

CMAP FY 2016-2020 CMAQ PROJECT APPLICATION

TRANSIT PROJECTS

I. PROJECT IDENTIFICATION		
Project Sponsor Pace Suburban Bus	Contact Information – Name, Title, Agency, Address, Phone, e-mail (e-mail required) Lorraine Snorden Department Manager, Planning Services Pace Suburban Bus 550 W Algonquin Rd Arlington Heights, IL 60005-4412 Lorraine.snorden@pacebus.com Ph: 847-228-4249	
Other Agencies Participating In Project		
<input checked="" type="checkbox"/> New Project <input type="checkbox"/> Existing CMAQ Project <input type="checkbox"/> Add CMAQ to Existing Project	<input checked="" type="checkbox"/> New Project <input type="checkbox"/> Existing CMAQ Project <input type="checkbox"/> Add CMAQ to Existing Project	
II. PROJECT LOCATION		
<ul style="list-style-type: none"> • Projects not readily identified by location must provide a title on the last line of this section • Attach a map sufficient to accurately locate this project in a GIS system 		
Name Of Street Or Facility To Be Improved	Marked Route #	
Benson Avenue (Evanston)		
Davis Street (Evanston)		
Ridge Avenue (Evanston)		
Dempster Street (Evanston, Skokie, Morton Grove, Niles, Park Ridge, Des Plaines)	IL 58, US 14	
Graceland Avenue (Des Plaines)		
Lee Street (Des Plaines)		
Touhy Avenue (Des Plaines, Rosemont)		
Mannheim Road (Des Plaines, Rosemont, Chicago)	US 12 / US 45	
Project Limits: North/West Reference Point/Cross St/Intersection	Marked Route #	Municipality & County
Davis Street CTA Station (Benson Ave b/w Davis St and Church St)		City of Evanston (Cook)
Project Limits: South/East Reference Point/Cross St/Intersection	Marked Route #	Municipality & County
O'Hare Kiss 'n' Fly (new location to open 2018) (Mannheim Road and Zemke Blvd)	US 12 / US 45	City of Chicago (Cook)
Other Project Location Information Or Project Title		
Pulse Dempster Line		

III. PROJECT FINANCING & CMAQ FUNDING REQUEST

Please review the [instructions](#).

	Starting Federal Fiscal Year*	Total Phase Costs	(New) CMAQ Funds Requested	Other Federal Funds Including prior CMAQ awards	
				Fund Type	Fund Type
Engineering Phase 1 (Project definition, NEPA)		\$1,300,000	\$		\$
Engineering Phase 2 (Design Services)		\$1,215,000	\$		\$
Right-Of-Way Acquisition		\$	\$		\$
Construction (Including Construction Engineering)		\$15,660,000	\$12,528,000		\$
Engineering (For Implementation Projects)		\$	\$		\$
Implementation (vehicles)		\$8,280,000	\$6,624,000		\$
Alternatives Analysis		\$	\$		\$
*Phase must be accomplished within 3 years		\$26,455,000	\$19,152,000		
Total Project Costs					
Source Of Local Matching Funds	<p>Pace funds Indicate if sponsor intends to apply for Transportation Development Credits.</p>				
If Soft Matching Funds Are Intended To Be Used, Please Contact CMAP Staff.					
Have the Matching Funds Been Secured? (Provide Details):					

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IV. PROJECT EMISSIONS BENEFIT DATA		
Project Type (Check One): <input checked="" type="checkbox"/> Facility Improvement <input type="checkbox"/> Service And Equipment <input type="checkbox"/> Access to Transit		
Auto Trips Eliminated Per Day (Round Trips): 265 per weekday		
Length Of Auto Trips Eliminated (One-Way Miles To The Nearest Tenth): 4.5 miles		
Auto Trips Diverted Per Day (Round Trips): 265 per weekday		
Line-Haul Length Of Diverted Trips (One-Way Miles To The Nearest Tenth): 15.0 miles		
Project Life (Years): 25 years		
Provide basis for parameters used to estimate benefits (e.g., new ridership, auto occupancy, trip length. See instructions):		
<p>2Q 2014 riderhip on local Pace Route 250 was 2,946 (Average Saturday: 1,793; Average Sunday: 1,232). Ridership forecasting has not yet been completed for the Pulse Dempster Line, however forecasting for the intersecting Pulse Milwaukee Line resulted in an estimated 36% increase in total corridor ridership. For Dempster, this would result in 1,060 new one-way transit trips (530 round trips).</p> <p>As was done with the Pulse Milwaukee Line, the Dempster Line ridership forecast will be prepared using the Federal Transit Administration's Simplified Trips-on-Project Software (STOPS) model. STOPS was developed by the FTA to evaluate and rate federally-funded transit projects, and is a simplified four-step model that uses a combination of local demographic data and forecasts, Census data, and national transit ridership trends to develop forecasts for new fixed guideway and BRT projects. Pace's STOPS model was constructed in close consultation with the FTA and the model's developer.</p> <p>Because a formal ridership forecast hasn't been prepared yet, it was estimated that half of new riders would be eliminated auto trips and the other half would be diverted trips. Average trip length for existing Route 250 trips was approximately 4.5 miles based on 2013 boarding data; this was applied to the eliminated trips. Diverted trips were assumed to use the full length of the corridor (15 miles).</p>		
SERVICE IMPROVEMENTS		
On-Time Performance - Route to be Improved: 71 % wkday, 32.7 % Sat, 78% Sunday System-Wide:		
Reliability Enhancements (Check All that Apply):		
Rail <input type="checkbox"/> New Vehicles <input type="checkbox"/> Upgraded Switches <input type="checkbox"/> Upgraded Power Supply <input type="checkbox"/> Positive Train Control <input type="checkbox"/> Station Consolidation <input type="checkbox"/> Track Improvements <input type="checkbox"/> Reduction of Freight/Vehicle/Pedestrian Interference	Bus <input checked="" type="checkbox"/> New Vehicles <input type="checkbox"/> Queue Jump/Bypass Lanes <input type="checkbox"/> Off-board Fare Collection <input checked="" type="checkbox"/> Reduced Stops/Express Service <input type="checkbox"/> New Dispatching/Decision Support Systems <input type="checkbox"/> Passenger Vehicle Movement Restrictions	<input checked="" type="checkbox"/> Transit signal priority <input type="checkbox"/> Multi-Door Boarding with Off-board Fare Collection <input type="checkbox"/> Bus-on-Shoulders <input type="checkbox"/> Managed Lanes <input type="checkbox"/> Dedicated Bus Way <input checked="" type="checkbox"/> Far-side Stops <input checked="" type="checkbox"/> Bus Stop Upgrades <input checked="" type="checkbox"/> Near Level Boarding
FACILITIES/CAPITAL IMPROVEMENTS		
Existing Asset Condition (1-5 scale used by RTA): NA		
Description and Location of Service (For Equipment Purchases): Pace Northwest Division will operate the service. Capital improvements will be made to Pulse station locations on Benson Avenue, Davis Street, Ridge Avenue, Dempster Street, Graceland Avenue, Lee Street, Touhy Avenue, and Mannheim Road.		
Net Number Of New Vehicle Parking Spaces: 0 Net Number Of New Bicycle Parking Spaces: 60 (two per platform, 30 platforms)		
V. PROGRAM MANAGEMENT INFORMATION		
Is right-of-way acquisition required for this project? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
If so, has right-of-way been acquired? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Engineering Status: <input type="checkbox"/> N.A <input checked="" type="checkbox"/> Not Begun <input type="checkbox"/> Engineering Underway (provide details below) <input type="checkbox"/> Engineering Completed		
Date completion is anticipated: 2018		
Estimated Completion Year/Start Of Service: 2018		

VI. PROJECT DESCRIPTION

The Pulse Dempster Line will serve as an innovative, high-quality transit solution that improves suburban connectivity, reduces congestion and enhances the transit experience for new and existing riders.

As part of Pace's planned *Rapid Transit Network*, the Pulse Dempster Line will advance Pace's long term vision and connect residents to employment generators, hospitals, schools, and other regional destinations. The Rapid Transit Network proposes a combined Arterial Bus Rapid Transit (ART) network and an expressway bus network for the 8 million residents of northeastern Illinois through an enhancement of existing surface transportation infrastructure. The Network provides service across 885 miles in the region with 655 miles on arterials and 230 miles on expressways. This premium service is the next level of transit to truly grow long term ridership supporting regional plans including GOTO 2040. Pace recently submitted their Rapid Transit Network to the US DOT as a Project of National and Regional Significance. (Please see PNRS attachment).

The Pulse Dempster Line will enter service in 2018, and will be the second Pulse line to be implemented, following the Pulse Milwaukee Line, which is expected to enter service in early 2017. PaceBus.com/Pulse

The Pulse Dempster Line route will span 15 miles in total, traveling from Davis Street CTA/Metra Station in Evanston to the O'Hare International Airport Kiss-n-Fly station, which is currently being redeveloped and relocated by the Chicago Department of Aviation. Currently, Pace Route 250 operates along this corridor, and it will be restructured to provide local service after the implementation of the Pulse Dempster Line. (Please see Demspter Pulse attachment for alignment).

The Pulse Dempster Line (and subsequent Pulse routes within the long-term Pulse network) will include the following system characteristics:

- Running ways that operate in mixed flow traffic.
- Fewer stops, with stations spaced at ½ to ¾ mile intervals.
- Stations, vehicles, and signage elements will be branded with the Pulse logo, providing a distinctive and modern appearance.
- Stations will include enhanced features such as: weather protection, infrared heating, lighting, benches, bicycle racks, and landscaping.
- Each station facility will include a branded and illuminated vertical marker that provides real time arrival information, service information, a route map, and a vicinity map.
- Pulse routes will use a branded and dedicated sub-fleet of 40-foot low-floor vehicles. Vehicles will have a modern design and will include technology features such as next stop announcements, onboard Wi-Fi, on-board electronic route maps, on-board surveillance, and USB charging ports.
- Transit Signal Priority and Intelligent Bus Systems will be used to increase travel time efficiencies and decrease greenhouse gas emissions.

Please see the Pulse attachment to view station designs, branding, and service characteristics.

To accelerate the implementation of the Pulse network, including the Pulse Dempster Line, Pace secured a Program Management and Oversight (PMO) consultant in October 2012. The PMO assists Pace in the development and maintenance of a master schedule, program budget, and operations plan, and oversees the planning, design, construction and implementation of the Pulse program. The PMO serves as an extension of Pace staff and will ensure that all construction schedules, costs, quality control goals and federal contract requirements are met.

Pace is seeking CMAQ funds to advance the implementation of the Pulse Dempster Line route. CMAQ funding would be applied towards station construction, vertical markers with real time information signage, and the procurement of 18 branded Pulse vehicles. TSP components are being implemented separately through an RTA regional TSP grant.

Infrastructure and vehicle costs included in this application are based on unit costs developed as part of the Pulse Milwaukee Line project, which is currently in the engineering phase.

Route 250

Effective Date
May 13, 2012



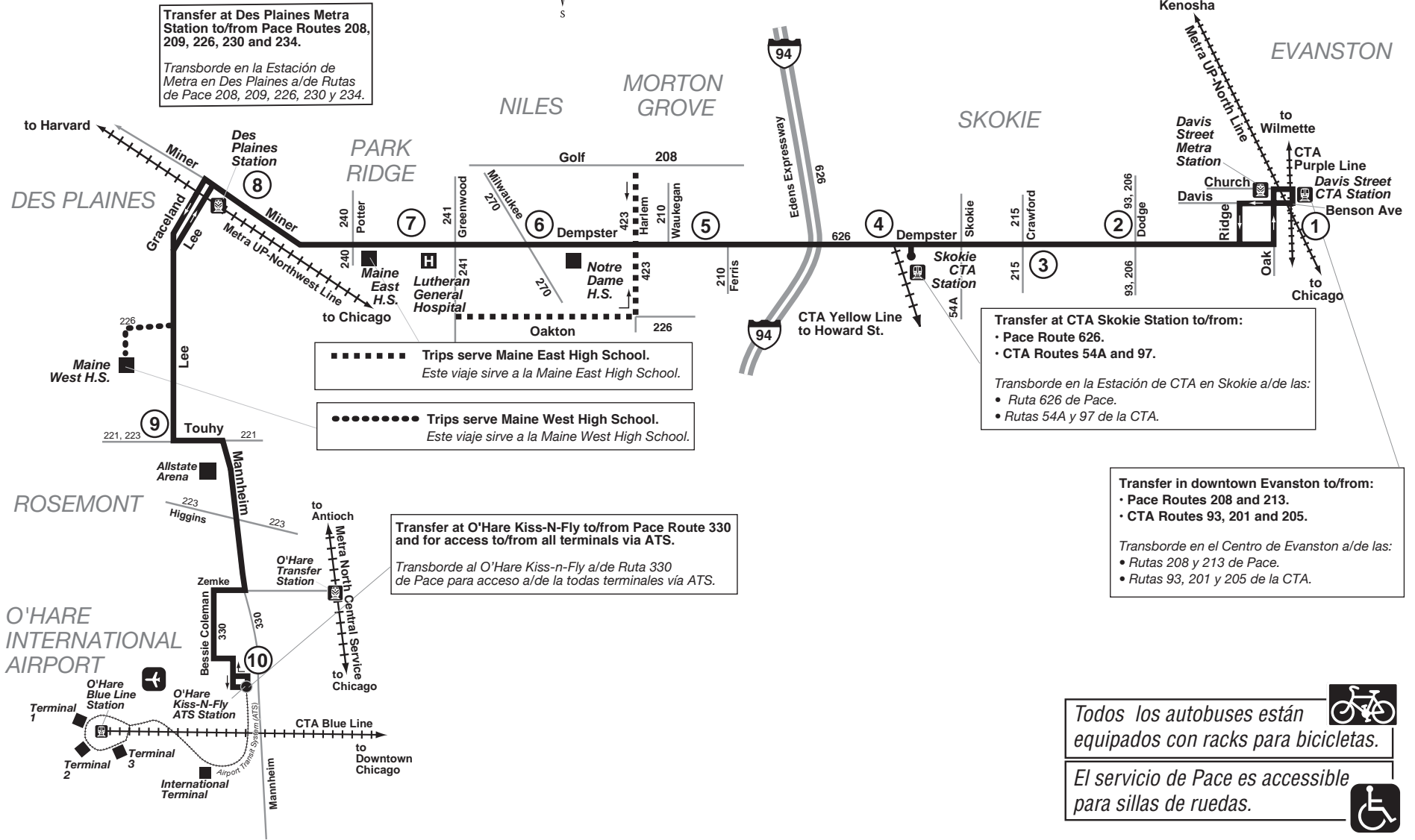
Posted Stops Only

Buses on this route will stop to pick up and drop off passengers only at bus stop signs with the Pace logo and route number. Please wait for the bus at a bus stop sign.



Solamente Paradas Asignadas

Los Autobuses en esta ruta pararan a recoger y bajar a pasajeros solamente donde haya parada de autobús señaladas con el logo de Pace y el número de la ruta. Por favor espere al autobús donde estén estas señales.



Transfer at Des Plaines Metra Station to/from Pace Routes 208, 209, 226, 230 and 234.
Transborda en la Estación de Metra en Des Plaines a/de Rutas de Pace 208, 209, 226, 230 y 234.

----- Trips serve Maine East High School.
Este viaje sirve a la Maine East High School.

..... Trips serve Maine West High School.
Este viaje sirve a la Maine West High School.

Transfer at O'Hare Kiss-N-Fly to/from Pace Route 330 and for access to/from all terminals via ATS.
Transborda al O'Hare Kiss-n-Fly a/de Ruta 330 de Pace para acceso a/de la todas terminales via ATS.

Transfer at CTA Skokie Station to/from:
• Pace Route 626.
• CTA Routes 54A and 97.
Transborda en la Estación de CTA en Skokie a/de las:
• Ruta 626 de Pace.
• Rutas 54A y 97 de la CTA.

Transfer in downtown Evanston to/from:
• Pace Routes 208 and 213.
• CTA Routes 93, 201 and 205.
Transborda en el Centro de Evanston a/de las:
• Rutas 208 y 213 de Pace.
• Rutas 93, 201 y 205 de la CTA.

Todos los autobuses están equipados con racks para bicicletas.
El servicio de Pace es accessible para sillas de ruedas.



Typical and Compact Station Renderings

Typical Station



Compact Station



Site-Specific Station Renderings

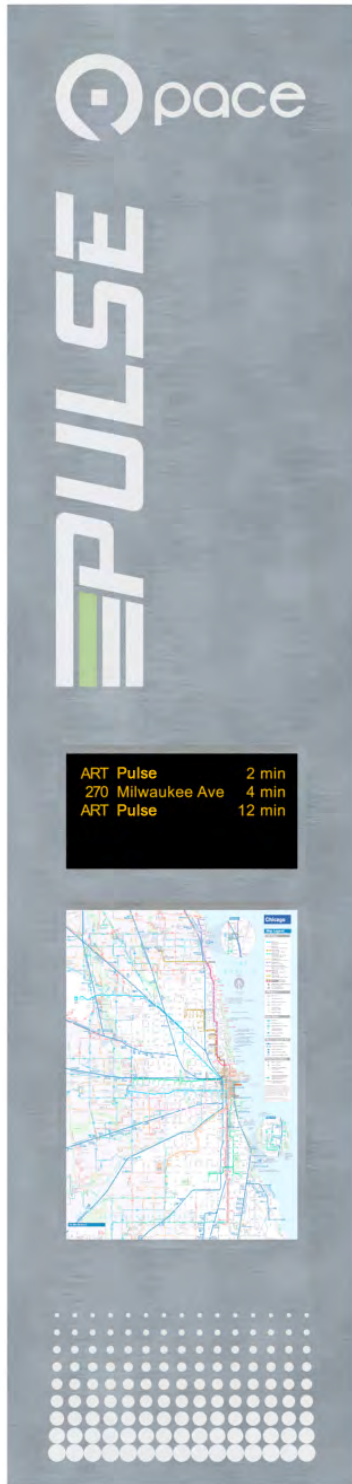
Oakton Street / Oak Mill Mall Southbound (Typical Station)



Central Avenue Southbound (Enlarged Typical Station to Accommodate Multiple Converging Routes)



Vertical Marker



PULSE

Milwaukee Line

COMING SOON: Pace's Newest Transit Service

Pulse, a brand-new service from Pace, provides frequent, fast and reliable travel. Pulse takes bus transit to the next level by providing passengers with faster service, shorter wait times, and enhanced station amenities.

PULSE SERVICE WILL PROVIDE:

- > **Enhanced station and passenger amenities**, including heated shelters, with lighting and seating; near-level boarding platforms; real-time bus arrival information signs; transit route and vicinity maps; and landscaping



- > **High frequency, limited stop service**, with stations placed approximately every half mile



- > **Improved travel time and reliability**, thanks to Transit Signal Priority (TSP)



As part of Pace's "family of services", Pulse will be integrated with the fixed route network, express bus routes, and community-based transit services.

- > **Highly visible and accessible stations** that feature Pulse-branded **route markers/kiosks**, customized for each community along the route



- > Buses with **Wi-Fi, USB charging ports, and digital information signs**



- > **Improved bicyclist/pedestrian connectivity** to transit service



FEBRUARY 2015 • ISSUE 1

PULSE

Better service through Transit Signal Priority (TSP)

TSP allows buses that are running behind schedule to catch up by shortening red lights and extending green lights by a few seconds at selected intersections to reduce the time buses spend stopped. The system works automatically to improve on-time performance for buses with virtually no significant impact on vehicular traffic. TSP will improve travel times and reliability, providing better service to customers while lowering Pace's operating costs.

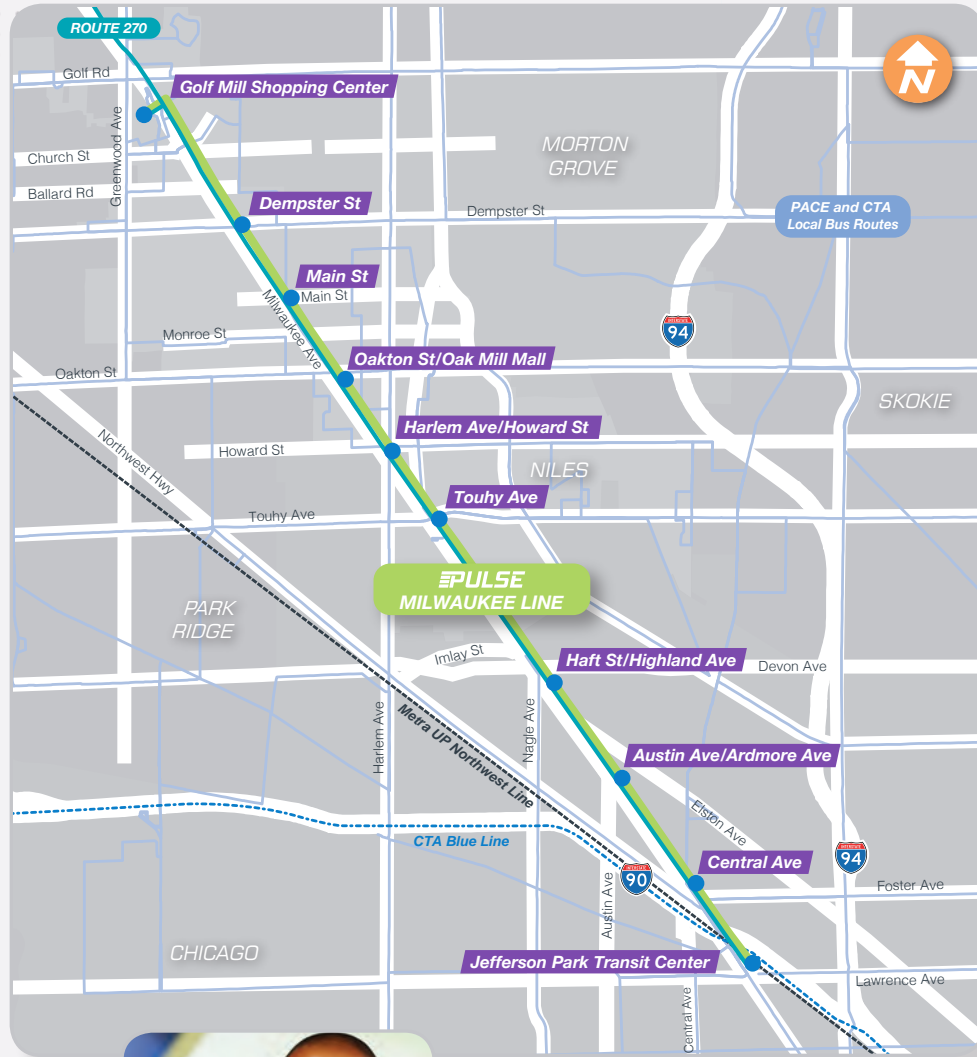
Pulse Milwaukee Line Service Begins 2017

Get involved now & stay informed!

- Please visit Pace's Pulse website at PaceBus.com/Pulse to stay updated on the Pulse program and the Pulse Milwaukee Line. Notices of upcoming public meetings will be posted to the News and Events section.
- Sign up for the project mailing list by filling out the public comment form posted to the Get Involved section.



CHECK OUT PULSE'S FIRST SERVICE: Milwaukee Line



The first Pulse line will operate along Milwaukee Avenue, between Golf Mill Shopping Center and the Jefferson Park Transit Center. The Pulse Milwaukee Line is 7 miles long and will serve the Village of Niles and the City of Chicago. In addition to the two terminal stations, eight pairs of intermediate stations are planned at major intersections along the route.

- Pulse will operate at 10-minute intervals during peak weekday periods, and at 15-minute intervals during off-peak periods and weekends.
- Late night service will operate at 30-minute intervals.
- Service will run for up to 19 hours each weekday.

The Pulse Milwaukee Line will be coordinated with existing Pace routes serving the corridor. Pace Route 270 (Milwaukee Avenue) will continue to operate at reduced service frequencies, offering local service to existing bus stops. Connections to the Niles Free Bus, other Pace and CTA fixed route bus routes, as well as the CTA Blue Line and Metra UP-Northwest Line provide passengers with a wide range of local and regional travel options.

Pulse Milwaukee Line Service Begins in 2017

WHERE WE ARE NOW:

Technical studies are currently underway to address any environmental factors and to refine service, operations, and station area plans. Coordination and collaboration with the Village of Niles, local Chicago Aldermen, the Chicago Department of Transportation, the Illinois Department of Transportation, the Federal Transit Administration, and the Chicago Transit Authority has been ongoing and will continue throughout the planning and development of the Pulse service.

Public and community outreach efforts are underway to educate stakeholders about the Pulse Milwaukee Line, and encourage their participation throughout the study and development process. A stakeholder is anyone who could be affected by this service and has a stake in the final design and operation of the service, including municipal officials, public agencies, community leaders and groups, businesses, area residents, property owners, and transit users.

Public involvement efforts will include the following:

- Public meetings
- One-on-one stakeholder meetings
- Website: PaceBus.com/Pulse
- Online comment form
- Direct mail of fact sheets
- Corridor Advisory Group
- Email blasts

WHERE WE ARE HEADED:

Once the environmental and technical studies have been completed, the final design of the Pulse Milwaukee Line stations will be prepared. Construction of passenger facilities will begin in 2016 and the Milwaukee Line will be operational in 2017.

Providing **FAST, FREQUENT, RELIABLE TRANSIT SERVICE** is the goal of this program.



This is only the beginning of Pace's enhanced transit plans

Pace has identified a 24-line Pulse network with 7 priority routes to be implemented over the next 10 years:

- Milwaukee Avenue
- Dempster Street
- Harlem Avenue
- Cermak Road
- Halsted Street
- 95th Street
- Roosevelt Road



PROJECT TIMELINE Pulse Milwaukee Line



- Initial design concepts & station locations
- Data collection
- Stakeholder outreach

- Stakeholder outreach
- Environmental & engineering analysis

- Facilitate & incorporate stakeholder input
- Final design concepts

● PUBLIC MEETING



Over the long term, the phased implementation of the Pulse network will improve mobility and travel choices throughout Pace's service area.

The Pace Rapid Transit Network

Pace Suburban Bus

Pace is implementing the future of bus transit in Chicago's suburban region through an enhancement of existing surface transportation infrastructure. Through Pace's strategic plan, *Vision 2020*, this Rapid Transit Network proposes a combined Arterial Bus Rapid Transit (ART) network and an expressway bus network for the 8 million residents of northeastern Illinois.

Pace's regional rapid transit network connects residents to suburban employment generators, health care facilities, schools, entertainment and other destinations. The network provides enhanced transit service that has proved successful in other states in improving regional mobility, access, speed, efficiency, reliability, security and comfort of bus transit—and, thus, increasing transit ridership. Pace's proposed program offers multi-modal connections to CTA service, Metra commuter rail, Amtrak intercity rail and the region's international airports.

Stations are planned to develop a "sense of place" within the suburban environment. Transit-supportive land use development, bicycle/pedestrian access and improved street crossings enhance the transit experience and support economic development and expanded employment opportunities.

The network provides service across 885 miles of corridors, including 24 ART corridors (655 miles) and 11 expressway corridors (230 miles). The rapid transit network also relies on the construction of three operating garages.



Arterial Rapid Transit (ART)

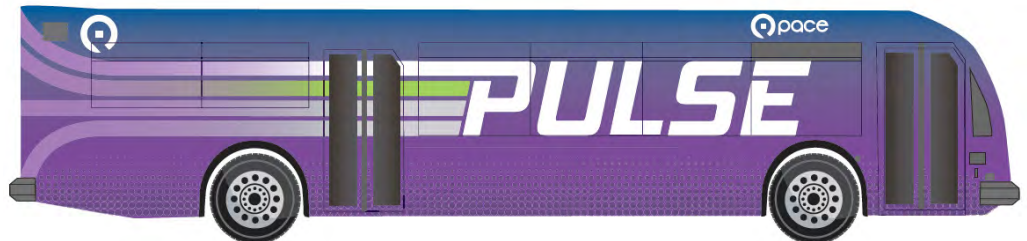
In 2001, Pace published *Vision 2020*, a blueprint for its vision of expanded transit mobility in the greater Chicago region. *Vision 2020* articulated Pace's long-term goal of developing line-haul rapid transit routes on both arterial streets and expressways. An accompanying 2002 bus rapid transit (BRT) study defined the functional elements of these rapid bus services and a preliminary list of potential corridors.

In the 2009 *Arterial Rapid Transit Study*, Pace further refined 24 proposed rapid transit corridors and prioritized these corridors for phased implementation, based upon the following evaluation factors: institutional support, community support, regional connectivity, current ridership, ridership potential, travel time savings and right-of-way impacts. The study established Milwaukee Avenue as the first corridor to be developed, prioritizing a near-term segment between Jefferson Park Transit Center in Chicago and Golf Mill Shopping Center in Niles, and identifying medium- and long-term extensions to Wheeling and Gurnee, respectively. Additional near-term corridors were designated on segments of Dempster Street, Harlem Avenue, Halsted Street, and 95th Street plus an additional corridor (the "Oak Brook corridor") was identified to connect western Cook County with the Oak Brook area, with an alignment to be defined at a later date. Later, the so-called "J Route", which connects Naperville to O'Hare Airport, was added to the list of near-term corridors.

In 2013, Pace initiated the Milwaukee Corridor ART Project Definition study to define Pace's first ART project to a level sufficient to advance into the environmental documentation and engineering phase in 2015. Construction is anticipated to begin in spring 2016, with revenue services anticipated for fall 2016. Branding of this service, including the name "Pulse" and a logo and color scheme, was finalized in 2014.

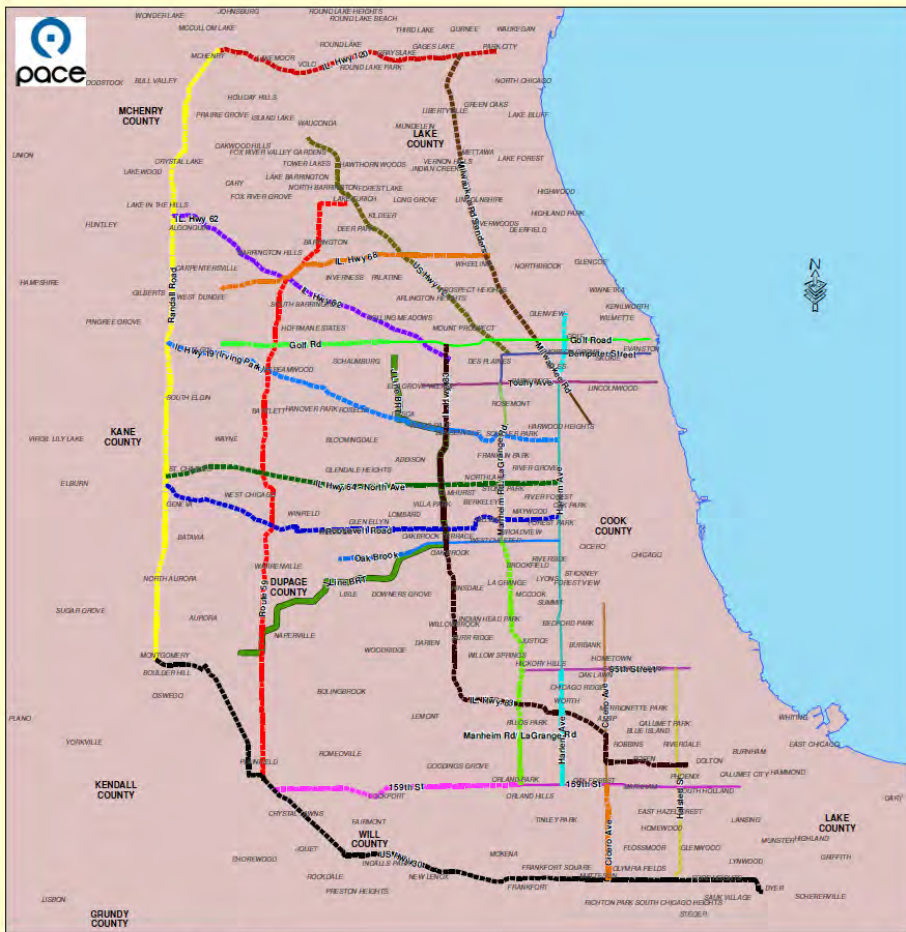
Characteristics of Pace's "Pulse" ART service include:

- Branded 40' low-floor vehicles, as shown at right
- Level boarding platforms
- Upgraded and branded stations that include enhanced features such as weather protection, infrared heating, lighting, and route maps
- Transit signal priority and other roadway improvements that give the ART bus an advantage over regular traffic
- Real-time arrival & departure displays
- Vicinity maps at stations
- Fewer bus stops (wider station spacing) for quicker and more efficient travel
- Frequent, all-day service (10-15 minute headways)
- Local service coverage (serving the last mile of trips)
- TDM strategies to provide coverage when ART service is not operating.
- On-board video surveillance to enhance passenger safety
- Free Wi-Fi for passengers
- Robust communications network between vehicles, traffic signals, dynamic signs, a dispatch center, and the customer (V2I, V2V, V2 Central Control, V2 Customer)



Map of 24 future Pace Arterial Bus Rapid Transit corridors

Pace ART Service Long Term Development



- Legend**
- LongTerm**
- 159th St, As Extension
 - 159th St, Long
 - 95th Street - , Long
 - Cicero Ave, As Extension
 - Cicero Ave, Long
 - Dempster Street , Long
 - Golf Rd, As Extension
 - Golf Road, Long
 - Halsted St, Long
 - Harlem Ave, As Extension
 - Harlem Ave, Long
 - IL Hwy 19 (Irving Park), As Extension
 - IL Hwy 64 - North Ave, As Extension
 - IL Hwy 120, As Extension
 - IL Hwy 62, As Extension
 - IL Hwy 68, As Extension
 - IL Hwy 83, Long
 - J Line BRT, As Extension Routing TBD
 - Manheim Rd/LaGrange Rd., Long
 - Manheim Rd/LaGrange Rd, As Extension
 - Milwaukee Rd, Long
 - Milwaukee Rd/Sanders, As Extension
 - Oak Brook, As Extension
 - Oak Brook, Long
 - Randall Road , As Extension
 - Roosevelt Road , As Extension
 - Route 59 , As Extension
 - Touty Ave. , Long
 - US Hwy 12, As Extension
 - US Hwy 30, As Extension

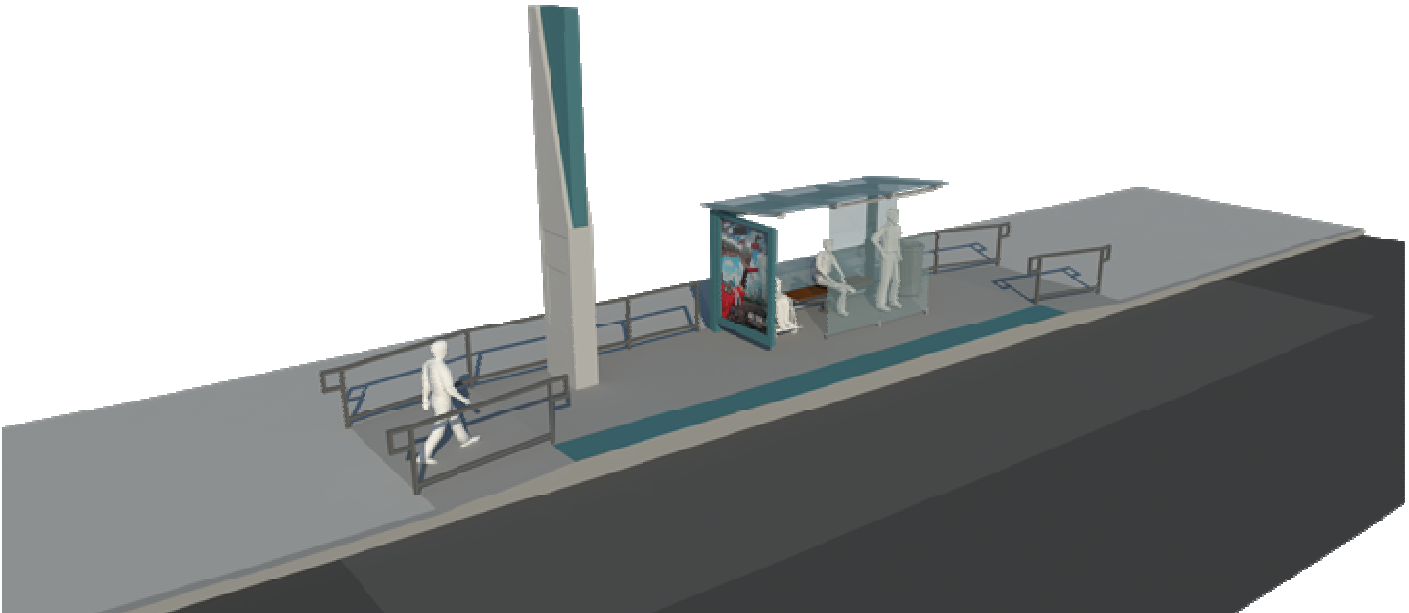
0 5 10 Miles

Service Analysis
Department of Planning Services
GIS

Proposed "Pulse" ART station



Rendering of proposed "Pulse" ART station



Transit Signal Priority/Communications Network

Within the Pace service area, the speed and reliability of Arterial Bus Rapid Transit vehicles is enhanced by a regional Transit Signal Priority (TSP) system. TSP allows buses to shorten red lights and lengthen green lights to keep on schedule, using technology similar to that in use by ambulances and fire trucks. In northeastern Illinois, TSP is being implemented through the Regional Transit Signal Priority Implementation Program (RTSPIP). Several corridors in our region already have TSP, and as part of the implementation of the Rapid Transit Network, all 24 ART corridors will have this technology.

The regionally interoperable TSP system will function for Pace Suburban Bus and Chicago Transit Authority (CTA) vehicles throughout the region. The Transit Signal Priority program follows the outline proposed by the Federal Highway Administration (FHWA) in their *Systems Engineering Guidebook for I.T.S.* Version 3.0.

Pace has not developed its TSP system in a vacuum. Rather, Pace and its partners have developed regional standards and guidelines for the design, implementation, operation and maintenance of a multijurisdictional TSP system. This coordination allows approved vehicles across the region to take advantage of a standardized technology. The RTSPIP's regional stakeholders include Pace, the Chicago Transit Authority, the Illinois Department of Transportation (IDOT), the Chicago Department of Transportation, local DOTs, the Chicago Metropolitan Agency for Planning, and other municipalities.

The RTSPIP goals are as follows:

1. Improved schedule adherence and reduced travel times for transit and improved signal coordination for general vehicles.
2. Regional TSP interoperability between Pace, CTA, CDOT, IDOT, and other local DOTs. Open standards for TSP provides the benefits of not being tied to a single TSP vendor, simplification of operations and maintenance for participating agencies, ability of Pace and CTA vehicles to request priority status from a single device within the traffic signal cabinet, and centralized monitoring of TSP activity.
3. Compliance with standards set by the Northeastern Illinois Regional ITS Architecture.

Characteristics of Proposed RTSPIP System:

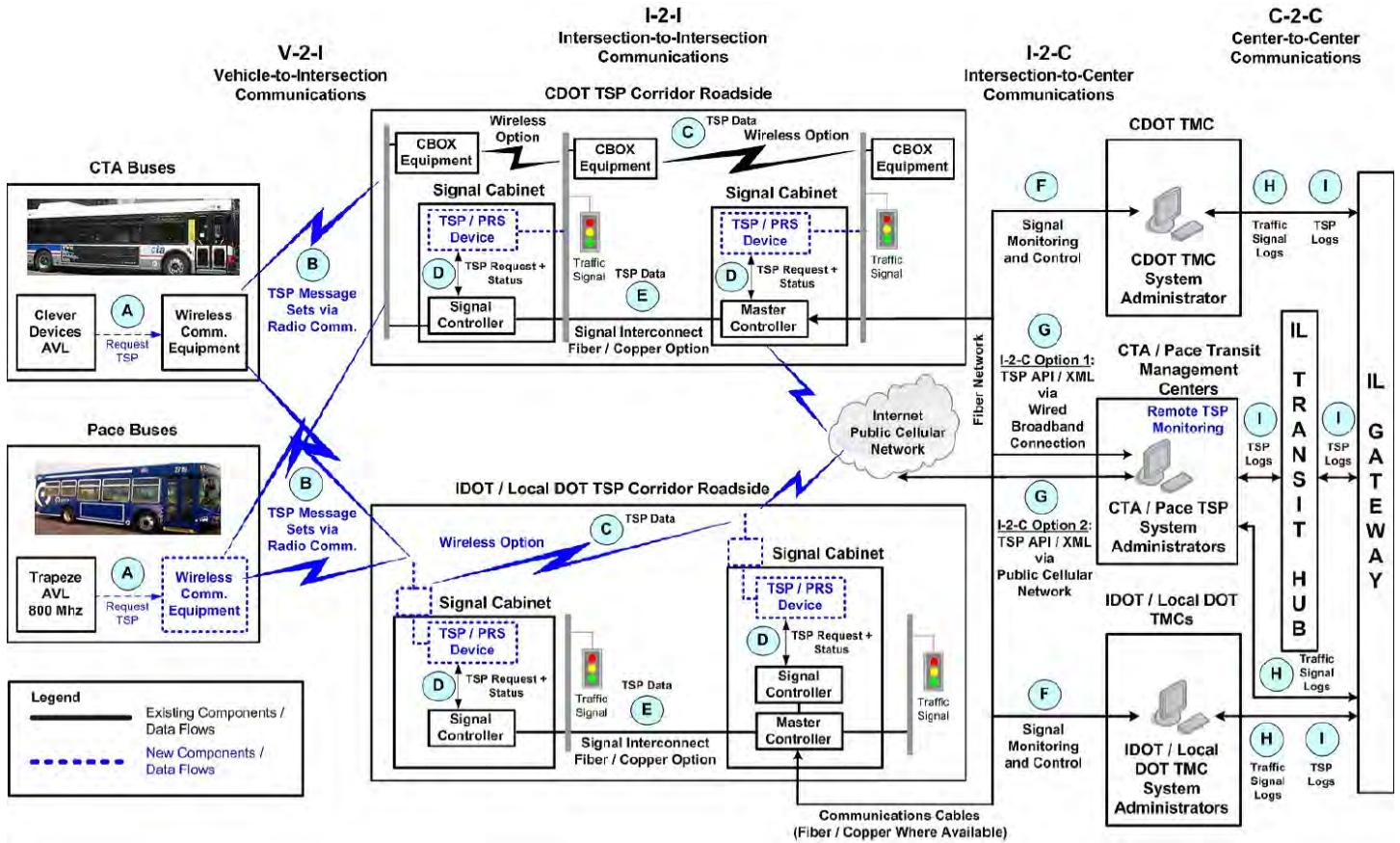
The proposed TSP system deployed through the RTSPIP is shown on the illustration below. The system is divided into three general areas of communication between system components:

1. Vehicle-to-Intersection (V-2-I): Represents equipment on-board Pace and CTA buses that communicates TSP requests and message sets to intersection-based equipment.
2. Intersection-to-Intersection (I-2-I): Represents equipment at intersections that can relay TSP requests to signal controllers and to other intersections as needed for the purpose of TSP operations
3. Intersection-to-Center (I-2-C): Represents the communications equipment that can relay operations data and logs from TSP equipment to Pace / CTA and CDOT/ IDOT central offices for system administration purposes.

The proposed TSP System will not access or interfere with the security of traffic signal operations and associated communications systems without expressed authorization of the transportation agency having jurisdiction.

Regional Transit Signal Priority Implementation Program

The schematic below describes the various channels of communication between vehicles, traffic signal equipment and central monitoring hubs.



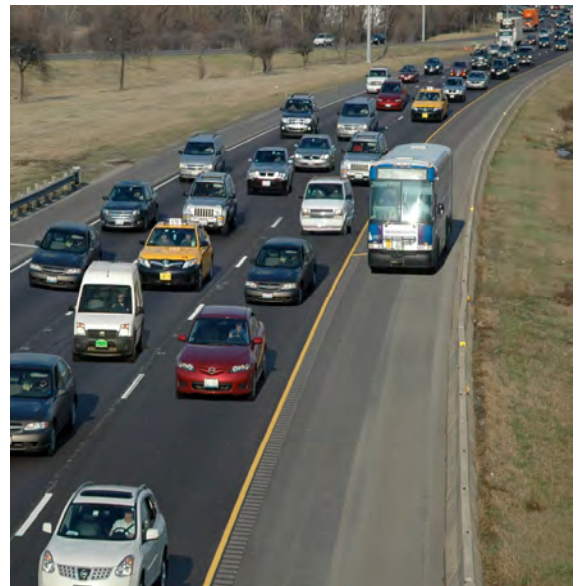
Suburban Expressway Bus Network

Express Service provides direct point to point connection between major centers of activities in the regions. Point to Point Express Buses take the fastest route between origin-destination points independently of corridors or arterials. Such express routes have a cluster of stops at origin and a cluster of stops at destination without stops in between. This model allows them fast travel between origin and destination nodes. Express buses provide a one seat ride between the route defining origin and destination centers.

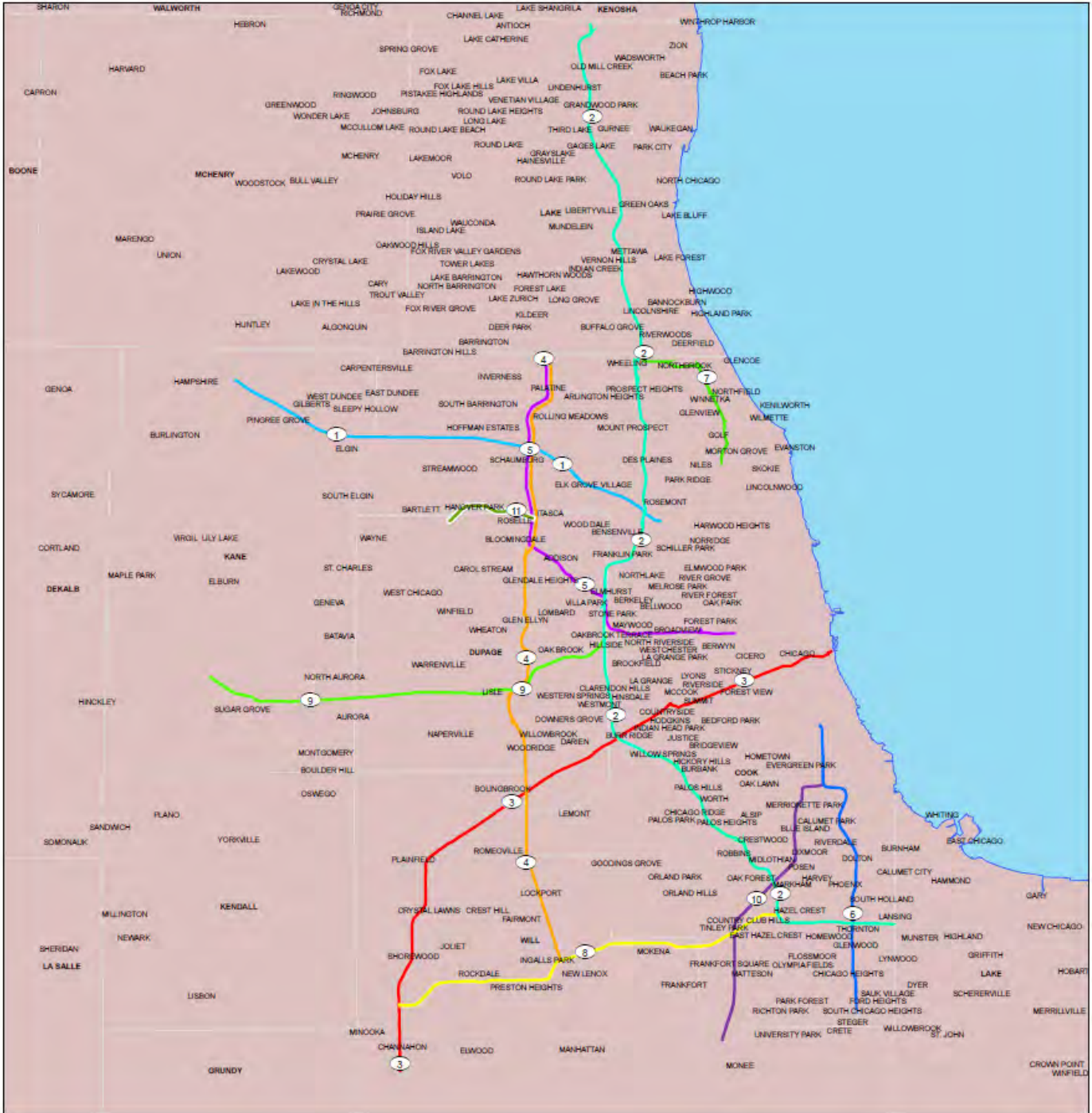
Pace currently has four bus routes operating on the shoulder of I-55 and has dozens of other routes using the region's expressways in regular travel lanes. Pace plans 11 other express bus routes as part of the proposed Rapid Transit Network.

Characteristics of Pace's Expressway Bus Service include:

- Branded over-the-road coach buses
- Park & Ride stations (see next page)
- Bus on shoulder operations, with appropriate bus exterior messaging as shown below and at right
- Free Wi-Fi for passengers
- Transit Priority access treatments
- Robust communications network between vehicles, traffic signals, dynamic signs, a dispatch center, and the customer (V2I, V2V, V2 Central Control, V2 Customer)
- Supplementary local service coverage (serving the last mile of trips, when necessary)
- TDM strategies to provide coverage when express bus service is not operating
- On-board video surveillance to enhance passenger safety
- Real-time arrival & departure displays
- Vicinity maps at stations



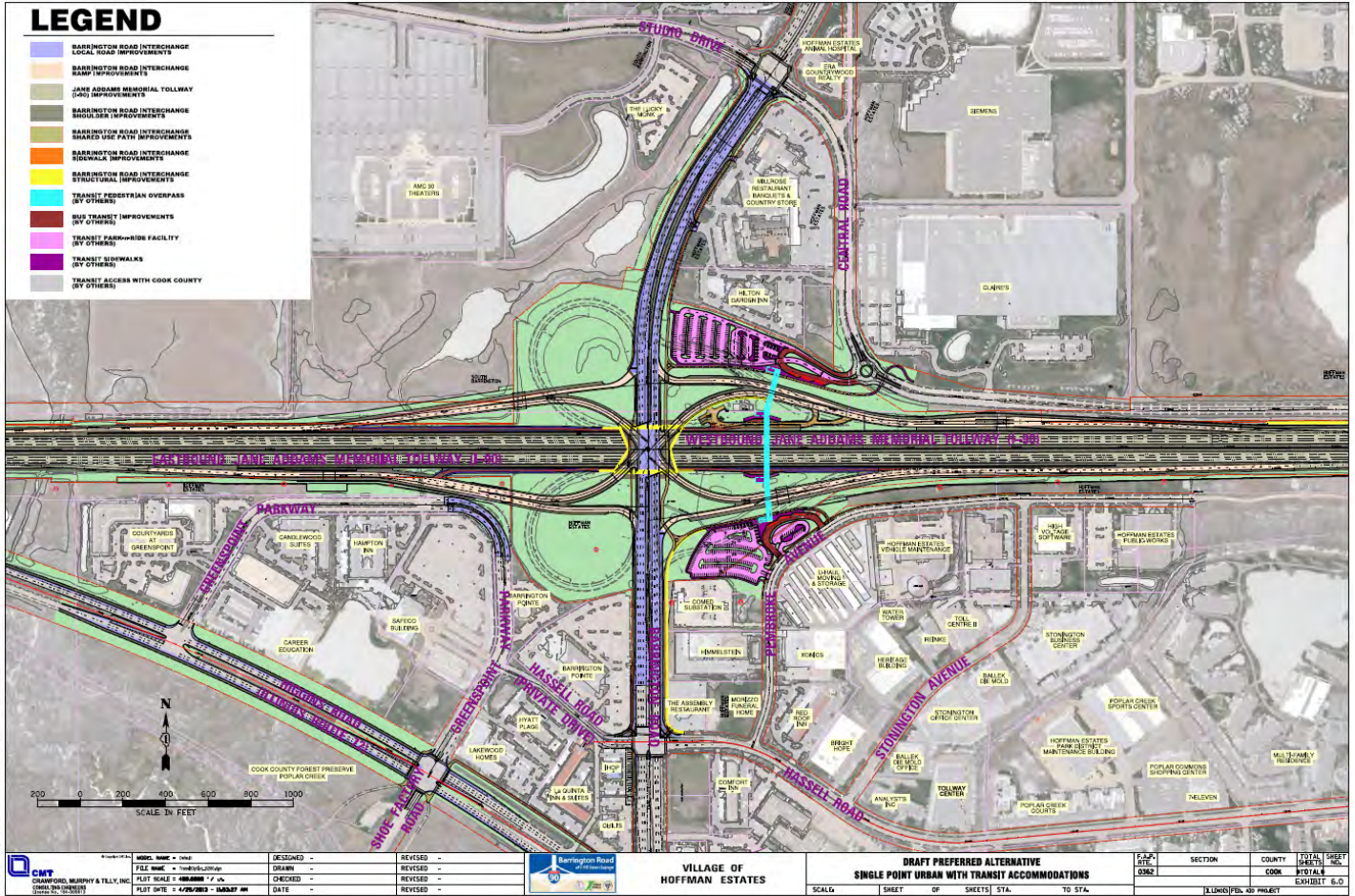
Pace Express Bus Network corridors



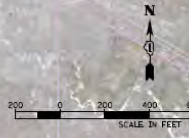
Legend

- 1 - I-90 Rosemont to Randall Rd., 1
- 2 - I - 294 Wisconsin border to Indiana border, 2
- 3 - I - 55 Joliet to Chicago, 3
- 4 - I - 355/I 53 - New Lenox to Lake/Cook Rd, 4
- 5 - I - 290 Forest Park to IL 53 Lake Cook Rd, 5
- 6 - I - 94 - I - 394 Sauk Village to 87th St, 6
- 7 - I - 94 Edens Dempster to Lake Cook Rd, 7
- 8 - I - 80 Joliet to I - 294, 8
- 9 - I - 88/ I - 290 Forest Park to Sugar Grove, 9
- 10 - I - 57 Chicago to Richton park, 10
- 11 - Elgin O'Hare Corridor - West Terminal to Elgin, 11

Proposed Park & Ride design at I-90/Barrington Road interchange



- LEGEND**
- BARRINGTON ROAD INTERCHANGE LOCAL ROAD IMPROVEMENTS
 - BARRINGTON ROAD INTERCHANGE RAMP IMPROVEMENTS
 - JANE ADDAMS MEMORIAL TOLLWAY (JAM) IMPROVEMENTS
 - BARRINGTON ROAD INTERCHANGE SHOULDER IMPROVEMENTS
 - BARRINGTON ROAD INTERCHANGE BRANDED USE PATH IMPROVEMENTS
 - BARRINGTON ROAD INTERCHANGE STRUCTURAL IMPROVEMENTS
 - TRANSIT PEDESTRIAN OVERPASS (BY OTHERS)
 - BUS TRANSIT IMPROVEMENTS (BY OTHERS)
 - TRANSIT PARK-RISE FACILITY (BY OTHERS)
 - TRANSIT SIDEWALKS (BY OTHERS)
 - TRANSIT ACCESS WITH COOK COUNTY (BY OTHERS)



<p>CMT CHAMFORD, BURNETT & TILLY, INC. (A DIVISION OF)</p>	<p>PROJECT NO. 15-001</p> <p>FILE NAME: 15-001-01.dwg</p> <p>PLAT NAME: 15-001-01</p> <p>PLAT DATE: APPROVED - JANUARY 2015</p>	<p>DESIGNED -</p> <p>DRAWN -</p> <p>CHECKED -</p> <p>DATE -</p>	<p>REVISED -</p> <p>REVISED -</p> <p>REVISED -</p> <p>REVISED -</p>
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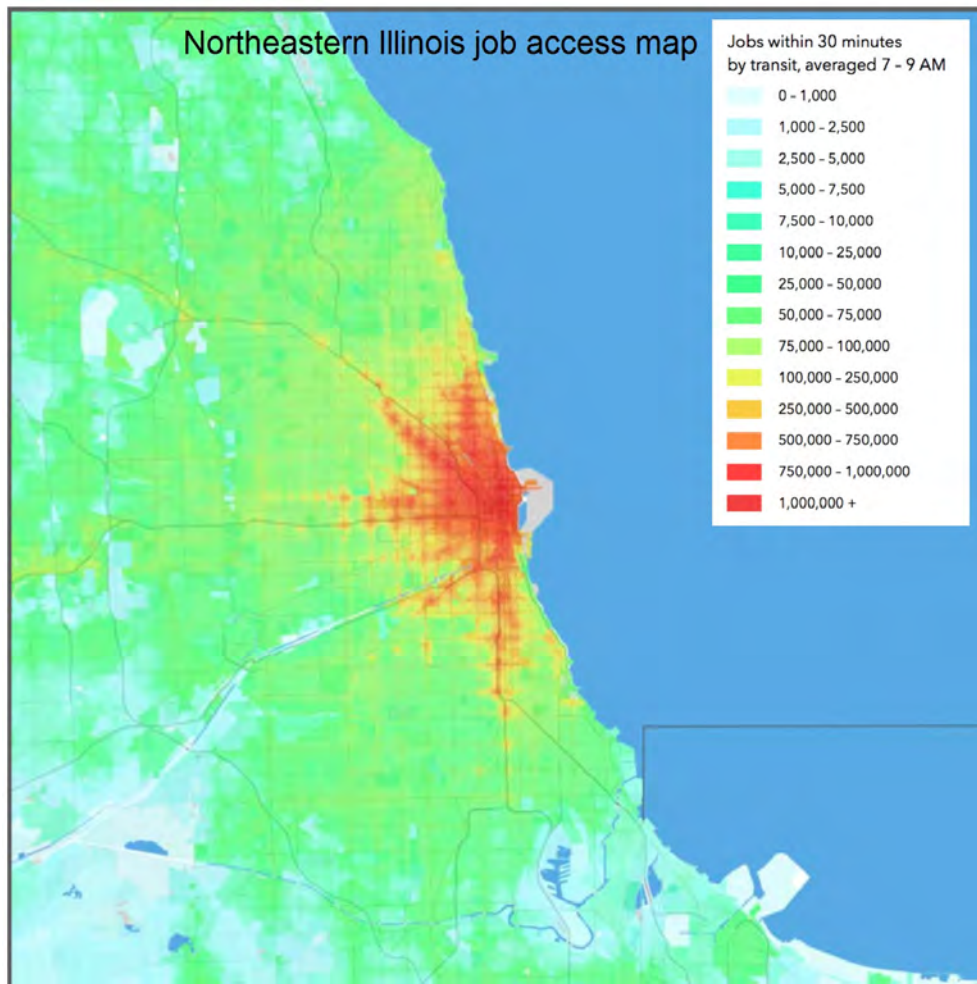
VILLAGE OF HOFFMAN ESTATES

<p>DRAFT PREFERRED ALTERNATIVE</p> <p>SINGLE POINT URBAN WITH TRANSIT ACCOMMODATIONS</p>		<p>E.P.A. NO. 0362</p>	<p>SECTION</p>	<p>COUNTY</p>	<p>TOTAL SHEETS</p>	<p>SHEET NO.</p>
<p>SCALE</p>	<p>SHEET 02</p>	<p>OF</p>	<p>SHEETS</p>	<p>STA.</p>	<p>TO STA.</p>	<p>EXHIBIT 6.0</p>

Suburban job access

A recent analysis from the Accessibility Observatory, a research group at the University of Minnesota, showed how much more difficult it is for residents of northeastern Illinois to access suburban employment opportunities within 30 minutes (see <http://www.washingtonpost.com/blogs/wonkblog/wp/2014/10/07/mapped-how-public-transit-changes-your-job-prospects/>). The Pace rapid transit network would vastly expand that job access, allowing suburban and Chicago residents alike to use public transit to access suburban jobs with much shorter commute times than they can using today's transit service.

Initial deployment of transit signal priority in northeastern Illinois created a travel time savings of up to 20% for standard bus service. When extrapolated to traffic signals over 24 ART and 11 expressway corridors (on arterial service to and from highway facilities) throughout the suburban region, the time savings would have a tremendous cumulative effect on the networks user's productivity and (by encouraging mode shift from driving to using transit) the region's fuel consumption.



Proposed Rapid Transit Network
Cost breakdown

Arterial Bus Rapid Transit

Capital cost per mile = \$2.8 million, including:

- Design
- Engineering
- Station infrastructure
- Real-time customer information
- Communications technology
- Transit Signal Priority
- Vehicles

655 miles along 24 corridors = \$1,834,000,000

Express bus

Capital cost per mile = \$1.5 million, including:

- Design
- Engineering
- Park & Ride stations
- Priority access for buses
- Bus-on-Shoulder infrastructure
- Vehicles

230 miles along 11 corridors = \$345,000,000

Bus garages

3 garages, \$40 M each = \$120,000,000

Total project cost = \$2,299,000,000