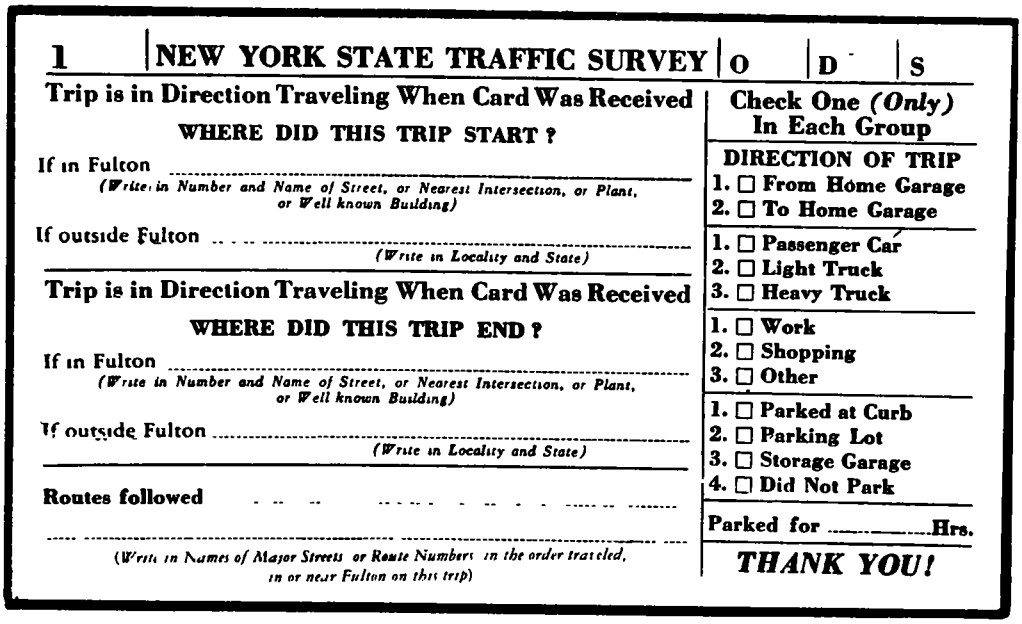
NEW YORK STATE TRAFFIC-PLANNING AND ORIGIN-DESTINATION SURVEYS FOR URBAN ARTERIAL ROUTES

MAYNARD A. BEBEE, SR. C.E., Bureau of Highway Planning
New York State Department of Public Works

The selection of procedures for urban-area traffic-and-planning studies in New York State was influenced by the scope of the contemplated program, the objectives to be met, personnel and organization considerations, and the adequacy of the data obtained.

In the four years just passed, the Department of Public Works has conducted traffic surveys in 60 of the state's 62 cities. Arterial recommendations developed from these surveys and related studies have been presented to 28 cities. Twenty-two city route plans have been adopted in their general features, and Upstate projects totalling $17,000,000 have been undertaken. (Upstate denotes all area of the state excepting the City of New York.) The arterial program in New York city, including expressways and some parkways, is progressing in accordance with an earlier overall plan based on land-use requirements, general origin-and-destination investigations and overwhelming traffic volumes. Projects amounting to $71,000,000 are completed or under contract on 32 miles of metropolitan arteries.



1 | NEW YORK STATE TRAFFIC SURVEY | O | D | S

Trip is in Direction Traveling When Card Was Received

WHERE DID THIS TRIP START ?

If in Fulton .....
(Write in Number and Name of Street, or Nearest Intersection, or Plant, or Well known Building)

If outside Fulton .....
(Write in Locality and State)

Trip is in Direction Traveling When Card Was Received

WHERE DID THIS TRIP END ?

If in Fulton .....
(Write in Number and Name of Street, or Nearest Intersection, or Plant, or Well known Building)

If outside Fulton .....
(Write in Locality and State)

Routes followed .....

(Write in Names of Major Streets or Route Numbers in the order traveled, in or near Fulton on this trip)

Check One *(Only)* In Each Group

DIRECTION OF TRIP
1. ☐ From Home Garage
2. ☐ To Home Garage

1. ☐ Passenger Car
2. ☐ Light Truck
3. ☐ Heavy Truck

1. ☐ Work
2. ☐ Shopping
3. ☐ Other

1. ☐ Parked at Curb
2. ☐ Parking Lot
3. ☐ Storage Garage
4. ☐ Did Not Park

Parked for .....Hrs.

THANK YOU!

Figure 1. Questionnaire Postal Card Used in Traffic Survey of Fulton, New York

It is apparent that the state's arterial planning, as well as design and construction schedules, have been fitted to the time provisions of present legislation and authorized programs in such a manner as to provide some measure of the desired traffic relief in the early stages of the undertaking. Present urban-route planning, and the initial phases of the state's long-range route planning are now 80 percent complete.

Questionnaire postal cards were used exclusively in 49 of the 60 traffic surveys which were conducted for the planning studies. The card used in Fulton, a city of 13,000 population in north-central New York, is shown in Figure 1. As a result of early experience, this card includes modifications to the original cards to assure a maximum of usable data.

The surveys were generally conducted from 7:00 a.m. to 7:00 p.m. on a summer Tuesday or Thursday. Each driver entering the city, or the inner cordon near the central area, received a card on his initial trip, and a colored instruction card requesting his cooperation in returning the questionnaire card. The colored form was also used as a pass at subsequent stations. Less than 2 percent of the returned cards were rejected because of unsatisfactory replies. Slightly over 1,060,000 cards were distributed in all surveys, and 34 percent were returned.

Roadside interviews were made in combination with the distribution of postal cards in six urban traffic surveys. In five other cities interviews were used exclusively, employing the form shown in Figure 2.

NEW YORK STATE TRAFFIC SURVEY

CITY OF _____ Type of Vehicle - P, L, H, B STATION _____
HOUR ENDING Mode of Parking - C, L, G LOCATION

TYPE	ORIGIN	DESTINATION	MAIN ROUTES OR STREETS	PARKING

Figure 2. Roadside Interview Form Used in Traffic Survey of Oneonta, New York

The relative origin-and-destination characteristics of Oneonta, a city of 12,000 where drivers on all trips were interviewed as they entered the inner and outer cordons, and of Fulton, where postal cards were used, are shown. Figure 3 shows external traffic entering Oneonta at the left, and Fulton at the right. Volumes less than 200 vehicles are not shown on the Fulton plate. Figure 4 is of traffic with internal origin in the two cities.

With 14 percent greater population in Fulton than in Oneonta, it was computed from the survey data that there were 23 percent more trips in Fulton. Although somewhat beside the point, it is interesting to note that 22 percent more traffic passed through Fulton. With 50 percent more people in Fulton employed in manufacturing and industry there were 70 percent more trips to the industrial zones. In Fulton, 37 percent fewer

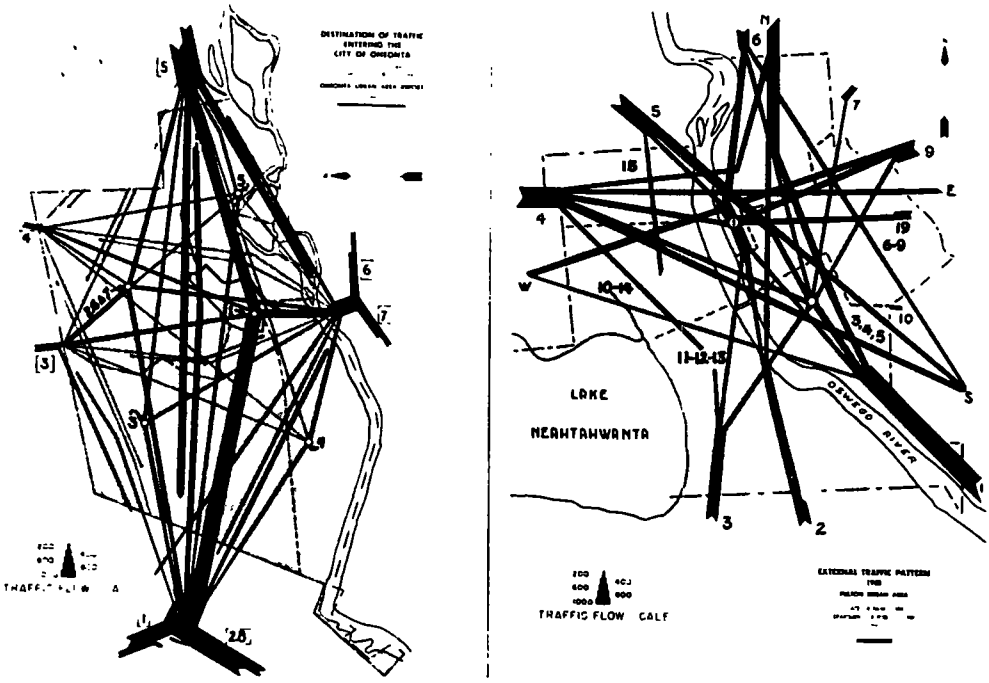


Figure 3. Destination of Traffic Entering the City of Oneonta (Left) and External Traffic Pattern (1948) Fulton Urban Area (Right)

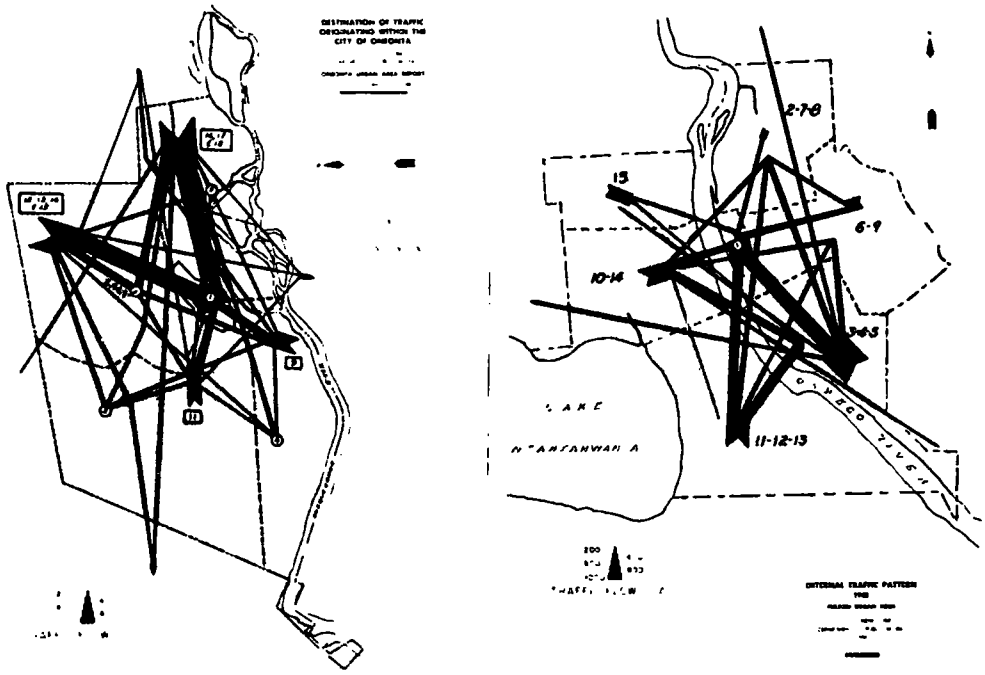


Figure 4. Destination of Traffic Originating Within the City of Oneonta (Left) and Internal Traffic Pattern (1948) Fulton Urban Area (Right)

persons were employed in the retail trades, and there was 22 percent less traffic destined to the business district than in Oneonta. The similarities and differences are what we would expect to find with either type of survey.

The correlation of such origin-and-destination data to area traffic volumes, with consideration to types of traffic, produces the traffic information basic to each route plan. Consideration is then given to peak-hour volume demands, street capacities, land-use requirements, critical forecasts, and the intricate location problems brought about by natural and man-made barriers.

The general attitude of the traveling public to the traffic surveys is reflected by the 34 percent return of the cards. Press and radio publicity seems to have accounted for some returns in the vicinity of 50 percent. Public interest, however, did not remain constant throughout the day, as revealed by the comparison of hourly returns for surveys in 22 cities of the state. The hourly returns shown in Figure 5 vary from 39 percent between 7:00 and 8:00 a.m., to 46 percent between 8:00 and 9:00 a.m., and 27 percent in the hour ending at 7:00 p.m.

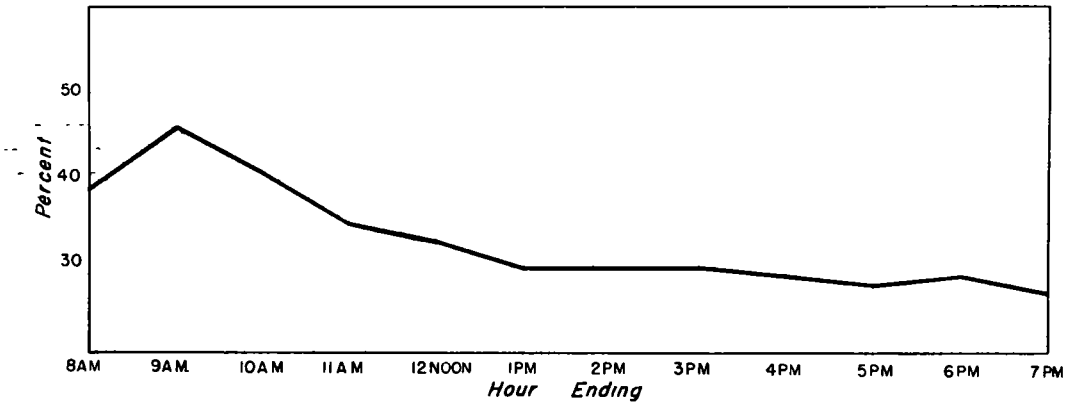


Figure 5. Percentage of Questionnaire Post-Card Returns by Hours from 22 New York State Urban Traffic Surveys

In checking if the first two percentages indicated a bias on the part of wage earners, which are presumed to be predominant in these early traffic volumes, comparisons were made as shown in Figure 6. The possible trend from the upper-left section of the graph, where high percentages of wage earners as related to urban population and low returns are plotted, to the lower-right section, where low percentages of wage earners and high returns are shown, did not materialize. Further studies are indicated if conclusions are to be reached concerning the possible bias of wage earners.

In and adjacent to those urban centers which are potent traffic generators is the problem of trends, which bears a direct relationship to the accuracy of origin-and-destination data. Traffic planners realize the urgency of combining their efforts with those of local planning authorities to the end that desirable and definite patterns of travel may be maintained or developed. Certain considerations today, such as real estate and competition, account for sudden developments for which no advance notice was given. Extensive industrial establishments are closed down overnight, and others geared to scientific development and invention are built in a few months. Cities are conceived and built in a year.

There are wars and rumors of war. Forecasts involving traffic movements will need periodic review and probably frequent readjustment. The ingenuity of the traffic planner must be exercised in providing certain flexibility in long-range plans. Simplified traffic-survey techniques are applicable to this problem.

Until recently, the efforts of the urban-planning unit in New York's Bureau of Highway Planning have been directed toward the completion of arterial plans for each urban area. While this will be the major effort of the unit until the reports are completed, increasing attention is being directed to actual trends as related to various forecasts and plans. The observations, findings, and recommendations developed from these studies will prove extremely vital to the long-range arterial program.

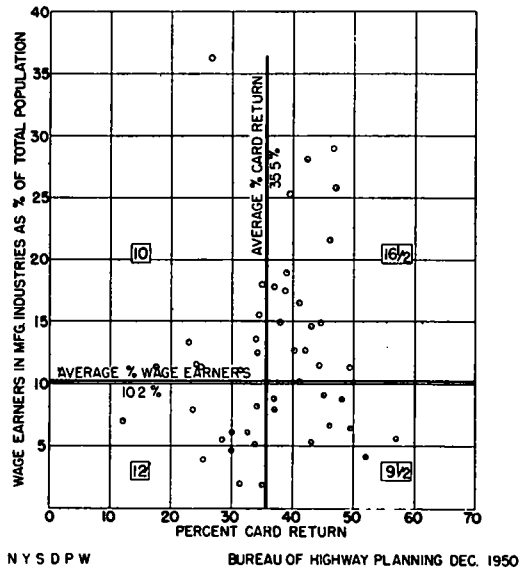


Figure 6. Comparison of Wage Earners in Manufacturing Industries as Percentage of Total Population and Percentage of Postal Card Returns in Each City from 48 New York State Urban Traffic Surveys

Origin-and-destination studies will continue to be a most important guide to the confirmation of present plans or to the making of necessary readjustments. Rigid control will be necessary where there are comparisons to be made over a long period of time, and it is desirable that survey procedures combine such control with simplicity and ease of processing.