A STUDY OF EASTBOUND FREIGHT SERVICE OF THE NEW YORK, NEW HAVEN, AND HARTFORD RAILROAD BETWEEN MAYBROOK, NEW YORK, AND HARTFORD, CONNECTICUT

by

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I. INTRODUCTION

Freight traffic entering the New England area via the New York, New Haven, and Hartford Railroad from other lines west thereof is approximately evenly divided between the New York and Maybrook gateways. The Maybrook Gateway is served by the Erie Railroad, the Lehigh and Hudson River Railway, the Lehigh and New England Railroad, and the West Shore Route of the New York Central System. Prior to April, 1957, the New York, Ontario, and Western Railway also served this gateway, however, after that month, operations were ceased by that road. The New York Gateway is accommodated primarily by car-float service from points in northern New Jersey. The major roads utilizing this service are the Central Railroad of New Jersey, the Delaware, Lackawanna and Western Railroad, the Lehigh Valley Railroad, the New York Central System, and the Pennsylvania Railroad. The practice during the period of study was to classify trains at these two gateways and then move them to Cedar Hill yard at New Haven, Connecticut, for further classification. The purpose of this study is to examine one facet of the eastbound freight service of the New Haven System for a test period and to determine whether or not the findings indicate that better service could be provided by other practices. Specifically, the traffic involved is that which enters New England through the Maybrook Gateway and is destined for points in the Hartford, Springfield, Waterbury, and Holyoke areas.

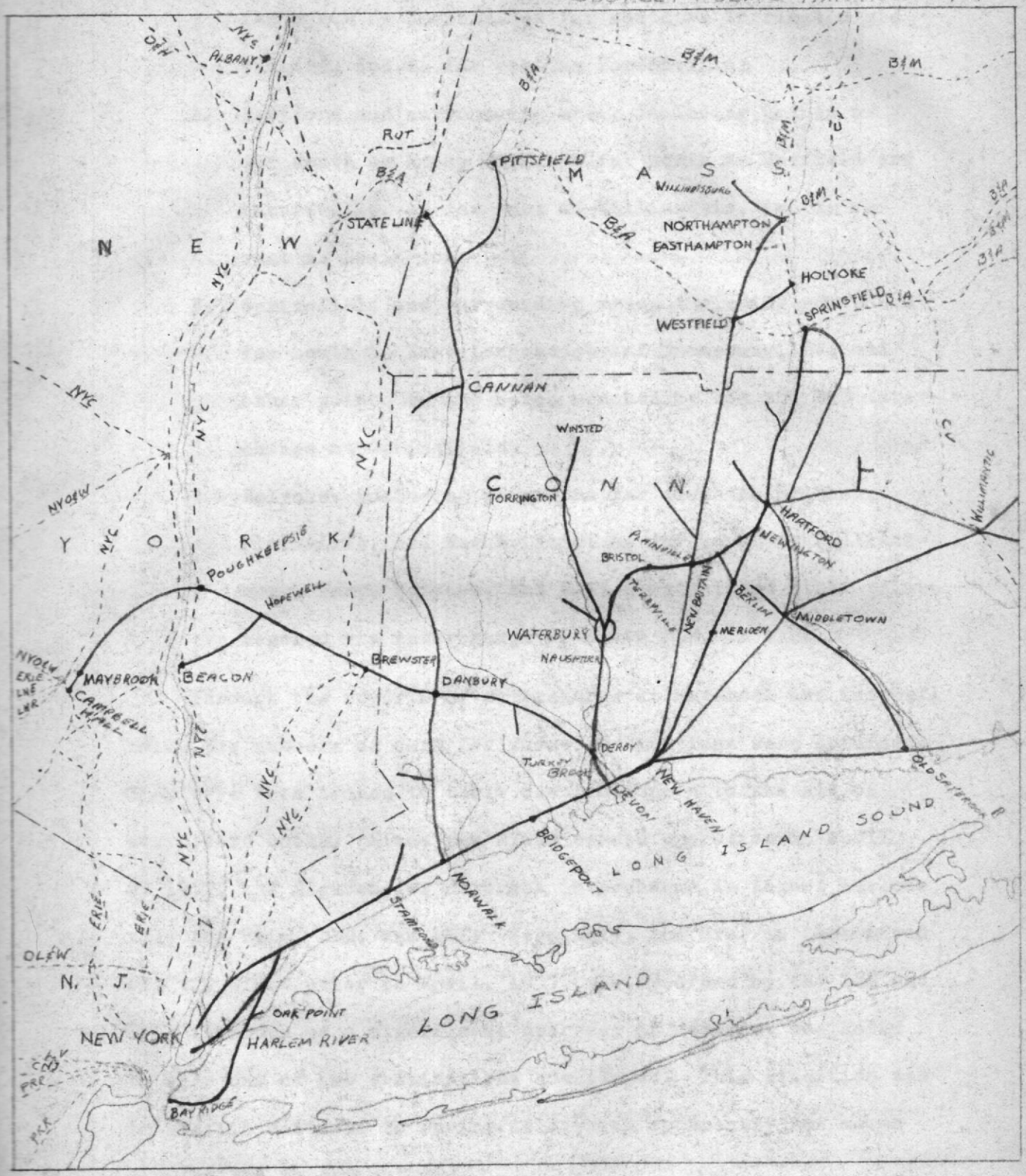
The first stage of the study was focused on the determination of the density of the eastbound traffic from Maybrook to Hartford and other nearby points. This was done by reviewing the reports of interchange at Maybrook and the wheel reports of trains from Maybrook to Cedar Hill and from Cedar Hill to the Hartford-Springfield area. A complete review of these reports for at least a full year would have been desirable, however, the limitations of time prevented a full study. Consequently, the data was gathered for one week periods in two months of the year 1957. Full week periods were used to determine whether or not there were any day-to-day fluctuations in the traffic and if so, to smooth out these variations. The months for which the data was gathered were January and August and the reasons for using these months were two-fold: First, they show the variation between winter and summer seasonal trends; and second, they represent months of relatively low and high total system car-loadings, respectively. The car-loadings for January were 74,000 and for August, 79,000; while the low and high for the year were 70,000 in July and 86,000 in March. For ease of data collection, the first full week of each month was used for the sample; (i.e., January 6 through 12 and August 4 through 10).

A map of the western portion of the New Haven System is included as Figure 1 as an aid to the location of the points discussed and the routes involved in the study. In the process of the investigation, it was found that the data involved could best be analyzed by separating it into four destination groups:

FIGURE 1

NEW YORK, NEW HAVEN & HARTFORD RAILROAD

SOURCE: PUBLIC TIMETABLE 1/2/58



—— NYNHH

--- OTHER ROADS

SCALE: 1" = 16.2 MI.

1. Waterbury and surrounding area including points as far south as Ansonia, as far north as Torrington and Winsted, and as far east as Forestville;
2. Hartford and surrounding area, including points as far south as Rocky Hill, as far north as Suffield and Hazardville, as far east as Willimantic, and as far west as Newington;
3. Springfield and surrounding area, including points as far south as East Longmeadow and Thompsonville, and other points to the north reached by B&A and B&M Interchange at Springfield;
4. Holyoke, including points as far south as Bristol, Plainville, and New Britain; as far north as Williamsburg, North Hampton, and East Hampton; and other points reached via interchange with the B&M.

Through the reports of interchange at Maybrook and Campbell Hall, the numbers of cars for these destinations were obtained. They were then traced to their destinations with the aid of car record books. Since the NYO&W ceased operation in April of 1957, the figures for Maybrook interchange in August include only the Erie, LHR, and LNE. Seemingly, the traffic that moved via the NYO&W prior to April, 1957, was absorbed by the LHR and Erie inasmuch as a significant decrease in movement was noted to only one of the destinations considered. This exception was in traffic destined to Springfield which apparently now moves via the B&A to Springfield.

Other interchange points which were investigated and the railroads involved thereat were: Pittsfield, B&A; State Line, B&A; Beacon, NYC; Poughkeepsie, NYC; and Brewster, NYC.

As was previously stated, cars were traced from these interchange points to their destinations with the aid of the car record books. In this manner accurate delay figures at all yards were developed as well as the over-all time consumed from interchange to arrival at destination. Wheel reports from Maybrook to the various points indicated were used to develop the daily volume of traffic to these destinations.

In addition to the data for the Maybrook Gateway discussed above, traffic from the New York Gateway was examined to determine the number of cars for the same four groups of destinations moving via the Shore Line. Wheel reports only were checked from this gateway inasmuch as delays and running times from New York are not pertinent to the study. Finally, wheel reports from Cedar Hill to the four general areas under consideration were investigated to determine the daily volume for the same periods originating at points east of New Haven and at points in the New Haven area.

Having determined the general flow of traffic and the service provided, the next step was to investigate the characteristics of the roadway used for the present routing and for other possible routes. Finally, the direct costs of the service were determined. Cost figures herein include only those costs which could be directly associated with the given traffic inasmuch

as a full cost study is beyond the scope of this study. In conclusion, several alternate methods of handling the traffic from Maybrook to Waterbury, Hartford, Springfield, and Holyoke are suggested and discussed. These conclusions are based solely on the data taken from the two sample weeks and a more complete study is required to decide the worth of any of the alternate proposals.

II. EXISTING TRAFFIC PATTERNS

In order to establish the volume of traffic moving through the Maybrook Gateway for destinations in the Waterbury, Hartford, Springfield, and Holyoke areas, the number of cars interchanged at that point on each day of the two sample weeks was recorded. The details of this survey may be found in Table I, Daily Interchange Statistics. A summary of the statistics is shown in Table II, Total Interchange During Sample Weeks, including the average week's total interchange receipts at each point based on the month's total of all empty and loaded receipts. The values shown for the first full week in January, 1958, are included merely to illustrate the effect on the Hartford traffic of the general decrease in carloadings during the last quarter of 1957 and the first quarter of 1958. Sufficient time for a more detailed study of this period was not available. It will be noted that traffic to the four general areas under consideration constitutes between 15 and 20 percent of the total eastbound interchange at the Maybrook Gateway.

In addition to the interchange reports, wheel reports were examined to determine the actual number of cars handled from Maybrook, New York, and Cedar Hill. These data are tabulated by day in Table III, Daily Wheel Report Statistics. It will be noted that the number of cars leaving Maybrook as shown by the wheel reports for the given dates is greater than the number of cars interchanged during the same period. This situation arose because some cars from the previous week's interchange

TABLE I

Daily Interchange Statistics

At	RR	January 6	7	8	9	10	11	12	Total	Avg.	August 4	5	6	7	8	9	10	Total	Avg.
To Waterbury																			
Maybrook	Erie	4	4	10	5	7	6	3	39	5.6	6	5	5	9	5	9	7	46	6.6
Maybrook	LHR	18	8	14	19	12	17	14	102	14.6	22	18	18	22	18	24	17	139	19.9
Maybrook	LNE	5	0	3	7	2	5	2	24	3.4	2	1	2	5	3	1	3	17	2.4
Maybrook	NYO&W	6	3	5	8	11	1	2	36	5.1	0	0	0	0	0	0	0	0	0.0
Campbell Hall	NYC	0	0	0	0	0	0	0	0	0.0	2	0	4	2	5	1	1	15	2.1
State Line	B&A	2	3	3	1	4	3	3	19	2.7	1	4	7	3	3	7	3	28	4.0
Pittsfield	B&A	0	0	0	0	0	1	0	1	0.1	0	0	0	0	0	0	0	0	0.0
Total		35	18	35	40	36	33	24	221	31.5	33	28	36	41	34	42	31	245	35.0
To Hartford																			
Maybrook	Erie	18	18	21	7	19	14	27	124	17.7	18	23	17	17	28	17	28	148	21.2
Maybrook	LHR	23	18	32	15	18	15	15	136	19.4	30	23	23	27	29	28	22	182	26.0
Maybrook	LNE	8	3	6	4	4	3	4	32	4.6	2	9	6	5	10	5	4	41	5.9
Maybrook	NYO&W	22	16	17	11	7	5	15	93	13.3	0	0	0	0	0	0	0	0	0.0
Campbell Hall	NYC	0	0	2	0	0	3	2	7	1.0	1	0	2	0	1	1	1	6	0.9
Beacon	NYC	0	0	0	0	0	1	0	1	0.1	0	0	0	0	0	0	0	0	0.0
Brewster	NYC	0	0	0	0	0	1	0	1	0.1	0	0	0	0	0	0	0	0	0.0
Pittsfield	B&A	0	0	0	0	0	0	0	0	0.0	0	0	0	1	0	0	0	1	0.1
Total		71	55	78	37	48	42	63	394	56.2	51	55	48	50	68	51	55	378	54.0
To Springfield																			
Maybrook	Erie	8	13	6	7	7	3	5	49	7.0	3	8	1	3	2	3	9	29	4.1
Maybrook	LHR	9	6	8	5	2	12	9	51	7.3	4	4	13	16	3	4	6	50	7.1
Maybrook	LNE	1	3	2	5	2	21	3	37	5.3	2	1	1	7	3	0	0	14	2.0
Maybrook	NYO&W	0	4	2	0	2	1	7	16	2.3	0	0	0	0	0	0	0	0	0.0
Campbell Hall	NYC	0	0	0	0	2	0	0	2	0.3	0	0	0	0	0	0	1	1	0.1
Beacon	NYC	0	0	0	0	1	0	1	2	0.3	0	0	0	0	3	0	0	3	0.4
Total		18	26	18	17	16	37	25	157	22.5	9	13	15	26	11	7	16	97	13.9

TABLE I (Continued)

Daily Interchange Statistics

At	RR	January 6	7	8	9	10	11	12	Total	Avg.	August 4	5	6	7	8	9	10	Total	Avg.
										To Holyoke									
Maybrook	Erie	2	6	5	6	4	9	2	34	4.9	4	6	6	6	3	2	8	35	5.0
Maybrook	LHR	11	9	11	14	8	19	8	80	11.4	3	19	11	23	13	13	8	90	12.9
Maybrook	LNE	1	1	3	4	2	1	1	13	1.9	4	4	1	0	2	3	3	17	2.4
Maybrook	NYO&W	4	1	6	4	1	4	1	21	3.0	0	0	0	0	0	0	0	0	0.0
Campbell Hall	NYC	0	0	0	0	1	0	0	1	0.1	1	0	0	0	0	4	3	8	1.1
Brewster	NYC	0	0	0	0	0	2	0	2	0.3	0	0	0	0	0	0	0	0	0.0
Total		18	17	25	28	16	35	12	151	21.6	12	29	18	29	18	22	22	150	21.4

Source: NYNH&H Interchange Reports 1/6/57 through 1/12/57 and 8/4/57 through 8/10/57

TABLE II

Total Interchange During Sample Weeks

Origin	RR	Average Week's Total Interchange	Number of Cars to Waterbury	Hartford	Springfield	Holyoke	Total	% to Four Destination Groups
		Jan. 1957		1/6/57 through 1/12/57				
Maybrook	Erie	1,340	39	124	49	34	246	18.3
Maybrook	LHR	1,520	102	136	51	80	369	24.3
Maybrook	LNE	309	24	32	37	13	106	34.4
Maybrook	NYO&W	706	36	93	16	21	166	23.5
Campbell Hall	NYC	58	0	7	2	1	10	17.2
Beacon	NYC	35	0	1	2	0	3	8.6
Brewster	NYC	5	0	1	0	2	3	60.0
State Line	B&A	227	19	0	0	0	19	8.4
Pittsfield	B&A	40	1	0	0	0	1	2.5
Total		4,240	221	394	157	151	923	21.8
		Aug. 1957		8/4/57 through 8/10/57				
Maybrook	Erie	1,549	46	148	29	35	258	16.6
Maybrook	LHR	2,220	139	182	50	90	461	20.7
Maybrook	LNE	566	17	41	14	17	89	15.7
Campbell Hall	NYC	152	15	6	1	8	30	19.7
Beacon	NYC	69	0	0	3	0	3	4.3
State Line	B&A	364	28	0	0	0	28	7.7
Pittsfield	B&A	31	0	1	0	0	1	3.2
Total		4,951	245	378	97	150	870	17.5
		Jan. 1958		1/5/58 through 1/11/58				
Maybrook	Erie	1,395	46	119	31	21	217	15.5
Maybrook	LHR	1,752	98	132	53	70	353	20.1
Maybrook	LNE	401	9	28	63	8	108	26.9
Campbell Hall	NYC	63	6	4	0	1	11	17.5
Total		3,611	159	283	147	100	689	19.2

Source: NYNH&H Interchange Reports, January and August, 1957, and January, 1958.

TABLE III

Daily Wheel Report Statistics

From	Via	January 6	7	8	9	10	11	12	Total	Avg.	August 4	5	6	7	8	9	10	Total	Avg.
To Waterbury																			
Maybrook	Turkeybrook	28	27	37	30	44	20	20	206	29.5	20	43	33	40	31	0	0	167	23.9
Maybrook	Cedar Hill	7	6	1	0	0	4	16	34	4.9	9	4	10	7	3	45	41	119	17.0
Danbury	Turkeybrook	30	8	4	4	9	11	0	66	9.4	8	2	9	6	6	0	0	31	4.4
Danbury	Cedar Hill	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	1	0	1	0.1
New York	Cedar Hill	22	21	20	30	20	37	18	168	24.0	13	18	7	20	9	7	20	94	13.4
East	Cedar Hill	28	9	15	17	15	18	8	110	15.7	19	10	20	23	22	20	8	122	17.4
Cedar Hill	----	10	4	12	29	14	35	10	114	16.3	2	0	18	14	16	19	26	95	13.6
Total		125	75	89	110	102	125	72	698	99.8	71	77	97	110	87	92	95	629	89.9
To Hartford																			
Maybrook	Cedar Hill	73	51	76	41	56	26	80	403	57.6	48	71	53	56	67	68	59	422	60.3
Danbury	Cedar Hill	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	2	0	2	0.3
Brewster	Cedar Hill	0	0	0	0	1	0	0	1	0.1	0	0	0	0	0	0	0	0	0.0
Beacon	Cedar Hill	0	0	0	1	0	0	0	1	0.1	0	0	0	0	0	0	0	0	0.0
New York	Cedar Hill	52	53	41	39	35	55	29	304	43.5	35	58	36	35	35	32	51	282	40.2
East	Cedar Hill	18	10	12	19	10	30	12	111	15.8	2	13	7	5	18	15	8	68	9.7
Cedar Hill	----	0	7	23	15	21	13	23	102	14.6	2	7	15	7	13	18	18	83	11.9
Total		143	121	152	115	123	124	144	922	131.7	90	149	111	103	133	135	136	857	122.4
To Springfield																			
Maybrook	Cedar Hill	30	14	15	20	14	8	45	146	20.8	9	16	9	25	28	18	22	127	18.2
Danbury	Cedar Hill	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0.0
Beacon	Cedar Hill	0	2	0	0	0	0	0	2	0.3	0	0	0	0	3	0	0	3	0.4
New York	Cedar Hill	13	21	8	14	11	10	21	98	14.0	9	14	11	13	10	9	18	84	12.0
East	Cedar Hill	10	4	5	11	13	8	27	78	11.1	28	12	23	5	16	22	26	132	18.9
Cedar Hill	----	22	41	91	70	51	57	65	397	56.7	18	40	53	110	41	74	72	408	58.3
Hartford	----	15	18	39	71	41	36	50	270	38.6	3	33	58	69	35	68	31	297	42.4
Total		90	100	158	186	130	119	208	991	141.5	67	115	154	222	133	191	169	1051	150.2

TABLE III (Continued)

Daily Wheel Report Statistics

From	Via	January 6	7	8	9	10	11	12	Total	Avg.	August 4	5	6	7	8	9	10	Total	Avg.
									To Holyoke										
Maybrook	Cedar Hill	23	20	22	21	18	29	21	154	22.0	15	12	28	10	32	22	23	142	20.3
Danbury	Cedar Hill	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0.0
Brewster	Cedar Hill	0	0	2	0	0	0	0	2	0.3	0	0	0	0	0	0	0	0	0.0
New York	Cedar Hill	15	17	10	9	5	12	8	76	10.8	9	11	11	3	7	20	7	68	9.7
East	Cedar Hill	0	12	6	7	7	4	7	43	6.1	0	16	26	34	26	14	0	116	16.6
Cedar Hill	----	0	11	15	21	44	15	16	122	17.5	0	39	27	14	32	29	52	193	27.8
Total		38	60	55	58	74	60	52	397	56.7	24	78	92	61	97	85	82	519	74.4

Source: NYNH&H Wheel Reports 1/6/57 through 1/12/57 and 8/4/57 through 8/10/57.

were moved from Maybrook during the test period and because no destination was shown on the interchange reports for some empty cars.

The averages were used to develop the traffic density map (Figure 2). This map shows the relative volumes of traffic originating at Maybrook and New York as well as from local points near Cedar Hill and from points east of Cedar Hill to each of the localities under consideration. The variance in the number of cars handled in each of the two sample weeks is not of sufficient magnitude to be apparent on the graphical representation so that the map is valid within the limits of its accuracy for both weeks.

The Cedar Hill local originations are composed primarily of coke and petroleum products from Belle Dock (a New Haven switching district) to Troy, New York, and Westover Air Force Base, Massachusetts, via Springfield interchange. The originations from points east of Cedar Hill are of two categories; first, loads from western points moving over differential routes via the GTW, CPR, CNR, and CV to New London, Connecticut, thence interchanged to the New Haven and carried to Cedar Hill for further movement to destination; second, empty cars moving on Special Car Order 90 which provides for short home routing of foreign cars. The increase of 10 cars per day to Holyoke from Cedar Hill is felt to be of a temporary nature, inasmuch as during the August sample week a great many New Haven cars were moved from Cedar Hill to New Britain for scrapping.

TRAFFIC DENSITY MAP
SHOWING DAILY AVERAGE TRAFFIC
FOR THE FOUR DESTINATION GROUPS
— WATERBURY; — HARTFORD;
— SPRINGFIELD; — HOLYOKE;
■ = 50 CARS PER DAY
SOURCE: NYNHEH WHEEL REPORTS
1/6/57 - 1/12/57 & 8/9/57 - 8/10/57

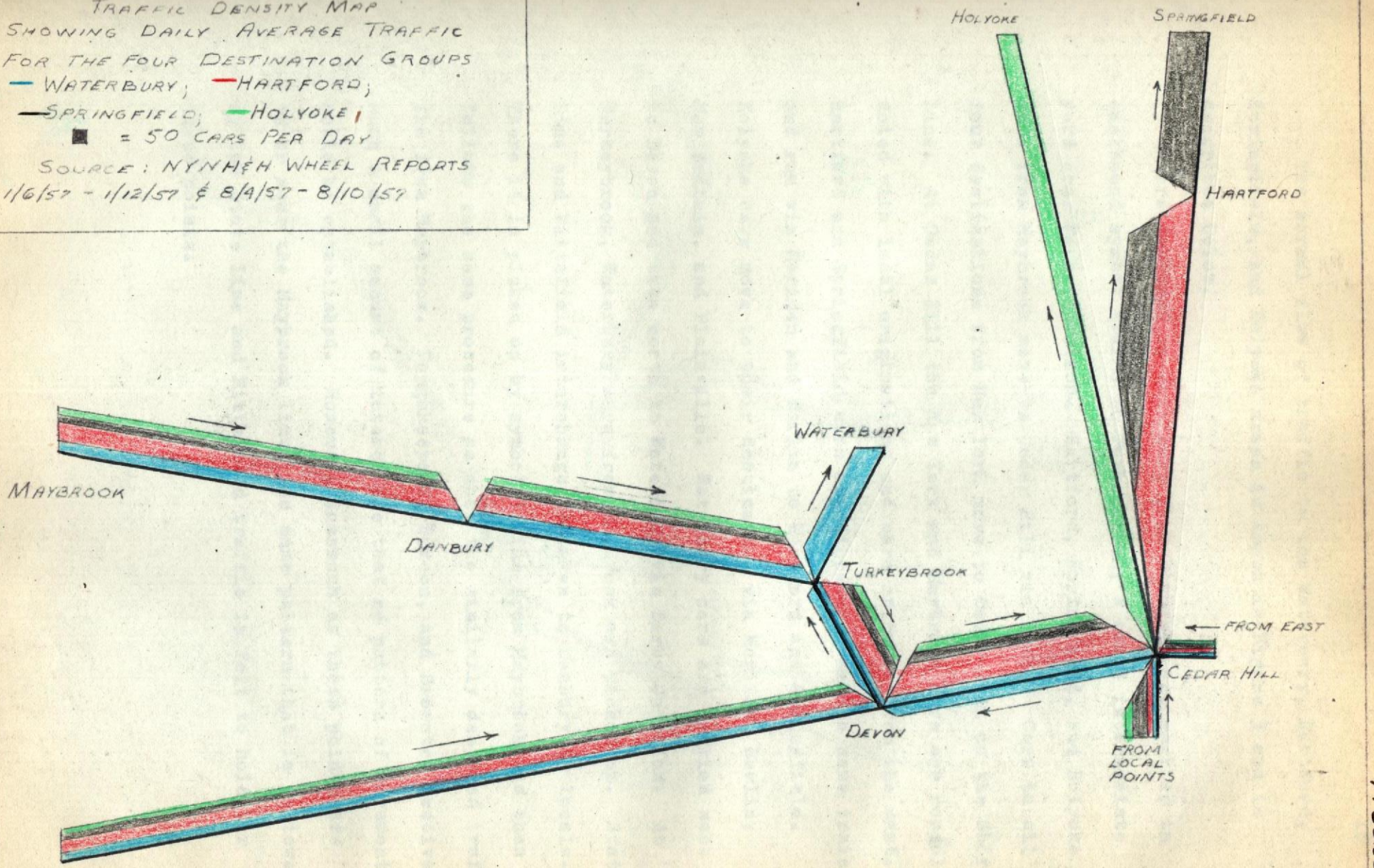
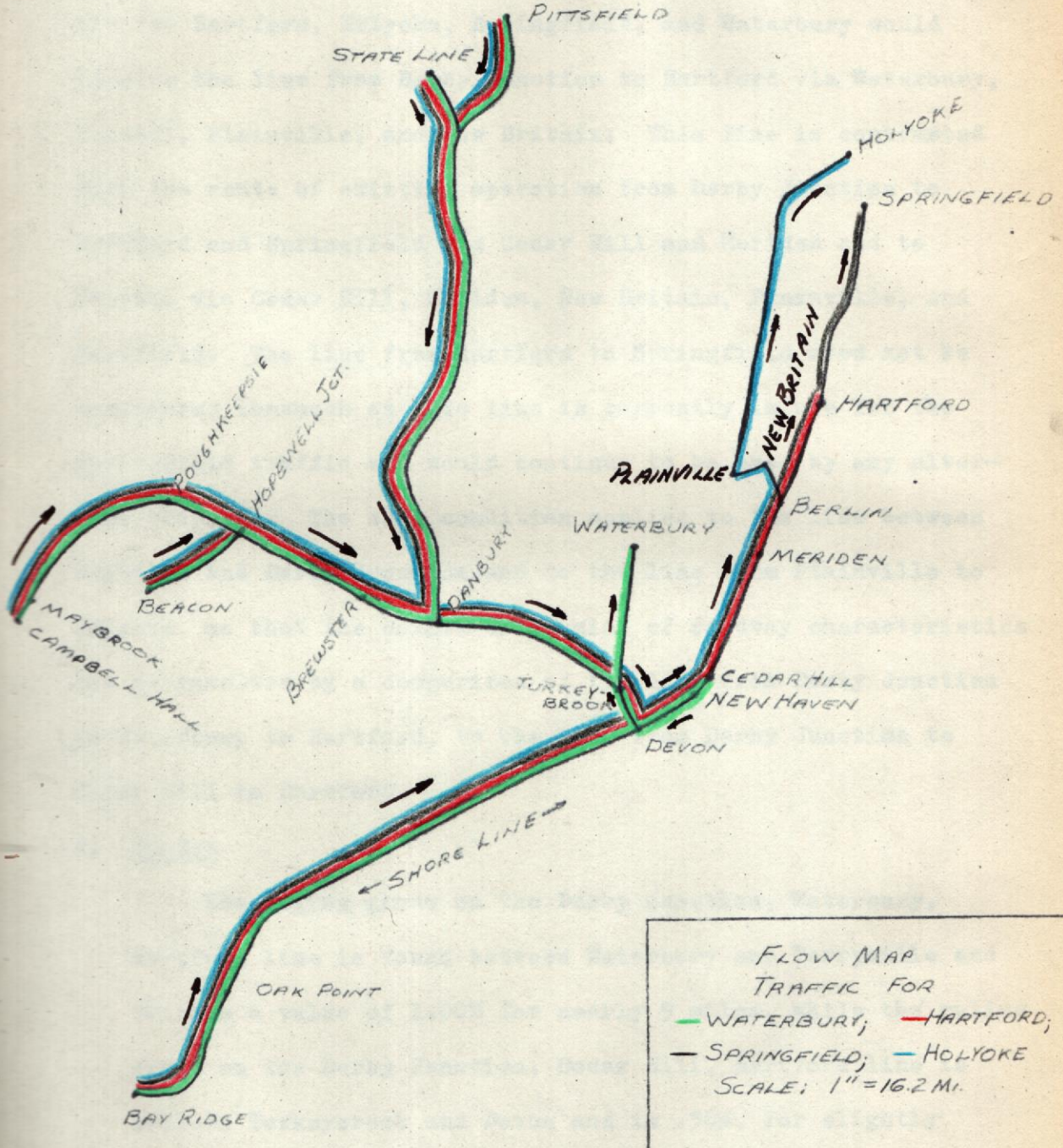


FIGURE 2

The normal flow of traffic to the Waterbury, Hartford, Springfield, and Holyoke areas is shown in Figure 3 and is described below.

Cars destined to Waterbury from Maybrook are carried in eastbound symbol trains to Turkeybrook, a small intermediate yard near Derby Junction. Hartford, Springfield, and Holyoke cars from Maybrook move to Cedar Hill via Devon. Cars to all four destinations from New York move to Cedar Hill on the Shore Line. At Cedar Hill the New York and Maybrook cars are consolidated with local originations and cars arriving from the east. Hartford and Springfield cars are dispatched in the same trains and run via Meriden and Berlin to Hartford and Springfield. Holyoke cars move to their destination via Meriden, Berlin, New Britain, and Plainville. Waterbury cars are carried west to Devon and then north to Waterbury via Derby Junction. At Turkeybrook, Waterbury cars from Maybrook are picked up. State Line and Pittsfield interchange is taken to Danbury by locals. There it is picked up by symbol trains from Maybrook and then follows the same procedure as does the similarly destined traffic from Maybrook. Poughkeepsie, Beacon, and Brewster received such a small amount of interchange that no pattern of movement could be established. However, inasmuch as these points are on or near the Maybrook line, the same pattern that is followed by the State Line and Pittsfield traffic is felt to hold for these points.

FIGURE 3


PITTSFIELD
STATE LINE
HOLYOKE
SPRINGFIELD
NEW BRITAIN
HARTFORD
PLAINVILLE
BERLIN
MERIDEN
WATERBURY
DANBURY
POUGHKEEPSIE
HOPEWELL JCT.
BEACON
MAYBROOK
CAMPBELL HALL
BREWSTER
TURKEY BROOK
CEDAR HILL
NEW HAVEN
DEVON
SHORE LINE
OAK POINT
BAY RIDGE
FLOW MAP
TRAFFIC FOR
WATERBURY; HARTFORD;
SPRINGFIELD; HOLYOKE
SCALE: 1" = 16.2 MI.

III. ROADWAY, MOTIVE POWER AND COST CONSIDERATIONS

In this section are listed various factors associated with but not directly contributing to the alternative types of service suggested in section IV. Any method of rerouting traffic for Hartford, Holyoke, Springfield, and Waterbury would involve the line from Derby Junction to Hartford via Waterbury, Bristol, Plainville, and New Britain. This line is contrasted with the route of existing operation from Derby Junction to Hartford and Springfield via Cedar Hill and Meriden and to Holyoke via Cedar Hill, Meriden, New Britain, Plainville, and Westfield. The line from Hartford to Springfield need not be considered inasmuch as this line is currently in use for the Springfield traffic and would continue to be used by any alternate proposal. The same condition applies to the line between Maybrook and Derby Junction and to the line from Plainville to Holyoke, so that the entire discussion of roadway characteristics can be resolved by a comparison of the line from Derby Junction to Waterbury to Hartford, to the line from Derby Junction to Cedar Hill to Hartford.

A. Grades

The ruling grade on the Derby Junction, Waterbury, Hartford line is found between Waterbury and Terryville and reaches a value of 1.00% for nearly 9 miles, while the ruling grade on the Derby Junction, Cedar Hill, Hartford line is between Turkeybrook and Devon and is .56%, for slightly more than 2 miles. Condensed profiles of the two lines are shown in Figure 4.

The tonnage ratings on the two lines are given by the NYNH&H according to the following table. They are valid for one 1500 or 1600 horsepower Alco road freight unit, or one 1750 horsepower EMD road switcher unit.

Derby Junction - Waterbury - Hartford

From	To	Tons	Ruling Grade
Derby Junction	Waterbury	2,200	.60%
Waterbury	Plainville	1,400	1.00%
Plainville	Hartford	2,500	.45%

Derby Junction - Cedar Hill - Hartford

From	To	Tons	Ruling Grade
Derby Junction	Cedar Hill	2,500	.56%
Cedar Hill	Hartford	2,700	.52%

B. Speed Restrictions

The nominal maximum speed from Derby Junction to Hartford via Waterbury is 40 mph for freight trains. Exceptions to this maximum occur at the following locations for the reasons given.

Location	Speed Limit	Reason
Derby Junction	20	Bridge
Ansonia	30	Curves
Seymour	35	Curves
Beacon Falls	35	Curves
Naugatuck	30	Curves
Waterbury	30	Curves
Bristol	20	Curves
Plainville	25	Yard limits
New Britain	20	Grade crossings
Hartford	20	Grade crossings and curves

Between Derby Junction and Devon the nominal maximum speed is 40 mph and from Devon to Hartford via Cedar Hill it is 50 mph. The exceptions to these maximums are tabulated as follows:

Location	Speed Limit	Reason
Derby Junction	20	Bridge
Devon	15	Turnout
New Haven	15	Passenger station and curves
New Haven	35	Curves
Meriden	20	Grade crossing
Meriden	45	Grade crossings
Hartford	20	Grade crossings and curves

C. Grade Crossings

Five of the twenty public grade crossings on the Derby Junction - Waterbury - Hartford route are manually protected as are ten of twenty-one on the Derby Junction - Cedar Hill - Hartford route. All others are protected by automatic gates or flasher lights. All protection is currently in operation 24 hours per day, so that the addition of extra crossing watchmen is not a contributing factor to any change of scheduling or route.

D. Clearance and Weight Restrictions

There are no structures on either line that impose undue clearance or axle loading restrictions.

E. Mileage

There is a difference of only seven miles in the distance between the two routes from Derby Junction to Hartford. The distance on the Waterbury line is 49.54 miles while the Cedar Hill route is 56.54 miles long. The two lines join at Newington--4.8 miles west of Hartford.

F. Motive Power Maintenance

The enginehouses capable of performing light running repairs and turns between Maybrook and Springfield are located

at Maybrook, Danbury, Bridgeport, New Haven, Cedar Hill, Waterbury, Hartford, and Springfield.

G. Costs

Only those costs directly variable with the route or scheduling are discussed:

Private Car Line Charges

During the January and August sample weeks, the interchange reports at Maybrook indicated 233 and 199 privately owned cars respectively for the four destination groups. The average charge for operating these cars is four cents per mile.

Yard Costs

During the January sample week, a total of 47,700 cars were handled at Cedar Hill yard. The cost of handling these cars varied from $.85 per car on a day when 7,220 cars were switched to $1.11 per car for 6,020 cars. The over-all average for the week was $.96 per car. In the August sample week, 48,270 cars were handled with a low of $.77 per car for 7,450 cars and a high of $1.15 per car for only 5,760 cars. The average for this week was also $.96 per car. With the drop in car loadings in January, 1958, the first full week showed only 40,210 cars handled at an average cost of $1.31 per car.

Locomotive Maintenance and Fuel Costs

The maintenance and fuel costs for the various types of locomotives used are released monthly by the mechanical department of the New Haven Railroad. The locomotives used on the lines under consideration are 1500 and 1600 horsepower Alco road freight units and 1750 horsepower EMD road switcher

units. The Alcos were purchased in 1947 and 1951 and their maintenance costs reflect several heavy overhauls. The EMD's on the other hand were acquired in 1956 and the maintenance costs for these units include no heavy repairs. Thus, the costs for the latter are unduly low. All costs are stated in cents per unit mile and are based on all costs accrued and mileages run since date of acquisition.

	Alco	EMD
Maintenance - Labor and Material	22.871¢	7.463¢
Crankcase Lubricating Oil	1.545¢	1.159¢
Fuel Oil	20.101¢	20.959¢

Wages

The rates of pay shown in this section include no overtime or arbitrary allowances and are thus somewhat idealized. However, the inconsistencies of these allowances do not permit a general survey.

The mileages indicated for train service employees are the mileages shown in the timetable. Enginemen and firemen are allowed additional mileage for running to and from enginehouses and this usually amounts to about 2 miles per trip. Local rates apply for train service employees when work is done at three or more points and for engine service employees when work is done at three or more points or when the aggregate working time amounts to 1.5 hours or more.

A swingman is required by law in New York state and is carried as far as Danbury from Maybrook--a distance of

74 miles. It is assumed that the swingman is paid for a minimum day since the schedules do not appear to permit a quick turn at Danbury. In other cases the full crew is composed of one engineman, one fireman, one conductor, and two brakemen. The mileages on which the various runs are paid are listed below:

From	To	Service	Engine Service Miles	Train Service Miles	Remarks
Maybrook	Cedar Hill	Straightaway	126	124	
Cedar Hill	Springfield	Turnaround	124	120	
Cedar Hill	Waterbury	Turnaround	100	100	Minimum day
Cedar Hill	Holyoke	Straightaway	100	100	Minimum day

In Table IV, Crew Wages in Cents Per Mile, engine service rates are shown for one, two, three, and four units of the 400 and 1200 series locomotives. The 400 series are 1500 and 1600 horsepower Alco road freight units and the 1200 series are 1750 horsepower EMD road switchers (GP-9). Train service rates are indicated for various sizes of trains.

TABLE IV

Crew Wages in Cents Per Mile

I. Engine Service	1-400 unit	1-1200 unit	2-400 units	2-1200 units	3-400 units	3-1200 units	4-400 units	4-1200 units
Thru Engineman	20.05	20.20	20.98	21.19	21.91	22.09	22.81	22.99
Thru Fireman	16.99	17.16	17.83	17.99	18.63	18.79	19.43	19.59
Local Engineman	20.61	20.76	21.54	21.75	22.47	22.65	23.37	23.55
Local Fireman	17.39	17.56	18.23	18.39	19.03	19.19	19.83	19.99

II. Train Service	0 - 81 cars	81 - 105 cars	106 - 125 cars	126 - 145 cars	146-165 cars
Thru Conductor	18.37	18.72	19.12	19.37	19.47
Thru Brakeman	16.64	16.99	17.39	17.64	17.74
Local Conductor	18.93	19.28	19.68	19.93	20.03
Local Brakeman	17.07	17.42	17.82	18.07	18.17

Source: NYNH&H, Engineers, Motormen, Firemen and Helpers, Hostlers and Hostler Helpers - Rates of Pay, 2/1/58
NYNH&H, Rates of Pay of Train Crew Employees, 11/1/57

IV. ALTERNATE PROCEDURES

A. 1957 Service

The pattern of all eastbound freight traffic on the New Haven system is generally controlled by the schedules of trains to Boston. These schedules are designed to provide delivery and early morning placement in that city on the day following interchange at the New York or Maybrook Gateways. The controlling factors in establishing the schedules are, of course, the scheduled interchange times from the more western carriers. Traffic to Waterbury, Hartford, Springfield, and Holyoke is forced to conform to these schedules and early morning placement within the four destination groups can seldom be accomplished.

Maybrook Interchange

The scheduled arrival times at Maybrook of eastbound trains during January and August are shown in Table V.

TABLE V

Scheduled Arrivals at Maybrook; 1957

Road	Train	Time	Road	Train	Time
1. LHR	30	0310	7. LHR	32	0945
2. Erie	NE-74	0400	8. Erie	NE-98	1000
3. NYC*	RV-2	0630	9. NYOW^	NE-4	1300
4. NYOW^	NE-6	0800	10. LNE	Local Ex	1400
5. LHR	HO-6	0930	11. LHR	AO-4	1500
6. LNE	Cement Ex.	0930	12. Erie	XC-98	2100

* Arrival is at Campbell Hall
^ January only

Source: NYNH&H Arranged Freight Train Service Symbol Book No. 4; 10/27/57

Certain departures from the schedule were noted during the sampled periods. On only one day of the January sample

week were there two LNE trains for interchange. All other days revealed only one LNE extra. In the August test period, there was only one day recorded with one LNE extra; on all other days of that week there were two.

The Erie ran one extra per day on six days of the January week, arriving at Maybrook between 0600 and 1100 hours.

Extras were operated by the LHR on all but one day of each sample week, and on the excepted day of the January week, there was a second section of train 32 arriving at Maybrook at 1530. On all of the other days the extras arrived between 1830 and 2130.

The NYO&W as stated previously contributed to the study only during the January sample week. One extra per day was operated on three days of that week arriving between 2200 and 2400 hours.

In order to determine the peak interchange periods of the day, the total number of cars received for the four destination groups in each of twelve two hour blocks in each sample week is shown in Table VI.

Schedules and Connections

At the time of the study the New Haven schedules provided for six eastbound symbol trains from Maybrook to Cedar Hill and nine from New York to Cedar Hill. From Cedar Hill there were three scheduled trains to Hartford and Springfield and one each to Waterbury and Holyoke. The

TABLE VI

Bi-Hourly Distribution of Interchange

Time	January			August		
	No.Cars	% of Total	Cumulative %	No.Cars	% of Total	Cumulative %
0001-0200	9	1.0	1.0	16	1.9	1.9
0201-0400	85	9.3	10.3	90	10.6	12.5
0401-0600	33	3.6	13.9	72	8.5	21.0
0601-0800	117	12.8	26.7	97	11.5	32.5
0801-1000	226	24.7	51.4	84	9.9	42.4
1001-1200	139	15.2	66.6	210	24.9	67.3
1201-1400	118	12.9	79.5	28	3.3	70.6
1401-1600	101	11.0	90.5	143	16.9	87.5
1601-1800	28	3.0	93.5	15	1.8	89.3
1801-2000	17	1.9	95.4	10	1.2	90.5
2001-2200	29	3.1	98.5	63	7.5	98.0
2201-2400	14	1.5	100.0	17	2.0	100.0
Total	916	100.0	--	845	100.0	--

Source: NYNH&H Interchange Reports; January and August, 1957

graphical time table (Figure 5) illustrates these trains and their connections. The functions and prescribed schedules of trains originating at Maybrook and Cedar Hill are summarized in Table VII, Scheduled Service, Maybrook to Cedar Hill, and Table VIII, Scheduled Service, Cedar Hill to Hartford, Springfield, Waterbury, and Holyoke.

Five unscheduled trains were operated from Maybrook during the January sample week (two of them on one day). Only one failed to carry any traffic for the four destination groups and one set out Waterbury cars at Turkeybrook. Extra service was operated on all days of the August sample

FIGURE 5

0400 0800 1200 1600 2000 2400 0400 0800

LHR 30
ERIE NE74
NYC RV2
LNE Ex
LH H06
LH 32
ERIE NE98
LNE Ex
LHR A04
BER 6
NE32 CEDAR HILL

MAYBROOK

OB6 CEDAR HILL
A/OB2 CEDAR HILL
OB2 CEDAR HILL BOSTON
OB4 CEDAR HILL BOSTON
ON4 CEDAR HILL
ON6 TURKEYBROOK BRIDGEPORT
STATE LINE IRI DANBURY
L/NS2 HARTFORD SPRINGFIELD
V/NS2 HARTFORD SPRINGFIELD
NS4 HARTFORD SPRINGFIELD
NY2 HOLYOKE
NO2 TURKEYBROOK WATERBURY
LV HARLEM RIVER CEDAR HILL HB8 BOSTON
CNJ HARLEM RIVER
PRR BAYRIDGE NE2 CEDAR HILL
CEDAR HILL HB6 BOSTON
LV OAK POINT
NYC
CNJ OAK POINT
PRR BAYRIDGE GB4 CEDAR HILL
PRR BAYRIDGE CEDAR HILL GB8 BOSTON
CNJ HARLEM RIVER HN4 CEDAR HILL
PRR BAYRIDGE CEDAR HILL FGB2 BOSTON
HN2 CEDAR HILL
LV OAK POINT HN-2
CNJ OAK POINT
HN6 CEDAR HILL

GRAPHICAL TIMETABLE
SHOWING
NEW YORK & MAYBROOK INTERCHANGE
AND
CEDAR HILL CONNECTIONS TO HARTFORD,
SPRINGFIELD, WATERBURY & HOLYOKE
SOURCE: NYNH&H ARRANGED FREIGHT
SERVICE SYMBOL BOOK; 10/27/57
RBW

0400 0800 1200 1600 2000 2400 0400 0800

Scheduled Service, Maybrook to Cedar Hill

Train Symbol	OB - 6	A/OB - 2	OB - 2	OB - 4	ON - 4	ON - 6
Final Destination	Cedar Hill	Cedar Hill	Boston	Boston	Cedar Hill	Cedar Hill
Operates	Daily	Daily	Daily	Daily	Daily	Daily
No. Units & Type	4 - 400	4 - 400	4 - 400	4 - 400	4 - 400	4 - 400
No. Cars	81 to 105	81 to 105	81 to 105	81 to 105	81 to 105	81 to 105
Destination Groups Served	Waterbury Hartford Springfield Holyoke	Waterbury Hartford Springfield Holyoke	None	None	Hartford Springfield Holyoke	Waterbury
Via	Cedar Hill	Cedar Hill	--	--	Cedar Hill	Turkeybrook
Remarks	None	Waterbury block set out at Turkeybrook on Sun. & Mon.	Boston Market train	None	None	Operates direct to Cedar Hill with unclassified train on Fri. & Sat. Connects from IR-1 at Danbury.
Exceptions during Sample Weeks	None	None	Cars for 4 groups carried on two days of Aug. week	Cars for 4 groups carried on all days. Operated only three days of Aug. week.	Waterbury cars handled to Turkeybrook on five days of Jan. week and one day of Aug. week. Waterbury cars handled to Cedar Hill on 3 days of Aug. week.	None

Schedule

Maybrook - Lv.	0800	1300	1400	1700	1800	2015
Danbury - Ar.	1025	1535	1630	1920	2020	2300
Danbury - Lv.	--	--	--	--	--	2330
Derby Jct. - Ar.	1130	--	--	--	2120	0035
Derby Jct. - Lv.	--	--	--	--	--	0105
Devon - By	1150	1655	1745	2040	2140	0155
Bridgeport - Ar.	--	--	--	--	--	0205
Bridgeport - Lv.	--	--	--	--	--	0225
Cedar Hill - Ar.	1230	1730	1830	2110	2210	0410

Source: NYNH&H Arranged Freight Service Symbol Book No. 4 - 10/27/57

TABLE VIII

Scheduled Service, Cedar Hill to Hartford, Springfield, Waterbury, and Holyoke

Train Symbol	1/NS - 2	2/NS - 2	NS - 4	ND - 2	NY - 2
Final Destination	Springfield	Springfield	Springfield	Waterbury	Holyoke
Operates	Daily	Except Sun. & Mon.	Daily	Daily	Except Sun.
No. Units & Type	2 - 1200	2 - 1200	3 - 1200	3 - 1200	3 - 1200
No. Cars	81 to 105	less than 81	106 to 125	81 to 105	less than 81
Destination Groups Served	Hartford Springfield	Hartford Springfield	Hartford Springfield	Waterbury	Holyoke
Remarks	Connects to B&M SJ-1 at Springfield 0850	Connects to B&M SU-1 at Springfield 1900	Connects to B&A BV-1 at Springfield 1230 Per Diem Train	Connects from ON-6 at Turkeybrook	None
Exceptions during Sample Week	None	None	None	Symbol train ND-4 operated during Jan. week only Cedar Hill - 1500 Waterbury - 1845	None
Schedule					
Cedar Hill - Lv.	0115	0440	1900	0230	0225
Hartford - Ar.	0245	0610	2030	--	--
Hartford - Lv.	0350	0655	2130	--	--
Springfield - Ar.	0445	0750	2210	--	--
Turkeybrook - Ar.	--	--	--	0335	--
Turkeybrook - Lv.	--	--	--	0415	--
Waterbury - Ar.	--	--	--	0530	--
Meriden - Ar.	--	--	--	--	0315
Meriden - Lv.	--	--	--	--	0335
New Britain - Ar.	--	--	--	--	0440
New Britain - Lv.	--	--	--	--	0445
Plainville - Ar.	--	--	--	--	0505
Plainville - Lv.	--	--	--	--	0520
Westfield - Ar.	--	--	--	--	0635
Westfield - Lv.	--	--	--	--	0715
Holyoke - Ar.	--	--	--	--	0745

Source: NYNH&H Arranged Freight Service Symbol Book No. 4 - 10/27/57

week for a total of eleven trains. All of them carried traffic for the four destination groups and five set out Waterbury cars at Turkeybrook. The majority of the extras left Maybrook between 0400 and 0800, did local work, and arrived at Cedar Hill early in the afternoon. The consists of the extras varied widely but in all cases there were less than 81 cars with either 3 or 4 units (400 series).

During the January sample week, four extras were operated from Cedar Hill, three of which ran through to Springfield; the other terminated at Hartford. In the August week, two extras were operated to Hartford. In all cases, the bulk of the extra traffic was for Hartford. The extras normally consisted of less than 81 cars with two units of the 1200 series.

Delays and Running Times

The general character of the service from Maybrook to Waterbury, Hartford, Springfield, and Holyoke has been outlined above in terms of the trains that provide the service. However, the real value of the service can be seen only by analyzing the movement of individual cars. All of the cars interchanged at Maybrook for the four destination groups were traced to determine the time required to reach their respective destinations. Local movements from Waterbury, Hartford, Springfield, and Holyoke were neglected. A certain number of cars were lost in the tracing process due to incomplete records, and diversions or reconsignments,

however, these lost cars amounted to only about 5% of the total. The results of the tracing operation are summarized in Table IX, Delay in Hours of Waterbury, Hartford, Springfield, and Holyoke Cars Interchanged at Maybrook, and Table X, Running Time in Hours of Waterbury, Hartford, Springfield, and Holyoke Cars Interchanged at Maybrook. A distinction was made between perishable and other freight to determine if the former received preferential handling. The movement of a typical day's receipts at Maybrook is shown graphically in Figure 6.

B. Proposed Service

The wheel report statistics presented in section II indicate that the Maybrook Gateway and State Line originate about 45, 60, 20, and 20 cars per day for the Waterbury, Hartford, Springfield, and Holyoke destination groups respectively. The total of 145 cars per day is of sufficient magnitude to warrant some form of specialized service to those groups. It should be noted that the average weight of all cars interchanged at Maybrook for the four destination groups in both sample weeks was 60 tons, and the respective daily tonnages to Waterbury, Hartford, Springfield, and Holyoke were 2700, 3600, 1200, and 1200 tons.

Plan #1

The most obvious proposal to be considered is the operation of one train (OS - 2) daily from Maybrook to Springfield via Waterbury to carry all cars originating on or near the Maybrook line for all four destination groups. Stops would

TABLE IX

Delay in Hours of Waterbury, Hartford, Springfield and Holyoke Cars Interchanged at Maybrook

Delay at	of Cars for	Month of Sample Week	Perishable Cars No. Cars	Perishable Cars Avg. Delay	Other Cars No. Cars	Other Cars Avg. Delay	All Cars Fastest 10% Avg. Delay	All Cars Slowest 10% Avg. Delay	All Cars Total Avg. Delay
Maybrook	Cedar Hill	Jan.	131	9.4	544	11.3	3.7	24.7	11.2
		Aug.	96	8.8	620	12.9	4.4	24.7	12.3
Maybrook	Turkeybrook	Jan.	19	9.8	163	15.1	4.5	40.1	14.2
		Aug.	16	10.0	103	12.4	4.9	23.2	12.1
Cedar Hill	Waterbury	Jan.	2	21.7	24	14.3	10.6	21.4	14.9
		Aug.	4	10.6	101	16.0	5.4	36.2	15.8
Turkeybrook	Waterbury	Jan.	20	5.2	139	5.9	0.9	12.3	5.8
		Aug.	17	4.3	93	8.5	2.2	22.8	7.9
Cedar Hill	Hartford	Jan.	123	4.0	276	5.6	2.3	19.3	5.1
		Aug.	79	9.3	313	13.3	1.6	57.1	12.5
Cedar Hill	Springfield	Jan.	6	4.3	118	9.0	2.7	22.3	8.8
		Aug.	5	7.7	76	8.4	1.3	27.5	8.4
Cedar Hill	Holyoke	Jan.	4	11.3	140	13.7	4.3	37.3	13.7
		Aug.	3	5.1	136	21.2	5.2	61.1	20.8

Source: NYNH&H Car Record Books, January and August, 1957

TABLE X

Running Time in Hours of Waterbury, Hartford, Springfield, and Holyoke Cars Interchanged at Maybrook

From	To	Month of Sample Week	Perishable Cars No. Cars	Perishable Cars Avg. Run.Time	Other Cars No. Cars	Other Cars Avg. Run.Time	All Cars Fastest 10% Avg. Run.Time	All Cars Slowest 10% Avg. Run.Time	All Cars Total Avg. Run.Time
Maybrook	Cedar Hill	Jan.	132	5.0	576	4.8	4.2	7.1	4.8
		Aug.	97	5.2	607	5.2	4.1	9.5	5.2
Maybrook	Turkeybrook	Jan.	22	4.1	163	4.7	3.4	7.3	4.6
		Aug.	16	5.3	104	5.5	3.6	8.6	5.5
Cedar Hill	Waterbury	Jan.	2	2.2	24	2.3	1.9	2.5	2.3
		Aug.	4	3.8	102	4.1	3.2	3.5	4.1
Turkeybrook	Waterbury	Jan.	16	1.0	139	1.0	0.6	1.2	1.0
		Aug.	13	1.3	97	1.2	1.0	1.5	1.2
Cedar Hill	Hartford	Jan.	140	1.5	258	1.6	1.3	2.3	1.6
		Aug.	79	1.6	312	1.5	1.0	1.9	1.5
Cedar Hill	Springfield	Jan.	7	3.1	118	3.3	2.4	5.5	3.2
		Aug.	5	3.2	78	3.1	1.9	4.1	3.1
Cedar Hill	Holyoke	Jan.	4	3.7	140	4.0	2.7	6.1	4.0
		Aug.	3	4.8	133	4.1	2.4	4.9	4.1

Source: NYNH&H Car Record Books and Wheel Reports, January and August, 1957

be scheduled at Waterbury to set out the Waterbury block, at Plainville to set out the Holyoke block, and at Hartford to set out the Hartford block. However, this proposal is unacceptable because of tonnage restrictions between Maybrook and Derby Junction. The tonnage rating imposed by the 1.14% grade between Hopewell Junction and Reynolds is 6000 tons for four units (400 series). The tonnage contemplated for OS - 2 is 8700 and six units could negotiate the grade satisfactorily with a train of this weight. However, axle loading restrictions do not permit operation with more than four units per train on the Poughkeepsie bridge. These factors, then limit trains consisting wholly of Waterbury, Hartford, Springfield, and Holyoke blocks to 100 cars.

Plan #2

With the exception of the 6 miles of 1.14% grade previously noted, four units could satisfactorily handle 9000 tons from Maybrook to Derby Junction. It would be possible to initiate helper service in the excepted territory to overcome this limitation. However, the use of helpers for one train is felt to be unjustified without further investigation, as the nearest terminals for helpers are Maybrook and Danbury--both 40 miles from the foot of the grade. Further, should these obstacles be overcome, the tonnage after setting out 45 cars at Waterbury would still be 700 tons in excess of the rating between Waterbury and Plainville and a helper or an additional unit would be required.

The operational difficulties encountered by this plan are felt to outweigh any economies or improvement in service that might be realized and its further consideration is deemed unnecessary.

Plan #3

Having established the impracticability, on the basis of tonnage, of one daily train from Maybrook to serve all four destination groups, the next proposal suggests the operation of two trains daily with the same objective. Each would carry 1/2 of the traffic from Maybrook and perform the same work as indicated for the train of Plan #1. With 75 cars or 4500 tons on each, tonnage would not be a controlling factor between Maybrook and Derby Junction. After setting out about 22 cars at Waterbury, the tonnage would be reduced to 3180, 1020 tons less than the rating for three units from Waterbury to Plainville.

The schedules of the two daily trains, called OS - 2 and OS - 4, which follow were established using the schedules of existing trains and trains which ran in Maybrook - Waterbury - Hartford service in 1948 (NYNH&H Arranged Freight Train Service Symbol Book No. 80, 9/26/48) as guides for the running times. The work at all points involves only picking up or setting out previously classified blocks and thus should require no more than one-half hour at each stop. Maybrook closing times were established with the use of Table VI. Inasmuch as about 90% of the daily interchange for the four destination groups arrived by 1600 hours,

this time is considered to be the closing hour of the later of the two trains (OS - 4). The 10% of the traffic arriving between 1600 and 2400 should move on the earlier train (OS-2). About 40% of the interchange arrived by 1000 and this time is set as the closing time for OS - 2. These times provide for an even split of all of the traffic between OS - 2 and OS - 4. The current schedules call for from two to five hours from closing time to leaving time at Maybrook. It is felt that two hours is sufficient time for classification of the last connecting train, inasmuch as the proposed schedules are based on actual arrival times of connections rather than scheduled times as is the case of the existing procedure. The stop at Danbury provided for OS - 4 is required to connect from IR - 1 which carries interchange from State Line and Pittsfield. The only traffic contributing to this study from the IR - 1 connection during the two sample weeks was destined to the Waterbury group.

Further study reveals that the proposed schedules of OS - 2 and OS - 4 would nearly duplicate the service provided by NS - 4 and 1/NS - 2 between Hartford and Springfield. A suitable connection with the Maybrook trains at Hartford could be made with 1/NS - 2 and NS - 4 to permit forwarding of the Springfield traffic from Maybrook. Thus OS - 2 and OS - 4 would terminate at Hartford and henceforth they will be referred to as OA - 2 and OA - 4.

The initiation of OA - 2 and OA - 4 should permit a reduction of the Maybrook - Cedar Hill service . Table XI,

OS - 2 and OS -4 Daily Maybrook to Springfield

	OS - 2		OS - 4	
Station	Time	Connects From	Time	Connects From
Maybrook Lv.	1200	LHR 30, Erie NE-74, NYC RV-2, LHR HO-6, LNE Cement, LHR 32, Erie XC-98	1800	Erie NE-98, LNE Local, LHR AO-4
Danbury Ar.	1500		2100	
Danbury Lv.	--		2130	IR-1
Waterbury Ar.	1650		2320	
Waterbury Lv.	1720		2350	
Plainville Ar.	1810		0040	
Plainville Lv.	1840		0110	
Hartford Ar.	1925		0155	
Hartford Lv.	1955		0225	
Springfield Ar.	2045		0315	
Maybrook Closing Time		1000		1600

Block		Set Off at		Classification	
OS - 2	OS - 4	OS - 2	OS - 4	OS - 2	OS - 4
From Maybrook					
1	1	Waterbury	Waterbury	Waterbury	Waterbury
2	2	Plainville	Holyoke	Plainville	Holyoke
3	3	Hartford	Hartford	Hartford	Hartford
4	4	Springfield	Springfield	Springfield	Springfield
From Danbury					
-	1	--	Waterbury	--	Waterbury

Connects To		Time		At	
OS - 2	OS - 4	OS - 2	OS - 4	OS - 2	OS - 4
Extras	Extras	--	--	Waterbury	Waterbury
NY - 2	NY - 2	0520	0520	Plainville	Plainville
Extras	Extras	--	--	Hartford	Hartford
B&M SJ-1	B&M SJ-1	0850	0850	Springfield	Springfield
B&A BV-1	B&A BV-1	1230	1230	Springfield	Springfield
B&M SU-1	B&M SU-1	1900	1900	Springfield	Springfield

TABLE XI

Distribution of Cars in Various Trains
from Maybrook to Four Destination Groups

Train	Month of Sample Week	Total Cars	Cars for Four Groups	% of Cars in Train	% of All Cars for Four Groups in Each Train
A/OB-2	Jan.	610	96	15.7	10.1
	Aug.	640	135	21.1	13.7
	Both	1250	231	18.5	12.0
OB-2	Jan.	600	0	0.0	0.0
	Aug.	695	51	7.3	5.2
	Both	1295	51	3.9	2.6
OB-4	Jan.	609	59	9.7	6.3
	Aug.	299	46	15.4	4.7
	Both	908	105	11.6	5.5
OB-6	Jan.	613	135	22.0	14.3
	Aug.	678	178	26.2	18.1
	Both	1291	313	24.2	16.2
ON-4	Jan.	544	458	89.0	48.4
	Aug.	618	210	34.0	21.4
	Both	1162	668	57.5	34.6
ON-6	Jan.	684	133	19.5	14.0
	Aug.	858	154	17.9	15.7
	Both	1542	287	18.6	14.9
Extras	Jan.	223	66	29.6	7.0
	Aug.	735	208	28.7	21.2
	Both	958	274	28.6	14.2
Total	Jan.	3883	947	24.4	100.0
	Aug.	4483	982	21.9	100.0
	Both	8366	1929	23.1	100.0

Source: NYNH&H Wheel Reports
January and August, 1957

Distribution of Cars in Various Trains, indicates the percent of the total number of cars for the four destination groups carried by each of the symbol trains in each sample week. Further, it shows the precent of all cars in each train that were enroute to the four destination groups.

A survey of this table reveals that theoretically 23% of the Maybrook - Cedar Hill service could be eliminated on the basis of volume alone. During both sample weeks, a total of 81 symbol trains and 16 extras were operated. A 23% reduction would call for the cancellation of eleven trains per week.

Inasmuch as ON-4 carried 34.6% of all traffic to the four destination groups, and in addition 57.5% of all the cars that moved in ON - 4 were destined to these groups, ON - 4 is the most suitable symbol train to be eliminated. From the standpoint of service objective, little harm would result from the cancellation of ON - 4 since the traffic to other points could readily be absorbed by the remaining trains. It would be inadvisable to consider the cancellation of ON - 6 since that train provides the only connection to New York from Maybrook. The elimination of ON - 4 would reduce the service by seven trains per week. The remaining four trains per week that could be cancelled should be made up by a reduction in unscheduled service (extras).

Additional reduction in service could be accomplished between Cedar Hill and Springfield. Traffic for the Hartford

and Springfield groups from New York, points near New Haven, and points east of New Haven amounted to about 160 cars per day in the two sample weeks. From Hartford to Springfield the average was about 40 cars per day for both weeks. Table XII, Average Daily Traffic to Hartford and Springfield by Trains, shows the average number of cars handled daily by each of the trains in this service during the test periods. These figures include the traffic that originated at Maybrook.

TABLE XII

Average Daily Traffic to Hartford and Springfield by Trains

From	To	Number of Cars				
		1/NS-2	2/NS-2	NS-4	Extras	Total
Cedar Hill	Hartford	43	22	35	31	131
Cedar Hill	Springfield	21	27	46	14	108
Hartford	Springfield	18	4	15	0	37
Total		82	53	96	45	276

Having rerouted 80 cars per day for Hartford and Springfield on OA - 2 and OA - 4, 33% of the traffic for Hartford and Springfield that previously moved through Cedar Hill has been eliminated. During the two sample weeks a total of 44 trains operated in Cedar Hill - Springfield service. A reduction of 33% would call for the cancellation of seven trains per week. From the standpoint of volume, 2/ NS - 2 could be most easily abolished, accounting for five trains per week. The cancellation of two extras per week would complete the reduction. The remaining trains would then average 75 to 80 cars or 4500 to 4800 tons between Cedar Hill and Hartford on the basis of the 60 ton average car

weight. No problem of tonnage limitations should be expected as the rating in this territory is 2700 tons per unit.

A still greater reduction in service is proposed by cancelling NY - 2 and moving cars for the Holyoke group to Hartford on 1/NS - 2 and NS - 4. New York, New Haven local points, and points east of New Haven originated about 35 and 55 cars per day for the Holyoke group in the January and August sample weeks respectively. It was noted that the considerable difference in these two figures was due to the movement of bad order cars for scrapping in August. A suitable average for this movement is assumed to be in the order of 40 cars per day.

The movement of the Holyoke cars in 1/NS - 2 and NS - 4 would require three unit operation, assuming that 20 cars per day movedin each train. Should all 40 cars per day move in one train, no more than three units would be required.

The service to Meriden normally performed by NY - 2 could readily be absorbed by the local service provided from Cedar Hill by NX - 25 and NX - 27. During the two sample weeks only ten cars for Meriden were carried by NY - 2.

Having moved the traffic for the Holyoke group to Hartford in 1/NS - 2 and NS - 4 it is proposed to initiate a new symbol train, AY - 2, for final movement to destination. The suggested schedule, which follows, provides for

daily except Sunday operation and is adjusted to permit a connection of one hour and fifteen minutes from 1/NS - 2 at Hartford.

AY - 2, Daily Except Sunday Hartford to Holyoke

Station	Time	Connects From
Lv. Hartford	0400	1/NS-2, NS-4
Ar. New Britain	0420	
Lv. New Britain	0435	
Ar. Plainville	0450	OA-2, OA-4
Lv. Plainville	0520	
Ar. Westfield	0635	
Lv. Westfield	0715	
Ar. Holyoke	0745	

Three unit operation would be required due to the low tonnage rating (1100 tons per unit) between Westfield and Holyoke. It is contemplated that AY - 2 would be operated in turnaround service since the distance between Hartford and Holyoke is only 67 miles.

No change in the Cedar Hill - Waterbury service is recommended. The continuance of ND - 2 is necessary to provide movement of the traffic from New York, New Haven local points, and points east of New Haven.

The effectiveness of the entire proposal in terms of service is indicated in Table XIII, Comparison of Existing and Proposed Schedules (Plan #3.). The elapsed time from interchange at Maybrook to delivery at the four destination groups as provided by the existing schedules is compared with the time provided by this proposal, for Maybrook closing times of 1000 and 1600 hours. The minimum values were found by assuming that all connections are made and the maximum values provide for the missing of one connecting train at each point.

TABLE XIII — Comparison of Existing and Proposed Schedules (Plan #3)

Maybrook Closing	Existing Schedules 1000 Min. Hours	Existing Schedules 1000 Max. Hours	Existing Schedules 1600 Min. Hours	Existing Schedules 1600 Max. Hours	Proposed Schedules 1000 Min. Hours	Proposed Schedules 1000 Max. Hours	Proposed Schedules 1600 Min. Hours	Proposed Schedules 1600 Max. Hours
Cars for Hartford								
1. Delay at Maybrook	3.0	8.0	2.0	16.0	2.0	8.0	2.0	20.0
2. Running Time to Cedar Hill	4.5	4.2	4.2	4.5	---	---	---	---
3. Delay at Cedar Hill	7.8	6.5	3.1	12.8	---	---	---	---
4. Running Time to Hartford	1.5	1.5	1.5	1.5	7.4	7.9	7.9	7.4
Total	16.8	20.2	10.8	34.8	9.4	15.9	9.9	27.4
Cars for Springfield								
1. Delay at Maybrook	3.0	8.0	2.0	16.0	2.0	8.0	2.0	20.0
2. Running Time to Cedar Hill	4.5	4.2	4.2	4.5	---	---	---	---
3. Delay at Cedar Hill	7.8	6.5	3.1	12.8	---	---	---	---
4. Running Time to Hartford	---	---	---	---	7.4	7.9	7.9	7.4
5. Delay at Hartford	---	---	---	---	3.1	19.6	1.9	8.4
6. Running Time to Springfield	3.5	3.2	3.5	3.5	0.7	0.7	0.9	0.9
Total	18.8	21.9	12.8	36.8	13.2	36.2	12.7	36.7
Cars for Holyoke								
1. Delay at Maybrook	3.0	8.0	2.0	16.0	2.0	8.0	2.0	20.0
2. Running Time to Cedar Hill	4.5	4.2	4.2	4.5	---	---	---	---
3. Delay at Cedar Hill	8.9	28.2	4.2	37.9	---	---	---	---
4. Running Time to Plainville	---	---	---	---	6.2	6.7	6.7	6.2
5. Delay at Plainville	---	---	---	---	11.2	28.7	4.7	35.2
6. Running Time to Holyoke	5.3	5.3	5.3	5.3	2.4	2.4	2.4	2.4
Total	21.7	45.7	15.7	63.7	21.8	45.8	15.8	63.8

TABLE XIII (Continued)

Comparison of Existing and Proposed Schedules (Plan #3)

Maybrook Closing	Existing Schedules				Proposed Schedules			
	1000		1600		1000		1600	
	Min. Hours	Max. Hours	Min. Hours	Max. Hours	Min. Hours	Max. Hours	Min. Hours	Max. Hours
				Cars for Waterbury				
1. Delay at Maybrook					2.0	8.0	2.0	20.0
a. for Cedar Hill	3.0	8.0	2.0	16.0	---	---	---	---
b. for Turkeybrook	10.3	34.3	4.3	28.3	---	---	---	---
2. Running Time					---	---	---	---
a. to Cedar Hill	4.5	4.2	4.2	4.5	---	---	---	---
b. to Turkeybrook	4.3	4.3	4.3	4.3	---	---	---	---
3. Delay					---	---	---	---
a. at Cedar Hill	9.0	28.3	4.3	38.0	---	---	---	---
b. at Turkeybrook	3.7	27.7	3.7	27.7	---	---	---	---
4. Running Time to Waterbury					4.8	5.3	5.3	4.8
a. from Cedar Hill	3.0	3.0	3.0	3.0	---	---	---	---
b. from Turkeybrook	1.3	1.3	1.3	1.3	---	---	---	---
5. Total					6.8	13.3	7.3	24.8
a. via Cedar Hill	19.5	43.5	13.5	61.5	---	---	---	---
b. via Turkeybrook	19.6	66.6	13.6	61.6	---	---	---	---

It is not possible to analyze the change in service to Holyoke for traffic from New York and other points since the delay at Cedar Hill for this traffic was not developed. However, the elapsed times from departure at Cedar Hill to arrival at Holyoke can be compared. Table XIV, Comparison of Existing and Proposed Schedules - Cedar Hill - Holyoke (Plan #3), shows these values.

TABLE XIV Comparison of Existing and Proposed Schedules Cedar Hill - Holyoke (Plan #3)

	Existing Schedules - Hours	Proposed Schedules - Hours	
Trains	NY - 2	1/NS-2 & AY-2	NS-4 & AY-2
1. Running Time to Hartford	---	1.5	1.5
2. Delay at Hartford	---	1.3	6.5
3. Running Time to Holyoke	5.3	3.8	3.8
Total	5.3	6.6	11.8

The statement of costs and savings which follows shows the approximate cost of initiating Plan #3 and the estimated savings possible from the proposal. The values are based on one week's operation to eliminate the fluctuations caused by trains that run on other than a daily schedule. In the case of turnaround runs, the one way cost is assumed to be one-half the round trip cost. It is further assumed that the cost of switching at Maybrook is the same for the proposed and existing service.

Additional Costs - Dollars per Week

1. Initiation of OA -2, Daily
   1064 Train miles per Week

Crew Wages - straightaway local service, less than 81 cars, 3 units (400 series), 154 miles for engine service and 152 miles for train service	$1,130.
Motive Power Maintenance and Lube Oil 3 units (400 series), 152 miles	780.
Fuel - 3 units (400 series), 152 miles	640.
Total	$2,550.

2. Initiation of OA - 4, Daily	
1064 Train miles per Week	
Crew Wages - straightaway local service, less than 81 cars, 3 units (400 series), 154 miles for engine service and 152 miles for train service.	$1,130.
Motive Power Maintenance and Lube Oil 3 units (400 series), 152 miles	780.
Fuel - 3 units (400 series), 152 miles	640.
Total	$2,550.
3. Initiation of AY - 2, Daily except Sunday	
342 Train miles per Week	
Crew Wages - Turnaround local service, less than 81 cars, 3 units (1200 series), 116 miles for engine service and 114 miles for train service	$ 330.
Motive Power Maintenance and Lube Oil 3 units (1200 series), 57 miles	90.
Fuel, 3 units (1200 series), 57 miles	220.
Total	$ 640.
Total Additional Costs	$5,740.
Total Additional Train Miles - 2,470	

Savings - Dollars per Week

1. Cancellation of ON - 4, Daily	
868 Train miles per Week	
Crew Wages - straightaway through service, 81 to 105 cars, 4 units (400 series), 126 miles for engine service and 124 miles for train service	$ 950.
Motive Power Maintenance and Lube Oil 4 units (400 series), 124 miles	850.
Fuel - 4 units (400 series), 124 miles	700.
Total	$2,500.
2. Cancellation of Four Maybrook - Cedar Hill Extras per week	
496 Train miles per Week	
Crew Wages - straightaway through service, less than 81 cars, 4 units (400 series), 126 miles for engine service and 124 miles for train service	$ 540.
Motive Power Maintenance and Lube Oil 4 units (400 series), 124 miles	480.
Fuel - 4 units (400 series), 124 miles	400.
Total	$1,420.

3.	Cancellation of 2/NS - 2, Five Days per Week	
	300 Train miles per Week	
	Crew Wages - turnaround through service, less than 81 cars, 2 units (1200 series), 124 miles for engine service and 120 miles for train service	$ 280.
	Motive Power Maintenance and Lube Oil 2 units (1200 series), 60 miles	50.
	Fuel - 2 units (1200 series), 60 miles	130.
	Total	$ 460.
4.	Cancellation of Two Cedar Hill - Hartford Extras per Week	
	70 Train miles per Week	
	Crew Wages - turnaround through service less than 81 cars, 2 units (1200 series), 100 miles (minimum day) for engine and train service.	$ 80.
	Motive Power Maintenance and Lube Oil 2 units (1200 series), 35 miles	10.
	Fuel - 2 units (1200 series), 35 miles	30.
	Total	$ 120.
5.	Cancellation of NY-2, Six Days per Week	
	456 Train miles per Week	
	Crew Wages - straightaway local service less than 81 cars, 3 units (1200 series), 100 miles (minimum day) for engine and train service.	$ 570.
	Motive Power Maintenance and Lube Oil 3 units (1200 series), 76 miles	120.
	Fuel - 3 units (1200 series), 76 miles	290.
	Total	$ 980.
6.	Reduction in Mileage for Privately Owned Cars	
	Maybrook to Hartford distance reduced by seven miles, 220 cars per week (average) at 4¢ per car mile.	$ 60.
7.	Reduction of Traffic Through Cedar Hill Yard 150 cars per day rerouted at 96¢ per car yard cost	$1,000.
	Total Savings	$6,540.
	Total Reduction in Train Miles - 2,190	
	Total Additional Costs	5,740.
	Net Savings per Week	$ 800.

Net Additional Train Miles per Week - 280

Plan #4

A variation of Plan #3 is now proposed in order to reduce the Maybrook - Hartford running time of OA - 2 to provide better service to Hartford and Springfield.

If OA - 2 carried only Hartford and Springfield blocks, the stops at Waterbury and Plainville would be unnecessary and the running time could be cut by one hour. However, no improvement could be made in the schedule of OA - 4 if it carried only Waterbury and Holyoke blocks. It would be desirable to establish 1600 closing times for both trains in order to reduce delay on the intense interchange between 1000 and 1600 hours.

The proposed schedules for this service are found on page 51.

The cancellation of ON - 4, four Maybrook - Cedar Hill extras, 2/NS - 2, two Cedar Hill - Hartford extras, and NY - 2 and the initiation of AY - 2 would still be possible under this plan.

It would be necessary to operate OA - 2 with 4 units (400 series) due to the estimated train weight of 4800 tons (60 Hartford cars and 20 Springfield cars). OA - 4 would require 3 units (400 series) for 3900 tons (45 cars for Waterbury and 20 cars for Plainville). Thus between Waterbury and Plainville OA - 4 would be considerably overpowered and light engine movement would ensue from Plainville to Hartford.

The effectiveness of this proposal is indicated in Table XV, Comparison of Existing and Proposed Schedules

OA - 2 and OA - 4 Daily Maybrook to Hartford

	OA - 2		OA - 4	
Station	Time	Connects From	Time	Connects From
Maybrook Lv.	1800	All Trains	1830	All Trains
Danbury Ar.	2100		2130	
Danbury Lv.	---		2200	IR - 1
Waterbury Ar.	2250		2350	
Waterbury Lv.	---		0020	
Plainville Ar.	2340		0110	
Plainville Lv.	---		0140	
Hartford Ar.	0025		0205	
Maybrook Closing Time		1600		1600

Block		Set Off At		Classification	
OA - 2	OA - 4	OA - 2	OA - 4	OA - 2	OA - 4
From Maybrook					
1	1	Hartford	Waterbury	Hartford	Waterbury
2	2	Hartford	Plainville	Springfield	Holyoke
From Danbury					
-	1	--	Waterbury	--	Waterbury

Connects To		Time		At	
OA - 2	OA - 4	OA - 2	OA - 4	OA - 2	OA - 4
1/NS-2	Extras	0350	--	Hartford	Waterbury
Extras	Extras	--	--	Hartford	Plainville
--	AY - 2	--	0520	--	Plainville

TABLE XV

Comparison of Existing and Proposed Schedules (Plan #4)

	Maybrook Closing	Existing Schedules 1600 Min. Hours	Existing Schedules 1600 Max. Hours	Proposed Schedules 1600 Min. Hours	Proposed Schedules 1600 Max. Hours
	Cars for Hartford				
1.	Delay at Maybrook	2.0	16.0	2.0	26.0
2.	Running Time to Cedar Hill	4.2	4.5	---	---
3.	Delay at Cedar Hill	3.1	12.8	---	---
4.	Running Time to Hartford	1.5	1.5	6.4	6.4
	Total	10.8	34.8	8.4	32.4
	Cars for Springfield				
1.	Delay at Maybrook	2.0	16.0	2.0	26.0
2.	Running Time to Cedar Hill	4.2	4.5	---	---
3.	Delay at Cedar Hill	3.1	12.8	---	---
4.	Running Time to Hartford	---	---	6.4	6.4
5.	Delay at Hartford	---	---	3.4	9.1
6.	Running Time to Springfield	3.5	3.5	0.9	0.7
	Total	12.8	36.8	12.7	42.2
	Cars for Holyoke				
1.	Delay at Maybrook	2.0	16.0	2.5	26.5
2.	Running Time to Cedar Hill	4.2	4.5	---	---
3.	Delay at Cedar Hill	4.2	37.9	---	---
4.	Running Time to Plainville	---	---	6.7	6.7
5.	Delay at Plainville	---	---	4.2	28.2
6.	Running Time to Holyoke	5.3	5.3	2.4	2.4
	Total	15.7	63.7	15.8	63.8
	Cars for Waterbury				
1.	Delay at Maybrook			2.5	26.5
	a. for Cedar Hill	2.0	16.0	---	---
	b. for Turkeybrook	4.3	28.3	---	---
2.	Running Time			---	---
	a. to Cedar Hill	4.2	4.5	---	---
	b. to Turkeybrook	4.3	4.3	---	---
3.	Delay			---	---
	a. at Cedar Hill	4.3	38.0	---	---
	b. at Turkeybrook	3.7	27.7	---	---
4.	Running Time to Waterbury			5.3	5.3
	a. from Cedar Hill	3.0	3.0	---	---
	b. from Turkeybrook	1.3	1.3	---	---
5.	Total			7.8	31.8
	a. via Cedar Hill	13.5	61.5	---	---
	b. via Turkeybrook	13.6	61.6	---	---

(Plan #4). The service effect on the Holyoke traffic from New York, New Haven local points, and points east of New Haven would be the same as that shown in Table XIV for Plan #3.

Due to the operation of OA - 2 with four units, the weekly costs would be increased over Plan #3 by $260. for maintenance and lube oil and by $220. for fuel. The net effect on crew wages of the increase for four unit operation and the decrease for through instead of local operation is a saving of $10. per week. The net saving that could be realized from Plan #4 is $330. per week. The train mileages are the same as those of Plan #3.

Plan #5

The basis of this proposal is the movement of Hartford and Springfield traffic in OA - 2 while continuing the existing procedure for the movement of Waterbury and Holyoke traffic. In this case, OA - 2 would operate on the schedule provided in Plan #4 and OA - 4 would not be operated. Four units would be required for the average of 80 cars per day or 4800 tons.

Since the movement of Waterbury and Holyoke traffic would remain unchanged, the cancellation of any part of the Maybrook - Cedar Hill scheduled service would not be practicable. ON - 4 would be required to provide service to Turkeybrook or Cedar Hill for the Waterbury traffic and to Cedar Hill for the Holyoke traffic. ON - 6 would be required to provide service to Bridgeport and the New York Gateway.

However, from the average of 80 cars per day to Hartford and Springfield and the total (8366 - Table XI) of all cars moved from Maybrook to Cedar Hill in both sample weeks, it is seen that a 13.4% reduction is possible. On the basis of the total of 97 trains that operated in both sample weeks, six trains per week could be cancelled. This reduction should be made in extra service.

As in Plans #3 and #4, 2/NS - 2 and two extras should be annulled to compensate for the reduction in traffic from Cedar Hill to Springfield. 1/NS - 2 should connect from OA - 2 at Hartford, and NS - 4 would have no connection from Maybrook.

The service to Waterbury and Holyoke from all points would remain unchanged as would the service to Hartford and Springfield from New York, local New Haven points, and points east of New Haven. The proposed service to Hartford and Springfield would be the same as that shown in Table XV for Plan #4.

A statement of costs and savings of Plan #5 follows. It will be noted that the cost of initiating OA - 2 is the same as that of Plan #4.

Additional Costs - Dollars per Week

1. Initiation of OA - 2, Daily	
1064 Train miles per Week	
Crew Wages - straightaway through service, less than 81 cars, 4 units (400 series), 154 miles for engine service and 152 miles for train service	$1,120.
Motive Power Maintenance and Lube Oil 4 units (400 series), 152 miles	1,040.
Fuel - 4 units (400 series), 152 miles	860.
Total	$3,020.
Total Additional Cost	$3,020.
Total Additional Train Miles - 1,064	

Savings - Dollars per Week

1.	Cancellation of Six Maybrook - Cedar Hill Extras per Week 744 Train miles per Week Crew Wages - straightaway through service, less than 81 cars, 4 units (400 series), 126 miles for engine service and 124 miles for train service	$ 810.
	Motive Power Maintenance and Lube Oil 4 units (400 series), 152 miles	730.
	Fuel - 4 units (400 series), 152 miles	600.
	Total	$ 2,140.
2.	Cancellation of 2/NS-2, Five Days per Week 300 Train miles per week Same as shown in Plan #3	
	Total	$ 450.
3.	Cancellation of Two Cedar Hill - Hartford Extras per Week 70 Train miles per Week Same as shown in Plan #3	
	Total	$ 120.
4.	Reduction in Mileage for Privately Owned Cars Maybrook to Hartford distance reduced by seven miles, 200 cars per week (average) at 4¢ per car mile	$ 60.
5.	Reduction of Traffic Through Cedar Hill Yard 80 cars per day rerouted at 96¢ per car yard cost	$ 540.
Total Savings		$ 3,310.
Total Reduction in Train Miles - 1,114 Total Additional Costs		3,020.
Net Savings per Week Net Reduction in Train Miles per Week - 50		$ 290.

Plan #6

In view of the meager savings developed from the previous proposals, the possibility of main tracking a daily Maybrook - Springfield train through Cedar Hill is proposed as Plan #6. Four units would be required for the operation from Maybrook to Cedar Hill with 80 cars or 4800 tons. Beyond Cedar Hill, only two units would be necessary if the

consist were unchanged. However, with four units, the train could be filled out to 10,800 tons (up to 100 cars of fill) from Cedar Hill. It is contemplated that the Waterbury and Holyoke traffic would continue to move under the existing pattern. The schedule of the proposed OS - 2 follows.

OS - 2 Daily Maybrook to Springfield

Station	Time
Maybrook Lv.	1800
Danbury By	2100
Derby Junction By	2130
Devon By	2150
Cedar Hill Ar.	2230
Cedar Hill Lv.	2300
Hartford Ar.	0030
Hartford Lv.	0100
Springfield Ar.	0155

Maybrook Closing Time: 1600

Block	Set Off At	Classification
From Maybrook		
1	Hartford	Hartford
2	Springfield	Springfield
From Cedar Hill		
1	Hartford	Hartford
2	Springfield	Springfield

As provided in Plan #5, Maybrook - Cedar Hill extra service could be reduced by six trains per week, and 2/NS - 2 and two Cedar Hill - Hartford extras per week could be annulled. Further, with the fill of up to 100 cars from Cedar Hill, it is felt that 1/NS - 2 could also be cancelled since 1/NS - 2 averaged only 82 cars per day during the sample weeks.

The service to Waterbury and Holyoke would remain unchanged. To Hartford and Springfield, the proposed service is shown in Table XVI, Comparison of Existing and Proposed Schedules (Plan #6).

TABLE XVI

Comparison of Existing and Proposed Schedules (Plan #6)

Maybrook Closing	Existing Schedules 1600 Min. Hours	Existing Schedules 1600 Max. Hours	Proposed Schedules 1600 Min. Hours	Proposed Schedules 1600 Max. Hours
Cars for Hartford				
1. Delay at Maybrook	2.0	16.0	2.0	26.0
2. Running Time to Cedar Hill	4.2	4.5	----	---
3. Delay at Cedar Hill	3.1	12.8	---	---
4. Running Time to Hartford	1.5	1.5	6.5	6.5
Total	10.8	34.8	8.5	32.5
Cars for Springfield				
1. Delay at Maybrook	2.0	16.0	2.0	26.0
2. Running Time to Cedar Hill	4.2	4.5	---	---
3. Delay at Cedar Hill	3.1	12.8	---	---
4. Running Time to Springfield	3.5	3.5	7.9	7.9
Total	12.8	36.8	9.9	33.9

A statement of costs and savings for Plan #6 follows.

Additional Costs - Dollars per Week

1. Initiation of OS - 2, Daily
   1288 Train miles per Week
   Crew Wages - straightaway, through service 126 to 145 cars, 4 units (400 series), 186 miles for engine service and 184 miles for train service. $1,450.
   Motive Power Maintenance and Lube Oil 4 units (400 series), 184 miles 1,260.
   Fuel - 4 units (400 series), 184 miles 1,030.
   Total $3,740.

Total Additional Cost $3,740
Total Additional Train Miles - 1,288

Savings - Dollars per Week

1. Cancellation of Six Maybrook - Cedar Hill Extras per Week
   744 Train miles per Week
   Same as shown for Plan #5
   Total $2,130.

2.	Cancellation of 1/NS - 2 Seven days per Week 420 Train miles per Week Crew Wages - turnaround through service 81 to 105 cars, 2 units (1200 series), 124 miles for engine service and 120 miles for train service	$ 390.
	Motive Power Maintenance and Lube Oil 2 units (1200 series), 60 miles	70.
	Fuel - 2 units (1200 series), 60 miles	130.
	Total	$ 590.
3.	Cancellation of 2/NS - 2, Five days per Week 300 Train miles per Week Same as shown for Plan #5	
	Total	$ 450.
4.	Cancellation of Two Cedar Hill - Hartford Extras per Week 70 Train miles per Week Same shown for Plan #5	
	Total	$ 120.
5.	Reduction of Traffic Through Cedar Hill Yard 80 cars per day not handled at 96¢ per car yard cost	$ 540.
	Total Savings Total Reduction in Train Miles - 1,534	$3,830.
	Total Additional Costs	3,740.
	Net Savings per Week Net Reduction in Train Miles per Week - 246	$ 90.

New York Originated Traffic

A detailed analysis of the traffic for the four destination groups originating at the New York Gateway is beyond the scope of this study. Only the volume of this traffic was established; therefore, no exact schedules can be proposed. However, during the course of the study it became evident that this volume was of sufficient magnitude to warrant specialized service (on the average, 85 cars per day; 20 - Waterbury, 40 - Hartford, 15 - Springfield, and 10 - Holyoke). Two of the proposals previously presented

for Maybrook originations could be closely paralleled for the New York origin, Plan #3 and Plan #6.

The parallel to Plan #3 would provide for one train operating daily from New York to Hartford and carrying cars for all four destination groups via Devon and Waterbury to Hartford. Set outs would be made at Waterbury for the Waterbury block, Plainville for the Holyoke block, and Hartford for the Hartford and Springfield blocks. Connections to the Cedar Hill - Springfield service would be made at Hartford.

The controlling tonnage rating for the proposed route is 1400 tons per unit between Waterbury and Plainville. On the basis of 60 tons per car average weight, this train could be operated with three units and 85 cars to Waterbury and 65 cars beyond after setting out the Waterbury block.

During both sample weeks 100 symbol trains and 20 extras operated from New York to Cedar Hill and carried about 7100 cars for all destinations. Of these 7100 cars, about 1200 were enroute to Waterbury, Hartford, Springfield, and Holyoke. Re-routing this traffic would permit a 17% reduction (10 trains per week) in the New York - Cedar Hill service. A further reduction in the Cedar Hill - Springfield service might be possible if the connections from Maybrook at Hartford provided in Plan #3, and the "per diem" service offered by NS - 4 were not required.

The parallel to Plan #6 provides for the operation of a daily train from New York to Springfield via Cedar Hill carrying cars for all four groups. Waterbury cars would be set out at Cedar Hill to connect to ND - 2. Holyoke cars would move in NY - 2 from Cedar Hill or in AY - 2 from Hartford. The train from New York would "main-track" through Cedar Hill stopping only long enough for the aforementioned set-out and to fill out with Hartford and Springfield cars from New Haven and the east. Three unit operation would be required.

The 17% reduction in New York - Cedar Hill service would be possible as well as the elimination of two trains per day from Cedar Hill to Springfield as proposed in Plan #6.

V. CONCLUSIONS

A. Service

Table XVII summarizes the scheduled service provisions of the existing procedure and Plan #3 as well as the service that actually obtained during the two sample weeks.

TABLE XVII

Recapitulation of Schedule Comparison - Total Elapsed Time - Maybrook to Destination

Destination	Average Cars per Day	Existing Service Actual Average Hours	Existing Service Scheduled Hours Min.	Existing Service Scheduled Hours Max.	Proposed Service Plan #3 Scheduled Hours Min.	Proposed Service Plan #3 Scheduled Hours Max.
Hartford	60	27.2	10.8	34.8	9.4	27.4
Springfield	20	28.5	12.8	36.8	12.7	36.7
Holyoke	20	38.1	15.7	63.7	15.8	63.8
Waterbury	45	28.2	13.5	61.6	6.8	24.8

The minimum values were determined by assuming that all connections were made and the maximums by assuming that one connection was missed at each point. It will be noted that the proposed schedules do not substantially affect the service to Springfield and Holyoke. However, considerable savings in time are indicated for the Waterbury and Hartford traffic and these two points absorbed over 70% of the total traffic. Of the several proposals, Plan #3 would effect the most improvement to the greatest volume of traffic. A further benefit of this plan is the earlier arrival at Waterbury and Hartford with resultant increased time for placement. ND - 2 currently arrives at Waterbury at 0530 and placement by 0800 appears to be quite difficult. The proposed schedules would allow 15.1 and 8.7 hours. At Hartford

1/NS - 2 allows only 5.3 hours for 0800 placement while the proposal would permit 12.6 and 6.1 hours. The arrival times at Springfield and Holyoke would not be changed.

Since the actual average elapsed time was more than double that of the minimum schedule under the existing procedure, it is felt that the service to all four groups could be substantially improved by closer adherence to the provisions of the existing schedules. Further improvement under these circumstances could be found through adjustment of the schedules to meet the periods of most intense interchange for the four groups at Maybrook.

The volume of traffic for the four groups originating at the New York Gateway is great enough to produce similarly improved service. Further investigation of this traffic would suggest the best means of implementing this service.

B. Costs and Savings

The train mile and dollar costs and savings of the several proposals are summarized in Table XVIII.

TABLE XVIII Recapitulation of Annual Costs and Savings

	Plan #3	Plan #4	Plan #5	Plan #6
Net Train Miles	+ 14,560	+ 14,560	- 2,600	- 13,790
Net Savings	$41,600	$17,160	$15,080	$ 4,680

In all cases, the realization of any savings is dependent on two assumptions:

1. That the cost of classifying cars for the four destination groups at Maybrook would not exceed the cost of handling which obtains for the existing procedures.

2. That the costs of operation at Cedar Hill yard would decrease in direct proportion to the number of cars to the four groups that would be re-routed.

These assumptions lead to net savings for Plans #3 and #4 in spite of substantial increases in train mileage.

Although none of the proposals exhibit savings of great magnitude, it is felt that the improvement in service developed by Plan #3 outweighs this factor. The fully distributed costs of both the existing service and Plan #3 should be developed if a more detailed investigation is initiated.

For the reasons stated, Plan #3 provides the most effective method of improving the service to the Waterbury, Hartford, Springfield, and Holyoke areas from the Maybrook Gateway.