

RTA 2016 Leadership Briefing + Field Visit to the Northern Virginia area



Tuesday,
June 28,
2016

Commuter rail, bus rapid transit, bicycle share,
and emerging innovations



Executive Summary

The Regional Transportation Alliance business coalition led the 2016 Leadership Briefing and Field Visit to the City of Alexandria and Arlington County in northern Virginia on June 28.

Nearly 50 business, elected, and transportation leaders attended to experience the new Crystal City Potomac Yard Transitway bus rapid transit system, Virginia Railway Express commuter rail service, Capital Bikeshare, and emerging transit innovations.

Trip attendees found the northern Virginia and D.C. metropolitan area's transportation programs to be helpful examples as approved transit plans in Wake, Durham, and Orange counties move forward.

Example takeaways, lessons learned, and potential applications for the Triangle market:

- **Bus rapid transit** The Crystal City Potomac Yard Metroway highlighted the potential for bus rapid transit in the Triangle, including approved transit plans in Wake and Orange counties. The Metroway demonstrated the opportunities for creating a high-quality transit experience with attractive station infrastructure and design. With frequent service as good as every 6 min. in some areas, the system is a useful and convenient option. Service is scalable and flexible, with dedicated lanes where needed. BRT has the ability to connect jurisdictions and tailor the service and infrastructure to each community's needs and land uses.
- **Commuter rail** The Virginia Railway Express system demonstrated that peak-period service can play an important role in a regional transit network. As Durham and Wake Counties pursue commuter rail as part of their respective approved transit plans, VRE serves as a good example of purposeful allocation of resources to frequency and span of service.
- **Bikeshare** The Capital Bikeshare program provides insight into infrastructure, location, and pricing across a regional system. As the City of Raleigh looks to implement the first municipal bikeshare in our market over the next two years, we can look to the metro D.C. area for the importance of integration with bus and rail transit to provide a seamless multimodal commuting option.
- **Emerging innovations** New automated technology is emerging in National Harbor, Md. with "Olli" – a self-driving electric shuttle being tested by Local Motors. "Olli" represents rapidly emerging innovations for transit including circulators and last-mile solutions. The Wake Transit plan has a purposefully short time horizon with a 10-year investment strategy enabling our community to take advantage of new technology in the future.

Download the tour report and slide decks at letsgetmoving.org/fieldvisit

See photos at letsgetmoving.org/Flickr

About the Regional Transportation Alliance RTA leverages the strength of the regional business community to advance critical transportation priorities that support our growing market. More than 100 companies and 23 chambers of commerce work in concert with elected and transportation partners through RTA.

Table of Contents

Executive Summary	2
Letter from our Leadership	4
Introduction	5
Overview	
- Metro Area comparison	6
- Triangle regional context	6
Primary elements of the 2016 RTA Field Visit	
- Crystal City Potomac Yard Transitway bus rapid transit	8
- Virginia Railway Express commuter rail	12
- Capital Bikeshare	15
- "Olli" automated shuttle	17
Findings and potential implications for the Triangle market	19
References	
- Agenda	20
- List of participants	21
- RTA Leadership Team investors and Field Visit sponsors	22

Letter from our Leadership

RTA members and partners,

The Regional Transportation Alliance envisions an efficient and resilient transportation system through business leadership and a partnership between the public and private sectors. We seek to offer opportunities to experience a variety of mobility options in other cities and to engage the leaders who have successfully implemented these solutions in their growing markets. We recognize that investments in transportation infrastructure connect residents to jobs, homes, shopping locales, and all facets of civic life in the region, and it is important for them to serve us effectively, both now and as we grow.

We enjoyed learning with you on this tour and hope that the 2016 Field Visit to Arlington, Alexandria, and Washington, D.C., has provided renewed momentum to identify ideas and potential solutions in the Triangle and other urban areas in North Carolina, particularly as Wake County prepares for referendum and Durham and Orange counties continue to implement their transit future.

Let's get moving!

*Steve Brechbiel, Quintiles, Senior Director of Community Relations
2015-17 RTA chair*

*Valerie Jordan, Cisco Systems, Inc., Partner Account Manager
2015-17 RTA transit vice chair*

RTA 2016 Leadership Briefing + Field Visit to the Northern Virginia area

COMMUTER RAIL, BUS RAPID TRANSIT, BICYCLE SHARE, AND EMERGING INNOVATIONS

Introduction

The high-growth Research Triangle region has been consistently ranked as having some of the lowest traffic congestion of major metropolitan areas in America. However, continued population growth is consuming the reserve capacity on our area roadways and there is increasing support for expanded mobility alternatives, manifested by approved enhanced regional transit plans in Durham, Orange, and Wake counties.

To better understand existing and emerging travel options and possibilities for our region, the RTA and area partners have taken tours of other markets for more than 10 years to various peer cities.

In June 2016, The Regional Transportation Alliance business coalition led a visit of around 50 community leaders to the northern Virginia area in June 2016 to get a first-hand look at possibilities for transit in the Triangle. RTA staff also took a few hours

on the morning after the group tour to gain additional background on elements that we learned about on the tour.

This report provides information regarding the Crystal City Potomac Yard Transitway in the City of Alexandria and Arlington County, the Virginia Railway Express commuter rail service, the Capital Bikeshare program, and an emerging automated mobility innovation, Local Motors' new self-driving electric shuttle, Olli.

Both the northern Virginia area in metropolitan Washington, DC and the Triangle region have been developing expansive and comprehensive transportation networks to accompany the respective population growth that they have seen and will continue to see. As the Triangle continues to grow, we benefit from observing the transportation strategies in the Northern Virginia area.

Prior RTA tours

2005 – San Diego and Orange County, CA
2009 – Dallas, TX and North Texas area
2011 – Denver, CO metro area
2012 – Cleveland, OH and Pittsburgh, PA
2013 – Suburban MD, Northern VA,
Baltimore, MD, and Washington, DC
2014 – Carmel and Indianapolis, IN
2015 – Austin, TX

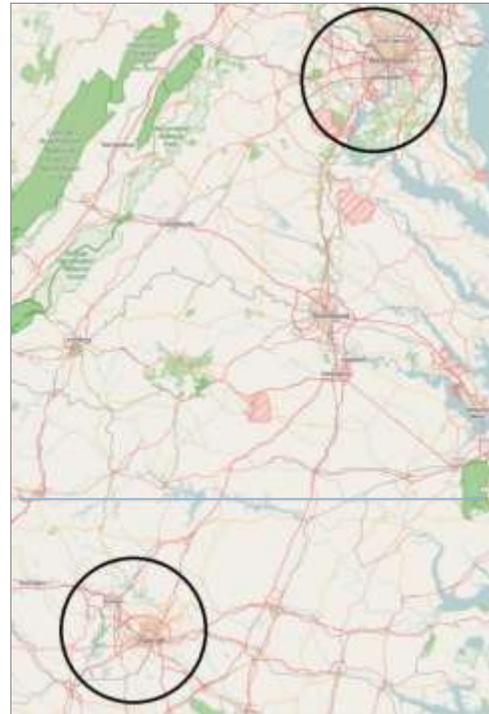
Overview

Metro area comparison

Population and Density The Washington-Arlington-Alexandria Metro Area is comprised of 6,300 square miles in Washington, D.C., Virginia, Maryland, and West Virginia. With a population density of 966 residents per square mile, the area is home to more than 6 million people.

The Raleigh-Durham-Chapel Hill Triangle combined statistical area occupies a similar swath of land, covering 5,600 square miles. More than 2 million North Carolinians live in this region, contributing to a population density of approximately 485 persons per square mile.

Importance of transit Several speakers during our visit echoed the idea that a driving reason behind investing in transit is to attract businesses and residents. The Triangle area and jurisdictions within it are consistently ranked as top locations for both of these things, and as Crystal City Business Improvement District Chief Operating Officer Robert Mandle told our group, many of Northern Virginia's transportation efforts are made with the goal of becoming "a place where the talent wants to be."



NC Triangle area and Washington-Arlington-Alexandria Metro Area

Triangle Regional Context

Existing bus transit service The Triangle region has local and university transit agencies serving Raleigh, Cary, Durham, and Chapel Hill that work in concert with GoTriangle, our regional transit agency that provides an extensive express bus and vanpool program. Travelers can monitor in real time the location of every bus in the entire regional transit network via live.gotriangle.org. In addition, buses along I-40 and the Wade Avenue freeway in Durham, Wake, and Johnston counties can use the regional bus on shoulder system ("BOSS") to avoid peak congestion.

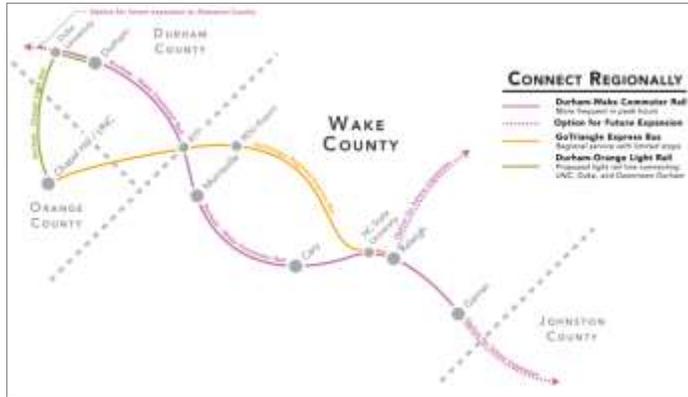
Enhanced bus and rail transit service Durham, Orange, and Wake counties have all approved new transit plans during this decade. In addition to enhanced bus service, those plans incorporate several proposed transit corridors including:

- A 17 mile light rail on new, dedicated tracks between Durham and Chapel Hill
- A 37 mile commuter rail using the existing NC Railroad Company freight and passenger tracks between Durham and Wake counties, with proposed stations in Durham, Research Triangle Park, Morrisville, Cary, Raleigh, and Garner
- Four bus rapid transit (BRT) lines emanating in all four compass directions from Downtown Raleigh, totaling 20 miles
- A 4 mile bus rapid transit in Chapel Hill, oriented in a north-south direction

Durham and Orange county voters passed referenda for a dedicated funding source in 2011 and 2012, respectively, while Wake County voters will have a referendum on a dedicated funding source in fall 2016. Durham and Orange counties have received additional enhanced bus service as a result of their approved dedicated funding. In addition, the Durham-Orange light rail corridor has completed all of its environmental work and has entered the project development stage.



Example of Bus Rapid Transit station
reference: Wake County Transit Plan



Proposed Commuter Rail and Light Rail in the Triangle
reference: Wake County Transit Plan

Existing and proposed bicycle share The Raleigh City Council voted in March 2016 to create the first municipally-based bicycle share program in the Triangle. The initiative will begin with 30 stations and 300 bicycles in the downtown area and at five neighboring university campuses including NC State University. In addition, both Duke University in Durham and the University of North Carolina at Chapel Hill have campus-based bike share programs for students to use. UNC's program, Tar Heel Bikes, is coordinated by their Residence Hall Association; Duke is a member of Zagster, a large national bicycle sharing program.

Primary elements of the 2016 RTA Field Visit

Crystal City Potomac Yard Transitway bus rapid transit

In April 2016, Arlington County and the City of Alexandria marked the substantial completion of the Crystal City-Potomac Yard Transitway, a joint bus rapid transit project in cooperation with the Washington Metropolitan Area Transit Authority and the Virginia Department of Rail and Public Transportation. The RTA tour included both a leadership briefing and a field visit of stations in Arlington County and Alexandria City along with a trip on a Metroway bus rapid transit vehicle.

Overview of Bus Rapid Transit: Bus rapid transit (BRT) is an enhanced bus-based transit system intended to provide higher speed and reliable urban mobility. BRT is a growing form of transit in the United States that can include a number of elements to improve patron comfort and the overall travel experience such as:

- All-day, dedicated travel lanes
- Peak period exclusive lanes
- Off-board fare collection
- Near-level boarding
- State-of-the-art buses
- Enhanced bus stops
- Real-time information at stations
- Signal priority at intersections
- Scalable completion of feature

Crystal City Potomac Yard Transitway overview:

The 4.5 mile Crystal City Potomac Yard Transitway bus rapid transit line, which connects the Crystal City and Braddock Road Metrorail stations, includes the Washington area's first BRT corridor with dedicated bus-only lanes. The system includes a new all-day dedicated transit lane in Potomac Yard and a peak period transit lane in Crystal City.

Arlington County has noted that "The Transitway will provide faster, more reliable bus service along the congested Route 1 corridor, connecting residents and employees to jobs, shopping and the region, while supporting redevelopment in Crystal City and planned development in Potomac Yard."

"At the core, (the Transitway BRT) is a network that's going to be able to move more people faster, and they're going to have a good experience while they're doing it."

-Christian Dorsey, Arlington County Board Member

Location:	Arlington County and Alexandria City, VA
Began service:	August 2014
Dedicated lanes completed:	April 2016
Stations:	15 per direction
Operates:	Sunday – Saturday
Frequency:	12 minutes daytime 15 minutes evening 20 minutes weekend
End-to-end time:	24 minutes
Transit partner:	Washington Metro
Daily ridership:	2,000 (May 2016)

The enhancement of the system over time is an excellent example of a prime benefit of bus rapid transit – scalable completion of various BRT features – since the system began operation almost two years prior to the completion of dedicated lanes in the Arlington/Crystal City area.

Service frequency, stop spacing, and operational performance: During daytime, buses run every 12 minutes, with 6-minute peak frequency for the northern section. In the evening, they run every 15 minutes, and on weekends every 20. This service frequency is identical to the MetroRail service.

Service extends to 10 pm most days, and until midnight on Saturdays. The new Transitway BRT line has 13 stops in each direction, with average stop spacing of 1/4 to 1/3 mile, although the actual spacing varies across the corridor.

The separation of buses and automobile traffic results in corridor-wide transit travel time savings of up to 10 minutes for the longest trips, and the route's on-time performance is the highest in the entire Metrobus network.

Patron fees: Fares are the same as for Metrobus services: \$1.75 using a SmarTrip card or cash and \$0.85 for seniors and riders with disabilities.



RTA tour attendees boarding a bus
18th and Crystal station



RTA tour attendees hearing from Arlington County
Transit Capital Program Manager Bee Buerkler

Capital costs: After a \$21.3 million budget was produced from federal, state and local sources, the Arlington section's estimated construction costs totaled \$10.5 million, which includes roadwork and station platforms. Construction costs for the Alexandria portion of the route totaled \$22.5 million, including \$14 million in Federal Transportation Administration grants and an \$8.5 million grant from the U.S. Department of Transportation.

This undertaking has represented an effective public-private partnership, with owners of Potomac Yard properties contributing land to make room for the construction of dedicated bus lanes.

Customer response: There has been a 25% year-over-year increase in corridor bus ridership in May 2016. There has been very high growth on Metroway and a decline in other bus services in the corridor, which suggests the Metroway service may be particularly attractive for patrons. Current ridership is 2,000 patrons per day.

The Transitway's website includes rider testimonials and survey responses, which shed light on the ways in which BRT has affected the travel behavior of residents of Alexandria and Arlington. User feedback shows that nearly all users praise the smoothness of their new commute. Many also make note of their increased inclination to shop and spend leisure time in areas near the transit stations.

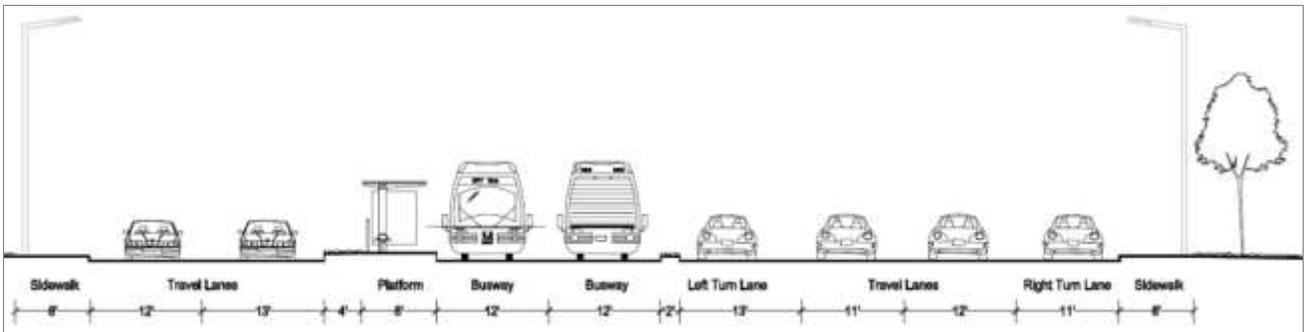
Over the coming decade, the population living in the Crystal City area of Arlington is expected to grow by 25 percent and in the Potomac Yard area of Arlington and Alexandria by 58 percent.



RTA tour attendees in front of a bus, typical design



RTA tour attendees at the 27th and Crystal Station



Street and Transitway typical section
www.alexandria.gov

Future plans for BRT in Northern Virginia: A Northern Virginia Transportation Commission project called *Envision Route 7* led to the selection of a BRT system running from a Metro Station in Tyson's Corner to the Mark Center in Alexandria. The Route is currently slowed down by frequent heavy traffic, and the indirect nature of the Metro connection also prevents smooth travel among various destinations along the corridor.

BRT- Additional Background: On Wednesday, June 29th, RTA staff visited Georgia Avenue in Washington, D.C. to take a look at the city's first "red carpet" bus lanes, which were just added in June 2016. The four blocks that the colored texture has been added to were long known for bus speeds significantly lower than average. This method of denoting bus travel lanes uses the strong visual cue of color to deter car drivers from using this part of the road. Bus riders will be able to move along this corridor with greater speed and efficiency.

Transit-oriented development – additional background: On Wednesday, June 29, RTA staff received additional information during a walking tour of neighborhoods surrounding the

Courthouse and Clarendon Metrorail stations in Arlington. We spoke with Chris Zimmerman, Transportation for America Vice President for Economic Development, and former Arlington County Board member, who has a number of experiences with inclusionary zoning along metro and is working on an ongoing Transportation for America (T4A) study in Raleigh. Zimmerman described the challenges and opportunities that accompany growth in the northern Virginia region; providing quality units that are very affordable and have amenities has been one of his priorities throughout his time in the area. Zimmerman also described the process of creating a "place" around transit: "economic benefits happen faster than coolness", he said. "There are great projects everywhere, but great places don't happen right away. You can design wonderful things, but the market only absorbs so much in a year."



Georgia Avenue "Red Carpet" bus lanes in Washington, D.C.



RTA staff follow-up with Dan Levine and Chris Zimmerman with Transportation for America

Virginia Railway Express commuter rail

Virginia Railway Express (VRE), a joint project of the Northern Virginia and the Potomac and Rappahannock transportation commissions, is a commuter rail-based travel alternative that links the growing northern Virginia area with Washington, DC. The 2016 RTA tour included both a leadership briefing and a field visit of stations in Washington, DC and Arlington County, Va. along with a brief trip on a southbound commuter train.

Overview of Commuter Rail Transit: Commuter rail transit is a commuter-oriented rail service intended to provide a higher speed, reliable travel alternative to congested roadway travel. The service uses existing freight/passenger rail corridors, with capacity expanded as needed to maintain effective train service.

Virginia Railway Express commuter rail service overview: Virginia Railway Express (VRE) is a two line train system that provides commuter rail service from the southern and western suburbs of Northern Virginia into Alexandria, Arlington, and downtown Washington, D.C. The 35-mile Manassas line generally runs parallel to I-66, and the 60-mile Fredericksburg line generally runs parallel to the I-95 corridor. The two lines share tracks from Alexandria to Washington.



Virginia Railway Express - system map
reference: VRE.org



Virginia Railway Express – Crystal City Station
source: VRE.org



Tom Hickey, VRE Chief Development Officer speaks
on a train from Washington, D.C. to Crystal City

Service frequency, stop spacing, and operational performance: There are multiple frequencies on both lines – but only during peak periods, and only in the peak direction (i.e., towards Washington in the morning, and away from Washington in the afternoon.)

The average peak period, peak direction frequency ranges from 23 to 37 minutes depending on the line and time of day, with an overall weighted system average of 32 minutes. Actual frequencies are not uniform during the peak period, with trains arriving anywhere from 10 to 45 minutes apart depending on the line and time of day.

VRE service during peak periods runs about every 30 minutes in the peak direction, providing congestion relief exactly when and where it is needed.

Commuter train travel in the opposite direction during the peak period, or at other times of day, is either minimal or nonexistent. There is either zero or one train in the reverse direction during the peak period depending on the line. Between the morning and afternoon peaks, the situation is similar, with either zero or one mid-day train per direction depending on the line. There are no evening or weekend trains available.

There are a total of 32 train frequencies across both lines on a given weekday; most but not all trains stop at all stations. A total of 12 Amtrak trains -- 5 per direction on the Fredericksburg line, and 1 per direction on the Manassas line – supplement the VRE service throughout the day. Amtrak trains only stop at some stations.

The stations along the Manassas (westbound) line are an average of 4 miles apart, and those along the Fredericksburg (southbound) Line are an average of 5 miles apart. Four stations serve both the Manassas and Fredericksburg Lines: Union Station, L'Enfant, Crystal City, and Alexandria; the station spacing for the northern interlined section (common to both lines) is about 3 miles apart. All station platforms are ADA-compliant, and all but three stations have parking available.

Trains generally travel at approximately 70 mph, but in times of heat restriction speeds are reduced by 20 mph to prevent track damage and promote passenger safety.

Patron fees: Passengers can purchase a monthly ticket, a ten-ride ticket, a day pass, a single-ride ticket, or a

Location:	Northern Virginia and Washington, DC
Project owners:	Northern Virginia Transportation Commission and Potomac and Rappahannock Transportation Commission
Began service:	1992
Stations:	18 across both lines
System length:	90 mi across both lines
Number of lines:	2
Operates:	Monday-Friday
Peak frequency, peak direction:	Varies; 32 min overall average peak frequency across all lines
Peak period trains, peak direction:	6 or 8 per line
Peak period trains, non-peak direction:	0 or 1 per line
Mid-day trains:	0 or 1 per line, per direction
Evening/weekend trains:	none
End-to-end time:	79 min Manassas line; 104 min Fredericksburg line

combination ticket for unlimited VRE and Metro usage for a calendar month. For both lines, prices for these tickets vary depending on distance.

Capital costs VRE's 2016 financial plan analysis states that there is a needed capital investment totaling \$2.6 billion from fiscal year 2016 to fiscal year 2040, of which \$2.2B will be met by VRE. Over the past two and a half decades of operation, fares have contributed to about 25-30 percent of funding, local governments and the Commonwealth of Virginia about 20-25 percent each, and federal formula and discretionary grants about 25-30 percent.

Customer response: VRE opened in 1992 with 16 trains serving an average of 1,800 daily riders, and during fiscal year 2015, 32 trains served an average of 19,000 daily riders.

According to a 2015 user survey, 40% of VRE users drove alone before using VRE. A similar study by the Texas Transportation Institute found that 1.6 to 3.8 million personal hours are saved annually by VRE riders. This demonstrates the capacity of this type of commuter rail to draw commuters who are otherwise driving in—and contributing to—roadway congestion.

Fredericksburg (southbound) Line:

Station	Miles to next station
Union Station*	2
L'Enfant*	3
Crystal City*	4
Alexandria Union Station*	4
Backlick Road	6
Rolling Road	2
Burke Centre	8
Manassas Park	3
Manassas	3
Broad Run	-

* station common to both lines

Manassas (westbound) Line:

Station	Miles to next station
Union Station*	2
L'Enfant*	3
Crystal City*	4
Alexandria Union Station*	5
Franconia-Springfield	5
Lorton	5
Woodbridge	4
Rippon	7
Quantico	11
Brooke	5
Leeland	4
Fredericksburg	5
Spotsylvania	-

Future Plans: VRE has a System Plan comprised of three phases that will be implemented by 2040. According to VRE's System Plan Summary released in 2014, the investments offer more peak capacity than an equivalent amount invested in highways or heavy rail.

PHASE 1: Run Longer Trains

- Longer & second platforms
- More station parking
- More railcars
- More train storage tracks

PHASE 2 & 3: Run More Trains

- Earn additional "train slots" through capacity improvements
- Additional tracks
- Long Bridge expansion
- Parking, railcars, yards Gainesville-Haymarket Extension

Capital Bikeshare

Capital Bikeshare is a regional bicycle share system that allows users to obtain and return bicycles at stations across Washington, D.C., Arlington and Alexandria, VA, and Montgomery County, MD. The 2016 RTA tour included both a leadership briefing and a field visit of a few representative bicycle share stations in Arlington County.

Overview of bicycle share: As one of the more common transportation facets of the growing U.S. sharing economy, bicycle share can be implemented by the public, private non-profit, or private for-profit sectors, or a combination. The objective is to create a low-cost, small footprint (both energy and geographically) means of active, mobility by making bicycle and bicycle stations ubiquitous and inexpensive in urban and suburban areas.

Capital Bikeshare (CaBi) service overview: Capital Bikeshare consists of more than 3,000 bicycles available from 350 stations in portions of northern Virginia, suburban Maryland, and Washington, DC. Information about bike availability, bike paths, and other system information can be found both online and in through the international bike access free smart phone application, Spocycle.

Program history and objectives: In August 2008, SmartBike D.C. was launched. The program saw a successful first two years of operation, during which Arlington County, VA, was putting together its own system. By May 2010, Arlington and the District formed a new, multi-jurisdiction plan with one operator. In the following two years, the regional Capital Bikeshare system was created and has since expanded. The mission of the program has been to transform the community by providing a high quality, convenient, and affordable bike transit system that will connect people to more places where they live, work, and play in the region. Now, CaBi is operated by Motivate, a company based in Brooklyn, NY that operates bikesharing systems in other cities across the U.S.

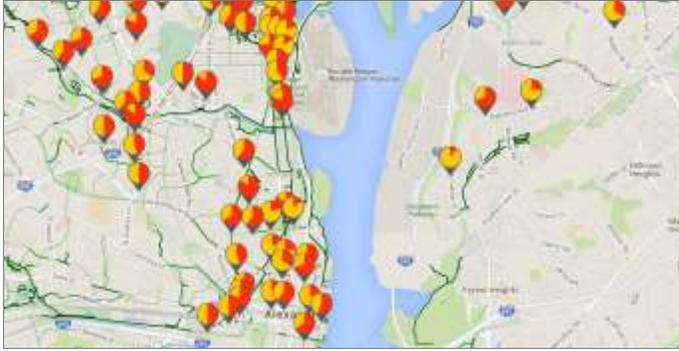
Capital Costs: Planning and implementation costs at the start of the program totaled \$5 million, and additional first-year operating costs were \$2.3 million for 100 stations. According to the 2015 DC Capital Bikeshare Development Plan, the program has a six-year expansion outline through 2021 with estimated capital costs of \$6.5 million.

CaBi also provides opportunities for sponsorship of stations. While sponsorship pricing varies by the size of the station and number of bikes, this relationship with CaBi offers placement of station near a sponsoring organization's location, the organization's logo and link on Capital Bikeshare's interactive station map, a designated number of free memberships, a cycling class for the organization's employees or tenants, and the organization's logo on both sides of station's map frame in Arlington stations.

Patron fees: Memberships are available for purchase online and in commuter store locations. There are a variety of usage and cost options for DC area residents looking to incorporate biking into their transportation routine:

Example pricing:

Single Trip	24-hour	30-day	Annual
\$2	\$8	\$28	\$85



Interactive Capital Bikeshare Map, illustrating bike availability and location



RTA tour attendees hear from Jason Hardin, Capital Bikeshare Planner

Capital Bikeshare influences commutes with a focus on interoperability. Stations are located strategically near other transit hubs.

Customer response: Bikeshare programs are noteworthy both as independent programs as well as in how they operate in tandem with other transportation systems, including transit. In a 2014 survey, Capital Bikeshare found that for nearly two-thirds (64%) of respondents, at least one of the bikeshare trips they made last month either started or ended at a Metrorail station. The survey results also showed that about a quarter (24%) of respondents had used Capital Bikeshare to access a bus in the past month.

Olli automated shuttle

To get a sense of emerging technologies, the RTA tour included a leadership briefing of a new self-driving electric shuttle known as Olli. Incorporating the IBM Watson artificial intelligence platform, Olli is being developed and tested by Local Motors.

Overview of Olli: Olli is a product of Chandler, Arizona-based Local Motors. The product is co-developed by customers and micro-manufactured at multiple facilities including National Harbor, Maryland, just south of the I-95/I-495 Capital Beltway and close to Alexandria. Local Motors is interested in distributing micromanufacturing globally, and certain cities like Washington D.C. are crucial in shaping regulation and opinion, which made this an ideal place to expand.

Local Motors co-founder and chief executive John Rogers notes the company's unique advantage with Olli; it is building the vehicles from the ground up, and producing most components with 3D printers. He hopes to be able to print the vehicle in about 10 hours and assemble it in another hour.

Operating characteristics: Today the vehicle is limited to 3-7 MPH; however, the expectation is that speeds of 35-45 MPH from a rechargeable battery-powered engine will be possible. The product is currently being prepared for testing in a variety of operating environments. Olli's operations are intended to revolve around summoning by users of a mobile app similar in structure to Uber, a ride-sharing application for smart phone.

"Olli is a self-driving electric shuttle. As long as you have a smartphone, wherever you are is a bus stop. And wherever you're going is your next stop."

-Local Motors

Expected costs and pricing: Press reports indicate that the cost to purchase one Olli shuttle may be around \$250,000 - \$300,000 range. Local Motors expects that they will be purchased in fleets of vehicles through a system where buyers like public transit systems, universities, private communities, hotels or convention centers, would purchase 10 to 15 units that would comprise one automated transportation system.



Speaker Jonathan Garrett narrates a presentation on Olli for RTA trip attendees

Additional background: On Wednesday morning, Local Motors Olli Product Manager Jonathan Garrett gave RTA staff a tour of their facility in National Harbor, Maryland. While a team was working on assembling some of Olli's interior parts, we were told about some of the vehicle's innovative features. It can operate on a predetermined course, like a circulator shuttle, as well as provide shared, on-demand service from point A to point B with real-time route optimization. Olli can be used as a downtown circulator in any relatively dense area with medium to high walkability, as a feeder line shuttle from one destination to a larger transit hub with the potential for multiple stops, or as a campus shuttle providing intra-campus mobility, among other things.



Olli on display at Local Motors' National Harbor, Maryland, Location

Findings and potential implications for the Triangle market

Bus rapid transit

- The Crystal City-Potomac Yard Metroway BRT highlighted the potential of scaled introduction of features. As we implement bus rapid transit in Chapel Hill, Raleigh, Cary, and potentially other parts of the Triangle, we may look for opportunities to jumpstart the service and implement various travel experience enhancements over time.
- The partnership between Arlington and Alexandria is an example of how different jurisdictions in the Triangle area can come together. This will be crucial as we build the transit infrastructure we need across both adjacent jurisdictions and the region as a whole.

Commuter rail

- Understanding how the DC Metro area has prepared for and responded to this network will be instrumental to the design and implementation of our own commuter rail here in the heart of North Carolina.
- VRE has maintained a high level of ridership without requiring significant increases in either frequency or span of service. We can explore this dynamic between service and ridership as we seek to implement our regional commuter rail line.

Bike share

- Observing how infrastructure, location, pricing, and other factors influence usage rates and rider satisfaction within the DC program will be a key to realizing a plan for bikeshare in Raleigh as well as expansion across the Triangle. As plans for bus and rail networks in counties within the Triangle unfurl, it will be essential to coordinate with bike operations to provide residents with smooth multimodal commute options.
- User feedback from Capital Bikeshare's app, SpotCycle, can also be an influence for the free BikeRaleigh app, which debuted in June 2016 and allows users to tailor their cycling experience based on their skill and comfort level.

"Olli" automated shuttle

- This automated vehicle concept provides an example of emerging opportunities for circulators and "last mile" solutions. It is also helpful to understand the business model of an organization that does without the large infrastructure costs of traditional automakers.

References

RTA 2016 Leadership Briefing and Field Visit: Agenda

Tuesday, June 28

- 10 a.m. Visit Begins: Welcome and Briefing**
- **Christian Dorsey**, Member of Arlington County Board
 - **Dennis Leach, AICP**, Arlington County, Director of Transportation, Department of Environmental Services
 - **Yon Lambert, AICP**, City of Alexandria, Director, Department of Transportation and Environmental Services
- 10:30 a.m. Field Visit: Arlington stations - Crystal City Potomac Yard Transitway and Capital Bikeshare**
- **Matthew Huston, PE**, Arlington County, Senior Design Engineer, Department of Environmental Services
 - **Bee Buegler**, Arlington County, Transit Capital Program Manager, Department of Environmental Services
 - **Jason Hardin**, Capital Bikeshare Planner, Consultant to Arlington County Commuter Services
 - **André Stafford**, Washington Area Metropolitan Transit Authority, Bus Operations Specialist
- 11:30 a.m. Lunch and Briefing**
- **Robert Mandle**, Crystal City Business Improvement District
 - **Tom Hickey**, Virginia Railway Express, Chief Development Officer
- 12:15 p.m. Field Visit: Virginia Railway Express commuter rail**
- **Tom Hickey**, Virginia Railway Express, Chief Development Officer
- 1:30 p.m. Field Visit: Alexandria stations - Crystal City Potomac Yard Transitway**
- **Lee Farmer, AICP**, City of Alexandria, Principal Transportation Planner, Department of Transportation and Environmental Services
 - **André Stafford**, Washington Area Metropolitan Transit Authority, Bus Operations Specialist
- 2:45 p.m. Closing Reception: Debrief, Q&A, and Emerging Innovations**
- **Jonathan Garrett**, Local Motors, Olli Product Manager
- 3:30 p.m. End of visit**

RTA 2016 Leadership Briefing and Field Visit: List of Participants

Richard Adams	Kimley Horn
Will Allen	GoTriangle Board
Emily Atkinson	Raleigh Chamber
Tim Bailey	Town of Cary
Tim Bender	City of Raleigh
Ken Bowers	City of Raleigh
Ted Boyd	Town of Cary
Steve Brechbiel	Quintiles
James Bridges	NCDOT
Matt Calabria	Wake County
Catherine Campbell	NC Railroad Company
Cody Christensen	STV, Inc.
John Hodges Copple	Triangle J Council of Governments
John Fournier	
Maeve Gardner	GlaxoSmithKline
Ken George	Cary Town Council
Kyle Greer	Cary Chamber of Commerce
Natalie Griffith	Regional Transportation Alliance
Jordan Gussenhoven	Chatham Street Commercial
Ruffin Hall	City of Raleigh
Jim Hartmann	Wake County
Tom Henry	GoTriangle
Dennis Heuer	Clark Nexsen
Josh Hurst	Clark Nexsen
Sig Hutchinson	Wake County
Taiwo Jaiyaebo	AECOM
Valerie Jordan	Cisco
Curt Ladig	Delta Dental
Eric Lamb	City of Raleigh
Tim Maloney	Wake County
Bill Martin	VHB
Bret Martin	Capital Area MPO
Ellen McAlexander	Regional Transportation Alliance
Joe Milazzo	Regional Transportation Alliance
Mike Munn	McAdams
Sunny Nandagiri	AECOM
Aaron Nelson	Chapel Hill-Carrboro Chamber of Commerce
Cathy Reeve	NC State University
Karen Rindge	WakeUP Wake County
Steve Scott	SEPI Engineering
Terry Snow	Gannett Fleming
Gary Tober	GoTriangle
Pam Townsend	Dewberry
Tara Lightner Robbins	Midtown Raleigh Alliance
Mila Vega	Town of Chapel Hill
Eddie Wetherill	Wetherill Engineering

RTA Leadership Team and 2016 Field Visit Sponsors

Gold and Sustaining Gold



Silver



Senior Regional Partners

Capital Area MPO
Durham-Chapel Hill-Carrboro MPO
GoRaleigh
GoTriangle
Raleigh-Durham Airport Authority

2016 Field Visit Sponsors

Delta Dental of North Carolina
GoTriangle
SEPI Engineering and Construction
Wetherill Engineering