a route planning perspective, this suggests proposals that seek to encourage occasional riders to become more frequent riders. Other potential markets include youths for shopping and social-recreational trips.
- **Economic Development** - Most of the service plan proposals will be guided by transportation factors related to their benefits and costs. Another dimension that should shape transit decisions is the ability of BT service to act as a catalyst for economic development. This would include a downtown shuttle service, which is currently under consideration by the City of Bloomington.

Service Proposals

This portion of the final report focuses on the suggested service improvements for transit operations. These proposals were designed to increase ridership, reduce operating cost, or improve the overall quality of transit service in Bloomington, as well as to respond to growth and changing conditions.

The service proposals that are described in this portion of the final report are presented on a route-by-route basis. They are followed by proposals relating to span of service and frequency

improvements that are specifically related to a particular BT bus route or the entire system depending on the service change proposal.

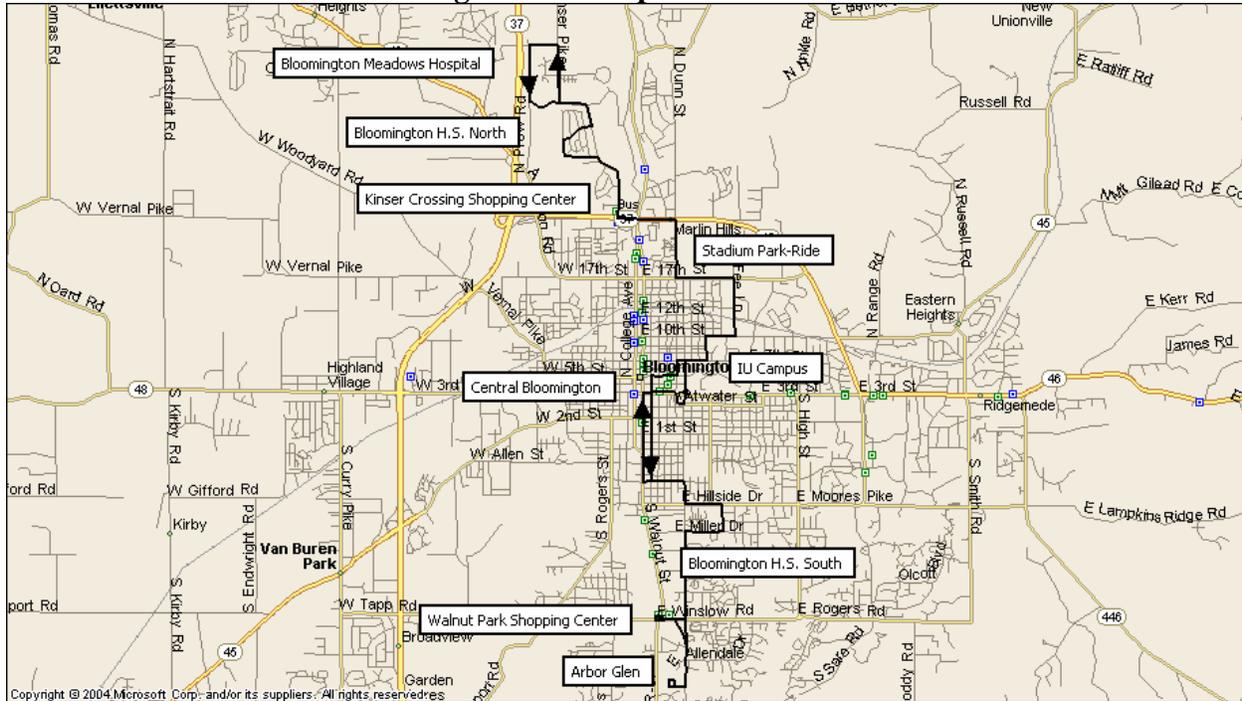
Route 1 - Route 1 serves the downtown terminal/transfer center at 4th and Washington Streets in downtown Bloomington. It has two distinct segments: a northern segment terminating at Bloomington High School North and a southern segment terminating at the Arbor Glen apartment complex. These two segments are through-routed with each other via the downtown terminal at 4th and Washington Streets.

As can be seen in Figure 23, the northern segment of Route 1 has several proposed changes. It would be extended north from the current terminus at Bloomington High School North so that it could also serve the Meadows Behavioral Care Center. In addition, the alignment of Route 1 through the area north of central Bloomington and west of the Indiana University (IU) campus would be modified so that the Park-Ride Lot at the IU Stadium would be served more easily. The Sav-A-Lot grocery store would continue to be served within walking distance of the reconfigured Route 1 and the existing Route 6.

As can also be seen in Figure 23, the southern segment of Route 1 would also be modified. It would operate on Walnut Street for part of its length south of downtown. Consideration was given to having the route remain on Walnut Street between Walnut Park Shopping Center and Grimes Lane, but the location of generators and relatively high ridership levels precluded a completely streamlined route. From Miller Drive, the Route 1 would operate to the south along Henderson Street to its terminus at Arbor Glen. In this way, Routes 1 and 7 - which both serve that portion of southern Bloomington - can have their alignments modified so that they are less circuitous and more direct. Recently, the Walnut Park Shopping Center has experienced a decline in retail activity and its impact on ridership is being monitored by BPTC. Should ridership decline from this location significantly, diversion of buses to this site should be eliminated.

The objective is to have two routes – one which serves the denser portions of Walnut Street corridor and Henderson Street and another that focuses solely on serving the Henderson Street corridor. As noted above, the actual alignment reflects current ridership levels and the land use and development within each corridor. The modifications to Route 7 are described in a subsequent section of this report. Currently, Route 1 operates hourly on its northern segment as well as on Saturdays. This frequency of service would be increased to a 30-minute service on weekdays. On weekdays, the southern segment of Route 1 would continue to operate every half hour.

Figure 23 – Proposed Route 1



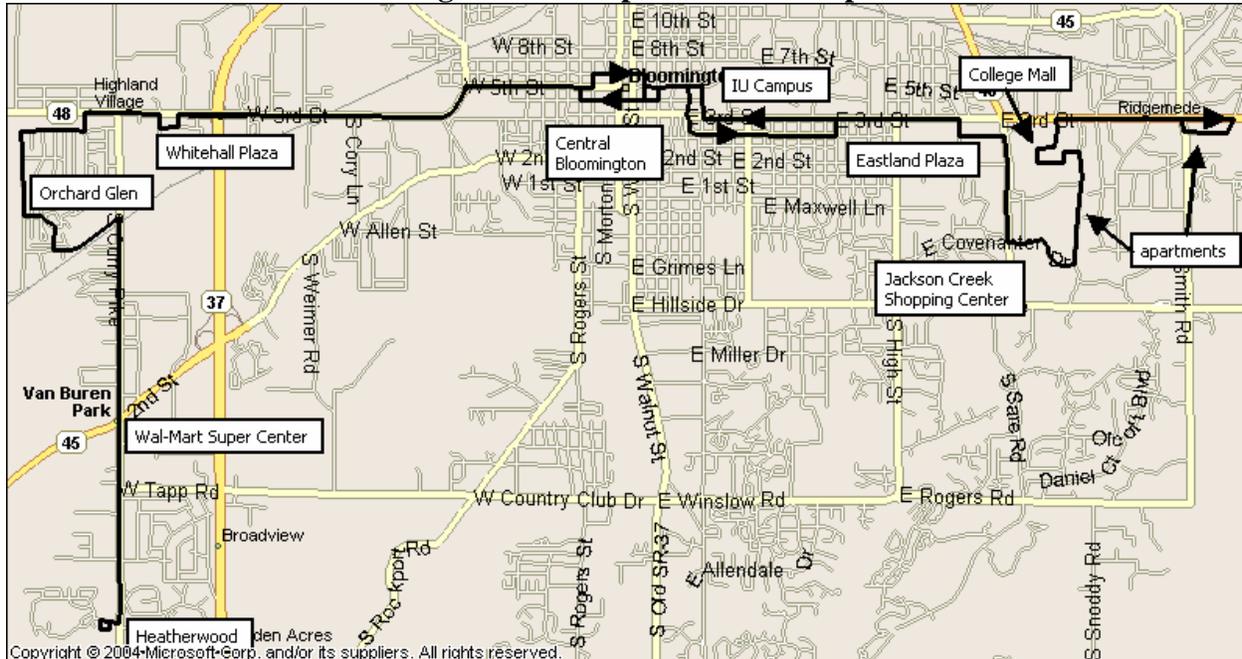
Route 2 - Route 2 also serves the downtown terminal/transfer center at 4th and Washington Streets in downtown Bloomington. Similar to Route 1, it has two distinct segments: a northern segment terminating at the Arlington Park Apartments and a southern segment terminating at the Country View Apartments. These two segments are also through-routed with each other via the downtown terminal at 4th and Washington Streets.

As can be seen in Figure 2, the northern segment of Route 2 remains unchanged. This segment of Route 2 serves an area of Bloomington where a significant amount of affordable housing is located. The alignment of Route 2 in this area is somewhat circuitous because of both the desire to serve several generators as well as the nature of the street pattern in the area. The northern segment of Route 2 also serves the Showers Complex, where Bloomington City Hall is located.

The southern segment of Route 2, which can also be seen in Figure 24, would be modified slightly so that the terminal loop utilizes Coolidge Drive after leaving the Country View Apartments. In this way, the Broadview Adult Education Center is afforded more direct service. This revision would require acceptance from the local community. Bloomington Transit should also work with the City of Bloomington so that a new traffic signal is installed at the entrances and exits of the Seminary Square Shopping Center. Because of the proximity with the traffic signal at 2nd Street and College Avenue, any new signal would need to be coordinated.

directly. Instead, this route would serve the Wal-Mart Super Center when it is operating northbound on Leonard Springs Road, where a shelter is presently located alongside the Wal-Mart Super Center’s parking lot. It should be noted that Rural Transit provides direct service into the Wal-Mart Super Center.

Figure 25 – Proposed Route 3 Option 1

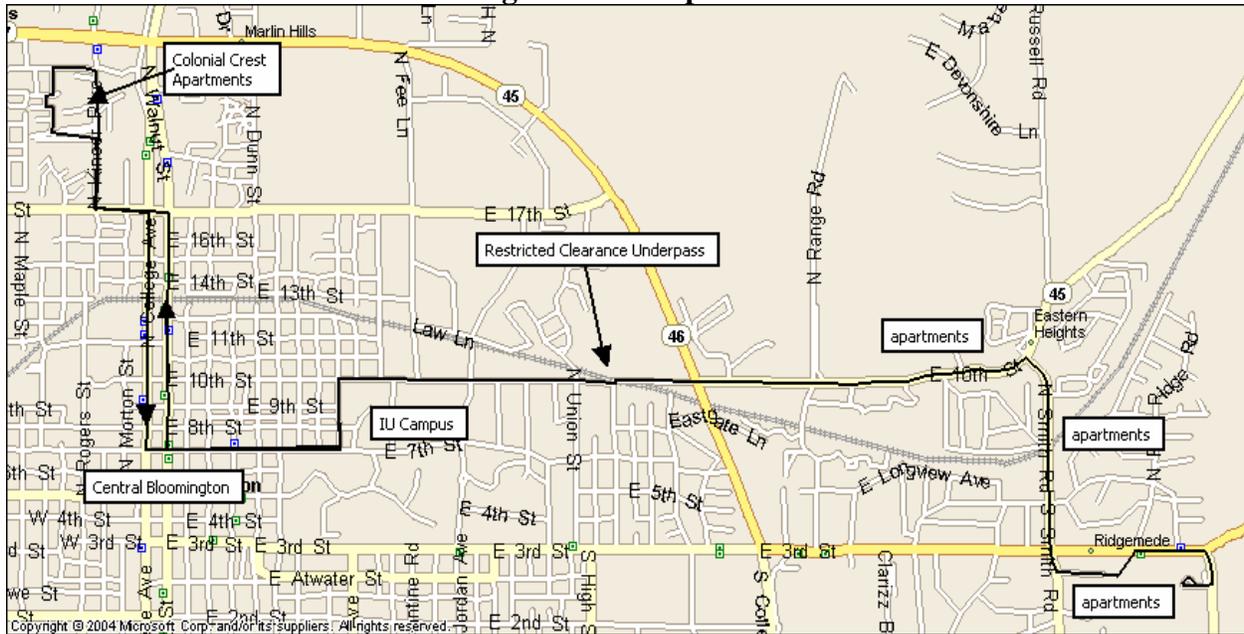


As can also be seen in Figure 25, the eastern segment of Route 3 would continue to operate as it does presently, with service to the Eastland Plaza and College Mall shopping centers as well as to the various apartment complexes located along Clarizz Boulevard. Route 3 would continue to terminate at the Bradford Place Apartments; however, it should be noted that the selected Route 3 trips that operate along 10th Street would no longer do so. In this way, Route 3 service is more consistent throughout the service day. The segment along 10th Street would continue to be afforded service via other bus routes, which will be described in a subsequent section of this report. Finally, Route 3 would continue to operate every half hour on weekdays and on Saturdays, with the exception of the route’s western segment, which operates hourly on Saturdays. This is the current service pattern on Route 3.

During the past few years, Route 3 has experienced increased running times which make it more difficult to return to downtown to meet other routes. One response has been to reduce direct access and circulation in shopping centers as noted with the first option. Because of the shift of the outlying service areas and alignments with Route 4 in the western part of Bloomington, concerns were expressed regarding running times. In particular, it is likely that the

consultation with INDOT to request features of this roadway between Perry Ellis Drive and State Road 45/46 that would expedite bus movements, enhance pedestrian movements and provide various amenities to bus patrons.

Figure 30 – Proposed Route 6



Route 7 – Similar to Route 6, Route 7 does not serve the downtown terminal/transfer center at 4th and Washington Streets in downtown Bloomington. Instead, it serves the IU campus via the 3rd and Atwater Streets couplet and connects the campus area with the southern area of the city primarily via Henderson and Walnut Streets.

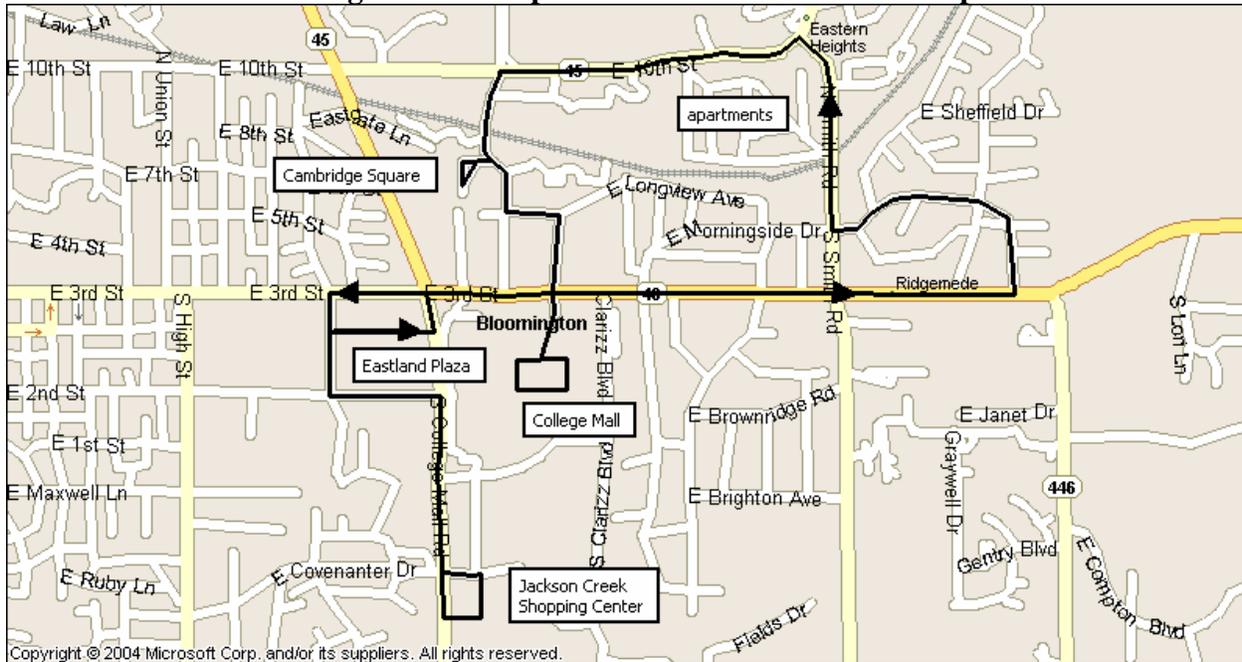
As shown in Figure 31, Route 7 will be modified so that its route alignment is more direct and serves the entire Henderson Street corridor, including that portion of the city near Bryan Park and the Bryan Park Pool that currently does not have any fixed route bus service.

Together with the proposed modifications to the southern segment of Route 1 described previously, these modifications to Route 7 will make both bus routes more direct and less circuitous in the southern areas of Bloomington that they serve. Finally, Route 7 would operate service every 15 minutes on weekdays which reflects the reduced running time with the proposed alignment. On Saturdays and during those days when IU is not in full session, Route 7 would operate every 30 minutes. Currently, Route 7 operates every 15 to 20 minutes only on weekdays.

eliminated. With one scheme, this area would not have transit service within walking distance of a bus route. Another option would be to replace the southern portion of Route 8 with a “Ride Request” service that would utilize BT Access vehicles to transport customers to a BT bus route (e.g., Route 6 at the College Mall) on an advanced reservation basis. At the College Mall they could then transfer to the BT fixed route system to continue their trip. On the return trip, they would alight from a BT bus route and then board a waiting BT Access vehicle. Clearly, they could also use the Ride Request service to travel to and from the College Mall.

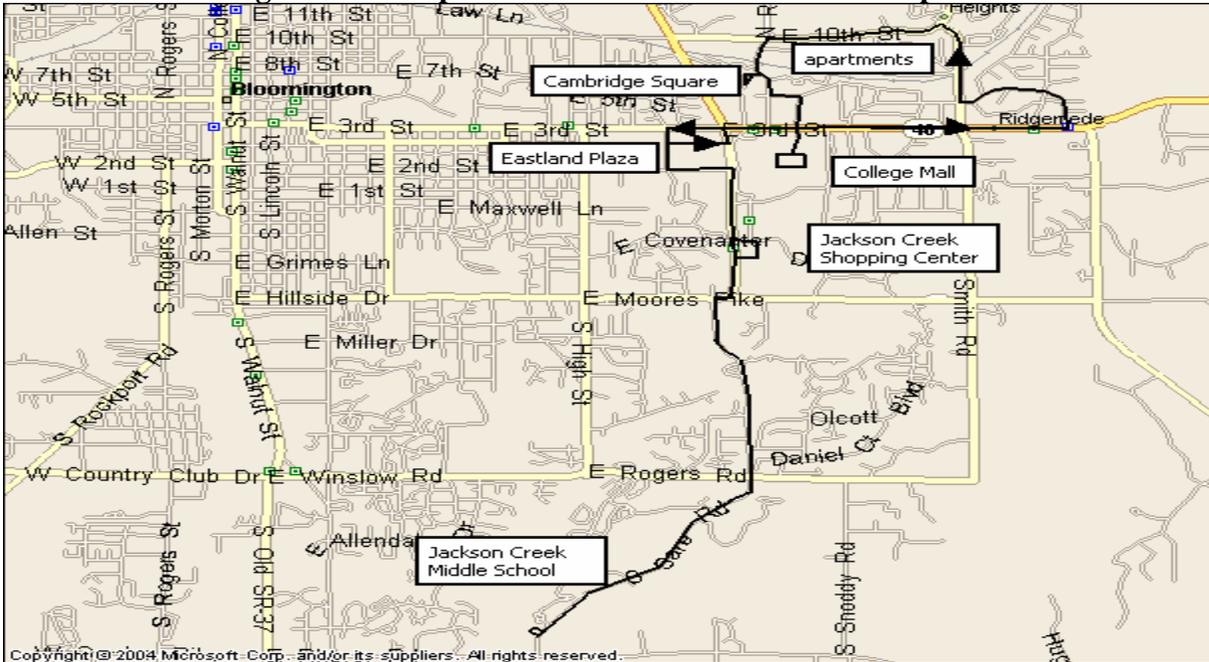
There are three possibilities for the remaining portions of Route 8. With the first proposal, shown in Figure 33, the remaining portions of Route 8 (i.e., those portions of the route north of the Jackson Creek Shopping Center) would continue to utilize a small transit vehicle so that service could continue to be provided directly into the Cambridge Square housing complex, where many senior citizens reside. Because of the shorter length of the route, service would be provided every 30 minutes on weekdays as well as on Saturdays.

Figure 33 – Proposed Route 8 Eastside Local Option



The second option for Route 8 is shown in Figure 34. Similar to the first option, the route could continue to utilize a small transit vehicle so that service would continue to be provided directly into the Cambridge Square housing complex, where many senior citizens reside. However, the route would now be extended west along the 3rd and Atwater Streets couplet to serve the IU campus and the downtown terminal/transfer center at 4th and Washington Streets in downtown Bloomington. Service would be provided hourly on weekdays as well as on

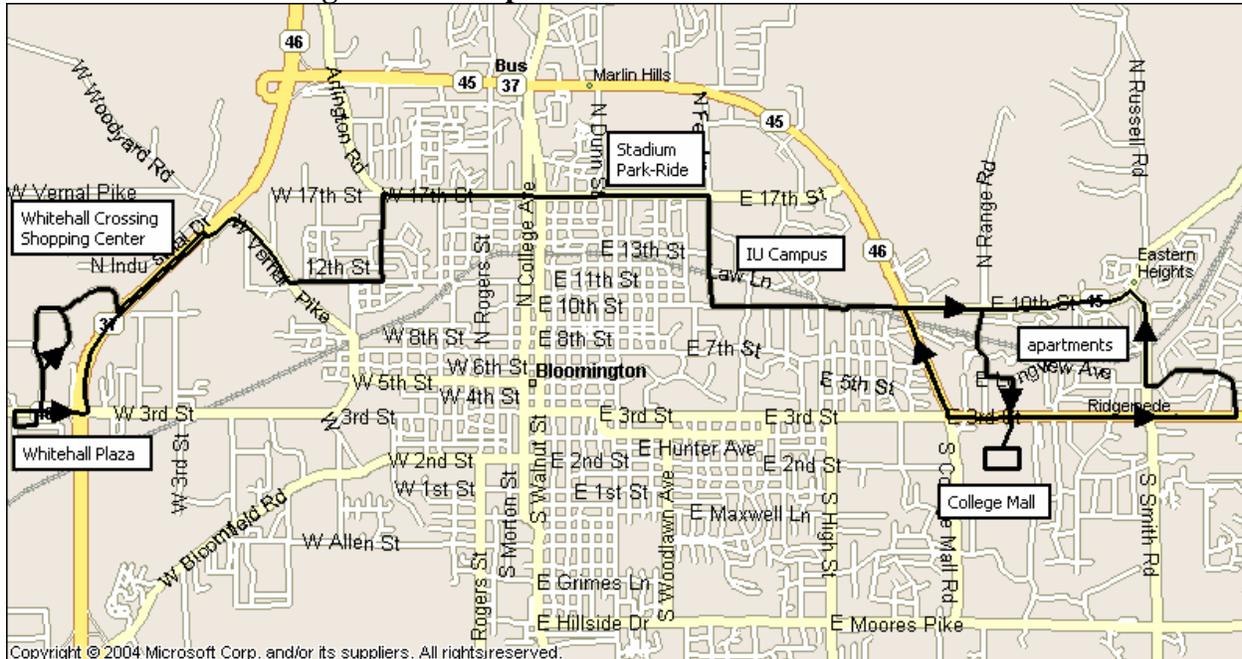
Figure 35 – Proposed Route 8 Sare Road Service Option



Northern Crosstown – A longer-term proposal, shown in Figure 36, would create a new “Northern Crosstown” bus route that would connect the College Mall and the various apartments along 10th Street with the Whitehall Plaza shopping center via the IU campus. Service would also be provided to the Whitehall Crossing Shopping Center. This proposed bus route would also serve the northwest quadrant of Bloomington which has many transit dependent residents along with the Park-Ride Lot at IU Stadium. As an alternative option, each side of the proposed bus route could become two new radial bus routes serving the downtown terminal/transfer center at 4th and Washington Streets in downtown Bloomington.

Within the planning horizon of the current study, this proposal would not appear warranted. This reflects the difficulty in finding a single east-west street and the proximity of the potential crosstown route to downtown. This proposal, which would have hourly service appears to be a long range option that should be considered several years hence.

Figure 36 – Proposed Northern Crosstown Route



Southern Crosstown – Another longer-term proposal, shown in Figure 37, would also be a completely new bus route and would become the new “Southern Crosstown” service. As shown in Figure 15, the Southern Crosstown bus route would operate between the Southern Indiana Medical Park on Tapp Road and the College Mall.

Similar to the Northern Crosstown proposal, each side of the proposed bus route could become two new radial bus routes serving the downtown terminal/transfer center at 4th and Washington Streets. This route would operate hourly on weekdays as well as on Saturdays. Since a complete crosstown route would not be warranted initially, only one part of the proposed service area would suggest a new route. The most logical portion of the southern crosstown alignment would be a radial route oriented to serving the southwest quadrant of Bloomington. Considerable development activity is either planned or underway in this area. Also, Adams Avenue will be extended from Allen Street to Tapp Road. This new radial route is shown in Figure 38 and would have terminals in downtown Bloomington and the Wal Mart Super Center. The proposed route would be via Allen Street and Patterson Road in the West Pointe neighborhood. This could eliminate the need for Route 4 to make this diversion from Bloomfield Road. Instead, Route 4 could serve the Landmark Center and proceed via 3rd Street to downtown Bloomington.

Downtown Shuttle – Ongoing with the preparation of these Service Proposals is the development of new Downtown Shuttle route options, which have been prepared by Bloomington Transit staff. Downtown Shuttle service would circulate in and around the downtown Bloomington area and would serve to connect major activity centers in the downtown area with each other. The costs of a frequent service with significant coverage and a lengthy span could be quite substantial. Accordingly, implementation of this proposal would mandate a new funding source to underwrite the operating deficit and vehicle purchases, particularly if a trolley or similar unique vehicle be purchased.

Ride Request Service – As was previously mentioned, the southeastern portion of the City of Bloomington served by a segment of Route 8 would no longer be provided fixed route bus service. Instead, transit coverage in this area could be provided by a “Ride Request” service that would utilize BT Access vehicles to transport customers in this area to a bus route at the College Mall on an advanced reservation basis. At the College Mall they could then transfer to the BT fixed route system to continue their trip, if they so choose.

This service could function as a prototype for Ride Request service in the Bloomington area. If it is successful, then a similar Ride Request zone could be established in other less densely developed areas in the City of Bloomington, where people would utilize BT Access vehicles to access the BT fixed route system to continue their trip.

Span of Service Improvements – The most commonly mentioned service improvements by members of the public were both a lengthening of the BT system’s service hours as well as the availability of bus service on Sundays. Public input indicated that these improvements would allow people to be able to utilize the BT system for various additional activities, including better access to employment opportunities.

- **Weekday Spans of Service** - In terms of weekday spans of service, the Campus Routes (i.e., Routes 6, 7 and C) typically have a longer span of service than the other BT bus routes. Route C operates past 11:00PM throughout the year, and Route 6 does so during the semester. However, during semester breaks, Route 6 operates until 9:30PM. Route 7 also operates until 9:30PM, but only during the semester - it does not operate during semester breaks. The suggested improvements to Route 7 would be operations on those days when IU is not in full session. The proposed span of service on the campus oriented routes on weekdays would be to operate Route 7 until about 11:00PM during the semester and to operate Route 6 until about 11:00PM during the semester breaks. As noted previously with the proposed change to Route 1, service on Route 6 would start about 30 minutes earlier.

The Downtown Routes' weekday spans of service all end by 9:35PM. These routes would be operated until about 11:00PM if weekday spans of service were to be improved. Finally, Route 8 and the proposed crosstown bus routes would operate until 7:00PM, as Route 8 presently does; the crosstown corridors would likely not require the same lengthy spans of service as the bus routes oriented to downtown Bloomington and the IU campus.

- **Saturday Spans of Service** - On Saturdays, all service ends by 7:30PM, with the exception of Route C, which operates until 11:10PM. However, during semester breaks, Route C only operates until 6:10PM. With the exception of Route 8 and the proposed crosstown bus routes, which would end at 7:00PM, Saturday service on all routes would end at approximately 9:30PM.
- **Sunday Service** - Presently, only Route 6 operates Sunday service throughout the year; Route C operates Sunday service only during the semester. If Sunday service were to be improved for the Campus Routes, Route C would also operate Sunday service between 10:30AM and 9:30PM during the semester breaks. Route 7 would not operate Sunday service.

In addition, Routes 5 and 8 - as well as the proposed crosstown bus routes - would also not operate Sunday service. However, the remaining Downtown Routes (i.e., Routes 1, 2, 3 and 4) would operate Sunday service. If hourly service were operated on these four interlined routes, then four buses would be required. Another possibility is to operate only three buses on portions of these four routes, as follows:

- **Route 1** – Two buses would operate on both segments of Route 1, providing hourly service.
- **Route 2** – This bus would operate on both segments of Route 2, providing hourly service.
- **Route 3** – Two buses would operate on both segments of Route 3, providing hourly service.
- **Route 4** – Two buses would operate service on both segments of Route 4, providing hourly service.

On Sundays, service would be provided on these seven buses between approximately 9:00AM and 5:00PM. This would permit operation of a single shift of drivers with limited if any overtime.

One issue related to the improvement of both weekday and Saturday spans of service as well as the introduction of greatly improved service on Sunday would be the need to operate BT Access. A concluding issue related to span of service is operation of bus service on holidays. Currently, BT does not operate on five holidays: New Years, Memorial Day, July 4, Thanksgiving and Christmas. It is suggested that the number of holidays with no bus service be reduced to two days (i.e., Thanksgiving and Christmas). As with any recommendations regarding span on the bus system, BT Access would need to be operated on these three days.

Frequency of Service Improvements – Another important issue with riders is the frequency of service. With the exception of the campus oriented routes, Bloomington Transit operates buses at headways of 30 and 60 minutes. Proposed changes are as follows:

- **Route 1** – During weekdays, the current hourly service on the northern segment would be improved to a 30-minute headway.
- **Route 4** - During weekdays, the current hourly service would be improved to a 30-minute headway for the eastern portion of the route. On the western segment, a 30-minute service should be maintained. In the event that Rural Transit eliminated operations on Bloomfield Road, BT would operate service every 30 minutes.
- **Route 5** – In response to increasing ridership, weekday headways would be improved from hourly service to a 30-minute headway.
- **Route 6** – During the summer and when IU is not in full session and on weekends, the hourly service would be improved to a 30-minute headway.
- **Route 7** - As noted previously, this route would be operated throughout the year. On weekdays when IU is not in full session and weekend, buses would operate every 30 minutes. This reflects the reduced running time with the proposed alignment changes to this route. During the academic year, the headways would be reduced to a uniform 15 minutes.
- **Route C** – This route has the most frequent service of all BT bus lines on weekdays when IU is in full session. At other times, this route operates every 40 minutes. This headway would be revised to 20 minutes..

Priorities

The sections above describe a relatively extensive list of proposals that relate to route alignments, span and frequency of service. It is not realistic to expect that all could be accomplished within a year or two given funding limitations. Accordingly, each proposal was assigned a relative priority ranking on a scale from 1 to 5. Proposals ranked 1 would be slated for early implementation while those assigned a priority of 5 would be longer term. Clearly, any proposals for service expansion will be dependent on adequate funding for operating assistance and capital expenditures.

Table 22 -Service Change Priorities

Route Designation and Name	Priority
Alignment	
1 Fee Lane/BHS North	1
1 South Walnut/Arbor Glen	2
2 West 11 th Street via Showers Complex	1
2 South Rogers/Countryview	1
3 Highland Village/Curry Pike	1
3 College Mall/Bradford Place	1
4 Bloomfield Road/Heatherwood	5
4 High Street/Sherwood Oaks	1
7 Henderson/Walnut Express	2
8 Eastside Local	1
- Southwest Radial	5
- Downtown Shuttle	TBD
- Ride Request	5
Span of Service	
Expanded Weekday	1
Expanded Saturday	4
Sunday Service	2
Frequency of Service	
1 Fee Lane/BHS North	3
4 Bloomfield Road/Heatherwood	5
4 High Street/Sherwood Oaks	5
5 Sare Road	5
6 Campus Shuttle	3
7 Henderson/Walnut Express	2
C C Route	4

This chapter has provided an overview of the initial service modification proposals for the Bloomington Transit fixed route bus system. Modifications range from minor adjustments to existing routes to the creation of entirely new bus routes and may also include the lengthening of the spans of service of several bus routes. As was previously mentioned, this chapter was originally prepared as an interim report. At that stage of the analysis, the objective was to solicit

comments and promote dialogue that would ultimately lead to a recommended plan. Subsequent revisions and discussion to this material has produced the recommended plan which is more fully documented in the next chapter in terms of its impacts.

RECOMMENDED PLAN

The previous chapter presented a number of proposals that comprise a substantial expansion of bus service in terms of coverage, frequency and span. The suggested revisions to service have been prioritized and in turn have been assigned an implementation period over the next five years. For purposes of this analysis, it is assumed that plan would extend from 2009 through 2013 with 2008 corresponding to the current budget for Bloomington Transit. The timing and sequence of the changes for the bus system are suggested as in Table 23.

Table 23 - Implementation Schedule

Year	Alignment	Frequency	Span
Year 1 - 2009	1N, 2S, 3W, 3E, 4E, 8		Weekday
Year 2 - 2010	1S, 7		Sunday
Year 3 - 2011		1N, 6	
Year 4 - 2012			Saturday
Year 5 - 2013	SW Radial	4E, 4W	

It is recognized that as the plan proceeds, revisions may be made in the future. This would include not only the proposal, but also the planned year of implementation for each of the suggested service changes. Clearly a consideration would be the priority assigned to each proposal as well as the availability of funding for both operating assistance and capital expenditures.

Operating Forecasts

To indicate the impacts of the recommended plan on the bus system, forecasts were prepared of key operating and financial statistics. The latter includes operating costs, farebox revenue and deficit. For each of the proposals, estimates were prepared of the anticipated change in revenue hours of service. For many of the alignment changes to existing routes, there was little or no change in hours of service. This was not the case for the proposed Southwest Radial route in the last year of the plan.

For frequency changes, the recommendations called for additional buses to be placed in service with relatively significant changes for the route. Similarly, span changes required additional revenue hours. Given the staged implementation of proposals, an increase in revenue hours in one year was continued in each of the subsequent years of the plan. Table 24 indicates the anticipated change in revenue hours.

Table 24 - Revenue Hours

Year	Revenue Hours
2009	83,500
2010	86,400
2011	89,700
2012	90,500
2013	102,300

The plan calls for gradual increases in revenue hours during the initial years of the plan with the greatest increase in 2013. This sequence reflects the nature of the changes along with their priority. The most ambitious proposals were assigned the lowest priority and slated for implementation in the last year of the plan (i.e., 2013). For example, the Southwest Radial bus line is oriented to development in this quadrant of Bloomington and the construction of the necessary streets. To the extent that growth does not occur at the expected rate, implementation of this new bus line would be delayed. Conversely, additional JARC and New Freedom funds may expedite changes to the span of service in earlier years. It should be noted that the changes anticipated for the first few years of the plan are consistent with the growth experienced by the system during the past few years.

Utilizing the service changes, estimates were prepared of ridership using the similar routes and elasticity methods. The former assumes that ridership changes on new routes or segments will be similar to that observed on other parts of the bus system. The elasticity method relates changes in ridership to percent change in service levels. Both approaches are suitable for macro level forecasts such those presented in Table 25.

Table 25 - Ridership (000's)

Year	Riders
2009	2,735
2010	2,852
2011	2,975
2012	3,077
2013	3,353

The discussion above addresses the impacts of the service changes. During the past several years Bloomington Transit has experienced gains in ridership that exceeded changes to service levels. To reflect the growth in ridership, a trend of three percent annually has been assumed between 2009 and 2013. Combined with the impacts of the service changes, it is estimated that ridership will increase by about one fourth. For comparison purposes, during the last complete fiscal year, Bloomington Transit carried about 2.4 million riders which represented a gain of about 20 percent during the prior the five years from 2002 to 2006.

The next step in the process was to convert the ridership levels to estimates of farebox revenue. For this analysis, the average fare for existing routes and the system was considered. It reflects the base fare along with the various discount provisions. Bloomington Transit has not increased fares for several years. Currently, BPTC plans to raise fares in early 2008 and it is possible that there will be a fare increase during the planning period. The additional funds generated by any likely fare increase would be relatively small in comparison to operating costs. Since there is no way of forecasting when and how much, if at all, fares will increase during the planning period, a conservative approach has been taken and it is assumed that the average fare will not change appreciably between 2009 and 2013.

The next step in the forecasting process was to estimate the operating costs for each of the five future years. In 2006, the cost per revenue hour of service was about 53 dollars which is expected to increase through the current and budget years of 2007 and 2008, respectively. Based on the observed trend in bus costs between 2002 and 2006, it was estimated that the cost per revenue hour in the first year (i.e., 2009) of the plan would be 60 dollars per revenue hour. Applying this unit cost to each of the proposed service changes, annual operating costs were estimated for each year in the planning period. These costs were escalated at three percent annually to reflect the impact of inflation. In this way, the bus operating forecasts are in current year dollars in the year of expenditure.

The resulting financial picture for Bloomington Transit during the five year planning period is in Table 26.

Table 26 - Operating Financial Forecasts (\$000's)

Year	Revenue	Cost	Deficit
2009	1,327	5,248	3,921
2010	1,382	5,592	4,210
2011	1,438	5,975	4,537
2012	1,487	6,210	4,723
2013	1,607	7,220	5,613

The results reflect a continuation of past trends in the financial results of Bloomington Transit along with the expansion of service between 2009 and 2013. During the first four years, the increase in operating deficit is at a moderate rate. In the last year, the dimensions of the service changes results in a relatively large increase in deficit. It is possible that some of these proposals which are oriented to growth in Bloomington might be implemented past 2013.

A couple of points are worth noting regarding the financial forecasts for the five years comprising the planning period. First, costs are expected to increase at a rate faster than revenue which results to the change in deficit. Costs reflect system expansion as well as escalating costs. In contrast, farebox revenue is subject to policies related to the number and magnitude of future

fare increases. This trend in revenue and costs has been experienced in the past five years and is expected to continue in the future.

Second, the recommended service plan consists of proposals that modify existing routes as well as add completely new services in terms of coverage and span. For example, adjustments to a route alignment will have little financial impacts. This is particularly the case, since the recommended plan maintains the pulse operations with round trip cycle times remaining the same. Other proposals call for expansion of service in outlying areas or during hours when buses don't currently operate. It is logical to expect that these new services will not have the same ridership productivity (i.e., riders per revenue hour) and farebox recovery as the existing bus system. For example, one element of the plan is to operate several bus routes on Sunday. It is reasonable to expect that ridership levels will not match those on weekdays when the magnitude of travel for all purposes is greater.

Capital Program

The capital plan is concerned primarily with major expenditures during the planning period that support the existing bus system and the proposed changes. The two largest expenditures are for buses and a new downtown terminal. Other amounts have been estimated for shelters and bus stops signs. It is recognized that Bloomington Transit will incur other capital expenses (e.g., engine rebuilds) which will be treated as part of the annual budget cycle.

The single largest expenditure between 2009 and 2013 is for the purchase of buses. As shown below, this includes a sufficient number of buses to meet peak vehicle requirements as well as spare buses. In addition, the bus acquisition program should replace buses as they reach their economic life and provide additional buses for system expansion as called for in the recommended plan (Table 27).

Table 27 - Fleet Requirements

Model Year	Budget 2007	Base 2008	Year 1 2009	Year 2 2010	Year 3 2011	Year 4 2012	Year 5 2013
Peak	29	29	29	29	30	30	33
Spares	9	9	9	9	9	9	9
Total	38	38	38	38	39	39	42

The resulting bus purchase program is shown on Table 28. It reflects the already programmed purchase of four buses which will arrive in 2007. No bus purchases are planned in 2008 with the next acquisitions in 2009. During the first three years of the plan. The bus purchase program will be oriented to replacing buses as they reach their useful economic life. For the majority of the current fleet of heavy duty buses the economic life is twelve years. For

two buses, (i.e., one each of the 2001 and 2002 models), the buses are lighter duty coaches with a useful life a few years less.

The service proposals in the first three years of the plan are oriented to alignment changes to existing routes with no need for more buses. Much of the planned service expansion is during off peak hours (e.g., Sunday service) which would not change the peak bus requirements. In 2011 and 2012, the fleet requirements will increase by one bus with the largest increase in 2013 when three additional buses will be required to meet planned service needs. As shown on the exhibit, a total of twenty buses will be purchased between 2009 and 2013.

Table 28 - Bus Replacement and Expansion Program

Model Year	Budget 2007	Base 2008	Year 1 2009	Year 2 2010	Year 3 2011	Year 4 2012	Year 5 2013
1989	2						
1990	2						
1995	5	5					
1997	8	8	4				
1998	1	1	1				
2001	1	1	1	1			
2002	4	4	4	4	4	3	3
2003	7	7	7	7	7	7	7
2005	5	5	5	5	5	5	5
2006	3	3	3	3	3	3	3
2007		4	4	4	4	4	4
2008							
2009			9	9	9	9	9
2010				5	5	5	5
2011					2	2	2
2012						1	1
2013							3
Total	38	38	38	38	39	39	42

As shown in Table 28, a total of 20 buses will be purchased during the five year planning period. A bus cost of \$340,000 was assumed and escalated by four percent annually. The other large capital item is the replacement of the downtown terminal. Earlier analyses have confirmed the need for a new, modern and larger facility. It is anticipated that the cost of the terminal, including design, land acquisition and construction will total \$5.8 million dollars. It is assumed that approximately \$2.8 million dollars will be spent in 2007 and \$3.0 million in 2008. The remaining amount (i.e., \$3 million), will be spent in the first year of the plan in 2009.

Other outlays are for ten shelters (five each in 2010 and 2012) to continue the current aggressive shelter program of Bloomington Transit. The unit cost of a shelter was estimated at \$4,000 which was also escalated at four percent annually to the year of purchase. The

concluding item in the capital program was bus stop signs which were estimated to cost \$100 installed in 2009 and then escalated at four percent annually. The changes to route alignments and a new route will mandate the installation of bus stop signs. The plan calls for 20 signs in each of the first four years with 80 installed in 2013 for a total of 160 bus stop signs.

The resulting capital expenditures by item and year are shown on the next page. A total outlay of more than ten million dollars is estimated for the five year planning period (Table 29). As noted previously, Bloomington Transit will also require other miscellaneous between 2009 and 2013 which have not been estimated.

Table 29 - Capital Expenditures Forecasts (\$000's)

Year	Buses	Terminal	Shelter	Signs	Total
2009	3,060	3,000		2	6,062
2010	1,768		21	2	1,791
2011	735			2	737
2012	382		23	2	407
2013	1,193			8	1,201

Funding

The concluding part of the forecasts is to estimate the magnitude and source of funds to close the gap between operating costs and revenue and permit capital expenditures. Based on past experience, the share of costs assumed by local, state and federal governments as shown in Table 30.

Table 30 - Funding Shares (Percent)

Source	Operating Deficit	Capital Expenditure
Local	30	20
State	45	0
Federal	25	80
Total	100	100

It is anticipated that Bloomington Transit will be able to leverage its contribution to receive state and federal funds. For the operating deficit, the proportion paid by each level of government is somewhat similar with the largest contribution by made Indiana. For capital expenditures, it is assumed that the local and federal government will share the costs on a 4:1 basis. It is recognized that funding levels are subject to policy and budget situations at each level of government. It is reasonable to expect that each government agency will contribute the same percentage which implies greater funding amounts as the system expands and costs escalate.

Application of these funding shares to the estimated operating deficit results in the expected annual subsidy by government agency. These amounts are all in current year dollars in the year of expenditure (Table 31).

Table 31 - Operating Funding (\$000s)

Year	Local	State	Federal	Total
2009	1,176	1,764	981	3,921
2010	1,263	1,895	1,052	4,210
2011	1,361	2,042	1,134	4,537
2012	1,417	2,125	1,181	4,723
2013	1,684	2,526	1,403	5,613

In a similar manner, the funding for capital expenditures was computed during the planning period. Unlike operating assistance, capital needs vary substantially from one year to the next (Table 32).

Table 32 - Capital Funding (\$000s)

Year	Local	State	Federal	Total
2009	1,212		4,850	6,062
2010	358		1,433	1,791
2011	147		590	737
2012	81		326	407
2013	240		961	1,201

An ambitious program of service expansion has been proposed for Bloomington Transit during the five year planning period. The proposals consist of changes to existing routes as well as entirely new service. In addition to expanded coverage, the study recommendations call for more frequent service which will be available more hours and days of the week.

The plan continues past trends to improve the bus system. The increased mobility and level of service will generate additional riders. The benefits to current and future Bloomington Transit customers are compatible with the expected costs. The necessary financial support from local, state and federal governments appears reasonable during the next few years which assures the viability of the plan. It could jeopardize the current high ridership levels. Accordingly, a series of proposals are presented which include minor revisions to existing routes and suggested new bus lines to respond to future growth.