Shared-Use Mobility Possibilities in Brooklyn Park: Existing Models

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City of Brooklyn Park
Community Development Department

Fall 2016

Brooklyn Park

Resilient Communities Project

University of Minnesota
Driven to Discover℠

The project on which this report is based was completed in collaboration with the City of Brooklyn Park as part of the 2016–2017 Resilient Communities Project (RCP) partnership. RCP is a program at the University of Minnesota's Center for Urban and Regional Affairs (CURA) that connects University faculty and students with Minnesota communities to address strategic projects that advance local resilience and sustainability.

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INTRODUCTION

Brooklyn Park is a growing suburb in the northwest Twin Cities metropolitan area. As it prepares for the coming Blue Line LRT Extension, Brooklyn Park is reviewing its options for helping its residents enjoy the benefits of this new connection to the metro area. As many of the suburb's residents lack cars, city staff believe shared-use mobility models may hold promise in connecting residences and future Blue Line stations. In looking into solutions for how best to connect those in Brooklyn Park to the LRT line, our focus has fallen on vehicle-based shared mobility. These vehicle-based models offer both year-round access and the flexibility. This would provide Brooklyn Park a suitable foundation for a shared mobility service that can grow with the needs of its residents. For this study into existing models we looked at two main types of shared automobility: ridesharing and car sharing. Ridesharing services, such as Lyft and Uber, allow users to connect with drivers in real time through a mobile app. These apps facilitate passenger pickup, dropoff and route guidance, thus offering tremendous adaptability when it comes to efficiently getting residents to their destinations. Car sharing takes a different approach and connects users directly to vehicles. Round-trip carsharing models, such as ZipCar, operate on designated pick-up/drop-off areas. One-way models, like Car2Go, offer greater flexibility, since vehicles can be found and deposited anywhere within the service's operating area. By examining case studies from around the nation, we can begin to form a picture of how other cities are tailoring these shared-mobility strategies to meet their specific transportation needs.

To form this picture, first we needed to understand the underlying requirements for a shared mobility solution in Brooklyn Park and the potential obstacles that might stand in the way of adoption. In identifying these needs we could then critically assess existing shared mobility models in terms of how well they might serve Brooklyn Park. After our site visit to Brooklyn

Park and preliminary discussions with the city's staff, we categorized Brooklyn Park's needs into two areas: Feasibility and Functionality. The Feasibility category addresses considerations necessary to make such a solution workable in Brooklyn Park's socioeconomic and political environment. Functionality addresses whether the model under consideration can meet the transportation issues Brooklyn Park is looking to solve. We can then apply these metrics to existing models to understand what aspects of Brooklyn Park's mobility challenges the model addresses and where there may be gaps. Furthermore, we can use these criteria to score and compare these models to help Brooklyn Park identify which models are the closest to their needs and what aspects of other models they can pull from to create a complete transit solution. The checklist and descriptions of individual criteria are shown in the table below.

TABLE 1: Feasiblity and Functionality Criteria

Feasibility		**Functionality**	
Low Cost Burden on City	*Is the cost burden on the city, or on a private company?*	Year-Round Access	*Is the service accessible throughout the year, including winter months?*
Funding Resources Available	*Are there funding sources available to help with adoption and operation?*	Dynamic Routing	*Can routes be modified with network disruptions/evolving demand?*
Low-cost Scalability	*Can the network be inexpensively expanded as demand increases?*	Suburban	*Does the case study occur in a suburban environment?*
Proven Technology	*Is the underlying technology/vehicle/ software proven?*	First Mile/Last Mile (FM/LM)	*Does the share- mobility solution address FM/LM problem in case study?*
Proven Adoption	*Has the service been adopted by a diverse range of users (low income, carless, minorities)?*	Low Income/Carless Access	*Is the case study's shared-mobility network accessible/ targeted to to low-income residents?*

While the checklist we used in our exploration of existing shared mobility model is simple, it can be further tailored to the evolving needs of Brooklyn Park. Beyond expanding the categories under consideration, these categories can also be weighted to allow for model scores to reflect the issues the city feels are most important. As Brooklyn Park continues its search for a suitable shared-mobility model, the above criteria and scoring system can be a valuable tool for objectively measuring the likelihood of success of these models.

CAR SHARING

Over the past decade, many cities have implemented carsharing programs for their residents. Each city is unique, and each has its own models, which reflect its particular needs. Below are existing examples of car sharing plans implemented in cities across the United States, explaining how these cities have managed to successfully implement their car sharing program.

In 2008, Ithaca, New York, launched its car-sharing program. Ithaca opted for a round-trip service, meaning that customers pick up cars in the parking lot and return them to the same lot after use. To attract users, the car-sharing service opened a storefront, where it employed three full-time and three part-time employees. Funding for this program came from the New York State Department of Transportation through the New York State Energy Research and Development Authority's Program Opportunity Notice 1028.

The City of Ithaca intentionally placed the storefront near Cornell University, and by a popular bus stop, to ensure a high traffic. In 2008, when the project began, it had a fleet of six cars. The city charged customers an application fee, an annual membership fee, an hourly usage fee, and a mileage fee. The city further offered many discounts, including a student or employee discount and a reduced hourly rate during off-peak hours, between 11:00 pm and 7:00 am. The

city has launched the car-sharing program service in conjunction with the local universities and the students, and from there the company was able to grow.

The chart below shows how Ithaca scores on the checklist defined previously. While the cost is fronted by the city, which has to pay staff, Ithaca found outside funding, which reduced the cost. However, the largest gap within the Ithaca model is the first- and last-mile problem. While the storefront does enable the program to serve the population who may not have access to cell phones, the requirement to go to this location to pick up/drop off a vehicle does limit the ability of some residents to access the car sharing and its benefits. In 2010, the Federal Transit Administration Job Access/Reverse Commute provided funding to target low-income residents. The funding enabled the program to further assist residents without internet access or debit and credit cards by continuing to fund the store front's operation

TABLE 2: Ithaca, New York

Feasibility		**Functionality**	
Low Cost Burden on City		Year-Round Access	X
Funding Resources Available	X	Dynamic Routing	X
Scalable	X	Suburban	X
Proven Technology		First Mile/Last Mile	
Proven Adoption	X	Low Income/Carless Access	X

Buffalo, New York, launched its car-sharing service in 2009. The project began with four vehicles, and it employs two to four full-time staff members, as well as volunteers and interns. Before starting its service, the city created a Business Plan Development to make it possible to partner with banks and auto dealerships, as well as to extend lines of credit. The Buffalo car sharing program operated as a non-profit, thereby giving the city access to grant opportunities, volunteer programs such as AmeriCorps, and tax-exemptions on purchases.

Like Ithaca, Buffalo sought to attract customers by opening a storefront in a popular neighborhood with heavy foot traffic. The City of Buffalo also partnered with a major employment center, the Buffalo Niagara Medical Campus, for funding. Buffalo also offers discounts for residents, including a "refer-a-friend" driving credit. However, in June 2015, Philadelphia Insurance ended the company's insurance coverage, leaving Buffalo Car Share unable to operate. In September 2015, the program was acquired by Zipcar.

TABLE 3: Buffalo, New York

Feasibility		**Functionality**	
Low Cost Burden on City		Year-Round Access	X
Funding Resources Available	X	Dynamic Routing	X
Scalable		Suburban	
Proven Technology	X	First Mile/Last Mile	
Proven Adoption		Low Income/Carless Access	X

The Buffalo program was scored according to its operation as a nonprofit (before June 2015). The cost is fronted by the city, which had to pay staff. However, outside funding helped defray the costs. The checklist shows that the model was not successful, because it could not continue to operate as a nonprofit. Even if the company had not lost its insurance, the program did not address the first- and last-mile problem as residents needed to go to a designated location to pick up/drop off their vehicles.

Ashland, Oregon, started its car sharing program in 2009 with just one car, and it operated with volunteers and two part-time employees. Like Buffalo, Ashland's car sharing program operated as a non-profit, thereby making it tax-exempt. The program started with funding from the Oregon DOT Public Transit Division. Customers pay an annual membership fee, an hourly fee, and a mileage fee. However, the company could not keep up with the increasing cost and ridership, and it closed in 2011. In 2015, ZipCar partnered with Southern Oregon University, located in Ashland, to attempt to make car sharing work in this city, this time focusing on the college student demographic. The chart below depicts Ashland's score on the checklist. The program does not meet many of the items on the checklist.

TABLE 4: Ashland, Oregon

Feasibility		**Functionality**	
Low Cost Burden on City		Year-Round Access	X
Funding Resources Available	X	Dynamic Routing	
Scalable		Suburban	X
Proven Technology		First Mile/Last Mile	
Proven Adoption		Low Income/Carless Access	

Car sharing is likewise offered on a regional scale. In 2008 Burlington, Vermont, started a car sharing program to serve an area larger than just the city. Rather than opening a storefront, the region opted for parking spots, or "pods," stationed downtown and near the University of Vermont campus. Customers unlock the car with a key fob and return the car to the pod when the user is done. The Vermont program is also a non-profit, with one part-time and two full-time employees. Users pay an annual membership fee, an hourly fee, and a mileage fee. To fund the project, the Burlington region partnered with Champlain College, the Vermont Energy Investment Corporation, and the University of Vermont. The Burlington model does appear to meet many of the criteria in the Brooklyn Park Feasibility/Functionality checklist.

TABLE 5: Burlington, Vermont

Feasibility		**Functionality**	
Low Cost Burden on City		Year-Round Access	X
Funding Resources Available	X	Dynamic Routing	X
Scalable	X	Suburban	X
Proven Technology	X	First Mile/Last Mile	X
Proven Adoption	X	Low Income/Carless Access	X

Arlington, Virginia, also operates a regional car sharing program for multiple communities. The program began in 2004 with twelve cars. Local government agencies partnered with Flexcar and Zipcar to implement their program. During its first year, Arlington offered discounts to individuals working in Arlington, and waived annual membership and

application fees. Moreover, it offered incentives for businesses that signed up their employees for the program. The chart below shows how the Arlington, Virginia model works with the checklist. This model partners with Flexcar and Zipcar, minimizing cost for the city and also addresses the first- and last-mile issue. However, it does not appear to tackle accessibility for low-income users or users who lack a personal motor vehicle.

TABLE 6: Arlington, Virginia

Feasibility		**Functionality**	
Low Cost Burden on City	X	Year-Round Access	X
Funding Resources Available		Dynamic Routing	X
Scalable	X	Suburban	
Proven Technology	X	First Mile/Last Mile	X
Proven Adoption	X	Low Income/Carless Access	

RIDE SHARING

In St. Petersburg, Florida, the local transit operator, Pinellas Suncoast Transit Authority (PSTA), experimented with ridesharing by implementing a pilot program called *Direct Connect*. This pilot program's goal was specifically to solve the first-mile/last-mile problem by connecting people located in areas with limited transit service to designated bus stops in order to create access to the region's bus network. The agency created a public-private partnership with Uber and United Taxi, a local taxi operator, to provide ride-sharing services.

The Pinellas Suncoast Transit Authority designed *Direct Connect* as a six month pilot program between February and August 2016 in order to assess alternative transportation connectivity to homes, activity centers, and bus stops within the PSTA transit system. The PSTA started by designated two separate zones of operation, one within the community of Pinellas Park and another in East Lake. Pinellas Park resembles Brooklyn Park in many aspects, especially in terms of population density and activity centers. Pinellas Park has a population density of 3,000 people per square mile, whereas Brooklyn Park has 2,906 people per square mile. Pinellas Park is a suburban city located six miles from the region's central city of St. Petersburg. It is made up primarily of low- to medium-density residential neighborhoods, retail corridors along major arterial roads, and scattered industrial clusters. The city of East Lake previously had regular bus service, but ridership throughout the city was consistently low. According to PSTA's CEO, Brad Miller, the transit provider reported an average of 75 riders per day rode local buses.[1] This low amount was enough to justify eliminating bus services in East Lake. Testing ridesharing in East Lake is a response to the removal of bus service in the community in hopes of reconnecting residents to transit.

Rides to and from designated bus stops and within the two target zones were eligible for subsidy by the PSTA. *Direct Connect* rides were available between Monday through Saturday between the hours of 7 a.m. to 7 p.m. Users used smartphone mobile applications to hail rides. Being an already established ridesharing company, Uber already had mobile technology available for use, whereas a specific mobile application was designed for United Taxi in order for users to hail their services in a similar manner. Users without a smartphone also had the option to use the service by calling United Taxi, however, Uber was not accessible without a

smartphone. The PSTA subsidized up to half of the total ride cost or up to $3.00 per ride. The subsidy was applied to each fare using the promotional code "PSTA."

The first experiment with ridesharing through the *Direct Connect* program was deemed a success and was unanimously approved for a second pilot with an expanded service area throughout Pinellas County. The PSTA Board of Directors unanimously approved an additional service contract with Lyft and extended contracts with Uber and United Taxi.[2] *Direct Connect* also received a "Future of the Region Award" for transportation and mobility by trying to solve the first-mile/last-mile within the St. Petersburg region.[3]

TABLE 7: Pinellas, Florida

Feasibility		**Functionality**	
Low Cost Burden on City	X	Year-Round Access	X
Funding Resources Available	X	Dynamic Routing	X
Scalable	X	Suburban	X
Proven Technology	X	First Mile/Last Mile	X
Proven Adoption	*(Testing Stage)*	Low Income/Carless Access	X

In early 2016 a Boston company called Bridj partnered with Kansas City Area Transportation Authority to begin operation of a multi-passenger ride sharing service. The company had been operating its service privately in Washington DC for a year and Boston for 3

years, and this was a big step forward in testing and deployment of the idea. The company's vision is to collect data on how people move about a city, and then deploy vehicles to make those trips more efficient. The most interesting parts about this version of ridesharing are the logistics of multi-passenger routing and the public-private partnership in Kansas City.

The ridesharing model relies on a fleet of vehicles to provide quick and efficient connections between general areas of the city with demand driven routing. The company has a mobile app allowing users to reserve a seat, select a date/time for the ride, select a destination, and pay by credit card. As people around the city request rides, routes are created and altered in real-time to determine the most efficient route and determine pick up points for each vehicle. There are no fixed routes or stops and people often have to walk a few blocks to pick up points. Each vehicle has a common destination, unless someone wants to get off at one of the pick up points, meaning this service is not intended to get people to their final destination and will mainly help to connect business, retail, and transit hubs. In Kansas city, fares range from $2 to $6 and the company brags it is able to get passengers from their pick up point to the drop off point 40-60% faster than regular route transit, with comparable walk distances.

Kansas City Area Transportation Authority has a big stake in its partnership with Bridj. The technology itself and administrative staff is maintained by Bridj, while the drivers work for the transit agency. Ford, an additional partner, provided a starting fleet of ten 14-passenger vans, equipped with Wi-Fi. Kansas is one of the first cities in the country to partner with a privately owned hailing service, but this micro-transit operation has a yet unknown effect upon transit and car ownership rates. Like many ride-sharing platforms such as Uber and Lyft, Bridj at times portrays itself in advertising as a more comfortable, personalized, flexible, and efficient alternative to public transit, particularly appealing to younger riders. Despite advertising, the

service has the potential to complement transit service by filling in network gaps and providing connections to transit hubs, but the impact upon transit ridership won't be measurable until it has been around longer. Kansas has less than 1% transit ridership and only 18% of jobs in the metropolitan area are within a 90 minute commute via public transit, providing a sharp contrast to Bridj's operating environment in Washington DC and Boston. In all three cities the service areas are restricted to denser areas of residential and commercial uses potentially well-served by transit already and the service claims to have a primary goal of avoiding traffic congestion in it's automatic routing, suggesting some competition with regular route transit. Results from Kansas City's attempts to fill gaps may be comparable to other urban areas where nodes or hubs of density are spread out.

TABLE 8: Kansas City

Feasibility		**Functionality**	
Low Cost Burden on City	X	Year-Round Access	X
Funding Resources Available		Dynamic Routing	X
Scalable	X	Suburban	
Proven Technology	X	First Mile/Last Mile	X
Proven Adoption		Low Income/Carless Access	

POTENTIAL FUNDING SOURCES

The efficacy of any shared use mobility strategy in Brooklyn Park is dependent on identifying appropriate funding mechanisms for project planning and operations. Like most Minnesota cities, Brooklyn Park's capital budget is subject to the annual fluctuations of available Local Government Aid (LGA), and with projected decreases in available Fiscal Disparities revenue, additional funding mechanisms would greatly support the implementation of shared use mobility strategies in the city. Existing funding mechanisms for shared use mobility projects vary greatly from project to project. Many examples utilize cost share agreements between local governments and transit agencies, while others leverage federal or local grant funding for shared use mobility improvements.

Perhaps one of the best opportunities to secure federal grant funding is through the Federal Transit Administration's (FTA) Mobility on Demand (MOD) Sandbox program. According to the FTA website , the MOD Sandbox Program is part of a larger research effort at DOT that supports transit agencies and communities as they incorporate new mobility tools like smartphone apps, bike- and car-sharing, and demand-responsive bus and van services[4]. MOD projects help make transportation systems more efficient and accessible, particularly for people who lack access to a car. Like the Met Council Regional Solicitation, MOD grants require a 20 percent local match for projects. In 2016, MOD grants were disbursed to eleven projects, with nearly $8 million in federally funding distributed between them. Every funded project worked to augment existing transit systems with enhanced shared use mobility options, including car sharing, bike sharing, first-mile / last-mile service enhancements, and technological improvements.

TABLE 9: Funding Overview: FTA Mobility on Demand (MOD) Sandbox Program [4]

Required Minimum Local Match:	20 Percent
Funding Range:	(Not specified)
2016 Funding Disbursement:	$8,000,000

Examples of successfully funded shared use mobility projects:

Agency: Dallas Area Rapid Transit (DART)

Funding Awarded: $1,200,000

Project: Integrating Ride-sharing services into their DART ticketing app to solve first and last mile issues near DART stations, particularly in non-walkable areas not well served by transit.

Agency: BART (San Francisco, CA)

Funding Awarded: $350,000

Project: Create an integrated carpool to transit program, integrating payment methods, preferential parking, and reservations/ scheduling to increase transit ridership and decrease trips by single occupancy vehicles.

Another potential funding source can be found locally through the Metropolitan Council's Regional Solicitation Process. Administered biennially, the Regional Solicitation disburses federal transportation funds to locally initiated projects to meet regional transportation needs. Most relevant to shared use mobility is the Travel Demand Management (TDM) category for projects that reduce peak-hour congestion [5]. Examples of previous submissions include a proposal for shuttle services to employment centers in Fridley from the NorthStar Commuter

Rail line, and the creation of a new staff position to coordinate transit service and car sharing programs and shuttle services in Scott County. While TDM projects are limited to $300K in federal funds, similar to the FTA's Sandbox Program, only a 20 percent local match is required.

TABLE 10: Funding Overview: Met Council Regional Solicitation: Travel Demand Management Category [5]

Required Minimum Local Match:	20 Percent
Funding Range:	$75,000 (minimum) to $300,000 (maximum)
2014/15 Funding Disbursement (TDM Category):	$1,200,000*

* $5.8 million was disbursed in 2014/15 for TDM funding for Met Transit and Transportation Management Organizations (TMOs); $1.2 million for competitive TDM selection

Examples of successfully funded TDM projects incorporating shared use mobility concepts:

Agency: Anoka County

Funding Awarded: $240,000 (2015)

Project: Improving first and last mile service with bus shuttle service between North Star Rail stations and area employment centers.

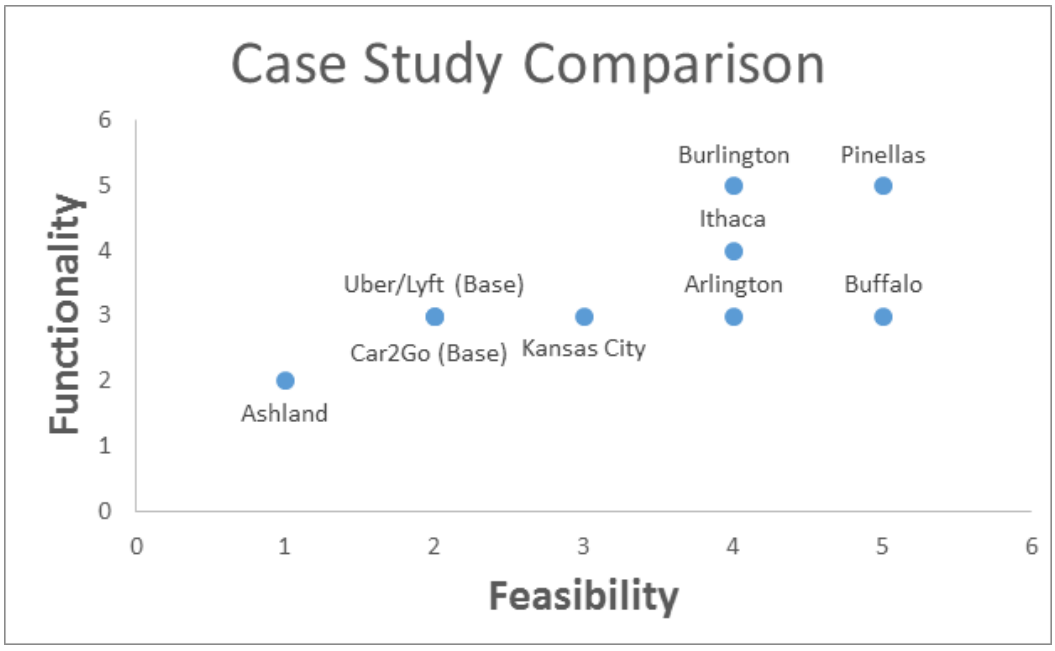
Agency: Scott County

Funding Awarded: $120,000 (2016, projected)

Project: Funding to create a new position and program to coordinate transit service, car sharing programs, and shuttle services in Scott County.

CONCLUSIONS

The Blue Line extension will have a dramatic impact on Brooklyn Park by connecting people who live or work in the city to the rest of the metropolitan area. While the planned route will link many areas of high employment density, it cannot reach all of Brooklyn Park's residential areas, which means that those who want to commute by train but do not live along the route will have to find a way to get to and from the stations. This first-mile / last-mile problem is notoriously hard to solve, especially in low-density areas like Brooklyn Park that cannot support frequent transit service. Shared-mobility programs may offer a solution to this problem. The graph below compares the Feasibility/Functionality scores of the existing models we reviewed to help identify which models has the greatest potential when compared to the transportation issues Brooklyn Park is looking to address.



As our review of existing shared-mobility models shows, several cities have piloted programs to give residents a wider array of transportation options. Car-sharing systems became a popular in the late 2000s, particularly in college towns like Ithaca, Burlington, and Ashland.

Given the small size of these programs, most of which have (or had) only a few vehicles, their impact on citizen mobility is likely low, especially when compared to the expense of purchasing vehicles and staffing a sharing program. Such programs serve users who need only occasional access to a car, but they are ill suited to solving the first-mile / last-mile problem, since cars have to be picked up at, and returned to, the same lot. (While at least one one-way car-sharing program exists—Car2Go—it seems to require a population density higher than Brooklyn Park to be successful; in any event, it recently announced it was ending service in the Twin Cities.)

Ride-sharing offers an alternative model for shared mobility. Mobile applications such as Uber and Lyft are reshaping the transportation landscape by offering one-way trips that are much cheaper and more convenient than conventional taxis. As the examples of Bridj and Pinellas, Florida show, such apps have the potential to expand the reach of a transit network by ferrying people to and from key transit stations, potentially solving the first-mile / last mile problem. Bridj in Kansas City shows successful operations of low-cost multi-passenger hub-connecting routes, potentially applicable for commute patterns in Brooklyn Park. A similar program in Brooklyn Park would presumably require a lower initial outlay, and would rely on the existing technological infrastructure that these companies require, thus making it easy to roll out on a trial basis.

As Brooklyn Park considers these options, it is worth noting that car sharing and ride sharing are not mutually exclusive. They meet different needs, and could well complement each other in their service. Soon the Blue Line will more closely link the northwestern suburbs to the rest of the metro area. Brooklyn Park can build on this new transit line to improve mobility for everyone who lives or works in the city.

ENDNOTES

[1] Girardi, S. (2016, February 26). *Pinellas teams up with Uber, cab company in pilot program*. Retrieved from Tampa Bay Times Web Site: http://www.tbo.com/pinellas-county/pinellas-teams-up-with-uber-cab-company-in-pilot-program-20160222/

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[5] Metropolitan Council. (2016). *Transportation Funding and Grants: Regional Solicitation*. Retrieved from the Met Council website: https:// https://metrocouncil.org/Transportation/Planning-2/Transportation-Funding/Regional-Solicitation.aspx