



Iowa Passenger Transportation Funding Study

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Iowa Department of Transportation

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IOWA STATEWIDE PASSENGER TRANSPORTATION FUNDING STUDY

Final Report

PREPARED FOR:

Iowa Department of Transportation

FOR SUBMISSION TO:

Iowa General Assembly

Iowa Governor's Office



PREPARED BY:

URS

December 2009



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iRIDE

Providing independence for Iowa's senior and other population groups, improving the connectivity of passenger transportation services, improving the convenience required for passenger transportation to compete for customers and environmental stewardship responsibility (green) are the purpose of iRIDE.

These not only represent impetus of the Funding Study, but they emphasize the action that reflects successful implementation of the end product

“I Ride”.



For More Information

www.iride21.com

This report and its data are the result of research conducted by URS. The data contained within this report is the result of research of URS, the consultant, and the compilation of that data by URS, the consultant. The data presented has not been verified by the Iowa Office of Energy Independence or the Iowa Department of Natural Resources.



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SECTION 1: STUDY PURPOSE

INTRODUCTION

Legislative actions and economic conditions of the last several years have combined to create a climate in which transit can play a more central role in the quality of life for all Iowans. From an economic perspective, increasing congestion in the metro areas, volatile fuel prices, continued urbanization of the state, and escalating institutional healthcare costs for seniors all create opportunities to rethink passenger transportation service and funding in the state.

The Iowa General Assembly, recognizing the changing social and environmental landscape of the mobility needs of Iowans, directed the Iowa Department of Transportation (Iowa DOT), in cooperation with the Iowa Office of Energy Independence (OEI) and the Iowa Department of Natural Resources (DNR), to complete the Passenger Transportation Funding Study (Funding Study).

The purpose of the Funding Study is to:

1. Quantify current revenue available to support public transit.
2. Determine whether current revenues are sufficient to meet future needs.
3. Assess how well the state's public transit network supports the current and expanding mobility needs of the state's senior population.
4. Identify the transit improvements needed to meet the state's energy independence goals.

The purpose of this report is to provide documentation of the methods, assumptions, data collection efforts, analyses and public outreach efforts used in addressing each of the four study elements listed.

A white icon of the Iowa State Capitol dome on a dark blue background.

SF 2420
SECTION 27
PUBLIC TRANSIT FUNDING STUDY

The Department of Transportation, in cooperation with the Office of Energy Independence and the Department of Natural Resources, shall review the current revenues available for support of public transit and the sufficiency of those revenues to meet future needs.

The review shall include but is not limited to, identifying transit improvements needed to meet state energy independence goals and an assessment of how the state's support of public transit is positioned to meet the mobility needs of Iowa's growing senior population. The Department shall submit a report to the governor and the general assembly on or before December 1, 2009.

KEY FUNDING STUDY ASSUMPTIONS/DEFINITIONS

The intent of the legislation was for the Funding Study to focus on the mobility needs of Iowa's seniors and on addressing energy use in the state. In the initial stages of the



study, two conditions were identified that became critical in the framework of the demand, improvements and cost analyses and ultimately in the finding and conclusions:

1. **Mobility Needs of Seniors:** Daily travel needs of seniors across the state are very similar to those of the remainder of the population. While seniors are not making as many work trips as those in the state under 65, their non-work mobility needs are similar to the remainder of the population. It was assumed that the intent of specifying seniors in the legislation was that a lower percentage of the senior population drive themselves compared to other population groups between 16 and 64 years of age. In the Funding Study, the needs of the non-driving seniors were assumed to be similar to other transit dependent populations of the state and that the intent is to provide them with a higher baseline of mobility than exists today.
2. **Transit as a Contributor to Energy Independence:** For passenger transportation services in the state to be a contributor to reducing the level of fossil fuel burned for transportation, the level-of-service for passenger transportation must provide travel times that are similar to auto travel. In this condition, travelers in the state will have an option of “choosing” to use passenger transportation services rather than drive themselves without experiencing a reduction in quality of service.

A key finding of the study is that in order for passenger transportation services in the state to address either the mobility needs of seniors and/or play a larger role in the state’s goals of energy conservation, a greater level of service is needed. If it is determined that it is a state priority to expand passenger transportation service, an increase in revenue is needed to implement recommended changes.

PASSENGER TRANSPORTATION – PART OF THE SOLUTION

Because public transportation plays an important role in Iowa’s mobility and quality of life there are many stakeholders. The first step in the study was to create a Study Advisory Committee that brought together a diverse group of stakeholders. Committee diversity provided the opportunity to identify needs, ideas and opportunities to address the needs, potential constraints to implementing the ideas and reasonable solutions from a range of perspectives.

While members of the committee were from different disciplines, there was a common understanding that, as is shown in Figure 1, passenger transportation is central in the

social, economic, and environmental wellbeing of the state. The universal understanding that transportation/mobility influences almost every part of our daily lives and the economy of the state is highlighted through transportation’s central role in most every one of the recent state agency policy plans, including:

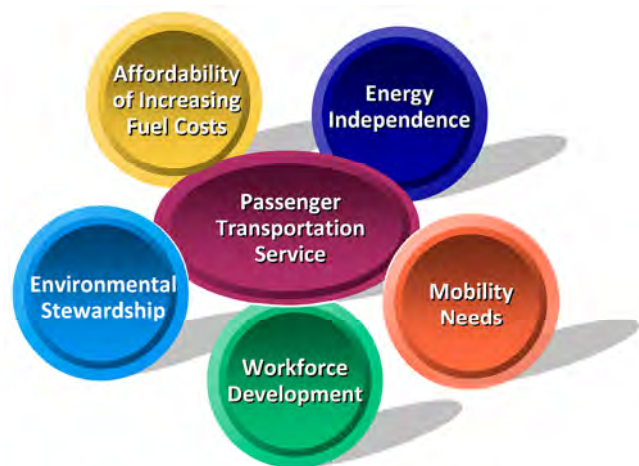
- State of Iowa Strategic Enterprise Plan, Governor’s Office
- Energy Independence Plan, Iowa Office of Energy Independence.
- The Iowa Climate Change Advisory Council, 2008 Final Report
- Livable Communities Initiative, Iowa Department on Aging.

The Iowa DOT, the OEI and the DNR partnered through the Study Advisory Committee to complete this study. The findings presented here represent an integrated plan for how passenger transportation services can play an even larger role in the mobility and energy consumption/efficiency challenges of the state and present a common opportunity relative to achieving each agency’s goals.

The Study Advisory Committee has representation from the following stakeholders:

- Iowa Department of Transportation
- Iowa Office of Energy Independence
- Iowa Department of Natural Resources
- Iowa Department of Human Services
- Iowa Department on Aging

FIGURE 1: PASSENGER TRANSPORTATION TOUCHES MANY CURRENT ISSUES AND GOALS





- Iowa Environmental Council
- Des Moines Area Regional Transit Authority (DART)
- Ames-CyRide
- Bi-state Regional Planning Commission
- Southwest Iowa Planning Council (SWIPCO)
- 1000 Friends of Iowa
- Iowa City Area Chamber of Commerce
- Iowa Medicaid Enterprise
- Northwest Iowa Planning and Development Commission
- University of Iowa Public Policy Center
- United Way of East Central Iowa

The Funding Study was prepared with input from across the state. Input was gathered in the early stages on needs, at the study midpoint as the service alternatives for addressing the needs were being evaluated, and later in the process as the preliminary findings and conclusions were established. Residents, employees, employers, public transit users and those with transportation needs were invited to participate in the study through attending any of the 12 public input meetings hosted by the Iowa DOT. The first six public meetings were held early in the study with the focus on gathering input on current service and unmet needs. The second round of six meetings provided opportunities to comment on the preliminary service concepts to address needs and potential funding ideas.

Public access to updated information was provided throughout the study on the project website (www.iRIDE21.com) and input was requested through a web-based needs survey and public information meetings. Additional information on public involvement and engagement is highlighted throughout the document.

CENTRAL THEMES OF THE STUDY

Consistent themes emphasized in documents prepared by a range of state agencies place mobility and passenger transportation service as a central element in achieving their goals because:

- **Mobility is a significant influencing factor to our overall quality of life.** Being able to drive ourselves or having convenient access to passenger transportation services affects where we live, where we work, our education opportunities, our ability to access healthcare, the ability of communities and the state to attract and retain the best and brightest to

sustain the workforce, and our ability to access Iowa's many cultural and entertainment areas.

The Funding Study is charged with identifying whether the mobility needs of Iowa's growing senior population are being met through current transportation services. If it is concluded that additional service is needed, the Funding Study should identify what services are needed, how much service enhancements would cost and how might the services be funded.

The needs of seniors are specifically addressed in the study because over the next 20 years the population of the state that is 65 years old or greater is expected to increase more than any other age group. Mobility provided through public transit is generally considered to be one of the key services that enhance a senior's quality of life¹.

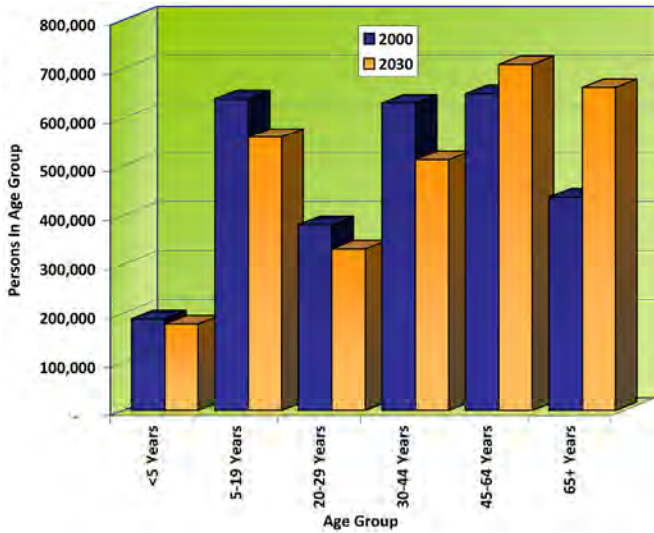
Providing passenger transportation services that support the independent living needs of Iowa's senior population that cannot or choose not to drive themselves, can impact rising healthcare costs. Access to transportation for medical treatment is one of the benefits generally provided by assisted living facilities. A portion of the seniors in facilities have made the move due, in part, to not having access to reliable and appropriate medical transportation services outside the facility. Living costs for seniors in assisted care facilities average over 600 percent per month more than the cost for seniors that, with appropriate and reliable non-emergency medical service transportation, are able to remain in their own homes.

As the senior population in the state grows the financial burden of increasing assisted care costs will continue to grow. If providing a more appropriate and reliable level of passenger transportation service can play a role in controlling the increase by supporting seniors' independent living, it is worth investigating the costs and types of service that are needed. Figure 2 displays the population change by age group for the state.

¹ Harris Interactive poll for the American Public Transportation Association – November 2005.



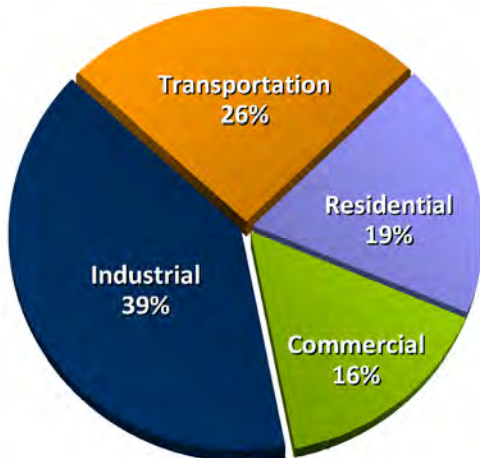
FIGURE 2: IOWA 2000 AND 2030 POPULATION DISTRIBUTION BY AGE



Source: US Census Bureau

- Using passenger transportation reduces fuel consumption.** Identifying different ways that residents and businesses can reduce their energy consumption is a common goal of the OEI and the DNR, as well as many of the goals in the Governor’s Enterprise Strategic Plan. Approximately 26 percent of the energy consumed in Iowa is used for transportation purposes (See Figure 3). By increasing the average number of people per vehicle (by shifting people’s chosen mode for some trips from autos to one of the forms of passenger transportation), the annual energy consumption per trip can be reduced.

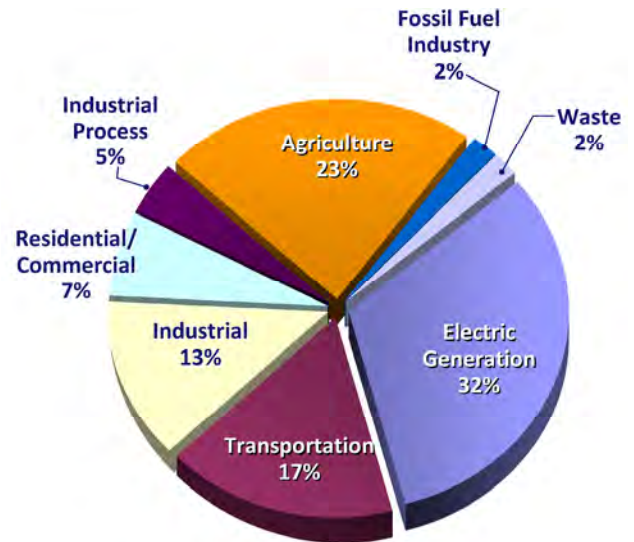
FIGURE 3: 2007 IOWA ENERGY CONSUMPTION BY SECTOR



Source: Energy Information Administration

- Increasing use of passenger transportation services reduces greenhouse gas and criteria air pollutant emissions.** Figure 4 displays that approximately 17 percent of the greenhouse gas emissions in the state are associated with the transportation sector. Automobiles and light trucks make up the vast majority of the vehicle miles of travel, daily trips and transportation fuel consumption and greenhouse gas emissions (see Figure 5). Providing passenger transportation service with travel times competitive with the automobiles helps curb emissions by reducing the per trip level. Reducing the emissions per trip results in lower overall emissions of greenhouse gases and other pollutants such as nitrogen dioxide, carbon monoxide, volatile organic compounds, supports OEI and DNR programs, and the Governor’s Enterprise Strategic Plan goals.

FIGURE 4: 2005 IOWA GREENHOUSE GAS EMISSIONS BY SECTOR



Source: Center for Climate Strategies, Iowa Inventory and Forecast (2008)

- Reducing fuel consumption will positively impact the state’s economy.** Historically, the economy has been able to grow even as fuel prices increased because of offsets in other areas. At the present price and the even higher prices experienced in 2008, the economy is less capable of absorbing changes, or volatility, in the price. Shifting some trips to passenger transportation modes can result in a reduction in the level of fuel demand and will decrease the level of economic dependence on gasoline. Reducing fuel demand has traditionally resulted in lower prices, or at least more price



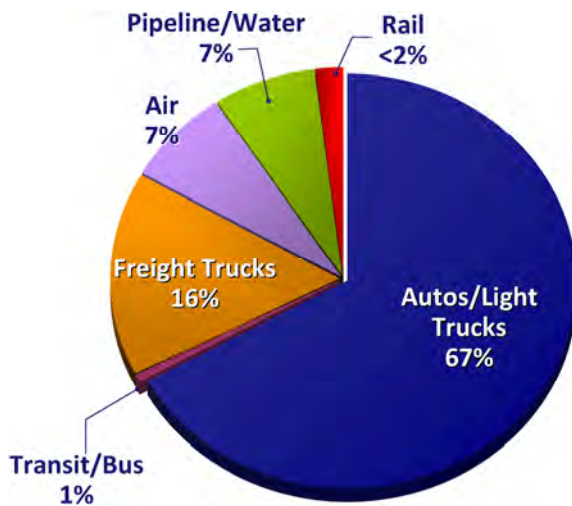
stability, which positively influences the economy by reducing commute costs, educational travel costs, healthcare travel costs, and recreational travel costs. Through stabilizing/reducing fuel costs, goals of workforce development programs and overall economic growth are supported. Before positive impacts can result, however, there must be an investment into growing the level of passenger transportation.

systems, vanpools, and carpools to a broader percentage of the state’s population.

- Enhancing the connection between land use planning and transportation alternatives in developing and redevelopment areas. Increased density, mixed uses, and development more central to the cities aid in improving the cost effectiveness of providing transit services and/or increase the range of feasible services to be offered.

Each of these elements was considered throughout the course of the study.

FIGURE 5: TRANSPORTATION SECTOR GREENHOUSE GAS EMISSIONS BY MODE



Source: US Environmental Protection Agency, 2007

FUNDING STUDY CONSIDERATIONS

Two broad over-arching goals of the Funding Study are: 1) Identify what services are required to support the travel needs and provide enhanced mobility for seniors. 2) Identify what services are needed to support the goal of reducing the state’s dependence on foreign oil and fossil fuels. Implementing sustainable change in the current passenger transportation system that results in the mode being a significant contributor to the solution will require:

- Support for passenger transportation services that can provide travel times that are competitive with private automobile travel.
- Promoting through pricing, education, incentives, and shifting personal preferences the use of transit

IOWA MOBILITY FACTS

444,400
Iowa Senior Population (2008)

52%
Senior Population 20-Year Change (2028)

Seniors
Iowa’s Largest Population Group (2028)

11%
Percent of Medicaid Patients that have Missed Medical Appointments due to Unreliable Transportation

33,000
Missed Medical Appointments a Year

79%
Percent of Iowans Driving to Work Alone





SECTION 2: STUDY PROCESS

INTRODUCTION

The Study Advisory Committee's first task was to identify Iowa passenger transportation vision. This set the direction for the study. Next goals and objectives that provide clear definition to the vision were prepared. The foundation provided by the vision and goals provided the structure for the remaining technical analyses and the public engagement process.

Initiating the study required establishing a consistent understanding by all of the stakeholders of the types of service included under the heading of passenger transportation. Passenger transportation services included in the Funding Study are:

- Urban fixed route transit service that is operated on set schedule and route in communities of more than 20,000 residents. Across the state there are 19 small urban (communities of less than 50,000 people) and large urban (communities/metro areas of more than 50,000 people) fixed route systems.
- Urban and rural (local and longer trips within the state) paratransit and demand-response transit service. Paratransit and demand-response services are provided at the users' request, meaning a user would pre-arrange a trip between a unique origin and destination and back again.
- Human services transportation provided principally via vans and cars. The range of operations across the state include rides that are offered by assisted living facilities, private van and car services that focus on Medicare/Medicaid eligible trips, volunteer organization services that many times are church sponsored, private medical practice services, and civic organization services.
- Carpooling.
- Vanpooling.

- Intercity bus/rail. Intercity passenger transportation is comprised of three unique components:
 - Commuter travel.
 - Intrastate non-commuter: City-to-city travel within the state that is non-commuter.
 - Long distance passenger travel between locations in Iowa and out-of-state communities.

This Funding Study addresses the commuter element of the three areas. The Iowa DOT is presently evaluating intrastate and long distance interstate rail travel through separate efforts.

PREPARING THE VISION AND GOALS

The Advisory Committee established the following vision and goals for the action plan of the Funding Study.

Iowa's Passenger Transportation Vision

Iowans will have convenient access to a sustainable and intermodal passenger transportation system that recognizes the dynamic environmental and societal conditions across the state and changing conditions over time.

Goals and Objectives That Support the Vision

Goal #1: Provide passenger transportation service throughout the state that is:

- Convenient.
- Accessible.
- Affordable.
- Safe and secure.

Goal #2: Provide a passenger transportation system that is focused on the future by:

- Coordinating land use and transportation.



- Incorporating efficiency-building 21st century technology.
- Utilizing alternative sources of power.
- Being a part of the statewide energy independence and environmentally conscience solution.

Goal #3: Address the diverse mobility needs and demand through a range of modes.

STEPS IN CONDUCTING THE FUNDING STUDY

Listed below are the key steps of the Funding Study process:

1. **Inventory of current passenger transportation services and funding.** Preparing a plan of where service should be in the future first requires having an understanding of where it is today. In the inventory the types of service by area, number and age for vehicles, service frequency, hours of service and funding by area, and other characteristics of current service were collected and documented.
2. **Assess Needs Relative to Current Service.** This step in the process drew from the public outreach program, incorporated information from the passenger transportation plans for each of the regional and urban systems, and provided a comparison of current transit ridership relative to an estimate of transit demand. The process emphasizes a balancing of the perceptions of needs provided by providers, agencies, users and non-users and quantification of needs from the study modeling and estimating.
3. **Service and Cost Analysis.** A viable and sustainable transportation system needs to support the service needs that there are throughout the state AND the service provided must have a reliable and consistent funding source(s). The alternatives analysis for the Funding Study addressed the first element of the new/expanded/revised service options available and how those service options satisfied the demand.

The service alternatives analysis used evaluation criteria that looked at the issues from a number of different perspectives. The broad range of criteria addressed the range of priorities that various stakeholders bring to the table. The criteria allowed for monitoring how the range of service alternatives addressed the passenger transportation vision and goals.

4. **Prepare Service Concept Implementation Plan.** The findings included in the Funding Study reflect input from the public engagement program, results of the technical service-demand assessment and the findings of the constraints analysis. The concept plan goes beyond a list of new services and an estimate of the costs for the services. The findings address enhancing jurisdiction/provider coordination to strengthen the service network and build cost-efficiency, and the legislation changes needed to support service enhancements.

An integral part the concept screening was determination that service changes reflected the passenger transportation vision. To provide the coordination, at the conclusion of each step the vision and goals relative to the intermediate findings were reviewed.



SECTION 3: IOWA'S CURRENT PASSENGER TRANSPORTATION SERVICES

INTRODUCTION

Presently, there is some level of passenger transportation service offered within each of the 99 counties across the state. The level of service, measured as the number of trips made in an area, varies widely across the state. In some areas peak hour fixed route service operates every five minutes or less (from commuter parking lots in urban areas), to other areas/communities where service is limited to one or two trips a week and passengers need to reserve a trip days in advance. Outlined in the following sections are the basics of public transit service across the state.

PASSENGER TRANSPORTATION SERVICE INVENTORY

The current public transit system in the state is made up of 35 transit systems that are divided into regional and urban systems. These 35 systems are the focus of the Funding Study relative to addressing the requirements of the legislation. In addition to the 35 systems, carpool-vanpool programs and inter-city carriers have been reviewed.

Regional Transit Systems

Rural (non-urbanized) areas of all 99 counties have been divided into one of 16 regions and within each of the regions there is a designated agency responsible for administering and/or providing transit service. The level of service that is provided within each county of a region and how service is funded in the county are set by the county board of supervisors. Therefore, across a multiple county region there could be a widely divergent level of service depending on the support of individual board of supervisors.

Service within each of the 16 rural regions is demand-response or dial-a-ride service where users must make a reservation for each trip they take. Required lead time on

reservations also varies widely across the state from 24-hours in advance of a trip to a week in advance. Figure 6 displays the boundaries for counties that make up each of the 16 regional transit systems. The general operating characteristics and annual ridership of the 16 systems are documented in Table 1.

Three of the 16 agencies are brokered systems, meaning they contract with other agencies (generally a larger transit agency) to provide passenger transportation service in their designated coverage area.

Small Urban Systems

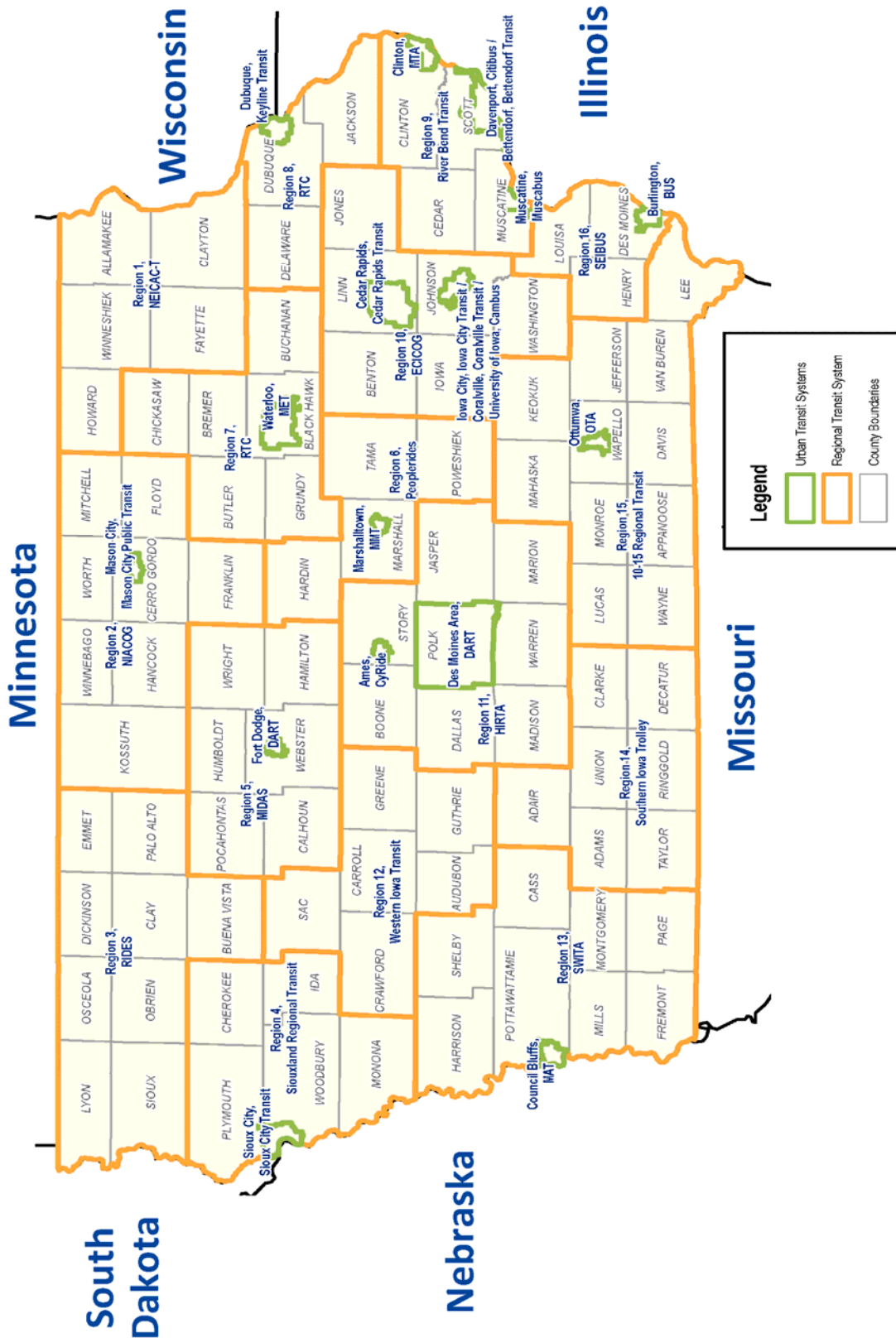
Urban transit systems are divided into small urban systems serving communities of less than 50,000 population and large urban systems in communities with a population of 50,000 or more.

Currently, seven communities in the state operate transit systems designated as small urban systems. The ridership mix for fixed route versus demand-response services varies across the small urban areas (each community with fixed route service also is covered with regional demand-response service). In Mason City, for example, 197,000 trips are made annually on the fixed route service, but 457,000 paratransit trips are provided in the larger regional service area. In Region 9, on the other hand, Clinton Muni Transit and Muscatine Transit combine for a total of 549,000 annual fixed route trips, but fewer than 198,700 demand-response trips are provided on Riverbend Transit, the regional transit system in the communities and outlying portions of the counties.

Communities in the small urban system category of service are documented in Table 1 and the table also contains ridership and agency organizational structure of the service.



FIGURE 6: COUNTIES INCLUDED IN REGIONAL AND URBAN TRANSIT SYSTEMS



Section 3: Iowa's Current Passenger Transportation Services

Final Report



TABLE 1: REGIONAL AND URBAN TRANSIT SYSTEMS

Public Transit Agency Location	Agency Organization		Operating Structure				2008 Public Transit Ridership	2008 Vanpool Ridership
	Public	Private, Non-Profit	Free-standing Transit Agency	City Department	Part of Other Agency	Brokered System		
Regional Transit Systems – Region Number/Name (Demand Responsive Service)								
1	NE Iowa Community Action Corp - Transit/NEICAC-T		●			●	205,500	-
2	North Iowa Area COG/Region 2 Transit	●				●	457,000	-
3	Regional Transit Authority/RIDES		●	●			356,600	-
4	Siouxland Regional Transit System		●	●			141,900	-
5	MIDAS Council of Governments	●				●	241,200	-
6	Region Six Planning Commission/ PeopleRides	●				●	48,200	-
7	INRCOG/Regional Transit Commission	●				●	147,900	-
8	Delaware, Dubuque & Jackson County Regional Transit Authority		●			●	181,500	-
9	River Bend Transit		●	●			198,700	-
10	East Central Iowa Council of Governments	●				●	231,700	-
11	Heart of Iowa Regional Transit Authority	●		●		●	346,800	-
12	Region XII COG/Western Iowa Transit Agency	●				●	243,700	2,500
13	SW Iowa Planning Council/Southwest Iowa Transit Agency	●				●	274,900	-
14	Area XIV Agency on Aging/Southern Iowa Trolley		●			●	145,900	-
15	10 - 15 Regional Transit Agency	●		●			265,000	-
16	South East Iowa Regional Planning Commission/SEIBUS	●				●	134,500	-
						Regional Subtotal	3,621,000	2,500
Small Urban Transit Systems (Fixed Route)								
	Burlington Urban Service	●			●		132,000	-
	City of Clinton, Municipal Transit Administration	●			●		369,000	-
	City of Fort Dodge (DART)	●			●		232,000	-
	Marshalltown Municipal Transit	●			●		114,000	-
	City of Mason City	●			●		196,000	-
	City of Muscatine	●			●		180,000	-
	Ottumwa Transit Authority	●			●		343,000	-
						Small Urban System Subtotal	1,566,000	-



Public Transit Agency Location	Agency Organization		Operating Structure				2008 Public Transit Ridership	2008 Vanpool Ridership
	Public	Private, Non-Profit	Free-standing Transit Agency	City Department	Part of Other Agency	Brokered System		
Large Urban Transit Systems (Fixed Route)								
Ames Transit Agency/CyRide	●			●			4,646,000	-
City of Bettendorf	●			●			179,000	-
University of Iowa, Cambus	●				●		3,722,000	-
Cedar Rapids Transit	●			●			1,404,000	-
Coralville Transit System	●			●			507,000	-
City of Council Bluffs	●			●		●	178,000	-
Davenport Public Transit (CitiBus)	●			●			1,107,000	-
Des Moines Area Regional Transit Authority (DART)	●		●				4,827,000	280,200
City of Dubuque, Keyline Transit	●			●			303,000	-
Iowa City Transit	●			●			1,936,000	-
Metro Transit Authority of Black Hawk County/ Waterloo MET	●		●				504,000	-
Sioux City Transit System	●			●			1,046,000	-
Large Urban Systems Subtotal							20,359,000	280,200
Statewide Total Ridership							25,546,000	282,700

Source: Iowa DOT

Large Urban Systems

Communities with a population of 50,000 or more are designated as large urban areas for transit services. Presently, there are 12 large urban transit systems operating in nine metro areas, with multiple services organized in the Iowa City-Coralville and Bettendorf-Davenport metropolitan areas. Transit systems in the large urban areas are generally established as a city department, with the exceptions being two regional authorities (Metropolitan Transit Authority in Black Hawk County and Des Moines Area Regional Transit Authority [DART]) and Cambus operated by the University of Iowa. Service in Council Bluffs is unique relative to the other large urban systems in that service is contracted from Omaha Metro Area Transit and American Ambulance.

Current ridership and general characteristics of the systems are displayed in Table 1. Large urban systems account for

approximately 80 percent of total ridership for the state; providing over 20 million trips in 2008.

Intercity Carriers

The state is served along both the east-west and north-south axes by intercity carriers that connect Iowa communities with other parts of the country. Historically, intercity carriers have provided connectivity between most towns of 1,500 population or larger. Over the past 25 years, however, as service costs have increased and ridership has decreased, only those towns located along the US Highway System have been able to retain intercity carrier service.

It is important to note that where intercity service remains, it is an extremely valuable transportation resource for Iowa's citizens who cannot or choose not to drive. This service allows residents to reach destinations within Iowa and across the country.



The following companies currently provide scheduled intercity bus service in Iowa:

- Burlington Trailways
- City of Fort Dodge (DART)
- Greyhound Lines
- Jack Rabbit Lines
- Jefferson Lines
- Royal Charters

Statewide 2008 Public Transit Ridership

In 2008, transit systems across the state carried approximately 25.5 million riders over approximately 31 million revenue miles. Over the year, approximately 1.7 million of the riders were Iowa's seniors and over 3.2 million trips were made by persons with disabilities. Table 2 documents many of the key passenger transportation service statistics for 2008.

CURRENT IOWA VANPOOL PROGRAMS

There are four main publicly owned vanpool programs operating in the state. A summary of these active vanpool programs is provided in Table 3. The origins of these four vanpool programs are illustrated in Figure 7.

The following bullets provide more details on the active programs:

- **Central Iowa Rideshare** is administered by DART. The program's 900 commuters in 100 vanpools are located within a 90-mile radius of Des Moines. The program includes:
 - Monthly fares based on the number of riders and distance of the commute. The fare covers the cost of gas, maintenance and insurance. The driver rides free and can use the van for up to 200 personal miles a month. Backup drivers pay a reduced fare.
 - Vanpools can be started with only a driver and four passengers.
 - Commuters can get a free ride pass to try the service before committing to a monthly pass.
- The Central Iowa Rideshare program has doubled its size over the past five years, mainly due to:
- Increased marketing efforts.
 - More involvement/support from employer-sponsored vanpools.
 - Federal commuter tax deductions/credits.

TABLE 2: CURRENT IOWA PASSENGER TRANSPORTATION STATISTICS (2008)

Service Type	2008 Ridership			Vehicle Miles Traveled	Passenger/Contract Revenue	Operating Cost Per Trip
	Total	Elderly Trips	Persons w/ Disability			
Unrestricted Paratransit	2,940,000	595,000	1,349,000	11,784,300	\$11,734,000	\$5.32
Elderly/Disabled Paratransit	2,399,000	337,300	948,600	8,837,400	\$9,929,400	\$2.60
Fixed Route Service	20,207,000	807,500	927,800	10,523,300	\$10,839,200	\$2.08
Statewide Summary	25,546,000	1,739,800	3,225,400	31,145,000	\$32,502,600	\$2.50

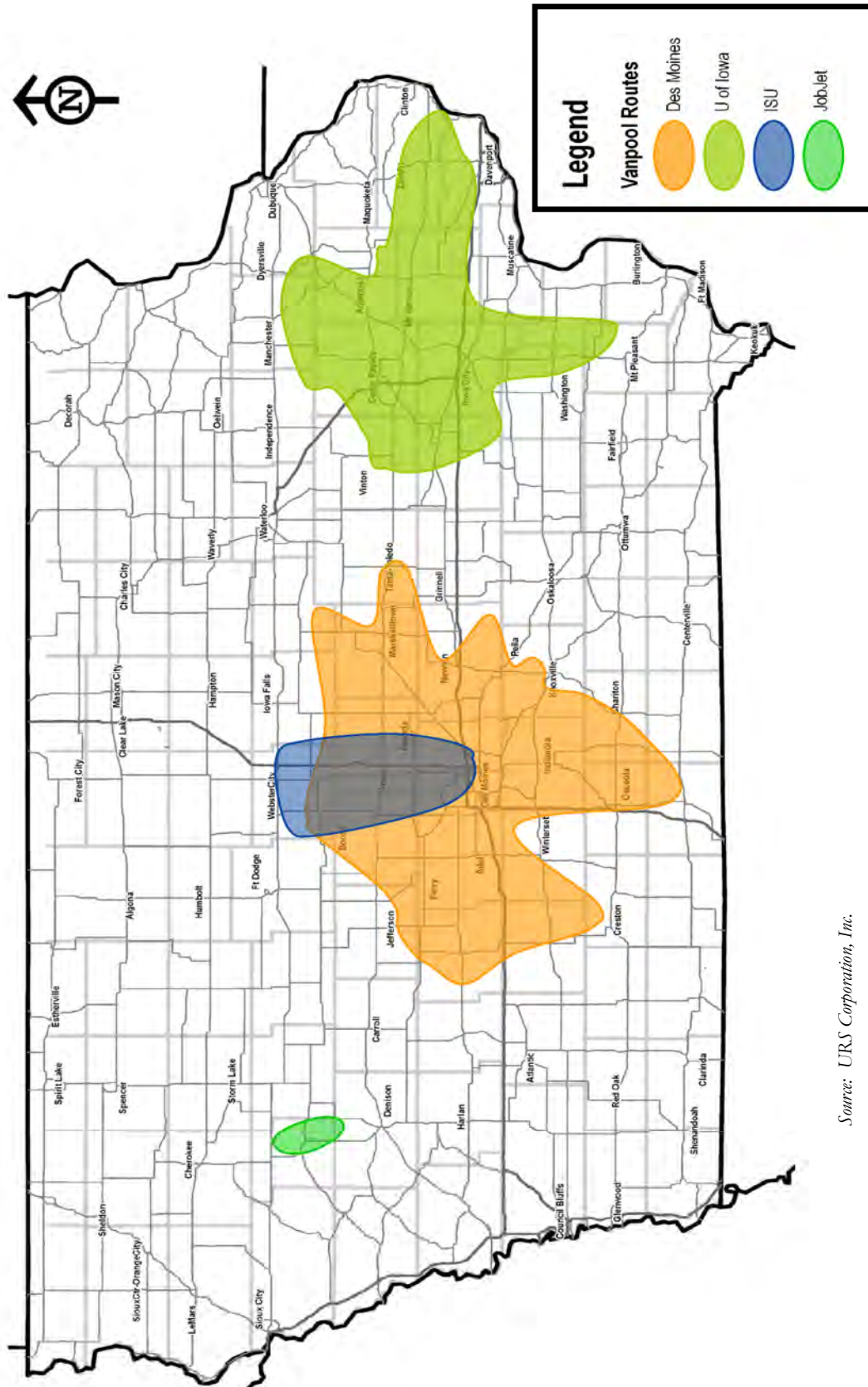
Source: Iowa DOT

TABLE 3: SUMMARY OF ACTIVE IOWA VANPOOL PROGRAMS

Program	Number of Vanpools	Daily Ridership	Van Type	Average Monthly Rider Cost	Van Ownership
Central Iowa Rideshare	100	900	7, 12, and 15 passenger	\$85	DART
JobJet	1	5	15 passenger	\$75	Region VII COG
Iowa State University	4	42	7, 12 and 15 passenger	\$76	ISU
University of Iowa	83	834	Minivans and 15 passenger	\$75	U of I

Source: URS Corporation, Inc. through interviews with providers.

FIGURE 7: EXISTING VANPOOL RIDER DRAW AREA BY REGION



Source: URS Corporation, Inc.



- **JobJet** is administered by the Region XII Council of Governments. JobJet started in July 2007 as the state's first rural commuter vanpool program. The primary impetus for starting single van with five people rural service was employer and commuter concerns with widely fluctuating gas prices. The program is funded through Iowa's Clean Air Attainment Program. State funding for the program has primarily gone toward purchasing 15-passenger vans and providing operational funding.
- **Iowa State University's vanpool program** is offered to employees, and requires one member of the vanpool to be designated as the driver. The driver has responsibility for the van, while passengers pay an operating cost monthly fee that is based on the number of people in the pool and commute distance. Organizers of the program would like to expand and say word of mouth has been their best promotional strategy. The program currently providing rides to 42 people in four vans is advertised on ISU's website and has been featured in the university newspaper.
- **The University of Iowa vanpool program** has 83 vans operating from various communities within a 60 mile radius of Iowa City. The vanpool program is currently in its 30th year, and has grown over the past five years from 744 to 834 members. Marketing is done in a variety of ways, including new employee orientation packets, word of mouth, and making the vans themselves identifiable as University of Iowa employee rideshare vans. This program has had success promoting the federal pre-tax commuter benefits that employers can take advantage of as a benefit to employees.

Metropolitan Area Planning Agency (MAPA), the metropolitan planning organization (MPO) for the region. The program is centered on a web-based carpool matching database that is anonymous and available for anyone who works or lives within the metropolitan area. Other elements of the carpool program include a new park-and-ride lot available on the fringe on the metropolitan area for carpoolers, and a guaranteed ride-home program in case of emergency.

CURRENT FUNDING INVENTORY

Financial support for public transit services incorporates federal, state and local sources. In 2008, revenue from all sources totaled approximately \$100 million in 2008. Figure 8 displays the current statewide funding by government jurisdictional level and from other sources.

In Iowa, there are four basic categories of financial assistance that may be available:

- Operating cost assistance.
- Capital improvement cost assistance.
- Transit planning assistance.
- Project administration.

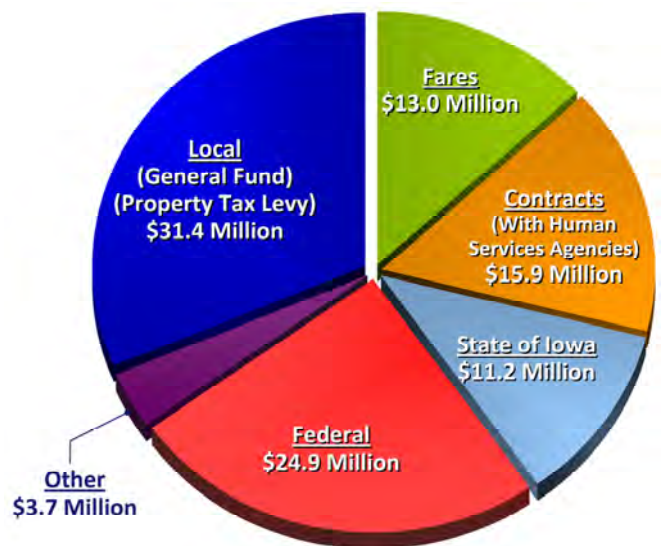
The Funding Study focus is on operating and capital programs.

Current Iowa Carpooling Programs

Informal carpooling occurs all across the state, often times via an assortment of various websites that allow individual riders to be matched to the carpool. Organized web-based carpool matching programs are active in the Des Moines and Council Bluffs-Omaha metropolitan areas:

- **The Des Moines area's carpool program, Rideshare**, is administered by DART, the Des Moines area's transit provider. The carpool program provides an on-line registration form for potential commuters and then matches commuters who live and work near each other. DART RideShare provides incentives to registered carpoolers, and provides the capability to match users to carpools or DART's extensive vanpool program.
- **The Council Bluffs-Omaha carpool program, MetroRideshare**, is administered by the

FIGURE 8: PASSENGER TRANSPORTATION ANNUAL OPERATIONS FUNDING BY SOURCE





The Funding Study is to provide an estimate of the dollars by source required to address the identified unmet needs. It has been assumed that the vast majority of any increment in funding for transit improvements would come from the following sources:

- State of Iowa.
- Local city and county jurisdictions.
- Farebox revenue associated with increases in ridership.

It has been assumed that substantial increases in federal funding are not likely to occur, because most of the federal dollars are allocated to the state based on Iowa's population and Iowa's passenger transportation ridership relative to US population and ridership totals. As population, more than ridership, has much more influence on the dollars allocated and the population is not expected to change substantially relative to the country as a whole, federal funding is not expected to change substantially.

State Public Transit Funding

Currently, the state provides approximately \$11.2 million in transit operating funding assistance to the urban and regional systems. State funding is distributed through the following programs.

State Transit Assistance (STA) – All public transit systems are eligible for funding under the STA program. STA funding amounts represents the revenue from the first four cents of what was the state “use tax” imposed on the sale of motor vehicles and accessories. The use tax has been replaced with the registration fee on new vehicles, however, the dollar amount provided each year for transit continues to reflect what would have been generated from the first four percent of the discontinued use tax.

The majority of the state transit assistance funding received in a fiscal year is distributed to individual transit systems on the basis of a formula using performance statistics from the most recent available year. These funds can be used by the public transit system for operating, capital or planning expenses related to the provision of open-to-the-public passenger transportation.

Public Transit Infrastructure Grant – This program provides capital improvement grants to aid local systems with maintenance, administrative and storage facilities. Funding from this program is appropriated on an annual basis and allocated on a statewide competitive basis through the Iowa Public Transit Infrastructure Grant program.

Local Public Transit Funding

Local funding makes up approximately 65 percent of total operating revenue. Sources of local revenue are described below.

Passenger Revenues – Fees paid by the passengers is one of the most common sources of local support. This can include:

- Revenue collected on-board the transit vehicle.
- Prepaid fares from sale of passes or tickets.
- Fares billed to the passenger after the fact.

Contract Revenue – Revenue from human service agencies, local communities, as well as private businesses that pay a part or all of the cost for certain types of rides provided as part of the open-to-the public transit operation.

Municipal Transit Levy – Iowa law authorizes municipalities to levy up to 95 cents per \$1,000 assessed valuation to support the cost of a public transit system. Presently the transit levy provides approximately two-thirds of the local revenue.

Regional Transit Levy – In 2005, the Iowa legislature enables Iowa's two largest counties to form special taxing districts, under the control of the county, for support of area-wide public transit services. The district can levy up to the 95 cents per \$1,000 assessed valuation; but, unlike the provisions in the municipal levy, the regional transit districts can set differing levy rates across their territory.

General Fund Levy – The cost of supporting transit services is an eligible use of general fund revenues for all Iowa governments.

Trust and Agency Levy – The Trust and Agency Levy can be used by cities and counties to support employee benefit plans. As such, it can be used to help support the cost of a city operated transit system.

Other Limited Use Local –

- **Student Fees** – Mandatory student fees established by a college or university are similar to a tax levy in that all members of the particular community contribute.
- **Advertising Revenues** – Sale of on-board advertising or advertising space in brochures, etc., can provide some additional revenues to the transit program.

SECTION 4: PASSENGER TRANSPORTATION NEEDS

INTRODUCTION

Passenger transportation needs across the state were documented through a number of qualitative and quantitative methods. Qualitative input reflected public, service provider and agency perceptions of transportation (mobility) needs that are not being supported by current services. Travel demand models were used to estimate the level of travel demand in the state that would appropriately be served by passenger transportation services. For the quantitative analysis, the level of unmet need would be the difference between the estimated demand and the actual current ridership. The model results and the information obtained from the qualitative input were brought together to provide a descriptive of picture of the types of travel needs that were not being served and the intensity of the unmet need gap.

QUALITATIVE INPUT ON NEEDS

Gathering input on perceived needs was a comprehensive process in which there were several avenues for public input and comment. Listed below are the key opportunities:

- **SERVICE PROVIDER SURVEYS AND INPUT WORKSHOPS.** Early in the study transit service providers across the state were asked to complete an information gathering survey. The survey, which was distributed as a paper copy and was also web-based, included questions about their current service, their current fleet, and a request for input on current passenger transportation issues. In all, surveys from 35 public transit systems were completed and returned. The study team also held needs input workshops with transit service providers as part of Iowa Public Transit Association (IPTA) meetings. The workshops gave providers the opportunity to hear views and concerns provided by other agencies across the state and talk openly about both capital

and operating funding issues. Two workshops were held with the first focusing on gathering input from transit service providers. The focus of the second was on prioritization of the needs to be addressed in the study.

- **REGIONAL PLANNING AFFILIATIONS PASSENGER TRANSPORTATION PLANS (PTP).** Each of the 18 regional planning affiliations (RPAs), in cooperation with transportation providers and human services agencies, prepares a four-year plan outlining their current operations, human services agency coordination efforts and its outlook for the near term. The current planning period for the PTPs is 2010 through 2013. The PTP documents from each of the RPAs, or the combined efforts of several RPAs, were reviewed as an additional source of transportation service needs and those consistently identified needs/issues were incorporated into the Funding Study. Table 4 documents the needs/issues that were consistently identified across the PTP reports.



*April 2009 Public Meeting
Needs Discussion*





TABLE 4: MOBILITY AND TRANSPORTATION NEEDS IDENTIFIED IN THE RPA PASSENGER TRANSPORTATION PLANS

Issue/Need Identified
Lack of Funding for: <ul style="list-style-type: none"> • Competitive driver pay • Staff to support service expansion needs • Reimbursement assistance to volunteer drivers • Marketing/education of available services • Travel vouchers for low-income riders • Capital for fleet replacement, maintenance facilities, etc. to support service
More hours of service per day
More service coverage in region: <ul style="list-style-type: none"> • County-to-county needs • Suburb-to-suburb needs • Region-to-region needs
More volunteer drivers
Need to make service more affordable to low-income riders
More coordination with human service providers
More vehicles: For many of the systems almost 100% of their fleet is needed for daily service. This condition impacts the feasibility of maintaining vehicles during the day.
Funds to provide more than simple subsistence travel: <ul style="list-style-type: none"> • Social/School activities
Maintenance and storage areas for vehicles
More local consideration for transit in land use planning/permitting

- **PASSENGER TRANSPORTATION STAKEHOLDER SURVEYS.** Across the state there are dozens of municipal, county and state human service agencies that assist their constituents in managing travel needs, even though the agency does not directly provide the ride. The broad base of agencies were requested to complete either a paper form or web-based survey in which travel information about their customers (including input on trips that were desired but were not made) was collected. Input was received from 23 human services agencies.
- **INPUT FROM THE GENERAL PUBLIC.** The Iowa DOT hosted a series of six public input meetings early in the study process. The meetings were held across the state (one in each of the Iowa DOT's six districts) and included a mix of large urban areas and smaller communities. The sizes (population) of the meeting communities were mixed to get the perspectives of small town needs, rural needs and larger urban area needs, which are not consistent across the state. The majority of the meeting time was allocated to listening to issues from the audience

and discussing a number of the more complex issues/needs to make sure there was a consistent understanding. After the needs were documented, meeting attendees were asked to help prioritize the importance of the needs/issues relative to the travel needs of users/non-users.

To broaden the base of input from those attending the meetings, a public sector web-based survey was used. Over 825 online surveys were completed.

The six public meetings for gathering input on needs generated extensive lists of areas where users and non-users perceive gaps in services. To assist in focusing the study on the most important areas, people attending the meetings were asked to identify the issues/needs that, in their opinion, are the most pressing. The information gathered at each of the meetings was summarized and those issues/needs consistently noted and consistently identified as the most critical were documented as those to be evaluated as part of the study. Table 5 displays a summary of the most critical needs identified through the meetings/workshops. The needs/issues listed in the table form the core of the needs addressed through the alternatives analysis.

QUANTIFYING PASSENGER TRANSPORTATION NEEDS

Input on needs obtained through the public meetings, from stakeholder and transportation service provider surveys and meeting discussions, and in the PTPs provides a representation of the perceptions of the stakeholders involved. While gathering qualitative information from the stakeholders is critical to the process, the bottom line product of the Funding Study is an estimate of the dollars required to address the current and future needs across the state. In order to provide a measurable estimate of the dollars required, the qualitative descriptions must be supported, or supplemented, to allow them to be reported as a value of:

- The number of additional trips required to address the mobility needs of Iowans.
- The number of necessity trips that are not made.
- The number of people not having adequate access to transportation services.
- The number of trips representative of transit being a competitive choice to personal auto travel.



TABLE 5: PUBLIC MEETING /PROVIDER WORKSHOP NEEDS PRIORITIZATION

Need/Issue Identified	Area Type Priority		
	Large Urban	Small Urban	Rural
Funding Not Adequate (All Jurisdictional Levels)	√	√	√
“More” Service is Needed:			
Hours of the Day	√	√	√
Frequency between Trips	√	√	√
Days of the Week (Add Weekend Service)	√	√	√
Service Area (Extend)	√	√	√
More Routes in Town	√		
More Intercity Service/ Connections:			
▪ Commute trips	√	√	√
▪ Medical trips			
▪ Suburb-to-suburb			
▪ Small town to regional center			
Higher Quality Secondary Roads – Not Reasonable to Provide Transit Service on Impassible Roads			√
Large Project Capital Funding Assistance	√		
Increased Level of Coordination:			
▪ Between adjacent systems	√	√	√
▪ Between public transit and human services agencies			
Better Regional Coordination Between Land Development and Transportation Service	√		
Consider New Modes (Rail)	√	√	√
Education/Marketing of Passenger Transportation Services	√	√	√

Estimates of the potential demand across the state were developed through application of a combination of several analytical models developed for similar uses in other regions of the country. The analytical models identified for use in the Funding Study employ different approaches to quantifying travel (transit) demand using simple input parameters. Model parameters focus on the key populations

representative of transit service users for the type of services provided throughout the state. The key input variables are:

- Senior population.
- Low-income population/persons living in poverty.
- Persons that cannot drive themselves due to a physical or mental restriction.
- Number of vehicles available for use in a household.

The demographic variables listed above are oriented to defining the level of need/demand for transit dependent persons and for estimating the choice rider potential in the urban areas. Presently, the majority of the statewide ridership, and the vast majority of the regional and small urban area service users are transit dependent (users that do not have another means of travel other than transit service). In addition, one of the charges of the study is to identify services that support energy reduction. Affecting, or influencing, energy use to a measurable extent will require providing passenger transportation service that would entice a mode shift from autos to higher occupancy vehicle modes (including carpools, vanpools, transit buses, rail, etc.). How each of the variables is used in the modeling for estimating transit dependent or choice demand is covered in the following bulletpoints:

- Transit dependent estimation variables:
 - Number of seniors in area or the percentage of population classified as seniors (65+ years old).
 - Number of persons whose annual income is defined by the Census Bureau as low income or persons whose income is at or below the designed poverty threshold.
 - Persons in an area described as having a disability that would impact their capability to drive.
- Choice rider estimation variables:
 - Number of zero car households in urban areas.
 - Number of two-car households in urban areas.

The demand estimation models used in the Funding Study were developed in different regions of the country and are intended to capture transit demand for communities/regions with different mixes of transit services, including:

- Paratransit only in rural areas and smaller communities.
- Combinations of smaller fixed route systems and regional paratransit in small to moderate sized urban areas.
- More extensive fixed route and paratransit services in larger metropolitan areas.

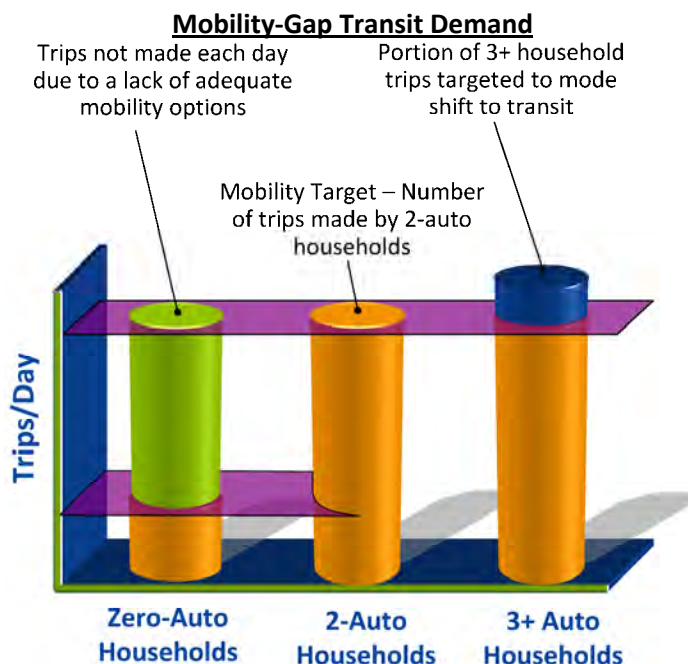
Model Overviews

The diversity of the transit conditions across the state and the need to estimate both transit dependent demand and choice rider demand led to selection of three separate demand estimation models. Each model is an application best suited for estimating community, county or regional transit activity levels and is not intended to provide demand in individual corridors in a community or a metro area. The models used in the Funding Study are listed below:

- Arkansas Public Transportation Needs Assessment (APTNA) Approach: This model is used exclusively in rural and small town areas that presently or would most likely be served by paratransit, but would not likely support fixed route service. The formulas used in the model for estimating demand were developed from survey data collected in rural and small communities in Arkansas as part of a regional transit assessment. All of the model input variables fall into the categories of factors used to define transit dependent demand, not choice rider demand. This model has the most applicability for areas covered by the 16 regional/rural transit systems.
- Washington State DOT Approach: This model was developed from survey data collected in rural, small and medium sized communities in Washington. Communities covered in the survey provided a combination of fixed route service and paratransit service. This model would have the most applicability in the small urban areas of Iowa, such as Mason City, Fort Dodge, Ottumwa, Clinton, Muscatine, Burlington, and Marshalltown. The model input variables used in the Washington State DOT model represent variables that best characterize transit dependent populations and would provide an urban area representation of transit dependent ridership.
- Mobility-Gap Model: In this model application the potential gap between daily/monthly/annual trip making for households with zero cars and households with access to autos (one, two or three plus) is used as a measure of restricted mobility (the gap) experienced in the region due to limitations in transit service. For the Funding Study the number of annual trips made by two-auto households was used as the desired mobility target, which means that all households in the state should have the ability to make as many trips as the typical two-car household. If there is not a vehicle available, or enough vehicles available, in a household to allow the desired level of mobility, passenger transportation services should be available to provide the trips. If passenger transportation services do not provide the desired trips, it would be concluded that a mobility gap exists in an area.

The Mobility-Gap model also assists in estimating the increment of trips from 3+auto households that could be shifted to transit modes if transit provided a competitive travel time. The incremental number of trips generated from 3+auto households relative to 2-auto households (shown in blue in the illustration above) would represent those trips targeted for shifting from automobiles to passenger transportation modes.

It should be noted that the Mobility-Gap model is used alone only in the choice ridership analysis.



Model Applications

Figure 9 displays the most critical information about each of the models relative to this study. The population and household information on age distribution, disability and income used in each of the models was obtained from US Census Bureau datasets.

Listed below are the general guidelines followed for applying the combinations of the models for estimating the transit dependent gap in each area:

- Rural and small urban areas without fixed route service: These areas closely reflected the population and density conditions for which the Arkansas application was developed (lower density areas that are rural or small communities). The Arkansas model results were used as the travel demand and the unmet need was estimated by subtracting the current ridership on the regional systems from the demand.



FIGURE 9: DEMAND MODEL APPLICATIONS

Arkansas Regional Service Model	Washington State DOT Model	Mobility – Gap Model	Passenger Transportation Demand and Ridership – Definitions
<p>Applicable Service Type</p> <ul style="list-style-type: none"> Demand-Response Service Only <p>Primary Inputs</p> <ul style="list-style-type: none"> Senior Population Number of Low-Income Persons Number of Persons with a Disability <p>Primary Output</p> <ul style="list-style-type: none"> Transit Dependent Demand 	<p>Applicable Service Type</p> <ul style="list-style-type: none"> Fixed Route Service Demand-Response Service Population: < 75,000 Persons <p>Primary Inputs</p> <ul style="list-style-type: none"> Senior Population Percent of Population below Poverty Threshold Number of Persons with a Disability <p>Primary Output</p> <ul style="list-style-type: none"> Transit Dependent Demand 	<p>Applicable Service Type</p> <ul style="list-style-type: none"> Fixed Route Service Demand-Response Service Metropolitan Areas (>50,000 Population) <p>Primary Inputs</p> <ul style="list-style-type: none"> Number of Zero Car Households Number of Two Car Households <p>Primary Output</p> <ul style="list-style-type: none"> Demand estimate if transit is a competitive choice relative to car 	<p>Ridership – The number of passenger boardings measured over a period (i.e. an hour, a day, a month or a year).</p> <p>Demand – The number of <u>potential</u> passenger boardings if the service offered was complementary to the trips that people <u>desire</u> to make. Thus, demand is equal to:</p> <p>Ridership + a percentage of auto trips + a percentage of walk trips + a percentage of bike trips + a percentage of trips that are not made due to travel time or dollar costs.</p>

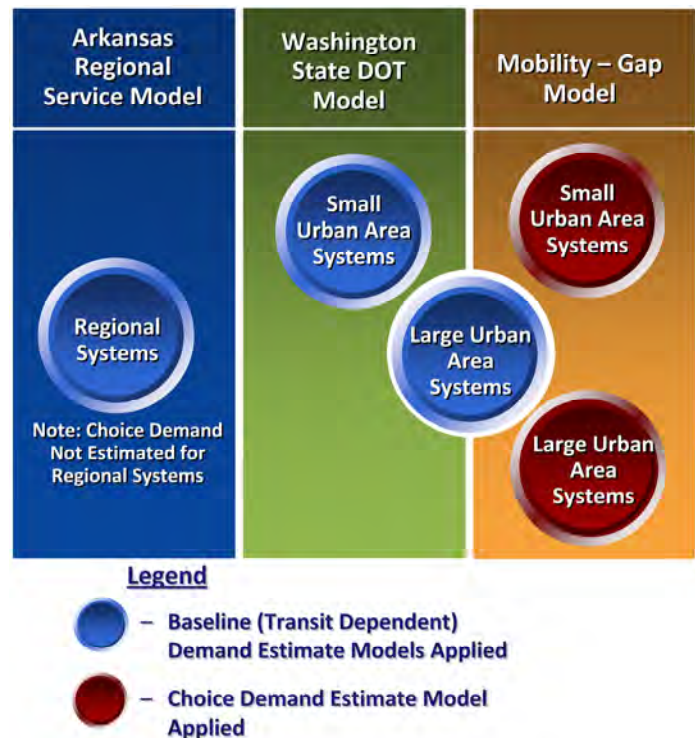
- Small urban (non-MPO) areas with fixed route and paratransit services: In most cases, these areas reflect characteristics consistent with those of the areas for which the Washington model was developed. For the small urban areas the demand estimates from the Washington model less the reported current annual ridership would be a reasonable estimate of annual unmet demand.
- Larger metropolitan areas: For the larger metro areas (Des Moines, Cedar Rapids, Waterloo, Iowa City, Sioux City, Ames, Dubuque, Council Bluffs and the Iowa Quad Cities), an average of the Washington state and the Mobility-Gap model results was used to define the transportation demand. Unmet need/demand was estimated as the difference between the model figures and the current annual ridership for the large urban fixed route service.

Figure 10 provides a representation of the models used by area type to estimate the transit dependent demand.

Transit Dependent and Choice Service Gap Estimates

Unique estimates of the unmet demand (gap) were developed for each of the 16 regional transit districts, each of the small urban system areas and for each of the large urban service areas for the following scenarios:

FIGURE 10: DEMAND MODEL APPLICATION BY SERVICE AREA GROUP AND FORECASTING CONDITION





- **Transit Dependent Service Gap:** Represents the difference between current system ridership and an estimate of the transit dependent demand.
- **Choice Rider (Energy Reduction) Service Gap:** The difference between the current ridership and the estimated choice ridership demand for urban areas of the state. The rural (regional) service areas were not included in this portion of the analysis as the lower development densities in the rural areas and small towns of the state would not support the type of service generally associated with choice service (fixed route and minimal headways).

The choice rider gap represents the difference between current annual ridership in the small urban and large urban areas and the model-derived estimates of demand based on the Mobility-Gap model. The Mobility-Gap model was used as the source for choice rider demand because it incorporates the trip-making assumptions associated with transit providing relatively unrestricted mobility (trip-making reflective of two-car households).

TRANSIT SERVICE DEMAND ANALYSIS FINDINGS

Through application of the selected models in each region, an estimated annual transit travel demand was generated. The increment between the estimated demand and 2008 observed ridership in a region represents the level of unmet need or the gap between present service and the demand.

Figure 11 documents the results of applying each of the three models to the geographical coverages representative of the 16 regional transit system districts, the small urban areas and the large urban areas of the state.

Baseline (Transit Dependent) Gap

In 2008, approximately 13.8 million rides (38,000 trips per day) that needed to be made by those persons without other reasonable means (transit dependent) were not served by one of the public transit services. The number of unserved trips represents approximately 54 percent of the current annual ridership of all of the systems.

By type of service (demand-response or fixed route) and the area type (regional/rural, small urban, large urban) the following are observed:

- The average gap for large urban areas is 54 percent of current urban area ridership. It needs to be noted that large urban area ridership represents approximately 80 percent of total 2008 ridership. The gap estimated for each of the large urban areas is

displayed in Figure 12.

- The average gap for rural areas, shown in Figure 13, is approximately 47 percent of current ridership.
- Figure 14 displays the estimated gap of each of the small urban areas, which combined represent a statewide gap of approximately 70 percent of current ridership.

A geographical distribution of the Baseline (transit dependent needs) gap analysis is displayed in Figure 15.

Choice Demand (Energy Reduction) Gap

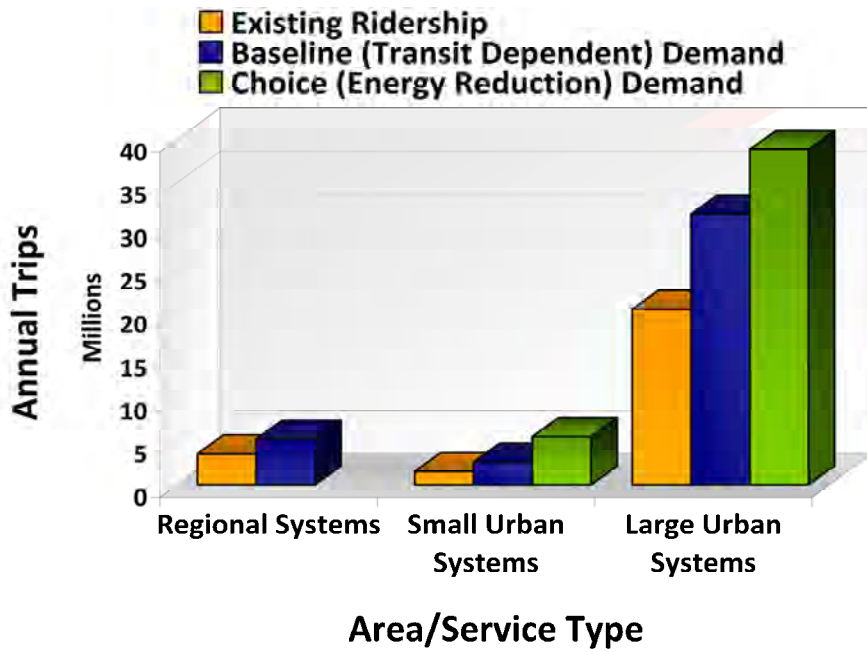
Choice demand estimates displayed in the figures reflect the urban area (small and large) annual demand attainable if passenger transportation services are a competitive choice for households relative to private vehicle use. Presently, the disparity in travel time (passenger transportation service travel time being much longer) and limited trip frequency (on average an hour between buses across the state) do not result in passenger transportation services being able to compete for choice riders if driving an auto is an available alternative. Eliminating the travel time disparity is forecasted to result in a shift of 24.3 million trips per year to passenger transportation modes.

Defining the Choice passenger transportation concept (mobility consistent with that observed by the typical two-car household across the state) allows quantifying the level of ridership needed to substantially expand the role that transit plays in addressing energy conservation and environmental stewardship goals of various state agencies and the Governor's office.

Looking at the results at similar levels as completed for the Baseline condition, the following are observed:

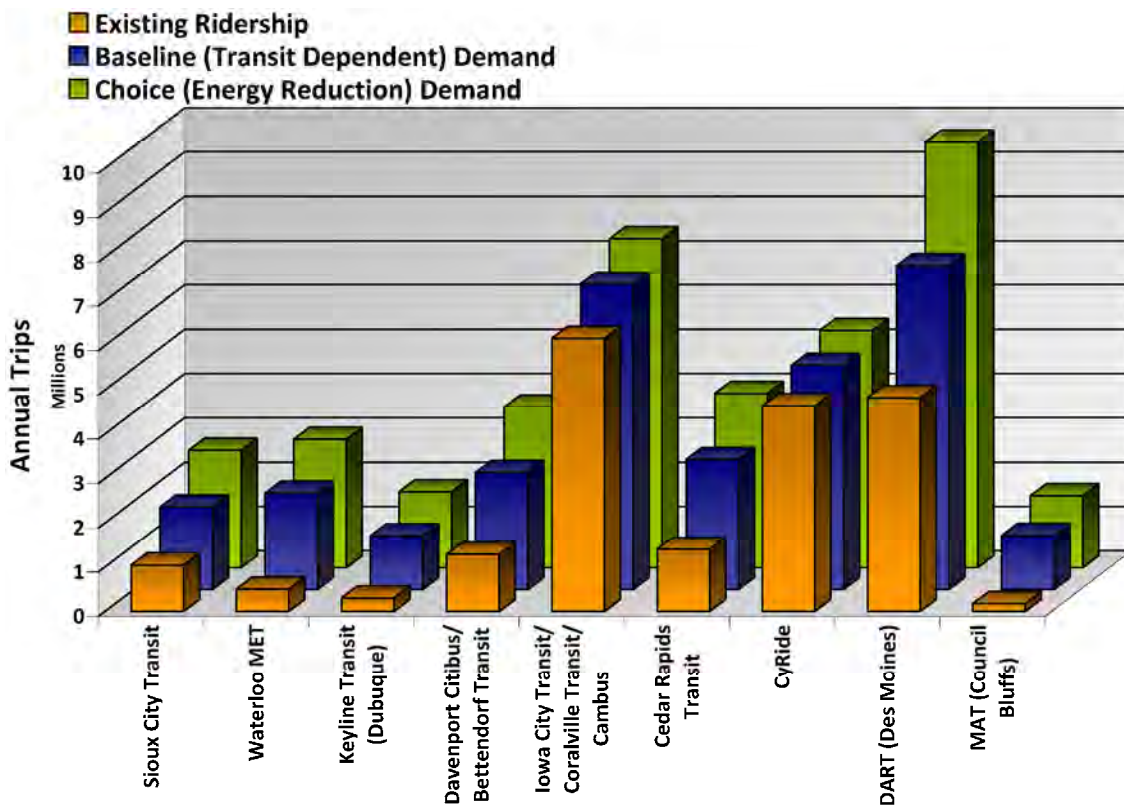
- The average gap for large urban areas is 90 percent of current urban area ridership.
- Statewide the average gap for the small urban areas is over 250 percent, which points out the difficulty associated with providing "choice" service in a small community. The frequency of service and number of vehicles on the street need to be disproportionately high relative to the larger areas (where longer travel times and greater congestion influence auto trip time much more).
- Choice service was not evaluated as an alternative in the regional coverage areas (rural) of the state due to the high level of service that would be required to provide any real competitiveness with the auto.

FIGURE 11: RESULTS OF EXISTING TRANSIT SERVICE GAP ANALYSIS BY SYSTEM TYPE



Source: URS Corporation, Inc.

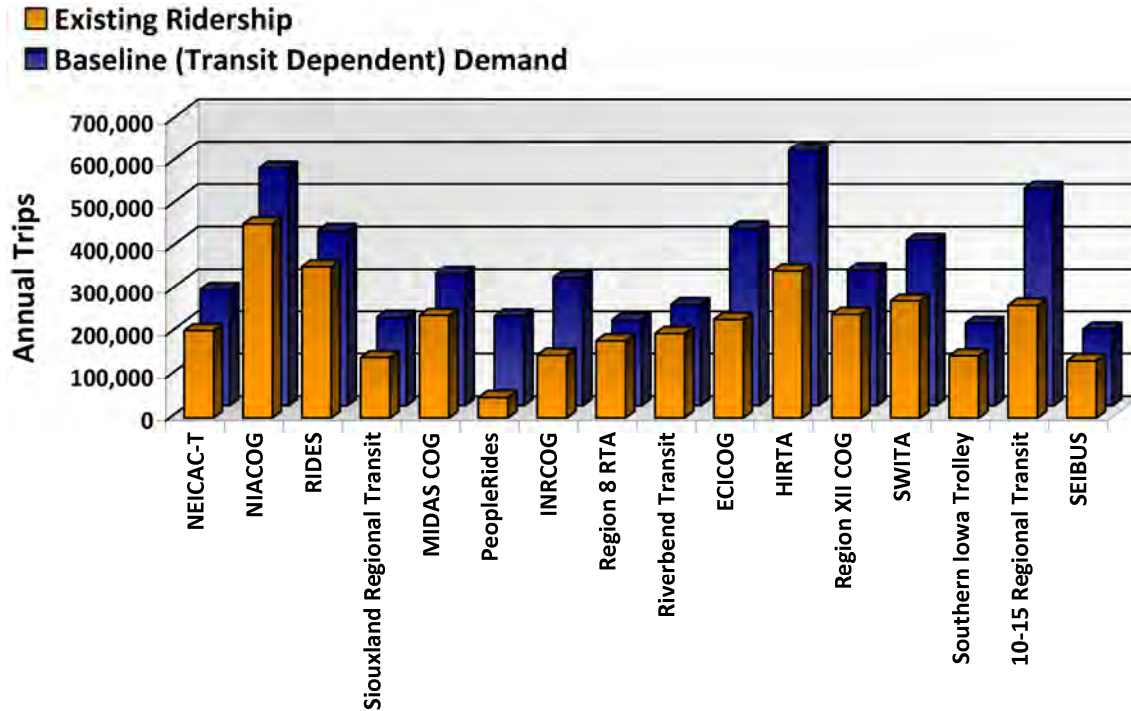
FIGURE 12: LARGE URBAN TRANSIT SYSTEM RIDERSHIP AND DEMAND/GAP ANALYSIS RESULTS



Source: URS Corporation, Inc.

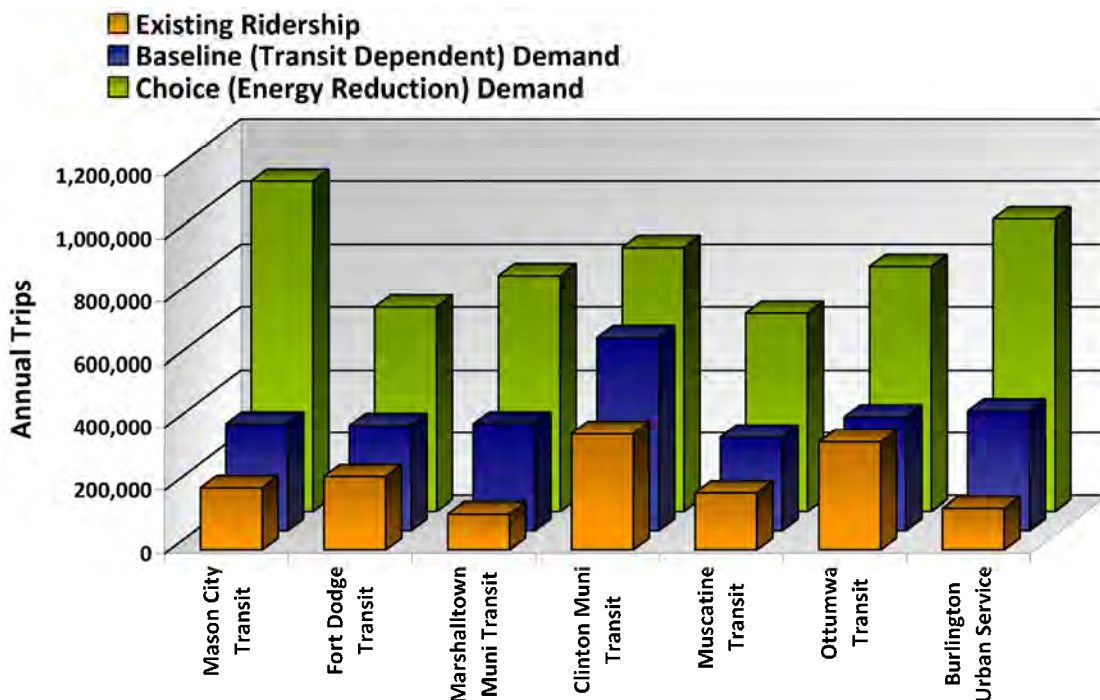


FIGURE 13: REGIONAL TRANSIT SYSTEMS RIDERSHIP AND DEMAND/GAP ANALYSIS RESULTS



Source: URS Corporation, Inc.

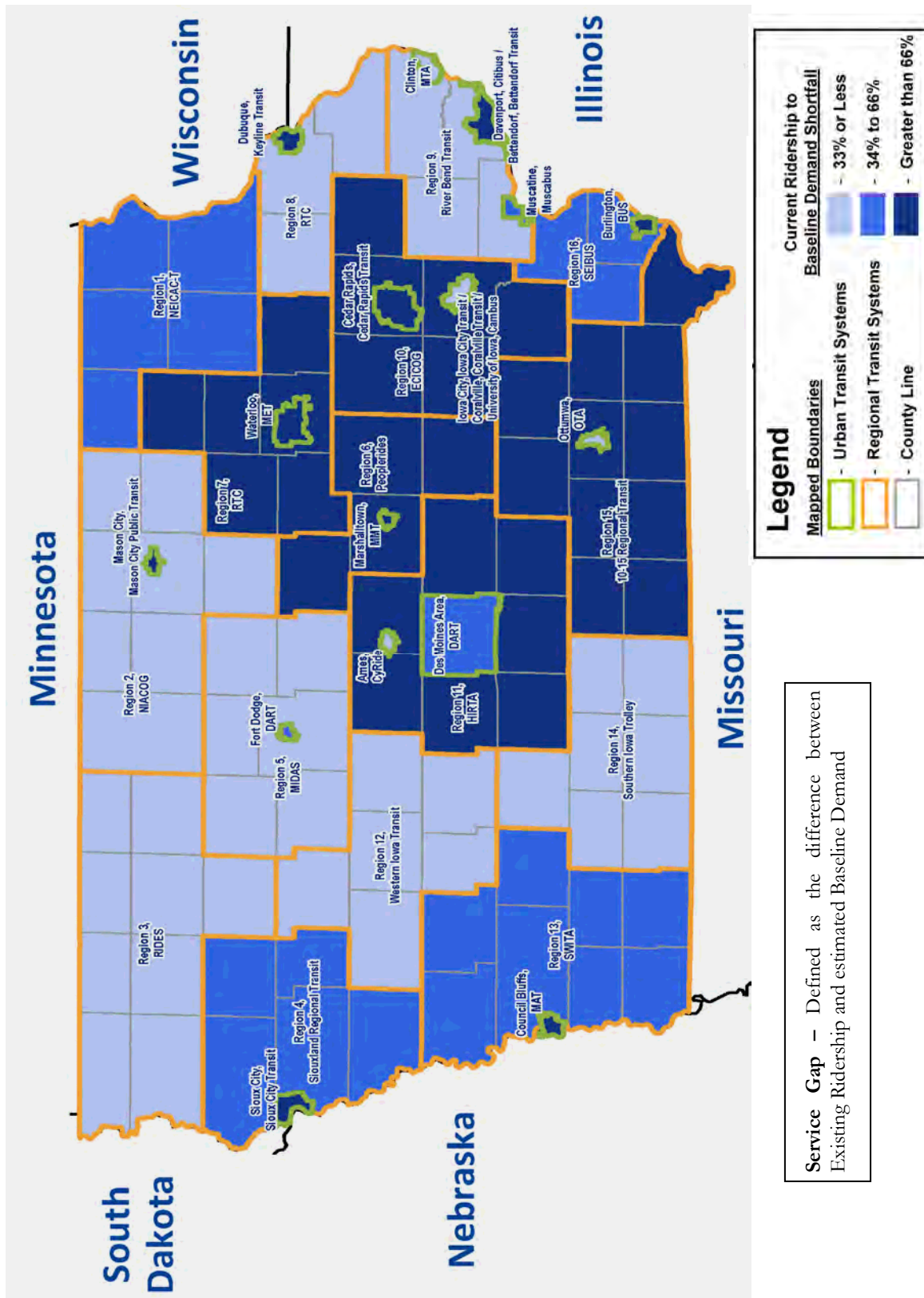
FIGURE 14: SMALL URBAN TRANSIT SYSTEMS RIDERSHIP AND DEMAND/GAP ANALYSIS RESULTS



Source: URS Corporation, Inc.



FIGURE 15: BASELINE SERVICE GAP ANALYSIS RESULTS BY REGION





PASSENGER TRANSPORTATION POLICY NEEDS

Providing passenger transportation service across Iowa requires a tremendous amount of inter-agency and inter-jurisdictional coordination and cooperation. Efforts being carried out today at the federal, state and local levels demonstrate the benefits of cooperation, but also provide insight into the institutional barriers that will need to be addressed in order to resolve the service gaps and the unmet needs.

Documented in this section are the institutional issues that need to be addressed in preparing a sustainable passenger transportation improvement plan that addresses service needs.

Age of the Public Transit Fleet - Statewide

Fleet age is a critical element in providing a level of service that addresses the passenger transportation goals. The influences that fleet age has on service include:

- An older fleet is generally less reliable and/or requires more resources for it to be maintained at an appropriate service level.
- An older fleet is typically less fuel efficient.

A general rule of thumb is that the average age of the fleet should be approximately one-half the average service life of the types of vehicle that comprise the fleet. The current fleet average age exceeds the average half-life for the mix of vehicles and a short-term action should be to systematically reduce the average age by replacing the older vehicles with new.

The current statewide public transit fleet is just under 1,500 vehicles and is made up of a range of vehicles from automobiles to large buses. Table 6 displays the current fleet

mix and the average age of the fleet. Based on the mix of vehicles in the fleet, the cost-effective half-life is 3.9 years. The current average age of vehicles in the fleet is 6.3 years. By vehicle classification, the following are observed:

- The average age of the fleet’s light duty buses is almost twice the cost-effective maintenance goal of three years. Over half of the entire fleet falls into this category.
- The average age of the medium duty bus fleet is only about one year over the goal for the vehicle classification.
- The heavy duty bus fleet exceeds the six year half-life goal by more than 50 percent. Heavy duty buses make up approximately 30 percent of the entire fleet and the vast majority of the fleet for the large urban areas.
- The average age of the van fleet, which is distributed across the state in all types of systems, is more than twice the cost-effective half-life.

Need for Local Access to Revenue

Two existing Iowa Code sections that address transit funding at the local level have created conflicts that were identified by providers and local elected officials. The code areas are:

- Title IX Local Government/Subtitle 4 Cities, Chapter 384 City Finance, Section 384.12 Additional Taxes – Provides for use of a transit property tax levy.
- Title I State Sovereignty and Management/Subtitle 10 Joint Governmental Activity/Chapter 28M Regional Transit Districts – Establishes the ability to organize a regional transit district.

TABLE 6: STATEWIDE FLEET VEHICLE AGE SUMMARY – REPLACEMENT NEEDS

Vehicle Type	Current Average Age (Years)	Current Vehicles	Age Target (Years)	Number Additional To Get Average Age to 1/2 of Life
Light Duty Bus	5.64	803	3	346
Medium Duty Bus	5.97	100	5	15
Heavy Duty Bus	8.22	414	6	109
Vans/Other	5.12	162	2	94
Totals or Average	6.33	1,479		564

Source: Iowa DOT and URS Corporation, Inc.



TRANSIT PROPERTY TAX LEVY

At the local government level there are conflicting interpretations of whether a community can use the transit property tax levy to fund all or part of the cost of contracting for service. Current legislation enabling the levying of a property tax specifically for transit states the funds are to be used for *municipal* transit. The conflicting interpretation is focused on whether regional service, supporting a number of communities, but is not organized by any one community, falls under the umbrella of ‘municipal’ transit. While a limited number of communities across the state use property tax levy, many more communities are served by transit. These communities are using other General Fund revenues as local money for participating in passenger transportation service in their area. Using General Fund revenue results in an annual competition with numerous other programs for funding. This annual decision process does not consistently result in transit service being financially supported by a town. Volatility in transit service budgeting which makes service planning and provision more difficult, results from the potential for inconsistent community funding.

REGIONAL TRANSIT DISTRICT POPULATION THRESHOLD

Current Iowa Code stipulates that a region where a transit district is being considered must contain at least one county with a population of at least 175,000 people before the district can be established. The minimum population threshold restricts regional districts to Polk County and the surrounding counties in the central portion of the state and Linn County and surrounding counties in the eastern part of the state. There are a number of counties/regions that may wish to, and benefit from, creating a transit district, but the population threshold prohibits their ability to establish one.

Stable and Reliable Revenue Sources Needed

One of the key challenges in providing passenger transportation service in Iowa has been that other than federal formula funds and the local property tax levy there has not been truly dedicated funding for either capital infrastructure or for operating. As examples:

- Much of the funding for vehicle replacements has come from Federal earmarks. Relying on Federal earmarks for funding results in unpredictable year-to-year funding that makes budgeting for vehicle replacement difficult.
- State transit funding does not come from truly dedicated sources. In 2008, the long-standing Motor Vehicle Use Tax dedicated to transit funding was replaced with the Statutory Allocations Fund. Public transit is one of five programs allocated dollars from

the Statutory Allocations Fund after dedicated assignments to TIME-21 and other programs are made. While establishing the funding and including public transit as one of the programs to receive funds is a step forward, transit was not one of the highest priorities for the fund.

- State funding amount is not tied directly to public transit costs. State participation in public transit funding is set at a level equal to what would have been generated from 1/20th of the first four cents of the motor vehicle use tax (even though the tax is not longer used). The level is not tied directly, or indirectly, to transit service costs.

The lack of dedicated state funding negatively impacts service planning and the feasibility of providing reliable mobility to the populations of the state that have no alternate.

Transit Facility Needs

In 2008 the Iowa DOT completed an assessment of the public transit support facilities across the state. From the study, it was concluded that an additional 186,000 square feet of maintenance space, 14,000 square feet of operations space and 666,000 square feet of vehicle storage area are needed across the state. The estimated cost for facilities was estimate to be \$53.3 million in 2008 dollars.

Any incremental space needs from today were attributed principally to expansion of the fleet and the level of fleet expansion was correlated to the estimated change in population. Population growth in the state is anticipated to be relatively minor at 0.5 percent per year, which results in the need to:

- Expand the large urban fleet by 111 vehicles.
- Expand the regional service fleet by 22 vehicles.
- Minimal expansion of the small urban area fleet.

Projected fleet needs in excess of the identified figures will result in the need to update the facilities plan and funding.

Iowa Medicaid Enterprise Transportation and Public Transit Coordination Needs

The Iowa Medicaid Enterprise has observed the service improvements other states, similar to Iowa in density, have been able to provide in part through establishing statewide transportation brokerages for coordinating medical trip making throughout the state.

The brokerage service will require implementation of both a management structure for scheduling, coordinating/consolidating and dispatching trips and implementation of



on-board intelligent transportation systems (ITS) technologies.

While the target population to be served is Medicaid participants, non-Medicaid riders will benefit as well, including older Iowans, day care users, and the general public.

Community-to-Community Travel Needs

Presently, there is at best limited passenger transportation service between communities across the state. Through the public engagement process the need for service between many of the larger urban areas and surrounding smaller communities. Issues raised were that people choosing to living in the surrounding smaller communities to find lower cost housing or for perceived quality of life benefits, need a non-automobile alternative for their commute to/from work in the larger urban area and to other critical services not found in the smaller community.

State Agency Transportation Reporting

Across the state there are dozens of public human services agencies that directly provide or arrange transportation service for their clients, but do not specifically track or report, basic information such as number of trips, operating cost per trip, capital costs, etc.

The purpose of the reporting is to help to identify opportunities for coordination of transportation services with existing public transit providers. Without the reporting, the potential for coordination, and cost sharing, has not been able to move much beyond the discussion of the unmet needs for agencies, because there is only qualitative information on present services provided and unmet needs.

Human Services-Passenger Transportation Coordination Needs

Passenger transportation services are provided in many different forms for a broad range of purposes. To the transportation needs of Iowans, it is essential that the variety of critical services are coordinated to maximize efficiency, reduce duplication of service and provide Iowans with appropriate access to transportation services.

The 2009 Passenger Transportation Plans address the need for coordination and ideas of how to expand the collaborative working relationship between public transit services and human services agencies throughout the state. A consistent theme of a potential barrier to implementation of coordination ideas is a lack of staff to oversee programs.

Local Coordination of Land Use Decisions with Transportation Plans

Land development decisions influence trip generation levels, regional trip patterns, and the range of transportation improvements that are needed and viable to support the development. As there is an interrelationship between land development and transportation, there is the need and responsibility to coordinate land development decisions and transportation decisions to reduce the potential for conflicts. Of primary concern are the following types of conflicts that exist today:

- Residential and commercial developments that need/can support passenger transportation service are proposed for areas where passenger transportation service is not provided and is not expected to be provided in the foreseeable future. Rarely, is this conflict addressed in the plan review process.
- Proposal and approval of healthcare facilities, which serve persons who are transit dependent, in areas that do not presently have transit service.
- Limited integration of transportation in land use decision-making process.



SECTION 5: SERVICE IMPROVEMENTS TO ADDRESS THE BASELINE AND CHOICE DEMAND LEVELS

INTRODUCTION

The goal of the Funding Study is to identify passenger transportation options that address the mobility needs of Iowans. Within the goal there are two main focal points:

- The needs of Iowa's senior population.
- How passenger transportation services can play a role in reducing the fossil fuel energy consumption in the state.

While much of the discussion and input received through the public and agency engagement process has emphasized public transit in its various forms as the primary mode for addressing the needs, the range of possible solutions included in the alternatives toolbox also includes:

- Carpool and vanpool programs.
- Intercity bus and commuter rail (or other non-rail commuter-focused service).

A consistent response during the public and agency outreach and a primary finding of the Gap Analysis is that "more" passenger transportation service is needed across the state to:

- Meet the goal of addressing the mobility needs of Iowans and primarily the senior and transit dependent populations of the state.
- Create the opportunity for a "by choice" mode shift from private vehicle use to passenger transportation services of a level that would improve the effective transportation fuel efficiency. Through providing passenger transportation services that result in an increase in use by choice riders, a slowing of the rate of growth in fuel consumption and reduced emissions can be achieved. Reducing the rate of growth, or possibly even reversing the annual growth trend, would be a huge positive step towards the goals of reducing Iowa's energy consumption,

reducing the dependence on foreign fossil fuels and improving the environment by reducing greenhouse gas emissions.

Definition of more passenger transportation services for the Funding Study has taken into account the diversity in the level of passenger transportation service currently provided and the types and quantity of service required to address the identified needs. Through the gap analysis, where the difference between demand (based on a set of potential user criteria) and present service was documented, it was found that demand in the state outpaces service by over 50 percent. The gap analysis also showed that there is a substantial range in the demand-to-present service gap for the regional systems, the small urban systems, and the large urban systems.

The purpose of this chapter of the Funding Study is to document how each of the alternatives address the Baseline and Choice demand gaps and to provide estimates of the capital and annual operating costs associated with the "more service" concepts. Service expansion scenarios that have been evaluated reflect a range of definitions of "more" identified through:

- The input received during meetings and survey responses supplied by public transit service operators/managers.
- Survey responses provided by the general public, which included persons that presently use transit services and those that do not, regarding unmet needs.
- Survey responses from human services agencies.
- Review of the RPA/MPO Passenger Transportation Plans.
- Information obtained from a mixture of transportation service providers, human services agency representatives, community/county staff and officials, and the public during study public meetings held across the state.



SERVICE EXPANSION ALTERNATIVES EVALUATION CRITERIA

The regional and urban transit system service expansion/improvement alternatives identified to address the unmet needs were assessed relative to a set of evaluation criteria. The alternatives that best addressed the evaluation criteria were combined to form a conceptual plan of the changes to the current systems that would be needed to support the passenger transportation goals.

The evaluation criteria used in the screening are:

- Consistency of the alternative with the passenger transportation goals – The primary goals of this study are to identify the service changes that are needed, if any, to support senior mobility and to support the state’s goal of reducing energy consumption. While each of the alternatives supports these goals, there is a range of degrees to which they satisfy the goals.
- Impact on reducing the Baseline and Choice demand gaps relative to current system ridership – Each of the service expansion alternatives reduce the identified gap, however, the degree to which each closes the gap varies significantly.
- Supports an identified need – The degree to which each of the alternatives addresses the range of unmet needs identified through the public meetings, transit provider meetings and Advisory Committee meetings.
- Cost per new rider – The ridership return on the service investment varies across the range of alternatives. Through this evaluation criterion the relative cost per new rider (based on the cost range) was documented.

- Extend the geographical service area into unserved portions of the community/metro area.
- In existing fixed route service areas add more routes covering more street miles reflecting an increase in the density of service.
- Provide service over more days of the week (add weekend service).
- For regional paratransit services, increase the number of trips made in a day.

DEFINING OPERATING AND CAPITAL COSTS	
Operating Costs	Capital Costs
<ul style="list-style-type: none"> • Driver pay/benefits • Administration pay/benefits • Fuel • Maintenance on vehicles • Maintenance on vehicles • Replacement parts 	<ul style="list-style-type: none"> • Passenger vehicles • Maintenance buildings • Storage buildings • Maintenance equipment • Transit stop/shelters • Administration buildings

Each of the scenarios listed above can be divided, for the purposes of the cost analysis, into the two primary elements of operating costs and capital costs.

Table 7 documents by scenario whether operating costs or a combination of operating and capital costs need to be incorporated into a specific scenario.

SERVICE EXPANSION ALTERNATIVES TO SUPPORT UNMET DEMAND

More passenger transportation service scenarios to address the Baseline and Choice demand gaps reflect the following types of changes to the present service:

- Increase the frequency of fixed route service (reduce service headway) by a given amount:
 - Throughout the entire service day.
 - In the peak hours of service.
- Add to the daily hours of service by either starting service earlier in the morning or extending hours later into the evening.

TABLE 7: COST ELEMENTS INCLUDED IN ENHANCEMENT SCENARIO

“More Service” Scenario	Cost Category Included in Scenario	
	Operating	Capital
Increase Service Frequency	√	√
Expand Daily Service Hours	√	
Extend Fixed Route Service Area/Increase Density of Service Coverage	√	√
Add Service Days to Week	√	
Increase Daily Paratransit Trips/Runs	√	√



As the Funding Study is being performed on a statewide geography, an appropriate balance must be struck between incorporating individual system detail/characteristics and getting too caught up in individual system detail that is not uniquely different than other systems. At the state level, the differences between systems and service in each system class (regional, small urban and large urban) are typically relatively minor. The relative consistency between systems allows for simplifying many assumptions and using general units such as average costs by revenue mile for operations or revenue hour.

One of the assumptions of the “more service” alternatives that include vehicles (capital purchases) is that adding storage and/or maintenance facility space is not included in the estimates. Maintenance, administration, and vehicle garage space was not included because the Iowa DOT has addressed storage needs and funding options in a separate project.

Increase Service Frequency (Fixed Route)

On average, the time between buses on fixed route systems across the state is 60 minutes. While some of the large urban systems, such as Des Moines, Ames and Iowa city-Coralville, operate some routes with shorter headways there are also many systems that operate most routes on a 75 minute frequency. The time between trips reduces the number of users because of the wait time for the next bus if their preferred time bus was missed.

Listed below are the remaining assumptions which, in addition to the scenario general assumptions that have been previously outlined, were incorporated into the cost analysis:

- The days per week and service hours a day are not changed.
- A simplified daily headway for each of the fixed route systems was prepared using the current schedules. While the characterized headways do not reflect all of the detail of each system, they are logical starting points. The statewide “typical” daily time between vehicles on a route is approximately 60 minutes.
- Adding service frequency will require adding buses (vehicles and drivers) to existing routes.

Table 8 displays the results of the increase service frequency concept within the range of “more service” scenarios aggregated by large urban systems and small urban systems. Listed below are the capital and operating costs associated with the range of service frequency improvements included in the alternatives analysis:

- Increase service frequency by 1/3 (which results in an average of 45 minutes between trips on a route) – The annual operating and capital cost increment ranges from approximately \$1.9 million for the smaller systems to approximately \$25 million for the total of the larger metro systems.
- Increase service frequency by 100% (cut the current headway for each system in half, providing 30 minute trip frequency on routes) – The incremental annualized costs range from \$5.7 million to approximately \$75.7 million.
- Increase service frequency to provide 15 minute service (resulting in a frequency increase of 400 percent from the current 60 minutes between trips) – The incremental annual costs for operations and capital for small urban systems of approximately \$20.9 million and approximately \$279.3 million for the large urban system total.

Add Daily Hours of Service

Most of the fixed route systems in the state end their service day between 6:00 PM and 7:00 PM. Exceptions are Iowa City Transit, Cambus (University of Iowa), Coralville Transit, CyRide (Ames), DART (Des Moines metro) and Council Bluffs (contracts service through Metro Area Transit - Omaha) which all run service until 10:30 PM or later. Ending the service day in the early evening limits the availability of passenger transportation service to access second shift jobs, attend social activities in the evening/late into the night, attend education classes that meet in the evening, etc. To provide service consistent with retail businesses hours, transit service hours were extended through 11:00 PM. This assumption adds up to five hours to the end of some systems’ service day. The following assumptions were incorporated into this “more service” scenario:

- Service frequency for the later into the evening service would be similar to other off-peak hours of the day (30 minutes to 60 minutes between trips).
- Service would be provided on all routes.
- Incremental costs are all for added operating costs (including fuel). No additional vehicles.
- If a system currently operates until 10:00 or later, extending the day was not included in the cost analysis (minor impact).

Table 9 displays the range of add hours scenarios evaluated in the study. This alternative concept requires only operating cost additions.

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TABLE 8: COST ANALYSIS RESULTS – INCREASE FIXED ROUTE SERVICE FREQUENCY

Transit Service Scenario	Ridership Increment by System Type			Incremental Cost Element (Annual)	Cost by System Type		
	Large Urban Fixed Route	Small Urban Fixed Route	All Fixed Route Systems		Large Urban Fixed Route	Small Urban Fixed Route	All Fixed Route Systems
Current (2008) Service Summary	20,354,000	1,566,000	21,920,000	Operating Costs	\$60,881,000	\$6,000,000	\$66,881,000
33% More Frequent Service (~ 45 Minute Frequency)				Operating Costs	\$21,405,000	\$1,499,000	\$22,904,000
	3,732,000	263,000	3,955,000	Average Capital Cost¹	\$3,580,000	\$369,000	\$3,949,000
				Total Annual Cost	\$24,985,000	\$1,868,000	\$26,852,000
100% More Frequent Service (~ 30 Minute Frequency)				Operating Costs	\$64,873,000	\$4,562,000	\$69,435,000
	10,556,000	744,000	11,300,000	Average Capital Cost¹	\$10,847,000	\$1,118,000	\$11,965,000
				Total Annual Cost	\$75,720,000	\$5,680,000	\$81,400,000
200% More Frequent Service (~ 20 Minute Frequency)				Operating Costs	\$152,101,000	\$10,696,000	\$162,797,000
	12,546,000	1,229,000	13,775,000	Average Capital Cost¹	\$25,432,000	\$2,622,000	\$28,054,000
				Total Annual Cost	\$177,533,000	\$13,318,000	\$190,850,000
400% More Frequent Service (~ 15 Minute Frequency)				Operating Costs	\$239,328,000	\$16,830,000	\$256,158,000
	18,618,000	2,682,000	21,300,000	Average Capital Cost¹	\$40,017,000	\$4,125,000	\$44,142,000
				Total Annual Cost	\$279,345,000	\$20,955,000	\$300,300,000

Note: Assumes days and hours of service are not changed

¹ - Assumes vehicles in the fixed route fleet cost \$200,000 new (mix of smaller and larger buses) and new vehicle needs are directly related to the level of increase service.

The operating costs associated with added hours of service are:

- Add one hour of service to those systems that end their service day in the 6:30 PM to 7:30 PM time frame - The incremental annual average increased cost ranges from \$368,000 for the smaller systems to approximately \$1.8 million for the larger metro systems.
- Add two hours of service per day - The incremental annual increased cost range from \$736,000 for the small system total to just under \$3.7 million for large urban systems.
- Add three hours of service per day – Small system annual increased costs equal approximately \$1.1

million, while the annual total increase for the larger urban systems would be approximately \$5.4 million.

- Adding four hours per day would require an additional \$8.8 million statewide, with \$1.5 million required for the small urban areas and \$7.3 million in the larger urban systems that end service in the late afternoon or early evening.
- Extension of the service day by five hours would allow service in most urban areas to continue until approximately 11:00 PM. The incremental cost would be approximately \$1.8 million for smaller urban area systems to almost \$9.1 million per year for the larger metro area.



TABLE 9: COST ANALYSIS RESULTS – ADD HOURS OF SERVICE

Transit Service Scenario	Ridership Increment by System Type			Incremental Average Annual Operating Costs		
	Large Urban Fixed Route	Small Urban Fixed Route	All Fixed Route Systems	Large Urban Fixed Route	Small Urban Fixed Route	All Fixed Route Systems Total
Current (2008) Service Summary	20,354,000	1,566,000	21,920,000	\$60,881,000	\$6,000,000	\$66,881,000
Add 1 Hour per Day	180,000	98,000	278,000	\$1,828,000	\$368,000	\$2,196,000
Add 2 Hours per Day	358,000	145,000	504,000	\$3,656,000	\$736,000	\$4,392,000
Add 3 Hours per Day	493,000	204,000	697,000	\$5,484,000	\$1,104,000	\$6,588,000
Add 4 Hours per Day	637,000	232,000	869,000	\$7,312,000	\$1,472,000	\$8,784,000
Add 5 Hours per Day	709,000	261,000	970,000	\$9,140,000	\$1,840,000	\$10,980,000

Systems not included: Iowa City, Coralville, Cambus, Ames (CyRide), DART, Council Bluffs (MAT)

Source: URS Corporation, Inc.

**Expand Urban Service Geographic Coverage/
Add Route Coverage Density in Current Area**

A trend observed across the state over the last sixty years has been a population shift from the rural areas and smaller communities to the medium and larger urban areas. Increased density and continued development of the urban fringe have brought with them the need to expand transit service in two ways:

- Expand fixed route and paratransit service farther from the central core to support development.
- Provide a higher level of service to those areas with limited fixed route service.

While the needs associated with these two urban development conditions are in competition for limited transit service dollars, how the identified needs are addressed is similar. Expanding either the geographical service limits or the route density within the present service limits requires:

- Additional operating and maintenance labor as more drivers, maintenance staff, and possibly administration staff are needed.
- Additional vehicles to provide the increased amount of service.

Relative to current service, the following assumptions are incorporated into this scenario:

- Headways (trip frequency) on the expanded service would be the same as headways for present service across the state.
- Daily hours of service in the expanded service areas would be the same as present service across the state.

- The annual days of operations for the expanded service concept would be the same as the present number across the state.

Consistent with many of the other scenarios reflecting “more service”, there is not a specific definition of how many additional revenue miles of service are needed across the state to satisfy the definition of “more service” needed. Capital and operating costs representative of a range of increases from a low of a 10 percent increase in the revenue miles to a 100 percent increase (doubling the service miles per day) were incorporated into the analysis. Table 10 documents the results matrix for the range of service increases.

The operating and capital costs associated with expanding service coverage and adding route coverage density are as follows:

- Increasing the present operating service area for the small urban systems by 10 percent would increase annual costs by \$435,000 and large urban area costs by approximately \$5.8 million.
- Adding 25 percent to the current service area or increasing route density by 25 percent would increase small urban system annual costs by approximately \$1.1 million and large urban area annual costs by \$14.4 million.
- An increase of service representative of a 50 percent increase in annual revenue miles would result in an increase in costs across the state of just under \$31 million, with approximately \$2.2 million and \$28.8 million from small urban and large urban areas, respectively.

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- Doubling the service area or doubling the route density in the current service area (representative of a 100 percent increase in revenue miles) results in annual cost increases of:
 - Approximately \$57.6 million in the large urban areas.
 - Approximately \$4.3 million across the small urban systems.

operate service on Sunday. The number of trips made on Saturdays and Sundays, if service is provided, is typically much lower than weekday trips. The exceptions to the no Sunday service norm are systems in Council Bluffs, DART (Des Moines), CyRide in Ames, and Cambus at the University of Iowa. The combination of adding service on Sundays for the other 31 regional and fixed route providers and adding Saturday service to the 14 systems that only run on weekdays makes up the add weekend service “more service” scenario.

Add Weekend Day Service

Currently, just over half of the fixed route and the regional paratransit systems run service on Saturdays and very few

TABLE 10: COST ANALYSIS RESULTS – EXPAND SERVICE AREA/ROUTE DENSITY

Transit Service Scenario	Ridership Increment by System Type			Incremental Cost Element (Annual)	Incremental Annual Operating Costs		
	Large Urban Fixed Route	Small Urban Fixed Route	All Fixed Route Systems Total		Large Urban Fixed Route	Small Urban Fixed Route	All Fixed Route Systems Total
Current (2008) Service Summary	20,354,000	1,566,000	21,920,000	Operating Costs	\$60,881,000	\$6,000,000	\$66,881,000
10% Coverage Increase (10% Increase in Annual Revenue Miles)				Operating Costs	\$4,930,000	\$350,000	\$5,280,000
	1,120,000	79,000	1,199,000	Average Capital Cost¹	\$825,000	\$85,000	\$910,000
				Total Annual Cost	\$5,755,000	\$435,000	\$6,190,000
25% Coverage Increase (25% Increase in Annual Revenue Miles)				Operating Costs	\$12,330,000	\$870,000	\$13,200,000
	2,800,000	197,000	2,997,000	Average Capital Cost¹	\$2,062,500	\$212,500	\$2,275,000
				Total Annual Cost	\$14,392,500	\$1,082,500	\$15,475,000
50% Coverage Increase (50% Increase in Annual Revenue Miles)				Operating Costs	\$24,670,000	\$1,730,000	\$26,400,000
	5,598,000	395,000	5,993,000	Average Capital Cost¹	\$4,125,000	\$425,000	\$4,550,000
				Total Annual Cost	\$28,795,000	\$2,155,000	\$30,950,000
100% Coverage Increase (100% Increase in Annual Revenue Miles)				Operating Costs	\$49,340,000	\$3,470,000	\$52,810,000
	11,196,000	790,000	11,986,000	Annual Capital Cost¹	\$8,250,000	\$850,000	\$9,100,000
				Total Annual Cost	\$57,590,000	\$4,320,000	\$61,910,000

Note: ¹ - Assumes vehicles in the fixed route fleet cost \$200,000 new (mix of light duty to heavy duty buses) and new vehicle needs are directly related to the level of increase service. Assumes a 12 year bus replacement schedule.

Source: URS Corporation, Inc.

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The cost analysis assumptions incorporated into the Add Weekend Service alternative are:

- Weekend labor rates, on a per hour basis, would be the same as the rates paid during the weekday period.
- Administrative costs over the weekend period are the same as the costs during the week.
- Over each of the weekend days, eight hours of service would be provided. The eight hour figure is consistent with the typical current Saturday service day.
- No additional capital rolling stock would be required to add Saturday or Sunday service.

The results of the analysis are displayed in Table 11 and are listed below:

- Adding/expanding Saturday service to the fixed route systems would cost an additional \$170,000 per year (to provide a minimum of eight hours per day). The estimated cost of adding Saturday service to the regional paratransit systems would be approximately \$2.1 million per year.
- Providing across-the-board Sunday service would increase current costs by approximately \$4.2 million annually for the fixed route systems and approximately \$3.6 million for the regional paratransit services.

Add Daily Trips to the Regional Systems

Adding to the number of daily trips made by regional paratransit systems can improve the level of mobility of seniors, low-income individuals/families, and persons with disabilities in small towns and rural areas. Increasing the

number of regional paratransit service trips made per day requires:

- Increasing operating costs by adding driver, administration, and maintenance labor.
- Purchasing additional vehicles to accommodate the increased trips.

Other assumptions that went into the alternative are:

- The capital cost of each paratransit vehicle is approximately \$75,000.
- Each vehicle would have a useful service life of six years.

For the increase in the number of daily regional demand-response trips scenario, the range of service increases starts at 10 percent and increases in steps to 100 percent. The input variable was the number of revenue miles per day. The results of the analysis are displayed in Table 12 and are listed below:

- Increasing present service revenue miles (service) by 10 percent would cost approximately \$3.8 million per year, in 2009 dollars.
- A 25 percent increase in service level would raise current costs by approximately \$9.6 million per year.
- A 50 percent increase in the number of trips per day, while retaining the same number of operating days per year, would cost approximately \$19.2 million.
- Doubling the level of service being provided (a 100 percent increase in revenue miles) would cost an additional \$38.3 million per year.

TABLE 11: COST ANALYSIS RESULTS – ADD WEEKEND SERVICE DAYS

Transit Service Scenario	Annual Ridership Increment by System Type		Increase in Annual Operating Costs by System Type		
	Demand Response Systems (Urban and Regional)	Fixed Route Systems	Demand Response Systems (Urban and Regional)	Fixed Route Systems	All Statewide Systems Total
Current (2008) Service	3,621,000	1,120,000 ¹	Not Available	Not Available	
Add Saturday Service Only	261,000	39,000	\$2,070,000	\$170,000	\$2,240,000
Add Sunday Service Only	36,000	86,000	\$3,610,000	\$4,190,000	\$7,800,000
Add Saturday and Sunday Service	297,000	125,000	\$5,680,000	\$4,360,000	\$10,040,000

Note: ¹ Systems not included that already have Sunday service - DART, Cambus, Ames CyRide, Council Bluffs (MAT)
 Large urban only – Small urban ridership number not available.
 Weekend and weekday labor rates are similar
 Assumes 8 hour service added

Source: URS Corporation, Inc.

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TABLE 12: COST ANALYSIS RESULTS – ADD REGIONAL DEMAND RESPONSIVE SERVICE TRIPS/RUNS PER DAY

Transit Service Scenario	Annual Ridership Increment	Current Operating of Incremental Cost Element	Regional System Costs
Current (2008) Service	3,621,000	Current Operating	\$29,451,000
10% Service Increase	206,000	Annual Operating Costs	\$2,332,000
		Average Annual Capital Cost	\$1,502,000
		Total Annual Cost	\$3,834,000
25% Service Increase	516,000	Annual Operating Costs	\$5,829,000
		Average Annual Capital Cost	\$3,754,000
		Total Annual Cost	\$9,583,000
50% Service Increase	1,032,000	Annual Operating Costs	\$11,659,000
		Average Annual Capital Cost	\$7,509,000
		Total Annual Cost	\$19,167,000
100% Service Increase	2,064,000	Annual Operating Costs	\$23,317,000
		Average Annual Capital Cost	\$15,017,000
		Total Annual Cost	\$38,334,000

Note: Assumes average vehicle cost of \$75,000. The number of new vehicles needed is consistent with increased service (i.e. Add 10% to service, will need to increase vehicles by 10%).

Assumes 6-year vehicle replacement schedule

Source: URS Corporation, Inc.



INTERCITY CORRIDOR ASSESSMENT

Intercity corridors present opportunities that have been tapped by carpool and vanpool programs, but not through other higher capacity modes. Current Amtrak service operates east-west in the southern part of the state from the Burlington, Iowa to Omaha, Nebraska. Amtrak does not, however, address, and is not designed to address, the intercity commute trips or intra-state travel. This conclusion is drawn from two principal parameters of the service:

- Operating times: The daily eastbound train travels through Iowa between about 6:00 AM and 11:30 AM. The westbound train crosses the state between 5:25 PM and 10:30 PM. The times that most communities are served do not satisfy commute times to or from work.
- Service frequency: Presently, one eastbound and one westbound trip are made per day, which does not represent intercity passenger service needed for commute trips.

The process for assessing the potential for service is not intended to provide a determination of whether intercity passenger rail service is viable for the state, a consortium of communities or private interests to pursue, but rather the purpose is to document:

- The process of determining daily trip levels between city-to-city or metro-to-metro pairs. This information would be a critical input to a more extensive analysis of the feasibility of intercity service.
- Ridership levels used as typical benchmarks of the type of technology (carpool/vanpool, bus, light rail, commuter rail) that is most appropriate for supporting the intercity trip levels.
- Typical capital and operating cost for the range of technologies.

Estimates of Potential Community-to-Community Travel

The primary source of intercity travel information was the Iowa statewide travel demand model that has recently been developed by the Iowa DOT. The statewide travel model is a computer application with the capabilities to provide estimates of daily person or vehicle travel across the state.

There were two main elements to the process of estimating community-to-community travel:

- Estimating, using the statewide model, the number of people that travel between each potential community-to-community pair in the state.
- Selecting from the statewide universe of community-

to-community pairs, those that demonstrate enough attraction to each other to support more analysis relative to passenger transportation service.

The city-to-city travel information resulting from this step in the process can then be assessed relative to a set of generalized feasibility criteria to help focus the areas of future analysis.

Use of the Statewide Travel Model Datasets

Person trips, rather than vehicle trips (many of which occur with multiple persons in the vehicle), are the appropriate type of trips to evaluate for this study. The analysis focused on person trips rather than vehicle trips, both of which are intermediate products of the modeling process.

The Iowa statewide travel model divides the state into 1,781 geographical units called traffic analysis zones (TAZs). TAZ boundaries are defined by features such as major roadways, rivers and lakes, and county boundaries. Larger urban areas are typically constructed of more TAZs, smaller urban areas typically have fewer. While the comprehensive TAZ geography provides improved detail for various model applications, simply evaluating the TAZ-to-TAZ travel across the state does not provide a complete picture of the travel between Iowa communities.

To establish the city areas, TAZs were aggregated into “districts” that reflected the approximate geography/boundaries of Iowa urban areas/communities. A threshold population of 4,000 was selected for establishing unique urban community districts in the statewide model, based on a review of model trips and Census data². A community-based person trip table was then established by aggregating the statewide person trip table to reflect the geography of the community districts.

Statewide Travel Estimation Results

Based on this estimation approach, community-to-community trip estimates were developed. Table 13 provides the results of the daily person trip estimates and distance for those community-to-community pairs with at least 5,000 daily trips. The trip estimates for those community pairs with at least 1,000 trips per day are shown in Figure 16.

The city-to-city travel estimates in Table 13 represent all daily trips that would be made between each city-to-city pair by any mode that is available, not just the trips that would use passenger transportation service if available. All modes,

² There were only two exceptions: Sioux Center – Orange City and Tama – Toledo, which had to be combined community districts as they shared a common TAZ.

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including auto, biking, carpool/vanpool, public transit, intercity carriers, and passenger rail, would compete for the trips based on travel time and cost by mode.

There are a range of potential passenger transportation improvements that could be implemented across the state, and the technologies/modes utilized for passenger transportation will vary by corridor. Typical urban passenger transportation shares across the state range between one percent and 2.5 percent for the various types of service provided, with transit mode shares in Ames and Iowa City approaching eight percent for work trips. A mode share of

approximately five percent of all city-to-city trips is likely reasonable. The trips displayed in Table 13 would be multiplied by 0.05 to obtain an estimate of potential city-to-city passenger transportation demand. Based on the information in Table 13, the range of demand across the state for those communities listed would range from 250 trips per day to approximately 1,750 trips per day.

TABLE 13: ESTIMATED DAILY PERSON TRIPS AND DISTANCE BY COMMUNITY PAIR

Community District Class	Community District Pair	Estimated Daily Person Trips	Miles Between Cities
Des Moines Area	Des Moines-Indianola	21,000	17.9
	Des Moines-Adel	18,000	18.0
	Des Moines-Winterset	8,000	26.3
	Des Moines-Perry	9,000	27.5
	Des Moines-Ames	15,800	28.6
Large Urban Population District to Large Urban Population District	Iowa City-Cedar Rapids	35,000	23.0
	Muscatine-Davenport	12,500	25.2
	Davenport-Clinton	5,600	28.8
	Muscatine-Iowa City	5,000	30.2
Medium City Population District to Large Urban Population District	Boone-Ames	12,500	13.1
	Ft Madison-Burlington	11,000	16.0
	Tama-Toledo-Marshalls town	8,200	17.2
	Anamosa-Cedar Rapids	8,500	21.4
	Oskaloosa-Ottumwa	8,000	22.1
	Vinton-Cedar Rapids	5,000	22.7
	Independence-Waterloo	10,000	23.2
	Fairfield-Ottumwa	5,900	23.3
	LeMars-Sioux City	8,700	23.7
Washington-Iowa City	7,400	26.4	
Medium Population District to Medium Population District	Pella-Knoxville	8,000	11.5
	Perry-Adel	5,000	16.1
	Pella-Oskaloosa	7,000	16.3
	Sioux Center-Orange City-LeMars	5,700	16.7
	Spirit Lake-Spencer	8,600	20.5
Small Population District to Large Urban Population District	Clear Lake-Mason City	20,000	8.7
	Nevada-Ames	15,600	9.1
	Mt Vernon-Cedar Rapids	8,100	12.9
	Glenwood-Council Bluffs	5,300	15.2
	Humbolt-Ft. Dodge	8,000	16.4
	Waverly-Waterloo	7,400	17.2
	DeWitt-Clinton	6,800	17.6
	DeWitt-Davenport	7,500	20.5

Source: URS Corporation, Inc.

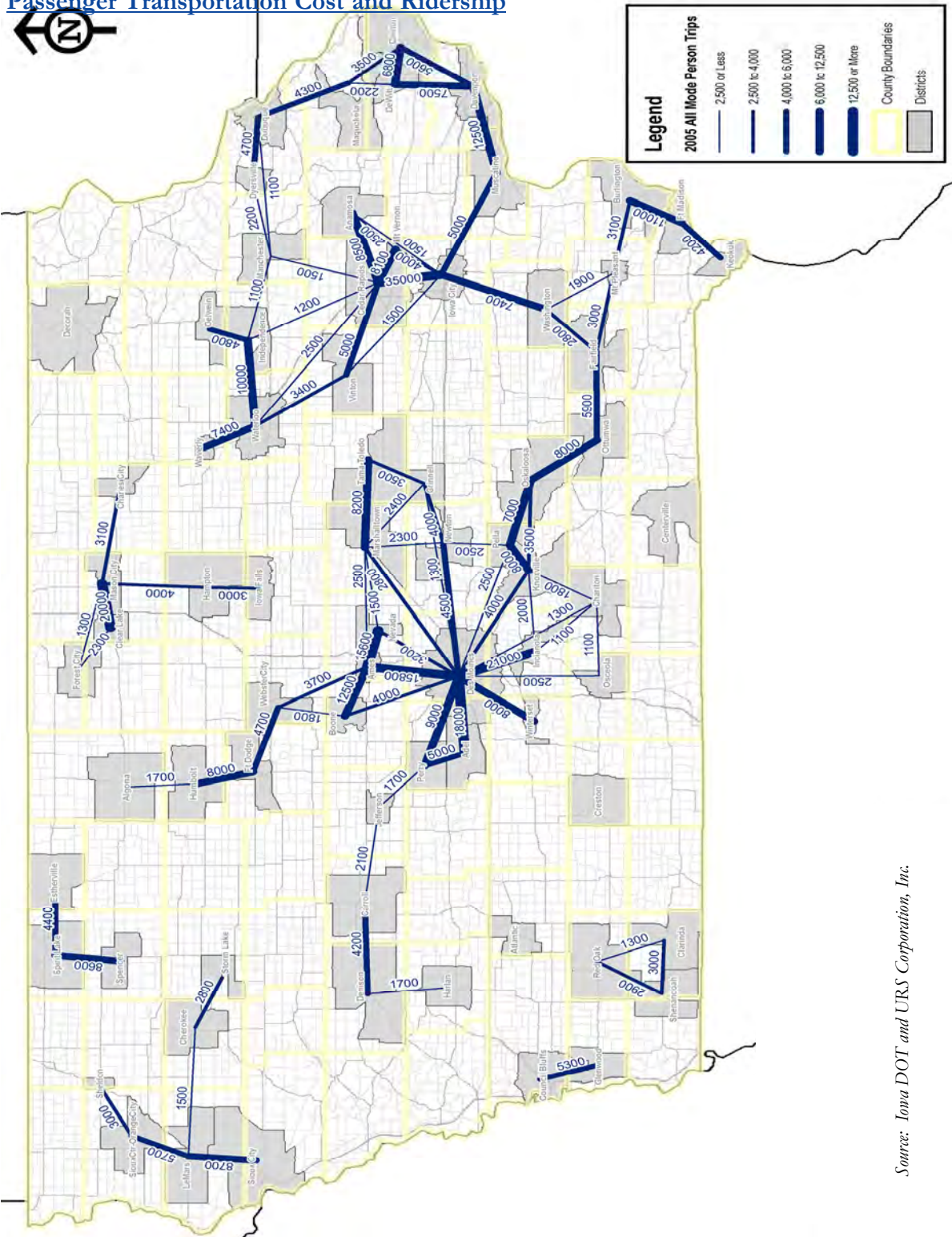
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FIGURE 16: COMMUNITY-TO-COMMUNITY PAIRS WITH 1,000 OR MORE TRIP INTERCHANGES

Passenger Transportation Cost and Ridership



Source: Iowa DOT and URS Corporation, Inc.



Parameters by Technology

Table 14 describes a range of potential modal technologies that could be applied in the identified city-to-city corridors, summarizing the typical daily ridership, right-of-way requirements and construction and operating costs. The information can be used, along with the city-to-city interaction, distance data, and the estimated passenger transportation mode share, to continue evaluating the feasibility of service between various community pairs.

Intercity Travel Analysis Summary

Providing passenger transportation service between any of the community-to-community pairs will be as much a social decision as it is a transportation service decision because a public subsidy will be required.

The previous sections provided an overview of:

1. The estimated level of travel between city-to-city pairs.
2. Typical mode split of total trips that are attracted to passenger transportation modes.
3. Costs associated with construction and operations for a range of passenger transportation modes.

From the information presented in the section, it can be concluded that there is no single operating format or technology that would in all cases provide the most cost effective service. In general, as the level of travel between

cities increases, the alternatives that involve dedicated right-of-way or a guideway become more cost effective. Lower volume pairs require low cost alternatives unless there is a substantial interest by the decision-makers and the public to more heavily subsidize service. Service between the communities could be provided as:

- Carpools/vanpools (ridershare programs)
- Public transit services.
- Public intercity bus service.
- Commuter rail.

INTERMODAL SERVICE IMPROVEMENT PLANS - BASELINE AND CHOICE DEMAND

The mobility needs of Iowa’s diverse population for work trips, medical trips, education trips, and social trips, combined with the range of current transportation services, dictate a coordinated multiple program enhancement approach to addressing the needs. A single program approach, such as increasing urban fixed route transit service trip frequency is a **step** toward fulfilling the passenger transportation vision, but attaining the goals requires multiple steps.

TABLE 14: TYPICAL PASSENGER MODE RIDERSHIP, RIGHT-OF-WAY REQUIREMENTS AND COSTS

Passenger Mode / Technology	Typical Daily Ridership	Type of Right-of-Way	Typical Modal Costs
Carpool	At least 2 per car	Shared	Some program administration costs. Operating costs borne by participants.
Vanpool	Typically 5-15 per van	Shared	Total costs of \$0.50 to \$1 per mile.
Bus Rapid Transit/ Express Bus	1,000 to 10,000 (Average – 100 riders per mile)	Shared / Semi-Exclusive	Capital costs: \$2M to \$20M per mile. Operating Costs: \$4.00 per revenue mile
Light Rail	10,000 to 40,000 (Average – 350 riders Per Track Mile)	Semi-Exclusive	Capital costs: \$30M to \$60M per mile. Operating Costs: \$11.50 per revenue mile
Commuter Rail	5,000 to 100,000 (Average – 470 riders per track mile)	Exclusive	Capital costs: \$4M to \$10M per mile. Operating Cost: \$23.80 per revenue mile

Source: URS Corporation, Inc.



The multiple step approach proposed for addressing mobility needs of Iowa's senior population and establishing the overall transportation system as a contributing partner in reducing the dependence the state has on imported fossil fuels includes:

- Increased passenger transportation trip frequency in small urban areas and the large urban areas of the state.
- Increased daily paratransit and demand- response transit system trips.
- More hours of passenger transportation service per day.
- Increase the level of Saturday and/or Sunday service on fixed route systems.
- Initiating or adding intercity and inter-regional transit service, such as:
 - Paratransit trips between outlying communities and regional medical centers.
 - Commuter service between urban areas where it may be warranted.
- Converting from an almost exclusively diesel fleet burning imported fossil fuel to domestically produced fuels that emit lower amounts of greenhouse gases.

The preferred service changes must be sustainable over time, so the feasibility of an alternative to reduce/close identified Baseline and Choice demand gaps must also include analysis of the costs. For example, investing \$7.8 million per year to add eight hours per week of Sunday service across the state would satisfy the need for weekend service, but would investing the same \$7.8 million to increase large urban fixed route systems trip frequency by approximately 10 percent address more of the gap? To reasonably address this question, the potential ridership associated with incremental changes in service (whether it be hours or service, frequency of service or extending the service coverage), was evaluated.

Based on the diversity of needs across the state, one service type improvement is not going to satisfy the passenger transportation vision. This is because the current ridership-to-Baseline demand gap represents more of a social need that cannot simply be reduced to the number of passengers served. There needs to also be an accounting of who is being served.

To address the needs identified through the public input process and the trip modeling, an increase in public transit service frequency, additional daily hours of service, added hours on weekends and expansion of the number of daily trips provided through the regional systems are needed.

Listed below are the proposed improvements to current passenger transportation service.

Increase Service Frequency (Fixed Route) - Small and Large Urban Areas

Increasing trip frequency over the current weekday and weekend operating hours has the greatest potential of any of the service concepts to address the estimated gap between current ridership and either the Baseline or the Choice demand levels. For each 10 percent reduction in the interval between trips, ridership is expected to increase by about 5.5 percent.

To meet Baseline and Choice demand would require the following changes in service frequency:

- Baseline demand – Trip frequency on average would need to be increased from a statewide average of approximately 60 minutes to approximately one trip every 30 minutes. This change represents a substantial enhancement relative to the current conditions, and essentially requires almost a doubling of the fixed route labor and capital resources on the street. This change is very substantial and will have the greatest impact of any change relative to closing the gap.

Increasing the frequency of trips on fixed route systems in the small and large urban areas from 60 minutes (on average) to 30 minutes is estimated to cost approximately \$81.4 million per year. The frequency change is forecasted to increase ridership by approximately 11.3 million passenger per year and address approximately 82 percent of the current ridership to Baseline demand gap.

- Choice demand – Average trip frequency would need to be reduced from 60 minutes on average today to 15 minutes across the small and large urban areas. Reducing the time between trips to 15 minutes provides the competitive trip travel time to the private vehicle that is needed to create the shift from private vehicles to high occupant vehicles. The 15 minute trip frequency target represents the typical trip length for small and large urban areas across the state. A review of the average travel time to work for the small and large urban areas was completed to confirm the reasonableness of the target. Reducing the time between trips to an average of approximately 15 minutes is forecasted to result in a ridership increase of approximately 21.3 million per year. Through this service improvement approximately 88 percent of the current ridership to Choice demand gap would be addressed.



Expanding small urban and large urban service to provide 15 minute service throughout the day is estimated to cost approximately \$300.3 million per year for operations and capital.

Add Daily Hours of Service in Small and Large Urban Areas

Longer into the evening service is the second most productive of the possible changes and addresses one of the key issues that was raised by the public. As most urban fixed service, even in many of the larger urban areas, ends between 6:30 and 7:30 PM, many transit dependent users are limited in their employment and evening education opportunities.

The potential to increase ridership by extending service hours into the evening is greater in the large urban areas relative to the small urban areas. The larger growth in ridership increment assumption is based on the greater number of second shift job opportunities and regional retail areas that provide both evening shopping and employment opportunities in the larger urban areas relative to the small urban areas. In the Baseline demand alternative service hours in only the large urban areas are proposed to be extended to 11:00 PM. Service characteristics of the extended period should be similar to the current.

To address the Choice demand concept of passenger transportation service that is competitive with auto travel, fixed route service hours in both the small and large urban areas would need to be extended to 11:00 PM. Cost and ridership impacts associated with extending service hours are:

- Baseline demand – Expanding service hours through 11 PM in the large urban areas is forecasted to attract an additional 709,000 riders per year and would cost approximately \$9.1 million per year. The incremental cost reflects primarily labor costs for expanding driver hours into the evening.
- Choice demand – In the Choice demand alternative later into the evening service would be provided for all fixed route systems in large urban and the small urban areas. Service expansion would attract approximately 970,000 riders per year. The incremental cost above current service costs would be approximately \$11.0 million per year.

As a stand alone concept, extending daily service hours to 11:00 PM would not address the entire Baseline or Choice demand gap that has been identified. As a result, the extending hours would represent a part of a multiple improvement approach and not a singular, alternative that address the estimated gaps.

Add Weekend Day (Sunday) Service

Adding Sunday service to the large urban areas so that each offers eight hours of typical weekend service is also one of the elements to address Baseline and Choice demand. Adding Sunday service to small urban areas is not recommended due to the cost relative to the ridership. As the Sunday trip making opportunities in the small urban areas are considerably reduced from those in the large urban areas (fewer weekend employment opportunities); the ridership increment does not support the estimated cost.

Adding to the hours of Sunday service, or adding Sunday as a new day of the week for service in large urban systems, is forecasted to result in an annual ridership increase of approximately 86,000 trips and is estimated to cost approximately \$4.2 million per year.

As weekend ridership potential is substantially less than weekday ridership potential (due to fewer weekend work trips), adding Sunday service would complement an identified need, but it would not close either the Baseline or the Choice demand gaps.

Expand the Number of Daily Regional Service Trips

Adding to the daily trip capacity of the 16 regional public transit systems will have the most significant impact on filling in the rural and small town Baseline service gap relative to any of the other service options. The vast majority of the regional trips today are for non-emergency medical service or shopping trips and these trips would still be the dominant portion of regional service trips in the Baseline condition. The increment of trips has been assumed to be added without making substantial changes to the current service hours. Medical and most shopping trips are focused on the period from 7:30 AM to approximately 5:30 PM, which generally corresponds with non-emergency medical office hours. While extending service later into the evening will add a minor increment to paratransit ridership and account for a small part of the estimated Baseline service gap, adding many of the trips after 6:00 PM will not provide much of a ridership return.

The following changes to regional paratransit daily trips are needed to support the Baseline and Choice demand:

- Baseline demand – The number of paratransit trips provided each day would need to increase by approximately 90 percent to address the small town and rural Baseline demand to current ridership gap.

The 90 percent increase in trips is forecasted to attract an additional 1.86 million riders per year at an estimated annual cost of approximately \$34.5 million.

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The cost estimate addresses the capital and operating costs associated with the increment of service.

- Choice demand – Expansion of the regional paratransit services across the state beyond serving Baseline demand is not recommended. The lower density of the rural and small town areas does not provide ridership growth opportunities consistent with the goals of the Choice demand scenario. The number of vehicle miles of travel required to cover the rural areas of the state would not be offset by a ridership increase of a level that would noticeably impact fuel efficiency or emissions.

PUBLIC TRANSIT SERVICE IMPROVEMENTS TO ADDRESS NEEDS

Ridership estimates by proposed service improvement and the cost associated with the improvements to current regional, small urban and large urban services are documented in Table 15. The increments of service displayed in the table are forecasted to address the gaps

between current ridership and Baseline demand and Choice demand estimates for the future.

Service Expansion – Urban and Regional Systems

The results of the individual service expansion or improvement alternative provided the conclusion that one action (for example: increasing the frequency of service over the current service day), would not address the needs identified through the qualitative assessment and the gap analysis. In addition, the level-of-service needed (Baseline) to satisfy the needs of transit dependent Iowans is different than the service needed to provide people with a reasonable alternate that they would choose over driving themselves (Choice).

Service improvements to address the Baseline and Choice demand are outlined in the following sections.

TABLE 15: SUMMARY OF PUBLIC TRANSIT IMPROVEMENTS NECESSARY TO MEET BASELINE AND CHOICE DEMAND

Proposed Action	Ridership and/or Ridership Increment from Current (Annual – Millions)	Annual Incremental Cost (2009 \$) (Millions)		
		Operating Costs	Capital Costs	Total
Current Conditions (Total of 35 Providers)	25.5	\$100.00	Variable	Variable
Baseline Demand				
Increase Service Frequency to 30 Minutes – Small and Large Urban Fixed Route Systems	11.2	\$75.7	\$5.7	\$81.4
Expand Daily Service to 11 PM Weekdays – Large Urban Systems	0.7	\$9.1	Minimal	\$9.1
Expand Daily Regional Paratransit Trips by 90%	1.9	\$21.0	\$13.5	\$34.5
TOTALS	13.8	\$103.8	\$17.9	\$125.0
Choice Demand				
Increase Service Frequency to 15 Minutes – Small and Large Urban Fixed Route Systems	21.3	\$279.3	\$21.0	\$300.3
Expand Daily Service to 11 PM Weekdays – Large and Small Urban Systems	1.0	\$11.0	Minimal	\$11.0
Expand Daily Regional Paratransit Trips by 90%	1.9	\$21.0	\$13.5	\$34.5
Expand Sunday Service – Large Urban Systems	0.1	\$4.2	Minimal	\$4.2
TOTALS	24.3	\$315.5	\$34.50	\$350.0

Source: URS Corporation, Inc.

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The Baseline and Choice demand service expansion/improvements are as follows:

- Baseline:
 - Reduce the time between trips in the small and large urban areas from 60 minutes to 30 minutes for existing operating hours.
 - Extend evening service hours in the large urban areas to 11:00 PM, while retaining current hours of service in the small urban areas.
 - Increase the daily trips provided in the regional paratransit systems by approximately 90 percent.
- Choice Demand:
 - Reduce the time between trips in the small and large urban areas from 60 minutes to 15 minutes for existing operating hours.
 - Extend evening service hours in the small urban areas to 11:00 PM, to match the Baseline assumption for the large urban areas.
 - In all of the large urban areas add eight hours of service on Sundays with frequency consistent with that presently offered on Saturdays.

An added element to both the Baseline and Choice service improvements is continued emphasis on coordination of service, dispatching, purchasing, etc. between human services agencies and passenger transportation service providers. The purpose of the coordination efforts is to reduce costly duplication of service while increasing the level of transportation service being provided across the state.

In 2009 dollars, the incremental costs over current levels associated with enhancing service to address the Baseline and Choice demand are approximately:

- Baseline Demand Service: \$125 million per year.
- Choice Demand Service: \$350 million per year.

The cost estimates reflect the following capital and operating cost assumptions:

- A mixture of heavy duty buses, light duty buses and paratransit vans would need to be added to the current fixed route and demand-response fleets for the increased trip frequency alternatives. The costs for vehicles have been reported as an annual average and reflect replacement periods ranging from 4 years for a van to seven to 10 years for a light duty bus to 12 years for a heavy duty bus.
- Labor costs for operations and maintenance consistent by service

and area type for regional operators, small urban operators and large urban operators.

- Fuel for the expansion fleet.
- The need to include either labor or capital, or both, into a service concept as was documented in Table 5.
- Added service hours to provide service to 11:00 PM reflect the actual current service end times.

Capital Purchases to Reduce Average Fleet Age

In addition to the annual capital and operating costs for the various service expansion alternatives, there is the need to address the advanced age of the current vehicle fleet. Fleet age is a concern because after vehicles reach about one-half of their useful service life, the annual maintenance costs increase dramatically.

Typically, transit agencies use an estimate of the half-life of their overall fleet as a goal for their fleet age. The half-life guide reflects balancing increasing maintenance costs for vehicles as they get older with the cost of replacing a vehicle when it still has reasonable service life remaining.

Reducing the average age of the fleet will result in:

- A substantial reduction in annual maintenance costs.
- A reduction in vehicle emissions. It has been assumed that the oldest vehicles in the fleet would be retired and older vehicles generally emit higher levels of pollutants.
- Improvements in fleet fuel efficiency. Similar to the issues with vehicle emissions, older vehicles likely experience worse fuel mileage than new diesel or new diesel-electric hybrid vehicles. Replacing the oldest vehicles in the statewide fleet would result in a per vehicle mile fuel cost reduction.

To reduce the current average age to the average half-life of the statewide vehicle mix, 564 vehicles would need to be added at a cost of approximately \$100 million. In the funding assessment it was assumed that replacing older buses to update the fleet would be done over a four year period as the Baseline demand service changes are being implemented. The \$25 million per year would be in addition to the funds required to implement either the Baseline or Choice demand service changes.

**ESTIMATED INCREMENTAL
SERVICE COSTS (ANNUAL)**

**Baseline Demand Service:
Operations/Capital - \$125 million**

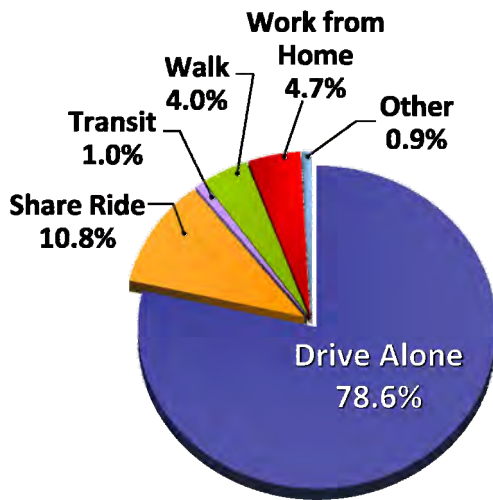
**Choice Demand Service:
Operations/Capital - \$350 million**



RIDESHARE'S ROLE IN THE SOLUTION

Rideshare programs, including vanpools and carpools, offer a relatively low cost, low administrative effort, lower ridership to be sustainable travel option that is viable in many lower density situations where public transit is not.

The focus of this discussion will be on the potential for rideshare programs to provide the passenger transportation option in the community-to-community corridors that have a mutual trip attraction, but the travel intensity is not to the level that would support public transit options from express or demand-response bus to commuter/intercity rail.



Mode of Travel to Work (Iowa)

Source: US Census Bureau

There are various methods for implementing both carpool and vanpool programs, from management/oversight to operational approach. When formalized, both types of programs can be implemented at various levels, whether by employers, transportation management associations (TMAs) or a governmental entity. Carpools typically use private vehicles, while vanpools typically use leased vehicles or vehicles owned by the governing entity, not the vanpool users. There are various elements that can be incorporated into rideshare programs to make them more effective, including:

- Guaranteed ride home programs, which provide rideshare users an emergency ride home if needed. These rides are typically provided by taxi, rental car or transit and are subsidized by the rideshare program.
- Web-based matching databases/ bulletin boards allow system managers to provide web-based applications where riders can be anonymously matched, or match themselves, based on commute origin and destination.

Opportunities for Carpool and Vanpool (Ridesharing)

Rideshare programs can be effective in areas where the trips are longer and potential users are too scattered to effectively use other modes of passenger transportation. With 100 vanpools and numerous formal and informal carpools already in operation in Des Moines and other areas, there is a clear precedence in Iowa that ridesharing can be effective at a metro level. Addressing the regional and statewide opportunities for enhancing smaller community and even rural area participation will likely require a more statewide management organization. The role of the management organization would be to aid employers with understanding more about opportunities and provide potential users with the information on opportunities to match into a pool.

Quantifying the potential traveler impact associated with expanding metro vanpool and carpool activities uses population and travel data from potential service areas. The community-to-community data from the statewide travel demand model was the primary source of travel data.

A reasonable goal for vanpooling is to attract up to five percent of work commuters between communities or within communities. For this study, however, only the community-to-community, or between communities element, is the focus. Rideshare programs are typically focused on work trips rather than shopping, medical or other trips. This is because the work trips are made every weekday; generally occur in the peak traffic hours, which is typically the period of concern, and the typical vehicle occupancy is very low (on average 1.2 persons per vehicle for the state for work trips).

The ridesharing assessment was limited to those community-to-community pairs that in the statewide model application showed a trip interchange level of 4,000 trips per day or more. The 4,000 total trips per day threshold results in a work trip threshold of approximately 1,000 trips per day, as work trips are typically about 1/4 of total daily trips.

There are a total of 45 community-to-community pairs shown in the statewide travel model to have more than 4,000 trips per day traveling between them. The total of the trips between the communities is approximately 352,000 person trips a day, or 176,000 daily round trips for all purposes. Travel to and from work is typically the primary trip that is covered by rideshare programs and work trips represent approximately 25 percent of all daily trips. By capturing five percent of the work trips, rideshare trips would total approximately 2,200 per day more than are currently made.

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With the goal of 2,200 new daily users in mind and making a conservative assumption that most users would be in vanpools, the present fleet would need to be expanded to 420 vehicles from its current 188 vehicles.

The inputs and results of the rideshare opportunities assessment are displayed in Table 16.

TABLE 16: SUMMARY OF POTENTIAL RIDESHARING

Current / Proposed Vanpool	Daily Corridor Trips, All Purposes	Daily All Purpose Corridor Round Trips	Candidate Work Round Trips (25% of All)	Existing / Targeted Vanpool Ridership	Number of Vanpools
Current Programs	--		--	1,781	188
Potential Expanded Programs, Corridors with 4,000 or more round trips/day	352,000	176,000	44,000	2,200	232
Statewide Vanpool Totals After Full Implementation				3,981	420

Note: The potential for double counting of rideshare users and commuter rail/passenger rail users must be addressed as/if commuter rail is advanced. As this gross level double counting is assumed to be relatively minor most carpool/vanpool non-metro origins would not be along a commuter/passenger rail corridor.

Source: URS Corporation, Inc.

Expanded Rideshare Program Costs

Table 17 documents that the annual costs for expanding rideshare programs to capture an increased portion of the commute trip (up to 5 percent) is estimated to be about \$5.89 million per year, with a rider cost recovery of approximately \$2.05 million. An annual operating subsidy of approximately \$3.84 million would be required (assumes most of the expansion is vanpool programs). In total, the vanpool program, including the existing vanpools, would provide nearly 8,000 person trips per day (4,000 riders at two daily trips).

TABLE 17: VANPOOL PROGRAM EXPANSION COST ESTIMATE

Number of New Vehicles	Average Trip Distance (Miles One Way)	Miles Traveled		Cost Per Mile (Capital/Lease and Operating)	Annual Program Cost	User Cost Recovery (Annual)	Net Program Subsidy (Annual)
		Daily	Annual				
232	35	16,240	4,222,400	\$1.40	\$5,890,000	\$2,050,000	\$3,840,000

Source: URS Corporation, Inc.

Ridesharing Funding Opportunities

In terms of identifying funding sources for the vanpool expansion, vanpools qualify under FTA Urbanized Area Formula Funds (Section 5307) as a transit mode whose revenue and passenger miles can generate funding for transit agencies when reported through the National Transit

Database (NTD). Capturing vanpool data (vehicle revenue and passenger miles) and reporting it to the NTD could yield additional funding for new/existing vanpools in Iowa, lowering costs to commuters, and attracting more drive-alone commuters to this mode.



Rideshare Program Conclusions

The benefits of rideshare programs are already being felt throughout the state through formal programs managed by DART and others, semi-formal programs managed by employers, and a very informal network of neighbors simply sharing the ride to work and back. Rideshare programs in the state are diverse in their geographic coverage from suburb-to-central city, suburb-to-suburb, and one community to another.

If rideshare programs are expanded, the changes should be in an incremental fashion. The first steps should be to increase the visibility of the Des Moines-Ames area and the Cedar Rapids-Iowa city area programs through additional marketing efforts.

There would be benefits of expanded promotion and coordination of rideshare services statewide. The current patchwork of informal arrangements used for carpooling across the majority of Iowa undoubtedly leads to more missed opportunities than captured trips in terms of carpooling. Centralization and coordination of statewide rideshare operations will improve the capture rate of matching carpooling opportunities.

The Iowa DOT website provides a link to a free, third-party website that provides local carpool matching services. Providing an Iowa-specific rideshare-matching database that is actively promoted would improve the potential for successfully matching interested carpoolers across the state. When coordinated with active local vanpool and carpool programs, overlap in matching services can be eliminated and would cast a wider net that would benefit both the local/metro-specific programs and a statewide program.

More active employer outreach ideas are:

- Adding vanpooling information to new staff orientation programs.
- Conducting regular visits to major employers promoting vanpooling on-site partnered with aggressive ride-matching at work sites.
- Hosting regional vanpooling informational meetings to educate the public on the benefits of vanpooling.
- Establishing vanpool incentive programs that might include reduced fares, referral programs, guaranteed ride home programs and seat subsidies for vanpools that are not full.

CHANGE IN FUEL USE AND CARBON DIOXIDE EMISSIONS

The reduction in the level of growth in auto emissions associated with the shifting auto vehicle miles of travel to improved/expanded passenger transportation services can be increased by also incorporating a fuel change from diesel. By not only shifting travelers to a potentially more efficient fuel mode, also converting to a fuel or vehicle technology that results in lower pollutant emissions, Iowans can experience an improved environmental quality of life.

The current urban system fleet for both small and large urban systems is almost exclusively diesel-fueled vehicles. The regional systems fleet is a combination of gasoline powered and diesel powered vehicles. Recent purchase requests for selected urban areas have specified hybrid diesel-electric buses, but the hybrid vehicles have not been received or put into service. Changes in the current fleet that create the potential for a combination of reduced emissions and/or less transit vehicle fuel use are:

- Convert from diesel fuel to biodiesel mixture, which provides similar fuel efficiency as diesel, however, results in lower emissions per gallon of fuel used.
- Convert from diesel fuel to compressed natural gas, which results in lower emissions per gallon of fuel used.
- Convert from diesel fuel to propane, which results in lower emissions per gallon of fuel used.
- Migrate the large diesel bus fleet to hybrid (diesel-electric) vehicles, which obtain more miles per gallon of fuel and create lower emissions levels.

Forecasted Automobile Use Reductions

Implementation of the passenger transportation service improvements/expansion identified to address the Baseline and/or Choice demand alternative are forecasted to:

- Reduce the annual automobile vehicle miles of travel across the state by approximately 34.4 million (Baseline) and 121.0 million (Choice) miles relative to the current conditions.
- Reduce statewide automobile fuel demand relative to the current passenger transportation service conditions by 1.7 million gallons (Baseline) and 6.1 million gallons (Choice) per year.
- Reduce statewide the amount expended on fuel for automobile travel. The Baseline demand alternative is forecasted to reduce automobile fuel costs by approximately \$4.5 million per year, at current per gallon fuel prices. Gasoline fuel prices used



throughout the analysis for was \$2.64 per gallon and for diesel a price of \$2.78 per gallon was used. Implementation of the Choice demand service expansions is forecasted to reduce automobile fuel costs by \$16.1 million per year, at current per gallon prices.

- Reduce the level of automobile greenhouse gas (carbon dioxide) emissions relative to the current passenger transportation conditions by 16,400 tons for the Baseline service and 57,800 tons for Choice demand service.

Passenger Transportation Service Expansion

Expanding urban and regional passenger transportation services to address the Baseline and/or Choice demand increases the passenger transportation vehicle miles of travel, fuel use and emissions. Typically, passenger transportation is primarily considered and thought of as a means of addressing mobility needs. By establishing a passenger transportation quality of service that creates voluntary shifts from lower occupancy cars and light trucks into higher occupancy passenger transportation vehicles, there is the opportunity to enhance the environment. Possible benefits include reductions in the statewide annual fuel consumption and reductions in transportation pollutant emissions. In order to create net environmental positives, the number of travelers shifted to passenger transportation services must be greater than the higher individual vehicle emissions from the larger transit vehicles.

Table 18 displays that relative to the current public transit system, the Baseline demand alternative annual passenger transportation system vehicle miles of travel are forecasted to increase by 21.2 million miles. Implementation of the Choice demand service expansions are forecasted, as shown in Table 18, to increase passenger transportation vehicle miles of travel by 42.2 million miles per year. Increases in vehicle miles of travel will result in:

- Increases in passenger transportation fuel use – Implementation of the Baseline demand service expansions/improvements is estimated to increase passenger transportation fuel use by 3.5 million gallons per year. Full implementation of the Choice demand service improvements is forecasted to result in an additional 6.9 million gallons of fuel demand. For the state, current operations fuel use is approximately 5.1 million gallons per year.
- Increases in fuel costs consistent with the percentage change in fuel use – For the Baseline demand service concept annual passenger transportation fuel costs would increase by \$9.6 million. Choice demand service fuel use would cost an additional \$19.2

million from the current \$14.2 million annual fuel costs.

- Increases in passenger transportation greenhouse gas (carbon dioxide) emissions – Greenhouse gas is a general category of gases that have been linked to global warming. Included in the category are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. As carbon dioxide represents 95 percent of the greenhouse gas emissions from most transportation sources, it has been identified as the primary greenhouse effect pollutant in completing the emissions analysis and comparison.

BASELINE DEMAND EXPANSION ASSESSMENT

For the Baseline demand alternative, statewide passenger transportation system incremental fuel use, fuel costs and vehicle greenhouse gas (carbon dioxide) emissions are greater than the automobile reductions associated with the shift from private auto travel to passenger transportation services. The primary reasons for the net increase are:

- The reduction in auto travel vehicle miles of travel and the associated emission reduction reflect impacting the state's transit dependent population. As many persons in this classification are either not making the trip or are sharing a vehicle trip, the auto vehicle miles of travel connected to the conversion to passenger transportation is not as great as it is for the Choice demand alternative.
- Service frequency improvements required to address the Baseline demand are disproportionately high relative to the number of persons that are forecasted to switch to passenger transportation services. Currently, and in the future, private vehicle trip travel times in most of the urban and regional system areas are relatively low (average trip lengths for the state are generally 15 to 20 minutes or less). Relative to current and projected auto travel times, similar origin-destination transit trip travel times are considerably higher. Factor into the travel mode choice decision the potential wait time between buses there is with the 60 minute typical frequency, current time between transit vehicles/trips.

Service changes needed to address the Baseline demand require cutting the current time between buses in half, or adding twice as many daily vehicle trips. Ridership increases resulting from service expansion for the Baseline demand concept are forecasted to be 54 percent. Expressed as percentage changes from current, service expansions for Baseline demand is 100 percent. As a result, the passenger transportation fuel use and cost increases are greater than the decrease for private autos.

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TABLE 18: COMPARISON OF FUEL USE, FUEL COSTS AND EMISSIONS BY ALTERNATIVE AND FUEL TYPE

Fuel Type and Variables	Current Conditions	Baseline Demand Alternative	Choice Demand Alternative
Annual Passenger Transportation Trips (Millions)	25.5	39.3	49.8
Annual Passenger Transportation Vehicle Miles of Travel (Millions)	31.1	52.3	73.3
Diesel			
Pounds of Carbon Dioxide Per Gallon ¹	22.4	22.4	22.4
Average Miles Per Gallon ²	6.1	6.1	6.1
Annual Fuel Use (Millions of Gallons)	5.1	8.6	12
Average Fuel Cost Per Gallon (\$)	\$2.78	\$2.78	\$2.78
Annual Fuel Cost (\$Millions)	\$14.20	\$23.90	\$33.40
Annual GHG Emissions (Tons)	57,100	96,300	134,400
Biodiesel (20% Blend)³			
Pounds of Carbon Dioxide Per Gallon ¹	17.9	17.9	17.9
Average Miles Per Gallon ²	6.1	6.1	6.1
Annual Fuel Use (Millions of Gallons)	5.1	8.6	12.0
Average Fuel Cost Per Gallon (\$)	\$3.28	\$3.28	\$3.28
Annual Fuel Cost (\$Millions)	\$16.7	\$28.2	\$39.4
Annual GHG Emissions (Tons)	48,200	81,300	113,400
Biodiesel (100%)⁴			
Pounds of Carbon Dioxide Per Gallon ¹	5.0	5.0	5.0
Average Miles Per Gallon ²	5.4	5.4	5.4
Annual Fuel Use (Millions of Gallons)	5.8	9.7	13.6
Average Fuel Cost Per Gallon (\$)	\$5.29	\$5.29	\$5.29
Annual Fuel Cost (\$Millions)	\$30.7	\$51.3	\$72.0
Annual GHG Emissions (Tons)	14,500	24,300	34,000
Compressed Natural Gas			
Pounds of Carbon Dioxide Per Gallon ¹	14.9	14.9	14.9
Average Miles Per Gallon ²	4.2	4.2	4.2
Annual Fuel Use (Millions of Gallons)	7.4	12.4	17.5
Average Fuel Cost Per Gallon (\$)	\$1.88	\$1.88	\$1.88
Annual Fuel Cost (\$Millions)	\$13.9	\$23.3	\$32.9
Annual GHG Emissions (Tons)	55,100	92,400	130,400
Diesel-Electric Hybrid			
Pounds of Carbon Dioxide Per Gallon ¹	22.4	22.4	22.4
Average Miles Per Gallon ²	7.9	7.9	7.9
Annual Fuel Use (Millions of Gallons)	3.9	6.6	9.3
Average Fuel Cost Per Gallon (\$)	\$2.78	\$2.78	\$2.78
Annual Fuel Cost (\$Millions)	\$10.8	\$18.3	\$25.9
Annual GHG Emissions (Tons)	43,700	73,900	104,200

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Fuel Type and Variables	Current Conditions	Baseline Demand Alternative	Choice Demand Alternative
Diesel-Electric Hybrid Burning Biodiesel (20% Blend)			
Pounds of Carbon Dioxide Per Gallon ¹	18.9	18.9	18.9
Average Miles Per Gallon ²	7.9	7.9	7.9
Annual Fuel Use (Millions of Gallons)	3.9	6.6	9.3
Average Fuel Cost Per Gallon (\$)	\$5.29	\$5.29	\$5.29
Annual Fuel Cost (\$Millions)	\$20.6	\$34.9	\$49.2
Annual GHG Emissions (Tons)	36,900	62,400	87,900
Propane			
Pounds of Carbon Dioxide Per Gallon ¹	12.8	12.8	12.8
Average Miles Per Gallon ²	4.5	4.5	4.5
Annual Fuel Use (Millions of Gallons)	6.9	11.6	16.3
Average Fuel Cost Per Gallon (\$)	\$1.50	\$1.50	\$1.50
Annual Fuel Cost (\$Millions)	\$10.4	\$17.4	\$24.5
Annual GHG Emissions (Tons)	44,200	74,200	104,300

Note: 1 – Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. US Environmental Protection Agency. EPA420-F-05-004 February 2005. <http://www.epa.gov/OMS/climate/420f05004.htm>

Biodiesel Performance, Costs, and Use, Anthony Radich. Energy Information Administration, US Department of Energy.

<http://www.eia.doe.gov/oiaf/analysispaper/biodiesel/>

<http://www.fueleconomy.gov/FEG/biodiesel.shtml> (Data source provided by the Iowa Office of Energy Independence)

Propane - <http://www.eia.doe.gov/oiaf/1605/coefficients.html> (Data source provided by the Iowa Office of Energy Independence)

2 – Source- Energy Information Administration.

3 – Biodiesel B20 – Is a blend of 20% biofuel (biodiesel) and 80% petroleum diesel.

4 – Biodiesel B100 – 100% biofuel – Limited quantities available

Limited availability in quantities required to satisfy demand of the current or expanded passenger transportation alternatives.

- The greenhouse gas (carbon dioxide) emissions per mile for transit vehicles are greater than the per mile emissions for autos. The number of trips that are forecasted to shift to passenger transportation modes does not offset the difference in per mile emissions between autos and transit vehicles. The 54 percent increases in ridership relative to current conditions that are associated with the Baseline service concept does not offset the increase in per vehicle mile emissions between autos and the typical diesel passenger transportation vehicle.

Diesel buses typically generate approximately 4.4 pounds of greenhouse gases (carbon dioxide) per mile, while the average automobile generates between 1.0 and 1.5 pounds per mile. In order to offset the higher diesel transit vehicle greenhouse gas (carbon dioxide) emissions, the mode shift from autos to passenger transportation would need to be approximately 3-to-1 or 4-to-1. The forecasted mode shifts for the Baseline demand concepts are less than 2-to-1.

CHOICE DEMAND EXPANSION ASSESSMENT

The passenger transportation emissions and fuel use conditions resulting from implementation of services to address the Choice demand compare much more favorably to the reduction forecasted in auto travel emissions and fuel use. The forecasted level of fuel use, fuel costs, and carbon dioxide emissions associated with addressing Choice demand are displayed in Table 18. Expansion of current passenger transportation services for regional and urban systems to support the Choice demand level is forecasted to result in an increase in carbon dioxide emissions, assuming a diesel bus fleet, of 77,500 tons per year. The auto mode emissions reduction forecasted to occur with the expansion in passenger transportation service is 57,900 tons per year. Also in the Choice demand condition, rideshare programs would be substantially expanded relative today. Expanding rideshare programs is forecasted to remove an additional 26,000 tons of carbon dioxide per year from the transportation sector. Combining the auto reductions associated with the shift to expanded passenger transportation and the shift to expanded ridesharing, results in a net reduction in carbon dioxide emissions of 6,600 tons per year. The result of implementing the Choice demand improvements would be an overall reduction in carbon



dioxide emissions relative to the not implementing the service improvements.

Impacts of Alternate Fuels

The air pollutant emission, fuel use and fuel cost increases associated with the substantial expansion in passenger transportation service required to address the needs can be mitigated in part through conversion from conventional diesel burning transit vehicles to:

- Biodiesel fuels: A blend of petroleum diesel and other distilled oils from renewable sources such as corn or soybeans.
- Compressed natural gas.
- Hybrid buses that burn fossil fuels (diesel/biodiesel/natural gas/propane) or biofuels only to generate electricity for the electric motor that propels the bus.

Each of the listed alternates is forecasted to either reduce the overall level of fuel consumption required to implement the service expansions or shift to a primarily domestic fuel source and they would reduce the forecasted level of emissions from the current diesel alternative. Converting from diesel fuel to compressed natural gas results in greater annual fuel consumption because natural gas mileage efficiency is lower than diesel fuel. Over 83 percent of the natural gas consumed in the United States, however, is from domestic sources. Use of domestic fuels promotes the goal of reducing the state's level of dependence on foreign fossil fuels. The passenger transportation system fuel consumption by alternative (current, Baseline, Choice), fuel costs and greenhouse gas emissions from changing passenger transportation fuels or converting vehicles to hybrid diesel-electric are documented in Table 18.

Shifting to biodiesel fuel can be accomplished using the current diesel fleet, but on-site fueling facilities would need to be modified to allow mixing diesel and biofuels. Conversion to natural gas, propane or hybrid diesel-electric engines is generally accomplished through vehicle replacement. Vehicles burning compressed natural gas, propane, and hybrid diesel-electric vehicles typically carry a higher purchase price than conventional diesel vehicles. The Funding Study cost estimates prepared for the Baseline and Choice demand alternatives that require additional vehicles assumed hybrid diesel-electric vehicles. Additionally, the cost estimates prepared as part of the fleet update assessment assumed replacement of heavy duty buses with hybrid diesel-electric vehicles.

Table 19 provides a summary of the forecasted change in fuel use, fuel costs, and pollutant gas emissions connected to each of the fuel and vehicle alternatives.

Contributions to the Funding Study's purpose of identifying the changes in operating conditions needed to support the state's goal of reducing the dependence on foreign (imported) fossil fuels and reducing greenhouse gas emissions, the following fuel and vehicle type findings have been developed:

- Transit bus vehicle fuel mileage per gallon using biodiesel is consistent with the diesel miles per gallon. While the miles per gallon is similar, biodiesel is a mixture of diesel fuel with a domestic renewable source of distilled oil, the total gallons of imported fossil fuel (diesel) burned for transportation would be lower in all of the scenarios.
- Conversion from diesel to all compressed natural gas would result in more than doubling fuel use from an all diesel condition, but:
 - Fuel costs would be relatively similar because compressed natural gas is less expensive than diesel. The cost differential and the fuel mileage differentials are essentially identical, resulting in a similar fuel costs for the diesel and compressed natural gas alternatives.
 - Most (approximately 83 percent, with an additional 15 percent being imported from Canada and Mexico) of the natural gas needs in the United States are satisfied with domestic source.
- At a cost of an additional \$200,000 per vehicle for a hybrid diesel-electric vehicle, it is unlikely that over the 12 year life of the vehicle that fuel cost reductions of about 30 percent would result in offsetting the incremental capital cost
- Greenhouse gas (carbon dioxide) pollutant emission levels would be less for each fuel or power (hybrid) alternative relative to the current primarily diesel vehicle conditions. The level of estimated reduction ranges from 12 percent with conversion to compressed natural gas between 20 percent and 70 percent if most vehicles are converted to a biodiesel (i.e. B20 – a 20% mixture of biofuel and petroleum diesel, B100 – 100% biofuel).

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TABLE 19: IMPACTS OF CONVERTING FROM DIESEL FLEET TO ALTERNATE FUELS – SMALL AND LARGE URBAN SYSTEMS

Service/Fuel Primary Variable	Change from Current		
	Fuel Use for Service (Annual Millions of Gallons)	Fuel Costs (\$ Millions)	Annual Tons of Emissions
FUEL/VEHICLE - SERVICE			
Diesel			
Current Vs. Baseline Demand	3.5	\$9.6	38,900
Current Vs. Choice Demand	6.9	\$19.2	77,500
Baseline Demand Vs. Choice Demand	3.5	\$9.6	38,600
Biodiesel - 20% Diesel-Biofuel Blend (B20)¹			
Current Vs. Baseline Demand	3.5	\$11.4	32,800
Current Vs. Choice Demand	6.9	\$22.8	65,400
Baseline Demand Vs. Choice Demand	3.5	\$11.3	32,600
Biodiesel - 100% Biofuel (B100)²			
Current Vs. Baseline Demand	3.5	\$18.4	8,600
Current Vs. Choice Demand	6.9	\$36.6	17,300
Baseline Demand Vs. Choice Demand	3.5	\$18.3	8,700
Compressed Natural Gas (CNG)			
Current Vs. Baseline Demand	5.1	\$9.5	37,700
Current Vs. Choice Demand	10.1	\$18.9	75,000
Baseline Demand Vs. Choice Demand	5.0	\$9.4	37,300
Diesel-Electric Hybrid			
Current Vs. Baseline Demand	2.7	\$7.5	30,200
Current Vs. Choice Demand	5.4	\$15.1	60,500
Baseline Demand Vs. Choice Demand	2.7	\$7.6	30,300
Diesel-Electric Hybrid Burning Biodiesel (B20)			
Current Vs. Baseline Demand	2.7	\$14.3	25,500
Current Vs. Choice Demand	5.4	\$28.6	51,000
Baseline Demand Vs. Choice Demand	2.7	\$14.3	25,500
Propane			
Current Vs. Baseline Demand	4.8	\$7.1	30,400
Current Vs. Choice Demand	9.5	\$14.2	60,700
Baseline Demand Vs. Choice Demand	4.7	\$7.1	30,300

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Service/Fuel Primary Variable	Change from Current		
	Fuel Use for Service (Annual Millions of Gallons)	Fuel Costs (\$ Millions)	Annual Tons of Emissions
SERVICE - FUEL/VEHICLE			
Current Service/Ridership			
All Diesel Vs. Biodiesel 20% Diesel-Biofuel Blend (B20) ¹	0.0	\$2.5	-8,900
All Diesel Vs. Biodiesel 100% Biofuel (B100) ²	0.0	\$4.3	-44,300
All Diesel Vs. CNG	2.3	-\$0.3	-2,000
All Diesel Vs. Hybrid	-1.2	-\$3.4	-13,400
All Diesel Vs. Hybrid Burning B20 ¹	-1.2	\$6.4	-20,200
All Diesel Vs. Propane	-1.9	-\$3.7	-12,400
Baseline Demand Alternative			
All Diesel Vs. Biodiesel 20% Diesel-Biofuel Blend (B20) ¹	0.0	\$4.3	-15,000
All Diesel Vs. Biodiesel 100% Biofuel (B100) ²	0.0	\$21.6	-74,600
All Diesel Vs. CNG	3.9	-\$0.4	-3,200
All Diesel Vs. Hybrid	-2.0	-\$5.5	-22,100
All Diesel Vs. Hybrid Burning B20 ¹	-2.0	\$11.1	-33,600
All Diesel Vs. Propane	-3.3	-\$6.2	-20,900
Choice Demand Alternative			
All Diesel Vs. Biodiesel 20% Diesel-Biofuel Blend (B20) ¹	0.0	\$6.1	-21,000
All Diesel Vs. Biodiesel 100% Biofuel (B100) ²	0.0	\$30.2	-104,500
All Diesel Vs. CNG	5.4	-\$0.6	-4,500
All Diesel Vs. Hybrid	-2.7	-\$7.5	-30,400
All Diesel Vs. Hybrid Burning Biodiesel ¹	-2.7	\$15.8	-46,700
All Diesel Vs. Propane ¹	4.5	-\$16.9	-29,200

Note: ¹ – Biodiesel B20 – Is a blend of 20% biofuel (biodiesel) and 80% petroleum diesel.

² – Biodiesel B100 – 100% biofuel – Limited quantities available

Source: Energy Information Agency and URS Corporation, Inc.



SECTION 6: FUNDING CONSIDERATIONS IN ADDRESSING THE NEEDS GAP

INTRODUCTION

Currently, public transit operating funding in Iowa totals approximately \$100 million annually, which supports just over 31 million annual vehicle miles of transit service and 25.5 million rides. Increasing the frequency of service, extending hours of service, adding days of service, are all elements of the enhancements needed to support the Baseline and Choice demand estimates. Providing one or a combination of the added level of service concepts would result in increasing passenger transportation system vehicle miles of travel and service costs. Ridership is anticipated to increase with service enhancements, which will increase farebox receipts, currently the farebox covers about 13 percent of operating costs. Increases in ridership associated with implementing the proposed Baseline and/or Choice demand service improvements would not generate the revenue needed to support the capital and operating costs for the expansions. If implementation of the service expansion is a priority for the state and local jurisdictions, revenue sources other than the farebox will be required. Historically in Iowa, non-farebox revenue has come primarily from public sources from federal, state and local jurisdictions.

POTENTIAL FOR CHANGE IN CURRENT REVENUE SOURCES

Listed below are the primary assumptions on whether additional revenue is reasonable for each of the current sources. The assumptions are based on the understanding that service enhancements would be implemented only if the state and local jurisdictions mutually pursue additional service.

The key assumptions include:

- Federal operating and capital expansion funding will

not likely increase substantially to support additional service investment in the state. The \$24.9 million in federal operating grants would not be substantially increased as they are principally allocated by formulas based on relative population and relative ridership. Even with the substantial ridership increases that could come with the expansion concepts, the increment would not likely result in a substantially greater allocation of federal dollars to Iowa.

- Contract revenue (from human services agencies) will not likely increase substantially from the current level. An exception to this assumption would be revenue from Medicaid if local transportation eligibility reimbursement rules were changed and public transportation's role in providing service was expanded.
- Passenger revenue/farebox will increase proportionally with the increase in ridership, not the increase in service provided. Farebox revenue is forecasted to increase by approximately 54 percent in the Baseline demand scenario and 95 percent from current levels for the Choice demand alternative.

Any statewide funding strategy developed to support passenger transportation service improvements would need to be diverse to appropriately distribute the financial burden and be capable of preserving funding for a multi-year period as service expansion would likely be implemented over time.

The study does not recommend or endorse an increase in taxes or fees to fund service expansion. As potential sources are investigated, both public and public sector options should be considered. By expanding from the tradition of an almost exclusively public sector funded passenger transportation program, the financial burden can be equitably distributed to a greater number of appropriate stakeholders.



SECTION 7: FUNDING STUDY FINDINGS/CONCLUSIONS

INTRODUCTION

Currently, passenger transportation service in Iowa addresses approximately 46 percent of the work, medical, education and social trip needs of the state's transit dependent population. Expanding passenger transportation services will enhance the mobility of Iowans and aid in reducing the state's dependence on foreign fossil fuels. The societal, quality of life and economic benefits make a compelling case for increased state and local investment into fixed route and regional demand-response service. The investment will be a key part of supporting livable communities initiatives, environmental stewardship initiatives, energy reduction initiatives, and will expand the mobility opportunities to support a sound and growing economy.

The 2008 Iowa legislature mandated the Funding Study to provide the following critical pieces of information regarding passenger transportation services in Iowa:

1. How much revenue is presently available to provide passenger transportation service?
2. Is the current level of revenue adequate to support passenger transportation service needs?
3. Does the current public transit network in the urban and rural areas support the current and expanding mobility needs of the state's senior population?
4. How does/can passenger transportation support the state's goals for independence from foreign fossil fuels?

While the initial focus of the study was on supporting senior mobility and energy reduction, an early finding was that statewide, the transportation needs of seniors is much the same as other age groups. The most significant difference is in the work trip, as only about one-third of the senior population remains in the work force. Of the one-third about equal percentages are working, part time seasonally, part time annually, and full time. The remaining two-thirds of trips that are made by seniors are also made by other

population groups. From the Funding Study review, it has been concluded that at the statewide level, the mobility needs of seniors mirror the needs of non-seniors. This allows a single focus to the analysis and creates a large constituent group for action.

Relative to the four initial questions that were to be addressed through the Funding Study, the following have been concluded:

- Currently across the state, approximately \$100 million is allocated from federal, state and local sources.
- Local sources include revenue from property tax levies, farebox receipts, agencies contracting for transportation service, advertising and sales taxes for a total investment in public transit of \$31.4 million.
- From input received from providers, system users, non-users, local human service agency staff and from the travel demand modeling, current service does not adequately address the mobility of needs of seniors and the state as a whole. To meet the annual travel needs of the state's transit dependent (Baseline) populations, an additional 13.8 million trips per year would need to be provided. To begin to be considered a contributing partner in addressing the energy pollutant emissions goals, at least an additional 24.3 million passenger trips (Choice) would need to be provided per day.
- Service expansion including adding trip frequency, evening service and more Sunday service is required to support the Baseline and Choice service demand levels. Providing additional service to address the demand will require substantial increases in annual funding. Baseline demand service improvements are estimated to require an additional \$125 million per year in revenue. Choice service, which adds 24.3 million trips to regional and urban systems, would require an additional \$350 million per year in funding.



- Current, funding sources are not adequate to support financially the level of service needed to address the mobility needs of Iowa's seniors or to allow passenger transportation services to substantially support energy independence goals.
- Transportation service enhancements that provide the level of mobility to support the Baseline demand do not address the energy reduction goals. The relatively short auto trip time for the average trip in the state is substantially shorter than for bus trips. Additionally, the longer time between bus trips (state average of 60 minutes) reduces the desirability of using transit services. Providing more trips per hour will resolve at least part of the disparity that creates the gap between current ridership and demand. The increment of service to address demand results in an increase in passenger transportation vehicle miles of travel. The estimated greenhouse gas emissions from the increase bus travel more than offsets the reduction in auto miles from people shifting to bus travel.
- Implementation of the passenger transportation service improvements to address Choice demand combined with expansion of ridershare programs are forecasted to result in reductions in the level of carbon dioxide emissions, or at least a reduction in the increase in emissions connected with the forecasted increase travel.
- A program of incentives and disincentives is critical to changing traveler behavior and enhancing the environmental benefits of passenger transportation investment. The forecasted shift from auto travel to passenger transportation modes and the resulting net reduction in carbon dioxide emissions documented reflect only the impacts of making transit more travel time competitive with auto travel. It does not take into account the increment that could also be provided through employer, community, state, and service provider incentives and disincentives to driving. While an increment of ridership from the programs has not been estimated, any additional ridership that would result from incentive-disincentive program mode shifts would be an added benefit to addressing the state's energy independence and environmental stewardship goals.

USER AND SOCIETAL BENEFITS OF EXPANDING PASSENGER TRANSPORTATION SERVICE

There are many user and societal benefits associated with implementing passenger transportation improvements that

address the Baseline and Choice demand levels:

1. **The added level of mobility for the state's transit dependent population** that is provided through implementation of improvements that address the Baseline demand. Improved mobility is quantified as the number of trips that would be served with the increase in service.

The Baseline demand estimate less the current ridership yields an estimate of the number of transit dependent trips needed, but are not being provided by current public transportation services. Annually, over 13.8 million work, medical, shopping, education opportunity trips are not being addressed with the current level of public transportation service.

2. **Address the unmet needs of Iowa's seniors.** In 2008, approximately 445,000 Iowans were 65 years old or older. Annually, the Iowa Department on Aging monitors the unmet needs of seniors (persons 65 years old and older) and Iowans defined as Frail Elders. Transportation was listed as an unmet need in approximately 15 percent of the documented unmet needs for seniors and over 14 percent of those documented for Frail Elders. Expansion of regional service by 90 percent that is included in the Baseline and Choice demand alternatives would provide capacity for an additional 1.9 million trips per year. This added capacity would directly support the unmet transportation needs for seniors and Frail Elders and enhance their ability to remain in their own home and be more independent.
3. **Healthcare savings to consumers living at home versus in care facilities.** In 2007 there were nearly 12,000 Iowans in assisted care facilities and almost 27,000 in nursing facilities. The cost of care for residents averaged approximately \$4,600 per month. Many of the residents of facilities are there due, in part, to the lack of transportation opportunities to access non-emergency medical and other services. At the average monthly cost per person, over \$2.1 billion are spent annually on assisted care and/or nursing facility care.

Home and community-based healthcare services that provide a quality of care consistent with that provided in assisted care/nursing facilities cost approximately \$750 per month. Over a year the net healthcare savings per client is over \$46,000. A key element in providing adequate community-based healthcare that many times is missing is client transportation to a medical office. At the differences in the costs for healthcare service, a substantial savings to consumers could be attained by providing adequate transportation services for seniors. For



example, for every one percent of the population that presently lives in a nursing or assisted care facility is provided medical transportation that allows them to remain in their own home an annual savings of over \$18 million results.

An AARP survey completed in 1982 and updated in 1989 concluded that over 86 percent of Iowa seniors would prefer to stay in their own home as they age.

4. **Enhanced economic well-being by connecting Iowans to jobs.** Currently, there are 428,000 Iowans, or approximately 30 percent of the workforce, employed in business sectors that traditionally run second and third shifts, have business hours that run until after 7:00 PM, and/or are open for business on Sundays. The majority of the small urban area systems and many of the large urban area systems end their service day between 6:30 and 7:00 PM and do not operate on Sundays. Iowans that do not drive, or cannot afford an automobile have a reduced level of access to these evening, overnight and weekend employment opportunities. The inability to have dependable/timely transportation may limit their earning potential and negatively impact their quality of life.
5. **Improved quality of life by connecting Iowans to services and activities.** The early evening end of service times for most of the public transit services in the state has a negative impact on the quality of life for the state's senior population. For example, daytime service levels may provide grandmothers and/or grandfathers the mobility to/from the basic subsistence needs of medical service, grocery shopping, but the lack of evening service restricts their access to social events, shopping, and interaction with family and friends. All of these listed activities are integral to a reasonable quality of life and keeping Iowa's seniors that do not drive involved and active in their community.
6. **Increased economic activity by connecting consumers to businesses.** Limited public transit daytime service frequency, limited evening service hours, and limited weekend service hours impact consumer's access to businesses throughout the state. Mobility restrictions on Iowan's that do not drive associated with the current level of transit service not only negatively impact their quality of life, but businesses also miss access to possible consumers. The higher travel times associated with the current level of transit service result in many trips simply not being made. These trips represent lost opportunities for sales by Iowa's businesses. Investing in passenger transportation services that make travel more convenient will potentially result in

an increase in consumer spending, which will benefit businesses and the state through increased sales taxes.

7. **Reduction in annual automobile vehicle miles of travel is forecasted to occur** by implementing the passenger transportation system improvements connected with the Baseline and Choice demand concepts.

Service improvements to address Baseline demand would remove over 34 million vehicle miles annually. Expanding passenger transportation service by those services listed in the Choice demand alternative would remove over 121 million vehicle miles of travel annually, while improving mobility for Iowans.
8. **Improved quality of life for the 334,000 Iowans living below the poverty level.** With the high costs for fuel and the likelihood of even higher prices in the future, expanded passenger transportation service would allow lower income Iowans to access jobs while lowering their transportation costs.
9. **Reduction in annual vehicle miles of travel associated with expanding rideshare programs relative to the current levels.** Implementation and management costs of ridershare programs are relatively low compared to the potential reduction in vehicle miles of travel during the busiest periods of the day. Travelers that typically take advantage of rideshare programs are those with longer commutes, which results in a proportionately greater reduction in vehicle miles traveled compared to the average trip.
10. **Reduction in auto travel pollutants and greenhouse gas emissions resulting from the mode shift from low occupant vehicles to higher occupant vehicles** forecasted to result with adding hours of service, increasing the frequency of trips, adding paratransit system capacity, adding Sunday transit service and increasing the rideshare program markets.

The primary auto pollutants of concern in Iowa are greenhouse gases and the combination of nitrogen oxide and volatile organic compounds. Nitrogen oxide and volatile organic compounds are a concern because they are pre-cursor gases for ozone formation. The mode shift opportunities with the Baseline and Choice demand alternatives have the potential to reduce emissions in each of the critical categories. For the study, carbon dioxide, the largest element of greenhouse gases, has been used as the measure for changes associated with expansion of passenger transportation services. The impacts of the potential mode shift from autos to buses, carpools,



vanpools and other passenger transportation modes associated with the Baseline and Choice demand alternative are estimated to be 16,000 and approximately 58,000, respectively.

11. **Reduction in auto travel fuel consumption connected with the shift from private autos** (low-occupancy) to either carpools/vanpools or other public transportation alternatives forecasted with implementing the Baseline and Choice (Energy Reduction) demand concepts.
12. **Fuel cost saving associated with implementing the Baseline and Choice (Energy Reduction) demand concepts.** At current gas prices of \$2.64 per gallon, a savings of approximately \$4.5 million to over \$16 million per year could be achieved through implementation of the Baseline and Choice demand service, respectively. At the 2008 higher fuel prices, the savings range from \$7 million to \$24.7 million are estimated for the Baseline and Choice service options.

13. **Vehicle cost savings for some families** in Iowa that could be possible if the level of transit service provided to address Choice demand would allow them to eliminate a vehicle from their household.

Table 20 summarizes the findings.

FINDINGS OF THE FUNDING STUDY ASSESSMENT

Service Expansion – Urban and Regional Systems

Additional service is needed to provide for the mobility needs of Iowa’s seniors and additional service is needed for transit to play a substantial role in energy conservation in the state. Service improvements to support the needs are:

TABLE 20: SUMMARY OF BASELINE AND CHOICE SERVICE IMPROVEMENTS AND RIDESHARE ENHANCEMENTS ON AUTOMOBILE TRAVEL AND EMISSIONS

Measure of Effectiveness	Unit of Measure	Change Due to Implementing Passenger Transportation Improvements to Address Demand		Rideshare Enhancements
		Baseline	Choice/ Energy Reduction	
Increase in Passenger Transportation Trips from Current (Annual)	Trips	13,800,000	24,300,000	NA
Reduction in Annual Vehicle Miles of Travel	Annual VMT	34,400,000	121,000,000	54,000,000
Reduction in Fuel Consumption (Annual)	Gallons	1,700,000	6,100,000	2,700,000
Fuel Cost Savings (Annual)				
At Current \$2.64 Per Gallon ¹	Dollars	\$4,500,000	\$16,100,000	\$7,100,000
At 2008 High of \$4.05 Per Gallon ²	Dollars	\$6,900,000	\$24,700,000	\$10,900,000
Reduction In Emissions:				
Carbon Monoxide	Tons	450	1,590	710
Nitrogen Oxide	Tons	10.4	36.5	16.5
Greenhouse Gases	Tons	16,400	57,900	26,000
Vehicle Cost Savings ³	Dollars	NA	\$890,000	NA

Note:

1. Current fuel price per gallon from Department of Energy – Midwest Region, Regular Gasoline, October 26, 2009
2. 2008 peak fuel price per gallon from Department of Energy – Midwest Region, Regular Gasoline, July 14, 2008
3. Assumptions:

Choice/Energy Reduction (121 million mile VMT reduction represents approximately annual travel of 8,100 vehicles at 15,000 miles per year. At 1.9 vehicles per household, 8,100 vehicles represent 4,250 households. Estimate 10 % of 3+ vehicle households (22.6% of all households) choose to eliminate one vehicle at \$8.095 per year (Bureau of Transportation Statistics)



- Baseline (Transit Dependent) Demand:
 - Reduce the time between trips in the small and large urban areas from 60 minutes to 30 minutes for existing operating hours.
 - Extend evening service hours in the large urban areas to 11:00 PM, while retaining current hours of service in the small urban areas.
 - Increase the daily trips provided in the regional paratransit systems by approximately 90 percent.
- Choice (Energy Independence) Demand:
 - Reduce the time between trips in the small and large urban areas from 60 minutes to 15 minutes for existing operating hours.
 - Extend evening service hours in the small urban areas to 11:00 PM, to match the Baseline assumption for the large urban areas.
 - In all of the large urban areas add eight hours of service on Sundays with frequency consistent with that presently offered on Saturdays.

Due to the level of funding required from all jurisdictional levels to implement service improvements to address the Baseline (\$125 million annually) and/or Choice (Energy Reduction) (\$350 million annually) service needs, expansion to either level would need to occur over time. A 10 year incremental implementation plan was developed in consultation with the Advisory Committee and the public. Key items of the implementation plan, shown in Figure 17, are:

- As selected large urban systems presently provide service that much more closely resembles Baseline (30 minute headways for at least part of the day on some routes and service until 11:00 PM) than others, holding off any Choice service implementation until all areas have Baseline service (to the extent they desire it), would not be practicable to those areas that support transit. The increase frequency element was expanded into a Baseline First Service line and an accelerated Choice Service line. In creating the dual track implementation, some elements of Choice service could be implemented in selected urban areas prior to 100 percent implementation of Baseline service across the state.
- The majority of Baseline service would be implemented by 2015 (5 years from completion of the Funding Study). Statewide implementation of expanded regional service was extended over the 10 year period rather than over the first five years (as a 90 percent expansion in daily runs is included in the

Baseline).

- The increment of dollars associated with each step of service improvement is estimated and future adjustments may be necessary.
- Sunday service has been placed in the end of the period due to the costs and relatively lower return on investment (from a ridership perspective).

Public Policy Actions

Service improvements are going to require additional revenue for capital and operating, extended agency and provider coordination and a longer-term funding plan prior to implementing changes. Many of the barriers that need to be overcome relative to service improvements require legislative or agency action.

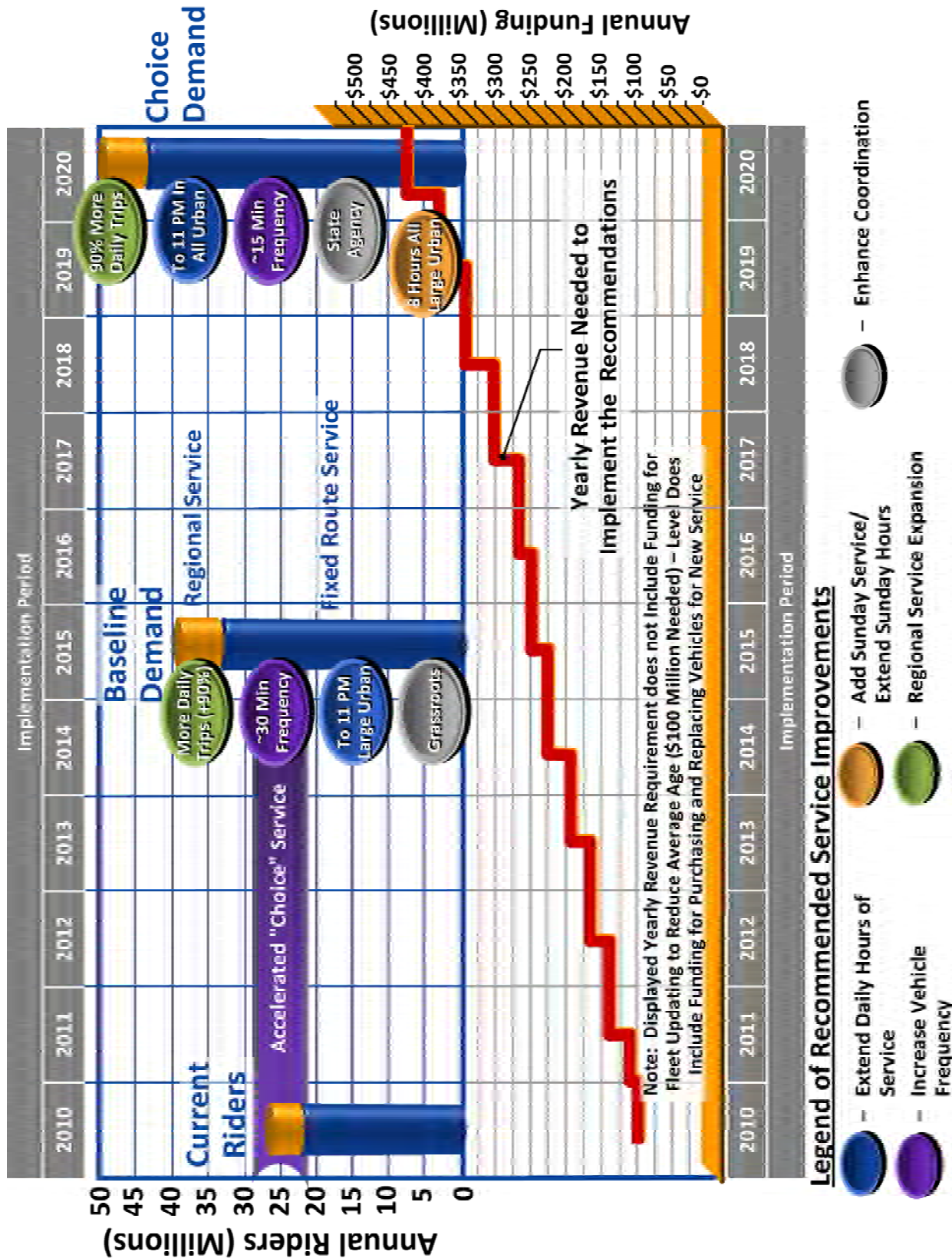
In order to promote implementation of service expansion, many of the institutional actions would need to occur prior to when new/expanded service is implemented, therefore, are suggested for the short-term (within the next 2-3 years). Elements of the short-term institutional issues action plan include:

- Addressing the current excessive fleet age status and alternate means of providing additional capital funds to replace older vehicles.
- Technical modifications to existing legislation intended to provide more widespread opportunities for local jurisdictions to help themselves to provide passenger transportation service.
- Transportation provider-human services agency coordination that is needed to prepare for service enhancements, including establishing service monitoring and reporting guidelines.
- Addressing coordination of inter-regional and intra-city medical trips and the unique time sensitivity considerations of the trips.
- Establish service level goals (Baseline, Choice, or another) for the state from the information presented in this report.
- Formalize jurisdiction level (state and local) funding responsibilities based on the reasonable revenue capacity of each jurisdictional level

Outlined in the following sections are the key elements of the Short-term Action Plan.



FIGURE 17: BASELINE AND CHOICE SERVICE IMPLEMENTATION



Source: URS Corporation, Inc.



IDENTIFY CAPITAL FUNDING SOURCE TO UPDATE THE STATEWIDE FLEET

Replacement of older vehicles with new addresses the energy efficiency, environmental stewardship, and senior mobility goals of the passenger transportation system. The estimated cost to update the fleet to ½ the estimated service life is \$100 million.

Replacing older (some transit buses in the statewide fleet were put into service in 1977 – 32 years ago) diesel powered vehicles with new diesel-electric hybrids or new vehicles using bio-diesel fuel will have a dramatic impact on the overall level of emissions from transit vehicles and on the amount of non-domestic fuel burned. In the last 10 years emission levels from transit vehicles have generally been reduced by 60 to 80 percent for particulate matter (PM), nitrogen oxides (NOx), and greenhouse gases such as carbon dioxide.

CREATE LOCAL FUNDING OPPORTUNITIES

Local funding plays an important role in passenger transportation services. Two existing Iowa Code areas where modification or clarification could expand local funding opportunities are:

- Title IX Local Government/Subtitle 4 Cities, Chapter 384 City Finance, Section 384.12 Additional Taxes – Provides for use of a transit property tax levy.
- Title I State Sovereignty and Management/Subtitle 10 Joint Governmental Activity/Chapter 28M Regional Transit Districts – Establishes the ability to organize a regional transit district.

Transit Property Tax Levy

Increasing service will require an increase in local funding. The state can play a role in assisting cities and counties providing opportunities for them to tap into funding sources. The Funding Study suggestion is to replace the word “municipal” with “public” in the Iowa Code language. Chapter 324A of the Code defines public transit, which will provide for consistent interpretation across the state. By clearing up the interpretation issue, full participation in the use of the levy would generate:

- At the current average levy rate of \$0.81 per \$1000 among jurisdictions that use the transit levy approximately \$64 million annually would be generated. This figure represents an increase of approximately \$42 million from the current levy revenue.
- At the maximum levy limit of \$0.95 per \$1000 of assessed valuation approximately \$75 million or an

increase of \$53 million from the current level.

Proposed Change to Iowa Code

**2009 IOWA CODE
TITLE IX LOCAL GOVERNMENT
SUBTITLE 4 LOCAL CITIES
CHAPTER 384 CITY FINANCE
SECTION 384.12 ADDITIONAL TAXES.**

10. A tax for the operation and maintenance of a ~~municipal~~ public transit system or for operation and maintenance of a regional transit district, and for the creation of a reserve fund for the system or district, in an amount not to exceed ninety-five cents per thousand dollars of assessed value each year, when the revenues from the transit system or district are insufficient for such purposes.

**2009 IOWA CODE
CHAPTER 324A TRANSPORTATION PROGRAMS
324A.1 - DEFINITIONS**

4. "Public transit system" means an urban or regional transit system providing transit services accessible to the general public and receiving federal, state or local tax support.

Incremental funding for expanding passenger transportation services to support Baseline and/or Choice demand estimates would primarily come from state sources, local sources, and farebox receipts associated with the increase in ridership. If the current funding proportions between state and local jurisdictions and fares represent a logical guide for estimating future responsibilities by source, it is concluded that the maximum of \$75 million generated by the transit levy will not be sufficient for the local responsibility.

To support this conclusion:

- For the Baseline demand condition: If all communities in the state eligible to use the transit levy employ it, a maximum of approximately \$75 million per year would be generated. This amount represents an increase of \$53 million in annual transit levy revenue from the current generation. In addition to the transit levy, local jurisdictions presently allocate an additional \$10 million to \$11 million annually from other sources.



Without making any changes to the relative funding responsibilities by source/jurisdiction, local jurisdictions would be responsible for approximately \$130 million of the estimated \$225 million annual cost associated with Baseline demand service. With the maximum funding generating capacity of \$75 million per year and assuming that the \$10 million from community/county General Funds would still be provided for transit, an annual gap of approximately \$45 million would exist.

To close the gap, the transit levy rate would need to be increased to approximately \$1.70 per \$1000 of assessed valuation and all communities would need to use the levy option.

The \$1.70 per \$1000, or double the current levy rate, is estimated to provide the funding to support the local responsibility for the Baseline demand concept, but would not allow for growth beyond the \$130 million level other than by increases in property valuation.

- Choice demand concept: Each of the assumptions outlined for the baseline demand alternative were carried into the Choice demand alternative. The annual operating cost associated with service to meet the Choice demand alternative is \$450 million. Of this, approximately \$270 million would be supported by local government sources. As the transit levy would generate approximately \$75 million per year and it is assumed that the additional \$10 million in local General Fund support would continue, an annual revenue gap of \$185 million would exist.

To close the gap for local jurisdictions, the transit property tax levy ceiling would need to be increased to approximately \$3.30 per \$1000 of assessed property valuation an increase of almost 3.5 times the current levy.

Increasing the transit levy to \$3.30 per \$1000 of assessed value would address the forecasted gap, but would not provide for any future increase in the funding yield other than through increases in property values.

Regional Transit District Population Threshold

A second key local funding policy recommendation is to remove the county population threshold for establishing a regional transit district. Current Iowa Code stipulates that a region where a transit district is being considered must contain at least one county with a population of at least 175,000 people before the district can be established. The minimum population threshold restricts regional districts to Polk County and the surrounding counties in the central

portion of the state and Linn County and surrounding counties in the eastern part of the state.

Eliminating the population threshold would allow any region of the state that has the desire to collaborate on transit funding through formulation of a multi-city/county

Proposed Change to Current Iowa Code

2009 IOWA CODE
TITLE I STATE SOVEREIGNTY AND
MANAGEMENT
SUBTITLE 10 JOINT GOVERNMENTAL ACTIVITY
CHAPTER 28 M REGIONAL TRANSIT DISTRICTS
SECTION 28M.2 REGIONAL TRANSIT DISTRICT
CREATED TRANSIT

1. A county ~~with a population in excess of one hundred seventy-five thousand~~ and participating cities may create, by chapter 28E agreement, a regional transit district in the county pursuant to this chapter. Two or more contiguous counties and participating cities may create, by chapter 28E agreement, a regional transit district pursuant to this chapter. ~~if one of the counties has a population in excess of one hundred seventy-five thousand.~~ A district shall consist of the unincorporated area of any participating county and the incorporated area of any city in the county that does not have an urban transit system. However, a city without an urban transit system may decline, by resolution forwarded to the board of supervisors, to participate in a regional transit district.

district to do so. The benefit of allowing any group of counties/communities to form a transit district is that economies of scale exist by bringing together the management of service over a larger area. In addition, developing passenger transportation services over a larger district has the potential to substantially enhance the level of mobility as city limits/county boundaries do not become barriers to travel as tends to occur with community-based transit service.

Implementation of the changes to the current Iowa Code included in this section would address the following needs that were identified by the public, human service agencies and transit operators:

- More inter-city service and connectivity.
- Increased coordination between public transit and human services agencies.
- Funding enhancement.



SUPPORT THE IOWA MEDICAID ENTERPRISE TRANSPORTATION BROKERAGE

The state should support the transportation brokerage and encourage giving existing public transit providers the right of first refusal in providing brokered service.

ENCOURAGE/REQUIRE ADDITIONAL STATE AGENCY TRANSPORTATION REPORTING

There should be added requirements for agencies funded in whole or in part by public dollars to report to the Iowa Department of Management, for purposes of enabling coordinated transportation efforts, the following information for all trips other than emergency medical trips:

- Service hours and days.
- Number of trips/rides provided on a monthly basis.
- The general origins and destinations of trips.
- Trip purpose.
- General information on client physical condition/special needs of their clients.
- Vehicle capacity.
- Cost per trip including dispatching, drivers, etc.
- Maintenance costs.

The purpose of the reporting is to improve coordination of transportation services with existing public transit providers with the goal of identifying where costs can be consolidated. When it can be demonstrated that all other things are reasonably equal and a public transit agency could provide the trip at a lower cost, that the transit agency be provided the right of first refusal to provide the trip.

PASSENGER TRANSPORTATION COORDINATION - A STATE PRIORITY

The Iowa Transportation Coordination Council provides an excellent mechanism for setting the framework and overseeing interagency coordination efforts. The Iowa Transportation Coordination Council, as defined in Iowa Code Chapter 324A, is a multi-agency committee created to provide leadership and guidance in overseeing transportation coordination activities in Iowa. The Council is charged with addressing institutional and/or regulatory barriers that hinder coordination. Support of the council and the council's charge should be demonstrated by each of the participating agencies. Support should be demonstrated by agencies providing the necessary support and personnel resources to successfully advance transportation coordination focused on enhancing the mobility of Iowans.

EXPAND COORDINATION OF PUBLIC TRANSIT AND HUMAN SERVICES TRANSPORTATION

In 2009, the Iowa DOT has identified \$300,000 in funding for hiring local/metro area mobility managers. The mobility managers are responsible for:

- Providing/organizing outreach programs to educate local consumers and businesses about the range of passenger transportation services available in an area.
- Coordinating public transit services with transportation services provided human services agencies.
- Providing how to ride assistance/education to potential customers.
- Coordinating services in their coverage area with sharing opportunities available in adjacent communities, metro areas, or regions.

The Iowa DOT mobility manager program provides local assistance grants at an 80/20 state and local split of the cost for employing a manager.

Currently, two of the regional systems (Region 10 in the Cedar Rapids area and Region 8 in the Dubuque area) and one urban system (Council Bluffs) employ a mobility manager who is partially funded through the Iowa DOT program.

FORMALIZE STATE'S PASSENGER TRANSPORTATION FUNDING PARTICIPATION ROLE

As part of their master planning process, the Iowa Climate Change Advisory Council proposed that the state be responsible for approximately 25 percent of the costs of transit service in areas where increasing ridership is demonstrated or where there is the ability to document vehicle miles of travel-reducing strategies. Presently, state funding represents approximately 10 percent of the total cost.

Figure 18 displays the funding responsibility for service improvements to address the Baseline and Choice demand with the state being responsible for 25 percent of the increment of service needed to bridge the gap between current ridership and the demand associated with each of the enhanced service concepts. The current level of funding by source is also displayed in the figure. State responsibility reflecting a minimum of 25 percent of the operating cost would be:

- Baseline Demand Service: The state's responsibility at 25 percent would be \$56.2 million of an annual funding estimate of \$225 million.



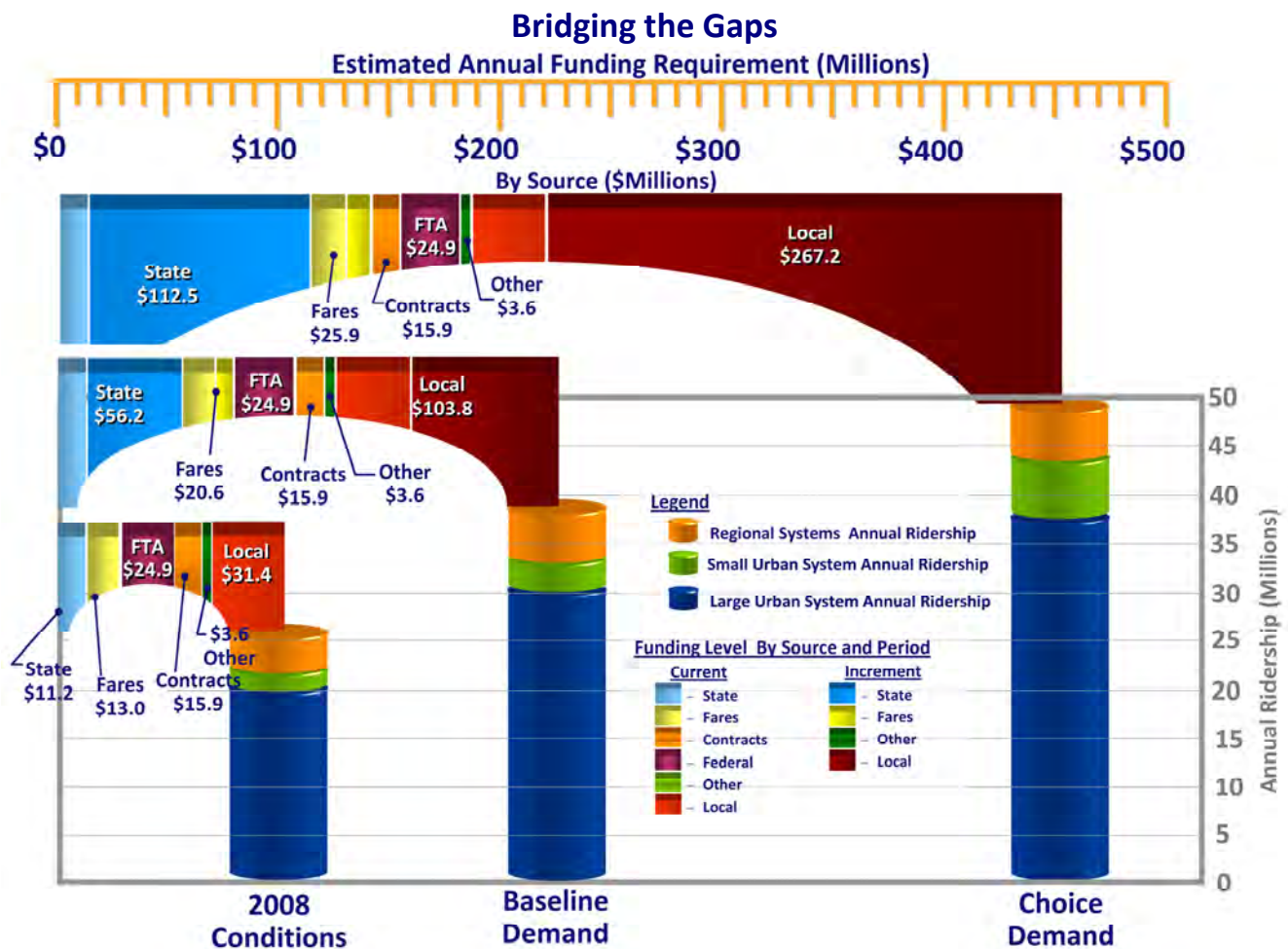
- Choice/Energy Reduction Demand Service: The state’s responsibility at 25 percent would be \$112.5 million of the total program estimate of \$450 million.

If the funding responsibility proposal provided by the Iowa Climate Change Advisory Council to set the state’s responsibility at a minimum of 25 percent of costs is implemented, the increase in the local funding gap discussed in an earlier Short-term Action item would be reduced. Listed below are the estimates of the potential impact to the local

jurisdiction funding gap that would occur if the property tax levy is the primary/only source for the incremental local funding:

- Baseline Demand Service: The local jurisdiction funding gap would be reduced by approximately \$30 million per year.
- Choice/Energy Reduction Demand Service: The local jurisdiction funding gap would be reduced by approximately \$106 million.

FIGURE 18: FUNDING BY SERVICE CONCEPT AND JURISDICTION LEVEL



Source: URS Corporation, Inc.

CONTINUE TO SUPPORT OF THE TRANSIT INFRASTRUCTURE GRANT PROGRAM

The Funding Study did not estimate the facility needs associated with of either the Baseline or Choice demand concepts. Given the differences between the estimated fleet size from the 2008 facilities study estimates of growth and

the estimates in the Funding Study, additional transit facilities will be required.

As the needs across the state vary substantially, individual system expansion plans derived from the information in the Funding Study should be accompanied by with a unique facility needs plan for the system. The plan should be coordinated with the state.



STRENGTHEN LOCAL COORDINATION OF LAND USE DECISIONS WITH TRANSPORTATION PLANS

Key findings that require more evaluation are:

- Reduce potential conflicts created by approving residential developments that need passenger transportation service, but are proposed for areas where passenger transportation service is not provided and is not expected to be provided in the foreseeable future. Additional coordination with transportation services should be incorporated into the long range land use planning process.
- Increase the level of coordination that occurs in the determining the location for a new medical facility and the need for passenger transportation services. Coordination could be a requirement in gaining approval of a healthcare facility Certificate of Need.
- Promoting the livable communities concept in the land use decision-making process.

The state can also be a lead entity for energy efficiency through the promotion of smart growth initiatives. As Iowa continues to transform into a 21st century economy, measures should be considered to reduce urban sprawl and vehicle miles of travel. Reducing the vehicle miles of travel could include such innovations as the creation of telecommuting hubs around Iowa. As new developments are considered, energy efficient measures should be a consideration of all development and construction projects. Incentives for infill and mixed-use development should be a consideration of policymakers. Developers should be encouraged to include provisions allowing for the construction of mass transit options, the inclusion of walking and biking paths throughout new developments, and bike lanes on new, urban streets.

The Office of Energy Independence (OEI) proposes denser growth in cities and advocates compact, transit-oriented, walkable, bicycle friendly land use, including neighborhood schools, and mixed-use development with a range of housing choices. Long-range, regional considerations of sustainability should have priority over a short-term focus. The resulting energy savings would be significant and consistent with the goals of the OEI.

Iowa has a unique opportunity to rebuild many parts of the state after the disasters of 2008. While many of the disaster funds help the state return to the way it was, the state should also consider adding value to the recovery efforts and incorporating new approaches to growth while rebuilding to create an even better Iowa.

A specific example of a potential strategy to reduce vehicle miles of travel is establishing telecommuting hubs. Telecommuting hubs can reduce peak hour volume in

congested corridors, reduce gasoline consumption, and help stimulate the economies of smaller communities and rural areas. Telecommuting hubs are simply office spaces in communities that allow residents that normally commute out of town for work to stay in their community to work. The hubs are ideal for office jobs where the bulk of a person's day is spent on the phone or computer. To keep vehicle miles of travel low, telecommuting hubs should be located in existing buildings in areas that are within walking distance of restaurants and amenities that office workers need for daily work. Incentives from state and local governments will also likely be needed.

Community-to-Community Corridor Findings Coordination with On-going Rail Studies

The Iowa DOT, in cooperation with the Illinois DOT, have requested grants to continue analysis of passenger rail corridors between Dubuque and Chicago and Iowa City to Chicago via the Iowa Quad Cities and to extend the passenger rail analysis across the state through the Omaha to Chicago study. The findings of the community-to-community pairs traffic flows should be incorporated, to the extent that it is logical based on the assumptions of each analysis, into the work that will be completed assuming the passenger rail grant requests are approved.

The level of travel between the community/metro area pairs of Des Moines and Ames and Cedar Rapids and Iowa City/ Coralville was estimated to be of a level that would warrant continued study relative to:

- The range of passenger transportation technologies that would be appropriate to address the demand.
- Operating parameters.
- Modifications to the current intra-metro transit service that would be needed to support the community-to-community service.
- Costs for providing the infrastructure, fleet vehicles, right-of-way (if the alternative requires a dedicated corridor).
- Institutional barriers that would need to be addressed prior to implementation.



SUMMARY/CONCLUSION

The purpose of the Funding Study was to assess whether Iowa's current system of passenger transportation services comprising public transit providers, human services agency transportation programs, carpools/vanpools, inter-city bus carriers, taxis are addressing the current and future demand. In particular, the Funding Study was to address the travel and mobility needs of Iowa's senior population and to identify services needed to address the state's energy conservation/independence goals. If current passenger transportation services are not addressing the needs, the study is to determine the additional services required and the cost of those services.

In 2008, public transit systems across the state carried 25.5 million travelers over 31 million vehicle miles. Relative to the 31.6 billion vehicle miles of travel per year on highways in the state, it can be concluded that the current passenger transportation system plays a relatively minor role in statewide fuel conservation goals. Passenger transportation services can be a greater contributor to the state's energy independence goals; however, it will require a substantial investment into service and marketing passenger transportation as a choice for all travelers.

Annual passenger transportation trip demand to address the needs of Iowa's transit dependent population is approximately 39.3 million trips, or 13.8 million more trips than current ridership levels. Iowa's seniors represent a substantial portion of the state's transit dependent population. The gap between current ridership and transit dependent demand is approximately 54 percent of the current ridership figures.

Closing the current ridership to Baseline, or transit dependent population, demand gap will require additional service on the regional and the urban systems. The estimated cost of the increment in service is \$125 million per year.

For passenger transportation to be a larger contributor to meeting the state's energy independence and greenhouse gas emissions goals, passenger transportation service that will address the Choice demand estimate and attract at least 24.3 million more passengers per year would need to be implemented. Service improvements/expansion would be needed in both the regional service and urban service areas. The estimated cost of the expanded services is approximately \$350 million per year.

Expanding service levels in the 16 regional system and 19 urban system areas will not by itself result in the auto-to-passenger transportation mode shift that is required for passenger transportation in Iowa to be a larger contributor to meeting the state's energy independence goals. The

overall passenger transportation system program will need to include more active coordination between public transit systems and human services agencies throughout the state and a multi-level incentives and disincentives program. The incentives-disincentives program combines positive and negative reinforcement that the business as usual approach of driving alone must change if the environmental and economic quality of life Iowans expect, combined with the high level of mobility that is also expected, is to be sustained.



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