

# Development of a Decision Support Tool to Better Manage Alabama's Rural Public Transit Vehicles

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In an ongoing effort to improve mobility and quality of life for Alabama's citizens, researchers at the University of Alabama in Huntsville are working to improve the state's ability to manage its rural transit fleet. This fleet management consists of a visual inspection for all state owned vehicles along with an examination of individual provider's records to verify vehicle identification numbers and mileage as well as assess the overall condition of the vehicle based on appearance, passenger comfort level, and maintenance needs. The research team is developing a vehicle inventory database to track all of Alabama's public transit vehicles and to be used as a decision support tool for the equitable acquisition of new vehicles and disposal of inadequate vehicles. This database will be used to establish a new record keeping system for all state owned vehicles. Specific functions for data entry, review, and reporting will be included with the database. This tool will allow access to information on all agencies in a user-friendly environment and benefit Alabama as an improved decision support tool providing potential cost savings associated with improved vehicle acquisition and disposal. Key words: public transportation, rural transit, fleet management, and GIS.

## INTRODUCTION

Personal mobility is a vital component of an individual's welfare and quality of life. However, in many rural areas of Alabama, a large portion of the state's residents lack the resources or ability to provide for their own mobility and are dependent on the state's rural transit program. The rural transportation program provides residents needed transportation services for trip purposes such as shopping, medical, and social/recreational.

The Alabama Department of Transportation (ALDOT) is responsible for providing new vehicles, as well as insurance and vehicle tags for the vehicles, and a portion of the agency's operating costs. The vehicles are then provided to the local agencies, responsible for operation and maintenance.

The current funding for the state's rural transit program allows for the procurement of approximately 50 to 60 vehicles, allowing for the replacement of about ten percent of the fleet per year. Unfortunately, the expected life for a rural transit vehicle is between five and seven years (or around 125,000 miles). This discrepancy is creating a situation where the local agencies are operating vehicles beyond the expected life as vehicles are aging faster than they can be replaced.

To compound the problem, many of the poorer counties providing rural transit service often require the vehicles to travel on unpaved roadways. Travel on these unpaved roadways rapidly deteriorates the vehicle operating condition. However, the expected vehicle life used to schedule disposal and procurement was based solely on vehicle mileage and age, making it difficult to equitably distribute newly acquired vehicles between counties with a differences in the percentage of paved and unpaved roadways.

Therefore, to assist the ALDOT in rural transit vehicle disposal and procurement equity, the University of Alabama in Huntsville has developed a decision support tool to better manage vehicle acquisition and disposal. The development of this tool was accomplished through a site inventory of all rural transit vehicles and the creation of a database system containing all rural transit vehicles in Alabama. This paper discusses the data collection procedure and development of the decisions support database, demonstrates some vehicle acquisition scenarios using the database, and comments on the possible reasons behind the different vehicle distributions. The paper concludes that the rural transit vehicle inventory was beneficial to Alabama, and the investment made will provide future cost-savings.

## ALABAMA RURAL PROVIDERS

Alabama's rural public transit system consists of 27 operators located throughout the state. Each operator is responsible for a specified number of counties, ranging from one county to nine counties with service provided in 52 of Alabama's 67 counties. Currently, 640 rural transit vehicles are licensed and insured in Alabama. These vehicles are generally fifteen-passenger standard vans or cut-away chassis vehicles seating between 17 and 21 passengers (Figure 1 shows an example of a cut-away chassis vehicle used in Alabama for rural transit).

## DATA COLLECTION EFFORT

The data collection effort involved an on-site inventory of all rural transit vehicles in Alabama. To assist in the data collection process, an inventory form was developed to allow the examiner to walk around the vehicle from the front driver's side to the rear. Figure 2 shows the form. Some of the items collected on the form are the vehicle identification number, mileage, seating capacity, and vehicle type. In addition to these basic data elements, each of the inspectors was required to assign a condition rating for each vehicle. To ensure



Figure 1 Cut-away chassis rural transit vehicle

Registered Owner Name	Baldwin County		
Vin Number	1FDKE30G2NHB05013	Verification 1999	9
Chassis Manufacturer	Ford	Design Capacity	17
Mileage	219360	Vehicle Type	CV
Body Manufacturer	Supreme	Model Year	1993
Body Serial Number	NO 8454 BS 25	Federal Program	5311
Tag Number	19120 CD	Delivery Date	10/8/92
LIR Equipped	<input checked="" type="checkbox"/>	Procurement Year	
LIR Manufacturer	Braun	Total Cost	\$40,614.00
Stations	2		
Comments:	UAH condition rating=poor		

FIGURE 2 Inventory collection form

consistency in the rating between data collectors and ALDOT, all members of the team inventoried one entire agency with the ALDOT present.

## DATABASE DEVELOPMENT

The database developed to manage the rural transit fleet was designed to allow for new vehicle acquisition, annual updates, and vehicle disposals. Using the Microsoft Access Database program, a table was developed containing all required fields to support each of these three stages in a vehicle life. Then, separate data entry and report forms

were developed to review, alter, or enter specific vehicle information. Examples of the forms for vehicle acquisition and disposal are shown in Figures 3 and 4.

## FINDINGS

The on-site inspections of all rural transit vehicles in the state revealed several interesting facts regarding rural transit in Alabama. First, there were over 40 vehicles discovered that were no longer operable for transit service. The inoperable vehicles were basically discarded by the agencies, however, they were not officially disposed of as a

Registered Owner Name	Vehicle Type	Purchase Acquisition Date	Local Check Received	Title Number
Accounting Code	Accounting Code	Purchase Acquisition Number <td>Local Check Received <td>Manufacturer's Production Number</td> </td>	Local Check Received <td>Manufacturer's Production Number</td>	Manufacturer's Production Number
Project Number	Project Number		Local Check Date Received	Prepared Delivery
Federal Program				Purchase Order Date
Comments			<input type="checkbox"/> L&L Equipment <input type="checkbox"/> HAC	Purchase Order Number

  

Registered Owner Name	Permitment Alabama Mental Health	2/1/99		TIT#AL01 40485034
Vehicle Type	Modified Van 15 Passenger	2/1/99	2/1/99	10595
Project Number				
Federal Program				
Comments				

**FIGURE 3 Vehicle acquisition form**

Registered Owner Name	Tuscaloosa ABC	Permission to Dispose	<input type="checkbox"/>
Vehicle Number	2B5WB31W1G6087124	Title Released	<input type="checkbox"/>
Body Manufacturer	Dodge	Vehicle Disposed	<input type="checkbox"/>
Chassis Manufacturer	Dodge	Disposal Date	2/4/99
Operating Owner Name	Tuscaloosa ABC	Date Title Released	1/1/99
Model Year	1996	Disposal Funds Received	\$680.00
Vehicle Type	SV	Comments	
Useful Life Years	4	Vehicle Disposed February 1999. \$680.00 Received.	
Useful Life Miles	175000		

**FIGURE 4 Vehicle disposal form**

reduction in fleet size would affect the operating budget amount provided to each agency from ALDOT. Second, there were 15 vehicles located that were licensed and titled by ALDOT, with vehicle title on hand, that were not claimed and operated by the respective agency intended to use the vehicle. In both of these cases, ALDOT realized a potential cost savings as these vehicles were subsequently removed from the state inventory list, saving approximately \$60,000 or roughly \$1,000 per vehicle for insurance and licensing.

## INVENTORY STUDY

To further demonstrate the usefulness of the database developed in this project, a case study was performed to examine the disposal and acquisition of vehicles based on mileage and age versus condition rating. Using the age and mileage criteria, new vehicle acquisition would be as shown in Table 1 (assuming 50 new vehicle acquisitions).

Using an equitable distribution providing the same number of new vehicles to each agency would allow each agency to acquire two vehicles per year (an annual total of 54 vehicles). However, twelve agencies are not in need of any new vehicles based on the condition rating and four agencies need only one vehicle.

The results of an examination of the percentage of vehicles in the fleet that would be replaced using the condition rating as the purchasing factor are summarized in Table 2.

Results of the inventory study show several unique vehicle acquisition factors in Alabama. First, the Alabama-Tombigbee agency is in need of more vehicles than they would receive through an equitable purchase for all agencies, vehicle age or vehicle mileage. In addition, the 15 vehicles they would receive using the condition rating would essentially replace 58 % of their operating fleet with new vehicles. One explanation for the additional vehicles to be purchased is that the Alabama-Tombigbee agency operates in Monroe and Clarke Counties which are large, scarcely populated counties offering home-to-work trips on unpaved roadways.

Second, the Baldwin County Commission experiences higher mileage with their transit vehicles in fewer years than any other agency in the state. There are two reasons behind this. First, they offer transit services to tourists visiting the Gulf Shores area, and second, Baldwin is one of the largest counties in the state. These reasons create a situation where Baldwin County vehicles have high mileage requiring replacement; however, they have not officially surpassed their useful life years.

Finally, Madison County Commission, which according to the condition rating would not receive any vehicles, has five vehicles that are among the state's fifty oldest vehicles. This situation is possible because Madison County is one of the smaller counties in the state with a relatively small rural population and Madison County has a very few unpaved roadways in the county.

**TABLE 1 New Vehicle Acquisitions**

Agency	Condition	Age	Mileage
Alabama-Tombigbee	15	10	11
Lee-Russell COG	9	8	9
Blount County Commission	8	5	9
Northwest AL. COLG	5	6	6
Baldwin County Commission	3	0	3
HELP INC.	2	2	2
Exceptional Children	2	2	2
Macon-Russell CAA	2	1	1
Lawrence County Commission (LCATS)	1	4	3
Jackson County Commission	1	2	1
Community Service of West Alabama	1	1	1
Morgan County Commission (MCATS)	1	3	0
Madison County Commission	0	5	0
Escambia County Commission	0	1	1
Covington County Commission	0	0	1

## CONCLUSION

The results of this inventory study for the rural transit vehicles in Alabama identified many unique situations and recommendations. The study allowed for the identification of several vehicles that should no longer be part of the state's insurance and licensing list. The study showed how a condition rating system could be used for replacement of vehicles that would be more equitable than a system based on mileage or age alone.

Possible additions to the database system that might improve equity in vehicle acquisition would be to incorporate the income of residents, average age of county residents, and vehicle ridership data. However, even without these additions, this project demonstrated

**TABLE 2 Vehicle Acquisitions as a Percentage of Fleet.**

Agency	New Vehicles	Total Vehicles	% Condition
Alabama-Tombigbee	15	26	58
Lee-Russell COG	9	34	26
Blount County Commission	8	16	50
Northwest AL. COLG	5	56	9
Baldwin County Commission	3	52	6
HELP INC.	2	14	14
Exceptional Children	2	11	18
Macon-Russell CAA	2	8	25
Lawrence County Commission (LCATS)	1	26	4
Jackson County Commission	1	11	9
Community Service of West Alabama	1	4	25
Morgan County Commission (MCATS)	1	33	3
Madison County Commission	0	21	0
Escambia County Commission	0	7	0
Covington County Commission	0	8	0

that a relatively small investment made by the Alabama Department of Transportation has the potential to save money in future years as vehicles are removed from state lists and provides a condition-based system for equitable vehicle acquisition.

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