

**The Best of Both: Combining the Benefits of  
Agency-Dedicated Vehicle Transportation and  
Coordinated Transportation**

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## Abstract

Coordinated transportation is being advocated in lieu of assigning dedicated vehicles to human service agencies. This paper compares the mobility options and service efficiency of an agency-dedicated vehicle transportation system with a similar coordinated transportation system to determine the positive characteristics exhibited by both transportation models. The recommendations propose a method of combining the best characteristics of both.

Vehicle utilization data, performance indicators, and ridership statistics per funding agency were used to compare the two transportation models. The comparison shows that the coordinated transportation system operates state funded vehicles over a larger portion of the day and increases the overall mobility of the community by making the vehicles available to clients of many funding agencies and the public. The agency-dedicated vehicle transportation system is more proficient at performing trips for the sheltered workshop and recreation and shopping routes for the elderly and disabled. The agency-dedicated vehicle transportation system's social services transportation, however, performed comparable to the coordinated transportation peer.

This paper recommends that the agency-dedicated vehicle transportation system transition to a coordinated transportation system to better serve its population. However, in becoming coordinated, the transit system should retain the most efficient aspects of the agency-dedicated vehicle transportation- the sheltered workshop and elderly and disabled trips. The least efficient aspect of its service, social service trips, should use its clients and vehicles to become the foundation of a coordinated system offering transportation to clients of other funding agencies and the general public.

## INTRODUCTION

There are two main types of human service agency transportation; 1) *agency-dedicated vehicle transportation systems* have state funded vehicles permanently assigned to each participating agency, and 2) *coordinated transportation systems* where mobility is provided to agency clients through contracts with one central transportation system that operates the state funded vehicles. Unlike agency-dedicated vehicle transportation, coordinated transportation systems have the ability to mix clients from multiple agents on individual runs and provide transportation to the general public.

There has been a strong push for publicly sponsored transportation providers to coordinate their services. Only two agency-dedicated vehicle transportation systems in North Carolina are still in operation. The purpose of this paper is to compare McDowell's agency-dedicated vehicle transportation system with a similar coordinated transportation peer by identifying vehicle utilization, service efficiency, and the overall mobility offered to the community. The final sections of this paper identify the perceived advantages of the agency-dedicated vehicle transportation system service and coordinated transportation models and suggest how the agency-dedicated vehicle transportation system can incorporate the best of both.

## DESCRIPTION OF THE STUDY AREAS

### **Agency-Dedicated Vehicle Transportation System - McDowell Transit**

McDowell Transit, located in McDowell County, North Carolina, in the foothills of the Appalachian Mountains, provides human service transportation for three agencies using vehicles that have been purchased by the State of North Carolina. The Department of Social Services (DSS) primarily transports Medicaid and other eligible clients to medical appointments. The Senior Adults program serves the elderly and disabled on scheduled shopping and recreation trips. Finally, a sheltered workshop program operated by Foothills Industries, Inc. provides transportation to and from its facility for workshop attendees. Drivers, administrative duties, and operating costs are covered by the agencies that operate the vehicles. McDowell Transit provides an average of 226 passenger trips per day.

### **Coordinated Transportation- Rutherford County Transit Department**

Located directly south of McDowell County and also in the foothills of the Appalachian Mountains, Rutherford County operates a coordinated transportation system that provides transportation to clients with multiple funding sources. Grants help provide job access and rural general public transportation. All trips are scheduled centrally and provided by in-house drivers. The system attempts to coordinate all runs by mixing recipients of funding sources according to geography and time. Rutherford County Transit Department provides an average of 230 passenger trips per day.

## **VEHICLE UTILIZATION COMPARISON**

The North Carolina Department of Transportation (NCDOT), Public Transportation Division, requires that each community transportation system in the state that possesses publicly funded vehicles report how the vehicles were utilized for one week, twice a year. This vehicle utilization report collects daily vehicle service and revenue time and mileage information along with the number of passengers. The data is designed for creating charts that show when the vehicle is in service based on the start and end times of the runs.

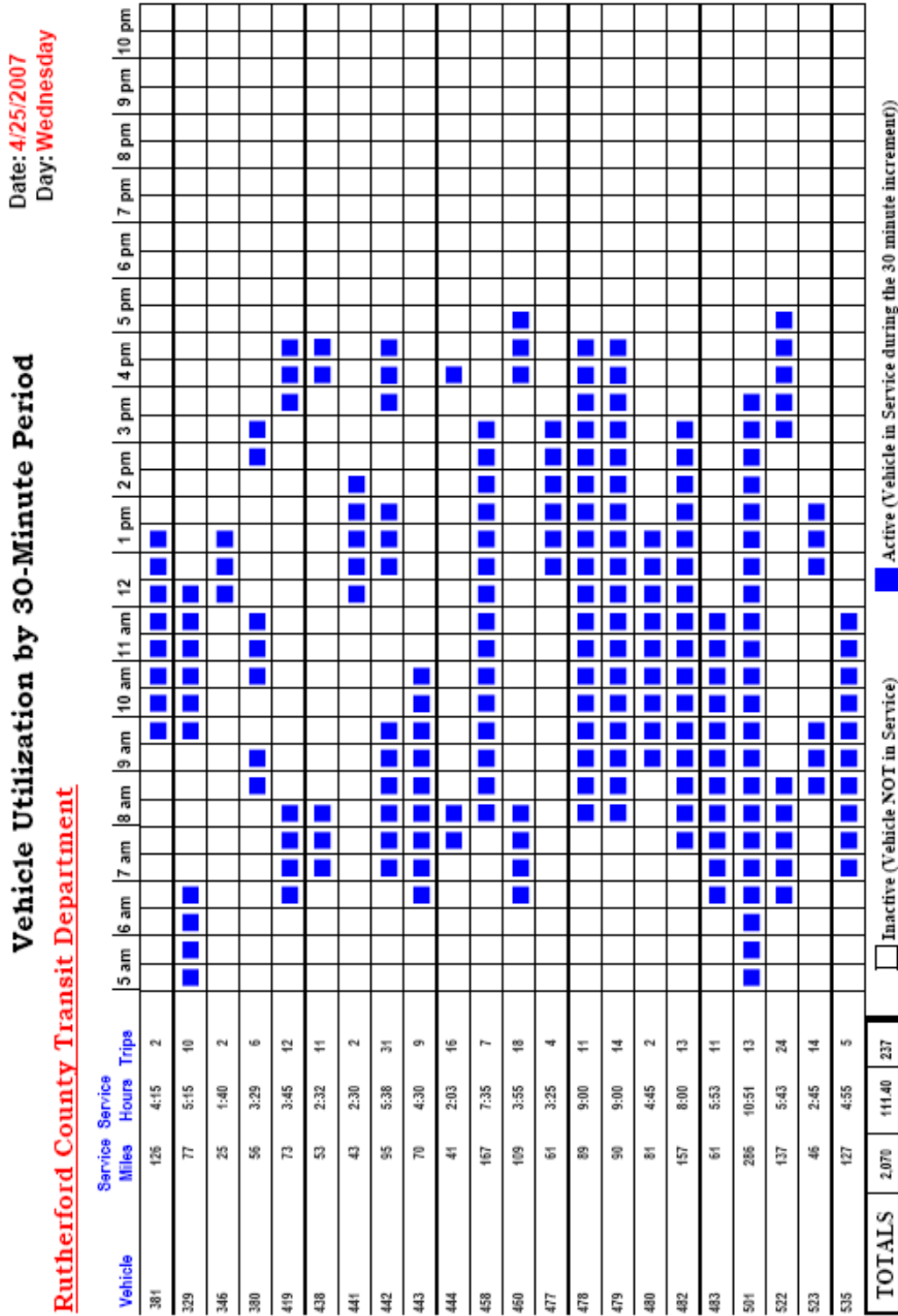
The most recent week of data available is April 23-27, 2007. Rutherford County Transit Department performed the highest number of passenger trips on Friday of that week while McDowell Transit reported their highest volume on Monday. Both systems performed their second highest number of passenger trips on Wednesday, April 25, 2007. For this reason, April 25 was selected as the most appropriate day for comparing both systems.

Figure 1 displays the vehicle utilization for the agency-dedicated vehicle transportation system, McDowell Transit. This temporal chart spans from 5 am to 11 pm on Wednesday, April 25, 2007, and shows that McDowell's vehicle fleet was predominately idle.

In comparison, Figure 2 shows the vehicle utilization for Rutherford County Transit System, the coordinated transportation provider. Most vehicles in the coordinated system were used for a large portion of the day.



**Figure 2. Rutherford County Transit Department Vehicle Utilization, 4/25/2007**  
 PLACEHOLDER. NOT ACTUAL IMAGE QUALITY/FORMAT



## PERFORMANCE INDICATOR COMPARISON

Although the coordinated transportation system in Rutherford County showed a much greater use of vehicles (see Figure 2), the performance indicators shown in Table 1 tell a different story. McDowell's human service agencies provided almost exactly the same number of passenger trips as the coordinated system, 230 compared to 237. Furthermore, McDowell Transit provided this mobility using 69% less service miles and 79% less service hours than the coordinated system.

**Table 1. Performance Indicators, 4/25/2007**

Performance Indicator	Rutherford County Transit Department	McDowell Transit	Percent Difference
Passenger Trips	237	230	-3%
Number of Vehicles	26	16	-38%
Service Miles	2,070	637	-69%
Revenue Miles	1,778	523	-71%
Service Hours	111.4	23.08	-79%
Revenue Hours	94.6	19.67	-79%
Passengers Per Service Mile	0.11	0.36	227%
Passengers Per Revenue Mile	0.13	0.44	238%
Passengers Per Service Hour	2.13	9.96	368%
Passengers Per Revenue Hour	2.51	11.69	366%

## AGENCY COMPARISON

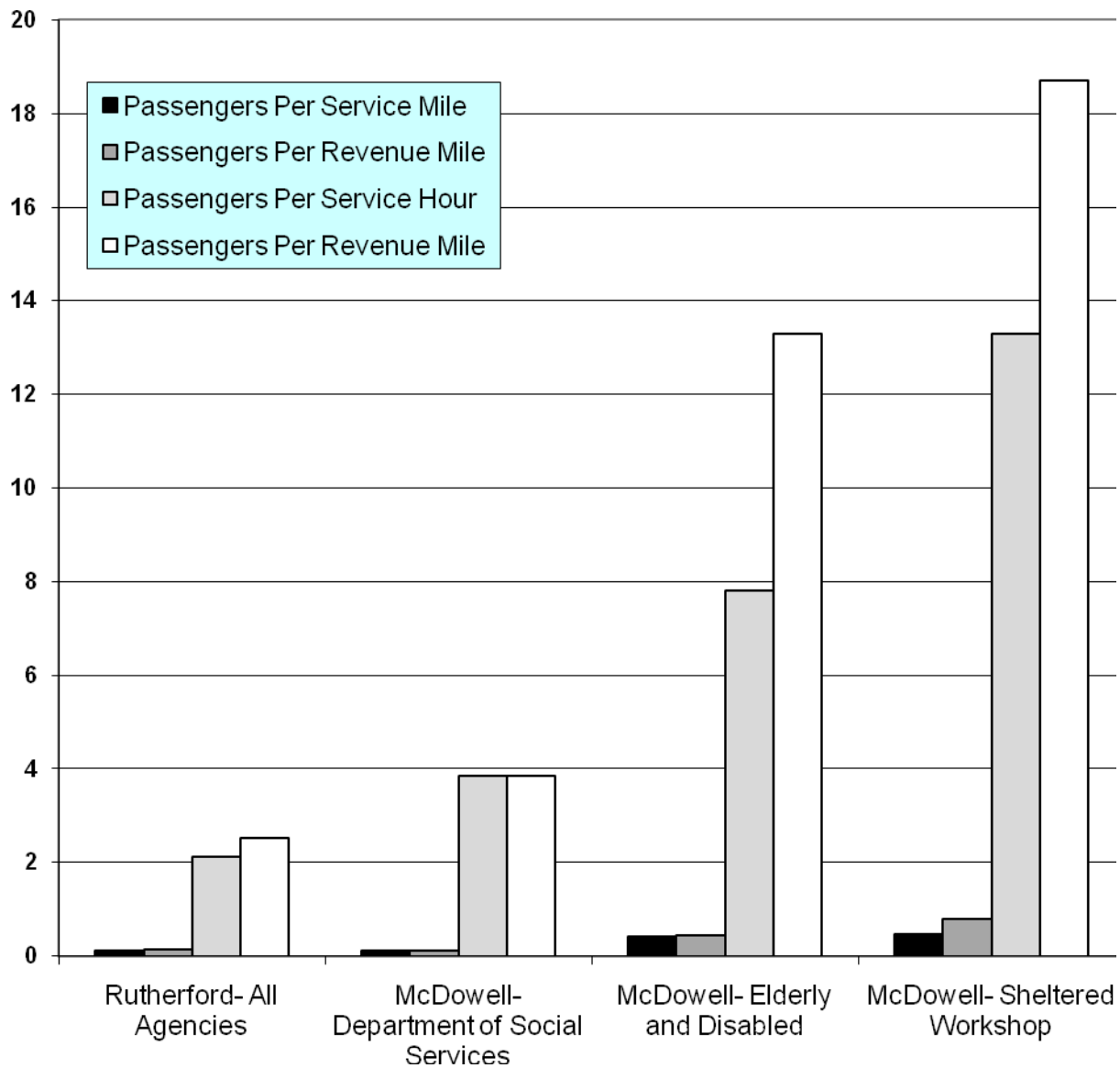
Because McDowell Transit does not coordinate trips, it is possible to analyze the performance of individual agencies to determine how they compare to each other and to Rutherford. The vehicle identification numbers in the Vehicle Utilization report (Figure 1) indicate which agency operates the vehicle. DSS indicates Department of Social Services, FI indicates Foothills Industries, the sheltered workshop, and SC indicates Senior Center, which serves the elderly and disabled.

Table 2 displays some performance indicators for McDowell Transit by agency responsible for performing the work. It is important to note that DSS for McDowell Transit reported the same service and revenue statistics. The actual revenue statistics should be slightly higher than the service statistics. Key performance indicators for each agency and Rutherford County Transit Department are graphically displayed in Figure 3.

**Table 2. McDowell Transit Agency Performance, 4/25/2007**

Performance Indicator	Department of Social Services	Elderly and Disabled	Sheltered Workshop
Passenger Trips	21	32	88
Number of Vehicles	3	3	10
Service Miles	184	79	187
Revenue Miles	184	71	113
Service Hours	5.5	4.1	6.6
Revenue Hours	5.5	3.4	4.7
Passengers Service Mile	0.11	0.41	0.47
Passengers Per Revenue Mile	0.11	0.45	0.78
Passengers Per Service Hour	3.8	7.8	13.3
Passengers Per Revenue Hour	3.8	9.4	18.7

**Figure 3. McDowell Transit Agency Performance Versus Rutherford County Transit Department, 4/25/2007**



The elderly and disabled trips are scheduled shopping and recreational routes where clients are transported to a common destination. These services are similar to subscription service because clients are required to reserve their space on a set route. The elderly and disabled transportation has nearly four times as many passengers per service mile and over twice as many passengers per service hour as DSS.

The sheltered workshop trips are established subscription routes, which allow for higher efficiency. The part time drivers are also staff at the sheltered workshop. The morning routes begin at the homes of the employees and they pick up clients on their commute into work. The drivers, vehicles, clients, and hours of the service remain the same from day to day. This situation allows the sheltered workshop to attain passengers per revenue mile values of over four times that of DSS and over 7 times that of the coordinated transportation peer, Rutherford County Transit Department.

DSS provides primarily demand-response medical transportation, usually involving spread out origins and destinations. These service factors are evident in the relatively low performance indicators. DSS’s performance indicators are similar to or slightly higher than the performance of the coordinated system in Rutherford County.

### MOBILITY COMPARISON

Thus far, it has been shown that Rutherford County Transit Department, a coordinated system, had its vehicles in service for more hours, but the human service agencies that make up McDowell Transit provide more efficient service when the vehicles were in service. This section compares the overall mobility that each transit system provided.

Table 3 shows the absolute number of passenger trips carried for Wednesday, April 25, 2007, and the associated agency for McDowell and Rutherford. *Other Trips* includes trips sponsored by an agency other than those served by McDowell Transit, which are sheltered workshop, elderly and disabled, and Department of Social Services. This comparison shows that nearly 1/3 of Rutherford’s trips are for customers that are not served by McDowell Transit.

**Table 3. Passenger Trips by Agency, 4/25/2007**

System	Sheltered Workshop Trips		Elderly and Disabled Trips		Department of Social Services Trips		Other Trips*		Total Trips
	#	%	#	%	#	%	#	%	#
McDowell Transit	177	77%	32	14%	21	9%	0	0%	230
Rutherford County Transit Department	35	15%	56	24%	70	30%	76	32%	237

\*Other Trips includes any transportation not related to sheltered workshop, elderly and disabled, or Department of Social Services

### Comparison of Transit Models

The following section on the perceived advantages of the two transportation models is derived from interviews and discussions with McDowell Transit, Rutherford County Transit Department, and industry professionals.

#### Advantages of Agency-Dedicated Vehicle Model

Some of the advantages that agency-dedicated vehicle transportation systems may realize from having dedicated vehicles include:

- *Accountability*- the clients of the elderly and disabled group and the Department of Social Services call the drivers directly to schedule a ride. As such, it can be reasoned that the drivers, when in direct contact with the customers, are less likely to deny a trip and more likely to reliably meet requested pick-up and drop-off times. The sheltered workshop is very interested in accepting every trip because each trip allows yet another worker to attend the workshop, furthering its mission.

- *Deadhead Time or Miles*- because each agency has its own fleet, there are no miles and hours necessary for when the vehicle switches between agencies. For instance, if the fleet was shared, there would be deadhead miles and hours while moving the vehicles from the sheltered workshop site to the elderly and disabled site.

- *Scarcity of Resources*- transit agencies that have dedicated vehicles and drivers most likely do not have the vehicle or driver availability of a coordinated system. This scarcity of resources can help make the transit system more efficient because there is pent up demand for mobility when the vehicles and drivers become available.
- *Service Design*- because there is a limited client base, the drivers learn the details of where all of their clients live and understand the best routes between their origins and destinations.
- *Vehicle Maintenance*- in general, every driver has a vehicle assigned to him/her. It is a reasonable assumption that a vehicle that is assigned solely to a particular driver will be maintained and cared for better than a vehicle driven by multiple people. This increase in care may result in less serious vehicle maintenance and downtime than in places with shared vehicles.
- *Vehicle Life*- outstationing vehicles and having a dedicated fleet reduces or completely eliminates deadhead miles and hours, resulting in an increased vehicle life span.

### **Advantages of Coordinated Transportation Model**

According to the interviews, some of the advantages of coordinated transit may include:

- *Fairness to Taxpayers*- the vehicles purchased by the State of North Carolina should be, as much as possible, available for use by the people who purchased them.
- *General Mobility*- coordinated agencies are able to provide mobility to the general public. This option is very important in rural communities, especially those that lack taxi service.
- *Overall Mobility*- a coordinated system increases the mobility of the entire population by providing transportation opportunities to clients of other agencies.
- *Out of County Trips*- coordinated transportation providers are more likely to have drivers and vehicles available for out of county trips. For rural counties with few local medical and shopping options, out of county trips are essential elements of mobility.
- *Service Availability*- coordinated systems are not as limited by scarcity of resources as transit systems that have agency-dedicated vehicles. As a result, coordinated systems enable clients to have more flexibility when scheduling appointments.

### **RECOMMENDATIONS**

There are mobility-impaired groups that are not served by the three agencies with state funded vehicles in McDowell County. It is recommended that McDowell Transit begin to offer service to the underserved population by creating a new coordinated transportation system.

However, the research shows that McDowell Transit performs well moving certain populations. Therefore, it is recommended that the most efficient services- sheltered workshop and elderly and disabled- retain their dedicated vehicles. The Department of Social Services trips have performance indicators that are comparable to the coordinated transportation system peer. Because the DSS trips are not being performed much more efficiently than a coordinated transportation system could perform them, it is recommended that the DSS trips and dedicated DSS vehicles form the foundation of a new coordinated transportation system.

By following these recommendations, McDowell Transit will retain all aspects of its highly efficient service and, at the same time, extend mobility options to other, underserved populations.

## **CONCLUSIONS**

Coordinated transportation is being strongly advocated to replace human service transportation provided with dedicated state funded vehicles. However, this study proves that some aspects of agency-dedicated vehicle transportation may be able to outperform coordinated transportation. Instead of dissolving agency-dedicated vehicle transportation and replacing it with a coordinated system, it is preferable to identify the highest performing aspects of the agency-dedicated vehicle transportation system and retain them in a new coordinated system. If the recommendations that combine the best aspects of agency-dedicated transportation and coordinated transportation are implemented as suggested in this paper, the overall mobility of citizens of McDowell County will be increased and the efficiency of the mobility and use of public resources will be maximized.

## **FUTURE RESEARCH**

Follow-up research is necessary to determine whether the perceived advantages of the agency-dedicated vehicle transportation and coordinated transportation are real.

In addition, a statewide methodology for assigning state-funded vehicles should be developed in the future. The resulting policy would help determine whether a human service transportation system is assigned dedicated vehicles or is allowed to retain dedicated vehicles. For instance, human service agencies that show they can provide a minimum number of passenger trips more efficiently than the coordinated transportation system would be eligible for dedicated vehicles. Those that do not meet the threshold would not retain their vehicles.

## **ACKNOWLEDGEMENT**

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