

Elgin O'Hare – West Bypass: Tier Two Transit Studies

TO: Illinois Department of Transportation District 1/Illinois Tollway
FROM: CH2M HILL
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This memorandum elaborates upon the Tier Two transit studies conducted for the Elgin O'Hare – West Bypass (EO-WB) project.

Background (Tier One)

Transit has been an integral component of the overall EO-WB project in both Tier One and Tier Two of the study process. From the onset of the EO-WB project, stakeholders stated the preference for more transit opportunities as part of the overall transportation solution. As such, new transit opportunities and connections in the study area were regarded as an important objective, and consequently are a component of the project Purpose and Need, and the overall transportation solution for the study area.

Tier One defined the scope of the potential transit opportunities for the area. These opportunities consisted of 16 transit corridor improvements including commuter rail service, rail or bus rapid transit (BRT), express bus, local bus, and shuttles (to be implemented by others). Other facets included new transit stations, intermodal facilities or transit centers, and park and ride facilities. The centerpiece of the transit plan includes a transit corridor in the median of the Elgin O'Hare corridor from the proposed O'Hare West Terminal station to the Schaumburg Metra Milwaukee District West (MDW) station. This transit service would likely be either BRT or rail and would link residents with jobs and activities within the corridor, and would help accessing jobs for reverse commuters (the future type of service will be determined by transit officials and units of government). The east end of the service would connect to O'Hare International Airport (O'Hare Airport), which plans the West Terminal and collateral development. A portion of the future trips generated by the new terminal activities, collateral development, and other activities would be well served by the proposed transit improvements. The possible extension of the CTA Blue Line to the proposed West Terminal would expand the market potential of the transit service in the Elgin O'Hare corridor to northwest Chicago and Rosemont. Express bus, circulator bus routes and shuttles connected to and extending from this east-west transit corridor were planned to develop better connections to stations, and employment and activity centers. Transit stations were added at key locations, as well as park and ride facilities to provide convenience to the system. The sum of these Tier One improvements was aimed at providing an alternative to the automobile for area residents and workers.

Tier Two

The Regional Transportation Authority (RTA), in a partnership with IDOT, jointly funded the next steps in the EO-WB Tier Two transit study efforts. Tier Two revisited and refined the preferred transit options studied in Tier One, focusing on transit facilities that would be

co-located in the roadway improvement corridors or logical extensions from the roadway corridors. The main transit feature is the preservation of space in the median of the east-west corridor (Elgin O'Hare corridor) from the western edge of O'Hare Airport to Schaumburg, sized to accommodate either BRT or rail transit (i.e., light rail transit, commuter rail, or heavy rail transit). Transit stations are provided at regular intervals with station access and parking. The project footprint for the Elgin O'Hare corridor has been sized to include the transit reservation. Additionally, roadway features, such as bridges would also be sized to accommodate the future development of transit. The implementation of the transit service and the transit type would be the responsibility of others (i.e., transit providers), and the timing of construction would be dependent on the market demand and financial considerations. The implementing agency would be required to provide the infrastructure inclusive of track or pavement, stations, pedestrian access and parking, signage, and signal controls for rail, and rolling stock.

Transit considerations have also included future transit service extending from the I-90 corridor to the proposed O'Hare West Terminal. The north leg of the West Bypass, in this case, has been located to provide sufficient space for such a transit facility to be placed along the east side of the roadway if warranted by future market demand. Extended transit service from the east-west transit corridor was also evaluated for routes from Schaumburg to Hanover Park, from the Elgin O'Hare corridor to Woodfield Mall along Rohlwing Road (IL 53), and from the proposed West Terminal to Rosemont – each are discussed in detail in the subsection *Extended Transit Service*.

In Tier Two, the transit concept was advanced with detailed study of those transit features to be co-located with roadway improvements. The objective of the Tier Two transit study was to refine the concept such that:

- 1) All the basic elements of the plan are reasonably defined (i.e., station locations, parking, pedestrian access, auxiliary service, cost estimates, etc.), and
- 2) The requirements of the transit plan are accurately reflected in the project footprint and preliminary design for the roadway plans. The transit study in Tier Two was accomplished by a series of special studies that examined various aspects of the transit requirements. Each of these studies advanced the detail of the transit concept and provided needed input to the preliminary roadway design process. The technical memorandums prepared for each of these special studies listed below are included in the project files and are available upon request:
 - Re-examination of the transit corridor location (in the median or side or frontage road) and determination of the transit right-of-way cross-section – *Transit Corridor Location Analysis Memorandum*, July 2010;
 - Examination of the feasibility of managed lanes – *Managed Lane Case Study Memorandum*, August 2010;
 - Examination of phasing the development of transit facilities – *Phased Transit Plan*, January 2011;
 - Refinements of transit station locations including station configuration and auxiliary facilities, such as parking, pedestrian access, etc. – *Transit Station Location Refinement*

Memorandum, August 2010 and Bus Rapid Transit Comparison Analysis - IL-53 (Rohlwing Road), October 2011;

- Examination of extended transit service: to Hanover Park from Schaumburg and from the west O'Hare terminal to Rosemont - *Transit Corridor Location Analysis Memorandum, July 2010 and Service Extension to Hanover Park Memorandum, October 2010;*
- Study of potential transit hub configurations - *Proposed New West O'Hare Terminal Transit Facilities, June 2009 and Commuter Rail and High Speed Rail Analysis from the Milwaukee West Line to O'Hare New West Terminal, July 2011;* and
- Consideration of transit operational requirements, including frequency of operation and costs - *Phased Transit Plan Memorandum, January 2011, Full Build Out Light Rail Stations Memorandum, January 2011, Operation, Maintenance, and Vehicle Costs for Hanover Park Connector Memorandum, March 2011, and Vehicle Costs for Full Build BRT or Light Rail Memorandum, March 2011.*

Location of Transit Service

At the conclusion of the EO-WB Tier One process, the Elgin O'Hare transit corridor was defined as a dedicated transit corridor located in the median of the roadway lanes which could be either BRT or rail transit. As the Tier Two process began, members of the Transit Working Group, including CMAP, DuPage County, RTA, CTA, Metra, and Pace requested that the location of transit within the corridor be reconsidered to ensure that all possible locations have been fully evaluated and the best possible location selected. In addition to the median location, two additional locations were evaluated:

- Frontage Roads: run transit service along the frontage roads that are included in the roadway design.
- Along-the-Side: run bi-directional transit service within a dedicated corridor placed between the main expressway lanes and the frontage roads either just north of the expressway lanes or just south of the expressway lanes.

These two alignment options were defined, analyzed, and then compared to the original median alignment. The results are contained in the *Transit Corridor Location Analysis Memorandum*. Typical cross-sections for the median and along-the-side options are shown in Figures 1 and 2 below from the *Transit Corridor Location Analysis Memorandum*. Since the frontage roads option does not include any exclusive transit right-of-way, no cross-section drawing is shown for this option.

Figure 1
Median Layout Cross-section

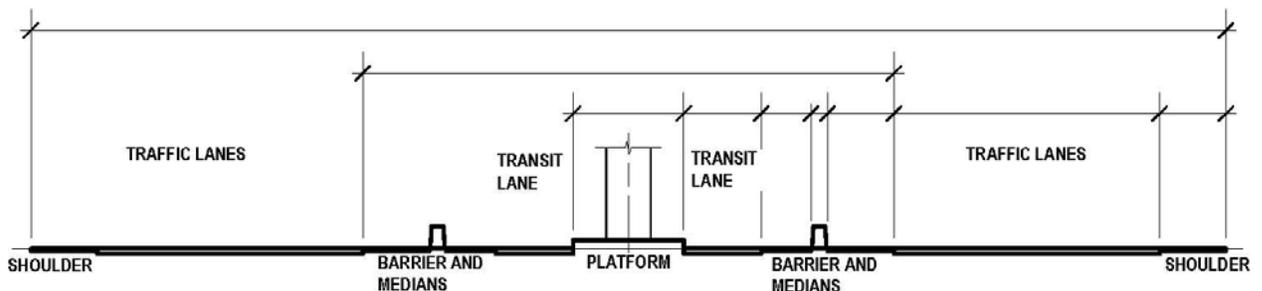
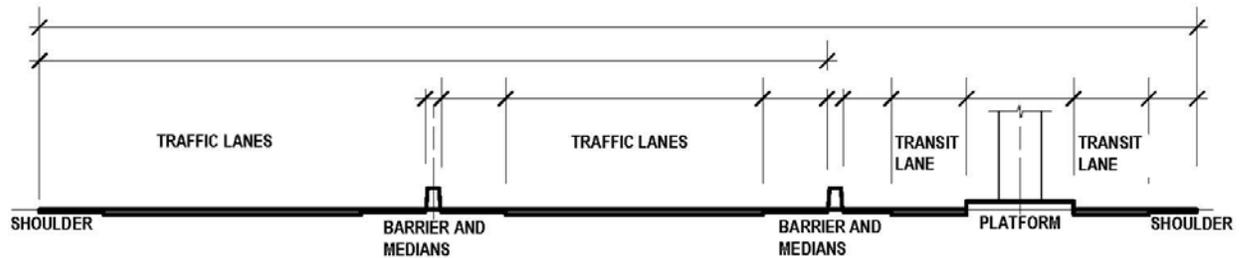


Figure 2
Transit Along-the-Side Cross-section



The *Transit Corridor Location Analysis Memorandum* describes the purpose, methodology, and results of the analysis for the three transit corridor placement options in the Elgin O'Hare corridor. The memo concludes that the median corridor option is most preferable, as it presents the fewest drawbacks in terms of transit and roadway performance for the following reasons:

- The median alignment would be a fully dedicated transitway from start to end; it insures the highest potential level of service.
- The median service would include stations located in the median; walking distances via pedestrian bridges to destinations to the north or the south of the corridor would be relatively equivalent, contributing to a favorable passenger perception of service quality.
- The eastbound and westbound service would share a center platform; connectivity would also be provided to north-south bus services at these locations.
- Finally, the median service could accommodate alternative modes that are being considered or could be designed as a managed-lane or high occupancy vehicle (HOV) component if desired.

Transit Right-of-Way Cross-Section

Right-of-way requirements were determined for transit located in the median of the Elgin O'Hare corridor and documented in the *Transit Corridor Location Analysis Memorandum*. The analysis of right-of-way requirement for transit was used as input to the development of the overall roadway cross-section. The analysis determined that the transit requirements would be the same for either BRT or rail options. The cross-section would measure a minimum of 60 feet and would provide for one dedicated lane/track in each direction with accommodation for barriers and shoulders. A study was performed to detail the median cross-section requirement at station locations. Based on applicable codes and standards, the right-of-way cross-section at station locations would be a minimum of 90 feet – see Figures 3 and 4 on the next page.

Figure 3
Transit Cross-section without Station (60' Median)

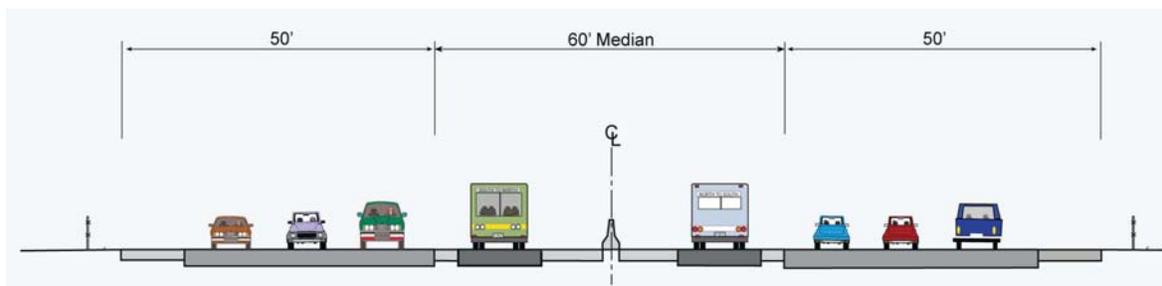
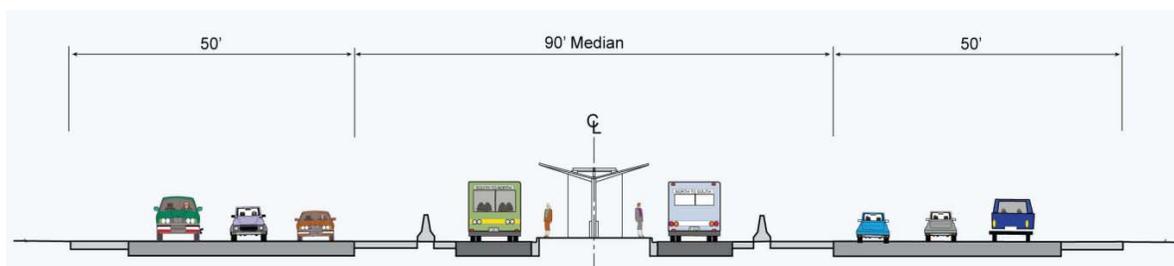


Figure 4
Transit Cross-section with Station (90' Median)



In further study of transit service along the north leg of the West Bypass and along I-90 in the vicinity of the system interchange (West Bypass and I-90) it was concluded that transit would be best located to the south side of I-90 and the east side of the West Bypass. The median location in these areas was not conducive to ideal roadway geometric solutions or construction phasing of roadway improvements. The roadway alignment has been engineered in these cases to provide sufficient space (40-50 feet) to the south of I-90 and to the east of the West Bypass for transit service in the future.

Managed Lanes

The *Managed Lane Case Study Memorandum* examines the use of a managed lane for transit service in the Elgin O'Hare corridor. The managed lane concept assumes that either the median or left-most lane would be managed, such as for the use of transit, HOV, or automobiles paying a toll premium. The analysis found that a managed lane could maximize person through-put rather than vehicle through-put, spread travel patterns, and have economic benefits while the disadvantages include, cost of additional infrastructure and controlled access issues.

Phased Transit Plan

The *Phased Transit Plan* document examines phased implementation of transit service for the project. The pros and cons and recommendations are provided. While, the roadway development will be phased, it was appropriate to consider a phased development plan for transit. In the examination of a phased development strategy for transit, the major objective was to maintain the high-level performance of the transit service as originally intended in the Tier Two Build Alternative.

Phased implementation of transit service would provide an express bus service along the Elgin O'Hare corridor using regular travel lanes with the option to use shoulder riding during periods of congestion. Bus stops would approximate the Tier Two Build Alternative station locations with stops at the proposed West Terminal, Wood Dale Road, Prospect Avenue/Arlington Heights Road, Meacham Road, Roselle Road, and Schaumburg Metra Station. Bus stops would be located on the interchange ramps at these locations allowing easy on-off movements. The express bus service would approximate the frequency of service offered by the Tier Two Build Alternative transit proposal with service frequency every 15 minutes.

Other phased opportunities include express bus service from the Elgin O'Hare corridor along IL 53 to Woodfield, shuttle service from the Schaumburg stop to Hanover Park, and express bus service from the proposed West Terminal site to Rosemont. Each of these extensions of service would provide an important transit link in the system to job centers, activity centers, or linkages to other transit facilities.

Location of Transit Stations

In the Tier One, transit station locations were identified, although precise station placements and other details involving pedestrian access, parking, and intermodal connections were not determined at that time. In Tier Two, additional studies were conducted to define the details about station placement, parking and kiss-and-ride, pedestrian/bicycle access, and connection with other modes of travel - *Transit Station Location Refinement Memorandum*.

Transit stations were identified in Tier One at six locations: proposed Western Terminal, near Lively Boulevard, Hamilton Lakes, IL 53, Roselle Road, and near Schaumburg Metra station. Transit station locations were reviewed and refined in Tier Two resulting in changes at three locations.

Station relocations at the Lively Boulevard and Hamilton Lakes stations involved a minor shift to the west. In the case of the Hamilton Lakes station, the shift was more proximate to the center of activity, provided improved passenger access, and was closer to a parking structure planned for the area. For the Lively Boulevard station, the shift to the west improved access to planned parking. In both cases, pedestrian access would be provided from both the north and south sides of the project corridor.

The IL 53 station was originally sited to provide commuter access to and from the employment center to the south and the transfer of patrons coming from the west that desire to use the service routed north along IL 53 to Woodfield Mall. The original configuration included both a station and dedicated bus ramps from the median to access IL 53. The combined width of these facilities would measure over 150 feet. The sizable median dimension for station and ramps challenged cost-effective roadway design solutions in this area. The process of refining the roadway section in the vicinity found that a median width of near 100 feet would be preferable. In discussions with the RTA, it was concluded that a median width of approximately 100 feet would provide a workable area for future transit infrastructure. Further, the agency preferred to defer the decision regarding either a station or ramps at IL 53, and revisit that decision later when both a transit provider and funding for transit service are identified in the Elgin O'Hare corridor - *Bus Rapid Transit Comparison Analysis - IL-53 (Rohlwing Road) Memorandum*.

Transit Station Parking

The *Transit Station Location Refinement Memorandum* discusses the specifics of parking and station access for four of the five stations planned along the route, including near Wood Dale Road, Hamilton Lake's development, Roselle Road, and near the Schaumburg Metra station. At each of the transit stations, provisions for parking (ranging from 200 to 650 spaces) and bicycle and pedestrian access would be provided (see Table 1). Parking for a potential station at IL 53 is also shown in Table 1, but note that parking is relevant only if a station were developed. The parking area requirements and locations have been included in the project footprint. The parking requirements at the proposed West Terminal will be determined when more advanced site development information at the airport is known.

TABLE 1
Transit Parking and Access

| Location | Description | Parking Capacity | Pedestrian Access | Kiss & Ride Facility | Intersecting Service Stops |
|-------------------------------|---|------------------|-------------------|----------------------|----------------------------|
| Schaumburg Metra | Re-build part of existing lot with two-level deck structure | 650 | Yes | Yes | Yes |
| Roselle Road | New surface lots as part of new retail development | 200 | Yes | Yes | Yes |
| IL 53 ^a | New surface lot | 350 | Yes | Yes | Yes ^b |
| Hamilton Lakes/Park Boulevard | Partial use of new multi-level parking structure built as part of adjacent commercial development | 550 | Yes | Yes | Yes |
| Wood Dale Road | Partial use of new multi-level parking structure built as part of adjacent commercial development | 300 | Yes | Yes | Yes |
| West Terminal | Parking requirements will be determined as proposed West Terminal complex develops further | NA ^c | Yes | Yes | Yes |

Note: Initial build parking capacity assumed to be 70 percent of the Tier Two Build Alternative parking capacity.

^a A station at this location is optional based on limited space for either a station only or access ramps to IL 53 only. The parking estimate would be provided only if a station is developed.

^b No intersecting services operate at Meacham Road and the Elgin-O'Hare Expressway. Local circular services are proposed. When stop is re-located to IL 53 with the Tier Two Build Alternative, intersecting services would have stops at this location.

^c Parking will be determined when more advanced site development information for O'Hare Airport is known.

Extended Transit Service – (North-South – East-West Connectivity)

Refinements in Tier Two also examined extending transit service from Schaumburg to Hanover Park, express bus service from the Elgin O'Hare corridor along IL 53 to Woodfield Mall, and express bus service from the proposed West Terminal complex to the Rosemont CTA station. Tier Two studies investigated the extension of transit service to the Hanover Park Metra station from the Schaumburg Metra station (a distance of two miles) - *Service Extension to Hanover Park Memorandum*. Eleven alternate routes were examined between

Hanover Park and Schaumburg for both BRT and LRT. The cost of the extended service was sizable, ranging from about \$43 million to over \$50 million, for the basic infrastructure (not including rolling stock). The travel time provided by the service would be approximately four minutes or represent about a four minute savings over alternate modes (i.e., shuttle bus in mixed traffic).

The high-type transit service (i.e., BRT or commuter rail) from Schaumburg to Hanover Park was deferred from further consideration for several reasons, including the high cost of transit service for a relatively small savings in travel time, and impacts to high quality wetlands, prairies, threatened/endangered species, and the West Branch DuPage River. However, the decision to defer the high-type service to Hanover Park does not preclude reconsideration of this service at a later date. In lieu of BRT/commuter rail service, bus shuttle service would be used to connect the Schaumburg Metra station to the Hanover Park Metra station. The study suggested that Hanover Park may wish to consider implementing an interim service to Schaumburg when the Elgin O'Hare transit system goes into service, and upgrading to one of the higher level options as the market demand develops and cost-benefits come into alignment.

On the east, express bus service was studied from the proposed West Terminal to the Rosemont CTA Blue Line station. This service is viewed as interim until such time that transit is extended across the airfield to the proposed West Terminal. As an interim service, it would provide connectivity for commuter and work trips between the project area and downtown Chicago and airport-related businesses. Alternative routes were examined around both the north and south ends of the O'Hare Airport. Routes to the north were found to be slower and provided less reliable service due to numerous signals and more out-of-direction travel. The route to the south was favored because of shorter travel times and the reliability of travel speeds. This route would use the south leg of the West Bypass corridor to Irving Park Road (IL 19), travel east on IL 19 to Mannheim Road, north on Mannheim Road to Balmoral Avenue, and then to the Rosemont CTA Blue Line station. The service would operate as express bus service between the proposed West Terminal and the Rosemont CTA Blue Line station with travel time of about 15 minutes. No special infrastructure requirements are anticipated for this service.

Express bus service is planned along IL 53 extending from the Elgin O'Hare corridor to the Woodfield Mall. The arterial route would include several stops at activity or job centers. In consideration of this service, north-south service along IL 53 and Meacham Road were considered. IL 53 was preferred because of its proximity to job centers and activity centers. Similar to the other express bus routes no special infrastructure requirements are anticipated other than bus stops.

Transportation HUB

In Tier Two the location of a transit center or hub was evaluated further - *Proposed New West O'Hare Terminal Transit Facilities and Commuter Rail and High Speed Rail Analysis from the Milwaukee West Line to O'Hare New West Terminal Memorandums*. It was determined that the proposed West Terminal area was the optimal location to bring together the various transit modes. More remote locations were eliminated due to the difficulty of moving passengers between the transit modes and the proposed West Terminal. A distinct transit "hub area" in the proposed West Terminal or separate building directly adjacent to the air terminal was identified as optimal in order to accommodate the goals of the approach.

A preliminary site plan was developed bringing all the proposed transit modes directly to the proposed West Terminal area. As this arrangement was evaluated, several feasibility challenges were identified. An alternative arrangement was developed that located the rail lines and platforms to the west of the proposed West Terminal, with the remaining modes being brought directly to the air terminal area, allowing for direct mode transfers.

The proposed transit center at the proposed West Terminal would provide the interconnection between the various transit and non-transit modes. It will create a new centralized intermodal transit hub for the airport and surrounding communities in the area served by the EO-WB project.

Conclusion

The goal of additional transit service and connections to other modes of transportation was highly regarded by stakeholders throughout the project area. Tier Two refinements advanced transit to a point that the east-west roadway component now has a reservation sized to accommodate most transit types. Further station locations have been reconciled, and again the roadway cross-section has been developed to accommodate the wider footprint required for stations. Additionally, extended bus express service to Hanover Park, Rosemont, and the Woodfield Mall are considered viable options either as interim or long-term services. Parking at stations has been addressed and appropriately sized to realistic demand levels. Additionally, bicycle/pedestrian access has been considered and a concept is available for follow on studies. Although, some cost information was developed during Tier Two, more work is required to determine the exact service type and the year of implementation before reliable cost estimates can be prepared. Thus, cost estimates have not been included pending further definition of the transit service. Similarly the operational requirements are best determined when a specific transit type has been identified; therefore this work has not advanced the operational characteristics of transit service.