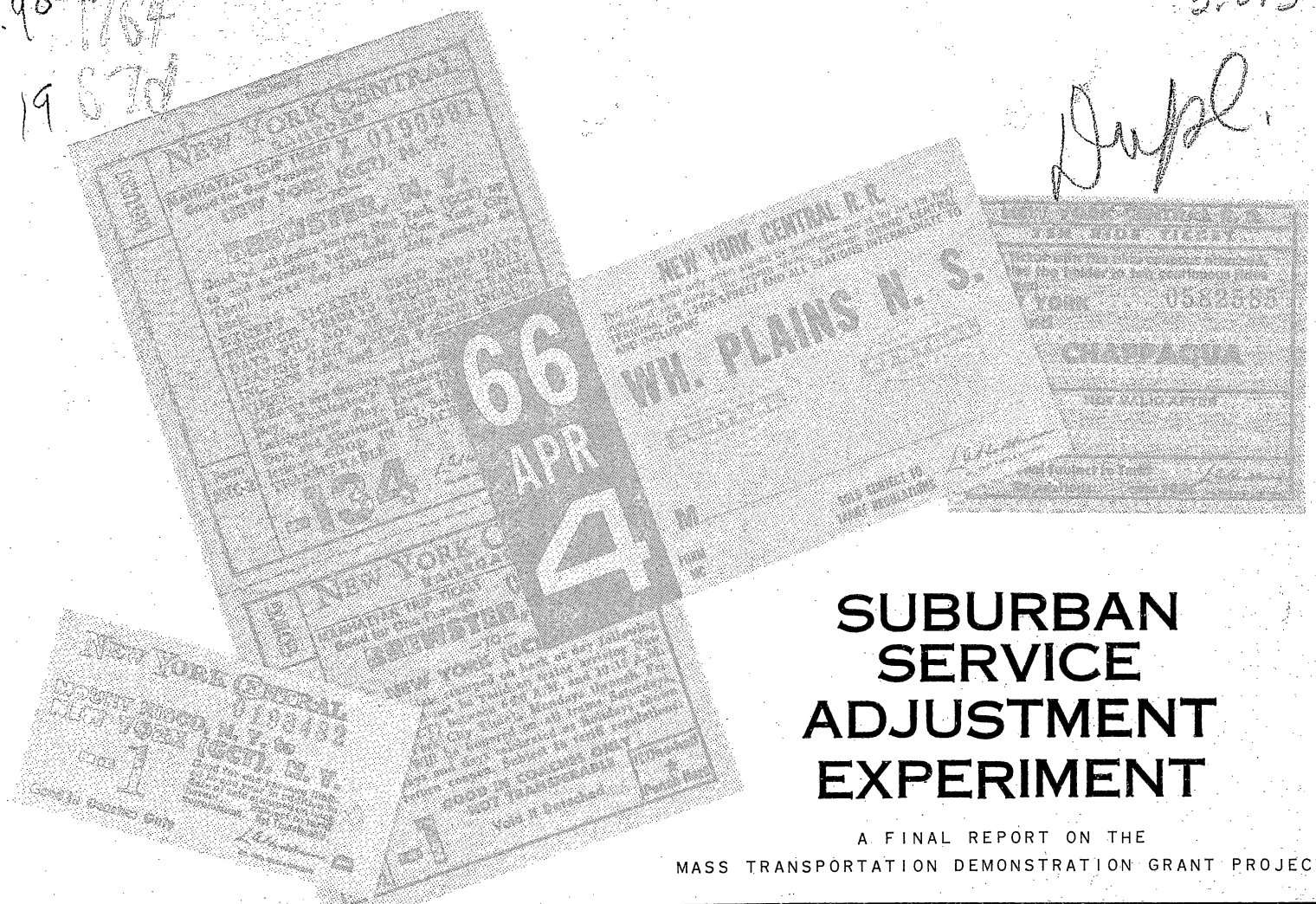


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# SUBURBAN SERVICE ADJUSTMENT EXPERIMENT

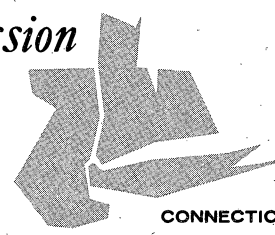
A FINAL REPORT ON THE MASS TRANSPORTATION DEMONSTRATION GRANT PROJECT



*Tri-State Transportation Commission*

*November 1967*

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The Tri-State Transportation Commission, an inter-state planning agency, defines and seeks solutions to immediate and long-range transportation and land-use problems of the New York metropolitan region covering 22 counties in New York and New Jersey and six planning regions in southwest Connecticut.

Established by legislative action of the states of Connecticut, New Jersey and New York in 1965, the Commission succeeds the Tri-State Transportation Committee formed by the governors of these three states in 1961.

Although regional planning is its primary task, the Commission is also a central supporting resource for local planning. It provides assistance in solving problems that spread beyond local jurisdictional control. It also encourages coordination among all agencies charged with planning or providing transportation and related public facilities within the Tri-State Region.

The three states and the Federal government finance the work of the Commission. Federal funds come from highway planning aid administered by the U.S. Bureau of Public Roads and also from planning and mass transportation grants provided by the U.S. Department of Housing and Urban Development.

Commissioners representing the three states are appointed by the governors in accordance with the laws of their respective states. Federal representatives are appointed by the appropriate officer holding such authority within the Executive branch.

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SUBURBAN SERVICE ADJUSTMENT EXPERIMENT: A Summary

Harlem Division – New York Central Railroad

Westchester and Putnam Counties

*A Final Report on the Mass Transportation Demonstration Grant Project:*

*July 1, 1964 – October 31, 1966*

Participating Agencies:

*Tri-State Transportation Commission*

*U. S. Department of Housing and Urban Development*

*The State of New York*

*Westchester and Putnam Counties*

*New York Central Railroad*

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A detailed version of this report, containing supporting tables, is available upon request.

Issued November 1967

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\* Some committee members have assumed new titles since the termination of the project.

## *The Harlem Division Experiment in Brief*

Will improved suburban rail service—faster schedules, more frequent service and expanded parking facilities—attract a substantial number of additional journey-to-work and midday users in an “outer ring” suburban area?

On the whole, an affirmative answer to this question was obtained during the recently concluded mass transportation demonstration project on the Harlem Division of the New York Central Railroad. This project, which was focused on the line between White Plains and Brewster, was sponsored by the Tri-State Transportation Commission and the State of New York. It was carried out in cooperation with the U. S. Department of Housing and Urban Development, Westchester County, Putnam County and the White Plains and Pleasantville Bus Line, Inc.

Project train service was initiated July 1, 1964, and, after 28 months of operation, rail patronage in the area had increased approximately 11 percent. In view of this favorable ridership increase, the New York Central decided to retain 11 of the 12 off-peak project trains after project financial support was terminated in October 1966.

Many of the original project ideas did not receive unqualified public support. But during the experiment modifications were made and much was learned that is expected to provide valuable guides for further suburban-rail changes in the Tri-State Region and elsewhere.

A speed-up in service was attained by adopting a skip/stop type of scheduling: six of the smaller stations north of White Plains were removed from the schedules of most trains.

In addition, stops at stations below White Plains were removed from these same schedules. Short of making capital improvements on track structures, station facilities and rolling stock, for which project funds could not be expended, skip/stop-type schedules proved to be the only apparent method of improving running times.

Initially, hourly off-peak service was provided by adding ten new Brewster/New York trains—five in each direction. In addition, four local trains—two in each direction—were operated between Brewster and North White Plains. Also added were 12 trains—six in each direction—between North White Plains and New York to provide service at those stations removed from the Brewster/New York schedules. Subsequent schedule changes in April 1965 resulted in 12 project trains operating between Brewster and New York with the four locals being discontinued.

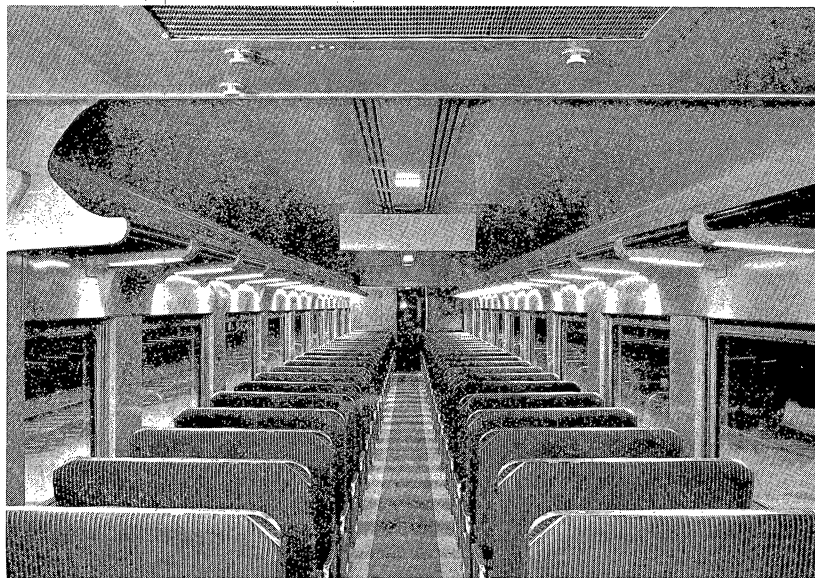
Parking facilities at six stations were expanded by more than 1000 spaces. New parking lots were built by the State of New York, and a portion of the cost was reimbursed by a space-rental arrangement approved by HUD. A coordinated rail-bus service was also instituted to feed travelers from the upper, nonelectrified service areas to North White Plains, where maximum service was available. It also provided an option for travelers from two of the non-express stations at which the number of train stops had been reduced.

From the day that word of the Harlem Division project was released, a steady stream of complaints and court-suit threats was received. Project opposition, which stemmed from the



*Early in 1966, the first of 40 converted, New York Central mainline coaches were added to trains in the project service area of the Harlem Division. Initially purchased after World War II, the cars had been rebuilt at the railroad's passenger car shop in Indiana at a cost of \$1.6 million. Each chrome-trimmed car is 85 feet long and loading takes place at one end only.*

*Interior improvements on these cars included new linoleum tile flooring; heat resistant and tinted glass that eliminated the need for window shades; and high-backed, 2-and-2 reversible seats upholstered in woven plastic fiber. Public address systems were also installed. Perhaps the greatest improvement was more than doubling the seating capacity of each car (52 to 108 seats).*



towns that saw themselves adversely affected by the proposed schedules, led to a series of public meetings at which project proponents urged support of the experimental schedules. It was agreed to restore a few of the stops on peak-period trains at the skipped or nonexpress stations.

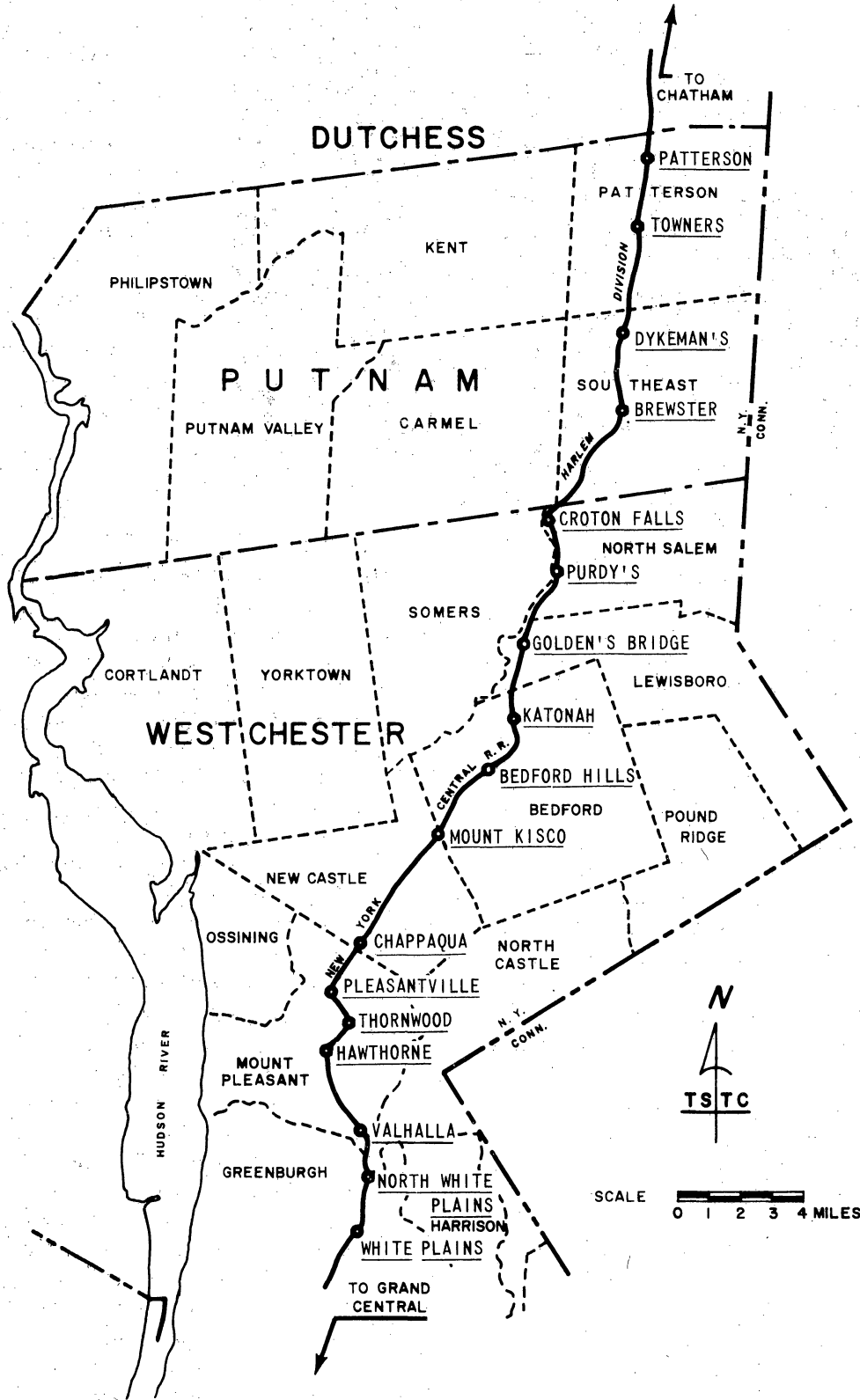
The project commenced as scheduled, and continued opposition from a small minority of the upper Harlem Division patrons culminated in a hearing held by the New York State Public Service Commission. The resulting PSC order restored peak-period service to near pre-project levels and, as a result, this phase of the project as originally planned was dropped from the experiment. While stops were also ordered on off-peak trains, the use of flag-stop scheduling enabled the retention of most running-time sav-

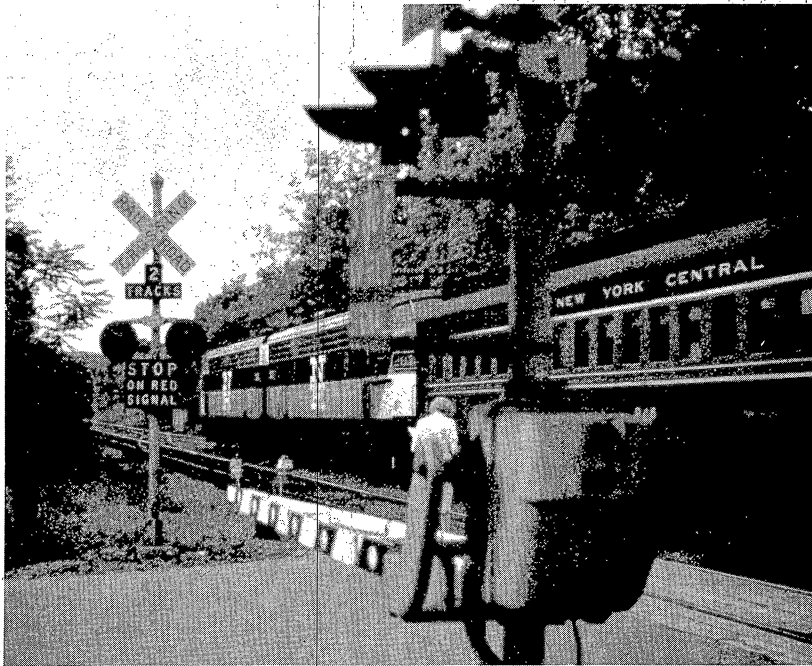
ings, so that this project aspect was, essentially, continued.

At the beginning of the project's second year, several new elements were added. Two dual-powered locomotives were assigned to two popular commuter trains for a four-month period. This was done to determine the extent of expected running-time savings due to elimination of the wait for engines to be changed at the end of the electrified territory at North White Plains.

Also, information about locomotive reliability in this type of service, as well as rail patrons' reaction to the service change, was gathered. Passenger equipment was improved with the addition of Budd rail-diesel cars on certain off-peak trains and later by the addition of rebuilt mainline coaches with a 108-seat

NORTHERN WESTCHESTER and PUTNAM COUNTIES  
 Showing New York Central Upper Harlem Division





*The New Haven leased two of its 60 FL-9 (Front Lead, Model 9) engines to the New York Central to use during the Harlem Division experiment. These engines, which perform either by diesel power or electricity, provide a highly desirable flexibility for electrified/nonelectrified lines, such as the New York Central. Conversion from one power means to the other is effected automatically while the train is in motion, thus eliminating the time loss of engine changes.*

capacity, tinted glass windows and a public address system. This latter improvement, instituted by the New York Central independently of the project at a cost of \$1.6 million, is indicative of its efforts to improve service and attract new patronage.

Perhaps the most important change of all took place in October 1964. A new railroad department—headed by a Director of Suburban Service—was established, making the suburban service the particular responsibility of one New York Central official. A continuing series of improvements have since evolved on both the Harlem and Hudson divisions. Zone schedules were placed in effect during peak periods on the Harlem Division and during the evening peak period on the Hudson Division. This scheduling arrangement improves service by reducing the number of station stops for most trains.

Off-peak service has been improved in the Bronx by the addition of 27 Bronx weekday locals on the Hudson Division; this has served to speed up Westchester trains which no longer make Bronx stops. Off-peak service has been further improved on the lower Harlem Division by the addition of new White Plains local-expresses which run nonstop between New York City and Mount Vernon, making all local stops between there and North White Plains. Night-owl trains providing round-the-clock service

between White Plains and Grand Central Terminal were also added.

Additional efforts to attract new riders included running football and baseball specials to Yankee Stadium. In an effort to increase the comfort of commuters, the railroad conducted a survey of their thoughts on smoking cars. The results revealed that about two thirds of the patrons preferred non-smoking cars, contrary to what management had believed to be the case. Indeed, management's thinking about the marketability of suburban service has changed; it is now willing to experiment and innovate in an effort to improve service, increase patronage and reduce operating costs.

Another element has been introduced that has had a favorable impact on patronage levels, although it was not directly associated with the experiment. At the urging of the New York State Office of Transportation, an experimental off-peak fare became effective on June 27, 1965; it has been continued since the project ended.

The off-peak, one-day Manhattan trip ticket (to and from New York City) already in effect on the Harlem Division provided a 25-percent saving over regular coach fares during the week, as well as on weekends and holidays.

The experimental reduction in the Manhattan trip fare enabled patrons from ten stations within the project to save up to another 25 percent

and gave patrons of all project stations a second day in which to use the return part of the ticket.

A summary of the Harlem Division project's various phases follows:

1. *Faster Schedules*—Changes in train schedules proved to be one of the most controversial phases of the experiment. Because of adverse reaction by a minority of patrons, the planned reductions in running time were not fully attained. However, the project served to focus the attention of the railroad and the public upon train schedules as never before. This awareness produced minimal time savings, even on trains with no station-stop changes.

Initial time savings were as much as 26 minutes on off-peak trains and 13 minutes on peak-period ones. When the Public Service Commission ordered added schedule stops in April 1965, the trains affected were slowed down, but use of flag stops on off-peak trains enabled most of the time savings on those runs to be retained. Despite faster train schedules, the automobile retained its travel time advantage—even during congested peak-period travel—between most Westchester communities and New York City.

2. *Frequency of Service*—The increased service proved to be one of the most positive phases of the experiment. The regular hourly service—together with the elimination of stops between White Plains and New York City—considerably improved the quality of off-peak service. In a user survey, the factors involved in this experiment—commuting-time length, convenience of return service and parking availability—were ranked one, two and three, respectively.

The experiment has indicated that there is a definite relationship between off-peak scheduling changes and peak-period patronage. Where off-peak service was considerably reduced and peak-period service ultimately returned to near pre-project levels (at Valhalla, for instance), peak-period patronage dropped significantly. Where off-peak service changes were the most significant improvements (Pleasantville and Chappaqua), peak-period patronage increases were encouraging. These patronage changes, together with the many favorable replies concerning improved afternoon and evening service in the homeward or outbound direction, indicate that the improved off-peak service has

increased the attractiveness of peak as well as off-peak service on the upper Harlem Division.

3. *Parking at Suburban Stations*—During the experiment a great deal was learned about locating and operating commuter parking facilities. Generally, it can be stated that a parking lot—in addition to being located close to the station so as to require a minimum amount of walking—must also be easily accessible by car. Charging a fee to park does not seem to detract from lot use, providing that there is a high level of train service and alternative parking facilities are at a premium.

By the end of the experiment, the number of cars being parked at upper Harlem Division project stations had increased by 27 percent. Of the eight new lots constructed, four were filled to capacity daily, two were about 85 percent filled and two were lightly used.

Two parking lots were constructed at Hawthorne—one of the express stations. The number of cars parked there increased from 53 in the pre-project month of May 1964 to 181 by October 1966. The smaller of the two lots, located on the east side of the railroad and approximately 600 feet from the station—also on the east side of the railroad—is normally filled to capacity. The second lot—the larger of the two—is located on the west side of the railroad and is generally used to only 10 percent of capacity. The walking distance from the center of this lot to the station is also 600 feet, but automobile access is indirect. Drivers approaching via the Taconic and Sawmill parkways to the west must follow a circuitous and time-consuming route to reach the lot.

Those approaching from the east (97 percent of the lot users) must pass the station or the first lot and continue across the railroad—an additional distance of approximately 2100 feet—and then walk back to the station. Rather than resort to this solution, however, users park in the immediate station area or along the street near the station, causing serious congestion here during the morning and evening peak periods.

The second under-utilized lot is located at Brewster, New York. The walking distance from this lot to the station is 800 feet and upgrade all the way. It may be used by purchasers of a monthly parking permit costing \$5. While

the total amount of parking in the Brewster area increased about 12 percent during the project, available parking closer to the station at the same or a lesser cost restricted utilization of the new lot. Some drivers chose to park in free spaces farther from the station.

While there is a surplus of parking capacity at Brewster for regular commuters, there are insufficient spaces for the occasional traveler. The 50 metered spaces, available in close proximity to the station, are filled by early-hour commuters. The occasional user arriving later in the day is hard put to find a space, even though the new lot may be 90-percent vacant. Construction of a stairway to shorten the distance to the station and installation of meters for the occasional travelers' cars would provide more desirable parking spaces and should increase facility utilization.\*

The greatest parking increase occurred at North White Plains, where parking fees are the highest. Katonah, which has free parking, ranks second in gains, and Chappaqua, which charges for parking, ranks a close third. Where fees have been established by the municipalities that operate the parking lots, they are comparable with those at other area facilities.

At North White Plains, the fee was initially 50¢ a day. On January 1, 1965, a monthly parking permit costing \$8.50 was also made available. Most recent figures show that the sum of daily space and monthly permits being sold exceed the new lot's striped capacity. It is at this location that the upper Harlem commuter has the optimum combination of favorable travel factors—generally good highway access, relative ease in reaching the station after his car is parked and dense train service during the day.

On December 1, 1964, the Village of Pleasantville made available commuter parking permits on a monthly as well as quarterly basis. Rates were reduced from \$12 to \$10.50 per quarter, and the monthly fee was established at \$3.50. As a result of these innovations, the utilization of the lots increased from 35 to 74 percent the first month; most recent figures reveal 85-percent utilization.

In Chappaqua, resident parking permits are sold on either an annual (\$10) or quarterly (\$3) basis. Nonresidents pay higher fees for these permits. There are currently 800 valid parking permits in use, including 25 held by

\* This stairway has since been constructed.

nonresidents. All-day meter parking (25¢) is also available. The lot is conveniently located in the immediate station area.

At all locations, the walking distance from lot to station is as much as 800 feet. Because of a rather steep incline, the walk at Brewster is the most arduous. Automobile access is convenient at all locations, except the Broadway lot at Hawthorne—especially if approached from the west or northwest—and the North White Plains lots for those approaching from the east side of the railroad. It is evident, however, that the higher level of service at North White Plains, as compared with stations to the north, outweighs the disadvantages of higher parking costs and the more difficult east-approach access.

4. *Coordinated Bus Service*—This added service proved to be far less attractive than expected and, as a result, the coordinated bus service was discontinued—after only eight-and-a-half months—on March 15, 1965, when allocated project funds had been expended. This phase of the project had been scheduled to operate 24 months, and it was expected that budgeted funds supplemented by revenue credits would meet the operating costs for the two-year period. But the lack of anticipated patronage dictated its curtailment.

Gains in bus patronage and revenue that did occur during the experiment represented, for the most part, an increase in local use. Observed transfers between train and bus at the North White Plains stations, at which points bus schedules were coordinated with train arrivals and departures, never exceeded a relative handful of riders. Typical counts made in July and August during the 4 to 9 p.m. period revealed a total of only 6 to 12 train riders taking buses at Holland Avenue Station—less than one person per bus.

A morning southbound count in July 1964, during the peak period, showed eight patrons transferring to trains. Surveys conducted during October, November and December revealed only small increases in bus-rail patronage. In February, the level of service was reduced by discontinuing the last four evening round trips; on March 15, 1965, all project service was terminated.

In this relatively brief period of operation, it became evident that commuters who had

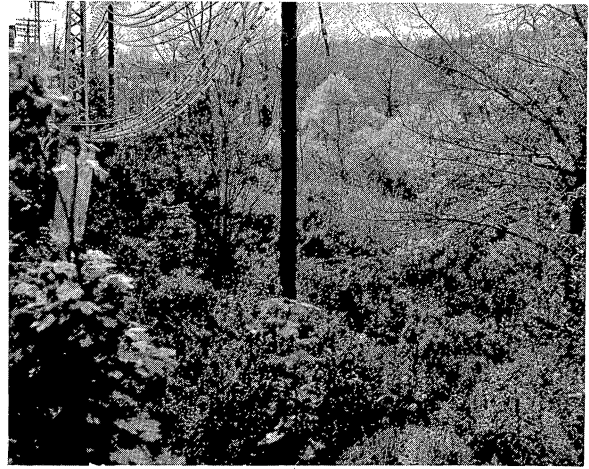
formerly used Valhalla and Thornwood stations, where rail service was reduced, were finding alternate means—other than bus—of getting to adjacent express stations. This experiment also revealed the difficulty of coordinating a line bus service with that of a railroad at an intermediate location on the bus route. Connections are missed when trains run late, and it is not practical to have buses wait for trains, thereby inconveniencing passengers already boarded.

5. *Other Tests*—The dual-powered locomotives proved to be reliable and were well received by railroad patrons. The elimination of the engine change and station stop at North White Plains provided a time saving of 6 to 7 minutes. The net running time in the morning did not reflect such time savings because of train congestion between White Plains and Grand Central Terminal. However, schedule adjustments over an extended period of operations could eliminate these delays, except for unusual occurrences. In the outbound direction in which train interference is less common, the net time saving was 7 minutes or more.

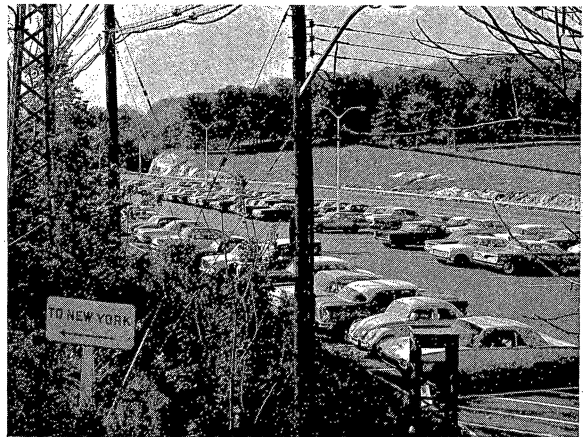
The experimental Manhattan trip fare had a favorable effect on off-peak travel. In the first year of the project—before the fare was introduced—use of this ticket had increased up to 52 percent. However, during the second project year, use of this class of ticket increased as much as 119 percent over the first project year. While the greater use of the Manhattan ticket resulted in a decreased sale of coach tickets, the net result of the sale of both types of tickets was an increase of 28.8 percent in rides sold and 28.6 percent in revenue over the pre-project year.

The effect of improved equipment—rail-diesel cars and rebuilt coaches—on rail patronage could not be measured finitely. However, there can be no doubt that these improvements have been a favorable factor in increasing rail ridership.

6. *Patronage Increases*—Increases in ridership as determined by ticket-sales data have been positive ever since the project was undertaken. For the area of the Harlem Division between Valhalla and Brewster, the number of rides sold to and from Grand Central Terminal during the first project year increased an average of 5132 rides per month over a like period just prior to July 1, 1964. Gains during the second



*One of the most important facets of the project was building convenient parking lots to encourage more journeys to work and other trips by train. The largest project lot was built at North White Plains. Here is the pre-construction site...*



*...and this is how the area looks today. During the project, the lot's 435 striped spaces were not always filled; however, since then, over-capacity conditions prevail at this facility each weekday. Expanding the lot—to the north and east—has been under consideration.*

project year were more impressive with the average monthly increase being 13,601 rides over the first project year and 18,733 per month over the pre-project year.

Unfortunately, the zone-fare structure that was instituted on the Harlem Division in February 1964 precluded a comparable measurement of patronage changes at White Plains and North White Plains. While the distribution of increased

patronage between peak and off-peak trains varies somewhat from month to month, a six-month period—May to October 1966—revealed approximately 58.4 percent of the increase occurring on off-peak trains where the greatest service improvements were made.

Ticket sales for a similar "outer ring" area served by the Hudson Division of the New York Central Railroad were measured against data from the upper Harlem to determine if similar increases were also taking place on the Hudson.

From May 1962 to May 1964, the ridership trend was upward on both divisions; however, increases on the Hudson were approximately four times greater than on the Harlem Division. Since the area within Westchester that is served by this particular section of the Hudson Division is more densely populated than that served by the Harlem, with population increases between 1960 and 1965 in the Hudson area exceeding those of the Harlem, the larger patronage increases on the Hudson were not unusual. In contrast, however, between May 1964 and May 1966 the effects of project innovations became evident. Increases on the Harlem trains were four times greater than on the Hudson's.

A comparison of the increase in cars parked at upper Harlem stations with the average daily increased ridership indicates that the two are approximately equal. The increased patronage, therefore, appears to consist of a driver traveling alone to the station and parking there. It follows then that the monthly increase in rides represents the number of auto trips per month that would have been added to highway traffic if not otherwise diverted.

The principal findings of the Suburban Service Adjustment Experiment were:

1. More frequent service and expanded parking facilities in an "outer ring" suburban area will attract a substantial increase in journey-to-work and midday traffic.

2. Public reaction to a reduced number of stops at minor or nonexpress stations—especially during peak periods—is likely to be adverse.

3. Adequate parking facilities—convenient to the station and providing good auto access for both regular and occasional travelers—are a prerequisite for attracting rail passengers in substantial numbers in low-density suburban areas. The location of lots and their design can be very important in attracting users.

4. Off-peak improvements will attract peak-period riders. Conversely, a reduction in off-peak service will result in a decrease in peak-period riders.

5. On the basis of this project and another one sponsored by the Tri-State Transportation Commission at New Brunswick, N. J., a trial period of 18 to 24 months may very well be necessary before a new service becomes sufficiently established to begin to evidence patronage growth.

6. The coordination of feeder-bus and rail service in an area with high automobile ownership (85 percent) will not attract riders in sufficient numbers to support such bus service.

7. Capital improvements—including extension of electrification or substitute dual-powered equipment with electric acceleration characteristics—are necessary to produce significant travel time reductions.

