



THE LAST MILE:

CONNECTING WORKERS TO PLACES
OF EMPLOYMENT



PUBLIC POLICY FORUM

ABOUT THE PUBLIC POLICY FORUM

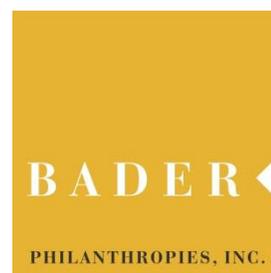
The Milwaukee-based Public Policy Forum, established in 1913 as a local government watchdog, is a nonpartisan, nonprofit organization dedicated to enhancing the effectiveness of government and the development of Southeastern Wisconsin through objective research of regional public policy issues.

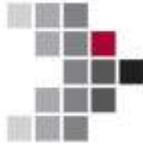
PREFACE AND ACKNOWLEDGMENTS

This report was undertaken to provide citizens, policymakers, and business leaders with information about potential strategies for improving transportation connections for the regional workforce to places of employment throughout the Milwaukee metropolitan area. We hope that policymakers and community leaders will use the report's findings to inform discussions during upcoming policy debates, budget deliberations, and civic gatherings regarding public transportation services and strategies in our region.

Report authors would like to thank the leadership and staff of the Milwaukee County Transit System, Ozaukee County Transit Services, Waukesha Metro Transit, and the many other organizations in the Milwaukee area and throughout the country that provided us with information and insight. Those organizations include BublR Bike Share; City of Centennial, CO; Denver Regional Transportation District; Denver South Transportation Management Association; Innova EV; Kansas City Area Transportation Authority; Menomonee Valley Partners; Milwaukee Careers Cooperative; Pinellas Suncoast Transit Authority; Potomac and Rappahannock Transportation Commission; Salem-Keizer Transit; Shared Use Mobility Center; Southeastern Wisconsin Regional Planning Commission (SEWRPC); and SouthWest Transit.

Finally, we wish to thank *MetroGO!* for commissioning this report, with support from Bader Philanthropies, Waukesha County, Menomonee Valley Business Improvement District, Commercial Association of REALTORS® WI, and the Greater Milwaukee Foundation. We also thank Bader Philanthropies for its general financial support of our workforce development research.





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INTRODUCTION

In 2013, the Public Policy Forum published *Getting to Work*, a report that explored efforts to connect Milwaukee County residents with major job locations in the region via public transit.¹ The report identified several common barriers, including one known as the “last mile” problem, which can arise when transit services allow individuals to get relatively close – but not all the way – to their job sites. This challenge is particularly common in suburban areas, where jobs are more dispersed and difficult for the Milwaukee County Transit System (MCTS) and suburban transit systems to serve efficiently, but it also can arise in some parts of the city that are difficult to reach by transit.

The last mile problem has generated considerable discussion recently among local elected officials and civic leaders who comprise the leadership of MetroGO!, a regional nonprofit organization dedicated to improving transportation connections between workers and employers in the Milwaukee metropolitan area. Those conversations led MetroGO! to commission this study.

Milwaukee is far from alone in trying to address the last mile problem. Metro areas throughout the U.S. are grappling with a range of related challenges that limit regional mobility and are experimenting with a variety of solutions. The Salt Lake City and Los Angeles metro areas, for example, have developed comprehensive studies that evaluate possible strategies for addressing both first mile and last mile problems in their regions.²³ (First mile problems exist in areas where the nearest transit stop is not within walking distance of an individual’s home.) Even metro areas with robust transit systems, like Boston, are struggling to find solutions.⁴

This report analyzes options for improving last mile transportation connections for the regional workforce in metro Milwaukee, with a particular focus on reducing transportation barriers for City of Milwaukee residents seeking employment opportunities throughout the region. Primary research questions include the following:

- *What last mile services currently are available or have been tried in the past in the Milwaukee area and what are their strengths, limitations, and future potential?*
- *What additional last mile strategies are other metro areas using that could be considered for adaptation and implementation in metro Milwaukee?*
- *How are last mile services that may be relevant to metro Milwaukee typically designed, what are their benefits and costs, and how are they being financed?*

¹ Public Policy Forum. “Getting to Work: Opportunities and obstacles to improving transit service to suburban Milwaukee job hubs.” December 2013. <http://publicpolicyforum.org/sites/default/files/GettingToWork.pdf>

² Southern California Association of Governments. “Maximizing Mobility in Los Angeles – First & Last Mile Strategies.” December 2009. <http://libraryarchives.metro.net/DPGTL/harvested/ocm643392063.pdf>

³ Utah Transit Authority. April 2015. https://www.rideuta.com/-/media/Files/Studies-Reports/UTAFirst_LastMileFINALCOMP1.ashx

⁴ Sweeney, Emily. “Making it that ‘final mile’ to work in suburbia.” *Boston Globe*. January 29, 2016. <https://www.bostonglobe.com/metro/regionals/west/2016/01/29/making-that-final-mile-work-suburbia/6FsC7Rcz63dgZ2nGfqaDNL/story.html>



Despite the fact that the last mile problem is ubiquitous across the country, the national research on potential solutions is relatively thin. In addition, transit systems are experimenting with a range of new partnerships with private, technology-based services (e.g. Bridj, Lyft, and Uber), but those partnerships are new and there is no comprehensive understanding yet regarding their costs and benefits. Consequently, we rely heavily on case studies in this report for insights regarding the potential pros and cons of the strategies considered. Conversations with transit system officials in other cities complemented our research.

A key conclusion from our analysis is that there is no silver bullet to solve last mile challenges. Rather, different solutions may be effective in different contexts. Often, a combination of multiple solutions is the best strategy for improving transportation access in a given area.

In addition, transit systems cannot be expected to solve all of metro Milwaukee's distinct last mile challenges on their own. Previous land use decisions have made it difficult – and in some cases impossible – for transit systems to effectively serve many employer locations, particularly given budget realities. Furthermore, the desire to improve transportation access to employers is just one of many worthy objectives that must be considered in designing an optimal regional transit system; demand for non-employment travel also must be considered, along with issues of cost, travel time, and other factors.

Nevertheless, it is our hope that the strategies explored in this report will provide viable possibilities for regional transit system leaders, policymakers, and businesses to consider as they seek to improve workforce mobility in the Milwaukee metropolitan area.



BACKGROUND

While most of the locations in the Milwaukee metropolitan area with strong job concentrations are served by public transit to some degree, some are completely disconnected from the transit system. **Figure 1** (on the following page) overlays a regional job density map with current transit services offered by the Milwaukee County Transit System (MCTS) and Waukesha Metro Transit. Each square on the map covers a ½ mile by ½ mile area and is shaded based on the concentration of jobs located within it. Black squares are the most job rich, containing at least 1,000 jobs each.

Figure 1 shows the extent to which transit services are fairly robust within the City of Milwaukee, but are less available in the surrounding suburbs. The local bus services provided by MCTS and Waukesha Metro Transit currently meet only in one location: Brookfield Square. MCTS does provide limited services into Waukesha, Ozaukee, and Washington counties through cost-sharing agreements with those counties. Waukesha County also provides bidirectional service on several commuter bus routes (not shown on the map) that Milwaukee residents can access in downtown Milwaukee and at the intersection of 35th St. and Wisconsin Ave.

Since ¼ mile is typically considered a walkable distance, the squares on the map that are not traversed by at least one transit line are the least accessible. Job hubs in Cedarburg, Mequon, Germantown, Pewaukee, and Muskego all fall into this category.



Transit riders can only transfer between MCTS and Waukesha Metro bus lines in a few locations, including Brookfield Square pictured here.

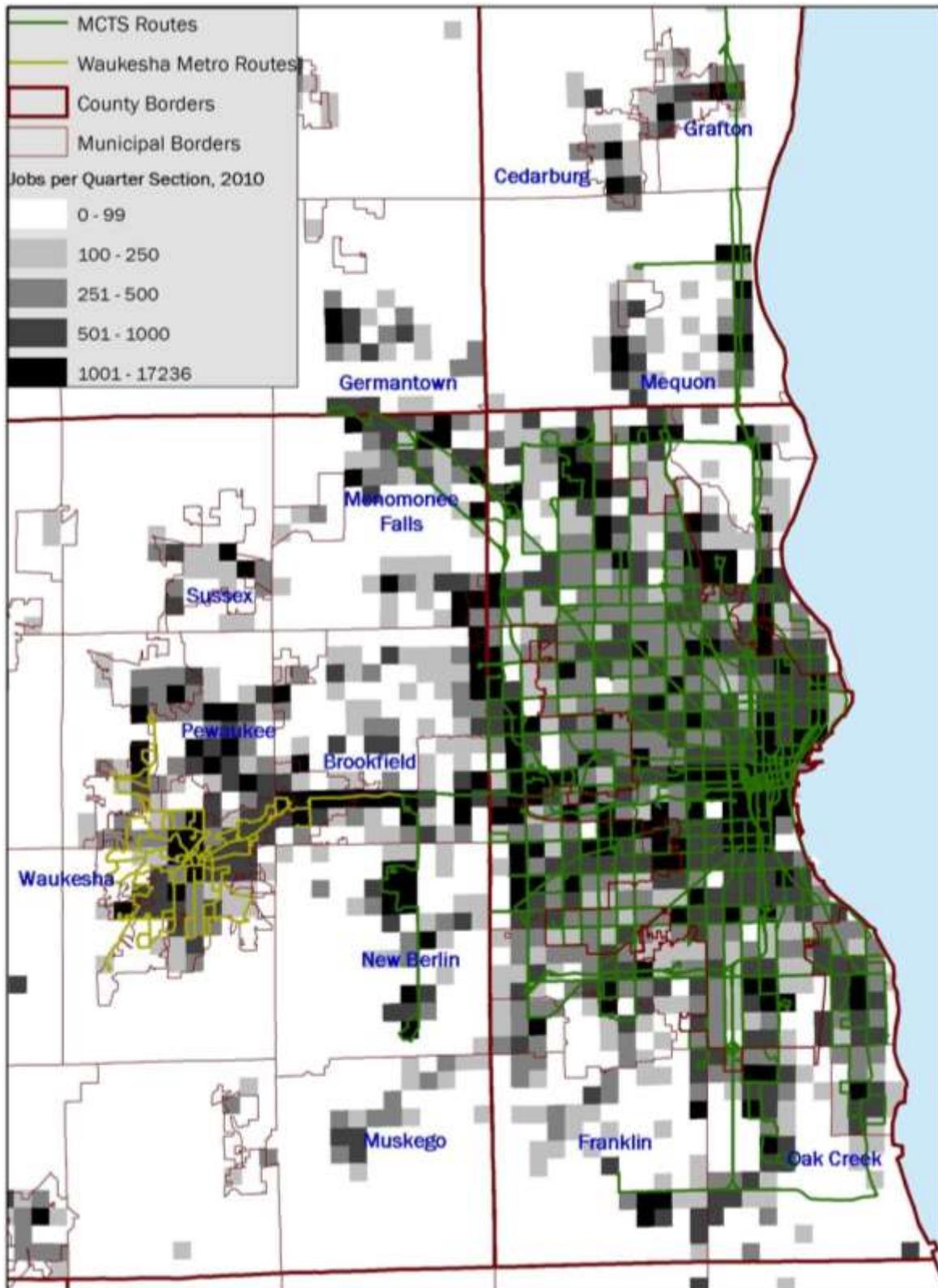
It is critical to note that **many additional places that are served by at least one transit line only are accessible by transit at limited times of the day and week**, which can make them ineffective transportation options for workers. For example, the City of Franklin contains an area with a strong concentration of jobs (the Franklin Industrial Park), which appears to be accessible by transit on the map. The bus route that serves that area, however, only operates on Saturday mornings to bring people to and from the Milwaukee County House of Correction, which is located nearby.

Poor transit access to jobs in the Milwaukee area is a problem that grew significantly between 2001 and 2014. A recent study by the UWM Center for Economic Development found that cuts made to the transit system because of budget challenges resulted in a *minimum* of 20,018 fewer jobs being within ¼ mile of a public transit route in 2014 than would have been accessible via the transit system that was in place in 2001.⁵ MCTS has been able to avoid further service cuts for the past several years, but the system remains significantly less robust than it was in the past.

⁵ Rast, Joel. "Public Transit and Access to Jobs in the Milwaukee Metropolitan Area, 2001-2014." UWM Center for Economic Development. January 2015. https://www4.uwm.edu/ced/publications/Transit2015_FINAL-1.pdf



Figure 1: Current transit services (2016) and job density (2010)⁶

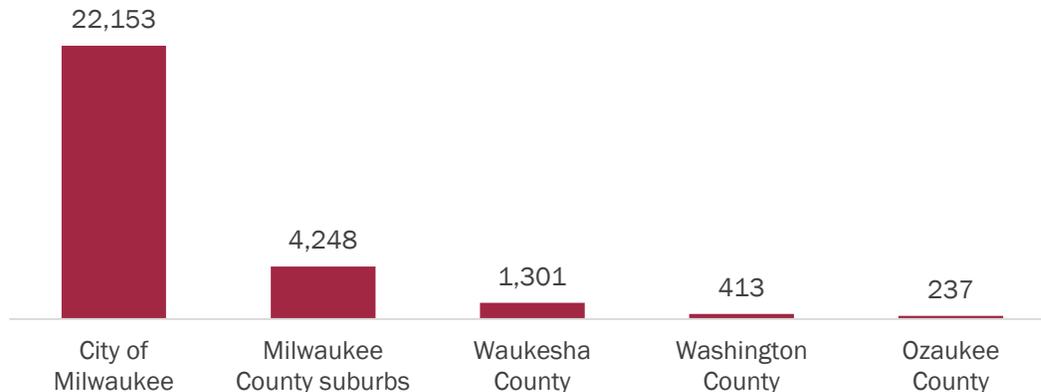


⁶ Job density data provided by SEWRPC. Data are from 2010 because they are only collected every ten years.



Unsurprisingly, transit usage is much more concentrated in the City of Milwaukee than in the suburbs, likely because of both the city’s greater availability of transit services and its higher number of transit-dependent residents. Among those who are employed, public transit is the primary means of transportation to work for more than 22,000 Milwaukee residents, while the same is true only for about 6,000 residents among all of the suburbs combined, as shown in **Chart 1**.⁷ Census data also show that roughly 55,000 Milwaukee County households have no vehicle, including 43,000 in the City of Milwaukee.⁸

Chart 1: Residents whose primary means of transportation to work is public transit, 2015



Unemployment also continues to be more concentrated in the city versus the suburbs. As of September 2016, the official unemployment rate (which only includes individuals who are actively looking for work) was 5.3% in the City of Milwaukee, compared with between 3.0 and 3.2% in each of the WOW counties (Waukesha, Ozaukee, and Washington).⁹

Looking to the future, state and regional projections suggest that nearly half of the net new jobs that will become available in the four-county Milwaukee metro area in the coming years will be located in the WOW counties, where transit services are limited. The Wisconsin Department of Administration (DOA) projects that the WOW counties will add 27,573 net new jobs between 2014 and 2024, while Milwaukee County will add 31,086 net new jobs during the same period.¹⁰

Meanwhile, the working age population is expected to remain relatively flat throughout the entire four-county Milwaukee metro area. According to state projections, the working age population (ages 15-64) will increase in the metro area by fewer than 1,000 between 2015 and 2025.¹¹ Milwaukee County is projected to have a working age population of 632,000 in 2015, while WOW counties will have a projected working-age population of 409,000. Filling all of the replacement job openings and new jobs that are expected in the coming years likely will require employing as many people as

⁷ U.S. Census Bureau. American Community Survey 2015 5-year estimates. Includes employed individuals ages 16 years and older.

⁸ U.S. Census Bureau. “Selected Housing Characteristics.” American Community Survey 2015 5-year estimates.

⁹ Bureau of Labor Statistics. Local Area Unemployment Statistics. <http://www.bls.gov/data>

¹⁰ Wisconsin Department of Workforce Development. November 2016.

<http://worknet.wisconsin.gov/worknet/downloads.aspx?menuselection=da&pgm=occprj>

¹¹ Wisconsin Department of Administration. Population and Household Projections. Produced in 2013 based from 2010 Census. <http://doa.wi.gov/divisions/intergovernmental-relations/demographic-services-center/projections>



possible from within the region *and* attracting more people to the Milwaukee metro area from outside of the region.

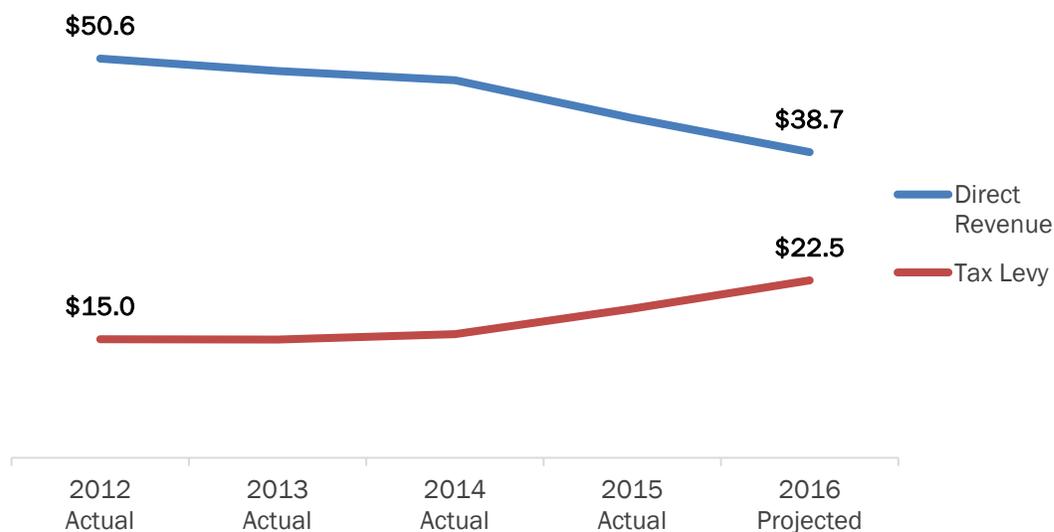
To the extent that the qualifications of Milwaukee jobseekers align with the current and future needs of employers in both the city and the suburbs, improved transportation options may be needed. New or modified public transit services could be one component of that, but as we pointed out in our 2013 report, *Getting to Work*, fixed-route bus services only can efficiently serve areas with a mix of land uses (commercial, residential, industrial, etc.) and with medium-to-high development density, because those characteristics generate demand for transit services throughout the day and week. In locations and at times when demand for transportation exists but is not sufficient to sustain a fixed bus route, last mile services may be needed.

MCTS FINANCES: A BRIEF SUMMARY

Financial challenges have made it difficult for MCTS to maintain existing service levels for many years, let alone add new services. We first reported on the severity of MCTS' budget challenges in our 2008 report, *Milwaukee County's Transit Crisis: How did we get here and what do we do now?*¹² The overriding problem we revealed – which still exists today – is that MCTS' revenue streams do not have nearly the capacity required to cover its annual growth in fixed costs and its bus replacement needs.

On the operating side of MCTS' budget, direct revenue (from fare payments and smaller sources such as advertising) has declined over the past several years, which the County has countered by increasing the amount of property tax levy allocated to the transit system (**Chart 2**). Direct revenue was expected to be almost \$12 million lower in 2016 than in 2012 (a 24% decline), while the annual amount of property tax levy going to transit increased by \$7.5 million during the same period.¹³

Chart 2: MCTS direct revenue vs. tax levy



¹² Public Policy Forum. "Milwaukee County's Transit Crisis: How did we get here and what do we do now?" May 2008. <http://publicpolicyforum.org/research/milwaukee-countys-transit-crisis-how-did-we-get-here-and-what-do-we-do-now>

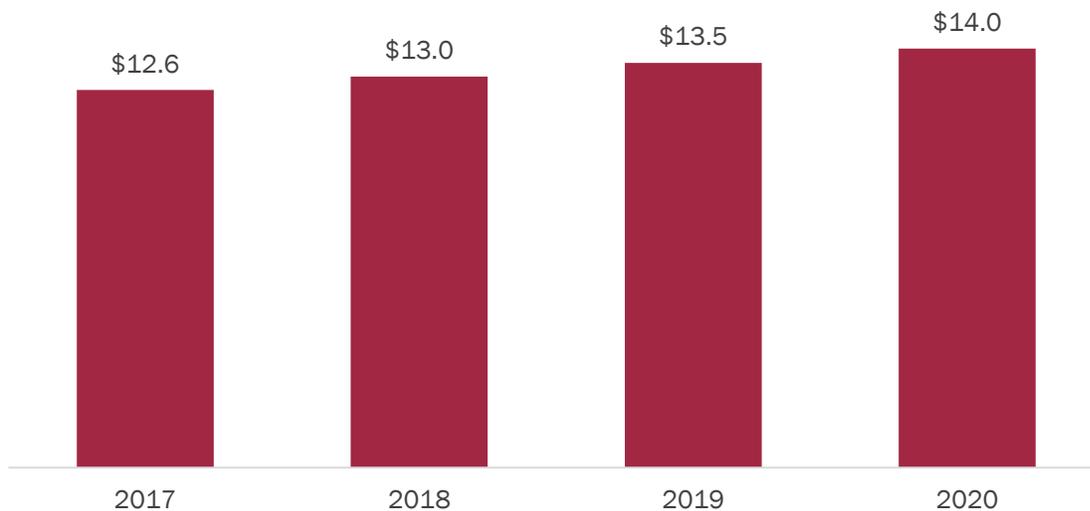
¹³ Milwaukee County budget documents.



A significant portion of the decrease in direct revenue stems from Milwaukee County's introduction of the Go Pass in 2015, which is a free bus pass for seniors and people with disabilities. County officials estimate that between 20% and 25% of all MCTS rides now are provided for free. The other major cause of the decline is decreased overall transit ridership; MCTS provided 40 million total rides in 2014 compared with 62.4 million in 2000, a decrease of approximately 36%.¹⁴

On the capital side of the budget, MCTS' bus replacements needs will pose a major financial challenge in the coming years. We recently projected that Milwaukee County would need \$12-14 million per year in locally-supported borrowing from 2017-2020 to maintain a healthy bus replacement schedule, as shown in **Chart 3**.¹⁵ That would represent nearly a third of the amount allowed annually under the County's annual borrowing cap for all County functions.¹⁶ The Governor's proposed 2017-19 State budget includes a proposal to provide Milwaukee County with a \$6.5 million grant and \$19.5 million interest-free loan to replace buses as a result of a settlement with Volkswagen. If adopted, this will provide temporary relief, but the underlying problem is likely to return when those funds run out barring a new infusion of State or federal funds.

Chart 3: Projected local capital spending for Milwaukee County buses, 2017-2020 (in millions)



Milwaukee County's recent introduction of a \$30 vehicle registration fee also will provide some relief to MCTS' budget, but not enough to make up for the continued increases in expenditures that are projected. According to a recent report by the Milwaukee County Comptroller, MCTS' operating revenue is projected to remain relatively flat over the next five years (**Chart 4**). Consequently, maintaining existing service levels likely will require Milwaukee County to continue to increase the amount of tax levy going to transit. The Comptroller projects the amount of tax levy needed for transit will triple between 2017 and 2021, to \$37.4 million.

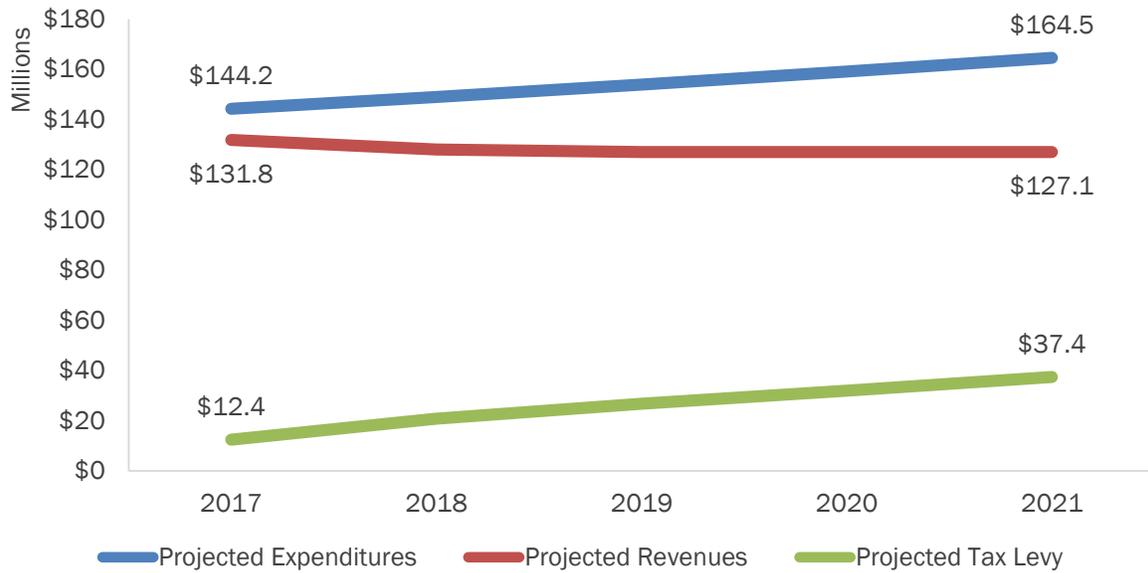
¹⁴ 2014 MCTS Annual Ridership Statistics Book

¹⁵ These projections are based on an expectation that Milwaukee County will receive an additional \$2.3 million annually in federal funding for bus replacements.

¹⁶ Milwaukee County Department of Transportation



Chart 4: Projected tax levy to support MCTS operations (in millions)¹⁷



In considering the expansion of existing transit services or introduction of new last mile strategies, it is important to understand the financial constraints that MCTS is facing. On the other hand, stemming MCTS' ongoing loss in overall ridership may require transit system enhancements that attract new riders.

¹⁷ Milwaukee County Comptroller. "2017 Recommended Budget – Vehicle Registration Fee and Milwaukee County Transit System." October 2016.



LAST MILE STRATEGIES - PRESENT & PAST

A variety of transportation options currently are available in portions of the Milwaukee metropolitan area that help individuals to complete trips to jobs and other destinations. Other services have been tried in the past but discontinued. In this section, we review past efforts to shed light on why some of them were unsuccessful, and we provide an overview of transportation options currently available and their prospects for future expansion.

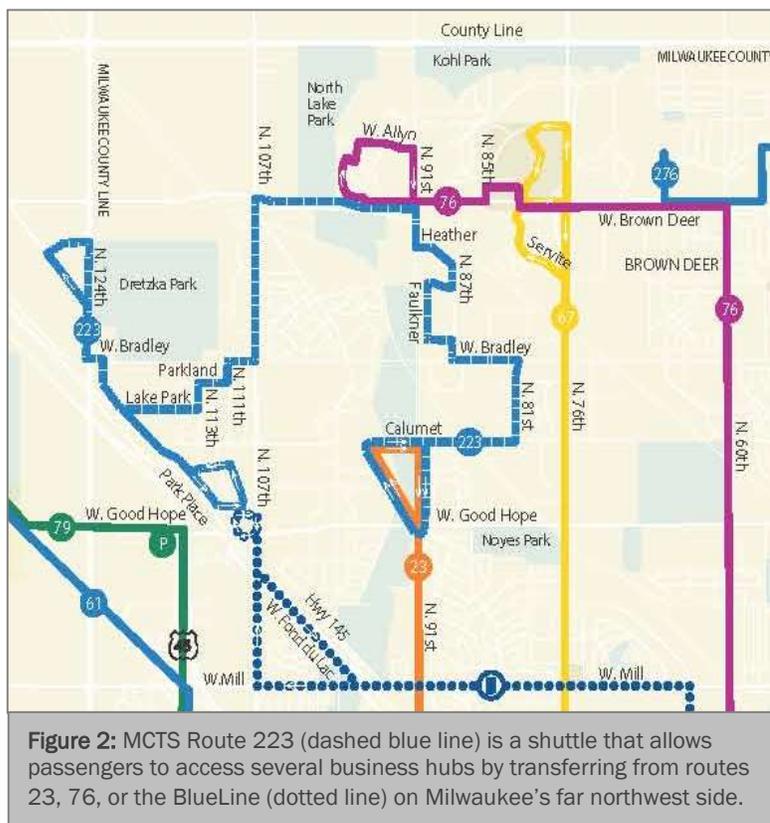
SHUTTLE ROUTES

MCTS shuttle routes use standard, 40-foot buses to provide relatively short extensions to areas that otherwise are not served. In most cases, passengers must transfer between a regular bus route and a shuttle route to reach their destination. Typically, the areas served by shuttles are employment hubs, such as business or industrial parks, where demand exists at certain times of the day and week but is not sufficient to sustain a regular bus route. For example, Route 223 operates on Milwaukee's northwest side and extends into Menomonee Falls, as shown in **Figure 2**.

Currently, MCTS operates three shuttle routes that serve business parks in Brown Deer, Menomonee Falls, Milwaukee, and Oak Creek.

The shuttles are designed to match shift change times, with service availability dropping off significantly at other times of the day.

While they fill a unique niche, MCTS' shuttle routes generate relatively low ridership levels. The productivity and efficiency of bus routes is measured by the number of passengers the routes generate for each hour a bus is in service (passengers per bus hour, or PBH). While the MCTS system overall averages more than 26 PBH, the three shuttle routes are in the 5-7 PBH range, as shown in **Table 1**. In fact, the three shuttles are among the five routes with the lowest average ridership among MCTS' 60-route system, as shown in **Table 2**. The other two least productive routes in the system are



specialized routes as well. For the system as a whole, MCTS' average cost is less than \$4 per passenger, but it is in the \$14-20 per passenger range for MCTS shuttle routes.¹⁸

Table 1: Ridership on MCTS bus routes designed for reverse commuters¹⁹

| Route Number | Route Name | Passengers per Bus Hour (Sept 2015) |
|--------------|------------------------------------|-------------------------------------|
| 219 | Oak Creek Shuttle | 5.3 |
| 223 | Park Place - Bradley Woods Shuttle | 7.1 |
| 276 | Brown Deer Shuttle | 6.4 |
| | MCTS System Average | 26.3 |

Table 2: MCTS' five least productive routes, fall 2015²⁰

| Route | Average Weekday Ridership | Average Passengers per Bus Hour | Route Description |
|-------|---------------------------|---------------------------------|--|
| 219 | 24 | 5.3 | Oak Creek Shuttle |
| 42U | 166 | 5.8 | UBUS route serving MATC's Downtown and North campuses, Concordia University, and Cardinal Stritch University |
| 276 | 107 | 6.4 | Brown Deer Shuttle |
| 137 | 31 | 7.1 | House of Correction – Saturday mornings only |
| 223 | 92 | 7.1 | Park Place - Bradley Woods Shuttle |

In addition to the three shuttle routes currently in operation, MCTS has operated several other shuttle routes in the past that were discontinued due to low ridership and budget constraints. Those routes include:

- MCTS Route 121, which connected Southridge Mall in Greendale – where multiple bus routes ended – with the Franklin Industrial Park. This route operated from 1993 to 1994.
- MCTS Route 227, which served both the Franklin Industrial Park and the South Branch Industrial Park in Oak Creek from 1997 to 2003.
- MCTS routes 101-106 and 280 are additional discontinued shuttle routes that previously served Brown Deer, Menomonee Falls, Milwaukee's northwest side, Oak Creek, and South Milwaukee.

MCTS also has experimented with using slightly smaller (30-foot) buses for shuttle routes but found that the cost savings garnered were minimal. While the vehicles were marginally less expensive to

¹⁸ Milwaukee County. Department of Transportation Budget. 2016. <http://county.milwaukee.gov/ImageLibrary/Groups/cntyDAS/PSB/Budgets/2016-Budget/2015-Recommended-Budget/5600-DOTTransit.pdf>

¹⁹ Late in the process of producing this report, we received MCTS ridership data from fall 2016. We use data from fall 2015 throughout this report as it was the latest data we had as we were conducting our research.

²⁰ Data provided by MCTS.



purchase and more fuel efficient than 40-foot buses, expenses remained the same for drivers and vehicle maintenance.

Shuttle routes operated with MCTS or Waukesha Metro Transit buses are unlikely to be expanded in the future to serve more areas due to the relatively low ridership they have generated to date. In fact, if MCTS finances require additional service cuts in the coming years, the elimination of MCTS' existing shuttle routes may be considered.

SHARED-RIDE TAXI SERVICES

Ozaukee and Washington Counties currently offer shared-ride taxi services, which provide point-to-point transportation to the general public within designated areas.²¹ While the services provide rides for any purpose, many are employment-related. In fact, employment was the most common purpose of rides provided by Ozaukee County's shared-ride taxi service in 2015, accounting for 41% of all trips.²² Fare amounts typically are based on ranges of miles travelled and differ for seniors, adults, and students. Ozaukee County offers a "subscription" option for regular users, and many subscribers use the service for daily transportation to their jobs.



Ozaukee County's shared-ride taxi program provides point-to-point transportation for the general public.

Ozaukee County operates a fleet of six hybrid sedans, 14 ADA-accessible mini-buses, and five vans (including two that are ADA-accessible) for its shared-ride taxi service.²³ All vehicles are equipped with tablet computers and routing/mapping technology that finds the most efficient route for the driver based on the trips that have been scheduled. The service is available from 5am to 10pm on weekdays and more limited hours on weekends.²⁴ Ozaukee County recommends booking rides at least 24 hours in advance, but same-day requests are slotted by dispatchers as schedules allow.

The demand for Ozaukee County's shared-ride taxi service has been growing steadily since 2010, as shown in **Chart 5**. Well over 100,000 trips now are provided each year. In 2015, the service averaged just over two trips for every hour a vehicle was in service.

In 2015, 108,513 trips were provided by Ozaukee County's shared-ride taxi service at a total cost of roughly \$1.76 million, or \$16.24 per trip. Of that, \$501,183 was provided by fares paid by individuals or social service agencies, reducing the County's total cost to \$1.26 million (\$11.62 per trip).²⁵ In addition to fare box revenue, Ozaukee County received approximately \$913,000 in State

²¹ Point-to-point transportation services pick people up wherever they are and bring them directly to their destination.

²² All ridership and cost data in this section was provided by Ozaukee County officials.

²³ By providing accessible options, the shared-ride taxi service meets the FTA's requirement that equivalent transit service must be provided for individuals with disabilities.

²⁴ Ozaukee County Transit Services. <http://www.ozaukeetransit.com/shared-ride-taxi>

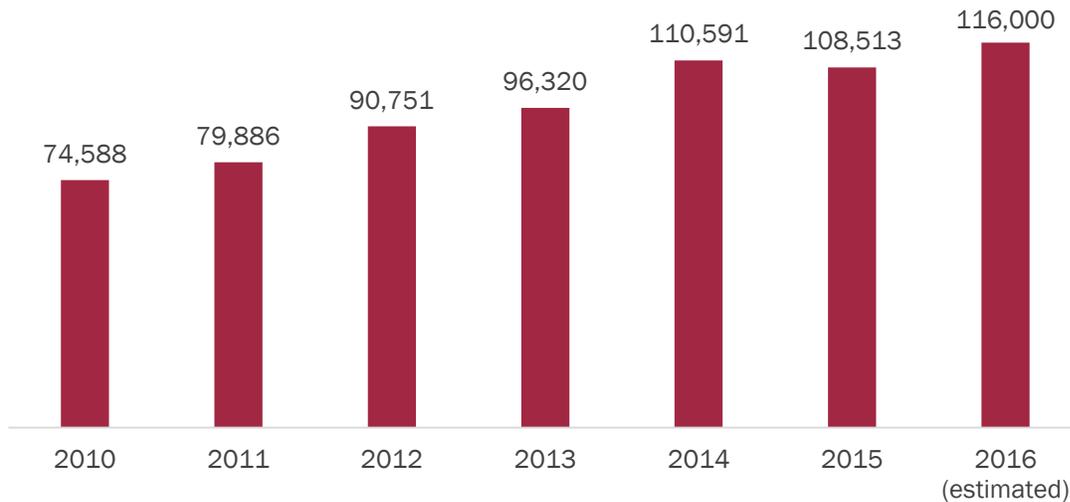
²⁵ An additional \$5,000 was collected in fines charged to individuals who requested the service and did not show up at the designated time and location, which also contributed to the reduced total cost for the County.



aid and \$98,000 in federal aid to support the shared-ride taxi service in 2015, and contributed \$364,000 in County property taxes.

Users are charged a fee based on the service's zone system. According to Ozaukee County officials, the average fare paid by riders in 2015 was approximately \$3.19.²⁶

Chart 5: Annual rides provided by Ozaukee County's shared-ride taxi service



In 2016, for the first time, Ozaukee County expanded its service area into Milwaukee County to improve connections to MCTS bus routes. Three bus stops, which together are served by six different bus routes that end near the Milwaukee/Ozaukee county border (12, 42U, 49, 49U, 63, and 276), now are included in Ozaukee County's service area, allowing passengers to "transfer" between the two services to complete their trips (**Figure 3**). Marketing efforts are underway to inform residents of both counties of the service expansion.

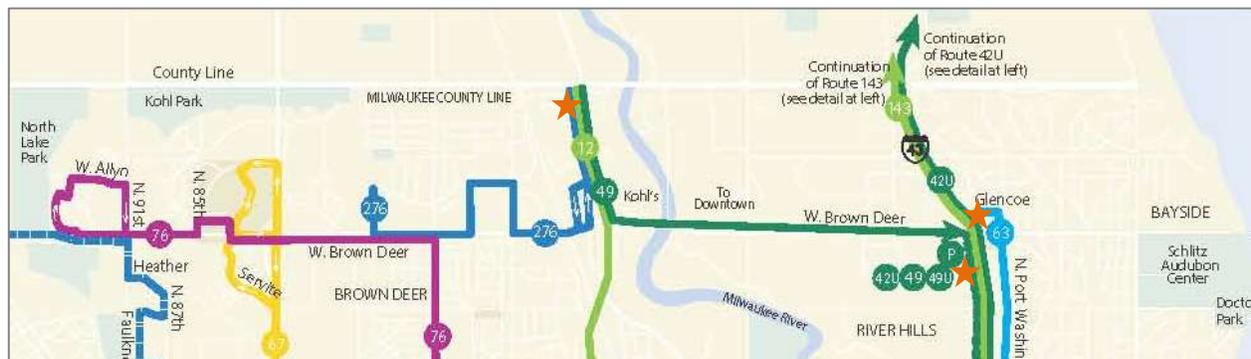


Figure 3: Ozaukee County's shared-ride taxi service now serves three bus stops in Milwaukee County where MCTS bus routes terminate near the Milwaukee/Ozaukee county border. Those stops are indicated above with orange stars.

²⁶ This is the average cost paid by riders for single rides or punch cards and does not include those paid by social service agencies.



Whereas previously Ozaukee County's shared-ride taxi service was viewed primarily as a social service, its potential as an employment/economic development tool is starting to be recognized by local leaders, according to Ozaukee County officials. A recent County survey of area businesses, for example, found that many employers believe they could fill open positions if transportation services improved within Ozaukee County and between Ozaukee County and Milwaukee County.

Riders currently access a diverse group of Ozaukee County employers via the shared-ride taxi service. Those most commonly accessed include Concordia University, Guy and O'Neill (a manufacturer), McDonalds, Portal (an employment service for people with developmental disabilities), and Walmart.

One potential limitation of the shared-ride taxi service as an employment transportation solution is that its pickup times are somewhat flexible. If a delay is caused by weather, traffic, or other factors, a person could be picked up as much as 30 minutes after the estimated pickup time without the service being considered "late." That rarely occurs, however, according to Ozaukee County. Dispatchers schedule rides to ensure that the person will get to work on time, and in the case of a delay, the dispatcher will call an employer to let them know that their employee's late arrival is the fault of the taxi service, rather than the employee.

Looking to the future, Ozaukee County is planning to begin to allow businesses to purchase rides for their service at a flat rate, which they can provide to their employees at cost, at a discounted rate, or as a cost-free benefit. The County also is planning to develop a mobile application for its service in 2017 that will allow users to schedule, pay for, and cancel rides; request ADA-accessible options; and track when their vehicle will arrive in real time with their mobile devices.

If the recent expansion of the shared-ride taxi service to cover MCTS bus stops proves effective, a further expansion could be considered to link additional bus routes that end near the Milwaukee/Ozaukee county border. Those may include routes 67 and 76, which end near Brown Deer Road.

BIKES ON BUSES

Biking can be another effective way to get to and from work from the nearest transit stop. Bicycle infrastructure is slowly improving in the Milwaukee area and Census data show that the percentage of Milwaukee County residents who commute to work by bike has increased to almost 1% (roughly 3,500 daily commuters).²⁷

Since 2009, all MCTS buses have been equipped with bicycle racks, which allow up to two users at a time to combine busing and



Over 150,000 passengers boarded an MCTS bus with their bike in each of the last two years.

²⁷ U.S. Census Bureau. "Commuting Characteristics by Sex." American Community Survey 5-year estimates 2015.



biking to complete their trips.²⁸ MCTS reported that 159,381 passengers boarded an MCTS bus with their bike in 2015, which works out to an average of 3,065 per week.²⁹ Waukesha Metro buses do not have bike racks, but individuals are allowed to bring bicycles on buses provided there is available space.

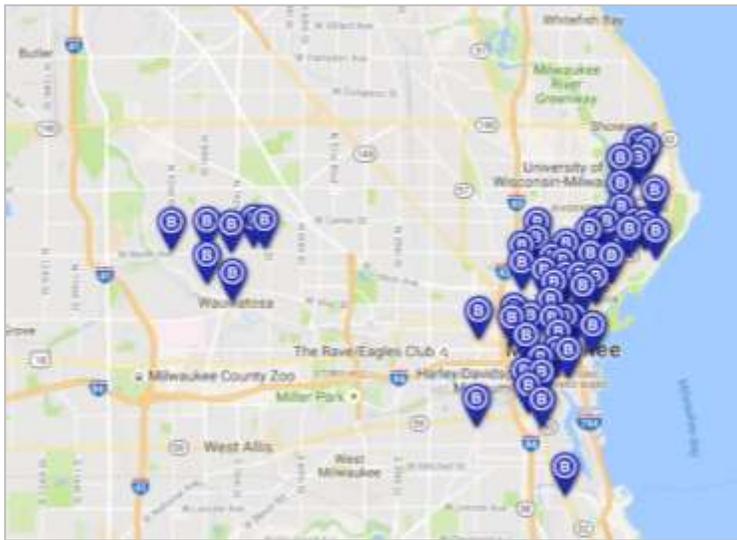
Of course, biking has limitations as a last mile solution. Fewer people ride bikes in winter months, on rainy days, and on hot and humid days. In addition to weather-related challenges, safety concerns limit the number of people who currently ride bikes in many locations. Nevertheless, biking is an option that is growing in popularity and one that can be combined with other strategies to improve overall mobility.

Increasing the number of people who use biking to complement transit will require both infrastructure improvements and public education. With regard to infrastructure, the Southeastern Wisconsin Regional Planning Commission's VISION 2050 plan calls for more than tripling the number of miles of on- and off-street bicycle facilities and paths throughout the region – from 1,186 total miles in 2015 to 4,099 miles in 2050³⁰ – which, if implemented, could facilitate a significant increase in bicycle commuting.

BIKE SHARING

Milwaukee's nonprofit BublR bike share system represents another option for last mile connections. Introduced in 2013, BublR greatly expanded in 2015 and 2016 to a current network of 57 stations (Figure 4), with an additional 15 stations planned for 2017. BublR's current number of stations places it among the 20 largest bike share systems in the U.S.³¹

Figure 4: BublR bike share station locations, December 2016



²⁸ Held, Tom. "More riders using bus bike racks." Milwaukee Journal Sentinel.

<http://archive.jsonline.com/news/milwaukee/109359444.html>

²⁹ MCTS. 2015 Annual Report. <http://www.ridemcts.com/docs/default-source/default-document-library/2015-mcts-one-sheet.pdf>

³⁰ Southeastern Wisconsin Regional Planning Commission. VISION 2015 Plan Summary.

<http://www.sewrpc.org/SEWRPCFiles/Vision2050/PlanSummaryDec2016.pdf>

³¹ Maulaouff, Dan. "All 119 US bikeshare systems, ranked by size." Greater Greater Washington. January 26, 2017.

<https://gwwash.org/view/62137/all-119-us-bikeshare-systems-ranked-by-size>



Most of Bublr’s bike share stations are located in downtown Milwaukee and on the city’s East Side, Third Ward, and Walker’s Point neighborhoods, but several stations have been introduced in other Milwaukee neighborhoods and in Wauwatosa. The system will extend its suburban reach further in 2017 with new stations planned in Shorewood, Wauwatosa, and West Allis.

A first step toward integrating Bublr with MCTS bus services began in 2016 when MCTS began announcing Bublr stations located near bus stops and listing them on its MCTS Real-Time website. Additional possibilities for coordinating and integrating Bublr with the transit system are discussed later in this report.

Bublr also has introduced a mobile application (B-cycle Now), which allows users to find the nearest station to their location and to know how many bikes and open docks are available.

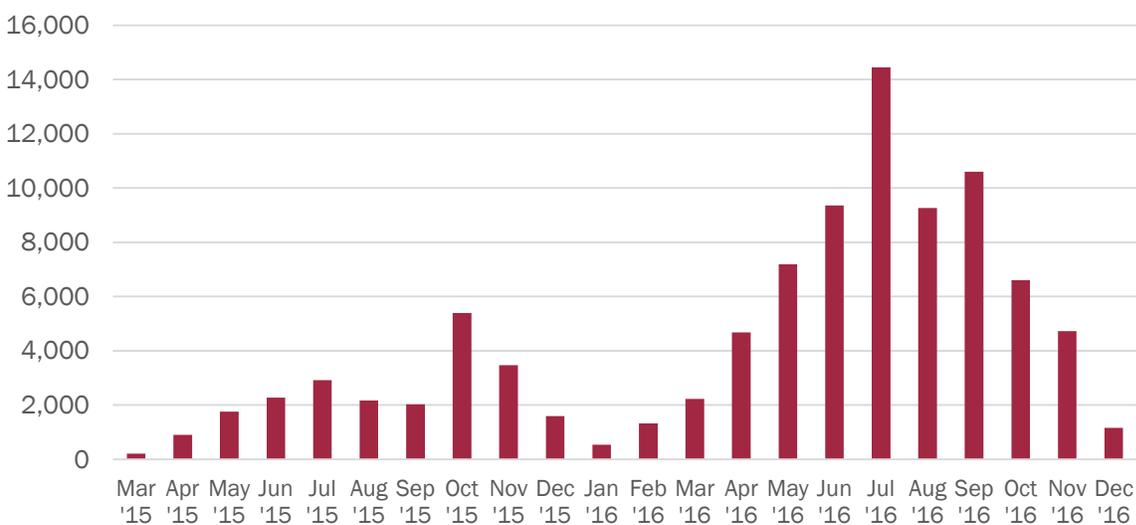
One limitation of bike share as a last mile strategy is that stations must be located both near transit and near employers’ locations so individuals can quickly and easily switch between the two modes of travel to get to and from work. Another limitation of the Bublr system is that it currently is only available in limited geographic locations within the region.

Ridership, Cost, and Funding Sources

More than 72,000 total trips were taken by Bublr in 2016, compared with just fewer than 23,000 in 2015.³² A significant increase in stations in 2016 likely was the primary reason for the sharp increase in usage, but increased visibility and familiarity with the system also likely contributed. As **Chart 6** shows, the number of monthly Bublr trips peaked at 14,454 in July 2016.

Fewer trips are taken during the winter months, however. In December 2016 and January 2017, for example, 1,162 and 1,324 trips were taken, respectively. Notably, the winter of 2015-2016 was the first year in which Bublr stations remained open and available all winter.

Chart 6: Bublr trips taken per month, March 2015-December 2016³³



³² Data provided by Bublr.

³³ Bublr Bikes. <http://bublrbikes.com/stats-n-stuff/trips-taken>



Users have several options for paying for Bublr. An annual pass for unlimited rides of up to 60 minutes costs \$80 per year or \$15 per month. (By comparison, the cost of an MCTS bus pass is \$72 per month.) To make the system more accessible, pay-as-you-go and single ride options are available as well. Currently, Bublr requires users to pay by credit card, but plans are underway to introduce a cash paying option for individuals without credit cards.

The cost of installing a new Bublr station varies significantly depending on the size of the station, power source used, site preparation required, and other factors. In some cases, the private sector has stepped up to pay for new stations to be added. Bublr currently charges \$60,000 up front or \$15,000 per year for a new station to be installed and maintained for five years.

Bublr stations are supported by a variety of funding sources. A majority of the active stations (31) are supported by federal Congestion Mitigation and Air Quality Improvement (CMAQ) funding. Wauwatosa's seven stations are supported by the State of Wisconsin's own congestion mitigation funds. Private businesses have provided full or partial support to 11 additional stations, and UWM supports five stations located on its campus. City of Milwaukee tax incremental financing (TIF) and Bublr itself are the funding sources supporting the remaining two stations. The nine stations planned for West Allis in 2017 will be supported with federal Transportation Alternatives Program (TAP) funding, with private donations accounting for a 20% match.

ADDITIONAL SERVICES

Several additional transportation services are available or have been tried in the past in the Milwaukee area to address the difficulties workers face in accessing jobs via public transit. Since these services technically are not last mile strategies, they are not covered in depth here. Additional information is provided, however, in the Appendix of this report.

- **Reverse commute bus routes** operated by MCTS and Waukesha Metro Transit provide transportation options for City of Milwaukee and Milwaukee County residents to access suburban employment hubs. Several such routes currently are in operation.
- **Private shuttle services** operated by individual employers, nonprofit organizations, and staffing agencies provide a direct link from locations within the City of Milwaukee to suburban employers' doors.
- **Vanpooling/Carpooling** services have been tried by both Milwaukee County and Waukesha County in the past to allow groups of workers to share rides to locations not easily accessed by public transit. Currently, neither county offers such a service.

SUMMARY & OBSERVATIONS

County governments have introduced and tested a variety of transportation options for improving last mile connections in the Milwaukee area in recent years. Meanwhile, new mobility options like the Bublr bike share system also have been introduced by the private sector. Each of these services improves mobility for workers and the general public, but each has its limitations.



MCTS' three shuttle routes bring people to job centers they could not otherwise reach by transit, but they are among MCTS' least productive routes. Thus, their long-term sustainability is not guaranteed and funding challenges likely would preclude creating additional shuttle routes in the future.

Shared-ride taxi services provide transportation directly to employers' doors in Ozaukee and Washington counties, and Ozaukee County's recent extension into Milwaukee County to serve three MCTS bus stops allows Milwaukee residents to more easily access jobs in that county. Additional integration between Ozaukee and Washington County's shared-ride taxi services with MCTS bus services could further improve jobs access in those counties.

Bicycling has become a much more viable last mile option since MCTS added bike racks to all of its buses in 2009. Even more recently, the introduction of Bublr bike share and its expansion into the suburbs provides an additional option to combine transit and biking to get to work. Major limitations of these options, however, include weather and safety-related concerns. While biking may not be a comprehensive, year-round solution for many people, it can represent one piece of the puzzle in many areas of the city and suburbs, particularly if combined with infrastructure improvements to make streets safer for riding.



LAST MILE STRATEGIES TO CONSIDER

Across the U.S., metro areas are utilizing and experimenting with a variety of last mile strategies that have not been tried in the Milwaukee area, or not to the same extent. We describe and analyze five such strategies here. While improving access to jobs for city residents is a primary focus of last mile discussions here in metro Milwaukee, it is important to note that other metro areas are seeking to meet a variety of objectives with last mile solutions, many of which also are relevant to southeastern Wisconsin. Those objectives include the following:

- Increasing transit ridership overall
- Assisting city residents to access non-employment destinations in the suburbs
- Assisting suburban residents in areas without transit services to access the transit system
- Reducing traffic congestion
- Avoiding the need to increase parking near transit stations
- Furthering environmental objectives

In examining each strategies pursued in other states, we considered a variety of factors that could influence their success in addressing the needs of Milwaukee area residents, local governments, and area employers. Those factors include:

Cost and travel time for users – Assuming individuals are transferring from a bus to a last mile service, they are already spending time and money for the bus. The goal should be to minimize both cost and travel time for users.

Cost and cost-efficiency for local governments – Local governments are struggling with tight budgets that have made it difficult to maintain existing transit services, let alone expand services. It is essential to keep the cost of last mile services manageable for local governments.

Connectivity/synchronicity with bus system – Based on both geography and schedule, the easier it is to transfer between bus services and last mile services, the more likely it will be to meet the needs of users.

Equity for those without mobile phones and the “unbanked” – Some individuals do not have mobile phones, do not use mobile applications, and/or do not have credit cards. Ideally, last mile solutions would be available to those individuals.

Accessibility for people with disabilities – To the extent that last mile services can meet the needs of people with disabilities, they could represent a paratransit alternative for some individuals.

STRATEGY #1: FLEXIBLE TRANSIT

Flexible transit services can be designed in a variety of ways, but the common characteristics are that they make stops at a limited number of scheduled locations at set times, while also providing



the flexibility to make unscheduled pickups and drop-offs at locations within a designated area. Since the Americans with Disabilities Act (ADA) requires public transit systems to provide complementary paratransit services covering all areas within $\frac{3}{4}$ mile of a fixed bus route, flexible transit services sometimes are designed to serve as both a transit and paratransit solution.

Transit systems typically utilize “cutaway” vehicles (small, 14-passenger buses) or vans to operate flexible transit services. Services usually follow a logical schedule; for example, stops may be made at designated locations every 30 minutes or every hour. Most flexible transit services involve dispatching systems that can communicate with drivers. Advanced reservations often are required for rides to and from locations that are not scheduled stops.

Among the 500 transit systems that responded to a national Transportation Review Board (TRB) survey in 2010, 39% stated that they offered some sort of flexible transit service.³⁴ The survey found that flexible transit services are growing in number across the country and are most common in smaller, less-dense areas (including many suburbs), where demand for transit exists but is relatively low.

Route deviation is by far the most common form of flexible transit offered by U.S. transit systems. In fact, among the TRB survey respondents indicating that their transit systems provide a flexible transit service, 64% stated that they utilize a route deviation model. A route deviation service is a relatively fixed route, often extending from a busy transit station or stop to another fixed destination with a limited number of set stops along the way. Often, deviations of up to $\frac{1}{2}$ or $\frac{3}{4}$ of a mile from the route are allowed to pick up or drop off passengers, though sometimes there is no distance limit set and service is provided anywhere within a designated zone. Extra time typically is built into schedules to allow for those pickups and drop-offs to occur.

Another relatively common form of flexible transit is a *demand-responsive connector*; 24% of the TRB’s survey respondents utilized this model. The only set stops under a demand-responsive connector model are points that connect riders to the fixed transit network. All other stops are made based on requests.

According to the TRB study, time-sensitive trips (like work) can be more difficult to accommodate with flexible transit services because they may not have set times for destinations other than the end points of the routes. Instead, it suggests that flexible transit can be most effective for transportation to shopping and non-emergency medical appointments, and in locations where there are a variety of trip generators and land use types.



³⁴ Transportation Research Board – Transit Cooperative Research Program. “A Guide for Planning and Operating Flexible Public Transportation Services.” 2010. http://www.tcrponline.org/PDFDocuments/TCRP_RPT_140.pdf



Nevertheless, there are many places using flexible transit (at least in part) as a last mile solution in areas of high employment, such as business parks.

Ridership and Cost

Flexible transit services typically are provided in areas where there is demand for transit but where that demand is insufficient to justify a fixed transit route. According to the TRB study, the average number of passengers per hour a vehicle is in service typically is in the 3-10 range for flexible transit, which is significantly lower than what is usually expected for fixed-route bus services (often 10+ in suburban areas and 20+ in urban areas).

The cost per ride for transit systems to operate flexible transit services typically exceeds that of fixed-route transit, but it is lower than fully demand-responsive (on-demand) transportation services. While costs vary significantly by location, the TRB study cites an estimate that fixed-route bus services average roughly \$3 per trip, fully on-demand transportation services (e.g. taxi service) average around \$30 per trip, and flexible transit services fall somewhere in the middle.

Fares for flexible transit services typically are the same as for regular fixed-route services. Among the respondents to the TRB survey, 70% stated that their fares are the same for those two service types.

What about Milwaukee?

Flexible transit services appear to have some potential to serve areas of the metro Milwaukee region where lower levels of demand for transit exist. Suburban areas where regular bus service is difficult or impossible to sustain may be the best locations for flexible transit services, particularly if they are relatively close to existing transit services and could be connected with a flexible route.

Flexible transit services were tried briefly in Waukesha County using full-size buses. Those services began in 2000 and ended in 2001 and 2002. According to Waukesha Metro Transit officials, a short-lived flexible transit service in Pewaukee did not have enough demand to fill a bus (van service may have been more effective there). In New Berlin, Route 302 provided regular bus service on weekdays and flexible service on weekends. That route was discontinued due to low ridership overall.

STRATEGY #2: RIDE-HAILING

In recent years, transportation network companies (TNCs) like Lyft and Uber have become increasingly established in U.S. metro areas, including metro Milwaukee. Similar to traditional taxi companies, TNCs provide on-demand transportation for paying passengers – a service often referred to as ride-hailing.³⁵ What makes TNCs different is that drivers typically use their own vehicles and users book and pay for rides via mobile applications.

Ride-hailing is flexible, provides point-to-point transportation, and only operates when demand exists. Thus, it can be an efficient option in lower-density areas and late at night, when transit services often do not attract sufficient ridership to operate frequently or at all. It also can be an effective way to provide last mile connections to fixed transit systems, particularly for areas within a few miles of a major transit station.

³⁵ Other common names for this type of service include ride-sharing, ride-booking, and ride-sourcing.



The potential for ride-hailing to serve as a last mile strategy for daily commuting is limited, however, by its relatively high cost for users, which can be particularly prohibitive for low-income individuals. In addition, ride-hailing services often are less readily available in smaller cities and suburbs, which can further limit their potential.

The rise of ride-hailing services may have both positive and negative implications for transit systems. Some transit advocates are concerned that ride-hailing will compete with transit and ultimately reduce transit ridership.³⁶ On the other hand, many transit systems see an opportunity to partner with ride-hailing companies (both TNCs and traditional taxi companies) to expand their service areas and fill gaps in their schedules.

Ride-hailing companies also see such partnerships with transit systems as an opportunity. For example, Lyft has an active campaign called “Friends with Transit,” which illustrates how the company is trying to market its services as complementary – rather than competitive – with transit. Advertisements illustrate how Lyft can provide last mile trips that extend to and from the fixed-route transit system.



In fact, partnerships between transit systems and ride-hailing companies are an emerging trend that appears to be gaining steam. Several transit systems throughout the U.S. are piloting partnerships with ride-hailing companies or are actively planning such pilots. Such partnerships can take the following forms:

- **Marketing partnerships** advertise a ride-hailing company as a complementary service to transit. For example, Chicago’s Metra commuter rail service recently announced a marketing partnership with Uber. Under the agreement, Uber will pay Metra \$900,000 over three years to advertise its service at Metra stations, on trains, and online.³⁷ While the partnership will bring benefits to both Metra and Uber, it appears that transit users will not benefit directly in any way.
- **Mobile application integration** syncs the mobile apps of a transit system and a ride-hailing company to allow individuals to plan and pay for trips involving both services in a streamlined manner. For example, an individual who takes an express bus to a transit station and then takes a short Lyft ride to reach his or her final destination would be able to plan and book the entire trip using one mobile app. Dallas Area Rapid Transit (DART) was the first transit system to add Lyft and Uber to its own mobile application, GoPass. Several others have followed suit.

³⁶ Walker, Jarrett. “Let’s Quit Pretending about Uber.” Human Transit. 10/4/16. <http://humantransit.org/2016/10/lets-quit-pretending-about-uber.html>

³⁷ Hendrickson, Matthew. “Metra enters marketing partnership with Uber.” December 14, 2016. <http://chicago.suntimes.com/news/metra-enters-marketing-partnership-with-uber>



- **Subsidized first mile/last mile ride programs** involve a transit system or local government paying a portion of the cost of rides to and from a designated transit stop or station. Several examples of subsidized first mile/last mile ride program are explored in depth in the next section of this report.

One major limitation of ride-hailing services is that some individuals do not possess mobile phones or are not familiar with or comfortable using mobile applications. Others do not have credit cards, which are typically required to use the services. These hurdles must be addressed to make ride-hailing accessible to users. Traditional taxi companies allow users to call to book rides and to pay with cash, which eliminates those barriers, but taxi companies often are more expensive than TNCs.

Another major challenge local governments have faced in working with TNCs is the companies' unwillingness to share data on the rides they provide, which could be very useful for transportation planning. Uber recently made some of its data on travel times publicly available on a new website called Movement, but the broader data-sharing challenge largely remains.

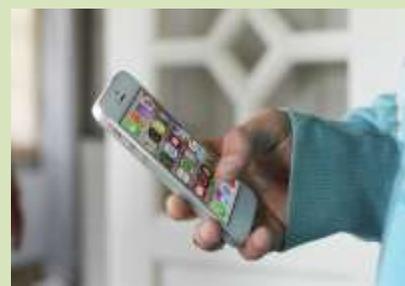
What about Milwaukee?

Lyft, Uber, and traditional taxi companies are active throughout the Milwaukee metro area. A partnership like those described above with a TNC or taxi company (or multiple companies) could be pursued to help fill in targeted geographic and schedule-based gaps in the transit system.

Mobile Applications & App Integration

In 2014, MCTS took major steps forward technologically by introducing electronic fare cards (M-Cards) and a new website that allows transit riders to track the arrival of buses in real time. MCTS still lacks an official mobile application, however, which would allow people to purchase bus passes and add stored value to their M-Cards, track buses, and get transit directions with ease using their mobile devices.

Metro areas of all sizes not only offer mobile apps for their transit systems, but many also are integrating other transportation services into those apps to make them even more useful.



For example, several recipients of the FTA's new Mobility on Demand Sandbox program (Chicago, Dallas, Portland, and Vermont) are using their grant awards to enhance their existing mobile apps by integrating the applications of ride-hailing companies and/or bike share systems. Those enhancements will make it easier for users to plan and pay for trips that involve more than one mode of transportation.

The Go Denver and Go LA apps allow transit riders to compare the cost, travel time, and environmental impact of all possible travel modes for their trip, including driving, transit, biking, walking, car share, bike share, and more. Users even can choose between the cheapest, fastest, and greenest options of completing their trips. Both apps were developed through partnerships between local governments and Xerox Corporation.

MCTS reportedly is planning a mobile app and hopes to introduce it in the near future. These examples from other U.S. metro areas show how such an app could develop into a robust tool that makes multiple modes of transportation more convenient for area residents.



Autonomous Vehicles

Autonomous vehicles have advanced from a science fiction fantasy to something we read about regularly in the news. Although it may be several years before they are introduced in the Milwaukee area, policymakers should begin to think about and plan for a future that includes autonomous vehicles.

There are differing opinions regarding the extent to which autonomous vehicles will take the place of traditional vehicles, the timeline for their rise in use, and the effects they will have on society and the environment. They already are being tested in several states, however, and the U.S. Department of Transportation recently designated 10 locations as official testing grounds for autonomous vehicles, including the City of Pittsburgh and the UW-Madison campus. Those locations vary in character, which gives them the combined potential to test vehicles in a wide range of settings.

Many experts predict that autonomous vehicles first will gain widespread use in the U.S. as shared vehicles owned and operated by ride-hailing and car sharing companies. For example, the Ford Motor Company has stated that it will have fully autonomous vehicles ready for ride-hailing companies to use by 2021. The president of Lyft also made headlines recently when he predicted that most Lyft rides will be provided by autonomous vehicles within five years.



An autonomous vehicle circulates in Pittsburgh.

At the October 2016 National Shared Mobility Summit in Chicago, several representatives of the auto industry and of ride-hailing and car sharing companies predicted that it would take 20-30 years for the U.S. to reach a tipping point when autonomous vehicles become the dominant mode of travel. A recent Brookings Institution study predicted that autonomous vehicles will account for about 25 percent of the global market between 2035 and 2040.

Eventually, it likely will be necessary for the City of Milwaukee and other municipalities in the region to regulate autonomous vehicles' use of city streets and curb space. For example, there may need to be a designated space on every block where people can be picked up and dropped off by autonomous vehicles. Some cities also are starting to think about how to discourage empty autonomous vehicles from congesting streets. For example, Seattle is considering the possibility of charging companies that use autonomous vehicles a fee for each seat (rather than each vehicle) to encourage shared rides.

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STRATEGY #3: MICRO-TRANSIT

Like flexible transit, micro-transit is designed to fill in gaps in a transit system with transportation services that usually are provided in vans. Similar to ride-hailing, micro-transit typically is provided by private companies that allow users to book rides using mobile applications. Rather than providing door-to-door service, however, micro-transit companies develop relatively fixed routes based on requested rides; those routes can change slightly over time as demand changes.

Micro-transit services have sprung up in several U.S. cities, including Austin, Boston, Kansas City, and San Francisco. The services that have been developed in those cities are meant to make trips that are not well served by the transit system faster and more convenient for users. In limited cases, the routes specifically are designed to serve as a last mile connection from a transit station to a major employment center. In Austin, TX, for example, micro-transit company Chariot is now providing rides between train and bus stations and Whole Foods' large corporate offices.³⁸

The cost to users for micro-transit services also typically falls between that of regular transit and ride-hailing – often in the \$3-\$5 range per trip. For example, Chariot's service in Austin is expected to average \$4 per ride.

One of the first partnerships to develop between a transit system and a micro-transit provider was a one-year pilot program in Kansas City that was launched in March 2016 between the Kansas City Area Transportation Authority (KCATA) and Bridj, a micro-transit provider. The Bridj service in Kansas City was developed to serve two large zones that include major employment centers during morning and evening rush hours. Under the pilot, the fare for a Bridj ride (\$1.50) was the same as regular bus fare and the first 10 rides for each user were free.

KCATA owned the vehicles used for the Bridj partnership and KCATA employees operated the vehicles, while Bridj administered the technologies that drivers used to navigate and passengers used to book rides. Ford also was a partner in the program, having built the 10 14-passenger vans Bridj used for the service.

Rather than extending the geographic reach of the transit system outward, the Bridj service in Kansas City (and in Boston, the other city where Bridj is active) was focused only on areas of the metro area that already are served by transit, as shown on the following page in **Figure 5**. The service area was determined based on cell phone usage data.

Ridership, Cost, and Funding Sources

Bridj is a private company and its data is proprietary, so we cannot report ridership numbers. KCATA officials indicate that the program met their ridership expectations, but that the primary goal of the pilot was not to generate high ridership. Rather, it was to see if micro-transit could attract new riders to transit who may otherwise drive. Survey results have shown that very few Bridj users had used other forms of transit in Kansas City, so transit officials feel the pilot was successful in that regard.

³⁸ Bien, Calily. "Chariot brings crowdsourced shuttle service to Downtown Austin." KXAN. October 7, 2016. <http://www.citylab.com/commute/2015/04/how-the-microtransit-movement-is-changing-urban-mobility/391565>



They also found through surveying that Bridj riders are willing to pay more for the service than they have during the pilot; most said they are willing to pay up to \$3 per ride.

Funding for the partnership between KCATA and Bridj came from local sales tax revenue, which funds the transit system in general. The one-year pilot was budgeted at approximately \$1 million. KCATA's contract with Bridj was for \$25 for each hour a vehicle was in operation.

KCATA officials have indicated that now that the one-year pilot has ended, it may be extended another year with modifications made to expand the service hours. Based on its experience with the pilot, KCATA also is planning a partnership with a soon-to-be-announced ride-hailing company to provide a less expensive, alternative transportation option to paratransit users.

According to KCATA planners, strong leadership from KCATA's relatively new CEO for testing new technology-enhanced services, along with support from political leadership and many businesses, were vital to the creation and development of the agency's partnership with Bridj.



What about Milwaukee?

Micro-transit does not exist in Milwaukee currently, so this strategy would require attracting a private provider into the region. In addition, since last mile connections do not tend to be the primary focus of micro-transit services, pursuit of this strategy likely should be accompanied by other primary objectives, such as attracting new transit riders in general.



STRATEGY #4: BIKE SHARING

A scan of bike share systems in other U.S. metro areas revealed a number of strategies that have not been tried in Milwaukee and that could be beneficial for improving last mile connections. Those strategies include:

Co-located bike share stations and transit stops – Baltimore introduced its new Baltimore Bike Share system in October 2016. Several station locations were specifically chosen to align with busy transit stops; in fact, those stations were sponsored by the Maryland Transit Administration.³⁹

Similarly, Toronto added 120 new bike share stations in 2016 and specifically made sure that all subway stations within the expansion areas include a new bike share station.⁴⁰ The expansion was described as a “last kilometer” strategy.

GPS-enabled and electric-assist bikes – A few bike share systems allow users to park bikes at places other than designated stations, which builds more flexibility into the system and allows people to reach more destinations.

Santa Monica, CA, for example, introduced a bike share system in 2015 that includes 500 GPS-enabled bicycles. The bikes allow users to park anywhere in Santa Monica – not just at stations.⁴¹ Users are charged \$2 extra for that added flexibility, but if they return the bike to a station within the day, \$1 is refunded. Houston is experimenting with a similar “smart bike” system.



Other bike share systems include electric-assist bicycles, which make biking faster and easier, particularly when going up hills. That feature can make bike share accessible to more people. The systems in Baltimore, Birmingham, and Montreal include electric-assist bicycles in their fleets. In fact, Baltimore’s system currently includes 200 electric-assist bikes (about half the fleet).

Options to make bike share more equitable and financially accessible – One common criticism of bike share systems across the country is that they primarily serve higher-income neighborhoods and individuals. Several bike share systems have made efforts to address those disparities by expanding into lower-income neighborhoods and by making their systems more affordable and easier to access.

³⁹ Shen, Fern. “Baltimore Bike Share rolling out this week. Baltimore Brew. October 24, 2016.

<https://www.baltimorebrew.com/2016/10/24/baltimore-bike-share-rolling-out-this-week>

⁴⁰ Landau, Jack. “Major Expansion of Bike Share Toronto Network Starting.” July 27, 2016.

<http://urbantoronto.ca/news/2016/06/major-expansion-bike-share-toronto-network-starting>

⁴¹ Nelson, Laura J. “Bike-sharing program gets going in Santa Monica, Venice; more areas to follow.” Los Angeles Times. November 12, 2015. <http://www.latimes.com/local/california/la-me-santa-monica-bikeshare-20151111-story.html>



For example, Philadelphia's Indego bike share system recently introduced a \$5 monthly membership option for food stamp recipients.⁴² That represents a 67% discount from the regular, \$15-per-month rate. Philadelphia and Chicago allow users to pay for bike share with cash at 7-Eleven and Family Dollar stores by using a mobile app called PayNearMe. Chicago also offers qualifying, low-income residents a one-time \$5 annual membership through its Divvy for Everyone program.

After discovering that the only way to access the Indego bike share system in Philadelphia was online and that many residents were not very technologically savvy, a Philadelphia nonprofit (Better Bike Share Partnership) helped to develop a program called Digital Skills & Bicycle Thrills as a partnership with Indego, the City of Philadelphia, and others. The program teaches people computer skills and gives them a six-month bike share membership for free.⁴³

Planning-Related Solutions

As we pointed out in our 2013 report, *Getting to Work*, **land use policies** that foster higher-density, mixed-used development patterns are the optimal, long-term solution for making jobs accessible by transit. It is often very difficult to serve job centers in outer suburbs with fixed bus routes because of the lack of both development density and mixed land uses along potential routes, which are needed to produce ridership throughout the day.

Land use policies should encourage businesses to locate in or near higher-density areas where public transit services already exist or where new transit connections could be sustained. **Transit-oriented development** involves guiding future development to areas within walking distance of transit by allowing for greater development density and a mix of land use types in those areas.

Planning for improved **bicycle/pedestrian infrastructure** also could make it easier for people to make last mile trips by bicycle or on foot. National best practices call for reducing barriers to accessing the transit network, including improving bicycle and pedestrian infrastructure near transit stations. The Utah Transit Authority recently completed a first mile/last mile strategy study and concluded that improving bicycle and pedestrian infrastructure near light rail stations would be one of the most effective and cost-effective ways to increase transit ridership in the Salt Lake City area. Dallas Area Rapid Transit (DART) is mapping where there are no sidewalks in areas around bus stops and rail stations in the Dallas area and will work to improve that infrastructure in the future.

Another trend that is emerging as a last mile strategy is the development of **mobility hubs** near busy transit stops or stations. Mobility hubs combine multiple transportation service options (bike share, car share, ride-hailing, etc.) together near a transit station to create integrated systems. San Diego and Chicago are two metro areas that are actively working to develop mobility hubs, including in suburban areas.

Milwaukee's Intermodal Station is a local example of a mobility hub. In addition to Amtrak and intercity bus services, the Intermodal Station is directly served by MCTS routes 12 and 57, is on the planned streetcar route, and includes a BublR bike station, bike parking, and a Zipcar (car share) vehicle. It also is well served by taxi and ride-hailing companies. Similar mobility hubs may be possible at other busy transit stops.

⁴² Anderson, Michael. "In Philly, \$5 bike share memberships for food stamp users take off." Better Bike Share Partnership. August 29, 2016. <http://betterbikeshare.org/2016/08/29/philly-offering-bike-share-discounts-food-stamp-cards-working-great>

⁴³ Simpson, Melissa. "This digital literacy program will also get you 6 months of free bikeshare." June 9, 2016. Technical.ly Philly. <http://technical.ly/philly/2016/06/09/free-indego-computer-class/>



To strengthen the connection between its transit and bike share systems, Toronto recently began subsidizing new bike share memberships for transit users of all income levels. Under the new program, individuals with transit passes are able to get the first year of a new bike share membership for 50% off. Each subsequent year is subsidized by a stepped down rate (40%, 30%, 20%, 10%) until no subsidy is offered in the sixth year of membership.⁴⁴

Integrated mobile applications and payment cards –Several transit systems are adding the mobile application for their bike share system to their transit system app to make it easier and faster for individuals to use both systems to complete their trips.

For example, Chicago recently won a federal grant from the FTA’s new Mobility on Demand Sandbox program to integrate its Divvy bike share system with the Chicago Transit Authority’s Ventra mobile app. This will allow transit riders to use the Ventra app to check the availability of bikes at docking stations near their transit stops and to pay for bike share rentals.

Houston is planning to integrate its transit and bike share systems by allowing users to pay for both with the same smart card.

What about Milwaukee?

As previously described, Bublr Bikes is quickly expanding the number and geographic reach of its stations in metro Milwaukee, and Bublr station locations are now announced on MCTS buses. Bublr and its partners could take further steps to improve its potential as a last mile solution by pursuing one or more of the strategies described above.

Mobility on Demand Sandbox Program

In response to the rise of technology-supported transportation services across the U.S., the Federal Transit Administration (FTA) recently introduced a new program called the Mobility on Demand Sandbox, which “supports transit agencies and communities as they integrate new mobility tools like smart phone apps, bike- and car-sharing, and demand-responsive bus and van services.”

In October 2016, the FTA awarded its first set of Sandbox grants to 11 U.S. communities for technological or service-level solutions, many of which address last mile problems. The total value of those 11 grants was \$8 million. MCTS applied for a Sandbox grant to develop a mobile app, but its proposal was not selected by the FTA in its first round of funding.

A second cycle of the Mobility on Demand Sandbox program already is in the planning phase and could represent a good opportunity for metro Milwaukee.

Source: Federal Transit Administration
<https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program.html>

STRATEGY #5: EMPLOYER SHUTTLES

Many private employers throughout the U.S. have developed or contributed funding to shuttle services that transport workers from nearby transit stations to their doors.⁴⁵ In many cases, those services involve at least one very large employer, such as a hospital or a major tech company. This is

⁴⁴ Spurr, Ben. “Got Presto? Bike Share has a deal for you.” The Star. September 1, 2016.

<https://www.thestar.com/news/gta/transportation/2016/09/01/got-presto-bike-share-has-a-deal-for-you.html>

⁴⁵ There also are examples of employer-provided or contracted shuttles that transport workers from central city locations to suburban workplaces; because these are not last mile strategies they are not considered here, but they are discussed in the Appendix.



likely the case because large employers are more likely to have both the volume of employees that use transit and the financial capacity to offer a shuttle service. In addition, employer shuttles tend to be more prevalent in places with rail systems, likely because a typical light rail or commuter rail station serves a higher volume of transit riders than the average bus stop.

The Lone Tree Link is one example of an employer-supported shuttle service (**Figure 6**). Located in the Denver suburb of Lone Tree, CO, the Lone Tree Link provides a free transportation connection for workers traveling between the Lincoln light rail station and major businesses, a medical center, restaurants, and retail outlets along Park Meadows Drive.⁴⁶ Approximately 4,500 people work in the area served by the shuttle, which runs every 10 minutes between 6 am and 7 pm. Service is provided in four 14-passenger mini-buses.

The Lone Tree Link was started in September 2014 through a public-private partnership involving three major employers/employer groups, the City of Lone Tree, and the Denver South Transportation Management Association, which is a public-private coalition that supports transportation improvements in the southern portion of the Denver metro area. As of May 2016, the Lone Tree Link had carried 114,208 riders.⁴⁷

In its first year of operation, the Lone Tree Link had a total budget of \$775,000. The City of Lone Tree contributed \$250,000 to support the service, while Charles Schwab contributed \$125,000 and Sky Ridge Medical Center, Kaiser Permanente, the ParkRidge Corporate Center, and the Denver South Transportation Management Association each paid \$100,000.⁴⁸



Figure 6: The Lone Tree Link is a shuttle service in a Denver suburb that serves a busy employment corridor and connects with a light rail station.

⁴⁶ Lone Tree Link: <http://www.lonetreelink.com>

⁴⁷ Gustafson, Rick. "Shuttle provides a convenient link." Lone Tree Voice. July 26, 2016. <http://lonetreevoice.net/stories/Shuttle-provides-a-convenient-link,231464>

⁴⁸ Woullard, Clayton. "Lone Tree debuts free link shuttle service to serve area employers." The Denver Post. September 23, 2014. <http://www.denverpost.com/2014/09/23/lone-tree-debuts-free-link-shuttle-service-to-serve-area-employers>



In addition to the Lone Tree Link, the Denver RTD operates a Call-n-Ride service that serves a larger area of Lone Tree. That service makes hourly stops at the Lincoln light rail station. The Call-n-Ride in Lone Tree is a demand-responsive service that requires users to make reservations at least two hours in advance, whereas the Lone Tree Link requires no advance reservations and provides much more frequent service.

Pace, the suburban transit system that serves 284 municipalities in the Chicago metro area, has offered an employer shuttle program for many years that is open to any employer in its service area. Under the program, Pace will provide a vehicle to an employer for a charge of \$750 per month.⁴⁹ Pace pays for insurance and maintenance of the vehicle. Employers must provide a qualified driver and pay for gas, and may charge a fee to employees who use the service. Notably, only *one* employer – a suburban medical center – currently utilizes Pace’s employer shuttle service, indicating a lack of interest in the program.

What about Milwaukee?

Several employers provide transportation services for their employees in the Milwaukee area, but our research did not identify any employers that offer shuttles designed as last mile services that connect with the transit system. While this strategy may hold promise – particularly in areas that include one or more large employers – it appears that such an approach may work best in locations that are in close proximity to busy transit stops, which is a condition that only exists in a limited number of places in the Milwaukee area.

Transportation Management Associations

Transportation management associations (TMAs) are nonprofit, member-led organizations that develop and implement transportation services in a defined area, such as a downtown, a group of suburbs, or an individual business park. TMAs usually include both private sector and public sector members and often focus on addressing the transportation challenges of employers. Typically, TMAs have at least one paid staff person.

TMAs may support a variety of services, such as rideshare (carpool/vanpool) programs, road and transit improvements, employer shuttles, or bicycle and pedestrian planning. They often are involved in promoting transportation programs and initiatives within their service areas as well.

The Denver South Transportation Management Association (DSTMA) is one example of a TMA that has been actively involved in developing new transportation services designed to improve first mile and last mile connections. In addition to the Lone Tree Link shuttle service, the DSTMA has been a key partner in an innovative ride-hailing pilot program in the Denver suburb of Centennial, which is described later in this report. The DSTMA is one of at least six TMAs active in the Denver metro area.

Much of the funding for TMAs comes from contributions from member organizations, with additional funding often coming from local governments, regional transportation districts, and/or state or federal grants. In the Denver area, for example, the Regional Transportation District (RTD) contributes about \$25,000 a year to each TMA and offers them incentives to form vanpools.

Sources: Victoria Transport Policy Institute
<http://www.vtpi.org/tdm/tdm44.htm>

North Central Texas Council of Governments
<http://www.nctcog.org/trans/cmp/tdm/tma.asp>

⁴⁹ Pace. http://www.pacebus.com/sub/vanpool/employer_shuttle.asp



SUMMARY & OBSERVATIONS

Several strategies that have been implemented in other U.S. metro areas have the potential to play a role in addressing last mile problems in the Milwaukee area now or in the future. While none would be a perfect, comprehensive solution in all areas of the region, each may be effective in certain contexts and/or in combination with other strategies.

Flexible transit, which allows buses or vans to make diversions from set routes to serve more dispersed businesses and other destinations, is an option that could be considered in suburban areas along the edges of the existing transit system, where demand often is too low to sustain regular, fixed-route bus service. Lower-density areas between four and 10 square miles that can generate between three and 10 passengers per hour of service are where flexible transit is commonly used nationally. One major challenge of flexible transit, however, is that workers and employers must be able to tolerate a degree of unpredictability and variability in arrival times.

Ride-hailing is a small-scale transportation option that offers users on-demand, point-to-point service. A partnership between a local government and a ride-hailing company has the ability to help individuals travel directly to their job sites from the nearest transit stop. One approach to such a partnership would be a subsidized last mile ride program, which could reduce the cost of ride-hailing for transit riders. Such a partnership has the potential to be designed at any scale to serve targeted geographic areas or to fill in gaps in transit system schedules.

Micro-transit is a technology-supported transportation service usually provided in vans that features routes that can be modified over time based on demand. Micro-transit is sometimes used as a last mile strategy, but more often is a standalone service providing longer-distance transportation. One of micro-transit's key objectives appears to be attracting users that are new to transit. While micro-transit could be a valuable addition to the future mix of transportation options in the Milwaukee area, no company providing this service has entered the Milwaukee market to date.

Bike sharing is growing in metro Milwaukee, but other places are expanding the impact of their systems as last mile solutions through a number of approaches that Bublr could consider. Those include strategically locating bike share stations near transit stops; introducing GPS-enabled or electric-assist bikes; and introducing cash payment options and/or low-cost membership options for transit pass holders or low-income individuals. Weather and safety concerns are a key limitation to bike share's effectiveness as a last mile solution, as is the need to have numerous and densely located stations that allow individuals to pick up and drop off bikes near both transit stops and their places of employment.

Employer shuttles provide transportation between employer locations and transit stops. In some cases, transit systems own, insure, and maintain the vehicles used by employers; in other cases, the services are developed and operated independently by an employer, group of employers, or through a public-private partnership. Since employer shuttles tend to be offered only by large employers or groups of employers and appear to be more common in places with high-volume transit stops or stations, this approach likely only has potential in limited parts of the Milwaukee area.



A CLOSER LOOK: FLEXIBLE TRANSIT & RIDE-HAILING

Based on our analysis of the five strategies presented above, we have determined that flexible transit services and ride-hailing partnerships have several unique strengths that merit a closer look as potential last mile strategies for metro Milwaukee. The attractiveness of those strategies is linked, in part, to their potential near-term and full-year viability. Unlike micro-transit, for example, flexible transit services typically are operated by local transit systems, while ride-hailing partnerships could be developed with companies already present in the Milwaukee area. Unlike bike share, both strategies can be equally effective year-round.

In this section, we present several detailed case studies of flexible transit services and ride-hailing partnerships in other U.S. metro areas. Those services and their costs are summarized in **Table 3**.

Table 3: Selected case studies of flexible transit services and ride-hailing partnerships

| Service Name & Location | Service Type | Total Operational Budget | Avg. Subsidy per Trip | Typical Fare |
|---------------------------------------|------------------|-------------------------------------|-----------------------|--------------|
| Call-n-Ride (Denver suburbs) | Flexible Transit | \$400,000-\$750,000 per area (2015) | \$12 | \$2.60 |
| OmniLink (Washington D.C. suburbs) | Flexible Transit | \$8 million for six routes (annual) | \$8 | \$1.50 |
| SW Prime (Minneapolis suburbs) | Flexible Transit | \$480,000 (2016) | \$9 | \$3 |
| *West Salem Connector (Salem, OR) | Flexible Transit | \$255,000 (first year) | \$21 | \$1.60 |
| *Dash on Demand (Itasca, IL) | Ride-Hailing | \$90-120,000 (first year) | \$0 | \$3 |
| *Direct Connect (Pinellas County, FL) | Ride-Hailing | \$140,000 (first year) | \$5 | \$1-2 |
| *Go Centennial (Denver suburb) | Ride-Hailing | \$400,000 (first year) | \$6-7 | \$0 |

**Pilot program*

Note: Data for Denver RTD only includes the five Call-n-Ride areas with flexible bus routes

It is important to note that two major obstacles limited our ability to analyze the costs and benefits of partnerships between transit systems and TNCs like Lyft and Uber:

- All partnerships between transit systems and TNCs started in 2016 and many are pilot programs that are still underway. This approach is so new that no comprehensive national research has been produced to date analyzing how well it is performing.
- As competitive private businesses, TNCs are unwilling to share data publicly, so we were sometimes unable to get precise exact usage and cost information.

Despite these limitations, the case studies we include illustrate how a few pioneering communities have designed and financed these strategies and provide perspective on some of their outcomes to date.

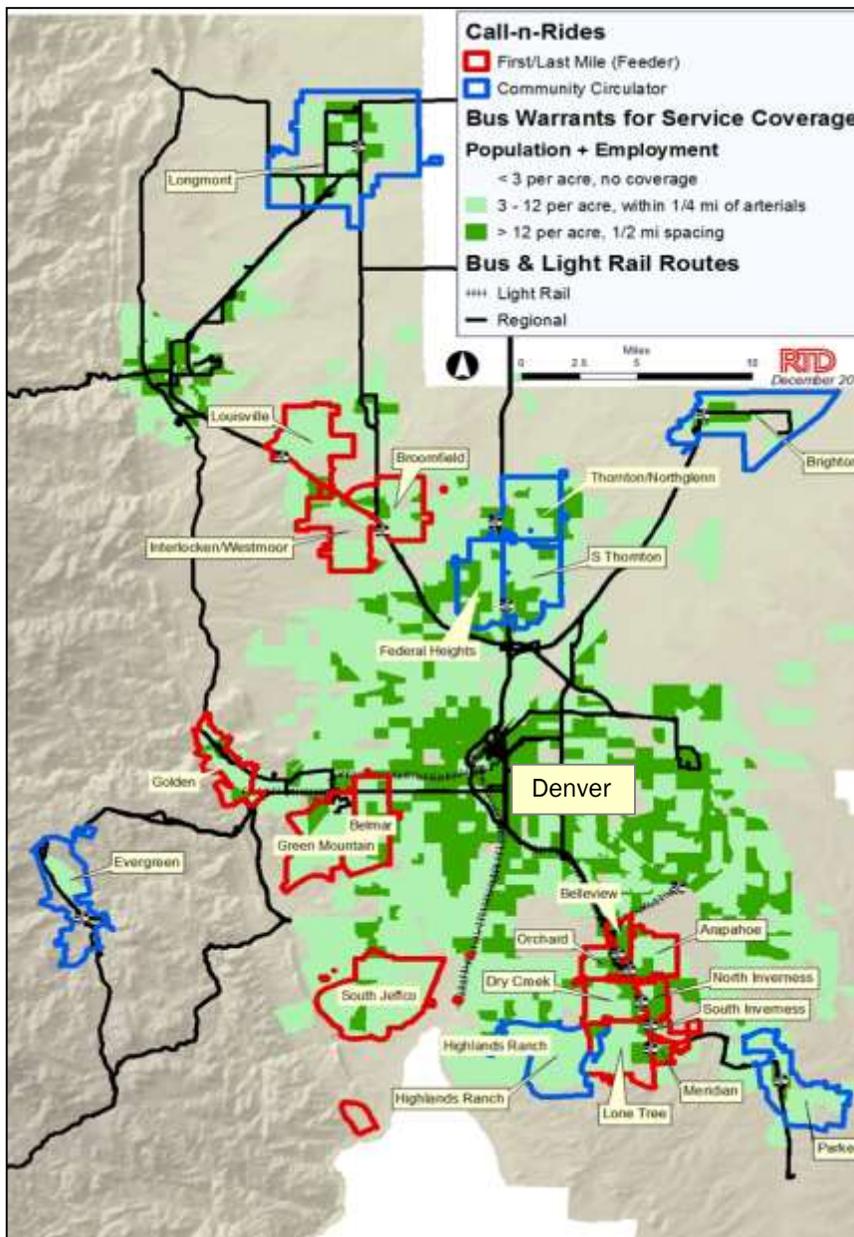


FLEXIBLE TRANSIT

Denver Metro Area - Call-n-Ride Services

In 2000, Denver's Regional Transportation District (RTD) introduced Call-n-Ride, a transportation service provided in small, 14-passenger buses in suburban areas where ridership is not high enough for regular fixed-route bus or train service. Today, 22 different areas within the Denver metro area have Call-n-Ride services (Figure 7), which collectively provide roughly 2,000 total rides per day. Those services have been designed based on the specific characteristics and needs of each area, resulting in considerable variation throughout the region. User surveys often have been employed to gauge demand and shape new services.

Figure 7: Denver RTD's Call-n-Ride program serves 22 suburban areas (outlined in red and blue)



In 15 of the 22 areas, the Call-n-Rides are “feeder” services that connect with RTD’s fixed-route transit system, which includes an extensive bus network and several light rail lines. The other seven areas are suburbs that otherwise are disconnected from the transit system; the Call-n-Ride services in those areas serve as “community circulators.”

In five of the 15 areas with “feeder” Call-n-Ride services, the RTD operates flexible transit routes (“flex routes”) that stop at designated locations while also accepting pickups and drop-offs at locations not on the route. The Call-n-Ride services in the remaining 10 areas are demand-responsive connectors, meaning the only scheduled stops they make are at a transit stop or station; all other stops are based on requests. In some Call-n-Ride areas, both flex routes and demand-responsive connector services are provided simultaneously to complement one another. Three of the five Call-n-Ride areas with flex routes generate much of their ridership from business parks in the area.

RTD’s flex routes do not require advanced reservations for scheduled stops; for pickups requiring route deviations, however, reservations must be made at least two hours in advance. Users can make reservations online, by phone, or using a mobile app (e.g. Go Denver). Regular users also can subscribe to the service for daily trips. Call-n-Ride drivers have computers equipped with an app that uses Google Maps and guides the driver based on scheduled calls for service.

Passengers must pay their fare for Call-n-Ride services in cash and fares are the same as for RTD’s fixed-route transit services (\$2.60 for a full-fare ride). Free transfers are provided between Call-n-Ride and fixed transit services. The RTD also operates a separate paratransit program called Access-a-Ride and provides passengers eligible for that service (who would otherwise pay \$4.50 each way for Access-a-Ride) with *free* transportation via Call-n-Ride. That amounts to a win-win in many cases for the passenger and RTD.

The RTD also is developing a pilot with Lyft to supplement one of its flex routes; under that scenario, the flex route would operate during peak hours and Lyft would take over during non-peak hours.

Ridership, Cost, and Funding Sources

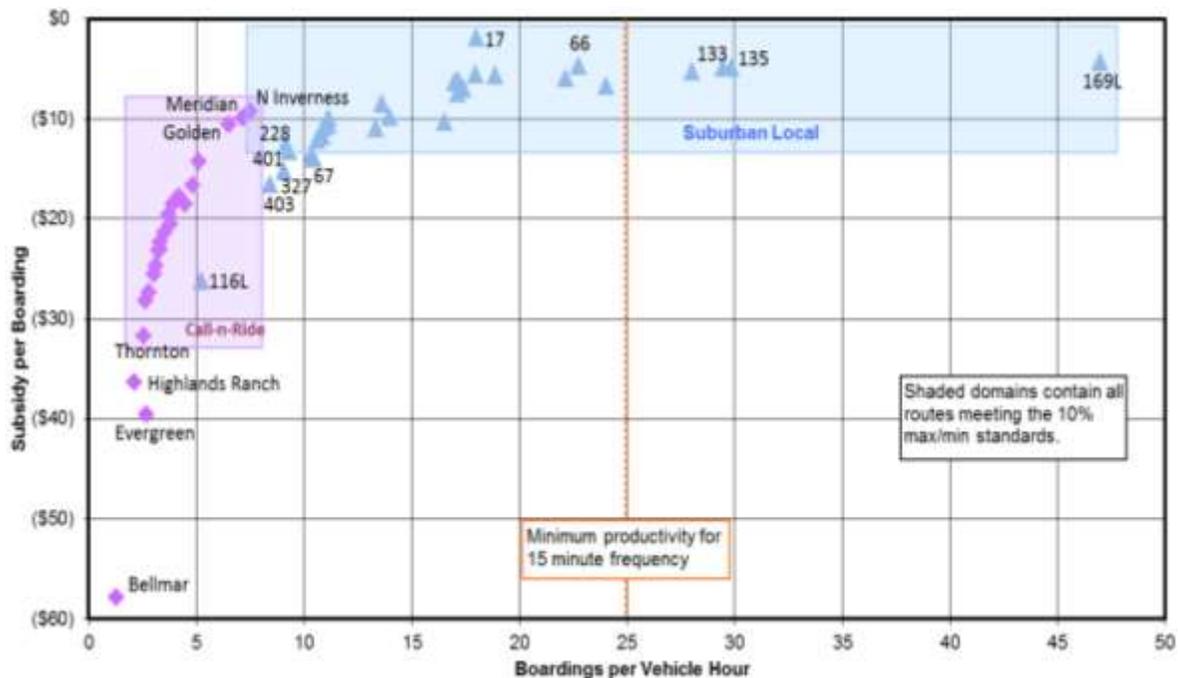
In 2015, the average number of passengers served per hour by Denver’s Call-n-Ride services ranged from two to seven, as shown by the purple diamonds in **Chart 7**. Notably, some served much higher rates of passengers during peak hours and very low numbers off-peak. By comparison, a majority of RTD’s suburban local bus routes generate 10-20 boardings per vehicle hour, as illustrated by the blue triangles in **Chart 7**.

If a Call-n-Ride service is attracting 10+ rides per hour, it may be considered for a fixed-route bus service. On the other end of the spectrum, if a Call-n-Ride is attracting fewer than three passengers per vehicle hour it may be terminated, though that can be politically difficult according to RTD officials.

Chart 7 also shows that the average subsidy per trip of operating Denver’s Call-n-Ride services varies by area, but tends to be in the \$10 to \$30 range. By comparison, the average subsidy for most of RTD’s suburban bus routes is less than \$15 per trip.



Chart 7: Ridership and cost data for Denver’s suburban local and Call-n-Ride bus routes, 2015



On average, the five Call-n-Ride areas that include a flexible transit route are approximately 3.8 square miles in area and serve about 5.8 passengers per vehicle hour.⁵⁰ Typically, two or three vehicles operate in those areas during peak hours, while only one vehicle operates off-peak. The average subsidy per boarding for those five areas was \$12.32 in 2015, as shown in **Table 4**. The areas with flex routes tend to be among the more cost effective of RTD’s Call-n-Ride areas.

Table 4: Ridership and cost data for RTD’s Call-n-Ride services that include a flex route, 2015

| Area | Flex Route Schedule | Total Boardings | In-Service Hours | Boardings per Hour | Annual Net Subsidy | Subsidy per Boarding |
|-----------------|---------------------|-----------------|------------------|--------------------|--------------------|----------------------|
| Golden | All day | 70,608 | 10,849 | 6.5 | \$750,708 | \$10.63 |
| Green Mountain | AM/PM peaks | 30,641 | 9,269 | 3.3 | \$708,663 | \$23.13 |
| Meridian | PM peak only | 39,936 | 5,599 | 7.1 | \$396,391 | \$9.93 |
| Inverness North | AM/PM peaks | 56,927 | 7,569 | 7.5 | \$530,224 | \$9.31 |
| Inverness South | PM peak only | 28,493 | 5,578 | 5.1 | \$406,090 | \$14.25 |
| Totals | | 226,605 | 38,864 | 5.8 | \$2,792,076 | \$12.32 |

Financial support for all of Denver RTD’s transportation services, including Call-n-Ride, comes from a regional sales tax that is levied throughout its entire eight-county district. In addition, local municipalities have contributed to the Call-n-Ride services in a few cases. For example, municipalities have secured grants and used them to pay RTD to provide Call-n-Ride services, which has been helpful for testing out the feasibility of new routes. In other cases (four in the last four

⁵⁰ All data on ridership and cost were provided by Denver’s Regional Transportation District and analyzed by PPF staff.



years), cost-sharing agreements have been established with local municipalities to keep underperforming Call-n-Ride services in operation.

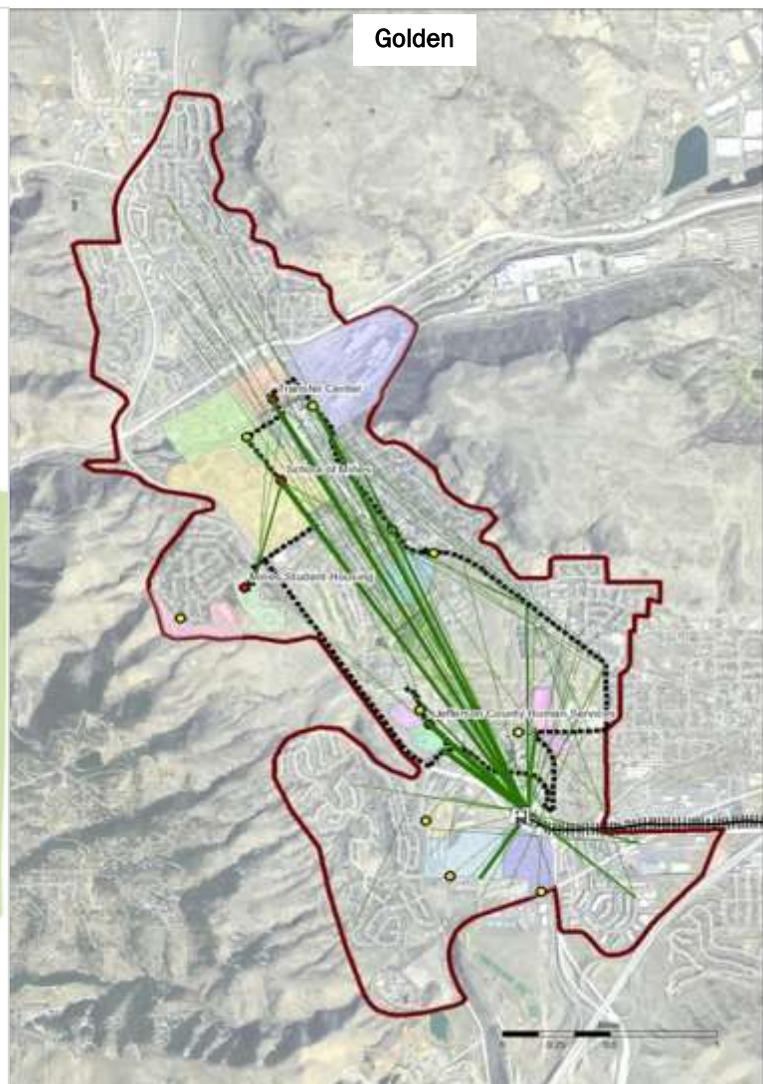
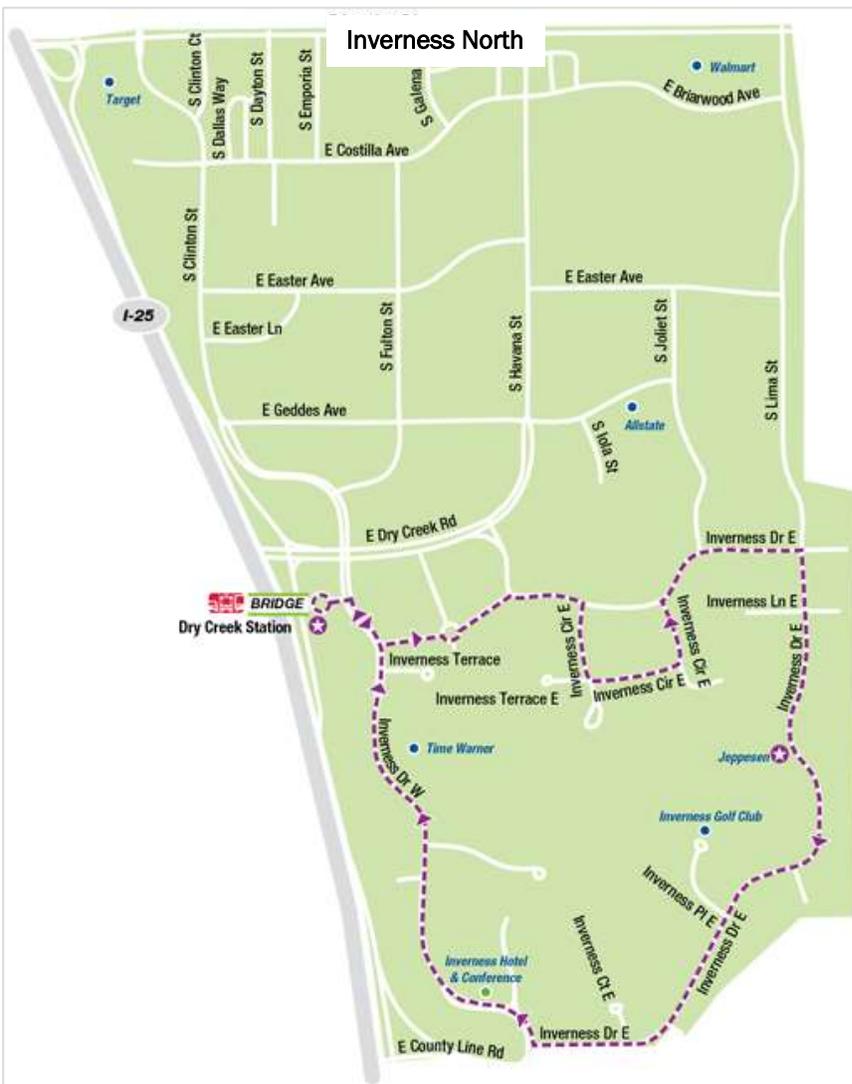
Example: Inverness North Call-n-Ride

One of RTD’s Call-n-Ride areas with a strong emphasis on employment is Inverness North, which connects a business park in Englewood, CO, with the Dry Creek light rail station. The business park includes a wide range of industries, including customer service, engineering, finance, hospitality, and retail, and is located approximately 17 miles southeast of Denver.

The Call-n-Ride in Inverness North features a flex route that runs every 10 minutes during morning and evening peak periods, which is shown as a dashed purple line in **Figure 8**. Two 14-passenger buses are used to operate the flex route. In addition, a third vehicle operates as a fully demand-responsive service all day serving the entire Inverness North service area. The Call-n-Ride in Inverness North began with demand-responsive service only; the flex route was added after RTD discovered that most of the demand in the area was during peak periods and that most passengers were going to the same spots within the business park.

While the current service design seems to be working, RTD is considering operating the flex route only during peak periods and subsidizing rides through a ride-hailing partnership during off-peak hours.

Figures 8 & 9: Call-n-Ride service areas and flex routes in Inverness North and Golden



Example: Golden Call-n-Ride

Golden, CO (population 19,000) lies about 15 miles west of Denver and is connected to the city by a light rail line. To provide first mile and last mile connections between the light rail station and other locations within Golden, the RTD operates a flex route every 30 minutes all day, allowing for limited diversions from the set route. Simultaneously, two other vehicles operate as demand-responsive connector services that make alternating hourly stops at the rail station every 30 minutes. Thus, there are four total stops made at the light rail station every hour by a Call-n-Ride vehicle. The Golden Call-n-Ride service serves several large employers, including Coors Brewing Company, the Colorado School of Mines, and a Safeway grocery store.

In **Figure 9**, the dark red line shows the zone served by the Call-n-Ride service in Golden, the dotted black line shows the path of the flex route, and the green lines show the actual trips made with the service's demand-responsive option in 2015. For the green lines, darker shades indicate increased trip frequency. This shows that while most trips are to destinations along or near the path of the flex route, other destinations throughout the community are served as well.

Other Examples of Flexible Transit Services

- The West Salem Connector in Salem, OR began operating in a hilly, low-density, primarily residential city neighborhood in June 2015, and ultimately replaced portions of two low-frequency, low-performing bus routes in September 2015. The service provides on-demand rides to and from 26 designated points in a roughly three-square-mile area of the West Salem neighborhood (**Figure 10**). Transportation is provided by one 14-passenger mini-bus and is offered between 6 am and 9 pm, Monday through Friday, which is the same schedule as the transit system's fixed bus routes. A majority of riders use the West Salem Connector to travel to the Glen Creek Transit Center, where connections can be made to regular bus routes that go to downtown Salem.

The fare for the West Salem Connector is the same as for regular bus service. Rides can be booked online or by phone at least 30 minutes in advance (this may lower to 5 minutes in the future), and subscriptions are available for regular trips (e.g. daily commuting). The service also provides text, email, or phone call notifications to let



Figure 10: The West Salem Connector provides rides between 26 designated stops (blue dots) and connects with local bus routes 5, 5A, and 6 for connections to downtown Salem.



users know when their bus will be arriving soon.

About 50 rides are provided per day by the West Salem Connector, and the service generated 3.3 passengers per vehicle hour in its first year of operation.⁵¹ The subsidy provided by Salem-Keizer Transit to operate the service was nearly \$21 per boarding between September 2015 and May 2016, which is somewhat higher than the cost per ride of the fixed bus services that were eliminated (\$16). Vehicle maintenance was one of the factors that increased the overall cost of the service to the transit system.

The overall goal of the West Salem Connector is to improve access and coverage. If ridership increases slightly and the vehicles are replaced with somewhat newer models, the transit system believes the West Salem Connector will provide a superior service at the same cost per trip as the fixed bus services that were eliminated. Salem-Keizer Transit is currently working on a document of lessons learned from the pilot that it plans to publish in spring 2017.

- SW Prime is an on-demand transit service operated by SouthWest Metro Transit, which serves the Minneapolis suburbs of Eden Prairie, Chanhassen, Chaska, and Carver City. The service provides point-to-point service in eight 14-passenger buses to and from anywhere within the transit system's 74-square-mile service area, including several transit stations where express bus routes transport riders to downtown Minneapolis. SW Prime was started in July 2015 and generated an average of 4,441 passengers per month in 2016.⁵²

Rides can be booked using SouthWest Transit's mobile app or website or by phone. Users can track the location of their vehicle in real-time using SouthWest Transit's mobile app or website. All vehicles used for the service are ADA-accessible, but SW Transit also operates a separate and fully ADA-compliant service called Metro Mobility.

SW Prime is offered Monday through Friday from 6:30 am to 6:30 pm and has a standard fare of \$3 per ride. For SouthWest Transit, the subsidy per ride works out to roughly \$9 per passenger. Most of the funding for SW Prime and all SouthWest Transit services comes from the Minnesota Vehicle Sales Tax.

- OmniLink is a flexible transit service operated by the Potomac and Rappahannock Transportation Commission (PRTC) in the Virginia suburbs of Washington, D.C. using 30-passenger buses. While not designed exclusively for employment transportation, 60% of the trips taken on OmniLink's six flexible routes are for employment.⁵³ OmniLink services are able to make deviations of up to $\frac{3}{4}$ mile from scheduled routes and are fully ADA-accessible, thus also serving as a paratransit service. OmniLink was designed in this manner because of budgetary limitations, which do not allow PRTC to be able to afford local bus services otherwise. In addition to scheduled stops along each route, PRTC will make "on-demand" stops at additional designated locations when requested by a passenger. Advanced

⁵¹ Salem-Keizer Transit. <http://www.cherriots.org/en/connector>

⁵² Data provided by SouthWest Metro Transit.

⁵³ Figure provided by PRTC.



reservations only are required for pickups and drop-offs that deviate from scheduled routes. “Standing orders” also are available for regular trips (e.g. for daily commuting).

The six OmniLink routes serve an average of more than 3,100 passengers per day with an average subsidy of \$8 per passenger.⁵⁴ The average ridership across the six routes is nearly 15 passengers per vehicle hour.

RIDE-HAILING

Pinellas County – Direct Connect Pilot

Serving St. Petersburg, Clearwater, and the remainder of Pinellas County (population 950,000) in western Florida, the Pinellas Suncoast Transit Authority (PSTA) was one of the first communities in the U.S. to subsidize rides with ride-hailing company Uber. The pilot partnership, known as “Direct Connect,” was launched in February 2016 with the goals of increasing overall transit ridership and exploring alternatives to fixed bus routes in areas with low ridership. In addition to Uber, the pilot has included United Taxi (a traditional taxi company) and Care Ride (an ADA-accessible transportation provider) as additional partners since its inception.⁵⁵ Lyft has since been added as well.

Under the original six-month pilot, PSTA subsidized ½ the cost of Uber or taxi rides (up to \$3 per trip) provided they began or ended at a designated transit stop within two zones and occurred between 7am and 7pm, Monday through Saturday. Users could access rides with the Uber app (a “PSTA” option has been added to it locally) or by calling United Taxi or Care Ride.

Like Milwaukee County, Pinellas County only has bus service (no rail) and does not have a dedicated local funding source for transit. A proposed county sales tax increase to support the transit system was rejected by voters in 2014, which led to the decision to cut services. At that time, the two least productive routes in the system – the Pinellas Park Circulator and the East Lake Connector – were eliminated and replaced with the Direct Connect pilot. Ridership on those routes was only 4.3 and 1.3 passengers per revenue hour, respectively, compared with a system-wide average of 18.7 passengers per revenue hour.⁵⁶ Both of the original Direct Connect zones covered areas of roughly 10 square miles.

There are several reasons why the Direct Connect pilot included three different transportation providers from the beginning. First, PSTA found that the Federal Transit Administration (FTA) has very stringent drug and alcohol testing requirements that Uber would not meet for programs that subsidize taxi services with the use of federal funds.⁵⁷ To avoid potential legal issues, PSTA decided to give transit riders multiple options to choose from through the pilot, including one (United Taxi) with strong drug and alcohol testing requirements. Unlike Uber, United Taxi also offers the option of paying with cash, which makes the program available to individuals who do not possess credit cards.

⁵⁴ Ridership and cost data were provided by PRTC and analyzed by PPF staff. Cost figures do not include expenditures for fuel or farebox revenue. According to PRTC, the cost of fuel increases the total cost of their OmniLink services by about 20% and farebox recovery covers about 10% of total operating expenditures. Using those estimates, the average cost per passenger would be approximately \$8.64.

⁵⁵ Pinellas Suncoast Transit Authority: <http://www.psta.net/directconnect/index.php>

⁵⁶ Data provided by PSTA.

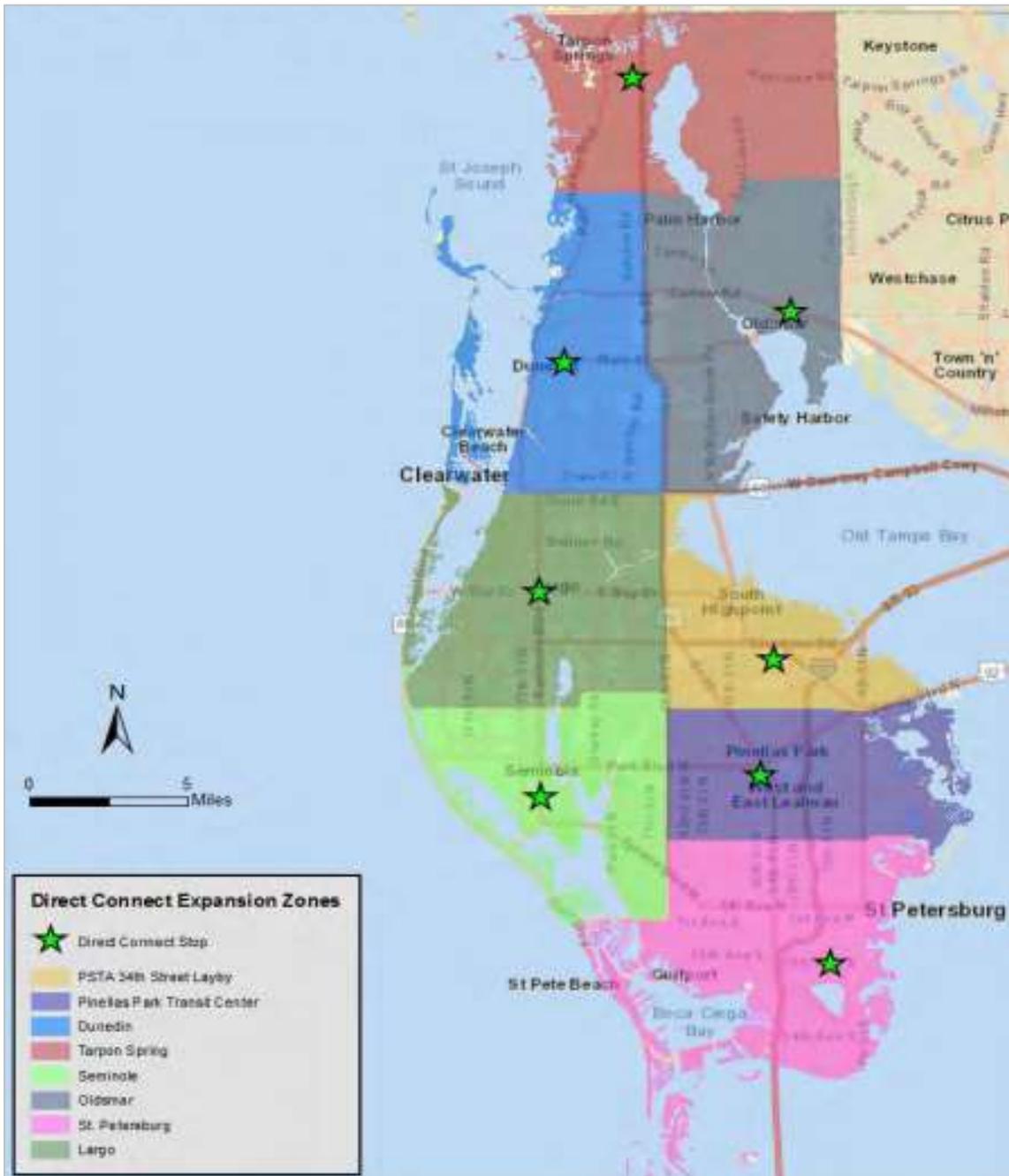
⁵⁷ Federal Transit Administration. <https://transit-safety.fta.dot.gov/DrugAndAlcohol/Regulations/Interpretations/LegalInterpretations/1999/ljones99.asp>



Care Ride was included as a third provider as it was found to be the best local option for ADA-accessible, on-demand transportation services for individuals with disabilities.

PSTA considered the initial, six-month Direct Connect pilot a success and decided to expand the service beginning in December 2016. The expanded pilot includes six additional zones (for a total of eight) that together cover all of Pinellas County (Figure 11). Each zone is roughly 10 square miles in area, and one bus stop within each zone is served by Direct Connect. The eight stops served by the Direct Connect pilot were chosen because they are centrally located within each zone and are on a core bus route that provides frequent service.

Figure 11: The Direct Connect program’s eight zones together cover all of Pinellas County



Under the expanded pilot, trips only are subsidized if they begin or end at one of the designated bus stops and remain within the zone in which that stop is located; most subsidized trips are for distances of three miles or less. The expansion also involves an increase in the subsidy PSTA provides to \$5 per ride. No additional transit routes were eliminated when the program expanded.

Ridership, Cost, and Funding Sources

Uber does not allow its data to be shared publicly, which makes it impossible to provide exact ridership and cost-per-ride figures. However, PSTA has stated that by the end of the initial six-month pilot, Direct Connect was providing a similar number of rides as the bus routes that were eliminated in the two original zones and that the cost-per-ride for the agency had been reduced.

According to PSTA, the vast majority of rides provided through the Direct Connect pilot thus far have been with Uber, which charges a minimum of \$5.95 for rides in Pinellas County. Most rides did not cost much more than Uber's minimum charge. Thus, in the original pilot, PSTA paid \$3 for most rides and the passenger paid roughly \$3. Since the expanded pilot offers a subsidy of \$5 per trip, PSTA estimates that most trips only will cost riders about \$1, making it a more affordable option for people already paying for bus service.

While very few Direct Connect rides have been provided via United Taxi, PSTA reports that the average cost for those rides has been in the \$10-\$12 range. Even with the expanded program, therefore, individuals who choose the United Taxi option likely will have to pay at least \$5 per trip.

The initial six-month Direct Connect pilot was supported with \$40,000 of the roughly \$80,000 in savings that were generated by eliminating the two low-performing bus routes. PSTA also has redesigned its bus system to focus on streamlining routes with fewer deviations and better connections between core routes, which yielded additional savings that helped the Direct Connect pilot expand. The expanded program currently is funded with a pool of \$100,000 that will be used until it runs out. Based on the program performance to date, PSTA is enthusiastic about Direct Connect and plans to push for its continuation.

Challenges and Lessons Learned

Two of PSTA's primary challenges involved raising public awareness of the Direct Connect pilot and familiarizing people with the Uber app. In the initial weeks of the pilot, few people were utilizing the service. Through survey work, PSTA found that mobile phone access was not as common of a barrier for accessing the pilot as they assumed. Rather, many people were unfamiliar with Uber or did not feel comfortable using a mobile app from a third-party provider, rather than one developed by PSTA. Finally, Uber deployed staff members to the bus stops served by Direct Connect for a full week to inform transit riders about the new option and show them how to use the Uber app. That helped to boost ridership, which has continued to grow ever since. Outreach is critical to the success of a program like this.

Another lesson PSTA learned in the initial pilot was that when a designated Direct Connect stop was located next to a major destination (e.g. a transit center located next to a shopping center), some people would avoid using transit altogether by taking Uber to the transit center and walking next door to shop. Since the pilot is meant to be a first mile/last mile service, the eight stops served by the



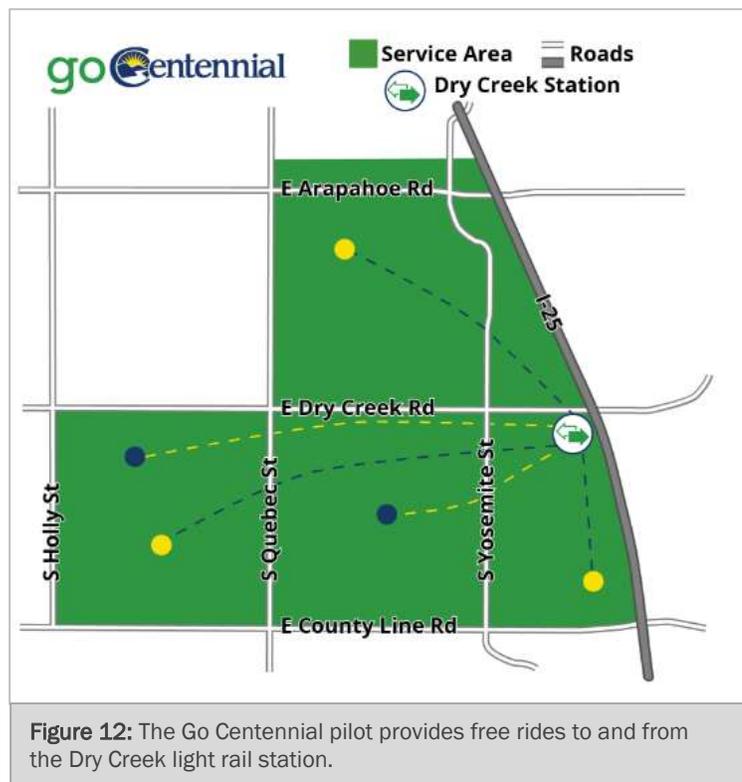
expanded pilot are not next to major destinations, which forces people to use transit for at least part of their trip. While the rationale for this change is justifiable, the resulting service differs from first mile/last mile strategies used in many other places, where services are provided to and from major transit hubs that tend to be near significant activity centers.

Another important ingredient to the success of the Direct Connect pilot, according to PSTA, was a willingness to take risks. Pinellas County was the first transit system in the U.S. to develop a partnership with a private ride-hailing company, which wouldn't have happened without the commitment of individuals at the transit authority, the county, and the state who championed the initiative.

Since the launch of the Direct Connect pilot, PSTA has initiated two additional programs that involve partnerships with ride-hailing companies. One is the Transportation Disadvantaged Late Shift program for low-income residents who begin or end work late at night when the transit system is not operating at full capacity. The State of Florida provided a \$300,000 grant for that pilot, which gives people monthly transit passes at a cost of \$11 per month and provides a 100% subsidy for rides to and from work via Uber, United Taxi, or Care Ride if they occur between 9 pm and 6 am. The second pilot, which is funded by a \$500,000 grant from the FTA's new Mobility on Demand Sandbox program, is supporting a partnership with TNCs for paratransit trips. Care Ride, United Taxi, and Lyft (screened drivers only) are all options for users under that pilot.

Go Centennial Pilot

Serving the Denver suburb of Centennial, CO (population 106,000), Go Centennial is the first pilot program to *fully* subsidize ride-hailing as a first mile/last mile solution.⁵⁸ The partnership between the City of Centennial, Lyft, and Via (a local ADA-accessible transportation service) officially launched in August 2016 and is free to all users on weekdays between 5:30 am and 7 pm. Trips either must begin or end at the Dry Creek light rail station and must remain within the pilot's service area, which is roughly four square miles (**Figure 12**). Additional partners for the pilot include Xerox (the developer of the GoDenver mobile app) and the Denver South Transportation Management Association.



⁵⁸ Go Centennial: <http://go.centennialco.gov/>



All rides provided by Lyft through the Go Centennial pilot are provided through the company's shared-ride "Lyft Line" option, which means that depending on demand, users may share a ride with another traveler.⁵⁹ Accessible rides for individuals with disabilities are provided by Via through the parallel "Go Centennial Access" pilot.

Go Centennial users must download Lyft's mobile app or Xerox's Go Denver transit app to book rides. The City of Centennial also offers the option of calling to book a ride, which ensures that the service is accessible for individuals who do not have smart phones. The phone call option was included to meet federal Title VI regulations, which protect people from discrimination, and was made possible by the fact that the City of Centennial already had a contract with a private vendor for call center services; the Go Centennial pilot simply piggybacked on that contract. According to the City of Centennial, very few people have called to book rides to date.

Ridership, Cost, and Funding Sources

The City of Centennial used transit demand modeling to estimate demand before launching the Go Centennial pilot, and also estimated that the average cost per ride for the service area covered would be about \$7. Thus far, the pilot has outperformed expectations from both a usage and cost efficiency standpoint. Within approximately two months of launching, more than 400 unique users had utilized the service, and the average cost per trip for Lyft Line was at or lower than the \$7-per-boarding that was anticipated.⁶⁰ The average cost-per-boarding also is significantly less than it was for the Call-n-Ride service RTD previously offered in the area, which cost roughly \$21 per boarding. Go Centennial's ADA-accessible service, however, involves a fixed contract, which is quite costly.

The City of Centennial and the nonprofit Denver South Transportation Management Association each contributed \$200,000 for Go Centennial's operations. In addition, the City of Centennial received funding to support the team that developed and executed the pilot from Bloomberg Philanthropies through their Innovation Teams program.

If the six-month pilot ultimately is considered a success, the City of Centennial hopes to continue it and expand it in the future. Operations likely would be financed with the same local and nonprofit funding sources and/or with the support of RTD, which manages the regional transit system.

Dash on Demand – Itasca, IL

Dash on Demand is a new ride-hailing pilot underway in the Chicago suburb of Itasca, IL. The service launched in November 2016 through a partnership between Hamilton Partners (a private company that owns the Hamilton Lakes Business Park), Choose Dupage (Dupage County's economic development organization), and Innova EV, a ride-hailing company that uses 100% electric vehicles. The program primarily provides transportation for workers traveling between the Itasca commuter rail station and the Hamilton Lakes business park, though it recently was expanded to allow the broader Itasca community to use the service as well.⁶¹

⁵⁹ Lyft offers its somewhat discounted "Lyft Line" option in a limited number of markets. Uber similarly offers a shared-ride UberPOOL service in some markets.

⁶⁰ City of Centennial.

⁶¹ Innova EV: <http://www.dashevondemand.com/>



The Dash on Demand pilot was initiated by Hamilton Partners, which approached Innova EV after several tenants of the Hamilton Lakes Business Park expressed concerns with employee recruitment and tenant retention. Choose DuPage joined the program to help with marketing and has connected Innova EV with local businesses and schools for expansion purposes.

The distance between the Itasca commuter rail station and the Hamilton Lakes Business Park is approximately 1.5 miles; under the pilot, rides of up to 2.5 miles are provided. Innova EV's electric vehicles can operate at speeds of up to 35 miles per hour.



Dash on Demand in Itasca, IL provides rides for \$3 or less to and from a commuter rail station using 100% electric vehicles.

All rides through the Dash on Demand pilot are booked via Innova EV's mobile app in real time. Often, a vehicle is parked at the rail station, so some users do not have to wait for a vehicle to arrive. Drivers are employed by and utilize vehicles owned by Innova EV and are paid \$10 per hour, plus tips.

Innova EV also is working on a similar but larger program in the Chicago neighborhood of Bronzeville that will begin service in April 2017 with five electric vehicles initially in service. Additionally, the company has partnered with Columbus, OH to provide transportation and solar energy services as a part of that city's Smart Columbus plan, which recently earned Columbus the federal government's first ever \$40 million Smart City Challenge grant plus \$100 million in matching private funds.

Ridership, Cost, and Funding Sources

Dash on Demand began operating in November 2016 with two vehicles in operation during morning and evening peak periods only. Typically, one of those vehicles remained parked near the station to generate awareness of the new service. Within the first three months, 61 unique riders had used the service. Innova EV plans to ramp up the number of vehicles to five and to expand the hours of operation in spring 2017. The total projected cost for the first year of the pilot for operations, technology, electric vehicle charging, and project management and support is in the \$90,000 - \$120,000 range.

Dash on Demand users are charged a flat rate of \$3 per ride and also are able to receive discounted rates by purchasing a 10-ride pass (\$2.75 per ride), 20-ride pass (\$2.50 per ride), or unlimited monthly pass (\$99). A cash option is available for individuals who do not have credit cards. The relatively low cost for the service is made possible, in part, by advertisements on the outside and inside of the vehicles. Businesses pay \$1,000 per month to have their ad wrapped on a vehicle's exterior and to advertise within a vehicle.



The need for electric vehicle charging stations represents one upfront cost for the Dash on Demand service. Hamilton Partners provides parking spaces in one of its parking structures for the vehicles when they are not in service. The company also installed standard 220-volt electric outlets for vehicle charging and pays for the electricity required to charge the vehicles. Innova EV covered the cost of the electric vehicle charging stations to be installed (approximately \$2,500).

The design of the Dash on Demand service was negotiated between the partners and, according to Innova EV, could be modified in other locations to meet the needs and conditions of the area served. For example, costs could be divided differently and the charge to users could be altered. Local government(s) could be added as partners as well.

Other Examples of Ride-Hailing Partnerships

- The City of Altamonte Springs, FL (population 42,000), an Orlando suburb, was the first city in the U.S. to begin subsidizing *all* Uber rides within its municipal borders.⁶² The City pays for 20% of all Uber trips within city limits and 25% of those that connect with the Altamonte Springs commuter rail station. The first year of the partnership had a budget of \$500,000 and includes some funding from local businesses.
- The Metropolitan Atlanta Rapid Transit Authority (MARTA) started a more modest last mile partnership with Uber in 2015, which simply offers new Uber users \$20 off their first ride with promotional code “MARTA.” MARTA also provides free Wi-Fi on all of its buses, which makes it easier for users to book rides with Uber and other ride-hailing services.
- Boston’s Massachusetts Bay Transportation Authority (MBTA) is piloting partnerships with Lyft and Uber for its paratransit program, “The Ride.” Under the pilot, users pay the first \$2 for an accessible ride with a screened and trained Lyft or Uber driver, and MBTA pays up to \$13 of the remainder. The new option facilitates mobility for people with disabilities by eliminating the need for paratransit users to book rides 24 hours in advance. It also reduces service costs for MBTA; in 2015, the average paratransit trip cost MBTA \$45. Over 10,000 rides have been provided by Lyft and Uber since the pilot began in October 2016.⁶³

MBTA’s traditional paratransit service still is available, so Lyft and Uber simply have been added as additional options for users who do not require wheelchair access. Lyft also has introduced a call center option that allows individuals without smart phones to call to book rides.

SUMMARY & OBSERVATIONS

Flexible transit services and ride-hailing services have been introduced in several lower-density areas in other U.S. metro areas that are difficult to serve with regular fixed-route transit services. As illustrated by the case studies presented above, those services are designed in varying ways from

⁶² Reuters. “First City in the Nation Plans to Subsidize Uber Rides.” *Fortune*. March 3, 2016. <http://fortune.com/2016/03/03/uber-subsidy-public-transportation>

⁶³ Boston Globe Media Partners. “MBTA to expand use of Uber, Lyft for disabled riders.” February 28, 2017. <https://www.boston.com/news/local-news/2017/02/28/mbta-to-expand-use-of-uber-lyft-for-disabled-riders>



place to place based on the specific characteristics and needs of the area. Key takeaways from our analysis of the case studies presented above including the following:

- Piloting a flexible transit or ride-hailing service may make the most sense in areas where demand exists for transit but where regular, fixed bus service may be unsustainable. The Denver RTD case study, for example, shows that flexible transit services are being used in areas where demand is relatively low. Likewise, Pinellas County began its ride-hailing pilot as a replacement for its two lowest-performing bus routes.
- The Centennial, Denver RTD, and Itaska case studies show that flexible transit, ride-hailing, and other last mile strategies may be especially effective as complementary services to rail and bus rapid transit (BRT) services due to the higher volume of riders that typically utilize each station relative to regular bus services.
- The Centennial, Itaska, and Pinellas County case studies show that ride-hailing partnerships can have a relatively low cost for both users and the transit system if they are designed as first mile/last mile connectors that make short trips to and from designated transit stops. The cost for trips of approximately three miles or less through ride-hailing services typically is in the \$6-10 range, though trips requiring ADA-accessible services cost significantly more. Subsidies can be offered that cover a portion or all of the cost of those trips.
- Ride-hailing case studies in Centennial and Itaska show that the private sector is taking an active role in developing and funding new first mile/last mile services in some metro areas. The pilot in Centennial, for example, benefited greatly from the involvement of a public-private transportation management association (TMA). In Itaska, a business park initiated the service and provides space for vehicles to park and charge overnight, and business advertisements on vehicles are reducing the cost of the service for users.
- Municipal funding and state and federal grants also support many transportation services in suburban areas. Centennial and Altamonte Springs are two examples of local municipalities that have helped to develop and fund new first mile/last mile services. Several communities have received federal grants from the FTA's new Mobility on Demand Sandbox program to introduce new ride-hailing partnerships or to integrate a ride-hailing or bike share service into the transit system's mobile application. Pinellas County also received grants from the State of Florida for two of its ride-hailing pilot programs.
- Transit systems in Virginia and Boston show that flexible transit and ride-hailing services can be used to reduce the cost of paratransit services. Virginia's flexible transit routes are designed to allow for $\frac{3}{4}$ mile diversions from set routes and are fully accessible for people with disabilities. Boston's partnership with Lyft and Uber is only for paratransit trips and involves screened and trained drivers.
- Pinellas County's Direct Connect pilot exemplifies the importance of outreach to make people aware of new first mile/last mile services, particularly if the primary way of accessing those services is through a mobile app with which many transit riders may be unfamiliar.



LOCAL AREA STUDIES

Our analysis shows that metro areas across the country are using a variety of strategies that Milwaukee could consider to improve last mile connections in targeted locations. To put our national research into local context, we decided to apply our findings to two distinct areas of metro Milwaukee where transit access has been identified by area businesses and/or civic leaders as a significant issue: Milwaukee's Menomonee Valley and New Berlin. Examining one urban and one suburban area illustrates how last mile challenges can differ from one location to another, and how the most promising solutions to address those problems may vary as well.

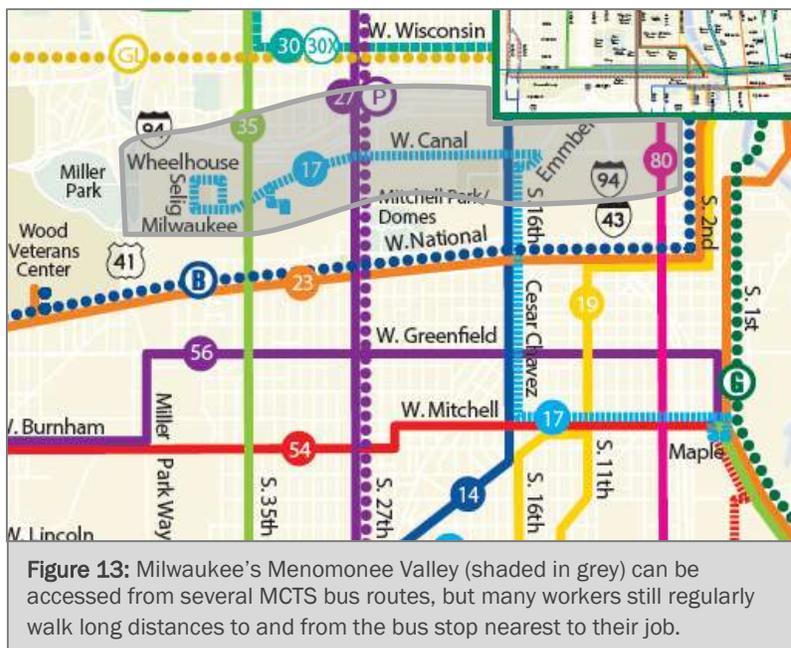
The analysis presented below was informed by interviews with business improvement district (BID) leaders, business association representatives, and individual employers. While we limited our analysis in this section to the Menomonee Valley and New Berlin, there are several additional locations throughout the metro area where last mile strategies may be worth considering.

MILWAUKEE'S MEMOMONEE VALLEY

Menomonee Valley Partners, Inc. (MVP) – a nonprofit organization dedicated to strengthening Milwaukee's Menomonee Valley district – recently completed a strategic plan that identified reliable transportation for employees of Valley businesses as a priority issue. Businesses of varying sizes, industries, and lengths of tenure in the Valley expressed concerns about the reliability of their employees' transportation options during MVP's strategic planning process, including Charter Wire, Palermo's Pizza, Potawatomi Hotel and Casino, Rishi Tea, Zimmerman Architectural Studios, and others.⁶⁴ Since MVP's strategic plan was completed, it has been used to inform the annual operating plan of the Menomonee Valley business improvement district (BID #26), which uses funds raised by a voluntary charge on Valley businesses to make district improvements.

Transit access

Currently, MCTS Route 17 connects the south side of Milwaukee to the heart of the Menomonee Valley via Canal Street (**Figure 13**). MVP played a key role in advocating for Route 17 to be initiated in 2006 and has since advocated for modifications to the service. For example, when MVP's analysis found that most Valley workers were coming from the city's south side, the route was changed to begin on Kinnickinnic Ave. near Mitchell St. rather than at the



⁶⁴ Menomonee Valley Partners.



former Downtown Transit Center where it originally began. In 2016, MCTS worked with MVP and surveyed Route 17 customers, which resulted in added trips, improved efficiency, and a small ridership gain. MVP still can influence the schedule for Route 17 if there is enough demand from employers for changes.

Currently, Route 17 operates on weekdays from 3:30 am to 7 am, 1 pm to 5 pm, and 10 pm to midnight. The route also operates on weekends, but with more limited hours. On average, 115 people ride Route 17 on weekdays.⁶⁵ At 10.7 passengers per vehicle hour, ridership on the route is more typical of suburban bus routes and is less than half of MCTS' system-wide average of 26.3. This is likely a reflection of the Menomonee Valley's lower-density development character.

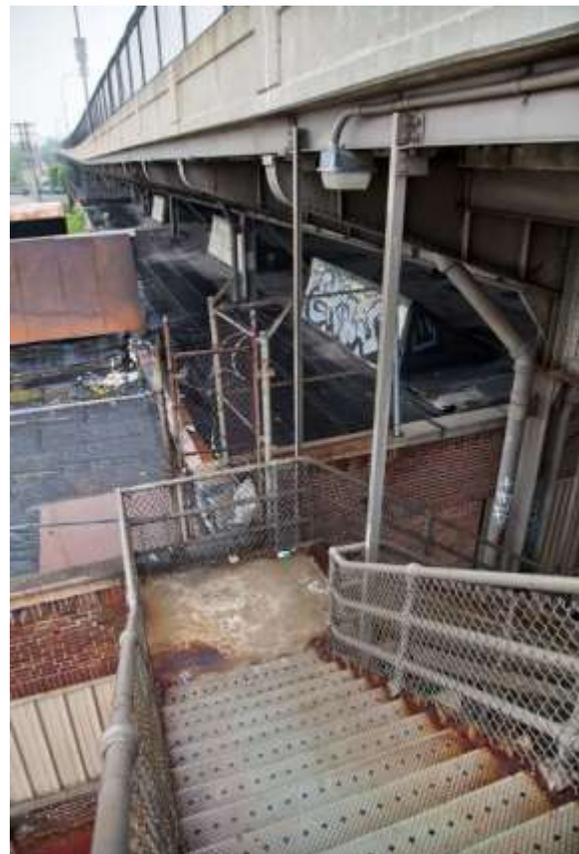
For the first three years of its operation, Route 17 was supported with funds from the federal Job Access and Reverse Commute (JARC) program, with a local match provided by BID #26, the Wisconsin DOT, and the Forest County Potawatomi. Despite Route 17's modest ridership, the route has been supported since 2009 by MCTS without the assistance of JARC or the other entities that previously provided matching funds.

While Route 17 provides good access to Valley businesses along Canal St. for workers coming from the south side, it is less effective for workers coming from the north and east sides. In addition, the route's schedule does not meet the needs of those who start their work day after 7 am.

As **Figure 13** shows, additional transit access is provided by routes that travel north and south over the Menomonee Valley (14, 27, 35, 80, and PurpleLine) and east and west just outside of the Valley (23, 30/30X, BlueLine, and GoldLine). With the exception of Route 80, which runs along S. 6th St. on the Valley's eastern edge, none of those bus routes provides direct access to Valley businesses. Rather, workers often must walk long distances to and from jobs in the Valley from the nearest bus stops on Wisconsin Ave., National Ave., the 16th or 35th Street viaducts, and other locations.

Walking to and from 16th and 35th Streets involves using stairways that connect the viaducts to the Valley floor. There also is a stairway attached to the 27th St. viaduct at Greves St., but with its location between Interstate 94 and an active rail line, it does not provide access to many employers.

For contextual purposes, the average number of people getting on and off of buses (boarding and alighting) at key intersections in and around the Menomonee Valley is provided in **Table 5**. These



The stairway on the 16th St. viaduct at Canal St. provides access to bus stops served by Route 14. (photo by Eddee Daniel)

⁶⁵ MCTS data. September 2015.



data do not allow us to know how many transit riders are going to and from jobs in the Menomonee Valley, but they do show that several of these intersections are major hubs of transit activity.

Table 5: Average daily bus ridership activity at intersections around and in the Menomonee Valley⁶⁶

| Intersection | Bus Routes Serving Intersection | Boarding | Alighting | Total On/Off |
|--------------------------------------|-------------------------------------|----------|-----------|--------------|
| 35 th St. viaduct & Canal | 35 | 13 | 18 | 31 |
| Canal St. & 16 th | 17 | 22 | 17 | 39 |
| 6 th & Canal | 80 | 19 | 24 | 43 |
| 16 th St. viaduct & Canal | 14 | 368 | 411 | 779 |
| 35 th & National | 23, 35, BlueLine | 597 | 555 | 1,152 |
| 16 th & National | 14, 17, 23, BlueLine | 626 | 544 | 1,170 |
| 27 th & National | 23, 27, BlueLine, PurpleLine | 1,096 | 962 | 2,058 |
| 27 th & Wisconsin | 30, 30X, GoldLine | 1,564 | 1,292 | 2,856 |
| 35 th & Wisconsin | 30, 30X, 35, GoldLine | 1,563 | 1,372 | 2,935 |
| 16 th & Wisconsin | 14, 23, 30, 30X, BlueLine, GoldLine | 1,873 | 1,764 | 3,637 |

Parking availability

In addition to the Valley’s limited transit accessibility, parking is a challenge for several employers, as many on the Valley’s west end have outgrown (or soon will outgrow) their parking lots. A significant amount of public parking is available along Milwaukee Rd. and Wheelhouse Rd., and limited street parking is available along Canal Street west of 35th St. and east of 16th St., but some employers have expressed concerns regarding the distance their employees who use those parking options must walk to get to and from work. Parking for businesses along St. Paul Ave. is limited as well.

Bicycle and pedestrian access

Bicycle and pedestrian access to the Valley has been improved significantly over the last 10-15 years with the development of the Hank Aaron State Trail, which runs along Canal Street and through Three Bridges Park. Bicycle and pedestrian-only connections into the Valley also have been added from 6th St., Pierce St., and Mitchell Park. In addition, lighting was added to the stairways attached to the 16th and 35th St. viaducts to improve safety.

Yet, safety concerns remain among some Valley employers for their employees who walk at night and in the winter to access bus stops on Wisconsin Ave. and National Ave. Also, there are fewer safe options for entering the Menomonee Valley from the north by foot or bike. Access is available from the north via 13th, 25th, and 32nd Streets, but none of those streets have bike lanes.

Since 27th St. is the second busiest transit corridor in Milwaukee, an improved pedestrian connection from that street could be very beneficial. That area is in the floodplain, however, so a new bicycle/pedestrian ramp from the 27th St. viaduct at Canal St. would not be allowed. Improving bicycle and pedestrian access into the Valley from N. 25th St. may be the best alternative.

BublR bike share stations have been added around the Menomonee Valley over the past two years, with stations currently located around the eastern end of the district and as far west as 16th St. to

⁶⁶ PPF analysis of MCTS data from September 2015.



both the north and south. A station has been proposed at the new City Lights Brewing on Mt. Vernon Ave., which would be the first station located in the heart of the Valley. Future growth of the Bubl system in and around the Valley appears promising.

Potawatomi Hotel & Casino

With 2,650 employees, Potawatomi Hotel & Casino is the largest employer in the Menomonee Valley. Casino leaders have been looking for solutions to their high employee turnover rate and are currently surveying employees on a range of issues, including transportation. Potawatomi already subsidizes half the cost of bus passes for its employees, and the hotel and casino are located on Canal St. along the Route 17 bus line, but casino leaders believe transportation still may be a key issue for many workers.

In fact, Potawatomi already has begun exploring options for improving transportation for employees of the hotel and casino, including the possibility of subsidizing Lyft, Uber, or taxi rides or operating a shuttle service. An independent shuttle would be quite expensive, however, as new vehicles would need to be purchased. In fact, the startup cost has been estimated at \$300,000, leading casino leaders to consider other possibilities.



Rishi Tea

Rishi Tea is a growing company that moved to its current location on 33rd Ct. on the west side of the Menomonee Valley in 2014. Currently, Rishi employs 108 people in its production and office operations, including 102 who work first shift. Rishi's parking lot has just 42 spaces. Limited street parking is available along nearby streets, but some employees have to park farther away from the business than they and the company's management would prefer.

Transit also poses challenges for some Rishi employees. The current layout of MCTS Route 17 works well for many individuals who work on the company's production team, a majority of whom live on the city's south side. Production workers begin work at 5 or 6 am and end between 3 and 5 pm, and the schedule for Route 17 accommodates the work schedule of those workers fairly well. Transit is not as effective for office staff members, however, who typically begin work at 8 or 9 am and end at 5 or 6 pm. The frequency of Route 17 drops off after 7 am and after 5 pm, which makes it ineffective for those workers. Individuals who live on Milwaukee's East Side, Riverwest, and other northern neighborhoods often end up taking other bus routes to the intersection of 35th and Wisconsin and walking from there. Others coming from the south side, Walker's Point, and Bayview often have to walk from bus stops at 35th and National. These are roughly 20 minute walks, which can be a safety concern at night and in the winter.



Last mile strategies to consider

Several strategies presented in this report could be considered to improve access to businesses in the Menomonee Valley. One simple option to address concerns with existing transit services would be to **modify MCTS Route 17**, which runs on Canal St. Such changes could involve expanding the hours the bus service runs or modifying the layout of the route to improve connections for north side and east side residents. Input from businesses and transit riders would be essential to informing any modifications to the route's layout or schedule.

The greatest strength of this approach is the relative consistency it would provide for those who already use Route 17. It would not address employers' parking concerns in a significant way, however, and extending the hours that Route 17 operates may not be an efficient use of resources. The lower development density of the Menomonee Valley, combined with restrictive zoning in the area that does not allow for mixed-use development, constrains it from becoming a 24-hour district that could sustain fixed-route bus services all day. Relaxed zoning regulations could make transit more viable in the future.

Another transit-related solution that could help improve access for some Valley businesses would be to shift one bus route that runs east and west along Wisconsin Ave. down to St. Paul Ave. If the planned East-West BRT project moves forward, several bus routes could be rerouted off of Wisconsin Ave., which could make this a real possibility.⁶⁷ St. Paul Ave. has limited parking, however, so removing street parking to make space for bus stops may be met with opposition from some businesses.

An alternative approach would be to **pilot an on-demand transportation service** for Valley employees. This approach could involve a partnership with a ride-hailing company like Lyft or Uber; an independent employer shuttle; or a service with elements of both. A pilot on-demand transportation service could be designed to provide rides within a defined geographic area to serve as a last mile service for both transit riders and drivers who currently walk long distances to and from their workplaces from nearby transit stops and parking lots. Some or all of the intersections in **Table 5** (on page 49) could be served, as well as the public parking lots on Milwaukee Rd. and Wheelhouse Rd. on the Valley's west end and potentially other parking facilities within or near the Valley. With this approach, MCTS Route 17 could be maintained, scaled back to operate only at times when ridership is high, or fully replaced by the on-demand service.

The Dash on Demand pilot in Itasca, IL could be one good model for the Menomonee Valley, as it provides on-demand transportation at an affordable price for riders with the support of business advertisements on vehicles. It also features electric vehicles, which could align well with the environmental ethic the Menomonee Valley has developed over the last two decades. Valley businesses and/or Milwaukee County could consider subsidizing the fares paid by users.

A third option that could be effective in the Menomonee Valley is to **add more Bublr bike share stations** at key transit intersections near and within the Valley. As **Table 5** (page 49) shows, thousands of transit riders get on and off buses at major intersections along Wisconsin Ave. and National Ave. Bublr could add stations near some of those intersections and at key locations within

⁶⁷ MCTS. East West Bus Rapid Transit website. <http://www.eastwestbrt.com>



the Valley to facilitate last mile trips. The cost of this approach would be \$15,000 per station per year for five years.

Financing possibilities

A new on-demand transportation service could be financed publicly, privately, or through a public-private partnership. A partnership with a ride-hailing company like Lyft or Uber, for example, could be financed by Milwaukee County by reducing service on or eliminating the Route 17 bus line or by acquiring a federal grant through a future phase of the FTA's Mobility on Demand Sandbox program. A partnership with Innova EV could be largely financed with private advertising dollars, though public funding could help make the service even more affordable for users.

An expansion of Bublr bike stations in and around the Valley could be financed through sponsorships by Valley businesses, federal CMAQ or TAP funding, State congestion mitigation funding, or a combination of sources. Employers also could consider subsidizing Bublr memberships for their employees.

Finally, the Menomonee Valley's business improvement district (BID #26) could play a role in helping to finance a pilot on-demand transportation service or Bublr expansion to help workers access their businesses. In fact, the BID has expressed openness to considering such possibilities. There is some precedent for BID involvement in local transportation issues in Milwaukee. In addition to BID #26's financial contribution that helped start the Route 17 bus line, the Downtown BID (#21) had a very active transportation committee during the Marquette Interchange reconstruction project that advocated for a number of design improvements and has contributed substantial resources to initiate and maintain the Downtown Trolley service. BIDs have contributed to transportation services in other cities as well, according to a recent analysis by the Utah Transit Authority.⁶⁸

NEW BERLIN

In our series of conversations with planners, economic development leaders, and transit system officials in Waukesha County, the City of New Berlin consistently was identified as a municipality where transit services have been a long-term challenge. Both MCTS and Waukesha Metro Transit have operated transit routes serving New Berlin in the past that were eliminated due to a combination of insufficient ridership and budget shortfalls.

Currently, MCTS Route 6 serves New Berlin, but the funding source supporting that route is temporary in nature. Milwaukee Innercity Congregations Allied for Hope (MICAH) and the Black Health Coalition of Wisconsin worked with MCTS to create Route 6 in 2014 using settlement money from the Zoo Interchange lawsuit.⁶⁹ Those funds likely will run out by the end of 2018, at which time Route 6 only will be maintained if MCTS is able to finance the route within its existing resources or an alternative funding source is identified.

⁶⁸ Utah Transit Authority. "UTA First/Last Mile Strategies Study." April 2015. https://www.rideuta.com/-/media/Files/Studies-Reports/UTAFirst_LastMileFINALCOMP1.ashx

⁶⁹ In the Zoo Interchange lawsuit, MICAH and the Black Health Coalition argued that the massive Zoo Interchange reconstruction project discriminated against low-income and minority city residents because it did not include public transportation improvements.



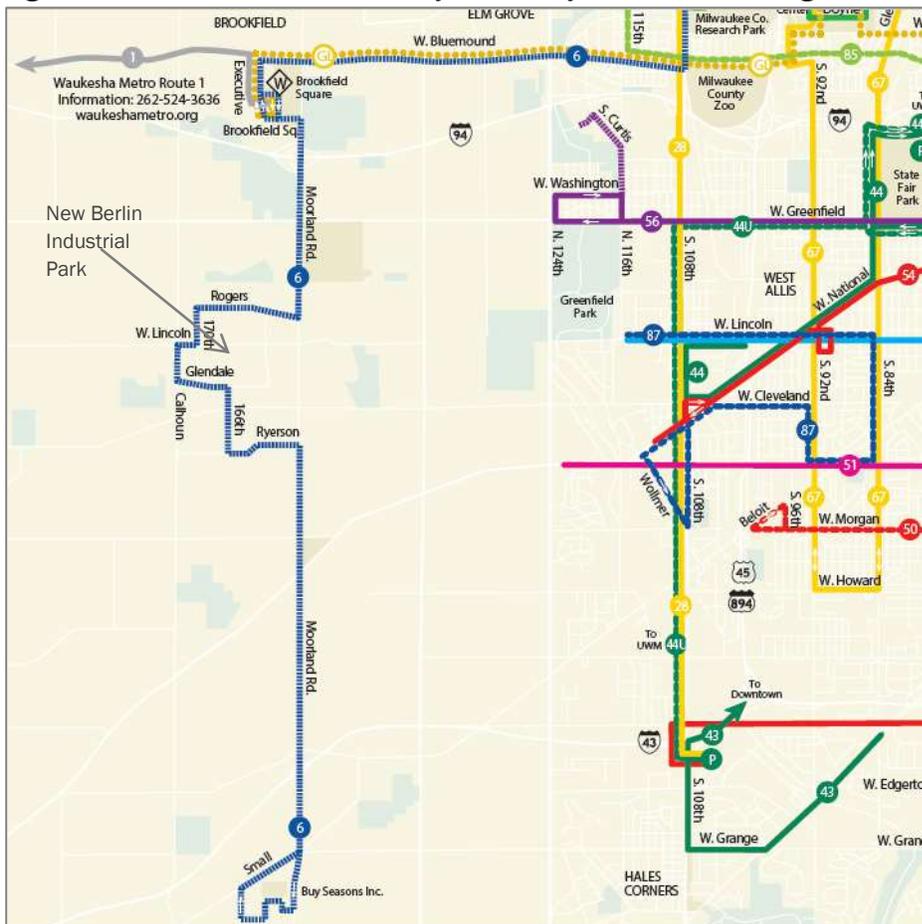
These factors – combined with New Berlin’s proximity to the existing transit system, its low development density, and its fluctuating demand for transit (due in part to the seasonal nature of some of the major employers in the area) – could make it a viable candidate for some of the last mile transportation strategies discussed in this report.

New Berlin businesses are organized through both the New Berlin Chamber of Commerce and the New Berlin Industrial Association. According to the New Berlin Industrial Association, there are roughly 600 businesses located in New Berlin’s three business parks, which together employ about 12,000 people. All three business parks are located near the north-south spine of Moorland Rd. The largest among them is the New Berlin Industrial Park. The other two parks are located further south along Moorland on opposite sides of Interstate 43. Two of the largest employers in New Berlin are FedEx and Buy Seasons, both of which offer a considerable number of seasonal jobs.

Transit access

MCTS Route 6 currently provides a direct transit connection to New Berlin for residents of several north side Milwaukee neighborhoods. The route begins on Capitol Dr. at Port Washington Rd., travels west on Capitol to Mayfair Rd., and passes Mayfair Mall and Brookfield Square on the way to New Berlin. As **Figure 14** shows, the route then travels south on Moorland Rd., winds through the New Berlin Industrial Park, and ends at Buy Seasons.

Figure 14: MCTS’s Route 6 currently is the only transit line serving New Berlin



Route 6 currently operates at limited times designed to align with the schedules of area employers, with additional trips added during seasonally busy periods. MCTS recently announced that the stretch of Route 6 between Brookfield Square and Buy Seasons will be ramped up to hourly service in the near future, which will improve connections to New Berlin significantly for individuals transferring from the MCTS GoldLine at Brookfield Square.

While Route 6 offers an opportunity for Milwaukee residents to access New Berlin by transit that was not available previously, travel times still can be cumbersome, particularly for south side residents. At least five other MCTS bus routes that get close to New Berlin end at the Milwaukee/Waukesha County border. Thus, south side residents typically must transfer between three different buses and spend at least 80 minutes to get to jobs in New Berlin. Below, examples are provided that illustrate the time it takes Milwaukee residents living in four high-poverty ZIP codes to travel by transit and arrive at businesses in the heart of the New Berlin Industrial Park (Lincoln Ave. at Calhoun Rd.) between 8 am and 8:30 am on a Monday morning.^{70 71}

- From Locust and Teutonia (ZIP 53206): 71 minutes on routes 80 and Route 6
- From Walnut and Lisbon (ZIP 53205): 73 minutes on BlueLine and Route 6
- From S. 13th and Greenfield (ZIP 53204): 85 minutes on routes 56, 28, and 6
- From S. 27th and Oklahoma (ZIP 53215): 89 minutes on PurpleLine, GoldLine, and Route 6

Nevertheless, many people do use the MCTS Route 6 bus service to get to New Berlin. On an average weekday, 142 people get off of a Route 6 bus in locations south of Brookfield Square, which is an area where Route 6 is the only transit option.⁷² In that same area, an average of 82 people board Route 6 buses each weekday.

Heritage at Door Creek /Regency New Berlin

Heritage at Door Creek is an assisted living facility on 147th St. near National Ave. in New Berlin. The facility employs approximately 300 people, a large percentage of whom live on Milwaukee's south side. For many employees, transportation is a major challenge. There is no direct bus line from the south side to New Berlin, and for many, taking multiple bus routes and then walking or biking a mile to work is not an attractive option. Some employees rely on rides from co-workers, which can be effective but is not always reliable. Many individuals who interview for jobs at the facility end up backing out due to the lack of transit options.



Regency New Berlin is another assisted living facility located on National Ave. in an area that is not served by transit. Most of its approximately 100 employees live in Milwaukee and many have difficulties getting to and from work. MCTS Route 51 ends at the Milwaukee/Waukesha County border one mile east of the facility.

⁷⁰ The poverty rate for each of these ZIP codes was at least 30% as of 2014 according to the U.S. Census Bureau.

⁷¹ In some cases, individuals could opt to take Waukesha Metro Route 901 instead of one of the MCTS routes to get to Brookfield Square, which may save them a few minutes but would cost an additional \$2.75 each way.

⁷² Ridership data from fall 2015 were provided by MCTS and analyzed by the Public Policy Forum.



There is no way to determine what the demand might be for bus service that would connect riders from the western terminus of existing MCTS bus routes to New Berlin (routes 51, 53, 54, 55, and 56 end in West Allis, Greenfield, or Hales Corners near their borders with New Berlin). We do know, however, that on an average weekday, 346 people get off buses at the western endpoints of those routes, while 410 people get on buses at those locations to travel east each day.⁷³

Last mile strategies to consider

One option for improving access to jobs in New Berlin would be to **add flexibility to MCTS Route 6** to allow vehicles to pick up and drop off passengers at destinations within a designated distance of the route. Since all three New Berlin business parks are located off of Moorland Rd., this may be an effective approach to increase access to more employers and destinations in New Berlin. Set stops still could be maintained, with added time built into schedules to accommodate route deviations. Route 6 either could be fully maintained or reduced only to extend from Brookfield Square to its current end point near Buy Seasons.

Adding flexibility to the route may need to involve introducing new technology that allows riders to request rides and drivers to navigate to requested pick-up and drop-off points. It also could involve replacing the vehicles used for the service with smaller 14-passenger vehicles.

While a fully flexible or on-demand transit service has never been tried in the Milwaukee area, Waukesha Metro Transit did briefly experiment with flexible service on its Route 302 bus line in New Berlin. That route was introduced in 2000, flexible service was added *on a portion of the route on weekends only* in 2001, and the service was eliminated in 2002. According to Waukesha Metro Transit, there was not sufficient demand in general at that time for Route 302 to be maintained. For that service, passengers could request to be dropped off at locations that were not scheduled stops while on board, and individuals could call at least one hour in advance to request to be picked up in a location that required an unscheduled stop. No new technology was required for that service.

Another transit improvement that could be considered would be to **extend one of the bus routes that currently terminate at the Milwaukee/Waukesha County border**. MCTS Route 51 or 54, for example, could be extended further west on National Ave. to connect with Route 6 at Moorland Rd., which would improve access to New Berlin for residents of Milwaukee's south side and West Allis.

A different strategy would be to **pilot an on-demand transportation service** that serves all (or more likely, a designated portion) of New Berlin. Such a service could be designed to connect transit riders from the MCTS and Waukesha Metro bus routes that terminate at Brookfield Square and near the Milwaukee/Waukesha County border with destinations throughout New Berlin, and either could complement or partially or fully replace MCTS Route 6.

For example, a service operated by MCTS or Waukesha Metro Transit could be designed similar to Denver's Call-n-Ride services to combine a flexible transit route and on-demand transportation service; or like SouthWest Transit's SW Prime services, which provide exclusively on-demand services. Based on the case studies in this report, the operational cost of such an approach may be

⁷³ Ridership data from fall 2015 were provided by MCTS and analyzed by the Public Policy Forum.



between \$8 and \$20+ per passenger depending on ridership, the size of the service area, the number of vehicles in operation, and other factors.

Alternatively, a partnership with a taxi company and/or TNC like Lyft or Uber could be considered. This approach would eliminate the need to purchase and maintain vehicles and could be available at any day, time, and location based on demand. To keep such a service affordable to users, however, subsidies likely would be needed. Examples of estimated trip costs via Lyft or Uber to the New Berlin Industrial Park and Buy Seasons are provided below.⁷⁴

- Brookfield Square to New Berlin Industrial Park: \$6-9
- Brookfield Square to Buy Seasons: \$12-16
- 108th and National in West Allis to New Berlin Industrial Park: \$9-12
- 108th and National in West Allis to Buy Seasons: \$11-15

Additional input from employers and individuals who work in New Berlin would be very helpful in determining what, if any, strategy to pilot in the area. If any new service were introduced, marketing that service and showing transit riders how to utilize the new service would be very important. For example, users may have to download and learn how to use a new mobile application to tap into the service. For those without smart phones, alternative options may be necessary.

Financing possibilities

With funding for MCTS Route 6 likely to run out by the end of 2018, redirecting funding from that service is not a long-term option. Consequently, a new funding source likely would be needed to add any new transportation services in New Berlin. Since improved transportation connections to businesses in New Berlin stand to benefit both Waukesha County employers and Milwaukee County residents, cooperation between the two county governments to implement such connections would appear logical.

As previously mentioned, if policymakers wish to pilot an on-demand transportation service in New Berlin or elsewhere, a federal grant could be pursued from the FTA's Mobility on Demand Sandbox program. The awards provided to recipients of that program's first funding cycle ranged in value from \$206,000 to \$1.35 million.

New Berlin employers also could be part of the solution to designing and helping to finance any new or modified transportation services in the area. One option of doing so would be to form a new transportation management association (TMA) made up of member employers and local

Shared Use Mobility Center

The Shared Use Mobility Center (SUMC) is a national nonprofit organization based in Chicago that works "to foster collaboration in shared mobility (including bikesharing, carsharing, ridesharing and more) and helps connect the growing industry with transit agencies, cities and communities across the nation."

The organization advises local governments and transit agencies and helps them to develop pilot programs that involve shared mobility options. The SUMC could serve as a valuable resource for Milwaukee area policymakers and transit system officials.

⁷⁴ Estimates are taken from Google Maps. Several MCTS bus routes serve the intersection of 108th and National.



governments, which could collect member dues and pursue grants to support new transportation services in the area. Alternatively, input and funding for transportation possibly could be funneled through the New Berlin Chamber of Commerce or New Berlin Industrial Association.



CONCLUSION

Our research shows that cities and regions across the U.S. are utilizing a variety of strategies to address last mile transportation challenges, from flexible transit services to employer shuttles. At the same time, the rise of smart phones, mobile applications, and new private transportation service providers has ushered in a highly experimental period in which transit systems are testing new ways of providing on-demand transportation services.

Here in the Milwaukee area, several last mile strategies have been introduced or tried recently, and progress has been made on the technology front as well. Yet, there are a number of additional possibilities local elected officials and transit system leaders should consider that could offer last mile solutions while also improving general transit access, coverage, and quality in the Milwaukee area. While no last mile strategy would be a perfect, comprehensive solution in all areas of the region, each may be effective in certain contexts and/or in combination with other services.

It is critical to recognize that implementation of any of these strategies will require additional public funding and/or an employer subsidy for each trip. As we have explained in our previous research, efforts to solve last mile and similar transit challenges related to suburban job sites typically require higher per-passenger subsidies given the relatively low volume of riders served, which is the byproduct of low-density development patterns. The lower ridership totals and higher per-passenger costs do not mean that solutions should not be pursued given the important workforce and economic development objectives that are at play. This does mean, however, that public and private sector entities may need to work together to secure funding and to identify options that can produce mutually acceptable solutions.

Based on our analysis of last mile transportation strategies, we recommend the following:

Build on recent efforts to improve transportation connections in the Milwaukee area through shared-ride taxi services and bicycle services and amenities.

The recent expansion of Ozaukee County's shared-ride taxi service to serve bus stops in Milwaukee County could help bridge a divide for Milwaukee County residents who commute to work in Ozaukee County. If successful, Ozaukee County should consider further expanding the service to additional Milwaukee County bus stops near its borders. Washington County could consider a similar approach. Public outreach to raise awareness of these service offerings will be essential to their success.

Bicycling has become a last mile strategy for many individuals through the installation of bike racks on all MCTS buses and the introduction of the Bublr bike share system. MCTS also has begun to collaborate with Bublr by calling out bike share stations located near bus stops and listing the bike share stations on its website. To build on these developments, Waukesha County should consider adding bike racks to some or all of its buses, and Bublr and MCTS should further coordinate by strategically locating future bike share stations near major transit stops. Continued infrastructure improvements (e.g. additional bike lanes and sidewalks) – particularly near transit stops – also can make biking and walking safer and more effective last mile options.



Develop and implement an official MCTS mobile application with robust capabilities.

MCTS recently introduced new electronic fare cards and a website that allows transit riders to track bus arrivals in real-time. As our analysis shows, other transit systems have gone further by developing mobile applications that allow users to purchase bus passes and add value to their fare cards, get point-to-point transit directions, and track bus arrivals in real-time using their mobile devices. In some cases, ride-hailing and/or bike share services are integrated into those mobile apps to allow transit users to plan and pay for trips that require a last mile connection.

An official MCTS mobile app could make transit and complementary transportation services more convenient for users and pave the way for a future that could include on-demand transportation services. Through regional collaboration, Waukesha County's transit and Ozaukee County's share-ride taxi services also could be integrated into the app.

Pilot a flexible transit and/or on-demand transportation service in metro Milwaukee.

It is very difficult to serve suburban business parks and other lower-density areas with regular bus service due to their dispersed nature and relatively low levels of demand for transit. Rather than a one-size-fits-all approach in which fixed-route bus service is the sole mode of public transportation, MCTS and Waukesha Metro Transit should consider experimenting with flexible transit or on-demand transportation services in targeted areas. On-demand services also could be considered for nights and weekends when the transit systems are not operating at full capacity.

Case studies included in this report show that both flexible transit and on-demand transportation services can improve access and coverage in lower-density areas where fixed-route bus services often are not feasible. Both service types can be designed to complement regular bus services and to be relatively low in cost to both users and the transit system by only serving limited geographic areas that connect with designated transit stops.

If new flexible transit or on-demand transportation services are introduced, it may be best to start with a small, targeted pilot in one or two priority areas. Public input and demand modeling could be used to gauge the likely ridership and cost of these services, and their performance then could be monitored over time. Public outreach would be essential to the viability of new services – particularly for those that would involve the use of new technology. If such a pilot were pursued, the FTA's Mobility on Demand Sandbox program would be one potential funding source.

Consider how benefits provided by innovative last mile strategies can extend beyond reverse commuters to broader populations of transit users and the transit system.

While the focus of our research was on improving access to employment for Milwaukee County residents, last mile transportation services also can improve mobility for other populations. For example, a primary goal of flexible transit and on-demand transportation services in some U.S. metro areas, such as Denver and Minneapolis, is to provide connections for suburban residents to the fixed-route transit system.



Flexible transit services in other metro areas, such as Washington D.C., are accessible to people with disabilities and designed to allow for deviations of up to $\frac{3}{4}$ mile from set routes for pickups and drop-offs. This approach expands transit coverage for workers and the general population in lower-density areas while also meeting federal paratransit requirements. Other regions, such as the Boston metro area, are partnering with taxi and ride-hailing companies to provide more convenient transportation services to paratransit-eligible riders while reducing costs for the transit system. These strategies could help MCTS to improve services while reducing its expenditures for paratransit, which currently average \$29 per ride.⁷⁵

If bus rapid transit (BRT) services are developed in metro Milwaukee, maximize their impact by co-locating last mile services near BRT stations.

Nationally, it appears that many last mile strategies are more commonly linked with rail and BRT stations, likely because the distance between stations is relatively lengthy and because each station typically serves a high volume of riders. Last mile strategies can have more limited impacts in locations where demand for transportation is lower, such as a typical suburban bus stop. If the plan to introduce BRT services in Milwaukee County moves forward, MCTS and other transportation service providers should take advantage of the opportunity by co-locating complementary transportation services and amenities. Those services and amenities could include designated space for ride-hailing companies to make pickups and drop-offs; bike parking and bike share stations; and connections to flexible transit routes and/or employer shuttle services.

Cultivate intergovernmental collaboration and private sector involvement to address last mile challenges in lower-density areas of metro Milwaukee.

The financial constraints facing Milwaukee County and other local governments have made it difficult for them to maintain existing transit services, let alone invest or experiment with new or expanded services. Regional transit planning and dedicated regional funding would be an ideal solution but has proved politically untenable. However, the opportunity to form partnerships around innovative, technology-driven last mile solutions may also represent a promising opportunity for county governments to break through past barriers and work together to plan and fund effective services that cross county and municipal borders. In some U.S. metro areas, municipal governments in inner ring and even outlying suburbs also are part of developing and financing local last mile transportation services.

Private sector involvement in designing and funding transportation services also is essential. Our case studies show that in other metro areas, transportation management associations (TMAs) are a promising model for involving employers in transportation planning and development. In addition, we have seen examples of large businesses and groups of businesses offering shuttle services or partnering with ride-hailing companies to provide on-demand transportation services for their employees.

⁷⁵ Milwaukee County. Department of Transportation Budget. 2016.
<http://county.milwaukee.gov/ImageLibrary/Groups/cntyDAS/PSB/Budgets/2016-Budget/2015-Recommended-Budget/5600-DOTTransit.pdf>



Overall, we find that recent technological advancements have created opportunities to provide last mile new services and amenities that can make transit more effective in connecting workers to places of employment. We acknowledge that implementing some of these recommendations would require new sources of funding and/or collaborative financing strategies – a prospect that is extremely daunting given that local governments can hardly afford to maintain the transportation services they currently provide. Yet, we also would argue that constant modernization of transit services is essential to attracting and retaining riders and must be part of the equation as local leaders seek to secure ongoing fiscal sustainability for their transit systems.



APPENDIX

While not technically last mile strategies, several additional transportation services have been developed or tried in the past to provide improved connections to jobs that were otherwise inaccessible by public transit. Those services are described in detail below.

REVERSE COMMUTE BUS ROUTES

Currently, MCTS operates routes 6 and 61, which connect the north side of Milwaukee with job hubs in Brookfield, Germantown, Menomonee Falls, and New Berlin using standard, 40-foot buses. As previously described, the routes were created by Milwaukee Innercity Congregations Allied for Hope (MICAH) and the Black Health Coalition of Wisconsin with settlement money from the Zoo Interchange lawsuit. The routes began service in August 2014 and January 2015, respectively.

In addition to MCTS' routes 6 and 61, which have been branded as "JobLines," MICAH and the Black Health Coalition created Route 279 in 2014 to connect Milwaukee with the Menomonee Falls Industrial Park. They decided to terminate that route in August 2016 due to low ridership, however.

While routes 6 and 61 provide new options for Milwaukee residents to access suburban job sites, ridership on the routes has been relatively low to date. The MCTS bus system as a whole generated an average of 26.3 passengers per bus hour in 2015, while routes 6 and 61 averaged 10 passengers per bus hour or less, as shown in the table below.⁷⁶



MCTS routes 6 and 61 have been branded as JobLines.

MCTS bus routes designed for reverse commuters, 2015

| Route Number | Route Name | Passengers per Bus Hour (2015) |
|--------------|------------------------------------|--------------------------------|
| 6 | New Berlin Industrial Park Express | 10 |
| 61 | Appleton-Keefe | 7.6 |
| | MCTS System Average | 26.3 |

Notably, ridership on Route 6 ebbs and flows throughout the year due to the seasonal nature of employment at some of the major businesses along the route. Ridership on that route was 18.9 PBH in September, 2016, for example, but only 10 PBH for the year as a whole. According to MCTS, ridership on Route 61 had increased to around 11 PBH by the end of 2016, making it comparable to Route 6.

⁷⁶ Data provided by MCTS.



There is no guarantee that MCTS will continue to operate routes 6 and 61 once the settlement funds are depleted, which likely will occur by the end of 2018. Their sustainability likely depends on MCTS' overall financial picture at that time and on whether ridership increases by then.

Other similar routes designed to serve reverse commuters have been tried in the past and discontinued. For example, Route 9 was launched in 1994 to connect Milwaukee residents with jobs in the Menomonee Falls/Butler area. Service was coordinated with shift times and transfer routes to help serve nearly 31,000 jobs in the area.⁷⁷ Nine businesses and the Waukesha County Department of Transportation provided funding for the route. The route was terminated in 2007 due to low ridership and budget constraints.

While it is certainly possible that routes 6 and/or 61 will be sustained, it is unlikely that MCTS will develop additional routes like them to other suburban employment centers due to the relatively low ridership they are able to generate, barring a significant change to the transit system's finances.

Waukesha County Metro also offers several commuter bus routes (901, 904/905, and 906) that provide additional options for reverse commuters to access jobs in Waukesha County. Those routes are designed primarily for Waukesha County residents that commute to jobs in downtown Milwaukee, however; Milwaukee County residents must travel to downtown Milwaukee (or Wisconsin Avenue at 34th Street) first to access the reverse commute services.

PRIVATE SHUTTLE SERVICES

Employment-focused shuttle services also are provided by private entities in the Milwaukee area. Staffing agencies, nonprofit organizations, and individual employers operate shuttle services directly to employer locations, typically with the use of vans.

The Milwaukee Area JobRide Collaborative (MAJC), for example, is a shuttle service provided by a local nonprofit. Since 2007, the MAJC has provided daily rides for low-income individuals to suburban job sites not served by the public transit system.⁷⁸ The service is managed by Milwaukee Careers Cooperative in partnership with Employ Milwaukee (formerly MAWIB) and Esperanza Unida. Utilizing a small fleet of 14-passenger vans, service is provided from Milwaukee directly to employers' doors. The MAJC also has ties to publicly-funded Job Center and Transitional Jobs programs and provides rides to job interviews and job fairs for participants.



The Milwaukee Area JobRide Collaborative provides rides directly to suburban employers' doors using 14-passenger vans.

⁷⁷ MCTS.

⁷⁸ Milwaukee Careers Cooperative: <http://www.mccjobs.org/MilwaukeeStaffing/Transportation>



Currently, the MAJC runs five shuttle routes to participating employers in suburban counties. Each of those routes begins at Milwaukee Careers Cooperative's office (35th and Wisconsin), which is near an intersection served by several MCTS bus routes. Some businesses served by the program are located in places where no transit service exists, while others are not served by transit for all days and shifts. The program's service area is within a 45-mile radius of Milwaukee Careers Cooperative's offices.

In fiscal year 2016, the MAJC provided a total of 32,359 one-way job trips, which translates into round trips for an average of 311 individuals per week.⁷⁹ The average cost per passenger was roughly \$13.⁸⁰

Funding for the MAJC service comes from the Wisconsin Employment Transportation Assistance Program (WETAP), which includes funds from the State departments of transportation and workforce development. Employ Milwaukee and Milwaukee Careers Cooperative provide a 25% local match. In addition, participating businesses are charged \$200 per shift per month for the service, and passengers are charged \$2.50 per trip.

While the MAJC could not succeed without the transit system as a foundation, it provides a complementary service that the transit system cannot easily provide with regular fixed-route buses. The MAJC has the flexibility to start new routes and redesign existing routes as needed, which is valuable for employment-focused transportation. The program also is able to provide transportation services 24/7 and to tailor trips to the shift times of participating employers.

Most workers use the MCTS bus system to get to and from the Milwaukee Careers Cooperative's offices at 35th and Wisconsin. For workers, therefore, the cost of using both the transit system and the MAJC can add up. Many workers likely pay for both an MCTS transit pass and \$5 per day for round-trip travel with the MAJC.

The MAJC is a small program that could be scaled up in the future to serve additional employers, but its financial prospects are far from secure. According to the program's coordinator, the demand for MAJC services from employers is high, but funding is at a six-year low. In 2016, the program was forced to increase fees and cut routes. For 2017, Milwaukee Careers Cooperative has been awarded \$397,000 in WETAP funding from the State, which is up slightly from 2015 but down by close to \$200,000 compared with 2012.

Local governments or private employers in southeastern Wisconsin could consider ways to expand the services provided by the MAJC, though that possibility would have to be weighed against other possible transportation solutions. The total cost of operating the service works out to about \$50 for each hour a vehicle is in service, according to Milwaukee Careers Cooperative.

Other examples of private shuttles that could be replicated or expanded in the future include:

- Allen Edmonds, located in Port Washington, is one example of a local employer that operates its own shuttle service. Through a contract with Johnson Bus, two buses bring Allen Edmonds

⁷⁹ Milwaukee Careers Cooperative WETAP Application 2017.

⁸⁰ MAJC had a budget in calendar year 2015 of \$490,000 and in calendar year 2016 of \$356,000, so using the average (\$423,000) translates into a per-trip cost of roughly \$13.



employees to and from the Walker's Point neighborhood of Milwaukee (9th and National); one bus brings workers to and from Bayshore Town Center and Brown Deer; and one bus connects locations in Sheboygan and Cedar Grove. Employees who use the service (currently about 70) pay \$28 per week. Therefore, those workers pay a combined total of about \$8,500 per month. Allen Edmonds pays for the remaining cost of operating the service, which averages \$10,500 per month.⁸¹

- The Joseph Project, a shuttle service run by Greater Praise Church on Milwaukee's north side, transports workers to living wage jobs in Ozaukee and Sheboygan County. Workers pay \$6 per day for the service after their first month of work, which covers about \$2,000 of the program's approximately \$5,400 in total monthly operations costs.⁸² Private donations pay for the remainder.
- Several staffing/temp agencies also provide shuttle services for their employees to get to work places throughout metro Milwaukee. Those services only are available for workers as long as they are employed by the staffing agency, however; if a business hires them directly, the transportation service no longer is provided. Thus, those shuttles provide a valuable service for a specialized population, but do not represent a long-term solution.

VANPOOLING/CARPOOLING

Both Milwaukee County and Waukesha County have experimented with vanpools as an alternative to transit. Vanpools, like carpools, allow groups of people to commute to work together, providing door-to-door service that in some cases can be more cost-effective and fuel efficient than full-sized buses or personal vehicles.

Milwaukee County's program began in 1994 with funding support from the state's Transportation Demand Management Program and the federal CMAQ program.⁸³ The program was discontinued at the end of 2011, at which time the county owned 14 passenger vans that all were being utilized by area businesses and agencies.

The rationale for discontinuing the program was that it no longer was financially sustainable without county property tax levy support. The vehicle fleet was aging and there was no capital funding available for replacements. In addition, the associated costs for operations and maintenance had increased to the point where the program's overall costs were greater than the revenues it was generating from users. Milwaukee County also cited reduced transit operating aid from the State of Wisconsin as another factor in its decision to discontinue the program.

While the vanpool program in Milwaukee County was well utilized but difficult to sustain financially, the vanpool program in Waukesha County was much less successful and shorter-lived. The County purchased eight vans in 2010 and carried out an extensive marketing campaign to generate interest

⁸¹ All program data provided by Allen Edmonds.

⁸² Romell, Rick. "Church's Joseph Project brings Milwaukee workers to Sheboygan County jobs." Milwaukee Journal Sentinel. February 15, 2016. <http://archive.jsonline.com/business/joseph14-b99666200z1-368842381.html>

⁸³ Milwaukee County interoffice communication. July 6, 2011.

<http://county.milwaukee.gov/ImageLibrary/Groups/cntySupervisors/cntybrdstandingcommittees/TPWT/2011/TPWT071311Packet1.pdf>



in the program. The program became operational in January 2012, but interest was limited and only one van ever was utilized. The service was discontinued in August 2012.

Waukesha County officials cited several factors as contributors to the program's failure. The program required employers to pay a monthly fee to Waukesha County for use of a van and to take responsibility for maintaining the vehicles on behalf of their vanpool, though costs could be passed on to participating employees or provided as a benefit by the employer. While there was significant interest in Waukesha County's program as it was forming, it proved difficult to attract participants who were willing to take on the responsibility of managing their own programs and vans. In addition, many prospective participants had difficulty meeting the program's requirements for drivers.

Other factors that were attributed to the program's failure included the following:

- It was more difficult than expected to find four or more individuals who were interested in participating in the program and who had the same work schedules to fill a van.
- The program was designed exclusively for individuals who live and/or work in Waukesha County. Some successful vanpool programs in other parts of the country – such as the program provided by Pace, the Chicago metro area's suburban transit provider – are operated under regional transit authorities, which offer both a dedicated funding source and the benefit of serving a larger regional population.
- The weak economy at that time may have made it less essential for employers to provide transportation, as they could attract plenty of job applicants with personal vehicles.
- According to Waukesha County officials, new federal regulations that would have required Waukesha County to comply with the Americans with Disabilities Act also were a factor in terminating the program, as retrofitting the one van that was in operation would have been cost-prohibitive.

While local vanpool efforts haven't proven sustainable, the Wisconsin Department of Transportation's Rideshare program also offers workers an opportunity for individuals to develop carpools with others who share their commute.⁸⁴

Technology-supported ridesharing

New technology is beginning to enhance ridesharing services in other U.S. metro areas, which could help carpooling make a comeback in the Milwaukee area in the future. Several startups have been created that connect workers with similar commutes via mobile applications. Those startups currently only operate within a few large cities, including San Francisco, Chicago, New York, and Washington D.C., but some transportation leaders predict that one of those services may expand its reach nationally in the coming years.

Scoop, which currently operates only in the San Francisco Bay Area, is one example of a growing technology-supported ridesharing service. Scoop builds commute networks by starting with larger

⁸⁴ Wisconsin Department of Transportation: <http://wisconsin.gov/Pages/travel/road/rideshare/default.aspx>



employers. The service is then advertised through the employer, and users are matched on a daily basis via Scoop's mobile app. With this approach, workers do not have to have the same schedule as their ridesharing partners every morning and night. Scoop also offers a guaranteed ride home, which will cover up to \$40 of a Scoop participant's return trip if no driver is available to bring him or her home.⁸⁵

With Scoop's model, riders pay between \$2 and \$10 for their trip, depending on the distance, and drivers are reimbursed with almost all of the money passengers pay. Thus, both riders and drivers save money compared with commuting alone.

Cisco Systems, a large technology company in San Jose, is one employer that has partnered with Scoop. Its employees share rides to work and Cisco covers the cost of all but \$1 of each trip.⁸⁶ Some other employers subsidize Scoop trips for their employees, but Cisco's program is particularly generous.

Recently, Bay Area Rapid Transit (BART) received a \$358,000 grant from the FTA's Mobility on Demand Sandbox program for a partnership with Scoop.⁸⁷ The program will use Scoop's carpooling system to connect riders to the transit system, thereby also reducing the demand for parking near busy transit stations.

Uber and Waze (a Google product) also are experimenting in a limited number of cities with services that allow drivers to earn money for commuting with others. Waze, for example, charges riders up to \$0.54 per mile (the federal reimbursement rate), which reimburses drivers for their expenses.⁸⁸

While these new services could make ridesharing an easier and more practical choice for many commuters in the future, they have their limitations. For example, the services' relatively high cost for riders could make them difficult for low-income commuters to afford. In addition, ridesharing services may be less effective for helping workers access smaller employers and lower-density suburban areas since fewer individuals are likely to share similar commutes to those locations.

⁸⁵ Scoop. <https://takescoop.zendesk.com/hc/en-us/articles/205655238-What-is-Guaranteed-Ride-Home->

⁸⁶ Dickey, Megan Rose. "Scoop raises \$5.1 million seed round for enterprise carpooling service." TechCrunch. May 24, 2016. <https://techcrunch.com/2016/05/24/scoop-raises-5-1-million-seed-round-for-carpooling-service-that-shuttles-tesla-twitter-and-cisco-employees/>

⁸⁷ Federal Transit Administration. <https://www.transit.dot.gov/research-innovation/fiscal-year-2016-mobility-demand-mod-sandbox-program-projects>

⁸⁸ Bliss, Laura. "What Carpoolers Really Want." CityLab. December 15, 2016. <http://www.citylab.com/commute/2016/12/what-carpoolers-really-want/510770>

