The Bulletin

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The Bulletin

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MAJOR CHANGES COMING TO THE GRAND CENTRAL SUBWAY STATION COMPLEX
by Subutay Musluoglu
(Photographs by the author)

New York City Transit's Grand Central Subway Station Complex, comprised of three distinct stations on the Lexington Avenue Line, the 42nd Street Shuttle, and the Flushing Line, will undergo a major transformation over the next few years to increase capacity and improve passenger circulation. Tentative proposals and preliminary designs have been floating around for some time, but recent developments have brought issues to a head. With the Lexington Avenue Line recognized as one of the most congested rapid transit lines in the world, and its Grand Central station being one of the line's major pinch points, there have been long standing concerns about the station's capacity, especially during the AM and PM peak periods. Those concerns have become more urgent recently, especially with respect to future growth. Early last year the City of New York finalized a major rezoning of the East Midtown area around Grand Central Terminal (GCT), allowing for a renewal of the area's commercial office building stock, which will ultimately bring tens of thousands of new commuters to the area. In addition, the anticipated 2023 opening of the Long Island Rail Road East Side Access project (ESA), bringing the LIRR to a new deep level terminal under the existing lower level of GCT, has the potential to swamp the platforms with thousands of additional passengers during the peak periods.

While Times Square remains by far the busiest subway station in the city, with 64.53 million riders in 2016, Grand Central is right behind it in second place with 46.12 million in 2016, with 160,000 on an average weekday, and 105,000 on the average weekend. And though the opening of the first segment of the Second Avenue Subway back on New Year's Day last year has brought some relief to the Lexington Avenue Line in the southbound direction during the AM peak period, the station remains heavily congested and will be hard-pressed to handle future growth, and quite possibly come to a standstill if all of the planned new development for East Midtown becomes a reality.

To address this situation, several distinct, interconnected efforts will be undertaken, some of which have already been completed, with others in progress right now, and more to come. In early 2016 construction began on a new stairway off the west side of GCT's 42nd Street Passage, directly opposite the existing central entrance leading down to the Lexington Avenue Line mezzanine. This extra wide stairway was built in the terminal's landmark style, with imitation Caen stone for the walls and Botticino marble for the wall trim, and opened for service on August 2, 2017. Prior to the completion of the stairway, work began in early 2017 to completely rearrange the main fare control area and enlarge the primary turnstile array, increasing passenger throughput. This was achieved in February, 2017 by relocating the station agent booth away from the fare array, while also repositioning/rebuilding one stairway from the mezzanine down to the southbound platform. The previous location of the booth was in a very awkward spot, which caused customer lines to interfere with the circulation

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THE GENESIS OF DASHING DAN — ENTER THE NORTH SIDE DIVISION by George Chiasson (Continued from February, 2018 issue)

ENTER THE NORTH SIDE—NUMBER FOUR: ONWARD TO PORT WASHINGTON

As LIRR's commercial interests grew through the Corbin years and beyond, it remained responsive to the constant changes that were inevitably engendered by its non-stop growth in patronage, as well as new business opportunities even if they be generated or bankrolled by outside parties. In the summer of 1895, an influential group of local citizens and investors persuaded Corbin and the railroad to accept its outside proposal to extend the Great Neck Branch as far as a seaward terminal in Port Washington. This marine-oriented portion of distant Queens County was somewhat isolated and quite rural in nature at the time. It served largely as a fishing port back then, had a fairly brisk trade with steamships that came in off Long Island Sound, and was the terminal end of regular ferry service from New Rochelle. The surrounding landscape was largely agricultural and stagecoaches had long been established as the primary means of land transport. Nevertheless, there was not a whole lot of movement in those days between the Village of Port Washington (originally known as "Cow's Neck") and the greater metropolis of New York (with its attendant economic prowess), a situation its local leaders sought to improve. As usual, Corbin saw this potential combination of new railroad access and seafaring allure as yet another potentially profitable chance to cater to the recreational cravings exhibited by some of New York's monied, aristocratic class. From the outset, money for construction was raised, surveys made, engineering assessments done, and (predictably) problems and questions arose.

On April 15, 1896 the Great Neck & Port Washington Railroad was chartered for the specific purpose of constructing the proposed extension. Then the proposal had to survive changes in the Long Island Rail Road's hierarchy which came after Austin Corbin's sudden death on June 4. Most daunting for a straightforward alignment between Great Neck and Port Washington was the "Manhasset Valley," an abrupt, natural ravine in the landscape that enclosed the Manhasset Stream, a narrow, deeply-imbedded waterway wrapped in marshlands flowing from the Mitchell's Pond basin into the crux of Manhasset Bay. In fact, this circumstance was what forced the main roads leading out of Port Washington to seek an inland path all the way to North Hempstead Turnpike before an east or west direction of travel could be attained, a disadvantage it was hoped that the railroad could overcome. Logically, there arose two chief alternatives out of this challenge, one of building the new railroad directly across the valley on a substantial viaduct structure as had been done at a number of locations around the country; the other of locating it on a circuitous, level (and expensive) alignment from Great Neck into the array of country estates that graced the northerly flank of central Long Island (almost as far as the modern day Village of North Hills) where the extension could turn north and make its break for the shoreline. Given the comparative costs and benefits, the first option was chosen despite the great risks involved with anchoring a long trestle through wet, swampy soil that might contain unseen hazards such as quicksand or sinkholes. By September of 1897 the Carnegie Steel Company was retained by the Great Neck & Port Washington to construct what would become the highest railroad bridge on all of Long Island. In turn this organization appointed King Iron Company of Cleveland to undertake the intimidating task of constructing the viaduct through the coming winter season, using the materials that it would manufacture. Laying of the remainder of the extension would be concurrent with erection of the viaduct inasmuch as possible, with the familiar objective being to open it in time to entice a share of leisure traffic out of the following summer.

Ultimately and quite remarkably, work on the overall project was achieved in just eight months through the cold weather season (some substantial portions in Port Washington were completed in just three months), and what emerged was a new, single-track railroad of 4.2 miles in length, which opened to great fanfare on June 23, 1898. The Port Washington extension continued eastward from the end of existing track at Great Neck, and almost immediately burrowed into the rising bluff of the Grace estate (and under Grace Avenue), from which it emerged into the Manhasset Valley, crossing 45 feet above (East) Shore Road on a steel girder bridge approximately 230 feet in length. This was situated immediately next to the westerly wing of the all-steel Manhasset Viaduct itself, which then passed in a level plane across 700 more feet of steel girder (elevated-type) structure and reached a maximum vertical height of 81 feet above the stream (where the line crossed into Manhasset). The steel girder viaduct was secured to ground by seven lattice supports, each with a perimeter measuring 20 feet at the base that tapered to about 10 feet at the top, and were spaced between 25 and 30 feet apart. The middle support of the seven was (and remains) partly anchored in the stream by piles driven through its bed that are encased in trap rock and cement. On the Manhasset side, the viaduct continued about 60 feet above Shore Road (now Bayview Avenue) to the easterly wing, from which the railroad returned to solid ground and entered the valley's easterly bluff. It then passed through the Bohannon property before curving slightly northeast to cross Manhasset Avenue at grade

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The Genesis of Dashing Dan

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and continued underneath Plandome Avenue (Road) before beginning a long, gradual turn to the north. Having attained a revised bearing toward Port Washington the extension then cut across the raw property of several private estates, crossed above West (now Stonytown) Road on a narrow overpass, and then wriggled north-by-east into the easterly portion of Port Washington village. It crossed Davis Road at grade and pulled into its expansive terminal along Railroad (now Haven) Avenue at Flower Hill (now Main) Street. As would be expected, the railroad provided a turntable for its motive power there and sidings for coach storage, as well as a substantial, single-story wooden depot.

Precisely as hoped, the ease of access that the new railroad brought about engendered suburban growth, which quickly followed the opening of the Port Washington extension into the outer portions of the North Shore. A pair of brand new stops were added within a few years as a result, each being centered around new or projected development. The first (complete with depot building) was opened at the Plandome Avenue overpass in 1899, in a commercial area that came to occupy the former (Andrew J.) Onderdonk estate almost as soon as the railroad started running. This new location was coined "Manhasset Village," even though the established, existing village by that name was almost a mile away, and in turn the railroad station was designated "Manhasset." Within a few years the actual business district of Manhasset did indeed come into correspondence with this machination, to the point where a new municipal building for the Town of North Hempstead was located just two blocks from LIRR in 1906. Meanwhile, in more recent decades the "old" Manhasset village center (as recognized before the railroad came through) later became known as Lower Manhasset, and is now called Thomaston. In 1905 the Plandome Land Company was formed with the mission of professionally brokering residential and commercial development on the former Singleton Mitchell estate, which bordered the recent LIRR extension at the West (Stonytown) Road underpass. Deriving its name from the Latin expression "Planus Domus" (Simple Home) the concern was successful in getting the Long Island Rail Road to establish another in-fill station called "Plandome" during 1909, again including a depot building. Following this expediency the planned "bedroom" community took shape and was populated rather rapidly, with the Village of Plandome then being formally incorporated in 1911, more or less as a direct result of the railroad's Port Washington extension.

As part of the firm transformation of the "North Side Division" into an integral part of the Long Island Rail Road in the 1890s and early 1900s came a number of other adjustments to reflect the quickly-changing suburban footing in formerly-pastoral sectors of Queens. To begin, the last of two stops known by the historic name of "Newtown" (that being the original Flushing Railroad station at Broadway) was re-christened Elmhurst in 1896 owing to latter-day development. As early as April of 1889, an in-fill station with a small companion depot was added on the branch to Great Neck at "Murray Hill" between Main Street and Broadway, positioned on Madison Avenue between Wilson and Boerum Avenues, later 41st Avenue between 149th Place and 150th Street (as renamed). Another was built well after the line's extension to Port Washington at "Auburndale" in May, 1901, located between Broadway and Bayside at Lancaster Avenue and Baldwin Street (now 192nd Street and Station Avenue). Meanwhile, in an almost exact duplication of the circumstances described above at Plandome, the former "Ziegler Tract" (so named for owner and Royal Baking Powder entrepreneur William Ziegler) was thrown open for development after his death in 1905 and came under the control of five trustees appointed by his heirs the following year. These gentlemen, (Messrs.) Maycock, Avis, Lewis, Bishop, and Alling, drew great interest (and funding) in the formation and marketing of residential properties on the former estate from a large group of Connecticut investors, and it finally began to take shape during 1908. The trustees labeled their burgeoning neighborhood "Malba" as an acronym for their own initials, a title which the Long Island Rail Road adopted for the new station added to the Whitestone Branch next to this improvement zone (through construction provided by its developers) in about March of 1909. It was located at the Malba Drive grade crossing (original Nostrand's Lane, now 144th Street) off 21st Street (now 11th Avenue), between the existing stops at College Point and Whitestone. The station was highlighted by a small, stucco depot and canopy, both with a tile roof, and was outfitted with a full-length, high wooden platform as portent of its looming status as a commuter stop with direct access to Penn Station, Manhattan. As part of an earlier operational expedient, the signal towers between Winfield and Whitestone Junction were consolidated from four to two sometime in 1903, thereby eliminating short-lived installations at Elmhurst (Tower 51) and Corona (Tower 52).

ENTER THE NORTH SIDE — NUMBER FIVE: PORT WASHINGTON, WHITESTONE BRANCH

Further symbolic of its emerging notoriety as a full-blown LIRR commuter line by the start of the new century, development schemes began to consume the adjoining wetlands along the Port Washington Branch and as a result the tidal basin of Little Neck Bay was gradually filled in. By October, 1904 the railroad began to replace the original wooden trestle of the Great Neck extension across this area with an embankment created by spoils from the East River tunnel project, a job completed the following March. The first piece of the Port Washington Branch was then double-tracked in May, 1906 to facilitate improved scheduling, that being the original grade-level right-of-way from the end of the bridge across Flushing Creek at Great Neck (Whitestone) Junction as far as the Main Street station.

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MIAMI TRIP REPORT
by Ronald Yee
(Photographs by the author)

This co-Editor had the occasion to visit Miami, Florida on January 9-10, 2018 and was able to ride and inspect the new Breda Hitachi MetroRail cars that went into service on November 30, 2017. After 6 weeks, only four of the $313 million,136-car order, cars 305-6 and 307-8, are in passenger service. Two additional cars, 309-10, are currently undergoing final testing out on the line during the late-night hours. The new cars generally operate for two round trips during the morning peak period from around 6 AM to around 10 AM, when they are removed from service and deadheaded back to the maintenance shop located near the northern terminus at Hialeah. In the afternoon, they re-enter service around 4 PM for another 1-2 round trips before wrapping up operations for the day. In addition to the Operator, a Metro-Dade supervisor, a MetroRail Mechanical Department employee, and a Breda Hitachi technician ride the train to oversee the train's operation and provide troubleshooting if the need arises. These cars offer a distinctly improved ride for MetroRail passengers, a smooth ride with the improved suspension system, a vastly improved contour seating cantilevered from the walls of the car, bright LED lighting, new informational graphics, and automated PA announcements that are clearly audible and understandable. An active signage system keeps passengers informed about the next station stop and wall-mounted LCD informational display and entertainment screens constantly rotate among passenger information, public service announcements, and messages from paid sponsors. The on-board Wi-Fi system seemed very capable of supporting the number of users on a typical fully loaded peak period train, and security cameras provide continuous security video records of all on-board activities inside the cars. Now for the downside: the cars apparently are not yet fully functional with the automated train control system and are operated in manual mode with cab-signal and automated train stop and speed control. During Miami's frequent but brief tropical downpours, the braking systems of these new cars do not seem to handle the wet rails very well. Unlike the older Budd-Transit America cars, they often begin sliding on the rails, activating the slip-slide feature to prevent flat wheels. However, like all trains operating under automated speed control (ASC), if a train does not decelerate to the new signal aspect and corresponding speed command within the specified time limits, the train automatically goes into penalty brake mode or in some cases, dumps the brakes into emergency. It apparently happens frequently with the new cars as I observed passenger reaction to two such incidents during a 3-mile ride in heavy rain. Most of them seemed all too familiar with emergency brake applications and the resulting delays while the brakes and speed control systems are reset. All four cars had wheels with flat spots that were more than halfway to the point where they would need to be trued or be removed from passenger service. Another issue I observed and experienced is that when the train slides past its four-car stop position on rails made slippery from heavy rain, the doors cannot be opened. Apparently the lead car of a four-car train must be aligned with a four-car position marker within the gauge of the track on the roadbed before the doors are released to the Operator to open. If they are not aligned, the door opening commands by the Operator are automatically inhibited to prevent doors from opening on cars that may not be properly platformed. As a result, the Operator, not being able to open the doors, must inch the train forward to the six-car position marker by the far end of the platform to get a "door release". The result is a one-minute delay in making the station stop and the riders in the first two cars are forced to exit the train out into the driving rainstorm instead of exiting under the canopy, which covers a four-car train properly centered on the platform. I was left wondering what will happen when a six-car train slides past its stop marker and cannot get a door open release for the Operator. Would the train be allowed to back-up a couple of feet or would it be forced to abandon that station stop and move on to the next station? From my experience in the operating department of a commuter railroad, a qualified crewmember must be in the rear to control the leading end of a reverse movement. Not a feasible option when a train is Operator-only. Bottom line, nice cars but they still need technical and performance tweaking before they can be accepted en masse to begin replacing the original cars. For anyone wishing to track the new cars as well as any other train on Miami's MetroRail, there is a fascinating official website for smartphones and tablet PCs that allows one to see the real-time location of each train operating over the system as well as its consist car numbers. Go to www.miamidade.gov/transit/mobile and select Metrorail. A system map will come up on your smartphone screen showing the location of every train on the line. Click on any train to get its car consist numbers. Green is for trains serving the northern line to Hialeah and orange is for the trains serving Miami International Airport. Trains portrayed in black are trains not in passenger service. It is a great tool for commuters as well as railfans wishing to track the new cars, which are numbered in the 300-series. The older cars are 100- and 200-series.

I also had a chance to visit the West Palm Beach (WPB) and Fort Lauderdale (FLL) stations of the soon-to-open Brightline train service. Fortunately, one of five trainsets, "Bright Red," was at the WPB station in simulated passenger service awaiting a departure slated for 12 noon. Photos and videos were recorded of the train

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Miami Trip Report

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from the sidewalk to the east of the tracks parallel to the station. At FLL, I was able to more closely inspect the station facilities, ticketing, and customer service baggage handling desks and counters, all in a bright yellow and two-tone light gray color scheme. In addition to an automobile passenger pick-up and drop-off area as well as access roadways designed wide enough to accommodate buses, there is a large seven-level parking garage structure adjacent to the station building, a glass-enclosed overpass with escalators and elevators linking it to the high-level station platform, which is well marked out with car position markers for passengers to properly position themselves for boarding their assigned coach. The test train, with locomotive 110 on the north end and 104 on the south end, accelerated very quickly (much like an electric multiple unit train) when it departed on its southward simulated service run. While Brightline had announced the start of service during the week of January 8 and I visited the property on January 10, it ended up commencing on Saturday, January 13, 2018.

MetroRail Breda Hitachi car at Miami Airport.

MetroRail Breda Hitachi car interior.

Miami MetroRail new Breda Hitachi cars approaching Government Center northbound.

Miami MetroRail Breda Hitachi cars at northbound at Dadeland-North.

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The Genesis of Dashing Dan

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By that time the former Flushing & North Side main line through western Queens was long in the throes of construction associated with the establishment of Sunnyside Yard, which was done in tandem with the adjoining two-track Long Island Rail Road. The two historically separate alignments were finally integrated when the unified six-track main line across the abuilding complex was placed in service on September 12, 1908. Though this improvement supported the initial opening of Pennsylvania Station in September, 1910, steam-powered North Side trains continued to serve the Long Island City (née Hunters Point) terminal at that time, even as the long process that led to their ultimate electrification was well underway. The extension of double track on

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Miami Trip Report

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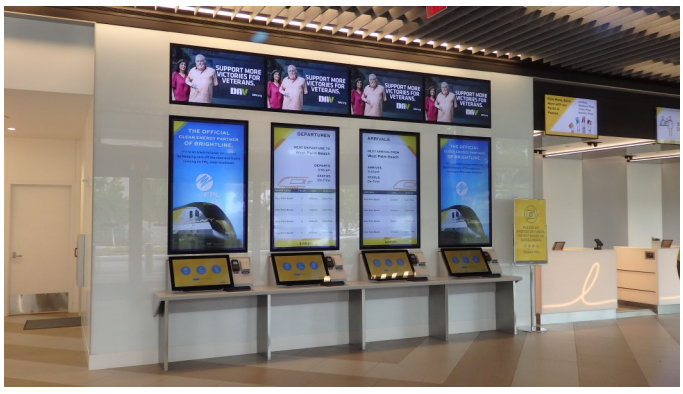
Miami MetroRail Breda Hitachi cars entering Vizcaya southbound.

MetroRail new and old cars at Miami Airport station.

Brightline Ft. Lauderdale station building.

Brightline Siemens Charger 104 with Bright Red consist at West Palm Beach station.

Brightline Ft. Lauderdale parking garage.



Brightline Ft. Lauderdale station check-in kiosks and customer service desks.

The Genesis of Dashing Dan

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the Port Washington Branch also had a high priority, at least where its "raw" (grade-level) state was open enough to stay ahead of the area's accelerating (and continually inevitable) development. Such work was commenced in a general fashion during March of 1910, along all 4½ track miles from a point west of Broadway (beyond the tunnel and cut through Flushing proper) to the original terminal at Great Neck. It was placed in service between the same two points on May 14, 1911, which brought about an associated expansion (most notably second platforms and walkways) or even slight relocation of those two stops plus way stations at Auburndale, Bayside, Douglaston, and Little Neck. Also worthy of note was a the construction of a new swing bridge across Alley Creek, which was unusual in that it incorporated the use of gauntlet track. Actual electrification of the North Side lines was heralded during the run-up to Penn Station's opening in the summer of 1910 when a new substation was built at Winfield Junction to feed its future third rail (as well as the expanded Main Line). Next, beginning on March 23, 1911 came the start of an effort to lay (or string) power cables, install third rail and otherwise electrify station and wayside facilities on the Port Washington Branch, which closely followed the double-tracking effort east of Broadway but continued all the way to the outward terminal.

By far the biggest civil undertaking of the North Side's electrification involved a considerable expansion and modification of the constrained right-of-way through Flushing between Main Street and Broadway. Not only was it too narrow to accommodate a second track as was, but an enlargement would require the acquisition of nearby properties that had been avoided during the 1866 extension to Great Neck, and also entail approvals by and legal assistance from the City of New York, which by this time was seeking a coordination of effort to reduce or eliminate the need for at-grade crossings. In August, 1911 the elevation of trackage was begun from the Jones Lumber Yard, immediately past divergence of the former Central railroad (now freight spur) at Great Neck Junction, to Union Street on the mild hillside behind Flushing proper. This included the original tunnel under the Flushing Institute property, to which a temporary grade-level track was installed for use while the adjoining (and pre-existing) survey was to undergo elevation onto a fill using spoil from various LIRR and Pennsylvania Railroad construction projects. Upon acquisition and removal of the otherwise historic school (with city help) over the summer of 1911, the former tunnel beneath was daylighted and a temporary track extended through the site on the original alignment, including the topographic depression, as far as Union Street, with the original trackage remaining in place from there to South Parsons Street. After several weeks of digging and flying dust, the temporary track and a first interim station at Main Street were placed in service, and the original alignment closed for construction, on October 25. This and several other elaborate aspects of the electrification and grade separation were done at great additional expense by the railroad so as to maintain normal operating schedules throughout the project, which correspondingly slowed its completion relative to the Whitestone Branch by about a year.

Eventually a two-track elevation was created through the Main Street station along the southerly edge of the Flushing Railroad survey (where the depot had most recently been) and extended eastward on an entirely new alignment. Its construction included the necessary appurtenances for electrification, which were also installed all the way down to Winfield Junction and continued along the former Flushing & North Side main line to Woodside Avenue, taking almost a full year to complete. Pursued during the same time period (and opened to train traffic on September 10, 1912) was an extension of this new right-of-way from west of Union Street as far as Percy (147th) that circumvented the most precipitous grades associated with the previously-excavated cut through "Monkey Hill." This effort required new underpasses (street bridges) at Union Street and Bowne Avenue, then undercut the existing grade crossing at South Parsons Street (Parsons Boulevard). It featured concrete retaining walls comparable to those exhibited on several portions of the Brooklyn rapid transit system, and was the first part of an overall depression of trackage through Murray Hill which would ultimately eliminate six grade crossings, including four within just 700 feet, through that thickly-settled vicinity. The new elevation through Flushing proper was made operational for steam-powered trains between the Jones Lumber property (west of Lawrence Street, later College Point Boulevard) and a point just west of the Union Street underpass on November 11, 1912. This included another temporary Main Street station up on the new embankment, along with provisional trestle work across that roadway itself. At this time the surface-level trackage between those two points (and the associated [original] grade crossing of Main Street) was closed and either filled over where appropriate or left to the whims of time and subsequent real estate development. Also pursued during the same time period (and opened to train traffic on September 10, 1912) was a short deepening and extension of the existing two-track cut from the Union Street overpass as far as Percy (147th) Street. This effort, which undercut the grade crossing at South Parsons Street (Parsons Boulevard) and featured concrete retaining walls comparable to those exhibited on several portions of the Brooklyn rapid transit system, was the first part of an overall depression of trackage through Murray Hill which would ultimately eliminate six grade crossings, including four within just 700 feet, through that thickly-settled vicinity.

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Major Changes Coming to Grand Central

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of passengers, especially as they traversed between the escalators and the turnstiles.

The landing point of the new stairway down from GCT also allowed for a reconstruction of a constricted area adjacent to the bottom of the central entrance, next to the ADA elevator. This location was previously very constricted; however, since the new stairway required working within the original GCT building envelope, it offered an opportunity to re-envision this entire area, yielding a much larger, open expanse. This has allowed for a complete consolidation of all the *MetroCard* Vending Machines (MVMs), with ample room for customers to queue for the machines, thereby further eliminating conflicts with pedestrian traffic. Previously, the MVMs were spread out over three separate clusters, which exacerbated the conflicting pedestrian movements. A smaller fare array to the west of the main array, located at the head of the unpaid passageway that leads back to the shuttle mezzanine, was enlarged with additional turnstiles. This fare array also happens to be directly across from the landing point of the new stairway down from GCT, thus serving as a relief to the central escalators/stairway. This arrangement will become all the more important when the central entrance is closed for a complete rehabilitation later this year, which includes the replacement of the escalators.

The work described thus far was programmed and paid for under contract A-36151 from the NYCT 2010-4 Capital Program. With these preliminary measures in place, the stage is now set for a much more thorough reconstruction of the Grand Central subway station. As mentioned earlier, East Midtown underwent a rezoning in early 2017. The objective of the rezoning is to renew the area's commercial office building stock, which is aging and seen as uncompetitive with the city's newer office districts such as the World Trade Center site and the developing area west of Penn Station and Hudson Yards. Improved transit is a major factor in the growth of these areas, exemplified by NYCT's Fulton Center and the Port Authority of New York & New Jersey's World Trade Center Transportation Hub/PATH terminal for lower Manhattan, and the 7 Extension and Moynihan Station projects for West Midtown. Ironically, it was the opening of GCT over a century ago that gave birth to the neighborhood that surrounds it. Now, as many of the buildings in the vicinity approach their own centennials, it has been decided that the replacement of these buildings will in turn help finance a program of transit improvements, not only at GCT, but at other East Midtown subway stations as well. This will be carried out using a variety of tools, with the focus on air rights transfers and zoning bonuses.

The first of the new office towers is 1 Vanderbilt Avenue, which is now rising on the entire block bounded by E. 42nd Street, Madison Avenue, E. 43rd Street, and Vanderbilt Avenue. The project itself is technically separate from the larger East Midtown program since its development process had been initiated prior to the program's approval. The developer of the site, SL Green, had been consolidating its holdings on the block for over a decade, and had entered into negotiations with the NYC Department of City Planning and the MTA in the last years of the Bloomberg Administration. Seeking a zoning bonus for their tower, SL Green offered to pay $250 million worth of improvements to the Grand Central Station Complex. Awarding zoning bonuses in exchange for upgrades to subway stations and the public realm has been practiced for decades. However, the scale of this project is unprecedented, representing the largest-ever private investment for a public transit improvement in New York City. The 1 Vanderbilt Avenue project will thus serve as a model for future commercial development funding public realm/transit improvements throughout East Midtown.

The site began to be cleared in the summer of 2015 with the demolition of several buildings, most which were built soon after the opening of GCT in 1913. A number of these buildings were interconnected, and two of them contained street level and interior lobby entrances linked to the mezzanine and platform levels of the 42nd Street Shuttle's Grand Central platforms. Demolition was completed in the autumn of 2016, and now 1 Vanderbilt is steadily rising, with structural steel currently at approximately the 10-story level. When it is completed in 2020 at a height of 1,401 feet and 58 stories, it will be the fourth tallest building in New York City.

The scope of this work is quite extensive. It includes the addition of several new street entrances to the complex; a reconfiguration of the mezzanine above the Lexington Avenue Line's 4 5 6 platforms; several new mezzanine to platform stairs, while also reconfiguring all the current stairs; improved access to the Shuttle platforms: an extension of the GCT Main Concourse under Vanderbilt Avenue into the lower level of the new office tower; and a Transit Hall within the 1 Vanderbilt building. Located at the northeast corner of the tower, the Transit Hall will be an atrium-like space containing a bank of escalators down to the GCT Main Concourse level, while also providing direct access to the future ESA concourse. A signature entrance will be located at the southwest corner of Vanderbilt Avenue and E. 43rd Street, which will be complemented by the permanent closing of Vanderbilt Avenue to vehicular traffic between E. 42nd and 43rd Streets, creating a landscaped pedestrian-only zone — an overall pleasant addition to the public realm adjacent to one of the city's great landmarks.

The work that will be performed at the 4 5 6 station is the central focus of the overall program and when completed should yield a transformation of the customer experience there. A unique feature of the station is its position, lying at an angle skewed to the Manhattan street grid, a result of the Lexington Avenue Line's transition from Lexington Avenue to Park Avenue. As such, a substantial portion of the station mezzanine is occu-

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Major Changes Coming to Grand Central

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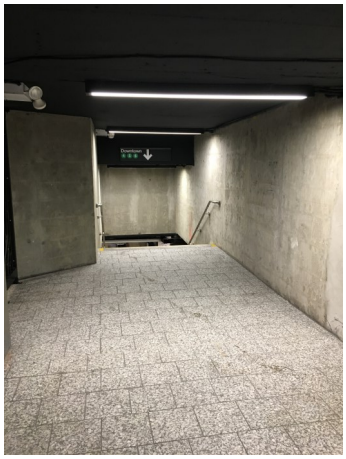

Top of new stairway P10, mezzanine to southbound platform, May 16, 2017.

New station entrance stairway within Grand Central Terminal, off the 42nd Street Passage, August 2, 2017.

View looking down new entrance stair, August 2, 2017.

Enlarged fare array directly across from the touchdown of the new entrance stairway, December 6, 2017.

New street entrances on the southeast corner of E. 42nd Street and Lexington Avenue, December 22, 2017.

Passageway under Lexington Avenue from new street entrance looking west towards station, December 22, 2017.

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Commuter and Transit Notes

No. 350

by Ronald Yee, James Giovan, and Alexander Ivanoff

MTA Metro-North Railroad

Ongoing budget woes (approaching a $3.5 billion shortfall) which have depleted the Connecticut state transportation fund may result in the suspension of all weekend train service on the three branches of the New Haven Line, affecting the 17 stations on the New Canaan, Danbury, and Waterbury Branches. While Connecticut pays for 67% of the operating costs of this line (the remainder financed by New York State), the three branches require almost $33 million in subsidies and may lose all weekday services except for the morning and evening peak periods. Connecticut State Transportation Commissioner James Redeker stated that the State of Connecticut may be forced to propose a fare increase of 10% as early as July 1 if funding cannot be secured from other sources. Additional fare increases of 5% each in 2020 and 2021 could raise the monthly pass between New Canaan and Grand Central Terminal from $335 to $406. The branches are an attractive target for service reductions or cuts as the subsidy per rider is $24.46 on the branch lines as compared to $3.25 on the mainline. During the period 2005-16, ridership increased 14% from 2.3 million to 2.6 million on the three branches, compared to an increase of 19% on the mainline (from 33.89 million to 40.48 million riders). A state panel convened to study the funding issues for public transit in Connecticut had recommended in 2016 that the gasoline sales tax be increased from 25 cents to 39 cents and that tolls be restored to the Merritt Parkway and I-95. While no action was taken at the time, Connecticut Governor Dannel Malloy is now looking at the restoration of tolls on I-95 and the Merritt Parkway and a 7-cent increase in the gasoline tax as a means of raising the needed revenue to continue supporting mass transit in the state. However, this would not avert the fare increases, as the process of setting up and installing the infrastructure for toll collection would require four years. (***New York Times***, February 1)

NJ Transit

The new Governor of New Jersey, Phil Murphy, nominated Kevin S. Corbett to serve as the next Executive Director of NJ Transit (NJT). He is currently the Vice President of AECOM, one of the world's largest transportation and infrastructure companies, overseeing projects such as Amtrak's Gateway, the first stage of NYCT's Second Avenue Subway, Penn Station New York, and the repair and restoration of the Port Authority Trans Hudson (PATH) infrastructure after Hurricane Sandy. Prior to AECOM, Corbett was the Chief Operating Officer and Executive Vice President of the Empire State Development Corporation and Executive Deputy Commissioner of the Department of Economic Development, where projects such as the redevelopment of Times Square, Moynihan Station and Brooklyn Bridge Park were created, and oversaw the economic recovery of lower Manhattan after 9/11. Corbett will be charged with spearheading Governor Murphy's plan to overhaul the beleaguered agency from top to bottom, restoring safety and reliability as well as reorganizing its leadership and management structure, revamping its financial footing, and improving the customer experience. NJ Transit was just cited in the most recent status summary report on Positive Train Control (PTC) by the Federal Railroad Administration as being one of the last passenger rail carriers to comply with the implementation required by December 31. (***New York Times***, January 30)

The National Transportation Safety Board (NTSB) released its findings that the September 29, 2016 crash at Hoboken Terminal and at the LIRR's Atlantic Terminal in January, 2017 were primarily caused by the failure of the carriers to test their operating crews for sleep apnea, resulting in the Engineers becoming unconscious as their trains arrived at the terminals. The NTSB also criticized the Federal Railroad Administration (FRA) for not developing, mandating, and enforcing new regulations requiring railroads to screen, test, and treat employees with such sleep disorders. (***Star-Ledger***, February 6)

Amtrak

A chartered Amtrak train carrying Republican members of Congress to a post-State of the Union Address conference being held at the Greenbrier Resort in White Sulfur Springs, West Virginia struck a large garbage truck at 11:20 AM January 31 in the town of Crozet, Virginia, 12 miles west of Charlottesville, injuring six and killing one. There were four minor injuries (two crewmembers, two passengers) aboard the train and two serious injuries and one fatality aboard the truck, which was totally demolished at the grade crossing. The Amtrak train consist was lead unit P-42-DC 145 (Amtrak 40th Anniversary colors and red, white, and blue striping), car 9800 (the former *Metroliner* Snack-Coach converted to a conference car), at least nine Amfleet-I coaches including 82565 and 82783, and trailing unit P-42-DC 4. Engine 145 appears to have significant damage to the nose, especially on the left side from the sill up to the level of the number board. It was reported that eyewitnesses, after the wreck, saw that the crossing gates were down and the warning lights flashing. The NTSB is investigating the sequence of events leading up to and causing the collision. This line normally carries Amtrak's *Cardinal*. (NBC4 TV News, ***New York Daily News***, January 31)

Train #91, the southbound *Silver Star* operating from Penn Station New York to Miami, Florida, slammed into a parked CSX freight train at 2:35 AM Sunday, February 4 in the town of Cayce, South Carolina, 10 miles south of the state's capital, Columbia. Of the 139 passengers and eight crewmembers aboard, the Engineer and Con-

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ductor, both of whom were in the locomotive, perished and 116 others were injured, ranging from cuts and bruises to broken bones and head impact injuries, with six being admitted to three local hospitals for the more serious injuries. The consist of Train #91 was P-42 47, three Amfleet-II coaches, Amfleet-II café-lounge car 28002, two Viewliner sleepers, and a Viewliner baggage car. The entire forward section including the operating cab of the engine was destroyed in the crash, café-lounge car 28002 was folded in half at its midsection from the forces of the sudden deceleration post-impact, and the lead coach had a slight compression crimping about ¼ from the front. Thankfully, the café lounge car was empty of passengers at the time of the crash. Passenger interviews by the press also indicated that the surviving Amtrak crew performed well and quickly evacuated all of the passengers not seriously injured from the train. Preliminary reports indicate the Amtrak train was traveling at 56 mph, less than the speed limit of 59 mph, but was unexpectedly directed off the mainline by an improperly aligned switch onto the siding where the CSX freight with two locomotives and 34 empty tri-level automobile carriers was parked. In-cab video/audio recording from the forward-facing camera recovered from the Amtrak locomotive showed that the Engineer began blowing the train's horn seven seconds before impact, the throttle was set to idle and brakes applied at five seconds before, and the emergency brakes applied three seconds before the crash. An NTSB investigation is underway to determine the sequence of events and circumstances leading up to the collision. The CSX train had two locomotives at the end where Amtrak #91 struck it. It was also reported that the usual signal system controlling train movements in the area was down for the installation of Positive Train Control (PTC) and that train movements were governed by track warrants in manual block "dark territory," all crews in telephone and radio contact with the CSX Dispatchers. *(Editor's Note by Ronald Yee: This Editor also believes that this former Seaboard Air Line mainline was downgraded over 20 years ago by CSX and its wayside signal system removed as a cost-saving measure for a line that carried only a few local freights and Amtrak's* Silver Star *each day. A ride several years ago revealed that both the track and ride quality was rough, despite the slower maximum permitted speed of 59 mph for a mainline under manual block signaling. CSX operates almost all of its through north-south freight traffic on the former Atlantic Coast Line, which also carries Amtrak's* AutoTrain*,* Silver Meteor*, and* Palmetto*.)* (CNN and ABC News, February 4)

Amtrak's *Acela* Train #2150 operating from Washington, D.C. to Boston, Massachusetts experienced a rare mechanical failure enroute. At around 6:30 AM, as the train traveled at 125 mph through Havre-de-Grace, Maryland (between Baltimore and Wilmington), a coupling drawbar became detached, causing the train to break into two portions. The break occurred between the first class and business class coaches. No injuries were reported and the 52 passengers aboard were transferred to Amtrak *Regional* Train #180, which pulled up alongside as a rescue train. *(Editor's Note by Ronald Yee: A press photo showed the open gangway between the two cars opened up, the accordion-like connection pulled away from the next car and exposing a drawbar that had detached from the car ahead. The round hole where the retaining pin goes in that drawbar appeared to be intact. While no cause was stated as this issue of the* **Bulletin** *goes to press, this Editor suspects that the vertical pin that locks the drawbar in place to the two cars it is attached to may have failed, either from not being properly locked into place, shearing, or fracturing and dropping away, allowing the drawbar to slip out of its mount. Interestingly, another press photo showed that several of the inter-car connection cables remained attached. While the train did uncouple, the gap between the two sections was kept to a minimum. Having a power car at both ends propelling each section at the same rate probably kept the two halves from completely separating and the braking rates were comparable as well. Thankfully, no one was passing through this open gangway passageway when the unexpected uncoupling occurred. Amtrak announced that all of its other* Acela *consists were being inspected for similar defects.)* (CBS News, ***New York Post***, February 6)

Miscellaneous

The Wilmington Chapter of the NRHS, led by Steve Barry, operated its 25th annual Super Saturday streetcar charter that is always scheduled for its namesake, the Saturday before Super Bowl Sunday. The weather cooperated with bright brilliant sunshine all day, albeit a bit chilly, and the fantrip organizers made the best of what SEPTA surface trackage was available for the trip to operate over. Around 20-25% of the surface route system was out of service for track maintenance that day, but they made the most of what tracks were available to ride over, including a run over Route 15, which is normally sees only PCC-IIs. Unique for this trip was the chartering of SEPTA Kawasaki LRV 9043, which was specially decorated in a colorful wrap in 2017 commemorating the 125th Anniversary of Streetcars in Philadelphia. (Ronald Yee, February 3)

Other Transit Systems

Boston, Massachusetts

Member George Chiasson pointed out a correction that is required to the story on the MBTA Mattapan-Ashmont Line PCC collision of December 29, 2017. There are no signals on this line for any Operator to miss. Also, on February 5, 2018, investigators revealed that the Operator of car 3262 had been using his cell phone while operating his trolley car just before the collision. In addition, he also had a loaded handgun in his backpack. He has been fired by the MBTA. There are conflicting reasons for the use of the personal cell phone including its use in lieu of an inoperative radio on his PCC to attempt to communicate with the Dispatcher. Since then, Operators must carry a portable radio that enables contact with the Green Line Dispatcher. While he may have seen the two PCC cars stalled west of the

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Cedar Grove Cemetery (car 3230 disabled ahead of car 3087), his distracted state resulted in him failing to notice car 3260 stopped directly ahead of him (its Operator had stopped to assist the other two cars) until it was too late. Car 3260's parking brake likely disengaged itself when the car was struck from behind by 3262, causing it to roll about 1,000 feet toward Cedar Grove near the Adams Street overpass. 3262 may in fact have been accelerating uphill out of Butler Street and negotiating the leftward curve where 3260 was stopped. (George Chiasson, January 31; ***Boston Globe***, February 5)

Philadelphia, Pennsylvania

The Trenton Line has the worst on-time performance (OTP), with 73% of trains considered as arriving at their destinations on-time during December, 2017, of all of SEPTA's regional rail commuter lines. A review of the OTP ratings for all of SEPTA's lines clearly points to one common factor: all three of the poorest performing lines operate over Amtrak-controlled rails. Amtrak is aware of the common denominator and has been working closely with SEPTA to improve the OTP. Unfortunately, the results for calendar year 2017 show little improvement, the fourth quarter of 2017 having an overall 76% OTP on the three lines (Trenton, Paoli/Thorndale, and Wilmington-Newark, Delaware) with around one-third of the delays attributed to Amtrak-related issues. The other lines' OTP over the same period of time in the comparative study scored an average of 10% better. SEPTA did meet its systemwide goal of 90% OTP in August and September, 2017, but it fell badly afterward due to slippery rail conditions caused by the fallen leaves of the autumn season and (in December, when only three of its lines met the 90% goal) above-average snowfall during and extreme cold conditions at the end of the month. Another factor causing poor OTP is the "learning curve" by train crews as they adapt to the implementation of Positive Train Control and its effects on overall train performance such as new braking patterns based on a more conservative scale during signal aspect downgrades and on approach to slower sections of track as well as strict over-speed protection which does not permit Engineers to make up for lost time if they become late. *(Editor's Note by Ronald Yee: SEPTA may need to adjust its schedules to reflect the "new reality" imposed by PTC. Metro-North did just that when added cab-signal enforced speed restrictions were implemented following the fatal wreck at Spuyten Duyvil on December 1, 2013. Running times were slightly lengthened to reflect the real timings of the trains.)* (***Philadelphia Inquirer***, January 28)

Atlanta, Georgia

The Metropolitan Atlanta Rapid Transit Authority (MARTA) contracted with Kinki Sharyo International to refurbish 118 of its rapid transit cars for $146.5 million as part of its Rail Car Life Extension program. The contract has an option for 94 additional cars and the work will be performed at the Kinki Sharyo plant in Piscataway, New Jersey. MARTA currently has three classes of rail cars in its 316-car fleet: CQ310 built by Franco-Belge with 96 active cars (numbered 101-200 and 501-520), class CQ311 built by Hitachi with 120 active cars (numbered 201-320), and class CQ312 built by Breda with 100 active cars (numbered 601-702). During 2002-9, Alstom overhauled all of the CQ310 and CQ311-class cars. No details were provided as to which class(es) of cars are slated for the rebuild. *(Editor's Note by Ronald Yee: During the 2017 ERA convention, our MARTA hosts during our tour of the Armour Yard Rail Services Facility mentioned that the CQ312 class built by Breda, while the newest cars, were the least reliable. The total number of cars covered by this contract for up to 212 cars roughly corresponds to the total number (216) of CQ310 and CQ311 cars in the MARTA fleet. It is suspected that four of these cars are not candidates for rebuilding and that the CQ312s will not be rebuilt but be the first to be replaced during MARTA's program of total fleet replacement in the 2020s.)* (Kinki Sharyo press release, January 26)

Nashville, Tennessee

Following action on February 6 by the Nashville Metro Council, voters in the Music City will decide May 1 whether to raise four taxes, including the sales tax, to pay for a sweeping mass transit plan, anchored by light rail and a massive downtown tunnel. The Council voted overwhelmingly 34-2 to give final approval to add Mayor Megan Barry's transit referendum to the local primary election ballot on May 1.

But bucking the administration, the Council tweaked the referendum language to list both the transit proposal's present-day cost of $5.4 billion as well as the estimated amount of long-term revenue needed for the project, $8.95 billion. The Mayor's office had lobbied for only the lower amount to go on the ballot.

However, Mayor Barry revealed in a press conference that she had been involved in an extramarital affair with a member of her security detail, which could complicate the measure. The Mayor has been one of its strongest backers. Despite a few calls for a delay on the measure, no delay was put forth.

The most significant factor for the measure has now come down to the dollar figure needed, as Barry's office wanted a $6 billion figure for just construction while the Metro Council wanted one that accounted for inflation, interest, debt payments, operations, and maintenance, which adds an additional $3 billion to the project, something that even some supporters favor, which one Councilmember likened to a compromise. The Metro Council was divided on the dollar figure language, only approving the higher figure by a 21-16 margin. Taxes on sales, lodging stays, and car rentals, and a hike on the business and excise tax, will be the revenue generators for the project.

The transit program is headlined by a combination of 26 miles of new light rail, more robust bus service, and a 1.8-mile tunnel below downtown. The adopted amendment will mention the tunnel in the language.

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Because of Mayor Barry's affair, the pro-transit referendum campaign is now rethinking its strategy by relying less on the Mayor and deploying multiple community members to regularly tout transit. (***The Tennessean*** [Nashville, TN], February 7)

CHICAGO, ILLINOIS

The Chicago Transit Authority (CTA) and Chicago Mayor Rahm Emanuel have set the routing for the next extension of the city's rapid transit "L" system. The Red Line (formerly known as the Dan Ryan) is to be extended 5.3 miles from its present terminus at 95th Street (which is about to complete its $280 million expansion) southward to 130th Street with intermediate station stops at 103rd Street, 111th Street, and Michigan Avenue. The line would follow an existing Union Pacific Railroad right-of-way with the CTA tracks running along the west side of the UP tracks from I-57 south to around 108th Place, where it would cross over to run along the east side of the UP tracks until after crossing the Metra Electric (formerly Illinois Central) tracks near 119th Street and then continue on an alignment west of Wentworth Avenue to the new 130th Street terminus in the south side suburban community of Riverdale. It would dramatically reduce travel times to downtown Chicago from south side communities. However, before the project can proceed, funding for the $2.3 billion route needs to be secured and up to 154 parcels of privately owned land will have to be acquired through eminent domain, the price being paid to owners of these properties yet to be negotiated. The CTA has already secured $85 million in federal funding covering preliminary engineering and environmental studies and will be seeking a blend of federal, state, and local funding for this project. The cash-strapped State of Illinois has not had a capital budget since 2009 and the current administration in Washington, D.C. is not expected to offer much in the way of federal funding. Construction is not expected to commence before 2022 and the project would require around four years to complete. (***Chicago Tribune***, January 26)

Metra placed into effect a combination of fare increases and service reductions to address serious financial shortfalls in its funding. The new fare structure calls for a 25-cent increase in all one-way fares for all zones; 10-ride tickets will increase between $4.25 and $7.75; monthly passes go up between $9 and $12.50; and the weekend pass goes from $8 to $10. Senior, Student, and Disabled fares will also see some degree of increases. The most significant service reductions are on the Rock Island Line with the elimination of three weekday trains (#622, 532, and 533) and schedules adjusted on other trains to fill in the gaps. On the North Central Line, two zone express trains in each direction (#106 and 108 and #111 and 113) were each combined into one train making all station stops. On the Milwaukee District North, four Saturday (#2606, 2610, 2609, and 2613) and two Sunday trains (#2606 and 2619) will be eliminated. On the Southwest Line, the 179th Street station will be the turnaround point for train #815 terminating there at 1:39 PM and Train #830 will originate there at 2:41 PM. They will no longer turn around at the Manhattan station. (Metra, January 30)

CEDAR RAPIDS, IOWA

A study of the feasibility of adding passenger rail to the CRANDIC Corridor (Cedar Rapids-North Liberty-Iowa City, Iowa) remains on track.

During a Metropolitan Planning Organization of Johnson County meeting in North Liberty, local elected officials agreed to proceed with the third phase of feasibility studies of a passenger rail service connecting Iowa City and North Liberty.

As with the first two studies, the Iowa Department of Transportation and the Cedar Rapids & Iowa City Railway, or CRANDIC, have agreed to pay two-thirds of the study's cost, with local entities responsible for the remainder. The cost per entity has usually been around $3,000 to $4,000.

The last study put the cost of an Iowa City to North Liberty passenger rail service at about $40 million to build out.

Last fall, an Iowa Department of Transportation study on the impact of alternative modes of transportation on Interstate 380 found a North Liberty-to-Iowa City passenger rail service with 30-minute headways would see an average workday ridership ranging from 3,200 in 2015 to 6,200 in 2040.

With 130-minute headways, the service would see an estimated 900 average workday riders in 2015 and 2,100 riders in 2040, according to planning organization documents.

While those ridership estimates would not offset future needs for improvements to the nearby — and congested — I-380, the service has been identified as a "natural first phase" for expanded Corridor transit service. (***The Gazette*** [Cedar Rapids, Iowa] via ***Mass Transit Magazine***, February 2)

SAN FRANCISCO, CALIFORNIA

The six-month-old Sonoma-Marin Area Rail Transit (SMART) train service has met and exceeded ridership and revenue projections. Of the 17 weekday and five weekday roundtrips, the two-car trains have been expanded to three cars on select peak period runs to accommodate higher than expected ridership (310,000) and provide space for a larger number of bicycles than anticipated. The busiest stations on the line are Petaluma, downtown Santa Rosa, downtown San Rafael, Marin Civic Center, and Sonoma County Airport. This was achieved despite devastating wildfires in the region that at first caused service disruptions and suspensions, and, post-fires, prompted SMART to offer free rides to assist and meet the needs of thousands of fire victims. The agency is also in a battle to secure federal funding for the 2.2-mile extension of the line to Larkspur, which would bring riders to within a short walk to the ferry services to San Francisco. If funding is approved (as hoped for in March), service could commence by the

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end of 2019. The service has been met with praise from its riders as a workable and less stressful alternative to the endless traffic jams on Highway 101 between Santa Rosa and San Rafael. (***San Francisco Chronicle***, February 5)

The Twin Peaks Tunnel and K/Ingleside trolley line observed its 100th birthday on Saturday, February 3. The 2.27-mile-long tunnel was, at the time it opened in February, 1918, the world's longest tunnel. It currently carries lines K, L, M, S, and T from the western portion of the city to downtown. The celebration was a cooperative effort among the San Francisco Municipal Transportation Agency, the West Portal Branch Library, and the Market Street Railway, with the latter conducting a brief walking tour highlighting the tunnel's history and SFMTA volunteers handing out souvenir K/Ingleside canvas tote bags, but just 100 bags, one for each year being celebrated. (sfmta.com, February 1)

Los Angeles, California

The San Bernardino County Transportation Authority issued Stadler a notice to design and build three "Flirt" class Diesel Multiple Unit (DMU) trainsets for use on the Arrow commuter rail service. There will be options for three additional units in the contract. Stadler will manufacture the DMUs at its new manufacturing plant in Salt Lake City, Utah to comply with federal Buy America requirements. The DMUs will be 48.5 meters (around 158 feet) long and have two passenger-carrying sections accommodating 116 seated and 118 standing passengers with a central section housing the EPA Tier 4 Final-compliant diesel and traction equipment. The 100 mph-capable Flirt-type DMU will operate in service at speeds of up to 45 mph over a nine-mile former Atchison, Topeka & Santa Fe freight line linking the University of Redlands to the Metrolink commuter rail station at the San Bernardino Transit Center with connections to Los Angeles. The line will have three intermediate stations and be designed to permit the line's conversion to zero-emission (electrification) propulsion technologies in the future. (***Metro Report International***, January 22)

Canada

Right after the February, 2018 ***Bulletin*** went to press, two Canadian news outlets indicated that Transport Minister Marc Garneau and the Liberal government were warmly receptive towards VIA Rail's ambitious and costly expansion plans in the run-up to the 2018 Canadian federal budget, but at the cost of increased scrutiny.

While no final decisions have been made, the government appears to be working toward approving VIA's C$1.5 billion request for new trains in the short term. The government would then ask the new Canada Infrastructure Bank to review VIA's multibillion-dollar plan to operate on new tracks exclusive to passenger rail along the Quebec City-to-Windsor corridor.

VIA Rail submitted a plan to Ottawa in December, 2016, that coupled the need for a new fleet in that corridor with a proposal called "high frequency rail." That plan would involve new inter-city passenger rail lines designed to avoid current delays because freight trains are given priority on the existing network. The combined proposal could cost more than $6 billion if it involved electric power.

However, the government is treating VIA's pitch as two separate decisions. In an interview with ***The Globe and Mail***, federal Transport Minister Marc Garneau expressed clear support for VIA's fleet-renewal request, stating that the "hardware" needed to be replaced "once in a while." Most of VIA's fleet is at the end of its useful life and the company has said some rail cars will start to be pulled out of service as early as this year. Prime Minister Justin Trudeau has also recently signaled his support for VIA's high-frequency plan, citing the positive economic and environmental impacts.

VIA's proposal would mean the construction of a new line between Toronto and Ottawa through Peterborough that would use an abandoned rail line that is currently a recreational trail. Meanwhile in Quebec, VIA is proposing new service between Montreal and Quebec City along the north shore of the St. Lawrence River through Trois-Rivières.

VIA Rail CEO Yves Desjardins-Siciliano has been promoting the idea for several years now and had expressed hope that Ottawa would make a decision in 2017. A VIA spokesperson said the company is "hopeful" based on Transport Canada's review of the plans.

VIA has lined up support from city councils along the Quebec City-to-Windsor corridor, who have been urging their local MPs to support the plan.

However, provincial government decisions in Ontario and Quebec have complicated matters. Ontario announced in October, 2017 that it is planning a high-speed rail line from Toronto to London, and perhaps as far as Windsor, and in Quebec, the province's pension fund is leading a $6-billion light rail project called REM in the Montreal region that would have a new line enter the downtown through a tunnel. However, VIA wants to run its heavy trains through that same tunnel as part of its proposed new line to Quebec City. Whether the two types of trains can share the tunnel is an unresolved issue. If the REM proposal is built, the concern has been raised that there would be a three-seat ride between Toronto and Quebec City.

The Conservative block in Parliament has come out with concerns with the proposal, while the NDP has shown support, but with concern it is not moving fast enough because of the infrastructure bank complications. (***Globe and Mail***, January 23; ***Montreal Gazette***, January 25)

Ottawa, Ontario, Canada

Ottawa's light rail network will open at the end of November, according to the office of Mayor Jim Watson through an update given on February 6, several months behind schedule.

Transit boss John Manconi and other senior city staff

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gave an update on the massive infrastructure project to the finance and economic development committee the morning of February 6 at City Hall.

Rideau Transit Group (RTG) is the consortium building the Confederation Line, a 12.5-kilometer (7.8-mile) rail system that includes 13 stations, from Tunney's Pasture in the west to Blair Station in the east. RTG was supposed to let the city know on November 24, 2017 whether it would make its May deadline, a date specified in the project contract. City council members only found out on December 15 that RTG deemed the May deadline "risky."

At the time, the city gave RTG until January 24, 2018, to come up with a definitive delivery date, but when January 24 came and went, RTG again asked for more time.

Under the original agreement between RTG and the city, surface construction in the downtown area was supposed to wrap up by June 1, 2017. Missing that deadline did not come with a financial penalty, according to the LRT contract. (CBC News, February 6)

Manchester, England

Track laying on the Trafford Park extension of the Manchester Metrolink light rail network began on February 1 at Parkway Circle.

Construction on the 5.5-kilomter (3.4-mile) mostly segregated route with six stops began in late 2016 and is being undertaken by the MPact Thales consortium of Laing O'Rourke, VolkerRail, and Thales, with WSP acting as delivery partner. It is due to open in 2020.

The Trafford Park extension is the first major project to benefit from a devolution deal signed by Greater Manchester local authorities and the government in November, 2014. Funding for the £350 million project is being provided from the devolution deal with a £20 million contribution from Trafford Council. (***Metro Report International***, February 2)

Paris, France

A newly released government audit is sounding the alarm over escalating costs and schedule slippage on the Grand Paris Express (GPE), a massive project to build 120+ miles of new metro lines in and around Paris. The core program is composed of three new orbitals — Lines 15, 16, and 18; and a new radial — Line 17, all to be built and opened in multiple phases between 2022 and 2030. The GPE has been in planning and design for close to a decade, and a launch ceremony was held on February 3 for the TBM that will bore the first segment of Line 15. The overall program also covers an eastern extension of existing Line 11 (2022) and existing Line 14 south to Orly Airport (2024), both of which are already under construction.

The audit expressed concerns with a number of issues. Construction costs have increased from a 2012 estimate of €25 billion to a current estimate of €35 billion; a project management and administrative structure that is not up to the task of implementing such a large and ambitious program; and an unrealistic timetable that was attempting to complete a substantial portion by the 2024 Olympic Games. Recommendations include overhauling the governance of GPE, resetting the budget and schedule, and scaling the program back. This is certain to anger many of the suburban constituencies that have been the program's most vocal champions. Local rail advocates and critics have asserted that the program has numerous flaws, including some of the proposed alignments, as well as incompatible technological differences between the lines, i.e. rubber-tired vs. steel-wheeled, and overhead current collection vs. third rail.

Meanwhile construction continues on other expansion works in Paris, including northern extensions to Lines 12 (2019) and 14 (2020). Line 4 is being extended to the south (2020), which is being undertaken simultaneously with the entire line's conversion to driverless operation, making it the third metro line in the French capital to be equipped for automatic train operation. An eastern extension of Line 1 is also in the planning stage, and in the longer term Line 11 might be extended even further east beyond what is planned under the GPE program.

Construction is also ongoing on a western extension to Line E of the RER regional rail network. Line E was originally conceived in the early 1990s to link the eastern and western suburbs through a tunnel under central Paris; however, rising costs and shifting priorities resulted in the completion of only the eastern half of the line from Chelles-Gournay through the central city tunnel to Magenta (adjacent to Gare de l'Est and Gare du Nord) and Haussman-Saint Lazare, which opened in July 1999. One month later a branch to Villiers-sur-Marne was opened, and then extended again to Tournan in December, 2003. The current project will be opened in stages between 2022 and 2024, extending the tunnel from Haussmann-Saint Lazare for an additional five miles under Paris, with two deep stations at Porte Maillot and La Défense, before emerging into the open at Nanterre La Folie. From there the line continues west, taking over the Poissy branch of RER Line A, and further on the SNCF line to Mantes-la-Jolie, for a total of over 34 miles with 14 stations. At a cost of €3.7 billion, the Line E project is a significant effort; the line will transform commuting patterns from the western suburbs and will provide much needed relief to Line A, which continues to be one of the busiest passenger railways in the world. It provides yet another link to the important office district at La Défense, and will enable connections to existing SNCF, Métro, and future GPE lines at a number of locations. The two aforementioned deep stations will be massive and comparable to the other "underground cathedral" stations for which the RER is well known.

Collectively, these developments in Paris show a continued commitment to rail transit and recognition of its critical importance to a global city. New York commuters, transit advocates, and railfans alike should be rightly envious and can only dream of a similar effort here.

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(***Metro Report International***, January 19; societedugrandparis.fr; ratp.fr; rer-eole.fr; fr.wikipedia.org)

Würzburg, Germany

The Würzburg City Council has approved a plan to replace the city's entire fleet of 41 trams with new low-floor vehicles.

Würzburg Tramways (WSB) must withdraw its six remaining GT-D trams (built in 1968-75) by the end of 2021, while the supply of spare parts for the fleet of 14 GT-E vehicles, which date from 1989, is only guaranteed until next year. Furthermore, the GT-N trams, which were delivered in 1996, are also due for replacement by the mid-2020s.

Under the proposals, a Europe-wide tender will be launched for an initial tranche of 18 vehicles, which will be delivered in 2021-3. The council expects to place an order for a second batch of 20 vehicles in 2023 for delivery from 2027 onwards. The initial order has an estimated value of €65 million.

The specification published by the council calls for a 70 kilometer per hour (43 mph) 36-meter- (118-foot-) long vehicle with a maximum entry floor height of 340 millimeters (1.1 feet) and capacity for at least 220 passengers.

WSB operates a 20-kilometer (12.4-mile) meter-gauge network comprising five routes with 46 stops. A 1.3-kilomter (0.8-mile) extension of Lines 1 and 5 to Pestalozzistrasse in Grombühl is planned. (***International Railway Journal***, February 2)

Bremen, Germany

Bremen Tramways (BSAG) has exercised an option with Siemens for 10 additional Avenio LRVs, which will take the operator's fleet of these vehicles to 77.

BSAG placed an initial order with Siemens for 67 standard-gauge Avenios in June, 2017, with options for up to 17 additional vehicles. Delivery of vehicles from the first option will begin following the completion of the main build in 2021.

The four-section LRVs will be 37 meters (121 feet) long and 2.65 meters (8.7 feet) wide with capacity for 259 passengers.

BSAG had originally planned to place a single order for 77 vehicles, but the main order was reduced to 67 vehicles pending a decision on the viability of refurbishing 10 of its GT8N trams, which date from the 1990s. BSAG has now opted to replace these vehicles with new LRVs. (***International Railway Journal***, January 31)

Utrecht, The Netherlands

Construction of part of the 8-kilomter (5-mile) Uithof light rail line linking Utrecht Central Station with the university area at De Uithof has been delayed and line is now expected to be completed in December, 2019 instead of this year, with an increase in construction costs.

The delay concerns the section between Utrecht Vaartsche Rijn Station and Utrecht Central Station, which is currently being redeveloped. The area around Central Station is critical for the light rail project as LRVs need to be able to cross the reconstruction area to reach the depot at Nieuwegein on Utrecht's existing light rail line. It has been discovered that the new line needs stronger foundations in the station area, which will delay the project.

The extra work and the delay will increase the cost of the project by €84 million. The city of Utrecht will cover €25 million, leaving the Province of Utrecht, which is also the regional public transport authority, to fund the remaining €59 million.

As the eastern part of the line has been completed to a major extent, the first of the 27 five-section CAF Urbos 100 LRVs for the Uithof Line have already made test runs on the section between Vaartsche Rijn and De Uithof Park and Ride Station. (***International Railway Journal***, February 1)

Amsterdam, The Netherlands

Construction has been completed on Amsterdam's Nord-Zuid Metro. The line, slightly over six miles in length with eight stations, has been under construction since 2002, and has been beset by engineering challenges and difficult geologic conditions. Originally scheduled to open in 2011, its costs increased from €1.4 billion to €3.1 billion. Amsterdam is well known as a city of canals with a high water table, necessitating innovative technologies for the building of the line, including ground freezing and tunnel boring under pressure. To build a particularly challenging section under the city's historic main railway station Amsterdam Centraal and the adjacent river, immersed tubes and caissons were built with great care so as not to disturb the extensive piling works upon which the station sits. Driver training and test running will commence shortly, with the objective of opening the line for revenue service on July 22. Much of the city's tramway network will be restructured to serve as feeder routes to the line, which links the suburbs north of the city with the Zuid mainline railway station in the south. (***Metro Report International***, January 12)

Cagliari, Italy

The largest investment would be €60.1 million to build a light rail line in Cagliari from the existing line at Vesalio to Quartucciu Centro Commerciale Le Vele in the east.

€31.6 million would be spent on the construction of a new maintenance depot for the Sassari tramway, as well as the purchase of three trams and track renewal.

A total of €17.1 million is to be spent on procurement of low-emission urban buses, while €8.8 million would go towards upgrading the Elmas-Decimomannu railway northwest of Cagliari. (***Metro Report International***, February 1)

Minsk, Belarus

Stadler Minsk has so far delivered nine trams of the 23 that it is supplying under a contract signed in 2016. These are currently being kept in a provisional depot at Khasanskaya Ulitsa, where test running is taking place.

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SWITZERLAND IN THE LATE SUMMER
by Jack May
(Photographs by the author)
(Continued from February, 2018 issue)

Clare would visit more museums today, while I traveled a long distance to ride one of my favorite lines, the international Centovalli railway between Domodossola, in Italy, and Locarno, Switzerland. Centovalli means 100 valleys, which evokes thoughts of a large number of hills and mountains. Although started before World War I, the electric interurban was not completed until 1923; it has 34 tunnels and 83 bridges to traverse the difficult terrain.

I needed an early start to make the most of my day, so I reached the railway station before 8:00. An extra train at 8:01, to supplement the regularly scheduled 8:07 Inter-City to Brig, was waiting, and I got aboard, invoking a self-imposed rule that calls for riding the first train possible, as you never can be totally sure if a later one will actually turn up (not so applicable in Switzerland). The extra consisted of a large number of double-decker cars and was full by Spiez, its second stop. Then the train zoomed into the new Lotschberg base tunnel and proceeded to its terminal, Brig, arriving at 8:59 (9:05). At the time the new twin-tube tunnel was the longest subterranean land crossing in the world, and its use has reduced intercity schedules from the north to Brig by over 30 minutes — and even more for those heading to the southwestern part of the country, as they now change at Visp, rather than continuing on to Brig and doubling back. The route through the old Lotschberg tunnel is very scenic and still can be traversed aboard hourly locals.

Despite being overcast in Bern, there was some blue sky in the distance at Brig, which made me hopeful. I speculated that the operation of the extra train was related to the demand created by the many hikers and tourists heading for the mountains. And so it was, as most of our backpack-carrying passengers detrained at Visp, the transfer point for Zermatt, Martigny, and similar destinations. My next train, a Saturday-only Inter-Regional to Domodossola, was not due out until 9:34, so that gave me time to observe the 9:18 *Glacier Express* stopping on the meter-gauge tracks in the station's forecourt, where we began our trip over a week earlier. In addition to the 9:34, there was a 9:44 *EuroCity* to Domodossola and Milan. My train was quite crowded and even more people got on before its late 9:42 (34) departure. It hurtled into the Simplon Tunnel five minutes later and emerged into brilliant sunlight after five minutes of darkness. The 10:17 (03) arrival was still earlier than the EC, which was scheduled for 10:12. Apparently we were slowed down by being behind an auto-carrier shuttle. These types of trains, conveying automobiles and trucks whose drivers do not want to surmount Switzerland's steep mountain ranges, are also operated on the Lotschberg base line.

According to the timetable, the EC's connection with the 10:25 interurban for Locarno was "guaranteed," so we left a little late, having waited for the passengers from that train who trickled down to the Centovalli's underground terminal (arriving too late to get window seats). The line's other terminal, in Locarno, is also in a subway. As it turned out most of the through trains on the mostly single-track meter-gauge 1,350-volt (nominal) d.c. line were a little late all day, although the locals operating on just the Swiss side of the border ran to schedule.

I think the portion in Italy, operated by the Societa Subalpina di Imprese Ferroviarie (SSIF), is the more scenic, but there are relatively few stops and even fewer local trains, so it is probably very difficult to photograph it comprehensively through the rugged territory it traverses. The Swiss side of the line, starting at Camedo, is operated by the Ferrovie Autolinee Regionali Ticinesi, whose acronym apparently amuses many American railfans. The almost hourly express trains cover the 32½ miles between Domodossola and Locarno in about 1¾ hours. Twenty of those miles are in Italy with 12 stations, while the remaining 12½ miles in Switzerland sport 10 stops.

My train arrived at Camedo at 11:54 (11:40), where I planned to take my first pictures — of a terminating Swiss local at 12:05 and a through train to Domodossola at 12:23. I was amused while waiting by the profusion of little lizards scurrying around at my feet. Photos accomplished, I waited for the next train on my itinerary, the 12:40 to Locarno, which did not come until 12:49. Nevertheless I rode it eastward to Intragna for some additional pictures. With a scheduled arrival of 12:57, I planned to photograph its westbound counterpart at 13:07 and then ride the following local back at 13:20. But now it would arrive at the same time as the westbound, which I had not realized until after I boarded. And if I stayed around for a photograph of a train on the trestle a little east of the platforms, which was my original plan, my schedule would be thrown off by an hour, as the following westbound was not scheduled until 14:20. Thus I began kicking myself, much to the amusement of all of the other passengers (actually I'm sure they would have been amused had my actions not been figurative). But as it happened I was in luck, as the westbound 13:07 at Intragna was also late, so I ended up getting a photograph of it on the trestle before boarding the 13:20.

The local got me back to the border point at Camedo by 13:39, giving me the allotted time to photograph trains on the beautiful arched Ruinacci viaduct, the system's longest bridge. I was able to catch eastbound lo-

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Switzerland in the Late Summer

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cals at 14:11 and 15:10, and expresses at 13:55 and 14:40 (both late) crossing the trestle or near the station. In the westbound direction I shot the 14:39 before my 15:24 (15:34 actual) departure back to Domodossola.

Perhaps due to the problems that caused the tardiness in the schedule, I saw some unexpected equipment in the mix — or maybe the consists were normal. Handsome blue-and-cream-painted 70-percent low-floor units built in the 1990s (some Swiss-owned and the remainder Italian-owned, easily identifiable by the small flags painted on the carbodies) hold down the bulk of the service. Some of these, usually used on through trains, have had fully low-floor sections equipped with buffets and WCs inserted into their centers to convert them into three-section articulateds. Supplementing these are three SSIF-purchased 4-unit Panoramico trains from 2007 with the same amenities. They are equipped with half cabs (like PATCO cars until recently), so passengers seated accordingly can get excellent views out the front or rear. All the side windows are large but slanted inward, giving the units a concave, angular look. But this also results in a certain amount of glare for passengers seated on the sunny side. Riders must pay a small surcharge when accommodated aboard these trains. What surprised me was seeing a through train equipped with a set of older cars originally built for the Lugano-Ponte Tresa interurban, but later sold to SSIF.

My morning eastbound train from Domodossola was supposed to be equipped with panoramic units but was not, but the return train had them, which allowed me to sample the cars (and pay the €1.50 supplement for the privilege). When heading east I had noticed an old tram-like interurban sitting on a side track at the Santa Maria Maggiore station (Italy), and so I had my camera ready and was able to get a decent photograph of it from the rear of the Panoramico as it slowed for the stop.

The train arrived in Domodossola at 16:46 (36), just in time for the 16:48 connection to Brig on the upper level,

My first two photos after arriving at Camedo on the Italian-Swiss border show Vevey (1992)-built 70-percent low-floor cars. The left view shows a terminating local from Locarno while the right one is of a through Domodossola-bound train with equipment that had a low-floor center section added. From an earlier trip I recall a manned border station at this point.

54 had pulled forward to lay over at Camedo until after a train of Panoramico equipment passed on the following Domodossola-Locarno express.

A three-quarter view at Intragna of one of the SSIF's Panoramic trains heading east toward Locarno. The three very stylized trains were built in 2007 by the now-defunct Italian Veronesi firm (with trucks and motors from Skoda).

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Switzerland in the Late Summer
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which fortunately was held. It departed at 16:51 and arrived at its destination at 17:24 (16). The connecting Inter-City train for Bern scheduled to leave from across the platform was also held, and left at 17:27 (20). It was a double-decker like my morning train, and contained a family area, in other words, a McDonalds-like playground for kids — a very nice touch. The train arrived in Bern at 18:27 (23), passing a large billboard advertising Bombardier, which proclaimed (in English): "The Climate is Right for Trains." It was a long day with lots of train travel, but not perfect, as the sun was not in an ideal position for my Intragna viaduct shot and it was covered by clouds at some inopportune moments. If I were to do it again (and I hope that will happen), I would probably want to work from the other end of the line and start at Locarno. We had dinner at a different neighborhood restaurant, which was a bit inferior to Bistro du Nord.

Of all the bridges on the line the Ruinacci Viaduct near the border at Camedo is the most notable, and it is featured in much of the railway companies' publicity. The top view shows an eastbound Domodosolla-Locarno express, with its Vevey-built articulated unit from 1992 (center section added between 2006 and 2009) augmented by two of three 1923-constructed 4-axle trailers that had been given new bodies between 1962 and 1991 (depending on the car numbers). The Camedo-bound local in the view at right consists of a 6-axle low-floor unit built by Vevey in 1992.

I hurriedly boarded 83 at Camedo after exposing this slide of the SSIF Panoramic unit.

MAN/Oerlikon streetcar 4, built for the SSIF in 1911, is displayed at the Santa Maria Maggiore station in Italy.

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Around New York's Transit System

MetroCard Machine Software Upgrade Postponed

After howls of protests from riders and rider advocate groups, the MTA postponed a planned *MetroCard* software upgrade that would have limited all of its vending machines to cash only, no credit or debit card purchases or refills, from late Friday night February 2 until Monday morning, February 5. As this issue goes to press, the MTA has rescheduled the upgrade-related outage to Saturday morning, February 10 from midnight to 6 AM.

Major Changes Coming to Grand Central

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pied by the footings and basement of the Grand Hyatt Hotel above. This blockage has long been recognized as a significant challenge to improving circulation at the station. For years, NYCT has been examining ways of reframing the hotel's foundation steel to free up space on the mezzanine to allow for the building of additional stairways down to the platforms. The high construction cost and physical disruption this work would entail has discouraged past efforts; however, the infusion of private capital to pay for this work will now allow this critical improvement to proceed.

The overall program is on a fast track and some elements have already been completed. A new stairway (P10) from the mezzanine to the southbound ❹❺❻ platform was opened on May 16, 2017. This is the first of three new stairways to the southbound platform. The first of the new street entrances was opened on December 22, 2017. Two new street stairs located on the southeast corner of E. 42nd Street and Lexington Avenue, across the street from the Chrysler Building, link to a previously existing corridor underneath Lexington Avenue to the lower level arcade under the Chanin Building, which in turn leads to an existing fare control area on the southeast side of the station mezzanine.

In the next part of this article, the specific elements of the Grand Central improvements will be described in greater detail, along with a look ahead at what's in store for the rest of East Midtown. *(Continued next issue)*

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Commuter and Transit Notes

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The vehicles must undertake 200 kilometers (125 miles) of test running before they are put into passenger operation.

The Transportnaya Koncessionnaya Kompanya consortium of Lider Group and LSR Group is developing the 14-kilometer (8.7-mile) fast tram route in the Krasnogvardeisky district under a 30-year BOT agreement. Revenue services are due to begin in March. (***Metro Report International***, February 2)

Kolomna, Russia

Uraltransmash delivered the first of 21 single-section Type 71-407-01 trams to Kolomna on January 27.

The partly low-floor 15.9-meter-(52.2-foot-) long tram has 27 seats and three 1,300-millimeter (4.3-foot) double doors. Operator Mosoblyelektrotrans placed the 430.5 million ruble order in November, 2017. (***Metro Report International***, January 30)

Volgograd, Russia

Sole bidder Avtotekhkom was awarded a 257.5 million ruble contract on January 29 to supply 10 Belkommunmash trams to Volgograd. Deliveries are due before April 10 and VEB-Leasing is providing financial backing. The 37% low-floor BKM-802 trams will be 15.5 meters (50.8 feet) long and 2,500 millimeters wide (8.2 feet).

Last year Volgograd municipality agreed a leasing deal for 20 UKVZ trams, which are due to be delivered by the end of March. (***Metro Report International***, February 1)

Volgograd and Rostov, Russia

Transmahsholding subsidiary Demikhovsky Engineering Plant has signed a 5 billion ruble contract to supply 22 four-car Class EP3D electric multiple-units to Russian Railways from February.

Four of the 25,000 volt 50 Hertz units are to be allocated to Privolzhskaya Railways for use in Volgograd, and 18 to Severo-Kavkazskaya Railway for use in Rostov. (***Railway Gazette***, February 3)

Lusail, Qatar

ALSTOM presented the first of 28 Citadis Al Mehmel low-floor LRVs for the Lusail light rail network to Qatar's Minister of Transport and Communications H.E. Jassim bin Saif Al Sulaiti during a recent visit to the company's plant in La Rochelle, France.

Alstom is a member of the Qatari Diar Vinci Construction consortium (QDVC), which was awarded an EPC contract in June, 2014 for the 28-kilometer (17.4-mile) three-line network, which will serve 25 stations. Alstom's share of the contract includes rolling stock, electrification, signaling, and track work.

The 33-meter- (108-foot-) long LRVs will accommodate 207 passengers, and will be equipped with Alstom's APS ground-based power supply system.

The design of the LRVs is inspired by the Dhow, the traditional Qatari boat used for pearl fishing.

The first vehicles are due to arrive in Qatar in March, and Qatar Rail says the project is currently 71% complete, with commercial operations due to begin in 2020.

The Lusail light rail network will be operated by RKH Qitarat, a joint venture between consortium RATP Dev and Keolis, France, which has a 49% stake, and the Qatari Hamad Group, which holds 51%. (***International Railway Journal***, January 31)