Scheduling and Dispatching Strategies

IMPROVED DISPATCHING THROUGH USE OF TECHNOLOGY

Capital Area Rural Transportation System (CARTS), Austin, Texas

SUMMARY OF THE STRATEGY:

CARTS has implemented a package of technologies, including scheduling and dispatching software, Mobile Data Computers (MDCs), and vehicles equipped with global positioning system (GPS)/Automated Vehicle Location (AVL) technology. This system enables CARTS to efficiently and effectively schedule rides and manage vehicle operations.

DETAILED DESCRIPTION:

CARTS first began to implement scheduling and dispatching software in 1995, when Trapeze/PASS was still a college project, to take trip requests and develop driver manifests. Over the years, as the product developed, CARTS use of the product developed accordingly.

Beginning in 2001, CARTS implemented MDCs on the vehicles, timed to take advantage of communications network infrastructure that the Lower Colorado River Authority was installing and making available to government agencies in its coverage area. The availability of the LCRA network provided CARTS with voice and data communications in all vehicles throughout the service area. The MDCs allow dispatchers to change manifests throughout the day without having to call drivers; the electronic manifest is immediately updated on the driver's MDC.

CARTS next implemented GPS/AVL technology which enables real-time monitoring all vehicles' exact location and

AGENCY PROFILE

Organization Type: Rural Transit District, a political subdivision of the state of Texas governed by a board composed of one county commissioner from each of the nine counties it services.

Service Area: CARTS provides public transit in nine rural counties surrounding Austin, Texas (all of Bastrop, Burnet, Blanco, Caldwell, Fayette, and Lee counties and the non-urbanized areas of Hays, Travis and Williamson counties) - approximately 7,500 square miles. CARTS also operates the Medicaid transportation program throughout these nine counties (including urbanized areas) as well as Llano County (subcontracted to Hill Country Transit).

Resources:

- **Fleet size:** 125 vehicles
- **Staff size:** 125 total, including 2 schedulers, 3 dispatchers, 6-7 reservationists
- **FY 2012 Operating Budget:** approx. $4.5 million

Service Summary:

- **Modes Operated:** demand-response, fixed-route, commuter and connector routes, and intercity interline service
- **Days and Hours of Service:** Varies by area and service. Curb-to-curb community transit ranges from 1 round vehicle trip 1 day per month from to all-day service Mon-Fri
- **General Public Cash Fare:** Zone-based -- $2 for trips wholly within a town or city, $4 for trips originating and ending within same county, and $6 for trips ending outside the county of origin
- **Passenger Trips/Year:** 415,000

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schedule adherence, and makes automated schedule adjustments based on the real-time conditions. This also allows CARTS to be more proactive in the planning process.

CARTS is now developing real-time customer information updates for its fixed-route customers, including web-based and mobile information, signage at facilities, and automated information by telephone.

Conditions that Prompted the Strategy:

Prior to implementation of MDCs, CARTS schedulers would print out driver manifests each evening for the next day's service and fax them out to remote operating bases. This was a significant effort, generated a great deal of paper waste, and rapidly consumed toner, ink cartridges, and fax machines. Then, any changes made to a driver's manifest during the day required contacting the driver by radio (if within radio coverage - which not all of CARTS service area had), requiring the driver to pull over and take the information manual over the radio, often resulting in delays to their schedule.

Results of the Strategy:

CARTS schedulers and dispatchers can assign trips to vehicles more efficiently and effectively, allowing CARTS to provide more rides without additional drivers and vehicles, particular in the more densely populated areas where demand is higher. Drivers can also focus on driving since their schedules are provided electronically, helping them stay on schedule and accommodate more riders.

Methods Used to Document Results:

- Basic operating statistics - passengers per hour and per mile, cost per passenger trip - indicate improvements in service efficiency and effectiveness.

Key Factors for Success:

- **Staff with the expertise and time to implement and maintain the technology, as well as to train other users** - CARTS uses a team concept of management and multiple individuals have responsibilities related to the technology. In addition to CARTS's IT Director, the Director of Office Productivity and Training as well as several senior staff in the call center are significantly involved in managing and maintaining the technology. Outsourcing technical support, and having to wait for the technician to show up, can be disastrous for a transit system if the technology goes down.

- **Putting the tools to use** - CARTS management noted that the technology is only useful if the transit system puts in it to use the tools to their full advantage. Again, this takes staff time and staff expertise.

- **Starting small and getting feedback** - When beginning the MDC implementation, CARTS first tested them on a small number of vehicles and convened a senior driver committee to give feedback and make recommendations.

- **Breaking projects into specific steps** - Implementing one thing at a time -

such as scheduling software, then MDCs, then GPS, rather than the everything at once makes the overall project much more manageable.

CHALLENGES:

- Communications infrastructure - If CARTS had been unable to tap into the LCRA's communications network, implementing MDCs would have been considerably more challenging given CARTS's 7,500 sq. mile service area and gaps in 2-way radio coverage. The current state of wireless and cellular infrastructure is a vast improvement over conditions ten years ago, so this challenge might not be as significant today.
- CARTS recommends going into the process knowing that not everything will work as promised and some things will take considerably longer than planned there will be delays.

IMPLEMENTATION GUIDE

RECOMMENDED FOR:

- Transit agencies with a large demand response operation, unless a very small operation

RECOMMENDED ELEMENTS FOR SUCCESS:

- Staff with the expertise and time to implement and maintain the technology, as well as to train other users
- Time investment to learn to use the tools
- Gradual implementation - break project into manageable pieces, start with a small pilot project and see how it works and affects other aspects of your operation
- Staff involvement - dispatchers and drivers - to test out and provide feedback before proceeding to next steps
- Anticipation of delays and hiccups

METHODS FOR DOCUMENTING RESULTS:

- Basic operating statistics - passengers per hour and per mile, cost per passenger trip - indicate improvements in service efficiency and effectiveness