Advanced Small-Transit Vehicle Development Study

Issues Paper

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Abstract

Based on a survey of 63 transit agencies, Hemily and King (2002) found that vehicle reliability and high maintenance costs were both the most frequently cited and highest-ranking concerns with regard to small transit buses (less than 30 feet long). The objective of this project is to examine the feasibility of developing a new transit vehicle, or vehicle specifications, to meet the needs of transit operators and riders. A transit vehicle designed to meet the specific needs of systems will lead to gained efficiencies by transit providers because of increased reliability and greater fuel economy while offering riders greater comfort with improved ride quality and greater vehicle maneuverability for operators. Surveys and stakeholder meetings will serve as a guide to determine the interest and feasibility of this research. The project will be reevaluated, and possibly redirected, when input from both manufacturers and transit agencies have been considered. This paper will outline the objectives of the project, provide preliminary background information and introduce the research plan and issues to be addressed.

Introduction and Objectives

Rural bus services are generally provided by traditional minibuses which hold 8-25 passengers, are less than 30 feet in length, and are powered by internal combustion engines (ICE). Some services follow preplanned fixed routes and schedules similar to urban systems while many provide only demand-responsive service to their local communities. The objective of this project is to examine the feasibility of developing a new transit vehicle, or vehicle specifications, to meet the needs of rural transit operators and riders.

Fred Gilliam, CEO of Capital Metropolitan Transportation Authority in Austin, TX, believes there is a market for a specialty 15-20-passenger small-transit vehicle in the United States. He also believes that "we have to get away from the low-bid process when purchasing our transit buses because quality suffers with such a process." Many transit managers echo Mr. Gilliam's belief that a large number of quality issues in small-transit vehicles stem from the low-bid procurement process. John Ruskin, the English author of the economic essay *Unto This Last*, described the low-bid process with the following:

"It is unwise to pay too much, but it is worse to pay too little. When you pay too much, you lose a little money...that is all. When you pay too little, you sometimes lose everything, because the thing you bought was incapable of doing the things it was bought to do. The common law of business balance prohibits paying a little and getting a lot...it cannot be done. If you deal with the lowest bidder it is well to add something for the risk you run. And if you do that, you will have enough to pay for something better. There is hardly anything in the world that some man cannot make a little worse and sell for a little cheaper, and the people who consider price only, are this man's lawful prey" (Ruskin, 1860).

Although written in 1860, this describes exactly what is happening in the small-transit vehicle industry today. When an agency pays the lowest amount possible for a vehicle,

quality inevitably suffers. The quality issues raised by transit professionals include poor suspensions, faulty brakes and wheelchair lifts, and low quality seats, to name a few. These issues will almost certainly continue if the low-bid process is not altered to encourage manufacturers to improve vehicle quality.

Current rural-transit vehicles tend to have high emissions when normalized to gram-per-passenger-mile of contaminant because of the low volume of passengers. Furthermore, accessibility has traditionally been limited, with many vehicles having only a single step up door. System flexibility has also been limited, forcing potential riders to travel to specific stops at predetermined times at distances much further than those common in urban transit.

A transit vehicle designed to meet the specific needs of rural transit systems could lead to gained efficiencies by transit providers because of increased reliability and greater fuel economy while offering riders greater comfort with improved ride quality and greater vehicle maneuverability for operators. Stakeholder input will be necessary throughout the project to provide insight to current marketplace structure and changes. Determining the need for a bus designed to meet a specific rural market will be a top objective of this project. Stakeholder input regarding industry interest will be of utmost importance as the study evolves.

Background

Most transit systems are designed and operated to serve urban areas with high population densities. However, a significant number of rural and suburban customers do not have access to regular transit operations. Currently, about 3.1 million of the 3.9 million miles of U.S. public highways are located in rural areas. Roughly 40 percent of all rural residents live in an area with no form of public transportation, and another 28 percent live in areas with very low levels of transit options. The 2000 census states the number of Americans in these areas is over 59 million. Nearly 80 percent of rural counties have no

public bus service, compared to about 2 percent in metro counties (CTAA, Atlas of Rural Public Transportation, 2005).

It is clear that a large segment of the transit market has yet to be addressed. Several issues have impeded the growth of rural transit systems. Ridership tends to fluctuate and destinations are spread out, making it difficult to select practical routes. Additionally, product and technology availability, as well as very limited transit budgets in rural areas, makes the acceptance and maintenance of industry advancements more difficult. Because of low demand, the cost-to-benefit ratio often makes any improvements less likely to obtain agency approval. Another indication of the need for improvements to rural transit is the current state of the fleets and infrastructure. In 2000 it was estimated that 59 percent of rural vans and 41 percent of rural small buses were past their expected lifetimes (CTAA, Atlas of Rural Public Transportation, 2005).

Increased rural transit funding through SAFTEA-LU will help small transit agencies update their bus fleets. Currently, many agencies are in a holding pattern as they anticipate funding increases for 2006. Procurement patterns could change dramatically within the next year or two as small agencies update their aging fleets.

Transit Agency Perspective

A 2002 study by Hemily and King on the use of small transit buses (less than 30 feet long) highlighted many important issues that can be addressed to develop the rural bus research plan. Based on a survey of 63 transit agencies, Hemily and King (2002) found that vehicle reliability and high maintenance costs were both the most frequently cited and highest-ranking concerns with regard to small buses (Table 1). This indicates the need for a small bus with higher mechanical reliability. More than one-half of respondents operating small buses reported that vehicle reliability was a concern, and 42 percent reported they had higher maintenance costs than predicted.

Table 1. Survey Responses on Concerns with the Use of Small Buses

Issue/Concern	Percent of Responses: Cited as Issue/Concern (%)	Percent of Responses: Cited as Most Important (%)
Capital Cost of Vehicle	17	3
Customer Acceptance	**39**	14
Maintenance Costs	**42**	13
Operator acceptance	**33**	6
Safety	12	2
Vehicle Reliability	**53**	**25**
Other	33	16

Hemily and King (2002)

Issues of customer concern highlighted by the survey results included poor ride quality, noise, fumes, single door, and crowding. Safety was only cited once as being the most important concern with the use of small buses. The most-frequently cited safety concern was for those standing on a crowded bus, a practice of little concern during bus use in most small urban and rural areas. Other issues, such as lack of seats and lack of capacity at peak hours, also do not concern most transit agencies within the rural bus industry.

Hemily and King (2002) also collected fuel consumption data from several transit agencies (Table 2). This has become a major issue in the past year because of the increase in fuel costs. Operational differences were found to have a large impact on the fuel consumption for small buses. Fuel economy was highest when small buses were used in regular linehaul service when average system speed was highest. Whenever significant idling time occurred, fuel economy dropped rapidly. This motivates the development of a small hybrid electric bus. Hybrid buses are optimal to operate in low-speed areas that require substantial dwell time. Some small towns may save a significant amount of money by switching to hybrid vehicles because many of their buses rarely leave the city limits and are operated at low speeds, less than 40 mph, throughout most of their service area.

Table 2. Fuel Consumption Experiences of Several Transit Systems

Transit System	Service Life Category	Average Fuel Consumption (mpg)
Kansas City Area Transportation Authority	4-5 year	8.75
Charlotte Department of Transportation	7 year	6.7
Port Authority of Allegheny County	7 year	5.25
Kansas City Area Transportation Authority	10 year	4.7
Connecticut Transit	12 year	3.59

Hemily and King (2002)

Transit agencies within the SURTC research states of North Dakota, South Dakota, Minnesota, Montana, Wyoming and Utah have also voiced some concerns regarding the performance and efficiency of their small-bus fleets.

Steps were also an item of primary concern. The fact that small buses do not kneel like larger transit buses makes it difficult for elderly individuals to board and exit them. Wheelchair issues included tie-down problems and also, when a wheelchair is tied down behind the rear axle (a common wheelchair tie-down area), the ride becomes extremely rough. Strong preference is given to having wheelchairs secured directly behind the drivers. It is easier to converse with wheelchair passengers located in the front of the bus and it is much easier to have two wheelchairs on a bus at the same time when they are located in the front of the bus where there is more room to move about.

Large wheelchairs with leg extenders are also a concern. Often the only way to have two such wheelchairs on the bus at one time is to be able to secure them in the front of the bus. Note that Q'Straint makes a new tie-down that allows for full circular motion that eases the wheelchair tie-down process for operators. Many buses are beginning to employ this new product. Consideration should be made to include these new tie-down specifications for a prototype rural transit bus. Most drivers also feel that the side wheelchair door is the only acceptable option for most rural communities. Rear loading of wheelchairs will not work because there are seldom curb cuts that allow for access from the rear when the bus is parked properly.

Ride quality is obviously based largely on the quality of a bus's suspension system. The leaf spring suspension is conventional in most small buses. One transit fleet manager said an air suspension system would offer superior ride quality and is offered by the International Corporation. A cost/benefit analysis of this suspension system should be analyzed before it is considered for implementation. International is willing to provide demo buses to transit agencies so ride quality can be compared to standard leaf spring suspensions. The Sprinter, which has been discussed as a possible rural bus prototype, incorporates the conventional leaf spring suspension system found in most small transit buses. A survey will be sent to CTAA transit agencies to determine what other ride quality problems hinder their small bus operations and need attention. The survey will cover current small agency vehicles along with their areas of interest in new fuels and technologies. Manufacturers will also be surveyed to gain a better understanding of their concerns regarding this rural bus initiative.

A driver from Jamestown, ND, mentioned that he worked for UPS for many years and the company and drivers were delighted with the quality of their vehicles. They used the Sprinter Freightliner model and obviously did not carry passengers, but he indicated "the drivers loved the way the vehicles handled." He added that the vehicles were "easy to maintain and inexpensive to operate." Many of the UPS vehicles had well over 200,000 miles on them and they still drove smoothly. Needless to say, he is an advocate for a Sprinter bus. Jamestown transit attempted to procure one just a few months ago, but were unable to find one anywhere in the United States that had side wheelchair lift access. They were given the option of placing a custom order for one to be delivered by next spring or summer, but they were unable to wait that long.

The latest version of the Dodge Sprinter van for 2006 includes the following features:

- Premium 2.7-liter CDI turbodiesel engine
- Three wheelbases (118," 140," 158") and two roof heights available,
- Ten-passenger seating and 112 cubic feet of cargo room with the 158-inch-wheelbase model,
- Standard air-conditioning with automatic temperature control,

- Four-wheel disc antilock brakes,
- Five-speed automatic transmission,
- Independent front suspension and solid rear suspension,
- 16-inch tires (RWD).

(Dodge-Sprinter, 2006).

Car and Driver has rated the Sprinter van highly the past few years. They rate the five-cylinder 2.7-liter Mercedes turbo-diesel as the best in its class and the following is part of their review. “The Sprinter is quick to start, doesn’t stink, and idles relatively smoothly and quietly. After a couple hundred miles, you forget it’s a diesel. It produces 154 horsepower at 3800 rpm and 243 pound-feet of torque between 1600 rpm and 2400 rpm. That’s not a lot, but it’s sufficient to propel this 5381-pound van to 60 mph in 13.1 seconds.

“One of the Sprinter’s most endearing traits is a smart, silky-shifting five-speed automatic that can also be shifted in manumatic mode: tip left for downshifts, right for upshifts. You can probe 350 revs deeper with the manumatic, and it’s quicker than the automatic at grabbing more earnest gears during uphill climbs. Given the diesel’s 18.0:1 compression, manumatic downshifts also work swimmingly as brakes. In a commercial van, it’s hard to imagine a better transmission. In our less-than-sensitive hands, the Sprinter returned an observed 30 mpg—pretty swell for a 10-passenger anything. It beats the eight-passenger Chevy Express’s 17 mpg and humiliates a 10-seat Dodge Ram 3500’s 13 mpg.” (Car and Driver, 2003). The price of the model tested was roughly $36,000. The 2007 version of the Dodge Sprinter is being manufactured near Charleston, SC, and they are promising new standards of refinement, space and performance compared to the current model.

Small Bus Market Conditions

U.S. bus manufacturers indicated repeatedly that generating a profit in the transit bus industry is extremely difficult and there is no room for error. Most of these manufacturers develop large buses designed solely for fixed-route service in large metropolitan areas.

However, similar problems hinder the small bus industry. The lack of large markets and stable demand cycles for transit buses, both large and small, are primary concerns leading companies to hold excess capacity in anticipation of large-order quantities. As a direct result of this and other issues, manufacturers enter and exit the industry frequently.

Manufacturers

North Dakota State University Small Urban and Rural Transit Center (NDSU SURTC) is currently conducting a small vehicle (less than 30 feet long) manufacturer study. The 2005 American Public Transportation Association (APTA) transit vehicle database includes more than 21,000 small transit vehicles built between 1990 and 2005. More than 60 different manufactures are included in this sample. Many of these manufacturers built only a handful of buses accounted for in the database while 19 manufacturers (Figure 1) were responsible for the overwhelming majority of buses produced. El Dorado National had more than 4,500 small buses in the database while Ford Motor Company and Goshen Coach represented the next two top manufacturers. Manufacturers that produced more than 100 small buses were included in this figure.

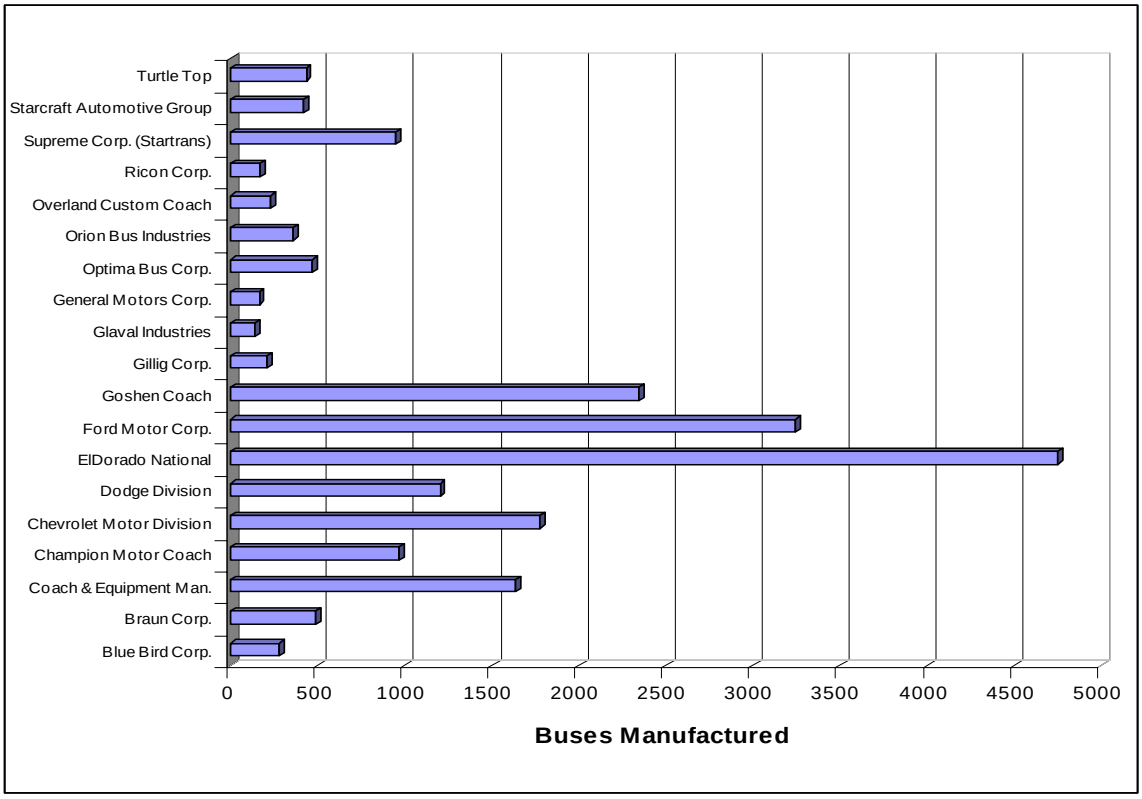

Figure 1. Major Small Vehicle Manufacturers (APTA 2005)

Active Vehicles

Figure 2 shows the number of active buses per model year represented in the database. The 8- to 10-year life cycle of small buses is quite evident here based on this figure as the number of active buses drops dramatically from 1,541 model year 1998 buses to 983 in 1997 and to 621 in model year 1996. Looking back from 2005, most of these buses were between seven to nine years old when the data was collected.

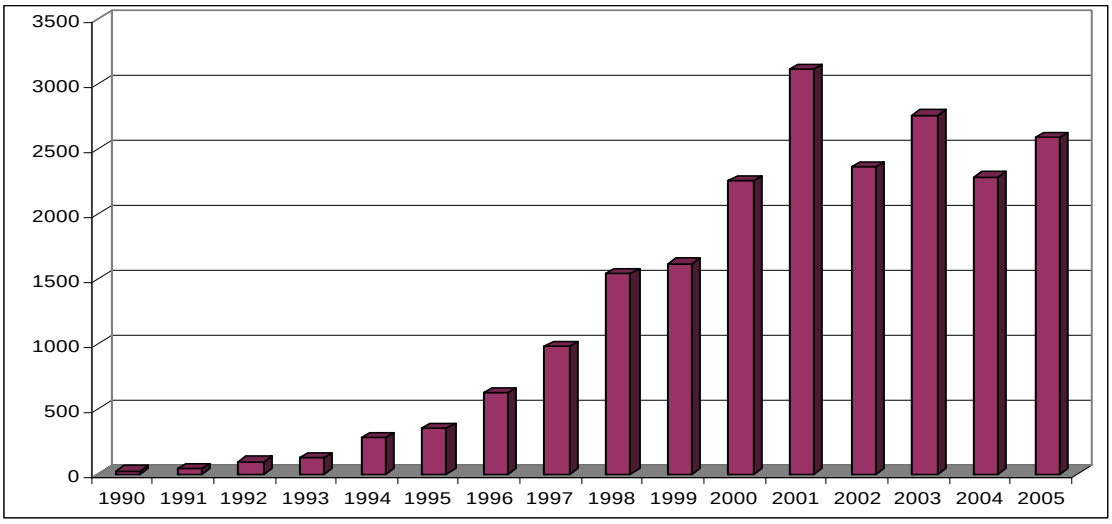

Figure 2. Model years of Active Small Transit Vehicles (APTA 2005)

Size

When considering the development of a new rural transit vehicle, attention should be given to the dimensions of the vehicle compared to industry standards. The majority of small vehicles represented in the APTA database are between 20 and 25 feet in length with the 20- and 25-foot buses being the most common registered lengths by a wide margin (Figure 3). ElDorado National and Goshen Coach both sell a large number of 25-foot transit buses which account for a large percentage of the buses at that length.

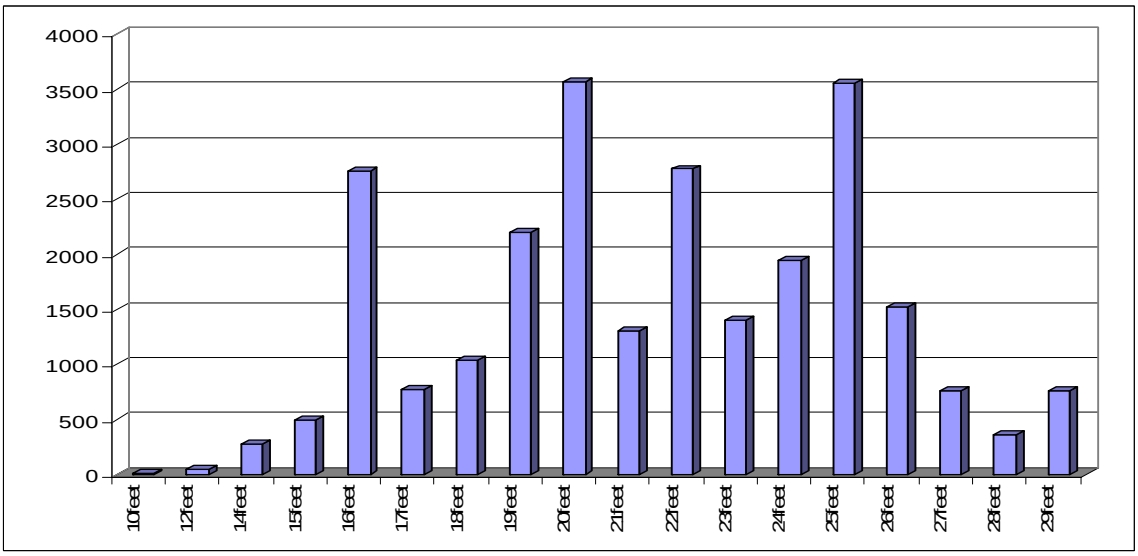

Figure 3. Length of Small Transit Vehicles (APTA 2005)

Cost

The average purchase price of a small transit vehicle also must be given some consideration when developing a new rural transit vehicle. Based on 2005 APTA database, the average purchase price per small transit vehicle after removing outliers was roughly $57,000 for model year 2005. This purchase price varies widely depending on the size and model of the vehicle procured and on specific features transit agencies stipulate within their procurement parameters. Transit agencies that request specific features that vary from agency to agency are a source of frustration for manufacturers and prevents them from reducing costs by producing a standard small vehicle for the industry.

ITS

Advanced technology is another area to consider when developing vehicle specifications. Automatic vehicle location (AVL) technology is used by nearly all of the larger transit systems and is becoming more prevalent in both small urban and rural systems as well. On-vehicle audio and video surveillance systems are another popular technology. The cost of such systems should be considered along with the market served by a vehicle designed to serve rural areas. Most rural areas would have little need for such systems. Equipping a vehicle with obstacle detection devices would be of greater importance in both small urban and rural areas. Backing a small bus can be very difficult and viewing small or low-to-the-ground obstacles while backing is virtually impossible. An obstacle detection device would serve this purpose and could prevent numerous accidents. Technologies such as electronic stop announcements and electronic passenger counters would also be welcome, but less of a priority than to AVL and obstacle detection devices.

Involvement

FTA

The FTA goal is to foster the development of a transit vehicle by conducting and encouraging industry analyses and creating stakeholder groups. If enough interest is found, further efforts will lead to a report outlining functional vehicle specifications.

Depending on industry interest and completed analyses, support for prototype development and testing may be provided.

NDSU

The NDSU goal is to aid in the data collection and analysis of current small transit vehicle market industry conditions. Conducting the feasibility study and developing a cost/benefit analysis for the implementation of a prototype vehicle are additional goals.

MANUFACTURERS

The manufacturer goal is to provide input to, and assist in the development of, functional specifications of a new transit vehicle that will optimize operations, increase ridership and customer service, and decrease environmental impact. The potential continuation of the project could lead to production of a new transit vehicle.

TRANSIT AGENCIES

The transit agencies' main goal is to provide input regarding current fleet conditions and improvements needed. They should also provide information regarding the features that should be incorporated in a new prototype including technologies that will improve their operating efficiencies as well as others which may not be necessary.

Discussion Points

The following discussion points have been identified based on literature and input from transit agency operators. These will be adjusted and updated as we gain further input from stakeholder recommendations and survey results. We will address all of the following while understanding that some issues will provide larger obstacles to overcome than others.

- Bus characteristics highlighted earlier such as high engine emissions, questionable reliability, limited accessibility and high maintenance costs will be addressed within this study. Specifications for a new or updated vehicle will address each of these issues in detail.
- Current small vehicle manufacturers may view the predicted outcome of this research as a handicap to their current production system. Developing specifications for a rural bus may require them to alter their vehicle production practices, resulting in increased costs to conform to the desired specifications. This research team must serve as facilitators between bus manufacturers and transit agencies to encourage the overall goal of increased efficiency between the two entities.
- Interest pertaining to the research will be largely based on industry reactions to surveys and stakeholder meeting suggestions. The project will be reevaluated, and possibly redirected, when input from both manufacturers and transit agencies have been considered.
- The feasibility of developing a rural bus prototype is a crucial issue. A thorough cost/benefit analysis must be performed to determine if such an endeavor is worth undertaking. Current small buses may already incorporate many of the features that are desirable to rural transit agencies and suggesting alterations to current vehicles may prove more feasible than designing a specific prototype.
- The appropriateness and acceptance of technology in rural areas is another issue. Unnecessary technologies must be identified because as many advanced technologies may prove to be needless throughout much of rural America and may not be worth the cost to implement; some may even be counter-productive.
- Agreement among transit agencies as to what features a rural bus prototype should encompass could become a major issue. This problem arises for manufacturers when considering transit agencies' specific wants and needs. Many transit agencies want a specific feature or technology that is not standard to a specific model design. It is impossible for manufacturers to make a standard vehicle when many transit agencies request specific features not present on the typical model and requests often vary from agency to agency.

Pros and Cons

Motivation

- Operator Needs: economics, service provision
- Vehicle Needs: fuel efficiency, emissions, accessibility, size, operating cost
- Passenger Needs: demand-response, paratransit, incidental, elderly, commuter

Concerns

- Current Manufacturers: possible market shift
- Safety: vans, passenger restraints, low-floor
- Accessibility: low-floor vs. terrain, ramp length, seating flexibility

Barriers

- Coordination: Head Start, school, community events, paratransit, fixed route
- Product Deployment: funding, procurement and pooled procurements

Potential

- Manufacturers: R&D funding, engineering, market
- Deliverables: prototype, specifications, demonstrations
- Advanced technologies: alternative fuels, ITS, applicability, interest, acceptance, maintenance
- Standards: differing markets, specifications, procurement
- Market Potential: projected orders, funding (ADA, CAAA)

Market

- Market Segments: vary among suburban, rural, remote
- Market Growth: aesthetics, branding, increased service

Work Plan: Phase I

Task 1: Scoping Paper

Objective: To produce a paper describing the background and goals of the small vehicle development project. This paper will include sufficient information into the current market and motivation of the project. The paper will be updated based on input from the stakeholder meetings and other reviews, including FTA. The first draft will be completed by January 2006 to allow for review at spring 2006 APTA and CTAA meetings.

Lead: Jill Hough & Del Peterson, NDSU SURTC

Timeline:

December 6, 2005	Develop paper outline
December 30, 2005	Initial draft completed
January 13, 2005	FTA comments completed
January 25, 2006	Final draft completed
May 2006	Paper presented at stakeholders meeting

Issues: Paper must include goals, background information, funding sources, potential to develop specifications versus prototype, foreign vehicle inclusion, and conflict with existing small vehicle manufacturers.

Task 2: Stakeholder Meetings

Objective: To hold a series of stakeholder meetings with representatives from manufacturing, transit agencies, research and industry organizations to gain input and gauge interest in the development of a new small transit vehicle. These meetings should be in conjunction with APTA and CTAA events, but will be held separately enough to maximize participation and focus. Necessary input will help adjust the goals of the project and identify potential participants in further efforts.

Lead: Mike Molloy, FTA

Timeline:

December 2005	Plan and schedule meetings
May 3, 2006	First stakeholder meeting
June 7, 2006	Second stakeholder meeting
September 2006	Stakeholder input report

Issues: These meetings must be used to develop an interest in the project and determine what the first major deliverable should be. Issues from scoping paper will be addressed and mitigated as possible. Discussion should include whether agencies and OEM's would support the development of a new vehicle, or would rather convert a vehicle to optimize it for transit applications.

Task 3: Survey

Objective: To gain input from a wider group of industry representatives, predominantly small urban and rural transit agency employees, survey CTAA members on their vehicle needs and interest in new technologies and the potential for a new vehicle.

Lead: Mike Molloy, FTA

Timeline:

December 2005	Finalize survey draft
January 2006	Approve final survey
Spring 2006	Distribute and collect survey with ATTI project
December 2006	Report on survey results

Task 4: Steering Committee

Objective: To create a project steering committee and hold meetings as necessary to stay on time and ensure the original goals are being properly addressed.

Lead: Santo Grande

Timeline:

December 2005	Final draft of membership list
February 2006	Steering committee meeting
Ongoing	Guidance meetings

Task 5: Market Study

Objective: To perform a thorough study of the current small transit vehicle market, determining the feasibility of encouraging the development of a new vehicle, examining the costs and benefits of introducing new technology to this market. Other issues from the scoping paper and stakeholder meetings will need to be addressed as well.

Lead: Jill Hough & Del Peterson, NDSU SURTC

Timeline:

Fall 2006	Begin market study
Fall 2007	Final report

Task 6: Final Report

Objective: To consolidate information from all Phase I tasks and prepare a paper that will facilitate the decision of proceeding with the project. The next potential step would be to create a program to develop a new vehicle that would define functional specifications.

Lead: Mike Molloy, FTA

Timeline:

Fall	2007	Consolidate information
December	2007	Final report on decision to proceed

Phase II: Examine necessity of further efforts

If feasible:

1. Program Development
    a. Develop functional specifications
    b. Prepare operational plan for testing and development

Phase III: Examine feasibility for prototype and testing

If feasible:

2. Prototype Development
    a. Employ functional specifications
    b. Design and fabricate vehicle prototypes
3. Prototype Test
    a. Test multiple prototypes (develop new or use existing vehicles)
    b. Update functional specifications and operational plan

Summary

The main goal of this research is to ensure that the small transit vehicle market is efficient at serving riders and transit agencies. One method to accomplish this is to develop either transit vehicle specifications or a specific transit vehicle to meet the specific needs of rural transit systems. This will lead to gained efficiencies by transit providers as a result of increased reliability and greater fuel economy while offering riders greater comfort with improved ride quality and greater vehicle maneuverability. The need for industry involvement throughout the study will be paramount to a successful research outcome. Both transit agency and manufacturer opinions will be given highest priority as the research work plan continues to mature.

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Small Vehicle Transit Agency Survey

The Small Urban & Rural Transit Center (SURTC) at North Dakota State University, in conjunction with the Federal Transit Administration (FTA) is examining the current small transit vehicle market to determine how well current vehicles meet transit agency needs. The results of this survey will be combined with recommendations obtained through stakeholder meetings to decide whether there are issues that need to be addressed in the small transit vehicle market. We appreciate any input you are able to provide. Please include comments to assist us in fully addressing this topic.

Please note that all responses will be kept confidential and will be used solely for the purposes of the Federal Transit Administration.

Transit Agency: _____

Name & Title: _____

Phone:_____ E-mail:_____Date: _____

1). Which of the following vehicles does your transit agency operate, and what is the approximate number/make/model of each vehicle type in your fleet?
(Feel free to provide inventory sheets and continue with question 2)

Vehicle Type	Number of Vehicles	Make / Model(s)	Seat Capacity	Length	Mileage
Small Transit Bus (Less than 30 ft.in length)					
Van					
Other small vehicle (Less than 30 ft. in length)					

2). Is your agency planning on purchasing new vehicles in the next 12 months?

- ☐ Yes **(Continue with question 3)**
- ☐ No **(Skip to question 5)**

3). If **Yes**, what type, how many, and at what cost?

Vehicle Type	Number of Vehicles	Make / Model	Price
Small Transit Bus (Less than 30 ft.in length)			
Van			
Other small vehicle (Less than 30 ft. in length)			

4). Please discuss the primary reasons for selecting the cited types of vehicles your agency procured, or plans to procure, this year. (e.g. replace vehicles, unique features, cost, etc.)

5). If **No,** please discuss the primary reasons for not purchasing new vehicles this year.

6). How many **transit vehicles** have or will be retired in 2006? Please discuss the primary reasons for retiring these vehicles.

7). What type(s) of transit bus service does your agency offer? Please check all that apply and indicate the number of routes by service type.

Type of Service	**Number of Routes**
□ Fixed-Route	
□ Demand Response (Paratransit)	
□ Express	
□ Other, please specify __	

8). What new service, if any, is your transit agency planning to provide in the next 3 to 5 years? Please check all that apply.

Type of Service	**Number of Routes**
□ Fixed-Route	
□ Commuter	
□ Express	
□ Other, please specify __	

9). If cost were not an issue, what technologies would you like to incorporate in your small bus fleet? (e.g. automatic passenger counters (APC), automatic vehicle location (AVL), electronic fare collection, obstacle detection devices, etc.)

10). Does your agency currently use, or plan to use in the next 5 to 7 years, any power source other than diesel and /or gasoline for your small buses/vans?

11). If **no,** what are your reasons for **not** using an alternative fuel source?

12). If **yes,** please check all that apply and indicate the number of small buses/vans.

Power Source	Transit Buses	Vans
□ Compressed Natural Gas (CNG)		
□ Liquefied Natural Gas (LNG)		
□ Diesel-Electric Hybrid		
□ Diesel-Gasoline Hybrid		
□ Biodiesel		
□ Hydrogen fuel-cell		
□ Other, please specify		
□ Plan to use alternative fuel but have not decided		

13). FTA is conducting a pilot **pooled procurement** program called the Cooperative Procurement Pilot Program (CPPP). What is your opinion about partnering with other transit agencies to procure buses through a single and standardized RFP for buses that share the same specifications, features and design?

14). How does the **Buy America policy** affect you agency's procurement process for federally funded procurement of vehicles?

15). What are the most significant challenges that your agency is facing currently with regard to procurement of vehicles?

16). Rank the following seven aspects of current fleet vehicles in order of how much you would like to see them improved, from highest priority (1) to lowest priority (7)

___ Fuel Economy
___ Operating Cost (maintenance, labor, etc.)
___ Capital Cost
___ Reliability
___ Accessibility
___ Emissions/Environmental
___ Service (meeting ridership demand)
___ Other:

17). What improvements would you most like to see offered in transit vehicles for low-density routes?

18). How likely might your agency be to adopt new technologies or vehicle specifications?

1	2	3	4	5
Not at all likely			Very likely	

19). In your opinion, would a specialized advanced small transit vehicle developmental program be useful? If you feel there are already vehicles suited to this market, please describe.

Additional Comments:

Small Transit Vehicle Manufacturer Survey

Manufacturer: _____

Name & Title: _____

Phone: _____ Email: _____ Date: _____

1). Small Buses (Less than 30 feet) and Vans Manufactured

Bus/Van Model	Altoona Bus Testing (yes or no)	Fuel Options	Standard Purchase Cost Range

2). What specific bus/van features do small bus/van buyers demand that are not present on standard models?

3). What steps do you take to improve your relationship with small bus/van purchasers?

4). Have your production practices changed in recent years to meet customer demand?

5). Do you currently, or plan to in the next 3 to 5 years, manufacturer small buses/vans that use an alternative fuel source?

6). What types of technologies do you offer on your small buses/vans (e.g. APC, AVL, electronic fare collection, obstacle detection devices, etc.)?

7). Annual small bus/van sales volume ($)

Year	Annual Sales Volume
2000	
2001	
2002	
2003	
2004	
2005	

8). Annual small bus/van sales volume by vehicle type ($)

	Vehicle Type				
Year					
2000					
2001					
2002					
2003					
2004					
2005					

9). Location of small bus/van production facilities (please list below)

Facility	Location
1	
2	
3	

10). Annual small bus/van production volume by facility (units)

Location	2000	2001	2002	2003	2004	2005

11). Annual small bus/van production volume by vehicle type (units)

Year	Vehicle Type				
2000					
2001					
2002					
2003					
2004					
2005					

12). Annual number of small bus/van warranty claims

2000	2001	2002	2003	2004	2005