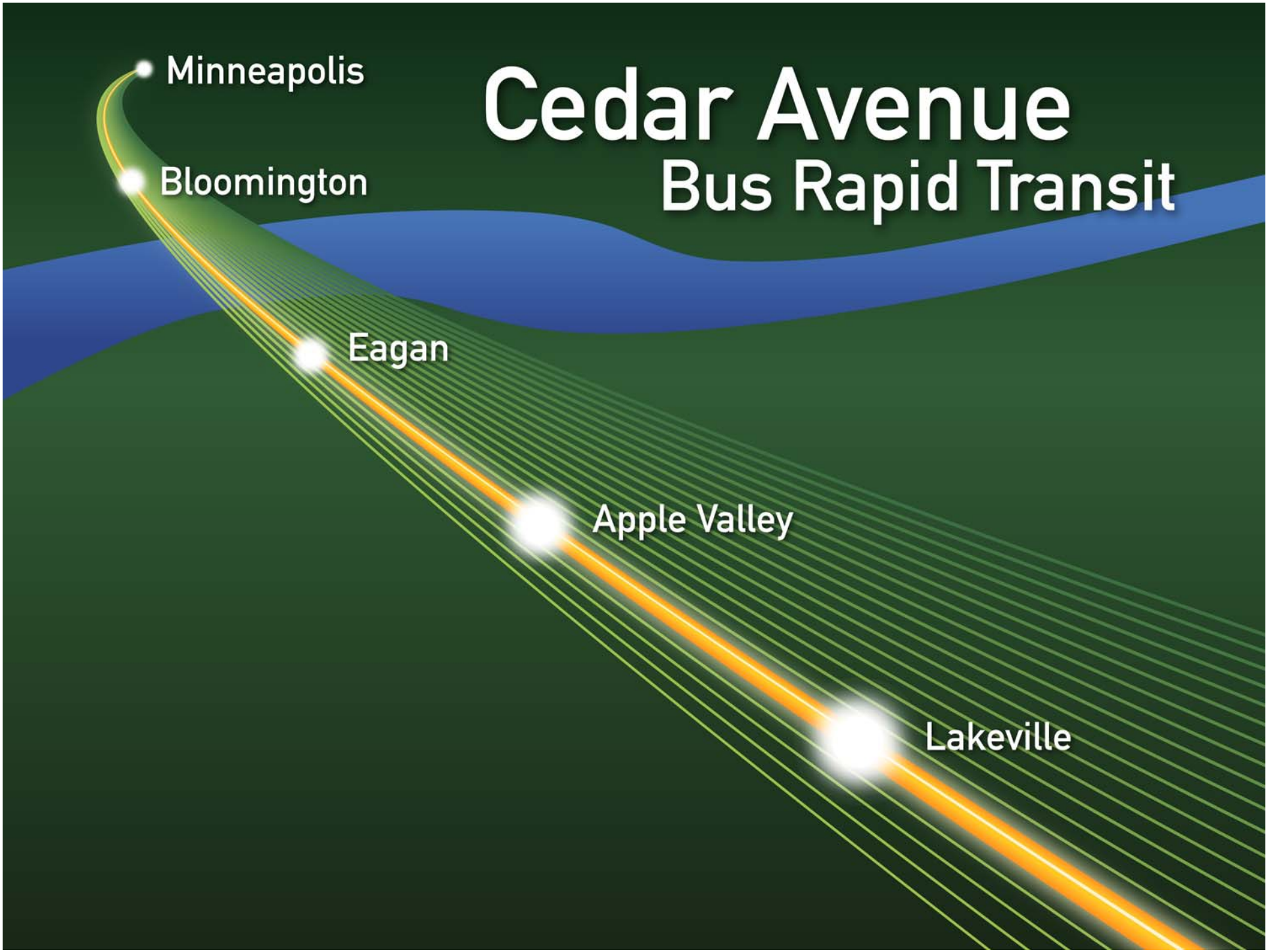

Minneapolis
Bloomington
Eagan
Apple Valley
Lakeville
Cedar Avenue
Bus Rapid Transit

Rev 041310

The Minnesota Valley Transit Authority (MVTA) is the public transportation provider for the businesses and residents of Apple Valley, Burnsville, Eagan, Rosemount and Savage. The MVTA is an active participant in the planning and implementation of Bus Rapid Transit (BRT) on the Cedar Avenue Corridor, and will be the operator of service along the transitway.

Currently, the MVTA has two transit stations along the corridor, the new Apple Valley Transit Station opened in January 2010 and the new Cedar Grove Transit Station slated to open in March 2010. The MVTA is also providing service to the new Lakeville Cedar Park & Ride located at 181st and Cedar.

In addition to the stations under construction and the service operating in the corridor, the MVTA is also working with the University of Minnesota Intelligent Vehicles Lab in developing a Driver Assist System (DAS). The DAS will help improve schedule reliability and driver confidence, as the plan along Cedar Avenue is to use bus-only shoulders rather than having a dedicated transitway.

*The MVTA has wrapped 10 buses to be operating in the Cedar Avenue Corridor featuring Bus2.0 technology and Driver Assist System.*

## Apple Valley Transit Station

The Apple Valley Transit Station is re-inventing the look and feel of transit in Apple Valley. In addition to a sweeping design, the station features the first pedestrian overpass in the city, connecting the southbound transit station to the northbound transit station.

Located at 15450 Cedar Avenue, the station will provide parking for 750 vehicles and will connect the city to downtown Minneapolis, downtown St. Paul, the University of Minnesota, Burnsville Center, Fairview Ridges Hospital, Minnesota Zoo, Mall of America and many more destinations. Riders can also transfer to other systems throughout the region.

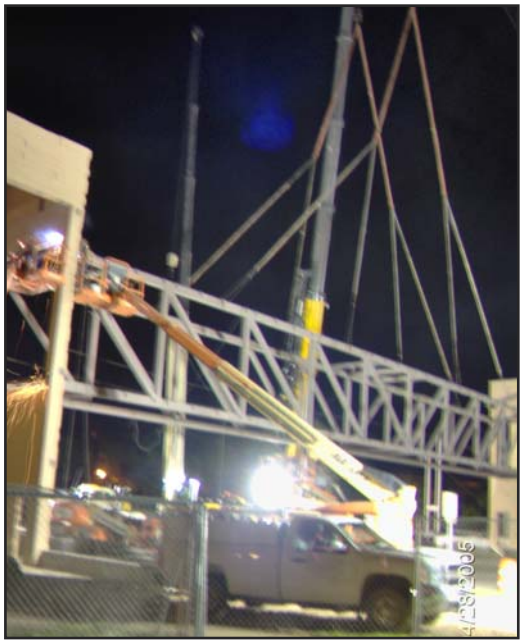

*Participating in the Apple Valley Transit Station Grand Opening from left: Sen. Jim Carlson, Rep. Tara Mack, Ed Kearney of the Apple Valley Chamber of Commerce, US Sen. Amy Klobuchar, Apple Valley Mayor Mary Hamann Roland and MVTA Chair Elizabeth Kautz. At right: Rep. Phil Sterner, CTIB Chair Peter McLaughlin and Dakota County Regional Rail Authority Chair Will Branning.*


*The Apple Valley Transit Station opened January 4, 2010, on schedule and on budget. The Grand Opening was celebrated January 8, 2010, featuring US Senator Amy Klobuchar and other local officials.*

The project incorporates a number of innovative features, including:

- 6-acre site with 2,475 square feet of enclosed space on two levels in the northbound station (1,125 square feet of covered platform space) and 1,898 square feet of enclosed space on two levels in the southbound station (279 square feet of covered platform space).
- The northbound and southbound stations, as well as the ramp, have full generator back-up for continuous operation during a loss of power.
- In an effort to save energy, all lights will be automatically controlled to turn on and off based on time of day or outside light levels. Lights can be programmed to turn on in early morning for early commuters, turned off during the day when there is sufficient sunlight to light the buildings, and then back on during evening for late commuters.
- Ramp and surface parking lots will be equipped with electronic vehicle counting notifying users when ramp or lots are full.
- Argon-insulated glass is being used on walls to provide more energy efficiency.
- Parking designated for hybrid vehicles only.
- Three active elevators (one in each station and one at the ramp); one for future ramp expansion.
- The exterior of the building will have architectural lighting elements made up of a light "tape" (roughly the thickness of a credit card) which uses less energy than LED lights.
- Some 45 cameras are located throughout the surface lots, parking ramp, station buildings and skyway. The cameras will record and store video on a DVR for up to 21 days.
- 10 Bike lockers; 3 bike racks; connections to city/county trails.
- Level boarding platform; bus pullout and passing lanes.

Materials being used at the site include: Station - colored concrete flooring, colored glass and colored concrete walls; Skyway - steel truss


*Construction workers worked through the nights of August 27 and 28 to raise the pedestrian span across Cedar Avenue*

structure with colored concrete flooring and mainly colored glass walls; Parking ramp - post-tensioned concrete structure with precast concrete panel exterior; Ramp elevator lobby - colored concrete and colored glass walls.

Partnerships have been key in gaining funding for the site. Sources include:

- Counties Transit Improvement Board (CTIB) $6,950,000
- Urban Partnership Agreement (UPA) $4,000,826
- Federal Transit Administration (FTA) $ 742,500
- State Bonds/Metropolitan Council
  - Land $6,124,250
  - Local Match (for federal funds) $1,885,832
- Dakota County Regional Rail Authority $1,255,000


## Cedar Grove Transit Station

The Cedar Grove Transit Station is located in a key redevelopment area in the City of Eagan. Located in the southeast quadrant of Highway 13 and Cedar Avenue. One of the City's primary goals is to promote a walkable new urban community with easy access to mass transit.

Cedar Grove provides parking for 164 vehicles, including six handicapped spaces. The initial service plan for the station includes some seven routes with nearly 200 daily local bus trips with connections throughout MVTA's cities as well as regional connections at the Mall of America Transit Station. Express service will evolve over time but it is expected that direct service to the University of Minnesota will begin in fall, 2010.

*Pedestrians will be able to enjoy the patterned paver design nicknamed "Raindrops on Roses" due to the round "drops" of red pavers at the Cedar Grove Transit Station.*

*Participating in the Cedar Grove Transit Station Construction Kick-off, from left, are: Sen. Jim Carlson, Mayor Mike Maguire, MnDOT Project Manager Nick Thompson; MVTA Chair Elizabeth Kautz, Rep. Sandy Masin, Dakota County Commissioner Tom Egan and Metropolitan Council Representative Dan Wolter.*

Among the notable features of this station:

- Exterior proudly displays regional Kasota stone for a warm, golden hue to the building.
- Ceramic in restroom includes 40 percent recycled content.
- Site will be home to native Minnesota vegetation, including trees, grass and wildflower species, designed to reduce carbon emissions from mowing.
- The Transit Station is being constructed on a former brownfield.
- LED accent lights which follow the roof-line and have changeable colors.
- Burnished block and low volatile organic compound (VOC) paints to improve indoor air quality.
- "Geothermal" heating and cooling of the building.
- Future connection to center-running BRT.
- Bike lockers, bike racks and connections to city/county trails.

The Cedar Grove Transit Station is also part of the regional Urban Partnership Agreement (UPA). Funding sources include:

- Urban Partnership Agreement (UPA) $3,199,174
- State Bonds/Metropolitan Council
  - 2005 Funds including land acquisition $ 240,500
  - Local Match (for federal funds) $ 799,793

The Metropolitan Council, on behalf of the MVTA, sought 2010 funding from the Counties Transit Improvement Board (CTIB) to fund operations from the facility.

## Lakeville Cedar Park & Ride

The Lakeville Cedar Park & Ride was constructed by Metro Transit, but service to the site located at 181st and Cedar Avenue is operated by the MVTA. The site features parking for 191 vehicles and was completed in mid-November 2009.

Service between the site and downtown Minneapolis on Route 477/477V began in September 2009, with five peak morning and five peak evening trips. Buses also serve the Apple Valley Transit Station, where riders can connect to buses traveling to downtown St. Paul, the Mall of America or the Fairview Ridges Hospital area.

This project is also funded as part of the Urban Partnership Agreement and the total cost is expected to be $1,874,519. The transit service is being funded by the Counties Transit Improvement Board.

## Driver Assist System

Improving schedule reliability by helping drivers feel confident when using bus-only shoulders on suburban highways is the goal of the Driver Assist System.

Using technology developed by the University of Minnesota Intelligent Vehicles Lab, the system combines GPS satellite tracking, on-board technology and specialized training in a simulator. The system is significant because there will not be a full transitway along the Cedar Avenue Corridor between Apple Valley/Eagan and Minneapolis, but rather the buses will be operating in bus-only shoulders. Shoulder operation presents special challenges because they are not as wide as the regular lanes and they butt up against either guardrails, jersey barriers or the edge of the pavement. Further, it can be challenging to drive on shoulders during inclement weather (ice and snow) or when it's dark.

The Driver Assist System will provide a mix of feedback to the driver, including visual (head-up display allowing driver to see both the real road and the virtual road projected on to a screen), tactile (driver's seat vibrates – acts like a virtual rumble strip in the road, but only the driver feels it) and haptic (torque on the steering wheel is sufficient to suggest the driver return to the center of the shoulder). The system will also warn of shoulder obstructions such as a stalled vehicle or debris.

*Technology has been installed on 10 MVTA buses designed to improve conditions encountered when driving on the Cedar Avenue shoulders .*

A future use of the guidance system will support precision docking at stations such as the low-speed operation form of this in Cleveland and Las Vegas. The medium-speed operation to be used by the MVTA is easily expandable to accommodate precision docking, providing roll-on/roll-off access for users in wheelchairs and other mobility aids. The technology is of high interest to the Federal Transit Administration (FTA). Further, the system is relatively inexpensive and highly scalable for additional implementations once the core system is operational.

*Funded by the Urban Partnership Agreement, the MVTA has acquired a training simulator to prepare drivers for using the shoulder-running BRT along Cedar Avenue.*

Real-Time Technologies (RTI) has developed a specialized training simulator for the MVTA, and it is currently being tested. It was determined that use of a simulator was the most efficient means of training drivers to take advantage of the DAS and operate the buses on the shoulders. The MVTA worked closely with the HumanFIRST Lab at the University of Minnesota to develop specifications for the training simulator and received two bids for the project. RTI was selected as the most responsive vendor and a contract was awarded in late 2008 in the amount of $627,810. The training simulator merges traditional bus-driver training with DAS components, overlaying the DAS virtual world on top of the simulator's virtual world. The plan is to train drivers first on the simulator, and then on 10 buses in the "real" world. In 2010, the MVTA will be operating the system in live passenger service.

The training simulator and DAS project are funded by the Urban Partnership Agreement (UPA) awarded to the State of Minnesota in 2007. The MVTA and the University of Minnesota are among the project partners working on components of the UPA.

To highlight the DAS, the MVTA also created unique "Bus2.0" wraps for the 10 buses that will be operating the service. The "Bus2.0" concept points to the fact that the new technology being deployed and tested in these buses is a quantum leap forward in transportation technology -- that hidden under the familiar shell of a city bus is really a whole new type of bus. Each of the three different designs highlights just a few of the specific features of the cutting-edge technology being developed and tested in these buses: in-road radio frequency identification tags, satellite navigation and head-up displays that aid the driver in keeping their eyes focused on the road.

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