Rapid Transit

by Paul & Leigh Matus

Part I

Photos from Paul & Leigh Matus Collection

Subways and elevated lines offer the model builder a bold new field that will require scratch building and plenty of research. Here's the prototypical way of running 70 ft. cars on 12 inch curves.

Back at the turn of the century every town thought it had to have a trolley operation — a one horse-car town could feel as though it were truly on the rise in this world. The growing feeling in this decade is that rapid transit is inimical, growth and prosperity—every bit as necessary for prestige as a trolley car was then.

What is rapid transit? The essentials of rapid transit are that it be an electric rail operation (although early rapid transit was steam and cable operated), at least two-track, usually drawing power from third-rail but occasionally employing trolley and catenary, operating on exclusive right-of-ways (including elevateds, embankments, cuts, subways, surface and median strip). Rapid transit is usually based in semi-urban areas feeding into the business areas of cities, though suburban rapid transit operates from semi-urban areas to the suburbs. Other characteristics include frequent, planned stops and payment prior to boarding. Most unique is its equipment—a wide variety of designs that span rapid transit history—with multiple-unit operation, loading at floor level and door arrangement made to facilitate rapid and convenient loading and unloading.

The thing that makes a binding rapid transit definition difficult is that there are certain operations having features that, while called rapid transit, are distinctly different from conventional rapid transit. These lines may be said to have "rapid transit-type service." Additionally, rapid transit equipment has been run on non-rapid transit right-of-ways. Pacific Electric, an interurban system, had a few stretches of line in the Los Angeles area similar to, if not intended to be, rapid transit; the North Shore and Chicago, Aurora and Elgin, in Chicago, shared the stations and trackage of the Chicago Rapid Transit elevateds. The North Shore, one of the more famous interurbans, even ran through the Loop and its trackage, once off the Chicago system, was adaptable for rapid transit. The Chicago Transit Authroity now runs its "Skokie Swift" on a portion of former North Shore right-of-way. Also included in the broad sweep of a "rapid transit-type service" is the Shaker Heights Rapid Transit in Cleveland which uses high-speed trolleys on rapid transit right-of-ways. Similar operations may be found in Boston, Newark (N. J.), and Philadelphia.

Rapid transit operations now blanket many of the great cities of the world. In the United States pure rapid transit has been a part of New York, Boston, Philadelphia and Chicago throughout this century, with Cleveland a newcomer. Cincinnati has a subway tunnel, now in its fourth decade of glorious disuse. At least ten U. S. cities are in some stage of rapid transit planning. Fort Worth is most aroused by the subway built by Leonards' Department Store, which is serviced by remodeled PCC's from Washington, D.C., with additional access and high-level loading; and San Francisco is well into its Bay Area Rapid Transit District planning. Elsewhere in the Americas, Toronto is expanding its rapid transit system as Montreal is building its system with unique, rubber tired cars, similar to those used in Paris. Buenos Aires has a rapid transit system developed largely through the efforts of the Brooklyn-Manhattan Transit Corp. (BMT) of New York which, incidentally, was also the major contributor to the planning and designing of the PCC trolley.

Rapid transit was first proposed in the United States close on the heels of the development of conventional rail transit. In 1832, an elevated railway was designed for New York City, which was planned to run on a ledge above the second story of building fronts. The laying of the "Golden Spike" of rapid transit did not come, though, until 1867 when a pillar was put in place at Greenwich Street on Manhattan's Lower West Side. This cable-drawn el, designed and constructed under the direction of Charles T. Harvey and opened for service in 1868, was constructed entirely of metal in its rails, cable vault and structure. However, this first great venture failed within three years and was bought at auction by

Here's rapid transit at its fullest: a 10 car train made up of two 5-section "Multis" articulated units on the New York City Transit Sys.

its bondholders for $960. They rebuilt the line, abandoned cable operation and purchased dummy steam locomotives to pull the trains. As the lines grew and fanned out steam became the predominant motive force.

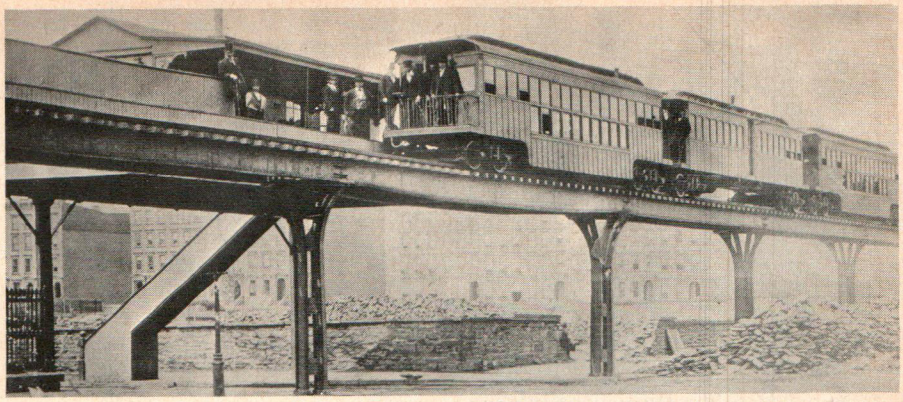
As work was progressing above ground, an underground movement had begun—Alfred Beach's pneumatic subway, (modestly dubbed the Beach Pneumatic Rwy.). The pneumatic tube idea did not quite succeed and the line was discontinued promptly. It was reopened a half-century later by the Brooklyn Rapid Transit Co. (BRT), widened and modified for the operation of conventional rapid transit trains (it is now the lower level of the City Hall station).

In the late 1880's electricity was already getting consideration as it became obvious that steam was an age behind the needs of swift, clean urban transportation. Electricity's great moment came when Francis J. Sprague demonstrated his multiple-unit train control (the operation of all motors in all cars from a remote position) on Chicago's South Side Rapid Transit el line. This made possible the operation of fully electrified rapid transit systems. From Chicago the pulse of this great innovation promptly made itself felt.

The immediate result of this invention was reflected in the New York City subway, built between 1900 and 1904. Whereas electrification could already be found on the els of Chicago, Boston and Brooklyn, multiple-unit operation was nowhere more essential, practical and convenient as for subway rapid transit. However particularly important it may have been to the development of the subway, rapid transit could never have reached its full capability—regardless of the right-of-way—were it not for Sprague and "MU".

The New York City subway was the first specifically designed for rapid transit equipment; however, Boston opened its Tremont St. subway in 1898, serviced by trolleys and for a time by elevated trains — the latter proving impractical. It was not until 1908 that Boston opened its first subway for rapid transit equipment.

After these developments the growth of rapid transit by no means followed a steady path of improvement. Undoubtedly the most interesting advent of these early days was in New York, where a rivalry developed between the Interborough Rapid Transit Co. (IRT) and the BRT. Before the IRT's subway had reached completion it had become, almost overnight, New York's major rapid transit system in two of New York's boroughs. In 1903 it leased the existing Manhattan Railway els, the first stage in an acquisitive design. Favored by the City Fathers (their subway was built with city funds) they

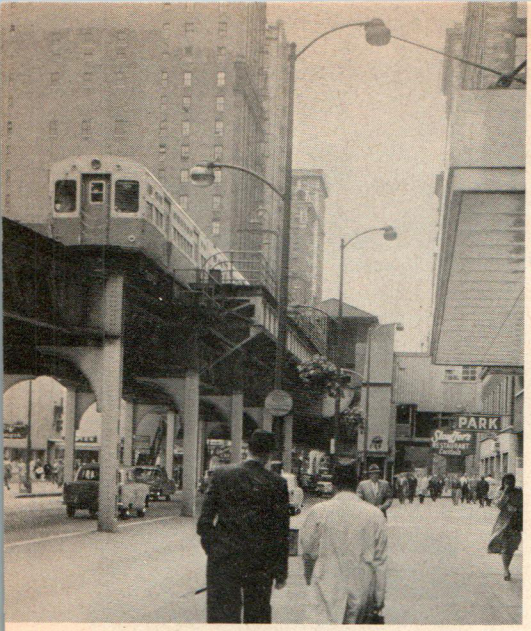


ABOVE: New York's 9th Ave. El in 1872, two years after conversion from cable operation. Space saving el structure was early design.

BELOW: Sixth and Ninth Ave. El structure in 1933 in view looking north from 80th St. & Columbus Ave., showing 81st Street Station.

ABOVE: Beneath Brooklyn's Culver line el are freight tracks of the South Brooklyn plus remnants of a one time street car line.

BELOW: New York's IRT Broadway line indicates how a subway can be a surface line and an el line, if the terrain permits. Note 3rd rail.



Chicago's loop is surrounded by el structure with white columns and grey superstructure. CTA el cars are converted from PCC parts.

Dearborn St. Subway, Chicago, opened in 1951 operates two routes. Cars are cream and light green. Systems vary greatly in different cities.

Chicago wisely provided rapid transit operation on median strip dividing heavily traveled Congress Expressway. No traffic problems!

planned to send tentacles out to all of the city's boroughs, except inaccessible Staten Island, and, in doing so, came face-to-face with Brooklyn's transit company.

The BRT, at the time (about 1910), was merely a number of the old surface steam lines that served the amusements available in south Brooklyn, plus an elevated and streetcar system which extended into Queens.

The BRT had its way in the form of satisfying its wishes in Brooklyn and Queens while the IRT was left with Manhattan and the Bronx.

Other major cities were growing in a straight and almost uninterrupted line. Chicago, which might well be called the birthplace of modern rapid transit, had lines stretching from its business district, which got its name from the amazing rapid transit terminal located there—the Loop. Into this Loop all of Chicago's els ran in a merry-go-round, except the North-South Line, now running through the State Street subway, opened in 1943.

Boston's system, by and large, grew in one great surge. The basis of its rapid tranist system was planned or developed by the end of the Great War. Philadelphia, on the other hand, has almost consistently been laying track for some new line or the other.

A phenomenon peculiar to Philadelphia is the variance of track gauges designed to make their lines incompatible—and therefore preventing the transit system from becoming a part of a conventional railroad network. This public suspicion even extended to the Philadelphia Suburban trolleys, which were also built as broad gauge lines.

The great dark streams, or so they looked in aerial photographs, which turned streets to lanes in perpetual twilight, the elevated lines are gone from Manhattan and much of Brooklyn. When the City of New York took over the IRT and BMT in 1940 the els were all but completely abandoned—even the els of Manhattan, leased by the IRT 37 years earlier for 999 years.

While the preceeding is an outline of the growth of rapid transit in the cities, the story is not complete without telling of the rapid transit lines that do not fall within the immediate history or development of the big systems, or are so apart in design and concept that they are here separately noted.

One such line is the Staten Island Rapid Transit Rwy. (SIRT) which still retains much of the charm of the partially developed borough which it serves. A great deal of it remains a surface operation with grade crossings and even a nice stretch through woodland. The SIRT might have become a more urbanized branch of the New York City Transit System had the hopes of the Baltimore & Ohio Railroad, its owner, and the BMT been realized.

The desired end was a link with the BMT via a tunnel under "The Narrows"—which is why its equipment is similar to the BMT's Standard design. This link never came into being, although the BMT did begin a tunnel, which was abandoned before it got very far on its course towards Staten Island. Hopes for this link were revived when the planned Verrazano-Narrows Bridge from Brooklyn to Staten Island moved toward becoming a reality. It opened last November—without rapid transit, the handiwork of Robert Moses, a figure with whom all New Yorkers must live.

The Philadelphia & Western (P&W), shares a terminal with the PTC's Market Street Line and the suburban trolleys of the Philadelphia Suburban system. The P&W first gained attention for its 80 mph. Brill-built "Bullets" and now has the limelight again due to the acquisition of North Shore's Electroliners, which it has refurbished and redesigned for its system, renaming them Libertyliners. These former interurban cars are now serving in a purely rapid transit operation and riding them one is not quite certain whether they are pleased about it.

Another famous suburban rapid transit line was the New York, Westchester and Boston (NYW&B). Grandiose in concept and ambitiously planned, its misfortune was comparable to other operations that exceeded in desire their capabilities. For all its handsome right-of-ways, fine equip-

Maybe this why so few modelers have tackled el structures. Structure supported the 34th St. Shuttle. Station is at 3rd Ave. Afar is 2nd Ave.

ment and elaborate structures the NYW&B never got past Westchester. Defunct since 1937, its right-of-way in New York City is now the IRT Dyre Avenue Line — one of the more attractive right-of-ways in New York.

Two other unique operations are New York's Hudson & Manhattan Tubes and the PTC's Camden-Locust Bridge Line—unique because they are the nation's only interstate rapid transit operations. The H&M, now the Port Authority Trans-Hudson Corp. (PATH), crosses the mile-wide Hudson River in the novel tunnels of William Gibbs McAdoo, from which it branches out to terminals in Hoboken, Jersey City and Newark. The H&M joins the Pennsylvania Railroad's main line west of Jersey City after which it shares the Pennsy station in Newark; right-of-way and track are mutual for much of the way. In Manhattan its right-of-way is a subway. The PTC Bridge Line (owned by the Delaware River Port Authority) operates as a subway from downtown Philadelphia across the Delaware River on the Benjamin Franklin Bridge, then into downtown Camden (N.J.) via subway. This line will be extended to Kirkwood, N.J., making it urban-interstate-suburban rapid transit. It will undoubtedly provide a service as unusual as its description.

The Chicago and New York Transit systems have an interesting side operation—trolley-freight lines that run on portions of rapid transit right-of-ways and maintain connections with other railroads. In both instances the freight operations were owned by a previous rapid transit company. The Chicago Transit Authority freight line was originally part of the Chicago Rapid Transit system's network and operates over a portion of their North-South Line. They can be seen on rapid transit track in Chicago five nights a week. The South Brooklyn Rwy. (SBK) was originally purchased by the BRT in 1900 and has survived to this day. It operates twice daily, five days a week through the complex near Ninth Avenue on the BMT West End Line and shares a yard with rapid transit passenger equipment.

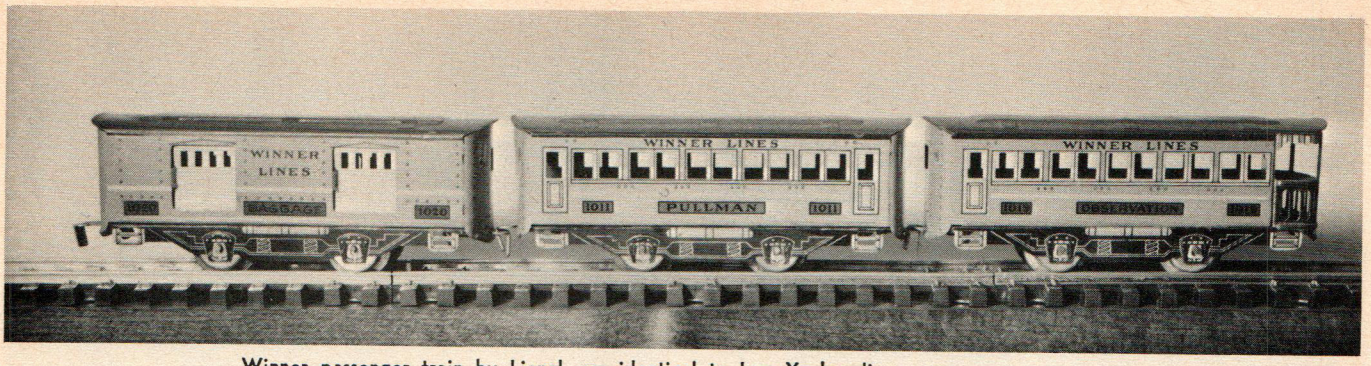
Only remaining grade crossing on NYCTS is at 105th St., Canarsie; in the wilds of Brooklyn.

The first el was a cluster of pillars on which the trackage seemed precariously balanced; but as the concept began to work and other rapid transit operations were planned, ideas began to grow more elaborate.

Dr. Rufus H. Gilbert, designer of the 6th Ave. el, originally contemplated incorporation of Beach's pneumatic system in an elaborate el, arched to a peak and supported by Corinthian columns. (He settled for a relatively conventional el design—though it is quite different from all the others.) El stations began to snatch bits of gingerbread from Americana and stirred it with Venetian lace molded in iron and steel with generous helpings of stained glass applied with a typical Victorian principle — nothing succeeds like excess. Perhaps it would take a bit of doing to outdo the terminal of the old New York and Brighton Beach RR (now the BMT Brighton Line), which was the Brighton Beach Hotel, into the lobby of which it ran in steam days. (The other terminals for Brooklyn's steam railroads running to Coney Island, before they became electrified rapid transit railways, were at similarly rococo structures.)

The great Chicago junction, the proudest spot in Chicago's complex, might well have been purposely designed for an impressive display of the bustle of rapid transit. The subway stations in New York, while not as elaborate as the one in Moscow, did show evidence of interest in more than the simply functional. Colored and mosaic tile were prominently and profusely used with the proudest achievements of the imagination of the BMT and IRT being their symbolic tiles. Many stations can be identified by these tiles (such as the beaver, symbol of John Jacob Astor's fortune, to be found at, of all places, Astor Place, while the station at Columbus Circle bears a relief of the Santa Maria; and a bell-stacked loco is at the Grand Central subway station).

The BRT prided itself on its Brighton Line embankment which, not at all the Chinese Wall that was feared, became a very reduced version of the Hanging Gardens of Babylon. They were similarly proud of their cottage-like stations with Spanish tile roofing.



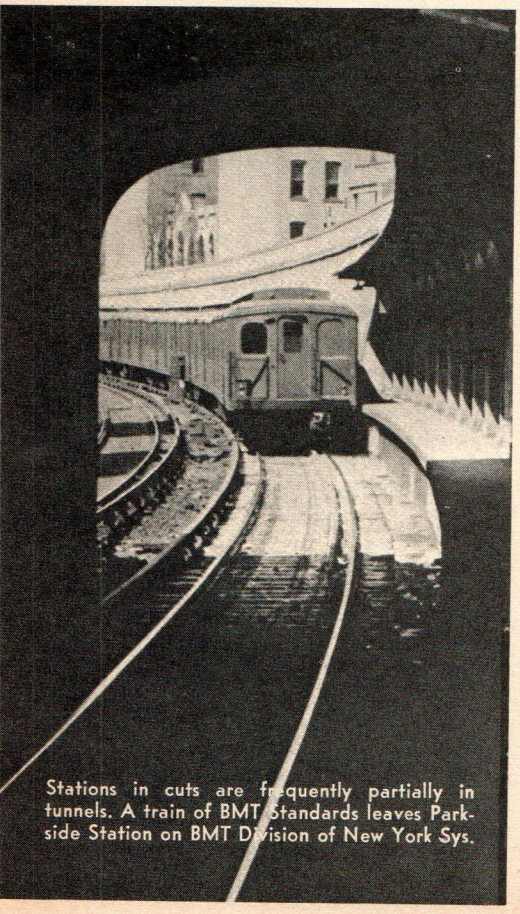
Winner passenger train by Lionel was identical to Ives Yankee line train except as to colors and lettering. Extremely low price on train did not cause lack of baggage, Pullman, and observation cars.

Yankee and Winner With a Lionel Nameplate

by Roger Arcara

The squelched master plan of the NYW&B might have resulted in one of the more remarkable rail operations. Nowhere was the NYW&B's imagination more perfectly evident than in its station houses. Constructed at about the same time architectural monstrosities were popularly called 'enduring works of art' these buildings can enjoy clear-cut labels for the finesse of design. Predominantly influenced by renaissance and mission architecture, a few range far afield. The most startling example was the station house at Third Street in Mt. Vernon, which bears a strikingly resemblance to the Temple of Mithra that was unearthed in London in 1954, vintage: 4th century A.D.

Incidental to the subways were the 'kiosks'—oriental-style structures that covered subway entrances. Occasionally a report would come in that Fatima of the Seven Veils had tripped lightly from a kiosk — it should be mentioned this has never been confirmed by anyone in a state of reasonable sobriety.



Stations in cuts are frequently partially in tunnels. A train of BMT Standards leaves Parkside Station on BMT Division of New York Sys.

Perhaps nothing is more indicative of the development and maturity of rapid transit than the various car designs. The first cable car straddled the gap between the horse-car and what was to rapidly develop as the 'el car.' Wood designs flourished in the last century with a peak reached at an early stage in the 522 series Manhattan Rwys. el car; Axminster carpeting and a decorative window arrangement marked that design. One of the more popular el cars was the convertible, the sides of which came down on balmy days. A week-end excursion was heightened by a ride in one of these vehicles.

With the steel age came a need for further advance in car design. At first a distinct reluctance in breaking away from the wooden el designs was evident. The H&M's steel car was capped to resemble wood, a nod toward convention. However, Brooklyn and Boston realized that something remarkable could be done with steel and, within a decade, cars fully twenty feet longer than previous equipment were in revenue service. They sported a great number of the features electricity was to allow and the old el car features were completely dropped to provide an altogether different experience in urban travel. The BMT exploited a new width to provide a car entirely keyed to comfort. They followed this with experiments in articulated rapid transit cars, producing five distinctive designs in only 15 years. The articulateds were a great success for the BMT and it is surprising that only Chicago was to try it in the ensuing years.

Thanks to the Mass Transit Act. initiated by the late President Kennedy and passed in the last session of Congress, rapid transit is beginning to assume increased prominence in city planning once again. Though all other rail operations never recovered from early censure and modern prejudice, rapid transit had its short twilight turn to dawn as it prepares for a new era of development. Maybe this is also the time for pike planners to consider it for the layout.

Freight cars included a buff-color box car with blue roof, No. 1514; a blue gondola car, No. 1512; a silver tank car, No. 1515; and a red caboose with dark brown roof, No. 1517. No example of the No. 1513 cattle car has yet been seen. The box car is found with the sliding doors and door runners painted either orange or light green. Probably those with the orange doors were intended for Winner sets, since orange was the characteristic color for the Winner series, but since no maker's name then appeared on these freight cars, it is likely that some green-door box cars found their way into Winner sets. No Yankee sets were catalogued with box cars. As with the passenger cars, both 2- and 3-car sets were offered. Both the freight and the passenger cars were about 6" long each, but different underframes were used: passenger cars had flat, lithographed frames with detailing, while freight cars had embossed frames of a different shape, painted plain black (and later red, when brighter colors became the rule).

As was briefly mentioned, the same cars used in the Yankee sets were also used in the Ives wind-up trains of 1932. The wind-up sets, however, were not part of the Yankee line, which included only the cheapest electric sets. A small, 5½" passenger car, No. 1504, was made for use in the

Rapid Transit

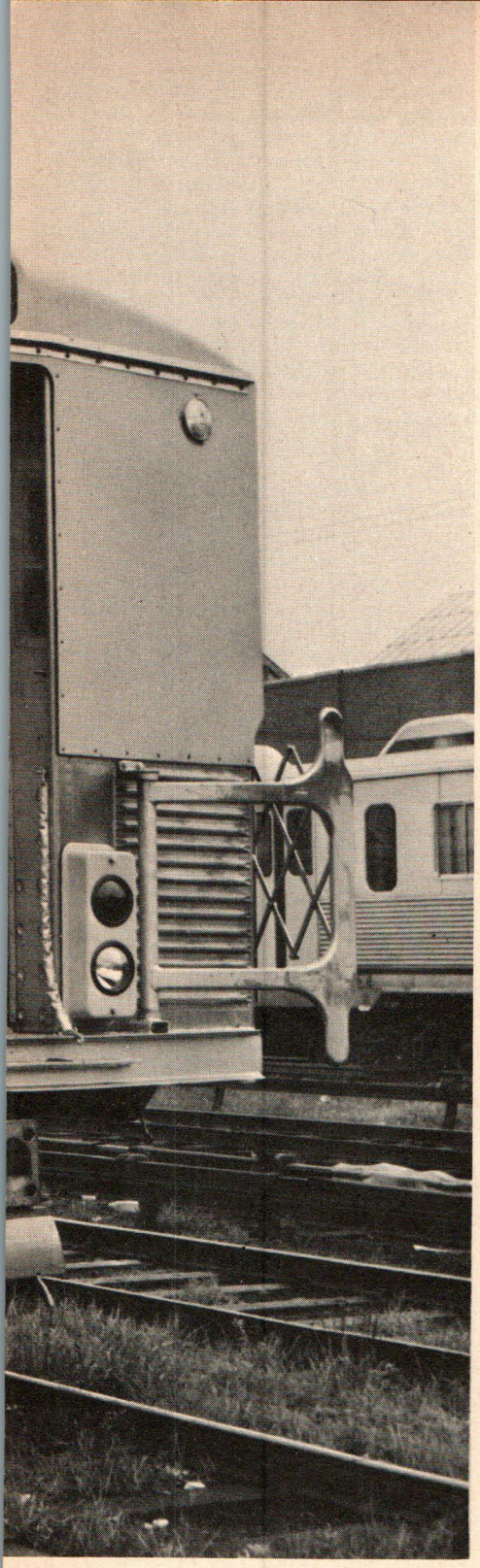
by Paul & Leigh Matus

Rapid transit lines already serve many of our larger cities and indications are that rapid transit will soon be serving countless more, bringing speedy, smog-free, traffic-free electric rail service to harried commuters.

Market-Frankford subway-elevated cars put into service in Philadelphia in 1960 replaced old wood cars. Budd stainless steel cars are equipped with PCC-type inside frame trucks. Note 3rd rail.

RAPID transit is one unexplored arena of modeling. The first thought that may come to many a mind is that rapid transit is unexplored because it is very uninteresting —one of a number of misconceptions that amounts to a lack of knowledge of the prototype, no proximity to a rapid transit city, or both. But a careful breakdown of the attractions of rapid transit in the prototype—and the applicability of them to the layout —would uncover a surprising number of pluses that no other form of modeling offers and very few flaws intrinsic to it alone. Its long and unbroken history, its eras of transition, its variety of right-of-ways and equipment is often greater than in any other single rail division. The demands of its operations, its great junctions and enormous yards, the possible network of rapid transit, trolley and even trolley-freight operations (such as in Brooklyn and Chicago), promises a truly moving and limitless layout. As such, it is worthy of inspection—deep inspection—by the modeler who is looking for something really exciting in a prototype. It allows great room for imagination and new and untried scenic ideas for the modeler a bit jaundiced by the ordinary operations; or for the modeler with a minimum of room and looking for a maximum of operation to fit the almost non-existent space he may have available without creating a layout which is both meaningless and not at all on speaking terms with the prototype.

The greatest virtue of rapid transit is that it serves people and they, un-



like cows and coal, will not wait a substantial amount of time for anything, especially on the way to work. Serving humankind is what gives traction its great vitality and is that which makes the layouts of traction modelers bustle with excitement and movement. These are prototypes for great planners and movers and this legacy is easily transferred to the modeler. Rapid transit is the multiplication of the planning and action of familiar trolley and interurban traction, as it must move many more people. The fact that the area in which this movement is required is limited serves to creat new problems which can only be solved in a layout alive with movement and trackwork.

The breadth of right-of-ways is nowhere greater than on rapid transit systems. Certainly, there is the primarily urban el and its compatriot, the viaduct; and the subways are an unforgetable operation. But they are more than generously balanced by the sweet woods through which the Staten Island Rapid Transit runs, the almost paradoxical grade crossings, the P&W track spanning the Schuylkill River in a scene familiar to western modelers; and the history-laden and varied right-of-way of the BMT Brighton Line. Over these right-of-ways have run, at one time or another, over a dozen varieties of equipment.

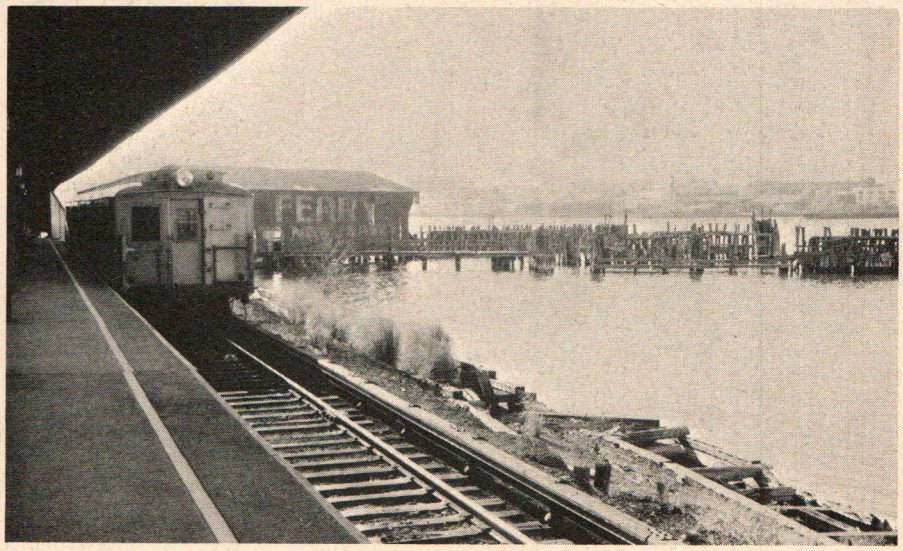
Rapid transit right-of-ways will always be recognizable as rapid transit alone. On the established layout it may be used for interurban and rail connections. It may even be employed as a service which takes commuters from your long-distance trains to some other spot in your urban complex. But skirting rapid transit is by no means to discover the attractiveness of these operations. A system of rapid transit operations will add variety, new experience and a revitalized look to a well-established pike.

Rapid transit is traction and capable of sharp curves and greater grades; the transition, from one to another is its own poetry. (One little shuttle, the Franklin Ave. Line of the BMT, though only four stations and one and one half miles long, begins in a concrete-walled cut, moves into a foliated cut and passes rapidly from embackment to el.)

Surface is the "common" right-of-way. From it the two right-of-way pairs may be spun off—the subway and cut or the embankment and elevated pairs. Of course, however limited surface rapid transit operation may be in the prototype, it is worthy of consideration as other than an easy or transitional right-of-way. The sight of from two to four hundred feet of subway cars running on the surface, through a grade-crossing with all the trimmings is as good and unusual for the model layout as it is the prototype.

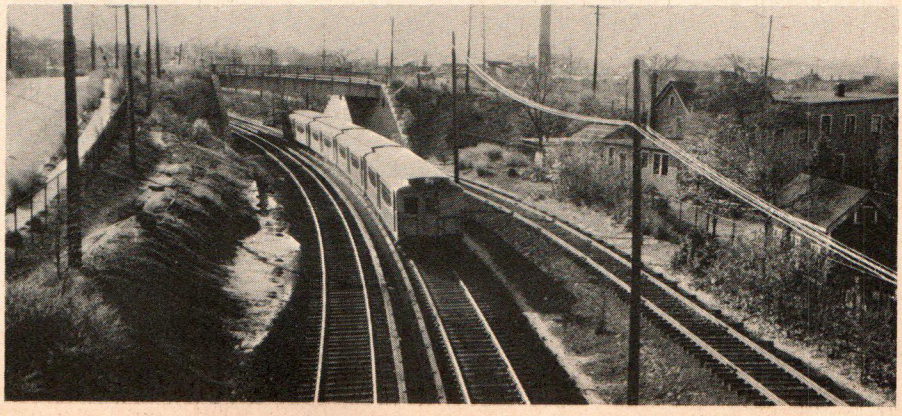
The aforementioned pairing of right-of-ways is little more than a means of taking advantage of a similar level to provide two dissimilar right-of-ways without radical change of grade being a necessity. The following paragraphs should clarify the incorporation of these right-of-ways and their value to the modeler interested in diversity.

The pairing of the cut and subway is a convenient and interesting operation. The cut is versatile and may be



ABOVE: Tottenville, Staten Island, doesn't look much like New York City, but it is. Ferry to Perth Amboy is gone. SIRT service was once better; has been cut back. B&O owns SIRT.

BELOW: Staten Island Rapid Transit right of way is well maintained. Freight service is performed by battery of diesel switchers. Cars are almost identical with BMT standards.



used anywhere but on the spot furthest to the rear of your layout. The cut may be made by raising the general level of the land surrounding the cut (a common occurence on the prototype) while having the choice of two distinct styles of cut to suit your taste. The walled (concrete) cut is a most familiar one that can show off your genius for construction; the sloped earthen cut, while less common, is a beautiful one if landscaped with trees, shrubs, and bushes (this is rarely a planned phenomenon in the prototype). It is easy to construct and allows a good view of your trains and right-of-way from many more angles than does its more formal counterpart. The cut may be used as a convenient, and even dramatic transition to a subway operation. If the cut would be run diagonally across your layout to enter into a subway it will creat a true effect that is just right for a unique view for the modeler or the observer. The view we speak of is an old favorite for rapid transit fans, trains entering or leaving a tunnel; a contrast that gives a hint of the interest of the subway operation.

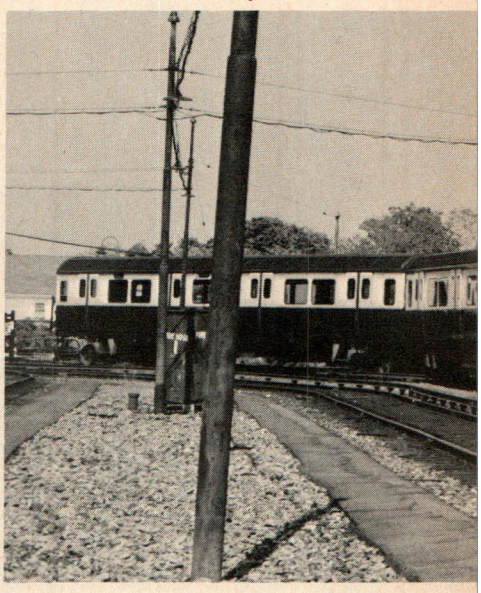
afford a very different view of your trains but contributes to the logical use and integration of the subway in your layout. Additional impetus may be given by taking one or a number of your trolley lines into your subway to run as a low-level local operation. The trolley-subway in Philadelphia operates on either side of the tracks used by conventional, high-level rapid transit equipment. Introducing trolleys to your subway at some intermediate point in the operation will add another dimension to the subway while providing a good excuse for the unusual underground trolley loop terminal adjacent to that for conventional rapid transit equipment; a splendid conclusion to your subway operation.

The embankment at its most decorative is brilliant as a right-of-way. (There are Chinese Wall embankments, ideal for angering residential folks and creating a construction good for little more than handball.) Embankments are rarely very high but, in many ways they are the most impressive of right-of-ways for highlighting the running appearance of your equipment. Generally they are

walks of the Ninth Avenue byway, Manhattan. The pillars of the first el were lengths of steel joined by bars, precariously supporting the tracks by means of a petal-like burst of steel. As the els developed and moved from the sidewalk to over the roadways, the elwork began to vary greatly; the pillars at their simplest were 'H'-beams with simple supports for cross-girders to lattice-work on the most complex. Now that the tracks were not separated by the street, they were supported by a network of girders run from pillar to pillar and perpendicularly set girders beneath each rail supported by the cross beams. The girders beneath the rails took on many variations, as well, and include a basic 'I' girder to varieties of lattice-work in 'V' and 'X's'.

Also peculiar to the embankment and el are the large structures that may be found on them; switch towers in a variety of sheds used by personnel. On the els, a carryover structure from early age was to be found long after steam was abandoned: the water bridge. A simple setup of lattice work and hoses, the water bridge spanning the tracks, fed thirsty locos.

ABOVE: Streetcars take to the subway in Philadelphia, too, providing faster traffic-free service not possible on crowded city streets.



ABOVE: New Boston equipment differs markedly from cars of Chicago, Philadelphia, or New York. Most systems use outside 3rd rail.

The subway is a place for a healthy imagination to run rampant. The mute tunnel, the lights and the girders, the lights in the trains, all set a tattoo of light and movement. While a subway may seem restricted, and therefore an illogical choice for a right-of-way, it offers many highlights that cannot otherwise be found in a conventional model railroad layout nor in many a prototype. A brightly-lit arcade in the subway station, the hazy tunnel lights and signals are just a part of the interest inherent in the subway right-of-way. Additional interest may be had by employing a curve that sweeps from your subway straight-away into a terminal station situated beneath some important central spot on your layout. Not only does this

about 15' high, allowing clearance for vehicles to about 12' above street level.

The well upkept rapid transit embankment is a riding experience. The earthbed provides a smooth quiet ride and in the warm months, when tree-tops form a wall of foliage, it is exceptionally scenic. However, the embankment can also be a simply functional and unadorned right-of-way when used to provide transition from surface, cut, or subway to an elevated.

The elevated railway, rapid transit's oldest fixture, comes in many designs, each of which reflects a great deal more than meets the eye. The very first el, mentioned in our previous article, was but a number of pillars in a row planted in the side-

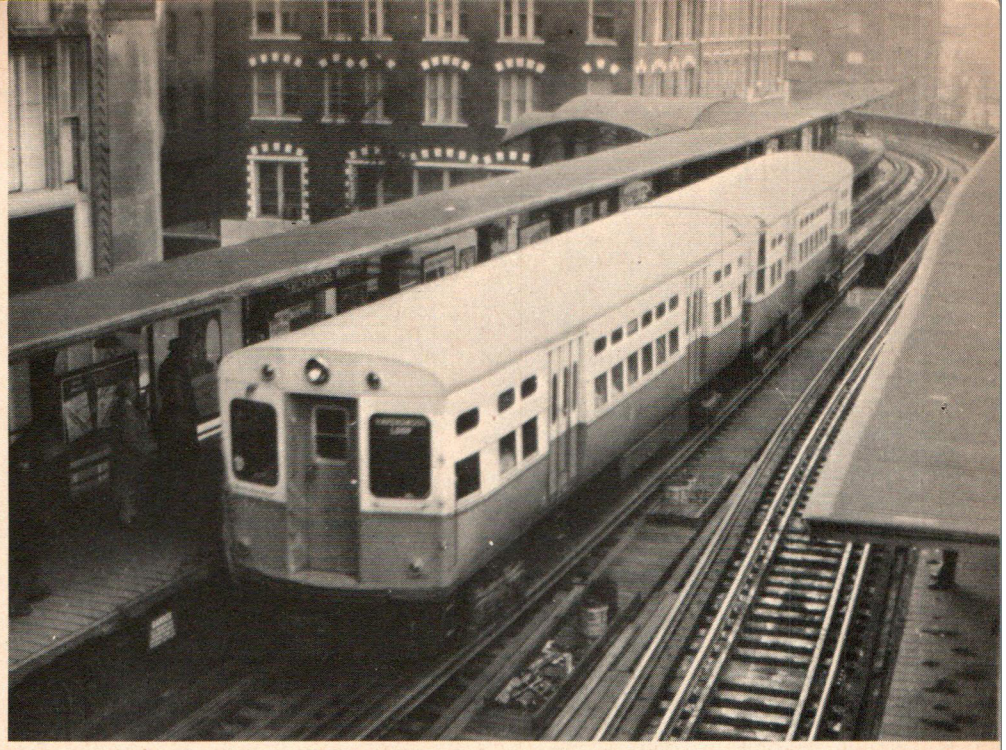
The modeler may take advantage of a rapid transit curiosity hinted at previously. "The level grade", is a marvel of manipulation of land area.

The Franklin Ave. Shuttle represents the purposeful alteration of contours to make a feasible, level operation. Perhaps the alteration of the flat land of Brooklyn along its right-of-way is best displayed by the fact the track passes under one street and above the one following it. Another example of a level right-of-way is on the IRT Broadway Line at 125th Street station and at the Dyckman Street station, both in Manhattan. These are not altogether man-made changes. The last Ice Age left many hilly areas in that borough and as a result the right-of-way passes from

subway to el with only the slightest of grades. At Dyckman Street, this phenomenon is exceptionally picturesque at the train pops from a portal in a gentle hillside and out onto an el after a station on an embankment.

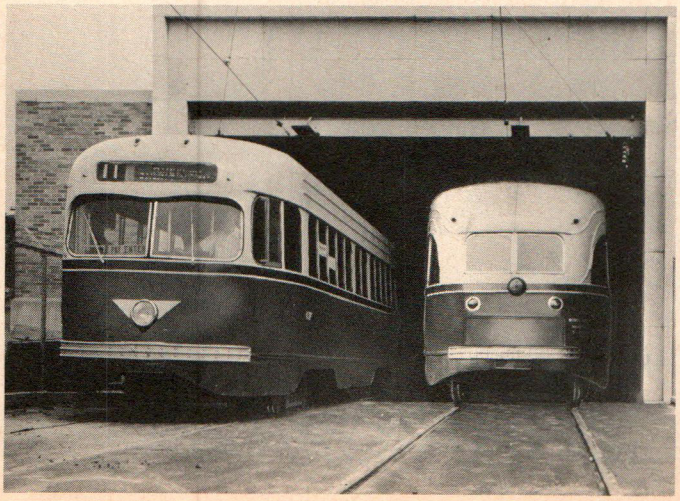
Once you have chosen the size of your layout, or that portion of your layout you wish to use for rapid transit, and have sketched out the plans of your right-of-way, you must then weave the pattern of your system. Do you prefer a fully urban system, an urban to semi-urban system, urban joining suburban or any of a number of combinations? Will it be arranged as a loop "figure-eight" or point-to-point? Will there be shuttles, a trolley-freight connection? Perhaps you would prefer a radius system with all lines meeting at some great junction. Where is the place best suited to your terminal and yard? Does suburban rapid transit suit your plans and, if so, will it meet your rapid transit city lines at some outlying spot or join with the urban rapid transit system? How great a variety of equipment do you wish to use?

As a rapid transit pioneer, you'll find ready to run equipment scarce.



Chicago's PCC-type el cars are largely rebuilt from former Green Hornet PCC cars. North Shore and CA&E once shared el track in loop.

BELOW: 40th St. Portal of Subway-Surface branch of Market St. Subway extension to 46th St. was placed in use, Oct. 1955 using PCCs.



BELOW: Polo Grounds Shuttle using portion of long gone 9th Ave. El was abandonded when N. Y. Giants left town. Station is half in tunnel.

A string of modern Budd cars slithers up onto the elevated structure after leaving the subway extension of the PTC near 46th st., Philadelphia.

The company providing building components will be your friend for some time into the future. Parts from Selley, Walthers, Wagner, Northeastern, Kemtron and others will provide a great range of items that can readily be fashioned into rapid transit articles. Colored and clear plastic will be a useful accessory and if you ever made pipe cleaner animals the trick you may have learned can be applied to wire to make any number of intricate constructions. In short, you can use every trick you have gathered from experience or imagination.

Accessories designed, or just right for rapid transit applications include prototype el car gates in brass from Kemtron in HO scale, available after two prototype styles. In "O" scale, Wagner has a large wheelbase PCC truck similar to those used on many post-war rapid transit cars. Prototype elevated structure parts and signals, as well as smaller rapid transit accessories, are being prepared or are already available from Silver Leaf Rapid Transit Models.

In actual rapid transit car models, Silver Leaf is currently developing its line, which now includes the New York City BMT Standard 67' subway car and Chicago's 6000 series PCC-style cars, both made in Japan of brass and fully detailed. Also available from Silver Leaf are el cars in kit form made of wood with metal parts according to the needs of the kit. All of these models are available in HO scale only thus far, "O" scale is promised shortly.

Ken Kidder has two models applicable for rapid transit use. The latest is the articulated low-level-loading San Francisco Key System car, now available in HO scale; and the 70' Japanese National Rwys. suburban coach, also HO scale. Both models are made in brass in Japan.

Model Tramways System will have the Electroliner of the North Shore, in HO which now provides suburban rapid transit service on the Philadelphia & Western mainline as the Libertyliner.

You will find that urban trolleys are excellent companions to your rapid transit cars. Model Tramways has a Brooklyn trolley of about the same vintage as Silver Leaf's BMT Standards, and a new Peter Witt. Ken Kidder is always a reliable source for a number of urban trolleys, particularly in "O" scale.

Rapid Transit information is scarce. Silver Leaf, has publications with prototype pictures and information geared to the modeler and his layout. Prototype information, generaliy of the newsy sort, but helpful to the modeler is available from the Electric Railroaders' Assn., 145 Greenwich Street. New York, N. Y.

Several open end rapid transit type car plans and other photos are found in "Traction Planbook," by RMC's publishers.

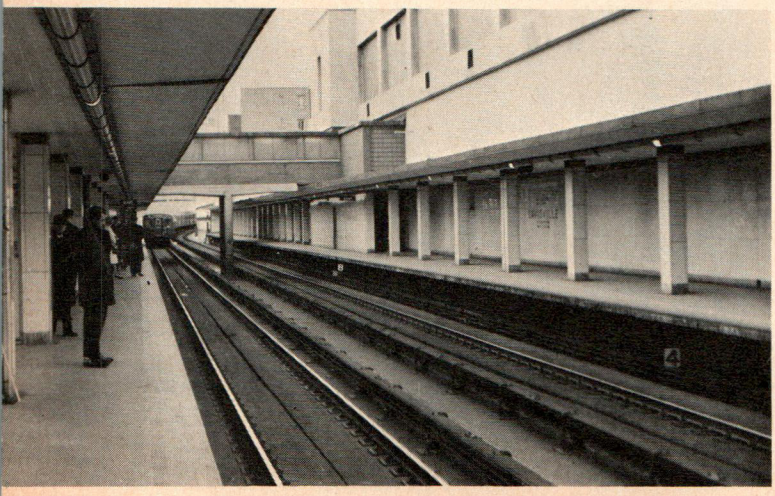
Before going further into some specifics of planning rapid transit, a word of caution. There will be many quality, ready-to-run items on the market for you in future years. Now, however, things are a bit on the lean side and your reliance upon your own resources, imagination, skill, craftsmanship will be very important. Everything you may want to know before and during planning your operation cannot be covered in one fell swoop by magazines and publications.

So, before exercising your imagination or craftsmanship give a thought to the future of your layout as well as its present. We often hear of a modeler who is rushing into building a specific right-of-way exclusively, or some particular operation, system, line or era.

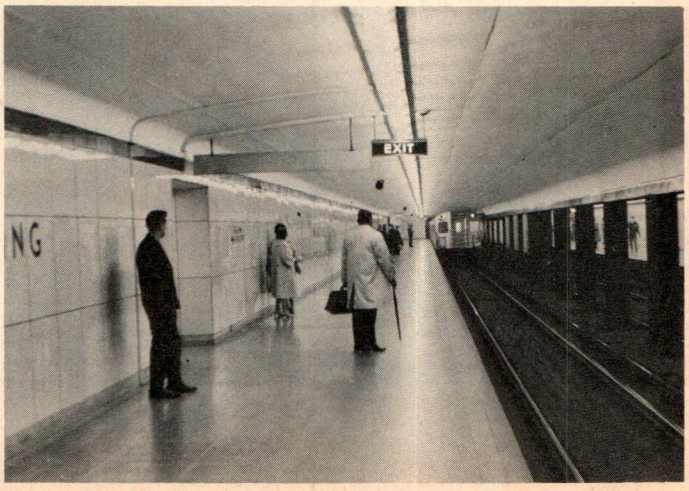
Plan now for those lines you may want to add, those right-of-ways you want to widen, those operations you may want to include. Keep in mind that rapid transit mixes eras with ease in the prototype and many types of equipment have run simultaneously on one right-of-way. The old very rarely disappears altogether in rapid transit, rather it is eased out.

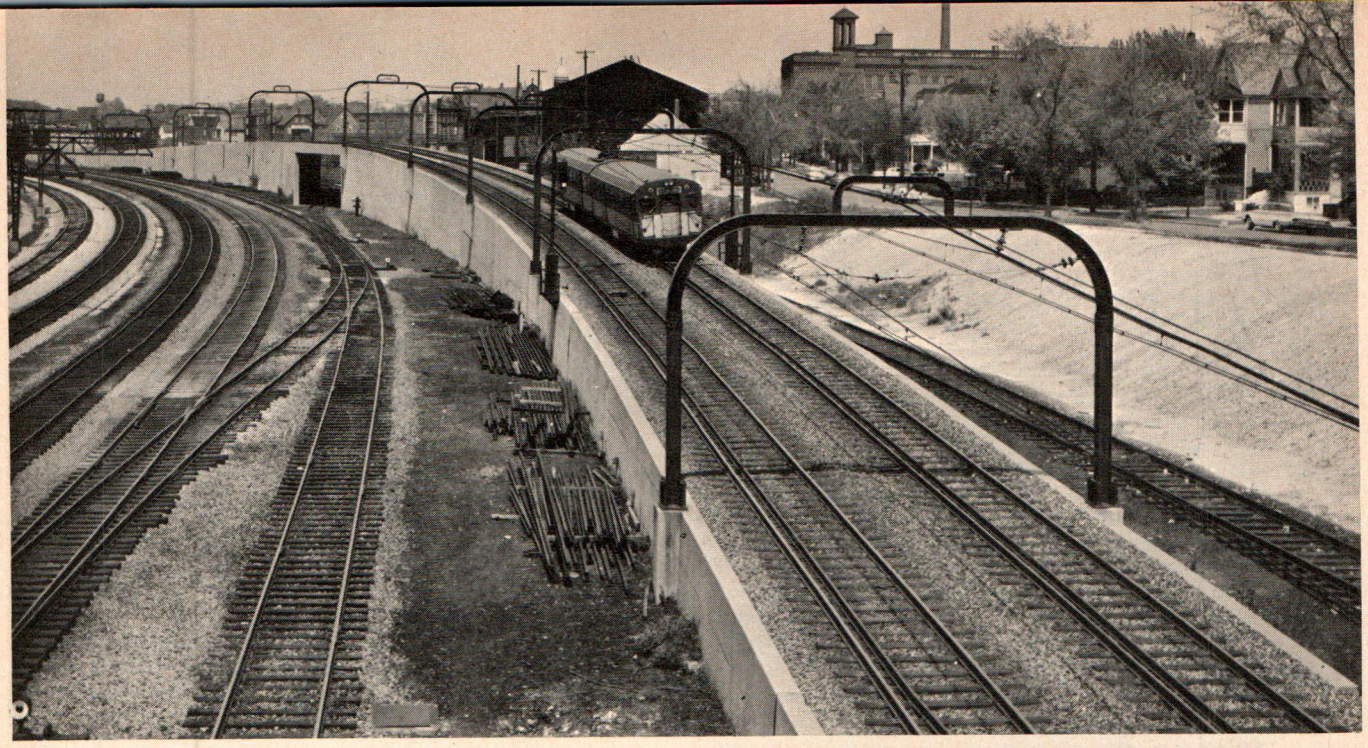
A well-planned layout need not date itself. If you are worried that your right-of-ways as planned now may outlive their uses go right ahead and make them. A change in the type of right-of-way you have begun with may turn out to be one of the more interesting aspects of your layout. Knocking down a cut wall to add a new line may actually result in a scene you will want to keep partially built. A "temporary operation" made permanent by the halt in construction might be served by some favorite old el cars. The permanently temporary operation is also true to prototype—ask any New Yorker. Rapid transit "under construction" is something all in itself.

BELOW: Davisville Station on Toronto's new rapid transit system is in open cut. Roadbed is unique; is built to provide fast draining.

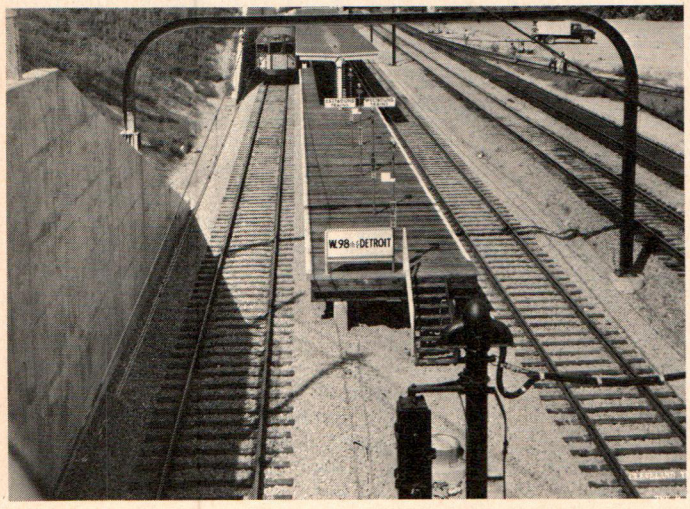


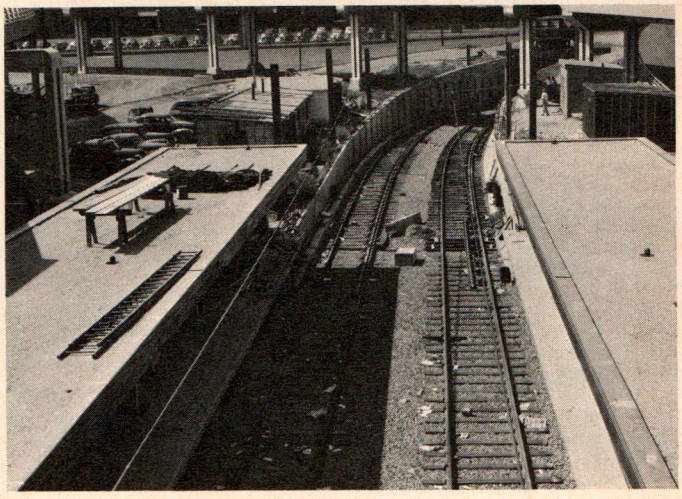
New York was never like this. Spotless Toronto system is washed down thoroughly during five hours system is closed down nightly.





Cleveland Rapid Transit, above and below, uses catenary for pickup; shares some right of way with PCC operated Shaker Heights System. New York Central parallels route. Overpass above crosses NKP.





Construction photos, above and below, of Boston's Airport Station. Rapid transit costs are far less than comparable highway costs; can carry larger crowds faster in fewer vehicles but need subsidy.

Thanks to the Mass Transit Act (which does not appropriate a great deal more funds to develop transit throughout the U.S. than goes into everyday highway capable of moving only a fraction of the people that could be carried by a rapid transit line at a lower cost per head per passenger mile rapid transit may make its debut in many U.S. cities by the end of this decade. The ten times proposed Second Avenue subway for Manhattan may even be built. That would leave only one place not covered by rapid transit—the model layout and only you can do something about that!

PHOTO CREDITS: Chicago views, Chicago Transit Authority. Elevated photos, Martin Schachne collection. Boston, Massachusetts Bay Transportation Authority. Philadelphia, Philadelphia Transportation Company. Cleveland, Cleveland Transit System. Toronto, V. M. Chudoba. Staten Island, Silver Leaf. Cover shot of Brooklyn fan special, Hal Carstens.