# How To Overcome Daunting Challenges in Rural Transit with Computer-Aided Scheduling

*By Paul Sorensen*

When Cissy Morton became Mobility Manager for Utah's Tooele County in 2013, she faced the same daunting challenges as any rural government or small transit agency manager. Despite severe fiscal constraints, she and her team still were responsible for providing public transportation to their community, including service for the disability and aging populations.

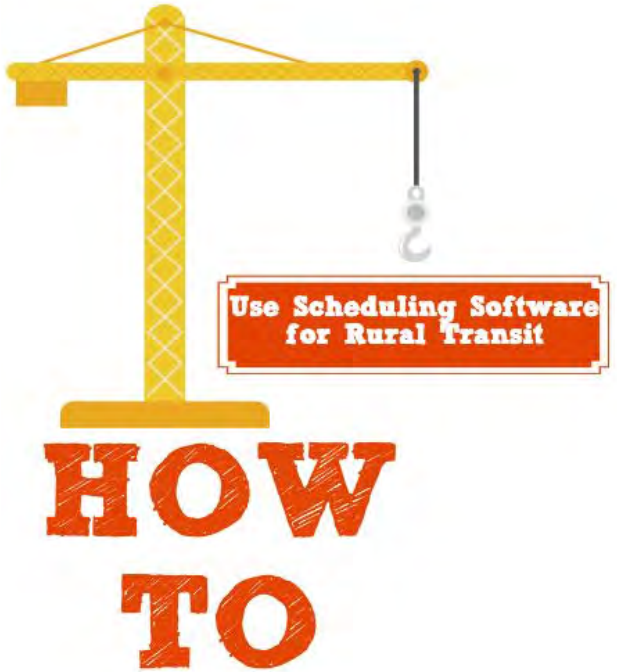
Conventional wisdom suggests that when an organization is lacking finance, the goal of efficiency becomes paramount. But, as Morton would discover, the county—short on funds for time-saving software tools—managed its transportation schedule manually through a series of spreadsheets. As each new week approached, county employees would start by copying the previous week's schedule and then make adjustments as needed. Any time they needed past scheduling information, employees had to manually search through retained copies of prior weekly schedule spreadsheets. On average, the spreadsheet system consumed about one person-week of labor each month to compile data for accountability reporting. This did not represent efficiency.

Luck would soon change for Morton and her team, thanks to a Tooele County grant from the Veterans Transportation and Community Living Initiative (VTCLI) for scheduling software, complemented by a budding partnership with the Utah Transit Authority (UTA).

### The Role of the UTA

As the largest provider of fixed-route, public transportation for Utah's Greater Salt Lake region, the UTA serves some 1.1 million residents—75 percent of the state's population—across multiple counties, with commuter rail, light rail, street cars, paratransit and over 500 van pools. It was no surprise, then, when two state transportation planning agencies asked the UTA to administrator federal funds for smaller agencies in the region to enhance transportation for the disabled and aging populations.

As grant administrator, the UTA also became regional coordinator of all specialized transportation services, many of which are provided by small government agencies and nonprofits. The goal was to increase the efficiency of these groups by leveraging UTA's resources, including marketing services, grant staff and the IT department.




"The agencies and nonprofits that serve people with disabilities and the aging population are striving to improve the quality of life for these individuals," said Ryan Taylor, UTA's Coordinated Mobility Manager. "It's important to the UTA to play its part in this big engine and help these providers serve their clients."

UTA, a technology champion, knew IT tools would greatly streamline the agencies' operations. But, despite national grants, transportation funding outside of mass

transit in Utah was severely limited. The state itself provides no dedicated funding for specialized transportation, and ridership fares are mostly voluntary.

Recognizing that the whole is greater than the sum of its parts, the UTA reached out to the smaller agencies and nonprofits for collaborative solutions to improving operations within the constraints of their tight budgets.

## Paratransit Challenges

Unlike fixed-route transportation, which operates on set routes and schedules, demand response type services involve provisions such as door-to-door transport for people with physical and cognitive disabilities, aging populations, veterans and others. In managing its operations, these providers must contend with varying arrival and return times, destinations, numbers of riders and requested amenities such as wheelchair lifts, on a daily basis. Behind the scenes, agencies need to track drivers' credentials, vehicle maintenance, trips completed and a host of other details for accountability reporting.

UTA's smaller transportation partners, lacking the funds for computerized scheduling systems, traditionally have managed their schedules with paper and pencil, index cards, spreadsheets or any combination thereof. Such manual systems are enormously labor-intensive, and they are prone to human error.

In addition, it is difficult to achieve a significant degree of operational efficiency when relying on manual scheduling systems. Demand response services are costly to provide, and manual trip planning can obscure an agency's view of how to most efficiently (and, in turn, most cost-effectively) schedule its vehicles and drivers. When agencies are unable to meet a client's requirements, they often use taxis as a fallback, adding to the expense. "We have a lot of resources in our community. If we maximized utilization of the resources we do have, we would not require as much funding," continued Taylor. "We need to efficiently use what we have as a community."

Tooele County's VTCLI grant for computer-aided scheduling would ultimately put a technology solution in the reach of all UTA's partners.

## Partnering for Computer-Aided Scheduling

Tooele County, which lies about 40 miles west of Salt Lake City, is in a rural environment with town centers located some 10 miles apart. Feeling the pain of its spreadsheet scheduling system, the county applied for and received a VTCLI grant for a computer-aided scheduling system. Tooele, however, faced two issues in executing the grant—it lacked matching funds, a VTCLI requirement, as well as the technical knowhow to procure the right system for its needs. For help, Tooele County turned to its regional planning coordinator, and UTA was happy to oblige.

To match Tooele's VTCLI funds, the UTA approached a state agency that obtains revenues via a driver's license renewal checkoff box. The funding request was approved with the proviso that the new computer-aided scheduling system be made available to other transportation providers, not just Tooele County. With all systems go, UTA then set out to identify the best computer-aided scheduling solution for its paratransit partners.

Expensive proprietary scheduling systems were ruled out early on. In addition to being cost-prohibitive, the functionality of these systems was overkill for the small agencies with modest fleets. UTA shifted its focus to the open source community for a viable alternative.

## Open Source Scheduling Tools

Prior to the Tooele County project, UTA already had been in touch with the IT department of RideConnection, an Oregon-based nonprofit paratransit provider. RideConnection had developed an open source scheduling tool called RidePilot. It was the open source nature of the platform that had sparked the UTA's interest—and with good reason.

Open source systems are not owned by

any individual or group and can be freely distributed and modified with no licensing fees whatsoever. By contrast, proprietary systems can carry hefty licensing fees on the order of six figures per year. With open source, an agency may still need to pay for maintenance and support, along with any desired enhancements. Any improvements to an open source platform funded by one agency, however, can be freely used by any other agency, thereby creating the opportunity for agencies to jointly benefit from their collective investments. "Using an open source platform," explained Taylor, "we could capitalize on the community-based efforts to solve the same problems we were experiencing with a low-cost solution."

With RidePilot as the starting block, UTA called together its partners, along with RideConnection's IT manager, to discuss how to modify the system to fit their needs. Once the group established the system's requirements, requests for proposals (RFPs) were issued for modifying and maintaining the system. UTA and Tooele County ultimately chose Cambridge Systematics, a transportation industry software provider known for developing and supporting open source systems, for the job. Cambridge Systematics met the project requirements and budget and was already a known quantity to UTA based on the agency's use of open source trip planning software developed and supported by the firm.

## UTA's Open Source Trip Discovery System

Prior to the RidePilot Project, UTA had received its own VTCLI grant for an online rider trip planning tool. The agency chose 1-Click, an open source system from Cambridge Systematics, and contracted with the provider to modify the software to its requirements. With the software now deployed, UTA riders can go to UtahRideLink.com to enter the particulars of a given trip, such as the date, destination, travel time and, as needed, paratransit eligibility information and required accommodations such as wheelchair access. The site matches a rider's information with all potentially applicable transportation options for the specified trip—including fixed-route transit, paratransit, taxi, ride hailing, driving, and even biking and walking options—and rates each option based on such factors as cost, travel time, wait time, and walking distance. Users who are eligible for paratransit can save their profiles for future use after their eligibility has been confirmed.

UTA also funded the development of a technology link between RidePilot and the trip planning tool. Once agencies are up and running on the RidePilot scheduling system, their customers can plan a trip via the UTA website, and when a traveler selects a paratransit service provided by an agency using RidePilot, the trip planning tool will connect directly with RidePilot to automatically initiate the scheduling process.

With the convenience of online trip planning for riders, connected with computer-aided scheduling for agencies, both groups will enjoy much smoother, more seamless transportation services.

## Tooele County Moves to RidePilot

As it was Tooele County's VTCLI grant that funded RidePilot, it was fitting that the county be the first beta tester as well. For easier deployment, UTA hosts the system on behalf of Tooele County and other partner agencies across the region.

With RidePilot, Tooele Country tracks riders, rider profile information, destinations, dates, travel times, and vehicles in the fleet along with vehicle maintenance records and mileage readings, drivers and their credentials, and more. When the county receives a trip request, employees enter all of the particulars into RidePilot. With all pertinent data well organized and clearly presented, they can then easily set up runs for the most efficient scheduling of resources.

For accountability reporting, Toole County and all other UTA partners can run their own reports, while the UTA can run aggregate reports for all providers in support of capital planning and cost justification. Report information, now systematically tracked within RidePilot's database rather than manually compiled from a series of spreadsheets, is much more accurate, and reports can be created instantaneously. Each

agency will correspondingly save untold person-hours of work in data-gathering, freeing up employees to work on more meaningful tasks.

Tooele County was more than ready for computer-aided scheduling. A few years back, the county's medical shuttle service transported just 10 clients to the Salt Lake City area every quarter. Today, it's more than a thousand. The growth of its ridership was due, in no small measure, to Morton's initiative in spreading the word about their services. At one point, Morton called a meeting of clients, volunteer drivers and a local journalist so that "everyone had a chance to tell their story" to the press. The resulting media article tripled ridership.

"In the beginning, all of our dispatch was done by hand or spreadsheets," said Morton. "Now we use RidePilot for all pickups and drop-offs and all driver and trip scheduling. If we were still doing this manually, we wouldn't be able to keep up. RidePilot has made our lives so much nicer and easier."

Morton's team now also uses the tool for accountability reporting. "In our manual system, it took 40 hours every month to go through our information for reporting. I had multiple employees manually tracking ridership for each of our programs," added Morton. "With RidePilot, we can enter all of our programs into one database but track each one individually. It has saved us a lot of hours, made reporting much more accurate and cleaned up the mess in our office. We look more professional, too—not like some hick town. It's a godsend."

## An Inspiration to Other Agencies

As other UTA partners come online with its open source scheduling tool, the agency has strengthened its mission to inspire smaller paratransit agencies across the U.S. to replicate its model: partnering for greater funding clout and shared used of open source technology. Free for ongoing use without licensing fees, open source puts technology firmly within any agency's reach. To emphasize the point, Taylor explained that agencies are entitled to use the UTA's scheduling software code base now

**Seasons of Transit Tours Past**

Our favorite time of the year is our annual road trip and the staff of *DigitalCT* (and *Community Transportation* before it) have been hitting the road each year since 1999, visiting transit providers across a given state. Here's where we've been before (click the link to view):

2015: Oregon
2014: Georgia | 2013: Minnesota | 2012: New Mexico
2011: West Virginia | 2010: California | 2008: Connecticut
2007: New York | 2006: Florida | 2004: Vermont
2003: Mississippi | 2002: Iowa | 2001: Pennsylvania
2000: Texas | 1999: South Dakota & Indiana

at no charge. To modify and maintain the code for their own use, the agencies will still need trained IT personnel or paid contractors, but will enjoy unrestricted use of the software. Additionally, as agencies make modifications, a community of users will form, each entitled to and benefiting from the other's investment in system enhancements for free.

Working as a team and availing themselves of low-cost open source tools, smaller paratransit agencies will be freed up to raise the quality of life for their disability and aging populations. As one Tooele County resident explained, he had not been away from home for three years, or conversed with anyone other than his dog, until he began using the county's medical shuttle service. It's stories like these that keep UTA and its partners going. **CT**

*About the Author:*

*Paul Sorensen is senior software project manager for Cambridge Systematics, a leader in the development of innovative policy and planning solutions, objective analysis and technology applications. For further information, please call (617) 234-0412 or go to www.camsys.com.*