

APPENDIX B
Upper Level Loop Analysis
April 2006



Long Island Rail Road
East Side Access



UPPER LEVEL LOOP ANALYSIS

Introduction

A report entitled “Assessment of the Upper Level Loop Alternative for the Manhattan Portion of the East Side Access Project”, prepared for the Institute for Rational Urban Mobility by the Delcan Corporation was submitted to MTA in the fall of 2004 (hereafter referred to as the Delcan Report). The Upper Level Loop Alternative is a variation on an alternative, called the “Apple Corridor” that was submitted by the Committee For Better Transit (CBT) in 1996 for consideration in the transportation planning process from which the East Side Access project emerged. The Apple Corridor scheme recommended using existing upper level Metro-North tracks and platforms and the loop track in Grand Central Terminal (GCT) for the new LIRR service to East Midtown. In addition, improvements in Queens to enable direct service between JFK International Airport and GCT were recommended. The Upper Level Loop Alternative, however, resurrects only the Manhattan portion of the Apple Corridor scheme and does not address airport access service. The objectives of the Delcan Report were to assess the technical viability of the Upper Level Loop Alternative and review and evaluate the disadvantages that are outlined in the MTA LIRR East Side Access Final Environmental Impact Statement (FEIS) regarding the Apple Corridor proposal.

The FEIS found the Apple Corridor scheme to be fatally flawed due to its significant adverse impacts on Metro-North service (existing service as well as planned) and its inability to meet the LIRR service requirements that were defined for the East Side Access project. The Upper Level Loop Alternative proposes the same Manhattan alignment as the Apple Corridor scheme and would have the same fatal flaws (i.e., severe impacts to Metro-North service and LIRR service shortfalls). Regardless, due to the recently increased level of public interest in this proposal, primarily due to the misconception that the Upper Level Loop Alternative would negate the need for the 50th Street Facility, the Upper Level Loop Alternative was evaluated once again.

The Upper Level Loop Alternative has been reviewed and rejected unanimously by: railroad operating personnel from both Metro-North Railroad and Long Island Rail Road; the presidents of both railroads; East Side Access tunnel engineers from the tri-venture team of Parsons Brinckerhoff, Parsons Transportation Group, and STV; constructability engineers from the Bechtel/URS Joint Venture team serving as Program and Construction Managers for the East Side Access Project; MTA’s independent engineer; and FTA and their oversight engineers. Additionally, the MTA’s proposed design for East Side Access was reconfirmed since the FEIS was completed independent of the proponents of the Upper Level Loop Alternative. When the responsibility for building East Side Access was transferred to the MTA Capital Construction Company (MTACC) in July 2003, one of the first actions taken was a thorough review of the design options for East Side Access to confirm the project’s scope and budget. The analysis included a review of planned service levels, ridership assumptions, existing capacity and whether or not LIRR train service could be accommodated within existing GCT space. To further validate these efforts, an outside firm with no prior involvement with East Side Access was utilized. The result of these efforts was a reaffirmation that the current design for East Side Access is the proper one. It is the only design plan that provides for sufficient

capacity to meet projected demand; it does not overload the existing customer circulation areas of GCT; does not adversely impact Metro-North's existing and future operations; and allows both railroads to meet their long-term growth potential.

The objectives of this appendix are to:

- Describe the approved Manhattan Alignment and provide an overview of the status of the East Side Access project;
- Describe the Upper Level Loop Alternative;
- Clarify erroneous assumptions used in the Delcan Report;
- Compare the benefits and adverse impacts of the current approved alignment and the Upper Level Loop; and
- Indicate why the 44th and 50th Street facilities (and other ventilation requirements) would be required under the Upper Level Loop Alternative.

East Side Access Manhattan Alignment Description

The design of the project reflects this key goal as well as delivering a 21st Century transportation system to accommodate approximately 160,000 daily customers who will ride the new service to East Midtown. With East Side Access, the number of commuter rail passengers in GCT will nearly double the approximate 190,000 daily MNR customers utilizing GCT today. While the Upper Level Loop Alternative makes absolutely no provisions for passenger circulation space in and around GCT, East Side Access includes:

- Eight platform tracks accommodating 12-car trains;
- Multiple banks of escalators, elevators and emergency stairs;
- Four mid-level mezzanines and three cross-passageways;
- A large concourse in the area currently occupied by MNR's Madison Yard;
- Passenger amenities in the new concourse including ticketing and information booths, restrooms, waiting room seating, retail elements and required administrative, operational, and mechanical support spaces;
- New exits/entrances to the GCT complex from the new LIRR concourse and to the street.

The Manhattan alignment begins at the existing 63rd Street Tunnel's terminus at Second Avenue and 63rd Street. From Second Avenue, new tunnels will be excavated well beneath private property, public streets and avenues, NYCT's Lexington Avenue IRT, existing Metro-North Park Avenue tunnels, and NYCT's 60th Street tunnel (N and R lines). Tail tracks to provide temporary storage for out-of-service trains will extend beyond GCT and terminate at about East 38th Street under Park Avenue (Figure 1). The required deep tunnel easements have already been acquired.

The new tunnels will bring tracks into new terminal caverns excavated beneath the existing lower level of GCT (Figure 2). Each of 8 platform tracks will accommodate 12 car trains, approximately 1,020 feet long (Figure 3). The platforms will be connected to four mid-level mezzanines (connected by cross-passageways) via six vertical circulation points from each platform (Figure 4). From the mezzanine, 17 escalators banks and elevators will rise to a large concourse in the area currently occupied by MNR's Madison Yard (Figure 5). The concourse will include passenger amenities, such as ticketing and information booths, restrooms, waiting room seating, retail elements and required administrative, operational, and mechanical support spaces. New exits/entrances to the GCT complex will lead from the new LIRR concourse to the street at 44th, 45th, 47th and 48th streets, the existing 47th Street cross passageway, and the concourse in GCT.

The project is being designed to optimize safety by following all applicable codes and regulations, augmented by modern system safety engineering technology, and performance-based design and industry standards. The design of the new tunnels and terminal in the deep cavern scheme meets the applicable standards of the National Fire Protection Association (NFPA), which are the nationally accepted design standards for public transportation facilities. Among these is NFPA 130, which is specifically intended to provide fire safety in underground passenger rail systems to protect the lives of customers, employees and emergency response personnel. NFPA 130 addresses the issue of safe evacuation through a combination of emergency exits, smoke ventilation, effective and prompt action by emergency forces, and prompt detection and suppression of fires.

East Side Access Project Status

East Side Access is currently identified as a priority project in the twenty-year long-range transportation plan for the New York Metropolitan Area and was listed as one of two "Highly Recommended" projects in the federal funding New Starts pipeline for transit projects in the United States (out of 27 projects nationwide). Significant project approvals include the following:

- June 1998 – The New York Metropolitan Transportation Council (NYMTC) adopts the locally preferred alternative for East Side Access. Consensus on the preferred alternative was obtained through an extensive transportation planning process that began in 1995 and included committees made up of interested individuals, elected officials, and transportation professionals in the region.
- May 2001 – Federal Transit Administration (FTA) issues a favorable Record of Decision for the East Side Access project based on the FEIS. The FEIS includes an extensive comparison of a shallow and deep tunnel option. The deep tunnel option emerged after review of the shallow tunnel option by experts brought in from around the world. The deep tunnel option is recommended since the shallow option would involve complex and risky construction methods to build in close proximity to Metro-North's Park Avenue tunnel and tracks, buildings along Park Avenue, and the other structures that traverse the alignment.

- February 2002 – FTA grants approval to enter into final design after an extensive review (by FTA and Army Corps of Engineers) of the Preliminary Engineering drawings, cost estimate, and risk assessment that were prepared for the project.
- July 2002 – construction begins on several East Side Access contracts.
- By June 2003 – 72 private property easements to construct the Manhattan tunnels were acquired.

To date, approximately \$1 billion has been committed towards the implementation of East Side Access, including final design of the approved Manhattan alignment and construction of new rail yards and related facilities.

Upper Level Loop Alternative Description

The Upper Level Loop Alternative would follow a different horizontal and vertical alignment compared to the approved East Side Access alignment in Manhattan (Figure 6) and include the following:

- Between Second Avenue and 57th Street, a tunnel for a twin-track mainline would be constructed under Metro-North's Park Avenue tunnel at a shallower elevation and a different horizontal and vertical alignment. Construction methods would involve using a tunnel boring machine (TBM), similar to that proposed for East Side Access, and controlled drill-and-blast excavation;
- Between 55th and 52nd /51st Street, the tunnel would rise to meet the existing Metro-North tunnel for connection to tracks I and C. Open-cut construction beneath the Metro-North tracks and underpinning of the tracks would be required;
- New LIRR trains would have exclusive use of Metro-North's existing Track I and C, platform tracks 38 through 42, and the upper level loop track for eastbound revenue service (Figure 7).

Alternatives Analysis

A comparison of the Upper Level Loop Alternative and the approved Manhattan Alignment for East Side Access is provided below to highlight the differences between the two with regard to operability, constructability, safety and construction-period impacts. The upper level loop was discarded because it cannot be built without severe impacts to Metro-North operations and does not meet the service objectives for LIRR service to GCT. The upper level loop also does not save any money as significant cost elements are not considered in the Delcan Report. The upper level loop would not adhere to today's safety standards that are designed to protect the lives of railroad customers and employees. By contrast, the approved design for East Side Access is the only design that provides for sufficient capacity to meet future demand, without exacerbating crowded

conditions in GCT or disrupting Metro-North service. The results of the alternatives analysis are summarized on Matrix 1.

Impacts to Metro-North Service

While GCT contains a vast network of tracks and platforms in both the upper and lower levels, there are only 10 approach tracks to these platforms (six to the upper level and four to the lower level) and four tracks in the Park Avenue tunnels (Figure 8). Metro-North currently operates for revenue on 9 of the approach tracks and the four in the Park Avenue tunnels. North of approximately 57th Street, the Metro-North tunnel consists of four tracks. South of 57th Street, as the tunnel approaches GCT, these tracks fan out into a number of tracks called “throat tracks” that enable trains to access all of the upper- and lower-level platforms in GCT. The throat tracks are tracks B, on the east side of the tunnel, through J, on the west side (track A is no longer used as a throat track). Three throat tracks (B, F, and J) provide access to the lower-level platforms, Madison Yard, and the East Side storage yard; and six throat track (C, D, E, G, H and I) provide access to upper-level platforms.

A key goal of the East Side Access project is to operate 24 trains per hour into GCT in the Peak period without any negative or adverse impacts to the quality of Metro-North service, Metro-North service levels (present and projected), and Metro-North’s ability to reach operating and safety performance targets. This fundamental and guiding principle, fully vetted and agreed to by all operating agencies, is included in the East Side Access Project Design Criteria and was a basis for the positive Record of Decision issued by the Federal Transit Administration to conclude the environmental review process. The Delcan plan fails to address the temporary and permanent impacts to Metro-North.

➤ Permanent Impacts to Metro-North Operations

Assertions are made in the Delcan Report that the Metro-North operating plan and physical configuration were carefully studied and measures were suggested to mitigate impacts. In reality, the Delcan Report shows that the impacts are extremely severe, involving considerable degradation to Metro-North operating performance and service delivery. It is important to note that the proposed mitigations fail to satisfactorily address the impacts, thereby failing when compared to the guiding principle of no or minimal impacts to Metro-North operations. In the Delcan Report there are numerous references to Metro-North service disruptions, changes and impacts both during construction and in the final proposed configuration.

The following points made in the Delcan Report are either factually incorrect or represent invalid assumptions and conclusions:

- **It is feasible to assign Tracks I and C to LIRR service, leaving eight Metro-North running tracks (“throat” tracks in Delcan terminology). This assumes that track A is reconnected. In such a plan, Metro-North can operate with one running track for**

each Park Avenue Tunnel track, leaving the remaining four tracks for yard moves, storing trains and construction.

Metro-North cannot effectively operate with one running track for each tunnel track; a minimum of two running tracks per tunnel track are required. The transition from 60 mph operation in the tunnel to 10 mph operation in the Terminal requires that trains be separated (“fanned out”) on the running tracks; otherwise, trains will begin bunching up and experiencing delays. Calculations show that having only one running track available for each tunnel track would result in a decrease in throughput from the current 1 train every 2.5 to 3 minutes (20-24 trains per hour per track) to 1 train every 3 to 4 minutes (15-20 trains per hour per track), a 20-25% reduction in capacity. GCT peak operations also require the ability to make parallel moves; that is, to have trains moving simultaneously along several routes within the terminal complex. The reduction in running tracks limits this capability as well. For outbound moves, it is necessary to feed trains from two or more running tracks into the tunnel track to ensure that maximum capacity is attainable in the tunnel.

Currently, eight of the nine running tracks are used primarily to feed and/or accept tunnel traffic, and the ninth track (Track C) is used for upper level yard moves (Track A serves this purpose on the lower level). While it is possible to operate successfully for short periods with one less running track, this level provides little flexibility and is not sustainable over long periods. The Delcan assumption that Metro-North could operate on six running tracks during construction is absolutely incorrect. A reduction in running tracks and ladders would have negative impacts on GCT peak operations.

In February of 2000, ESA conducted a train operations workshop to analyze and best configure a proposed interlocking and terminal arrangement. At that workshop it was demonstrated that a simple 2 track operation could not support 2.5 minute headways. The determining factor was then, and is now, the necessary distance and time for deceleration. Trains had to be separated at speed in order to avoid ripple delay, and allow for multiple and simultaneous routing.

In the PM, the adjustment had to be made, not just in number of running tracks, but in the length of the track circuits, the distance between signals and switches to “release” routes for trains following each other as the distance to be traversed and the speed of travel exceeded the 2.5 minute headway between dispatches.

For example, trains operating on 2.5 minute headways initially at 60 mph decelerate to 10 mph and in so doing, the distance between the rear end of train A and head end of train B reduces to 1231 feet. Train A reaches the access point for platform routing and must travel its own length to clear that point and allow for routing of a following train. Train A then travels 1020 feet (12 cars) at 14.7 feet/sec, consuming 69 seconds. Train B has to travel 86 seconds plus 69 seconds, 2 minutes 35 seconds, to clear for Train C. The 2.5 minute headway is thus exceeded. Trains are forced to slow down “further back” on the mainline.

Delays are incurred not because of platform availability but because of the transition times and distances.

- **There are a number of underutilized tracks in Grand Central that, by better utilization, would accommodate all the trains currently using the loop tracks.**

First, Delcan is in error with reference to the number of these tracks, as shown in the table on page 29 of the Delcan report); specifically:

- Tracks 22 and 31 were permanently removed to make room for the GC North passageways.
- Track 14 is a non-revenue track used for recycling and garbage cars, and is not suitable for use by passenger trains.
- Track 113 was not included in the 1990's interlocking improvement plan, and is not in service. This track, however, is scheduled to be reconnected to the interlocking as part of the ESA lower level improvements.
- Track 116 holds four cars, not five, and thus is usable for only a very small number of trains.

Second, the track utilization efficiency cannot be calculated based on the percent of time that a track is occupied. The key metric is the percentage of tracks that are occupied at the peak time during the rush hour. At Grand Central, this critical time is between 8:30 and 8:45 a.m., and in that time period, every available revenue track, except as noted in the next paragraph, is occupied. The fact that 30% of the tracks may have been unused in the previous 30 minutes is immaterial.

Based on experience and operating practice, three passenger tracks are unassigned during the peak periods. In the time period sampled by Delcan, these were tracks 28, 39 (not shown in the report) and 106. Metro-North must allow for any two tracks to be out-of-service at any time for maintenance and capital work (currently tracks 26 and 27 for switch replacement), and one track must always be available for late trains, unscheduled turns, trains with mechanical problems, etc.

- **Any platform track can be substituted for any other platform track in reassigning trains from the loop.**

Trains are assigned to GCT tracks based on their size, type (EMU or locomotive hauled) and route. Reassigning a Hudson train from track 42 to track 24, for example, creates serious routing conflicts within the terminal which results in train congestion at CP1. Upper Level trains cannot be routinely routed to the Lower Level if they are locomotive hauled (because of the grades) or if they are sufficiently large to create a customer flow problem on the narrow lower level platforms and stairways.

- **Trains can be “double berthed” on long platform tracks to create additional capacity.**

Stacking two trains on a platform track was an accepted, but seldom used, Metro-North operating strategy in the late 1980's. This practice represents a significant inconvenience for customers, increasing the time required to exit a train to the terminal. More significantly, with the opening of Grand Central North in the late 1990's, this practice was discontinued in all but emergency situations due to the construction of the stair enclosures on the north ends of the platforms. These enclosures, which are generally 6 to 10 car-lengths from the block, occupy 50% or more of the platform width. Unloading a train mostly or entirely north of these enclosures forces customers to exit south and traverse the narrow passages between the enclosure and the platform edge. The resulting customer flow rates are unacceptable from a customer service and safety perspective. The practice of stacking trains was specifically prohibited from consideration when the original MOU between Metro-North, LIRR and East Side Access was developed in 2000.

- **Additional capacity can be created by more efficient service time of equipment on the platforms.**

The time required to clean and service trains for outbound trips is never the governing criteria for platform occupancy. Outbound trains are scheduled to meet customer demand, schedule pattern and the availability of operating slots in the Park Avenue Tunnel and along main line tracks.

- **The amount of time required to yard a train (i.e. clear a platform track for another train) is 201 seconds; hence, all 16 yard trains can be handled in less than one hour of track occupancy time on a running track.**

The Delcan Report's basic equation is flawed in a number of ways; primarily in that it assumes an average speed of 10 mph. The maximum speed is 10 mph; average speed will be considerably less, taking into account acceleration and deceleration and any delay due to conflicting moves, signal clearance times, etc. Delcan allowed only 20 seconds for the move to change direction; in practice, this is considerably higher depending on whether the move is being made by an engineer alone, two engineers or an engineer and a conductor. Delcan also incorrectly assumes that the reverse move is made at the first switch where the train clears the platform, when in fact trains may have to travel a considerable distance before being able to change ends (for example, from track 105 to ladder T to track 150 to ladder N to track A). In all, Metro-North believes that 8-10 minutes per yard move is a more reasonable estimate. Delcan also fails to include the five yard moves currently made off the loop in their calculation.

- **Metro-North could provide the same service level with fewer trains by increasing train lengths.**

Increased train length implies one of two alternatives; either outlying stations receive less frequent service in order to fill the larger trains, or two or more service zones are combined, resulting in more stops per train and longer travel times for customers. Either of these options would significantly degrade the quality of service that Metro-North provides its customers, and as such, violate the basic premise that Metro-North not be adversely

affected by the ESA project. This concept is also in conflict with Delcan's earlier proposal to "double-berth" trains, which requires train lengths of no more than 6-7 cars.

- **Metro-North may have to alter its operating plan from a 3:1 ratio of inbound to outbound capacity.**

This option has a significant service impact. Delcan recognized in their report that Metro-North cannot, under the current operating plan, operate any additional reverse peak trains in the peak hour; the single outbound track is at capacity. They are correct in this assumption. The only feasible alternative would be to change the operation in the Park Avenue Tunnel and Viaduct from 3 tracks inbound/1 track outbound to 2 tracks inbound/2 tracks outbound. By doing so, it would be possible to dispatch every arriving train during the peak period. However, as Delcan itself notes, Metro-North currently operates 51 inbound trains on three tracks in the peak hour. Going to a two track inbound operation would limit that capacity to 20 trains per track, or a total of 40 trains. This represents a 21.5% reduction in service, and permanently prohibits any service growth during the peak hour. This is a major service impact to MNR customers; hence, this option is not acceptable.

In sum, all of the strategies proposed by Delcan are fatally flawed, either for operational reasons or because they have a major negative impact on Metro-North's service to its customers. In fact, we do not believe that there are any strategies or combinations of strategies that can adequately mitigate the impacts to Metro-North of the Upper Level Loop Plan. Figure 9 summarizes the service constraints that would prevail under the Upper Level Loop Alternative.

➤ Construction Impacts to Metro-North Operations

Temporarily removing the west end of Ladder L connecting tracks J & I and track I & H in order to permit construction of the portal at 33+90 means that no trains operating on track 2 in the Park Avenue Tunnel can be routed directly to J or H to access platform tracks on the upper or lower level. Access will be to/from Ladder Y, or Track F-Ladder U, effectively creating a single track operation on each level, preventing simultaneous northward and southward movement.

The Delcan Report states: "The two adjacent tracks used by MNR for access to the upper level (track H) and lower level (track J) may be affected to varying degrees during this phase of construction over at least part, if not all of the time required to build the new structures...It would be very difficult to avoid encroachment into the operating envelope for MNR operations on track J, and would therefore likely require MNR operations restricted to other lower level access tracks during construction." This would be a major disruption as it would leave only one track in each direction to access the lower level from the Park Avenue Tunnel. Loss of access to track J would make access to yard storage tracks 165 through 125 more difficult and inefficient.

At various other points in this section, the Delcan plan discusses encroachments on track H, track D and track B during construction. Each of these would result in a major service disruption to Metro-North, which could curtail peak service by as much as 50%.

Impacts to LIRR Service

The Delcan Report states that 24 trains per hour can be accommodated operating at speeds of up to 15 to 18 MPH utilizing the loop track. In reality, the design speed for the upper level loop track, based on track structure and geometry, is 10 mph. However, Metro-North does not believe that such a speed is sustainable due to excessive rail wear and very close side clearances which could result in trains hitting the walls if there is any lateral motion due to track or equipment defects. Metro-North believes, therefore, that a realistic operating speed on the loop is 4 MPH, which would result in only 12 LIRR trains per hour in the peak. In addition, evacuating a train would be exceedingly difficult within the limited clearances of the loop. This is a greater issue with LIRR trains due to the length of the trains (12 cars vs. MNR's average length of 8 cars) and the number of trains that would be operating on the loop track.

As indicated above, in order for the Delcan plan to work, it is necessary to take running tracks, lead tracks, platform tracks and yard access away from Metro-North for use by LIRR. This not only reduces capacity in GCT for Metro-North but it would force Metro-North to operate its four Park Avenue tunnel tracks with 2 inbound and 2 outbound (current operations are supported by the configuration of 3 inbound tracks and 1 outbound track in the AM peak and vice versa in the PM peak), in order to support an increased flow of outbound trains to access outlying yards to make up for the lost yard access in GCT, as well as the loss of platform capacity. In total, this would permanently reduce Metro-North service in peak periods by 20-25% with no ability to expand service.

As a result of these speed limitations, only 12 trains per hour could operate under the Upper Level Loop Alternative, which would not meet the service levels required. By contrast, East Side Access is fully responsive to LIRR and MNR passenger service operating requirements. The current design for East Side Access will accommodate the demand for the foreseeable future (year 2020) and beyond, by providing for a safe practical capacity of 30 trains per hour, while reliably supporting operation of 24 scheduled trains per hour.

The Delcan Report is silent on the magnitude, disruption, and cost of alterations to the upper level platforms, switches, and tracks that would be required to make the existing platforms long enough, and trains fast enough, to meet the 24 train per hour capacity that would make the new service cost-effective. Improvements to GCT infrastructure to increase speeds would be very costly, cause unavoidable impacts on the Lexington Avenue subway and the Times Square Shuttle passageway, and involve complex, high risk construction. It is important to remember that Grand Central Terminal, built in 1914 for intercity rail on the upper level and commuter service on the lower level, was also a real estate development project. There are thousands of columns – as close as five feet apart – lining the network of narrow platforms and tracks. These columns support Metro-North tracks, Park Avenue real estate, and other midtown skyscrapers. The tracks and platforms on the upper level were not built to support the volume of passengers that will be seen with East Side Access, and the upper level loop track can not support passenger

service at the required speeds and frequency without major rehabilitation, which would constitute high risk and costly construction.

Existing switches would need to be replaced and the loop track would have to be widened and super-elevated. These are major cost items due to the existing building infrastructure (including the columns and tracks) and proximity to the foundations of skyscraper office buildings in the GCT trainshed. Such improvements would require the underpinning of dozens of buildings and impact the Times Square Shuttle passageway and the Lexington Avenue subway (see Figure 10) and would also be hindered by existing space constraints. In reality, these types of improvements are not feasible due to the configuration of existing crash walls and track layout. None of these costs have been included in the Delcan proposal.

Figure 11 summarizes the service constraints that would prevail under the Upper Level Loop Alternative.

GCT Circulation and Support

The Upper Level Loop Alternative would rely on existing circulation elements in and around GCT to handle the 160,000 LIRR daily customers – nearly doubling the number of today’s commuters in the GCT area. New LIRR customers would be discharged onto narrow platforms (15’-17’ wide), which have only two exits – a ramp to the Biltmore Room and a single stair to the 47th Street cross-passageway. The platforms and stairways would be overcrowded and platform clearance times would not meet safety requirements. A number of other locations in GCT would be over capacity as a result of new LIRR customers, particularly under delay conditions, including: 47th Street cross-passageway, Met Life escalators, entrance/exit at 47th Street and Madison Avenue, and entrance/exit at 48th Street and Park Avenue. By contrast, East Side Access would provide an ADA accessible station for LIRR and Metro-North customers, with the new entrances and terminal space described above. Each new 27’ wide platform will have six vertical circulation points, which will permit platform passenger clearance capacity to meet code requirements.

Schedule and Risk

Proponents for the Upper Level Loop Alternative have estimated a mid-2009 completion date for its construction, which is unrealistic as it does not account for the environmental review period, the property acquisition process, the federal funding process, or the high risk construction that is involved, which combined could easily extend the schedule by three years or more. The environmental review process for the Upper Level Loop Alternative would require the preparation of a Supplemental Environmental Impact Statement, a comprehensive outreach program to commuters in Metro-North territory (Westchester, Putnam and Dutchess counties and the State of Connecticut), and the identification of measures to mitigate its significant adverse impacts.

The vertical profile of the Upper Level Loop Alternative comes in close proximity to NYCT structure at 60th Street (BMT subway). As a result of the shallow alignment

dictated by the connection to GCT's Upper Level and maximum grade requirements for operating the railroad, there would be inadequate rock cover to excavate the new tunnel beneath the 60th Street line without underpinning the existing structure. Underpinning and tunneling in close proximity to an active subway constitutes high risk construction that must be scheduled during off-peak hours to minimize impacts to NYCT service.

By contrast, the underground easements required to build the current East Side Access deep alignment have already been acquired. Underground easements for a shallow alignment would be more contentious and costly. Furthermore, the risks associated with the deep cavern scheme have been fully evaluated by the project team, MTA's independent engineer, outside experts, and the federal program management oversight committee. The deep cavern scheme was adopted following an outside pier review with leading tunneling experts in 2000. The overwhelming consensus was that the deep caverns present a significantly reduced level of risk when compared with the underpinning requirements of shallower options. The current schedule (and cost estimate) for East Side Access includes provisions for the evaluated risks.

Safety

The Upper Level Loop Alternative would not meet the relevant safety standards for underground tunnel systems and passenger rail stations. The upper level of the nearly 100-year old terminal was not constructed with safety provisions for the volume of passengers that will be delivered with East Side Access. Such provisions are known to be the difference between railroad incidents and disasters.

For example, the Delcan Report does not contain any provision for new emergency exits in the loop track area, which would be used for revenue service, or proper tunnel and station ventilation that would be required with the construction of a major capital transportation project (which increases train traffic in the existing tunnel and terminal by 75 percent and nearly doubles the current number of passengers). New emergency exits to the street would have to be constructed to meet today's code to permit egress from the loop track and tunnels in the event of a stopped train and to permit access for emergency personnel in the event of a fire. Current federal safety standards would dictate ventilation facilities for the Upper Level Loop Alternative similar to those proposed for the East Side Access Project (i.e., at 63rd Street and Second Avenue, 55th Street, 50th Street, and 44th Street) and additional facilities above the existing loop track where passenger-loaded trains would operate. It is unrealistic to believe that a project costing billions of dollars, that will serve hundreds of thousands of people every day, could be built without incorporating modern safety standards and complying with the intent of the relevant building codes. The Delcan proposal assumes just that. Even if the project were to file for the many variances that would be required, MTA and their design team would be unwilling to accept the responsibility for such an inadequate and unsafe design.

By contrast, the design of the new tunnels and terminal in the deep cavern scheme meets the applicable standards of NFPA 130 and the New York State building code. The current GCT plan provides code-compliant egress at six locations from the platforms, leading to four code-compliant mezzanines. In accordance with NFPA 130 standards, the

mezzanines will function as the “Points of Safety” from the platforms, serving as transitional space if the terminal needs to be evacuated. The mezzanines will be constructed of 3-hour fire resistance rated floor/ceiling materials which, in addition to the use of glazed partitions, automatic sprinklers and a modern emergency ventilation system, will provide a minimum of 1-hour protection from thermal and smoke effects of a fire on the platform levels in accordance with safety standards.

From the mezzanines, code-compliant egress is provided by escalator banks and emergency stairs leading to the concourse which will act like a "manifold" allowing distribution of passengers to code- and ADA-compliant exits to the street. The Upper Level Loop plan includes none of these features. In fact, it would cause overcrowded conditions at a number of critical circulation points within the existing GCT, as it does not create a single square foot of new passenger terminal space for the approximately 160,000 LIRR daily customers.

Overall, the new station design is state-of-the-art, with safety features more advanced than those in existing stations in the region. In addition to emergency egress, East Side Access ventilation and smoke evacuation will also meet code requirements and the latest industry standards.

Cost

The Delcan cost estimate is not a comprehensive estimate as it ignores several high cost items that would be required to construct and operate the Upper Level Loop Alternative. As proposed, the Upper Level Loop Alternative would not meet fire/life safety standards in the areas of ventilation or emergency egress. The Delcan Report assumed a cost savings in the area of ventilation, when in fact, ventilation for the Upper Level Loop would be more expensive than with East Side Access as a result of the additional facilities required to ventilate the loop track. In addition, the Delcan Report severely underestimates costs for working within the confines of an operating railroad, costs for underpinning the NYCT structure at 60th Street, costs of railroad force account personnel, and costs to mitigate significant impacts to Metro-North service both during construction and operation of the Upper Level Loop Alternative. As indicated above, a new environmental review and property acquisition process would delay the mid-point of construction in both Queens and Manhattan and costs related to escalation would need to be included. When these additional costs are added to the Delcan cost estimate, the savings are negligible.

If the cost to reconstruct the loop track were added to the Delcan estimate (to permit the service levels required by East Side Access), the cost of the Upper Level Loop Alternative would exceed that of East Side Access. While costly improvements could be made to GCT's infrastructure to permit greater LIRR service, the Upper Level Loop Alternative still would not create any new passenger space for the 160,000 new passengers, would have unacceptable and unavoidable impacts on Metro-North service both during construction and permanently, and the service would be unreliable (due to the single loop track). For these reasons, the current deep cavern design was selected as the preferred alternative over the Upper Level Loop Alternative.

Conclusion

The project development process for the East Side Access project followed FTA's metropolitan planning process and FTA's NEPA-implementing regulations, which included a cooperative, continuous, and comprehensive framework for making the transportation investment decision. A rational planning process to arrive at the Preferred Alternative was carried in a public forum. This process included:

- Development of project goals and objectives;
- Formation of a long list of alternatives;
- Development of a set of evaluation criteria which reflect the goals and objectives;
- Screening process to those alternatives (a short list) that best meet the project goals and objectives; and
- Detailed evaluation of all "reasonable" and "feasible" alternatives in the EIS.

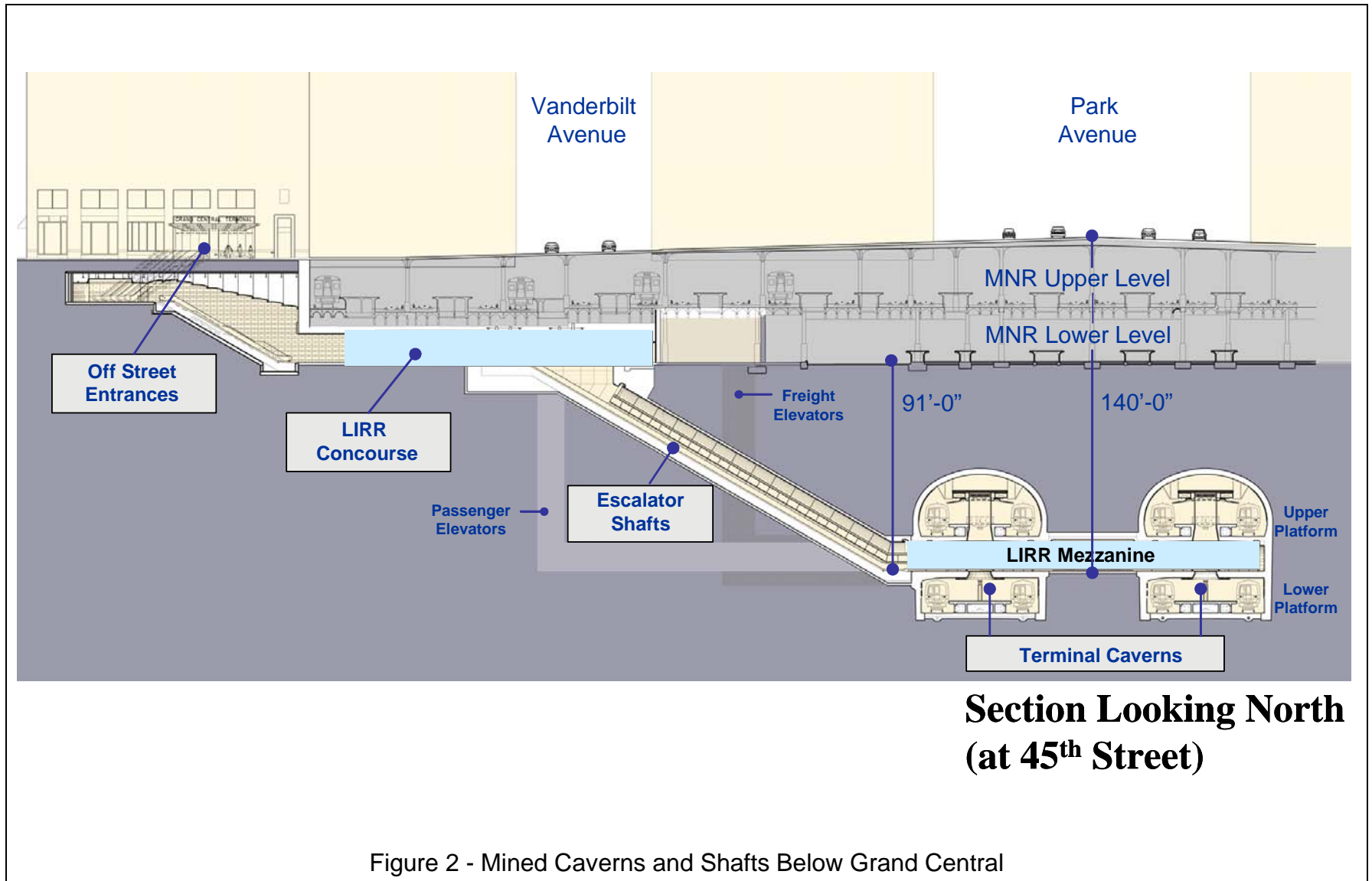
Use of upper level tracks within GCT for LIRR service was considered throughout the project development process for East Side Access. Use of a portion of Metro-North's upper level area was eliminated from consideration in what is commonly referred to as a "fatal flaw" screening process. An alternative is typically considered fatally flawed for one of three reasons:

- Infeasible construction;
- Does not meet the project goals and objectives; or
- Significant adverse impacts are identified that would be difficult to mitigate.

The use of the upper level of GCT for LIRR service fails on two accounts in the fatal flaw screening – it would not meet the established goals and objectives and unmitigatable adverse impacts would occur to Metro-North service in GCT.



Figure 1 – East Side Access Project Route





- **Column free**
- **27'4" platform width**
- **4 escalators from each platform to mezzanines**

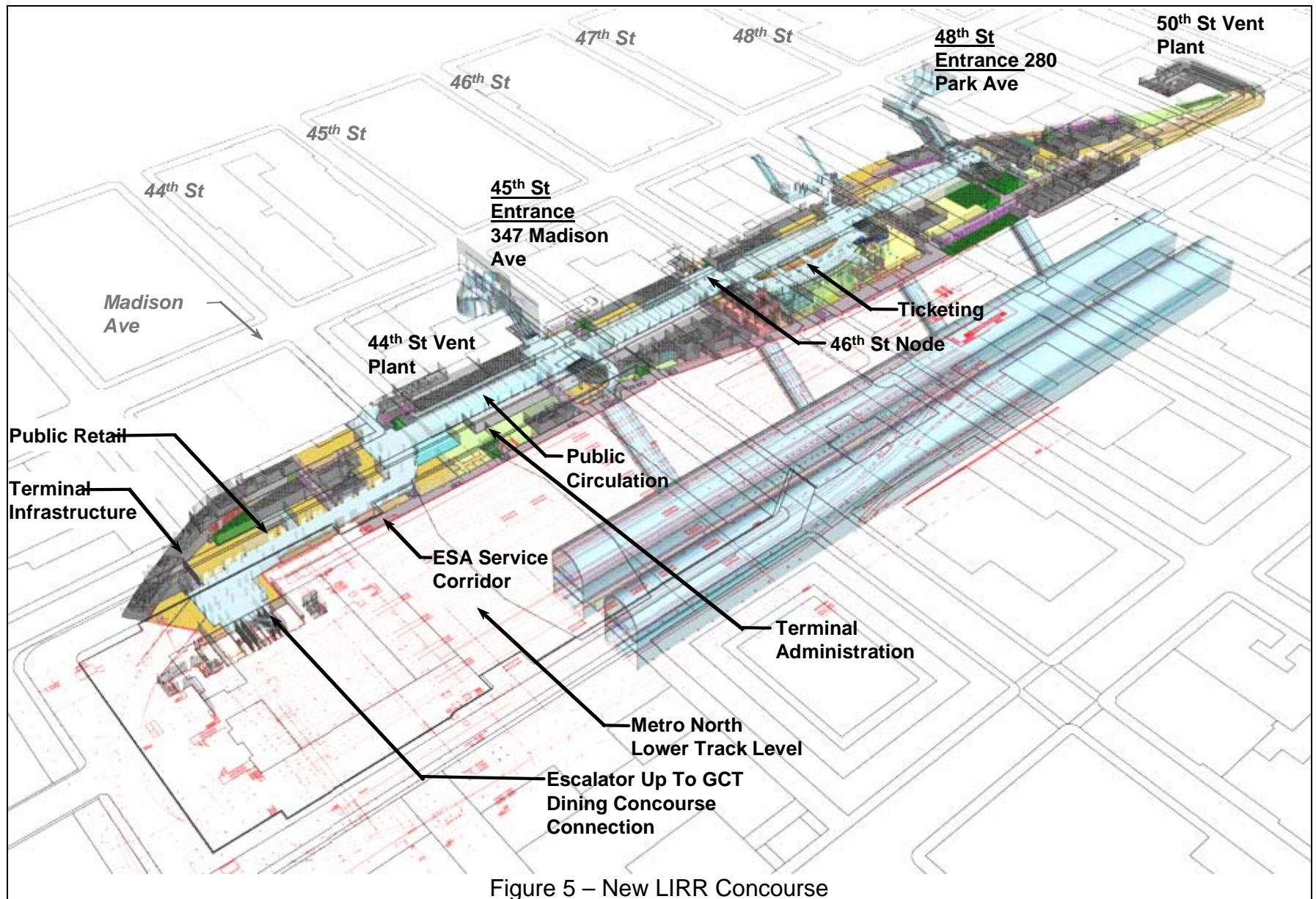


Figure 3 – Upper and Lower Platforms

- Circulation points under 48th, 47th, 46th and 45th streets
- 59,600 square feet of public space at mezzanines



Figure 4 – Mid-Level Mezzanine



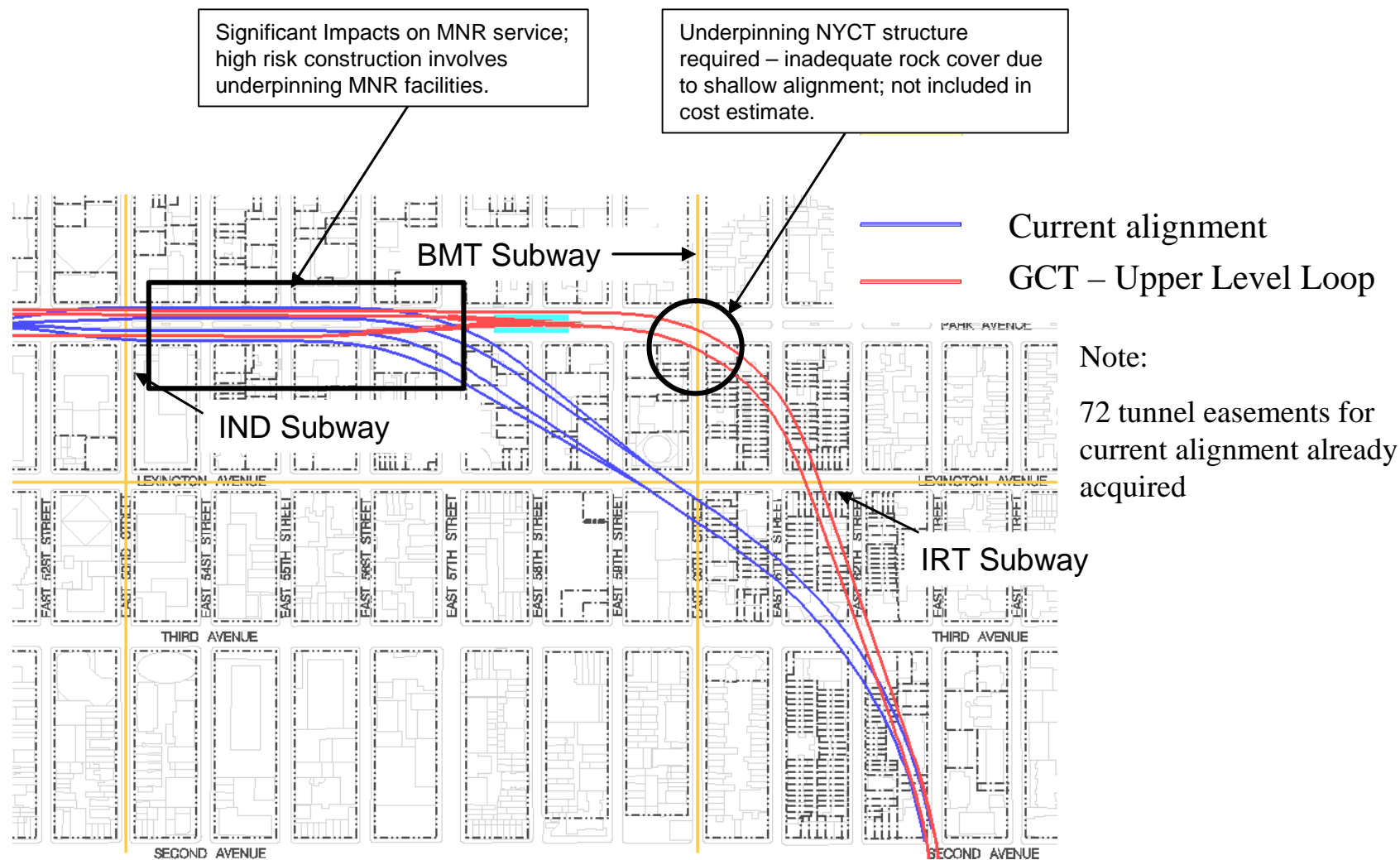
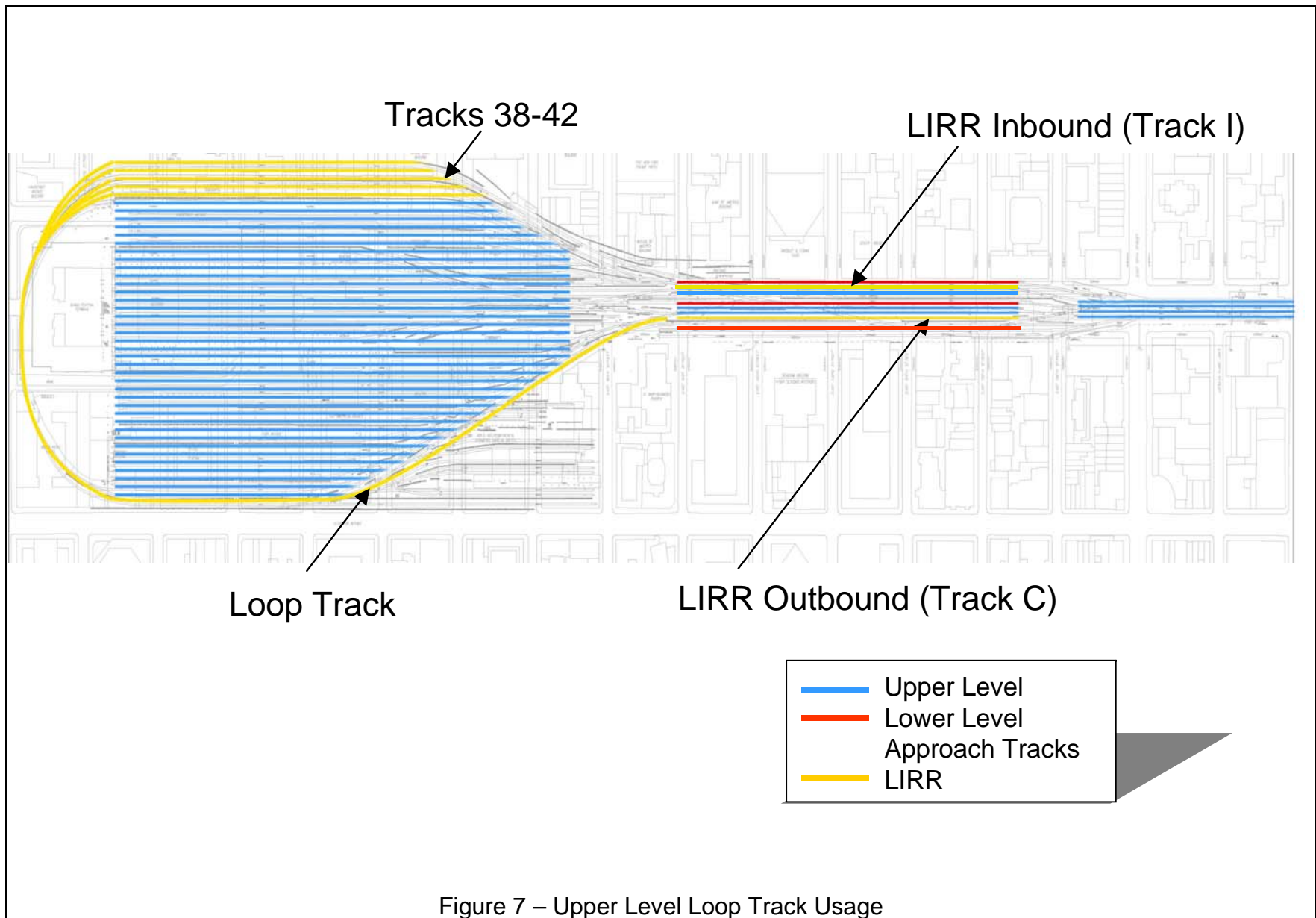
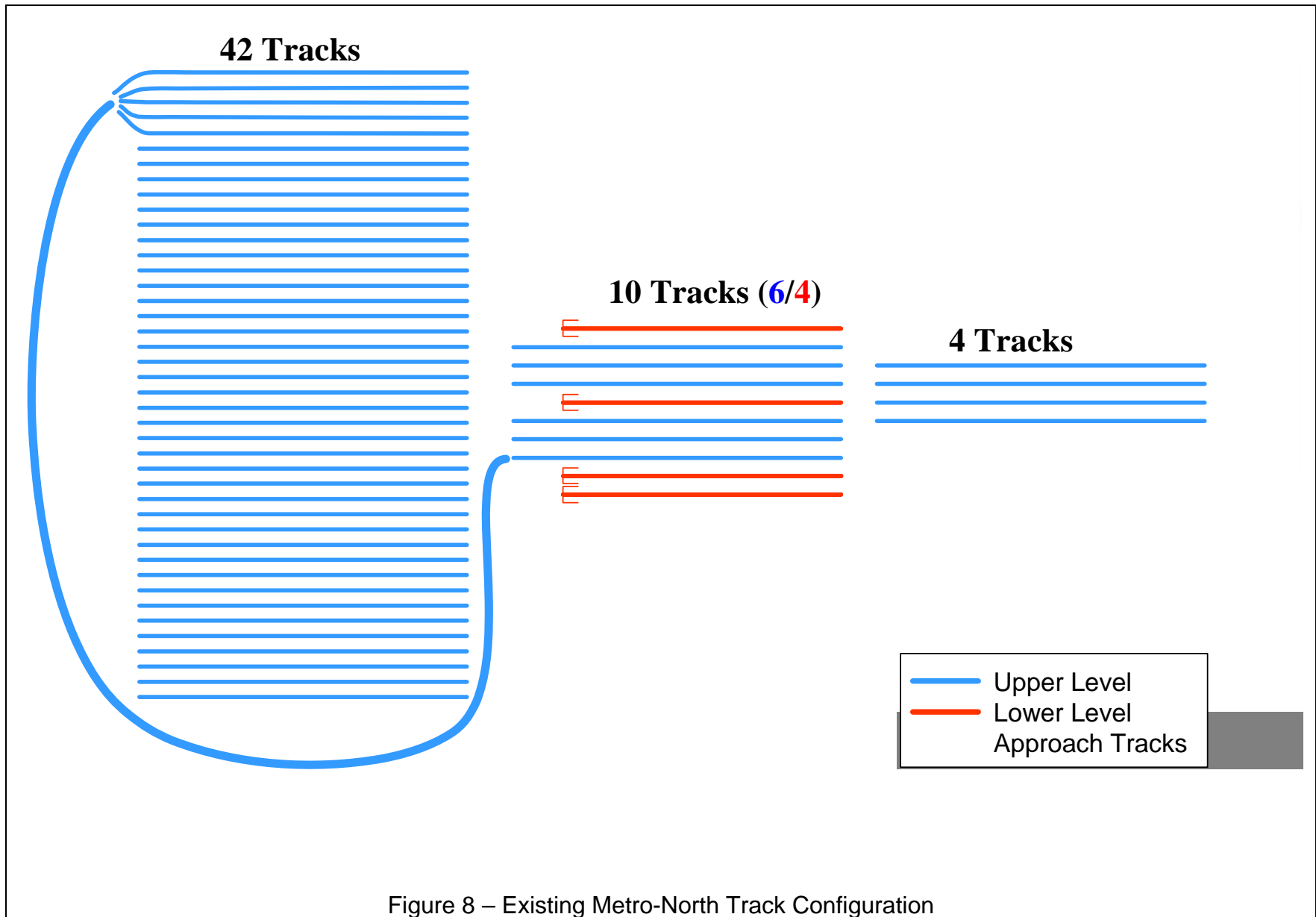
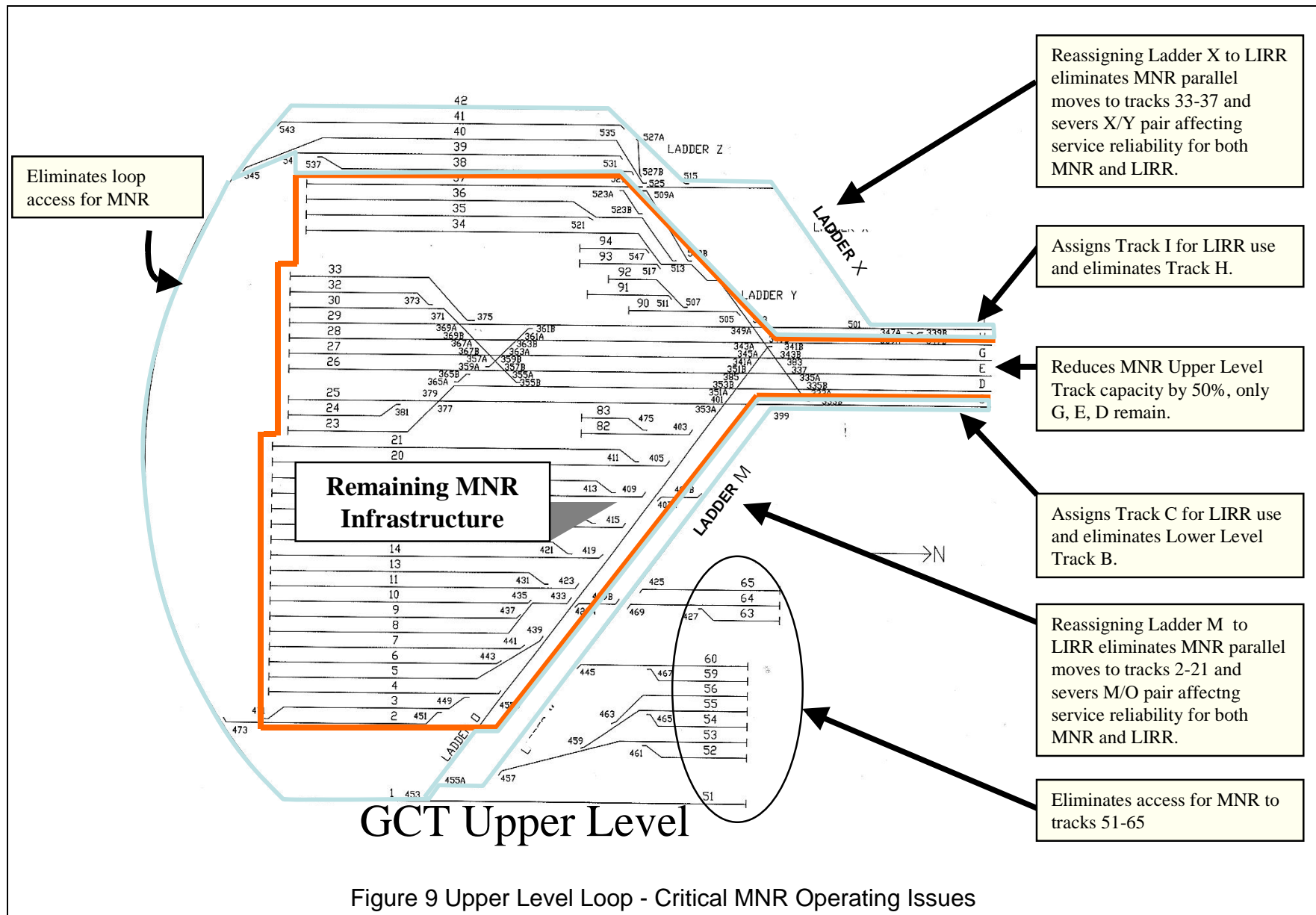


Figure 6 – Upper Level Loop Alignment







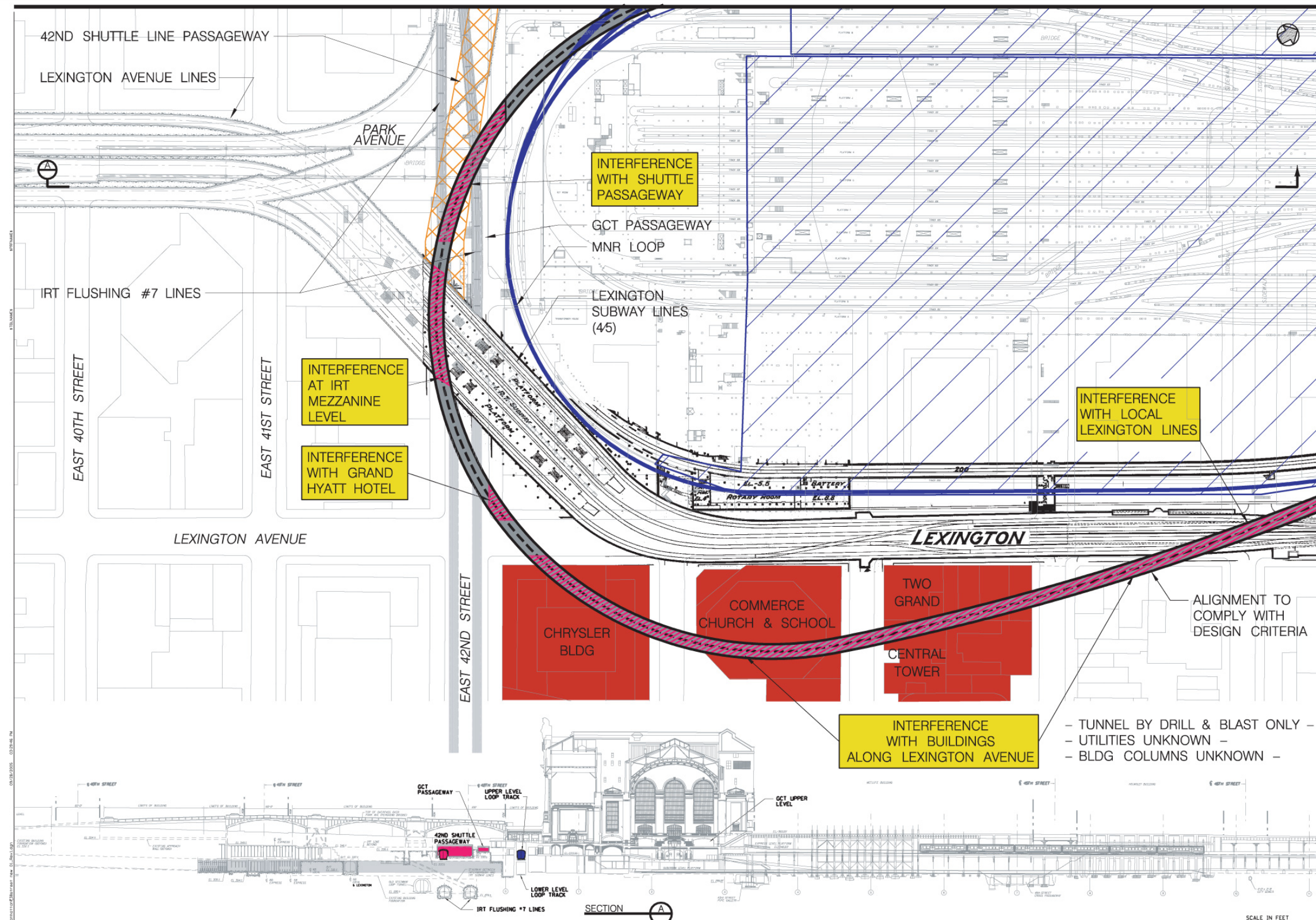


Figure 10 Upper Level Loop Alternative at GCT Terminal

