

# **I-55 Bus on Shoulder Demonstration In the Spirit of the Time**

By

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## **Introduction**

Transit system expansion seems a distant possibility in metropolitan Chicago in the post recession era, due to a scarcity of operating and capital financial resources from traditional federal, state and local sources. In the second decade of the 21<sup>st</sup> century, and for the foreseeable future, we are driven toward fixing and maintaining the system that we have. In 2010 our region adopted a new long range plan, the GO TO 2040 Comprehensive Regional Plan<sup>1</sup>, which solidified our commitment to operating, maintaining and modernizing our existing transportation system, and squeezing more mobility from it. Most of the 18 priority major capital projects listed in the Plan are improvements to the existing system.

In the aftermath of economic recession and with an uncertain future, we must do more with less in transportation. The regional expressway and tollway network carries a significant amount of travel, almost none of it by transit. Shared use strategies, such as transit use of highway shoulders, and managed lanes that can be used by cars and high performance bus service alike are proven ways to increase the capacity of the existing transportation system.

The Illinois General Assembly recognized the value of high performance bus service and using highway shoulders for transit when it directed the Regional Transportation Authority, (RTA), the Illinois Department of Transportation (IDOT) and Pace Suburban Bus to investigate and establish a demonstration to test the feasibility of these concepts<sup>2</sup>. For the past two years, the RTA and its Phase I consultant AECOM, has been working closely with IDOT by conducting the necessary planning and preliminary engineering work to thoroughly examine the idea of using the Interstate 55/Stevenson Expressway shoulders for Pace's 755 and 855 commuter express bus routes from the southwest suburbs to Chicago. As a result of the preliminary engineering and environmental (Phase I) study, IDOT has given design approval on the engineering and operational aspects of the bus on shoulder operation. The Department has included the bus on shoulder capital improvements to its I-55 resurfacing projects currently underway.

### ***Purpose and benefits***

The RTA, IDOT, and Pace, in coordination with the Illinois State Police (ISP), will conduct a two year demonstration of transit bus operations on the I-55/Stevenson Expressway shoulder as a low speed priority treatment for transit under congested highway conditions. This demonstration will add transit as an allowed use to the I-55/Stevenson Expressway shoulders roughly between Kedzie Avenue and I-355. This shoulder option will be an added feature of routes 755 and 855 that can be used on an as-available basis. The purpose of this demonstration is to determine whether using the highway shoulder for transit can improve transit service and the customer experience while also maintaining the primary function of the shoulder and overall traffic safety, and to examine this new strategy to increase the capacity of the existing urban transportation system.

The benefits of using the shoulder for these bus routes are expected to be:

1. increased people-moving capacity of the highway
2. improved running time, schedule adherence and schedule reliability of transit service
3. convenience for the transit customer and improved customer experience
4. new transit ridership and increased transit capacity.

The demonstration will be conducted under specified conditions designed to ensure safe operations, similar to those in other metropolitan areas where buses use Interstate shoulders. The demonstration is expected to begin in late fall 2011 and continue for two years. A joint evaluation will be conducted by the RTA, IDOT, Pace and ISP during the second year. The evaluation will provide policy makers with information and recommendations needed to decide the future of the I-55 demonstration and to determine the value of bus on shoulder operations in Illinois.

Although using highway shoulders for transit is a new concept in Illinois, bus on shoulder is successfully operating in a number of major metropolitan areas around the country such as Minneapolis-St. Paul, Minnesota, and Cincinnati, Ohio. The advantage of a bus on shoulder program is that the major capital facilities are already in place and it is unlikely to have major environmental and community impacts. Bus on shoulder is generally a low cost, quick-to-implement capacity addition that does not require costly expansion of the highway. Bus on shoulder will add a significant new feature to routes 755 and 855 at little cost – less than \$1 million for the two year demonstration.

### ***Background***

The I-55/Stevenson Expressway corridor between Kedzie Avenue and I-355 is the most straightforward place in the Chicago region to demonstrate bus-on-expressway shoulder travel. The corridor has nearly continuous wide shoulders (12 feet or greater), severe and recurring congestion for prolonged periods in the traditional (toward downtown Chicago in the AM peak period) commute direction, and existing Pace services.

Pace provides the radial transit service in this corridor to serve the traditional commute from suburb to downtown. Commuter express routes 755 and 855 using 45-foot over-the-road coach buses operate between park-and-ride lots in several southwest suburbs and Chicago via I-55. This bus service is unique in the region where most radial transit service is provided by rail (CTA or Metra). This is destination-based service, serving long distance trips of 15 to 35 miles from Burr Ridge, Bolingbrook, Romeoville and Plainfield to two major destinations - downtown Chicago (route 855) and the nearby Illinois Medical District (IMD) (route 755). Routes 755 and 855 are traversing the most congested segments of I-55 during the most congested times and will likely benefit from using the shoulder.

This paper presents the experience in other cities with bus on shoulder operations, the existing conditions and motivation to test bus on shoulder in the Chicago area, the

highway design and operational features of the upcoming demonstration and the expected approach to evaluating the effectiveness of this I-55 bus on shoulder demonstration.

### **Experience in Other Cities**

While bus on shoulder operations is a new concept in Chicago, a number of other U.S. cities have been operating buses on shoulders for several years. The project team conducted a thorough review of six bus on shoulder operations and used this information as the basis for concepts developed for the I-55 corridor<sup>3</sup>.

Minneapolis-St. Paul has by far the most extensive experience with bus on shoulder operations. Their program started in 1991 and has expanded significantly to a network of approximately 271 shoulder lane miles today. Minneapolis-St. Paul is considered the leader in bus on shoulder policy and operations. In fact, throughout the research for this I-55 demonstration, all of the agencies surveyed relied to some extent on Minneapolis-St. Paul's operating procedures and practices.

### ***Right and Left Shoulder Operation***

With the exception of Cincinnati, all of the metro areas utilize right-hand shoulders. As is the case with the proposed I-55 bus on shoulder operations, Cincinnati uses the left shoulder because of the numerous conflict points associated with bridge piers and merge lanes on the right shoulder. Minneapolis and San Diego are also in the process of developing left shoulder segments for operations.

### ***Vehicles***

Standard 40-foot transit buses are operated in most of the peer cities. Miami utilizes 30-foot transit buses. However, this bus is applied due to the lower ridership demands, rather than roadway constraints. Minneapolis-St. Paul, being the largest bus on shoulder operator uses a mix of 45-foot over-the-road coaches, 40-foot transit buses and 60-foot articulated transit buses. Atlanta also uses 45-foot over-the-road coaches in addition to traditional 40-foot transit buses.

### ***Roadway Requirements***

The facilities utilized in bus on shoulder operations are almost all limited access highways with a mixture of state and Interstate designations. Only the Minneapolis-St. Paul region applies bus on shoulders to arterial highways. Shoulder width requirements among the surveyed cities range between 10 and 12 feet. Pavement depth requirements were stated generally as "must be of sufficient strength subject to inspection" or not specified. Spacing between merge ramps and minimum usable segment specifications appeared in only one metro area's standards. In Miami, a minimum usable segment of 2,500 feet was established together with a minimum of ½ mile between merge ramps.

### ***Signage and Striping***

Signage application was fairly consistent among the peer metro areas, despite there being no federal or industry standards specific to bus on shoulder operations. This appears to be a direct result of the Minneapolis-St. Paul program being used as a template for subsequent services. Typical signage includes "Begin" and "End" signs to mark the

designated bus shoulder segments; and intermediate “Shoulder Authorized Buses Only” reminder signs placed at ½ mile intervals along the corridor. Additional “Yield to Buses on Shoulder” and bus merge signs are used in some of the cities examined. San Diego is the only operation that uses special pavement markings for bus on shoulder operations.

### ***Modifications of Rumble Strips***

Most systems studied do not use rumble strips in the shoulder. In Minneapolis, the rumble strips are moved toward the center of the shoulder and out of the wheel path of the bus.

### ***Drainage Structures/Grates or Manholes***

Soon after buses began operating on shoulders in Minneapolis-St. Paul, the Minnesota Department of Transportation developed a new catch basin design standard specifically for bus shoulders that includes placing a concrete pad around each catch basin and bringing the structure level with the pavement. The new design is intended to reduce the wear on the pavement surrounding the structure; however, the effectiveness of these new catch basins in removing storm water has been slightly reduced. In San Diego, the existing inlets at the edge of the shoulder were adjusted to prevent dips in the pavement. In other systems no special provisions were made.

### ***General Transit Operating Parameters***

The six peer cities all feature unique operating conditions. Thus, their operating rules also vary in some respects. For example, Atlanta requires their buses to merge back into general traffic at each interchange wherever a general traffic merging ramp “breaks” the shoulder lane. The other cities allow buses to maintain travel in the shoulder lane and through the taper and gore, but require buses to yield to vehicles entering and exiting at the ramps. Cincinnati, which is the only city with an active left-shoulder operation, does not face this situation as they have no left-hand merge ramps within their bus on shoulder corridor.

### ***Bus Speed***

With some exceptions, the maximum bus speed allowed is 35 mph with a 15 mph maximum speed differential. For example, if traffic is moving at 15 mph the bus cannot exceed 30 mph. Cincinnati allows the buses to reach 49 mph, perhaps due to the minimum shoulder width of 12’ and the absence of merging from left hand ramps. Minnesota is considering legislation to increase the maximum speed of buses operating on the shoulder.

### ***Lane Prioritization, Obstacles and Obstructions***

The primary purpose of the highway shoulder is to provide a means for disabled or emergency vehicles to safely exit the general traffic lane with minimal impact to traffic flow. It is designed for emergency use and must be prioritized to maintain that use first and foremost. All of the peer cities recognize this and require their buses to return to general traffic lane should the shoulder be occupied by an emergency or disabled vehicle. Buses in all cities are also required to yield to maintenance vehicles (including snow plows) in the shoulder.

### ***Training***

Mandatory training programs for bus on shoulder operations were in place at all of the surveyed cities' transit properties. In most cases, operators are given a combination of classroom and on-the-road instruction. The drivers are typically provided with a training manual, class time, route and safety pamphlets, video and on-board training.

### ***Safety***

The agencies surveyed found no discernible increase in crash rates due to the implementation of bus on shoulder operations. None of the agencies developed special emergency procedures for bus on shoulder operations.

### **Existing Conditions**

The Interstate 55 Corridor extends diagonally over 30 miles, from Lake Shore Drive in the heart of Chicago to Weber Road in the Bolingbrook / Romeoville area and beyond. The corridor spans three counties, (Cook, southeast DuPage and northwest Will) and 15 communities in the southwest portion of the region. I-55 has 3 travel lanes in each direction with inside and outside shoulders. The shoulder width varies significantly but the median shoulders between I-355 and Kedzie are generally at least 12 feet. Congestion and lack of mobility options are the main problems for many people traveling within the corridor

### ***Transit service in the corridor***

Currently, two express bus routes operate on I-55 over the segment designated for the bus on shoulder demonstration project: Route 755 Plainfield – Illinois Medical District Express and Route 855 Plainfield – East Loop Express. Route 755 offers three northbound and three southbound trips per weekday – two in the peak direction of travel and one in the reverse peak – and has a daily ridership of about 35 passengers. Route 855 offers six northbound and southbound trips per weekday in the peak direction of travel and has a typical daily ridership of between 250 and 300 passengers.

The bus service on I-55 is subject to the same travel conditions as traffic in the general purpose lanes, characterized below. Pace's service contractor provides travel time data between the Bolingbrook park-and-ride lot and the intersection of Monroe Street and Wabash Avenue (Monroe/Wabash) in downtown Chicago (which captures the entire length of the demonstration project), allowing additional analysis about the transit service.

Data from September 2010 through March 2011 shows that the average travel time for AM trips on route 855 between Bolingbrook and Monroe/Wabash was 63 minutes; however, the standard deviation was 17 minutes (or nearly a quarter of total travel time). Over the limited data collection period, travel times ranged from 35 minutes to over two hours (121 minutes). Trips earlier in the peak period tend to have quicker and less variable travel times; variability of travel times typically increases throughout each peak period. For example, the first trip of the AM peak period has a 34 minute difference between the longest and shortest trip over the analysis period, whereas the last trip of the AM peak period has a 72 minute difference, with the shortest trip still taking 14 minutes

longer than the shortest trip from the first trip of the day. Illustrating the high variability of travel time, during the September 2010 to March 2011 period, one quarter of the AM inbound trips arrived at their downtown destination on time (within 5 minutes of the scheduled arrival time), while 43 percent arrived early and 32 percent arrived late.

### ***Interstate 55/Stevenson Expressway travel conditions***

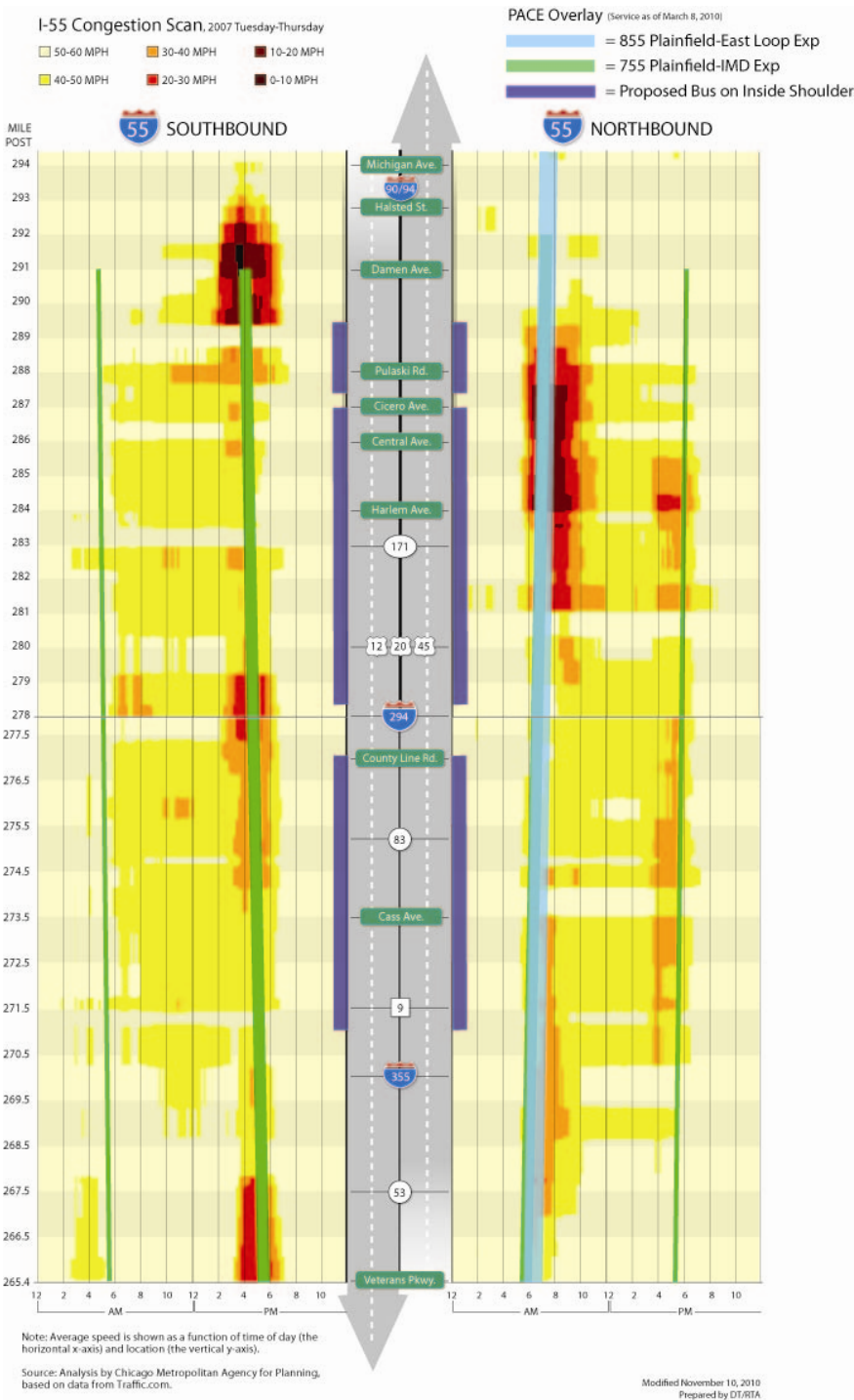
Existing travel conditions on I-55 are available from published Chicago Metropolitan Agency for Planning (CMAP) congestion scans and Gary-Chicago-Milwaukee corridor travel statistics<sup>4</sup> for the 28-mile highway segment between Veteran's Parkway/Bolingbrook and downtown Chicago, which captures the entire length of the demonstration project. In 2009, the average travel time in this segment of 52 to 54 minutes (northbound and southbound, respectively) increased to 84 to 88 minutes during worst-case congestion days. Accordingly, the average travel speeds between 30 and 32 mph over this segment declined to between 19 and 20 mph during worst-case congestion days.

The I-55 Bus on Shoulder Demonstration Project Weaving Analysis Summary included in the Phase 1 Project Report<sup>5</sup> provides existing conditions for level-of-service (LOS) and crash rates. Highway LOS is provided in each direction at five locations – IL Route 53, Joliet Road/I-294, County Line Road, Cicero Avenue and Ashland/Damen Avenue – for AM and PM peak periods. Findings show that the existing LOS was between D (approaching unstable flow), E (unstable flow) and F (forced or breakdown flow) at each location across the time periods and directions considered. These LOS levels represent congested conditions.

Crash data for the I-55 project corridor was collected for years 2006-2008. AECOM calculated the crash rates for the entire corridor at locations noted for the LOS analyses. The entire corridor had a crash rate of 115 crashes per hundred million vehicle miles traveled (CPHMVMT). Crash rates at weaving segments at the southern end of the corridor were similar to the corridor as a whole (between 111 and 123 CPHMVMT), while weaving segments near the north end of the corridor had crash rates that were significantly higher (196 to 198 CPHMVMT). More details are available in the Accident and Weave Analysis included in the Phase 1 Project Report.

### ***Summary of existing transit and expressway conditions***

Figure 1 shows the CMAP congestion scan for I-55, with existing Pace service and proposed shoulder locations overlaid on the scan. Even though one trip on Pace route 755 operates in the reverse-commute direction, most of the existing Pace service for routes 755 and 855 operates on the facility during the periods with the highest volume of recurrent congestion. The inside purple lines also show the proposed shoulder locations overlapping with a significant portion of the congestion on the facility, especially in the northbound direction during the AM peak period. Figure 1 does not reflect non-recurrent congestion, likely due to road accidents or inclement weather, that may occur anywhere along the facility and that does affect both transit and expressway operations.



**Figure 1 Congestion scan with Pace routes 755 and 855 and proposed shoulder access locations**

## Highway Design Features

Several highway design features have been considered in the development of this bus on shoulder demonstration. These include the physical parameters of the shoulder segments, signs and pavement markings, and the relocation of existing rumble strips. Each of these parameters is described in more detail below.



### ***Shoulder segments***

The demonstration will be conducted under specified conditions that are similar to what has been applied in other metropolitan areas where buses use Interstate shoulders that are designed to ensure safe operations. These conditions include a minimum 12-foot shoulder width, and a minimum continuous shoulder length of 5,000 feet (approximately 1 mile). The minimum continuous shoulder length of one mile was derived from operational utility. At a distance of less than one mile, the utility of travel in a shoulder lane diminishes and the number of merges required to access and egress the shoulder increases. A distance of one mile allows operators (and passengers) the opportunity to bypass segments of congestion that can provide operational benefits in travel time savings and schedule reliability.

Three adjacent sections of I-55 comprising approximately 16 miles in both directions are designated for bus on shoulder operations utilizing the left (inside) shoulder. From north to south these are:

- Kedzie Avenue to BRC railroad (1 mile)
- Cicero Avenue to I-294 interchange (8 miles); and
- County Line Road to I-355 interchange (6 miles)

### ***Signs and pavement markings***

The RTA and AECOM worked closely with IDOT to develop the design features and highway improvements required to safely operate buses on the I-55 shoulder. Signage was a particular area of interest since the 2009 edition of the Manual of Uniform Traffic Control Devices (MUTCD)<sup>6</sup> for the first time describes signs and signing for preferential and managed lanes, but not for bus on shoulder applications. The resolution was to progressively develop the bus on shoulder signs to make them compatible with the standards and examples presented in Chapter 2G (Preferential and Managed Lane Signs) of the MUTCD. The proposed bus on shoulder signs include: 1) advance signs prior to begin and end points of segments where buses are allowed to use shoulders; 2) begin and end signs to mark the designated bus shoulder segments (these are the largest signs and are mounted overhead on trusses); and 3) intermediate reminder signs placed at ½ mile intervals along designated bus shoulder segments. Interstate 55 is believed to be the first application in the country with these particular signs. Pavement markings are limited to striping to guide buses in areas where there is an abrupt change in shoulder width, and a lane drop arrow to be used in conjunction with the sign marking the end point of a designated shoulder segment.

### ***Rumble strip***

The shoulder rumble strip is an important safety feature of the highway to prevent run-off-the-road crashes. Treatment of the inside shoulder rumble strip is of particular concern since it will need to be relocated to remove it from the wheel path of the bus. A standard rumble strip is present on the inside shoulder throughout the demonstration project limits and beyond. The rumble strip is 16-inches wide and is located 12-inches from the edge of pavement. A minimum 10-foot, 6-inch width is needed between the left edge of the rumble and the edge of the paved shoulder or base of the median wall to

provide a clear path for the bus on the shoulder. On a 12-foot shoulder, the location of the existing rumble strip would be within the wheel path of the bus. The driver would need to operate too close to the median barrier wall or the edge of the shoulder to avoid the rumble strip. Running on the rumble strip would create undesirable noise and vibration to both the passengers on the bus and people living along the roadway. It may also cause excessive wear on the buses and prematurely deteriorate the pavement. From approximately Harlem Avenue to Kedzie Avenue, northbound and southbound, the existing inside shoulder rumble strip will be removed and replaced with a rumble strip consisting of a 12-inch rumble located 6-inches from the edge of pavement, with the 4-inch edge line located 2-inches from the edge of pavement.

## **Operational Features**

The operational features extend beyond the bus on shoulder operating rules to include maintenance, communications, incident management and public awareness. Each of these components is described in more detail below.

### ***Shoulder operating rules***

The shoulder option is an added feature of routes 755 and 855 that can be used on an as-available basis. Several operating rules, adopted from other cities that have bus on shoulder operations, are designed to ensure safety of transit customers and expressway drivers. A summary of these rules follows:

- Use of the shoulder is strictly at the discretion of the bus operator based on existing conditions and their professional judgement.
- Buses can use designated shoulders only when traffic is moving at speeds less than 35 mph.
- Buses cannot exceed 35 mph in the shoulder lanes.
- While using the designated shoulders, buses are prohibited from traveling more than 15 mph faster than the speed of traffic in the general purpose lanes. If traffic is stopped, buses are limited to 15 mph.
- If the shoulder is obstructed in any way (due to the presence of vehicles, debris, snow, ice, water, etc), the bus must re-enter the mainline lanes to avoid the obstruction.
- At constrained locations on I-55 in the vicinity of I-294 and Cicero Avenue - where the shoulder width is less than 12 ft. - the bus must re-enter the mainline.
- Bus drivers must yield to any vehicle that enters the shoulder.
- Buses can use the shoulder any time the minimum traffic condition exists, except while “deadheading” or when returning with an empty bus to the beginning of the route or a new route.

### ***Maintenance***

IDOT will be responsible for maintaining the bus shoulder to keep it safe and available for transit operations during the demonstration. Shoulders used by buses will be cleared of small debris, large obstructions and snow as a part of normal expressway maintenance operations. Since the shoulder option is an added feature of routes 755 and 855, it may not always be available – such as when maintenance is being performed, after a major

snowfall, when it is occupied by a broken down vehicle or when it is being used for law enforcement operations.

However, IDOT will begin a program of incremental maintenance to improve availability of the shoulder for bus use. This will include additional sweeping and salting of the shoulder. Currently, sweeping of the shoulder is a standard practice, but the frequency will improve once shoulder operations are in effect. Salting the shoulder during snow events will be a new practice and shoulder plowing will also become more common. Shoulder plowing will not be prioritized ahead of plowing general purpose lanes, but the shoulder segment will be prioritized over other shoulder segments. It is likely that plowing will occur earlier than it would have under prior conditions.

### ***Communications***

Prompt and efficient communication between the Pace contractor bus drivers, the Pace contractor operations center, and IDOT's Operation and Communications Center is an essential component of the I-55 demonstration. Direct and continuous contact between IDOT and the Pace contractor operating the service is needed to communicate information about construction and maintenance, debris/hazards, breakdowns, autos driving on the shoulder, and incidents and requests for assistance that will affect the availability and use of the shoulder. No new communications systems or infrastructure is proposed as part of this I-55 demonstration. Suitable contacts among IDOT, Pace and the Pace contractor will be established and maintained to facilitate operational communications.

In addition to contacts between the communications centers, IDOT will continue to provide traffic, construction/maintenance and incident information via its Illinois Traffic Alert System (ITAS) as well as TravelMidwest.com. IDOT plans to add Pace to its short list of key people/agencies that get alerts directly from their Communications Center. Additionally, the Pace contractor will register with ITAS to receive customized congestion, incident, construction and Dynamic Message Sign reports for I-55/Stevenson Expressway. In addition, the Pace contractor operations center will report any information reported from their drivers relating to the status of the shoulder lane (and possible impediments) to the IDOT Operation and Communications Center by voice communication.

### ***Incident Management***

The incident management plan developed for the demonstration project provides guidelines for evacuating an in-service transit vehicle. This plan is based on similar incident management plans for peer systems with shoulder operations. In summary, as a first response, the bus will consider returning to the right shoulder, when possible. Otherwise, if the left shoulder is used, then the bus should stay as far to the left as possible. In all cases, the operator will contact their dispatch center, which will relay the message to IDOT and the ISP. As necessary, IDOT and ISP will provide resources to ensure passenger safety in an evacuation to a replacement bus or place of safety.

### ***Public Awareness***

Public information and communications campaigns are a standard feature of all large transportation projects. The purpose is generally to inform the public of the location, nature, extent, purpose, impact and duration of the project; alternate routes and travel options; and/or work zone traffic safety awareness. As a condition of their approval to begin bus on shoulder operations on I-55, the Federal Highway Administration and IDOT require a public awareness campaign to explain to motorists what is changing on the highway. Additionally, the campaign will aim to answer a broad range of questions that include who the project sponsors are, what changes to the transit service will there be, and what the operating rules and safety features are.

The public awareness campaign may also include marketing-related components from the project partner agencies. First, there will be information about the transit service and the potential benefits of bus on shoulder operations. Additionally, this will serve as an opportunity for the partner agencies to promote their coordination in successfully implementing this new service feature. Both public awareness and marketing-related components of the campaign will be communicated through public education materials including press releases and visual messages through print, radio and web media outlets.

Public awareness will help to determine the success of the I-55 demonstration, from both a traffic operations/safety perspective and a transit service standpoint. It will enable the RTA, IDOT and Pace to convey the purpose, location, limitations, and benefits of the demonstration to the public, transit users, and motorists alike in a coordinated effort.

### **Legal Framework**

As of this writing, the Illinois Vehicle Code<sup>7</sup> does not allow vehicles, including transit buses, to drive on the shoulder except under certain limited conditions specified in statute. Since bus on shoulder will initially involve state-maintained expressways and Interstate highways, the RTA requested that IDOT take the lead in drafting and introducing suitable legislation. As of May 17, 2011 a bill (HB 1884) to amend the Illinois Vehicle Code to allow buses to drive on shoulders has passed both houses of the General Assembly and has been sent to the Governor for signature. The proposed amendment: 1) allows authorized transit buses to drive on designated shoulders including on the Illinois Tollway, 2) establishes a 5-year bus on shoulder pilot program within the RTA service area, and 3) requires a report to the General Assembly on the effectiveness of bus on shoulder after 2 years of operations.

### ***Project Evaluation***

The legislation amending the Illinois Vehicle Code (HB 1884) sets up a five-year demonstration period, as an automatic sunset. While the existing project is a two-year demonstration, positive action in the form of a follow-up amendment to the vehicle code would be needed to make bus on shoulder permanent on I-55 or elsewhere in the region. Additionally, the existing legislation requires an evaluation report at the end of the two-year demonstration project. Thus, understanding conditions of project success in advance will clarify expectations for post-demonstration recommendations and facilitate decision

making related to extending bus on shoulders as a permanent transit option for our region.

The project partners are currently reviewing proposed performance measures that would be used in project evaluation. Two types of metrics are included, as follows:

- Before and after operational metrics for performance comparison. These measures use data that is currently available and would be collected and tabulated for a minimum of 6 months and up to 3 years in advance of the demonstration project. These measures – related to bus service performance, general traffic conditions and existing highway traffic safety conditions – allow direct comparison of the performance of the transit service and highway operations before and after buses have access to shoulder travel.
- Post-implementation project metrics to supplement evaluation. The data needed for these measures will not be available until the demonstration project has commenced and will be most valuable after at least six months to one year of bus on shoulder operations, but are still important to include in an evaluation of the project. These measures are related to safety, project costs and cost effectiveness.

Each performance measure would be evaluated based on whether or not the expected positive outcome was achieved during the demonstration.

## **Conclusion**

Significant progress has been made toward a fall 2011 startup of bus on shoulder operations on I-55. As a result of the technical work, two milestones have been achieved: 1) the General Assembly has passed and sent to the Governor for signature an amendment to the Illinois Vehicle Code that will temporarily legalize bus on shoulder operations, and 2) IDOT has granted design approval of the highway design and operational aspects of the bus on shoulder demonstration.

Significant changes to transit and highway operations rarely occur. Bus on shoulder operation is one of these changes. Even though there is a long and successful history of bus on shoulder operation on Interstate highways in other metropolitan areas in the U.S., it is a new concept in Illinois and needs to be tested and proven on our facilities, under local traffic and weather conditions and maintenance practices. Through on-going professional engagement and constructive collaboration, the RTA, IDOT, Pace ISP and AECOM have worked to resolve a number of important technical and policy issues to use the I-55 shoulders for transit. Some of these issues include signage, relocation of the rumble strip, maintenance, and amendment of the Illinois Vehicle Code.

Bus on shoulder is a good fit for the fiscal constraints of our time and also aligns with the GO TO 2040 Plan, which recommends strategic investment in transportation. Bus on shoulder can be a high value improvement that is quick to implement, with low cost and potentially significant travel time savings. GO TO 2040 also recommends increasing our commitment to public transit. Allowing buses to use highway shoulders under certain conditions promotes additional radial transit lines to the urban core and may ultimately provide the flexibility for successful reverse commute radial trips. Finally, bus on

shoulder achieves several of the RTA's ongoing priorities – in addition to strategic capital investment – including: enhancing the customer experience and increasing use of the transit system. Finally, in coordination with Pace, bus on shoulder can be a precursor to potential high performance Bus Rapid Transit and managed lanes on I-55/Stevenson Expressway and possibly throughout the region.

#### Acknowledgement

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