

A REPORT  
OF AN ORIGIN AND DESTINATION SURVEY  
FOR  
US 281 SOUTH OF GRAND ISLAND

Prepared by  
Department of Roads and Irrigation  
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A REPORT OF AN ORIGIN AND DESTINATION SURVEY  
FOR US 281 SOUTH OF GRAND ISLAND

Purpose

The section of highway US 281 through Grand Island and immediately south of that city is in such condition as to seriously impede the safe and normal flow of traffic.

Several factors contribute to the congested condition of this highway. The highway makes two right angle turns at junction points with highway US 30 within the city. Since US 30 carries very heavy volumes of cross-country, as well as local, traffic these turning movements frequently "tie up" traffic. In going through Grand Island the highway both north and south of US 30 follows heavily traveled local streets. These are of inadequate width to properly handle the present traffic volume. From the south city limits to the junction with US 34, ribbon development and heavy traffic volumes force traffic to proceed at "a snail's pace". The existing narrow bridges over the several channels of the Platte River on the section common with US 34 are veritable "death traps". There are 4 pony truss bridges and 2 I-Beam bridges, all 18 feet in width, located on this section of highway. The bridges while structurally sound do not lend themselves to widening. In recent years several fatal accidents, as well as numerous accidents of a less serious nature, have occurred at these bridges. The present 20-foot concrete pavement from near Grand Island to south of the Platte River is in very poor condition. It is map-cracked, and spalling badly. A bituminous armor coat was applied as a maintenance measure a few years ago, but this has almost completely worn away. Early improvement of this highway is imperative.

Since through traffic on highway US 281 now travels about  $1\frac{1}{2}$  miles adverse distance in going through Grand Island, it is probable that a route around the

city to the west would prove advantageous. Due to the absence of fringe development in that area the problem of adequate right-of-way with limited access should be less costly. Another factor which should be considered is the fact that on the county road north of Doniphan the existing river bridges are in very poor condition. These will need to be replaced within the next few years. The bridges on the present route while too narrow for heavy traffic volumes are structurally sound and should be adequate to serve secondary traffic for a number of years. Thus in the interest of overall economy it might be cheaper to build on the western location, if traffic could be properly served by such a route.

The question as to the proper location and type of traffic facility to relieve the situation calls for a knowledge of the origin and destination of traffic now using the highways in this area. Such data together with the estimates of cost of the various alternates will enable the proper authorities to determine whether improvement of the existing route, relocation through the city, or a bypass around the city or a combination of these will best solve the problem. The fact that the ultimate location for the Interstate highway in this vicinity has not yet been decided upon, further complicates the problem. The location of US 281 should be such that an interchange, or interchanges, with the Interstate highway may be built to provide convenient access to Hastings and Grand Island.

During the war an origin and destination survey was conducted on highways around Grand Island. The findings at that time showed some traffic wishing to bypass the city. Also from that study it seemed that traffic from US 281 south would not be inconvenienced by selecting a route due north from the turn just west of Doniphan. However, since traffic has increased tremendously since that earlier survey, it was considered wise to bring that study to date by securing current information as to the origin and destination of today's traffic. This report deals with the findings of that survey.

## Summary

1. Highway US 281 from Grand Island to south of the Platte River is in very poor condition. The section from Grand Island to the junction of US 34 carries heavy traffic volumes. With ribbon development throughout, the congestion is severe. Six narrow bridges over the channels of the Platte River have proven quite hazardous to traffic, as they have been the scene of numerous serious accidents. These bridges although structurally sound are of a type not adapted to widening. Improvement of this facility or an alternate one to replace it cannot be deferred longer. The existing county road across the Platte River 2 miles to the west is gravel surfaced. The river bridges on this route are in very poor condition and will need to be replaced within the next few years. This road at present carries moderate volumes of local traffic. Since highway US 281 now turns west for 2 miles shortly after crossing the river, the approximate county road location might also be considered as a possible location for US 281. Purely in the interests of economy such a plan would seem wise, as then only one new set of Platte River bridges need be constructed within the near future. The cost of the western route should be comparable to the reconstruction of the present route.
2. Of the 2,200 vehicles per day which now cross the Platte River south of Grand Island, about 95 percent come from Doniphan or areas south and west. Approximately 56 percent of this traffic crossing the River is destined for the eastern section of Grand Island. This is to be expected as this section includes the business district of the city. Another 26 percent of the traffic, however, is destined to western Grand Island or to points north or west of the city. This traffic would save considerable distance and time if the western route were to be selected. About 16 percent is bound to highways east or northeast of Grand Island, and the remaining

2 percent is destined to the area between the River and Grand Island. A study of the traffic crossing the River shows a considerable advantage in distance to a sizeable portion of the movements if the western location were to be selected. There would be very little inconvenience insofar as the River crossing was concerned to any sizeable segment of traffic. The use of the entire western location north to 2nd Street or US 30 would cause but slight inconvenience to traffic bound for the eastern section of Grand Island and points northeast.

In addition to traffic crossing the Platte River, there is considerable local traffic generated by the businesses, industries and residential development between the River and Grand Island. On an average day this amounts to almost 900 trips. Again the eastern section of the city is the terminus for a large portion, 54 percent, of this traffic. About 27 percent of this traffic was destined to western Grand Island or areas west and north of the city, 15 percent to highways east or northeast of the city, and 4 percent to local areas. Since this traffic does not cross the River, the location of the bridge is not of consequence. Twenty-seven percent would prefer the western route due to time savings. The remaining vehicles, however, would probably prefer a route into town somewhere in the vicinity of the present highway. To offer service to these trips, and also to provide an alternate for traffic from south of the River, it might be well to consider leaving a highway through town along approximately the present route, perhaps Nebraska 2, to serve as a distributor for traffic destined for eastern Grand Island. US 34 should then be extended west to the proposed western location, to serve as the through route to the south, north or west. Since no river bridges are involved on this eastern route into Grand Island, the cost would not be too great, and such a scheme should offer excellent service to all major segments of traffic.

3. Another important vein of traffic which must be taken into consideration when studying changes in the highway routings south of Grand Island, is that on Nebraska 2 and US 34 east of Grand Island. At present 2,400 vehicles use this route each day. Of these 33 percent are destined beyond Grand Island on highways west or north, 7 percent are bound for areas west of the city and an additional 8 percent wishes to go south on US 281. A route around the city would be helpful to this traffic. There were, however, 42 percent of the vehicles bound for eastern Grand Island. These will desire access to the city along approximately the present route. Proper service to this traffic again points to the need for two routes, one around town and one into town along approximately the present location. Such a combination of routes should speed up through traffic, offer relief to congestion on present routes, and allow better circulation of traffic within the area. If these new facilities are developed with proper control of access, they should remain relatively uncongested for years to come.
4. The planning for US 281 south of Grand Island must be carefully coordinated with that for the Interstate highway through this area. The ultimate location of the Interstate route and the number of interchanges to be provided in this area may very well decide the best location for US 281. From the east there will be important veins of traffic on the Interstate destined toward Hastings; toward Grand Island, particularly the eastern section; and toward highways north and west of Grand Island. From the west the important movements are south toward Hastings, north to Grand Island and to highways beyond that city, particularly US 30 northeast. If all traffic destined for this area is to be handled at one interchange some of the traffic will have to travel added distance to their destinations. The importance of eastern Grand Island as a traffic generator would indicate the desirability of locating such an interchange approximately due south

of the central business district of that city. This, of course, penalizes traffic from the west bound for Hastings, western Grand Island, or north and west of Grand Island. Since Grand Island is growing toward the west and north this would be more serious in years to come. One interchange also offers inferior service to traffic from the east wishing to bypass the city. If two interchanges were to be provided, one should be located north of Doniphan for service to traffic bound for Hastings, western Grand Island and highways west or north of the city. The other could very well be located east of the Platte River crossing of Nebraska 2, so as to utilize that crossing of the River. However, should the Interstate be located north of the River in this vicinity, this interchange might be economically provided due south of Grand Island.

#### General Information

Highway US 281 runs from Canada to the Gulf of Mexico at Brownsville, Texas. During the past decade rapid strides have been made in providing dustless surfacing for this route in its entirety. As the remaining gaps are filled in the route will become increasingly important to through traffic. Since one of the poorer sections on the route now lies between St. Paul and O'Neill, Nebraska, through traffic has been relatively light in this area. With work underway toward improving this gap, however, through traffic may be expected to increase.

The section of highway with which this report is concerned lies between Grand Island and Hastings, and carries considerable volumes of interurban traffic between these two cities. In 1950 Grand Island had a population of 22,682 and was third in size among Nebraska's cities. Hastings with 20,211 persons was fourth in size. Both cities have experienced rapid growth within the past ten years. Hastings is the home of the Hastings Naval Ammunition Depot, a permanent installation covering about 75 square miles. The city also has

considerably more light industry than most Nebraska cities of its size. Grand Island has the Cornhusker Ordnance Plant west of the city. This plant is still in operation, but on a greatly reduced scale as compared to wartime. Grand Island lies on the main line of the Union Pacific Railroad, and is also served by the Billings line of the Burlington. It is the terminal point of numerous truck lines, is served by several bus lines, and with an excellent airport is a regularly scheduled stop for several flights. Thus transportation provides an important segment of its economy. There are several small industries, being for the most part engaged in food processing. In recent years the city has been growing to the west and northwest. Future growth is expected in the same directions.

Both Grand Island and Hastings are retail and wholesale centers for considerable areas in central Nebraska. Hastings' trade territory for the most part lies south of the Platte River and follows the Burlington Railroad. Grand Island serves the territory to the north of the River, and a limited area to the east.

Grand Island lies at the junction of US 281 and US 30, a major east-west transcontinental highway. Nebraska 2 also passes through the city, connecting with US 34 two miles south of town. Hastings lies 27 miles south of Grand Island, at the junction of US 281 with US 6 and US 34 - also major east-west through routes. The interchange of traffic between the two urban areas is considerable. The Interstate highway across Nebraska is to pass through this area. At present studies are underway to determine its final location. It seems most likely that this east-west limited access facility will pass between Hastings and Grand Island, probably in the vicinity of the Platte River. Thus US 281 will undoubtedly serve as a major distributor for traffic from this route.

Highway US 281 enters Grand Island from the north on the section line, is joined by Nebraska 2, turns southeasterly along Eddy Street passing through the

new subway under the Union Pacific Railroad to a junction with US 30 on 2nd Street. The highway then joins US 30, proceeding east five blocks to Wheeler Street. It then follows Wheeler Street southeasterly to Locust Street, which is the first section line east of that on which US 281 entered the city. Highway US 281 then follows this section line south for about 10.5 miles, where it turns west 2 miles through Doniphan, and then turns south toward Hastings. There is considerable ribbon development along US 281 from Grand Island south to its junction with US 34, as well as along US 30 both east and west of Grand Island. This reduces the carrying capacity of the routes considerably. Chart No. 1 (page 9) is a map of the area showing the alignment of existing State highways and county roads. This map also shows the limits of the incorporated areas and the location of farms and other improvements in rural areas, as well as the average daily traffic now using the various roads.

#### Survey Procedure

An origin-destination survey was required to obtain information necessary to bring our wartime study up to date. Interviewing operations were scheduled on US 281 north and south of Grand Island, on Nebraska 2 east and west of Grand Island, on US 30 southwest of Grand Island, on the county road north of Doniphan and upon the cutoff from US 34 and Nebraska 2 to US 30 southwest. Most of these stations were to have been operated during the 1956 Statewide origin and destination survey, which is being made to aid in locating the Interstate highway across Nebraska. In order to obtain origin-destination data in the Grand Island area, our schedule was advanced and these stations were operated during early November, 1955. Each station was operated for a period of eight hours. Approximately one-half of the traffic using the highways during this period was interviewed as to its origin, destination and stops within the area.

Additional traffic counts were secured throughout the year in conjunction with our key-counting and origin and destination program. Thus 24-hour annual

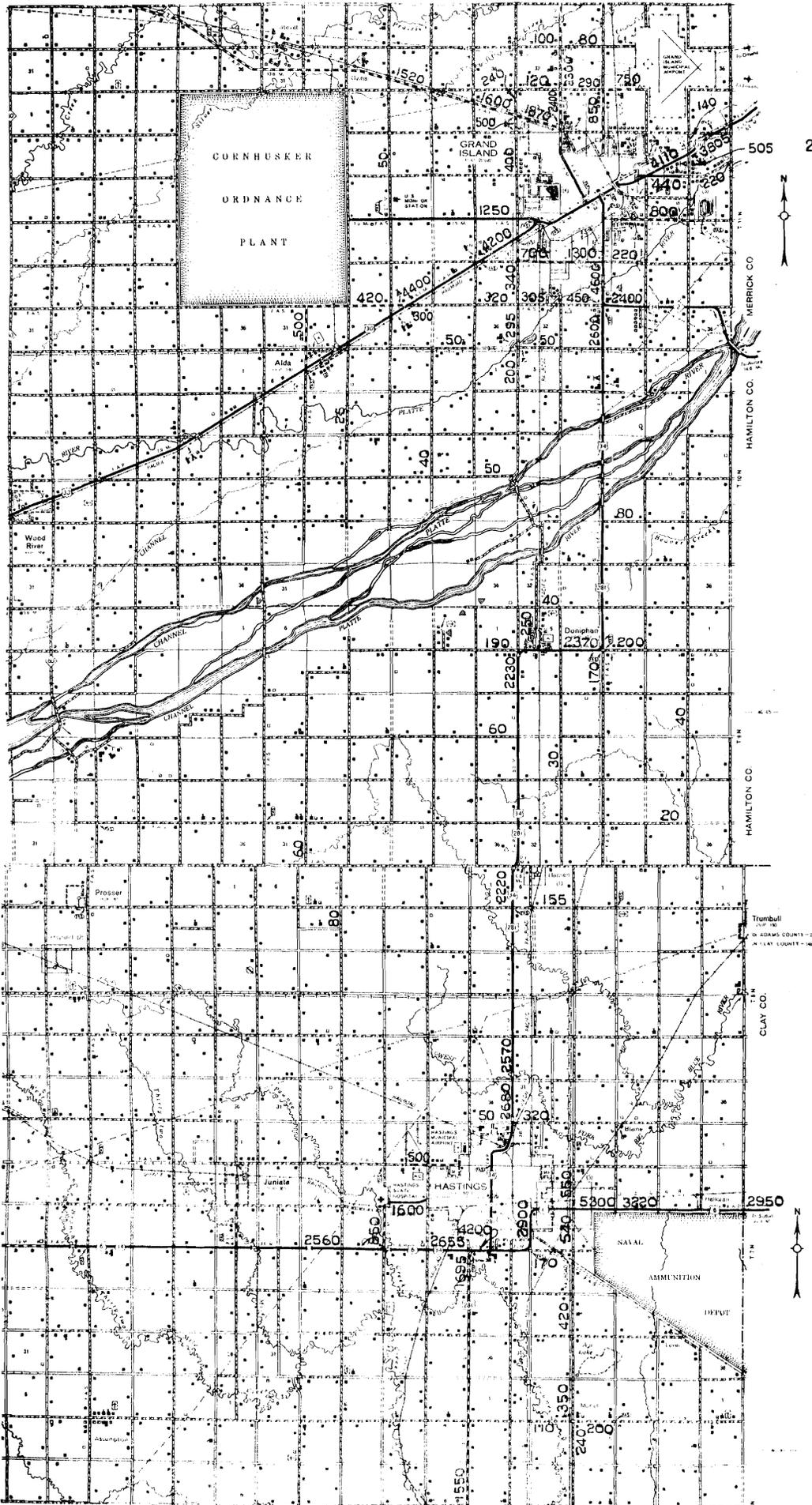


CHART I  
 24-HOUR ANNUAL AVERAGE TRAFFIC  
 ON STATE HIGHWAYS AND  
 COUNTY ROADS  
 GRAND ISLAND-HASTINGS AREA  
 1955

LEGEND  
 2600 24 Hour Annual Average Traffic

average traffic figures classified as to type of vehicle and place of registration were available for expansion purposes. All origin and destination data were adjusted to the 1955 24-hour annual average traffic level. Separate expansion factors were calculated for vehicles registered in (1) Hall County, (2) all other Nebraska counties, and (3) out of State. Since each of these are related to the annual average separately, the effect of seasonal movements is minimized.

Using data collected in the Interstate Origin and Destination Study conducted in eastern Nebraska during 1955, together with expanded data for local movements from this study, an estimate of traffic movements which might be expected to and from the Interstate highway in this area with traffic at the 1955 level was prepared. This estimate will be valuable in calculating the future useage of various sections of highway in and around Grand Island.

Since any traffic facility must be built to serve the traffic which may reasonably be expected to use that facility during its useful life, an estimate of future traffic is necessary. Estimates are presented here for traffic expected in 1975. These estimates are based on past trends, and are considered conservative. In these projections we have attempted to separate the traffic using the Interstate highway from that remaining on the existing routes. The traffic leaving interchanges in the Grand Island vicinity will naturally have to be superimposed on the volumes shown for the existing highways. The sections of highway which will be used by this traffic will depend upon the number and the location of the interchanges provided in this vicinity.

### Findings

Chart No. 1 (page 9) shows the 1955 24-hour annual average traffic on the various highways and county roads in the Grand Island vicinity. Table No. 1 also gives these average daily traffic volumes in greater detail for certain of the major routes. On the basis of origin-destination data the 1955 volumes have been divided into two categories; (1) that traffic which may logically be

TABLE NO. 1  
1955 Average Daily Traffic and that Estimated for 1975  
in Grand Island Vicinity

Location	24-Hour Annual Average Traffic				
	Total	1955		1975 Estimated	
		Local 1/	Will use Interstate <sup>2/</sup>	Local 1/	To or From Interstate <sup>3/</sup>
Nebraska 2 & US 34 East of US 281	2,400	1,391	1,009	2,300	
US 281 & Doniphan Road crossing River So. of Grand Island	2,203	2,001	202	3,400	
US 281 & County Roads So. of Grand Island - No. of River	897	787	110	1,400	
US 30 & County Roads Southwest	4,720	2,082	2,638	3,500	
Nebraska 2 West	1,600	1,397	203	2,400	
US 281 North	2,400	2,322	78	3,900	
<u>On Proposed Interstate Highway</u>					
To US 30 East	261	--	--	--	700
To US 34 East	9	--	--	--	50
To areas South of River	575	--	--	--	1,500
To areas between Grand Island and River	29	--	--	--	100
To US 30 and County Roads Southwest	54	--	--	--	150
To Nebraska 2 West	108	--	--	--	275
To US 281 North	100	--	--	--	250
To eastern Grand Island	550	--	--	--	1,400
To western Grand Island	94	--	--	--	275
Thru on Interstate	2,950	--	--	--	7,700

<sup>1/</sup>Traffic which will not be interested in using proposed Interstate highway in this vicinity, and thus will remain on present routes.

<sup>2/</sup>Traffic which may be expected to travel through the area on the Interstate highway, or to enter or leave that highway in this vicinity.

<sup>3/</sup>Traffic entering or leaving Interstate highway in this vicinity.

expected to remain on the existing highways after the Interstate highway is built, and (2) the traffic which may be expected either to use the Interstate highway through the area, or to desire access to that highway in this vicinity. You will note that the greatest losses to the Interstate highway will be from US 30 and from Nebraska 2 and US 34 east. About 200 a day from US 281 south of the River and from Nebraska 2 west will also be interested in the Interstate route.

This table also gives the daily traffic estimated for 1975. In order to provide flexibility in planning for the interchanges with the Interstate highway, the volumes shown for each route are the projections of only that traffic which is expected to remain on the present highways. The daily movements to and from the Interstate highway in this vicinity must be added to the appropriate routes to get the total volumes which may be expected in 1975. The projections are based on past trends and are considered conservative. It should be noted that the Interstate will provide effective relief on US 30. The increases on US 281 both north and south of the city will be considerable. Since there are an estimated 1,500 vehicles each day desiring to leave the Interstate for areas to the south, these will add to the congestion on that route. Also from the Interstate highway there are about 675 vehicles each day destined to areas north or west of the city, about 1,675 to Grand Island and about 700 to US 30 northeast. Adequate highways to carry this traffic must also be provided.

Charts Nos. 2 to 5 inclusive were prepared to show pictorially the distribution of the traffic from the various highways in this area. In the preparation of these charts incidental stops such as those for gas, oil or meals were disregarded, as it has been found that most drivers desiring these services do not leave the marked route to obtain them. All other stops were considered as terminating a trip. The volumes of traffic are shown by bands drawn to scale.

All bands indicate total traffic and include inbound as well as outbound vehicles. The cross-hatched portion of the bands represents at the 1955 level the daily traffic which has no desire to use, enter or leave the proposed Interstate highway in this area. The solid portion of the band indicates that part of the traffic which desires to use at least a portion of the Interstate highway.

Chart No. 2 (page 14) shows the distribution of traffic entering or leaving the Grand Island area from across the River to the south. On a 1955 daily basis there were 2,203 vehicles per day from south of the Platte River. All except 95 of these vehicles came from Doniphan or points south and west. The eastern part of Grand Island is the destination for 1,233 trips or 55 percent of the total. There are 573 trips destined to points in western Grand Island or to points north or west of that city. This represents 26 percent of the total trips crossing the River. These for the most part would be benefited by a route due north of Doniphan, which would save them considerable distance.

Chart No. 3 (page 15) shows the distribution of traffic from US 281 north of Grand Island and from that area immediately south of the city lying between Grand Island and the Platte River. In 1955 there were 2,400 vehicles per day on US 281 north of the city. Of these 2,127 came from along the highway, while 273 came from the area to the east. Again the eastern section of Grand Island is the terminus for the greatest number of trips, 1,720 or 71 percent being so destined. There were, however, 469 trips destined for points beyond Grand Island to the west or south, which would be benefited by a bypass.

Of the 897 vehicles from the area south of the city 488 or 54 percent were destined for the eastern part of Grand Island. Another 239 or 26 percent were destined for the western part of Grand Island or to areas west or north of that city.

**CHART 2**  
 ORIGIN OR DESTINATION OF TRAFFIC  
 ENTERING OR LEAVING THE AREA ON  
 U.S. 281 SOUTH

1955  
 GRAND ISLAND, NEBRASKA

PREPARED BY  
 DEPARTMENT OF ROADS AND IRRIGATION  
 PROGRAM AND PLANNING  
 IN COOPERATION WITH  
 U.S. DEPARTMENT OF COMMERCE  
 BUREAU OF PUBLIC ROADS

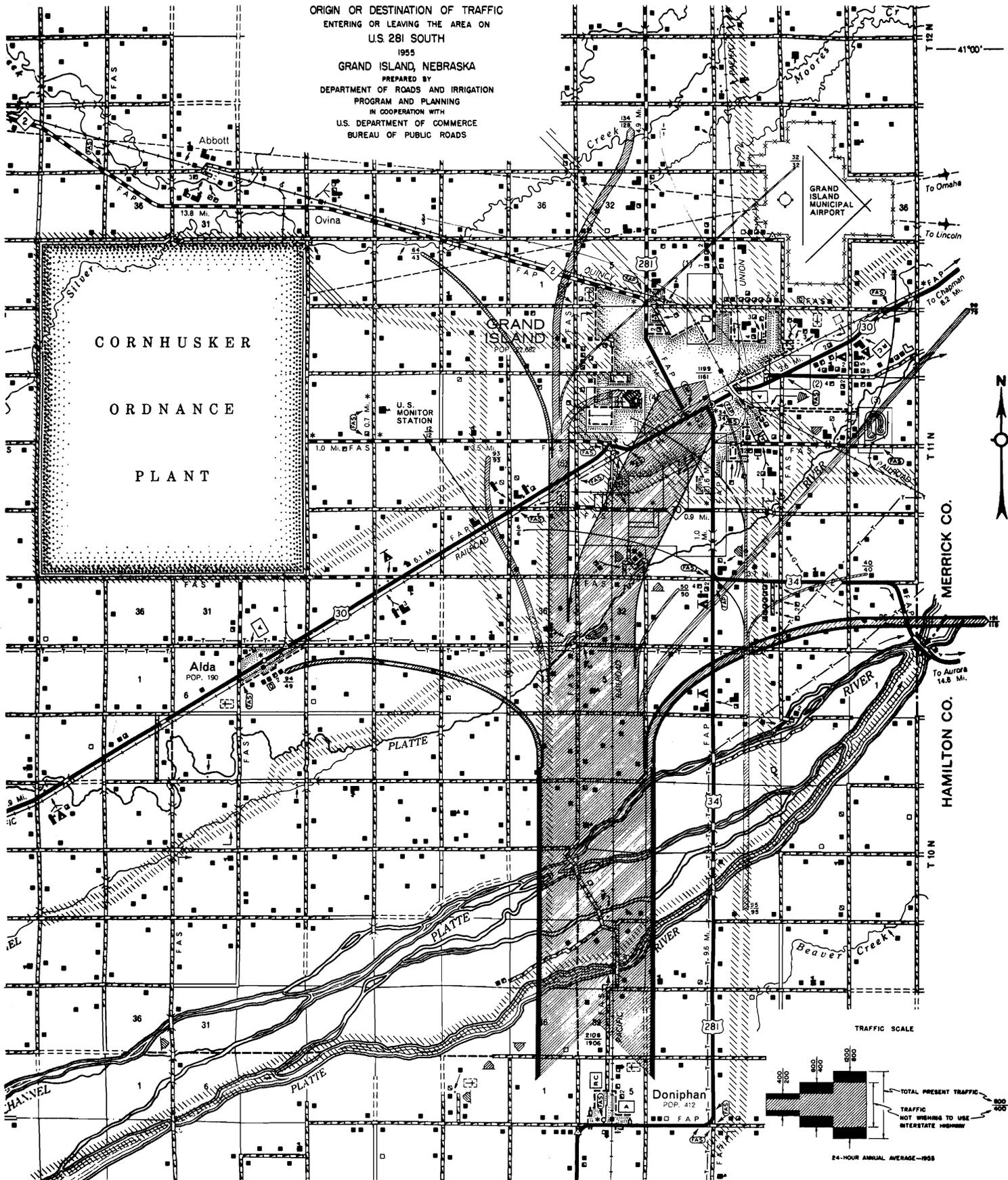
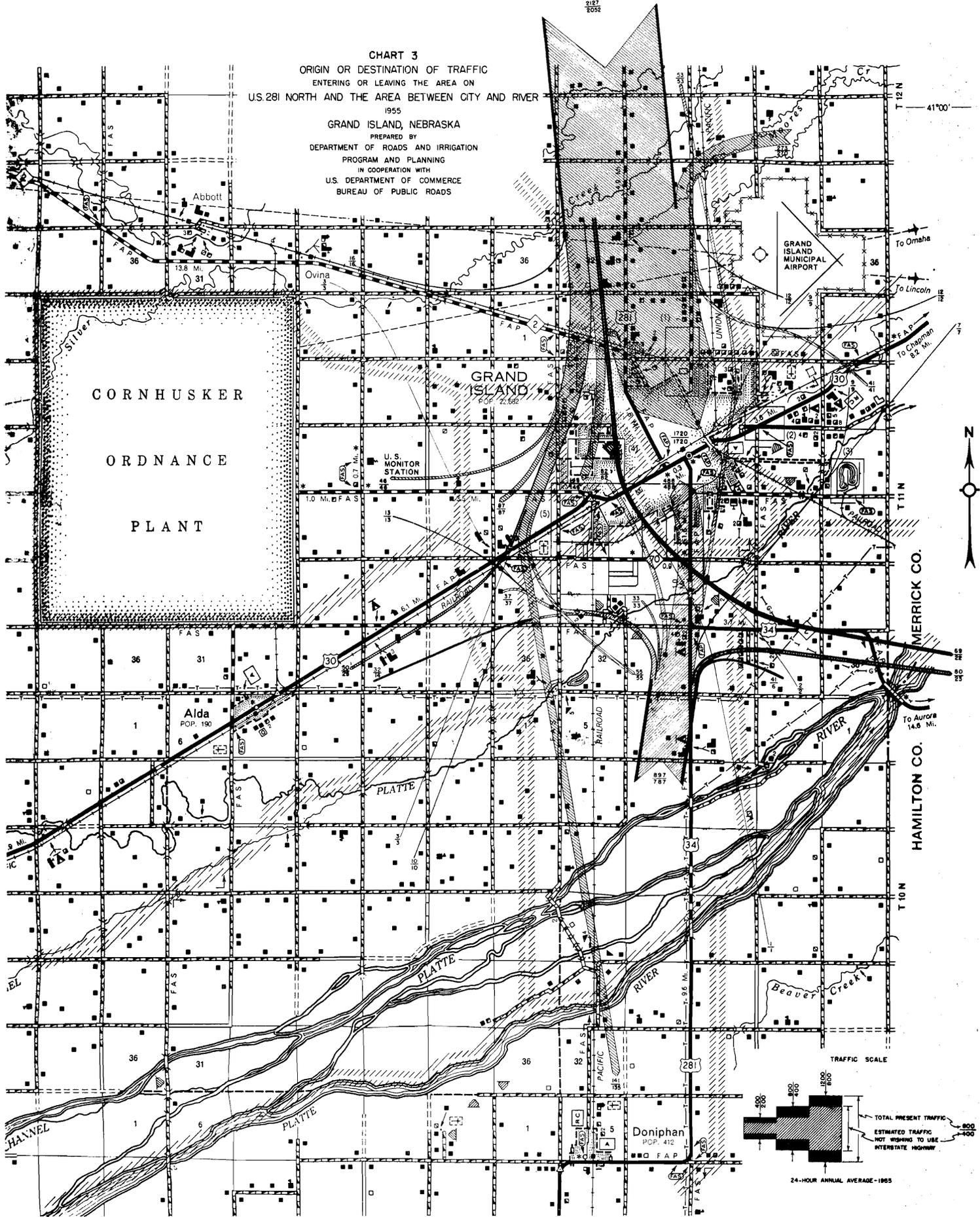


CHART 3  
 ORIGIN OR DESTINATION OF TRAFFIC  
 ENTERING OR LEAVING THE AREA ON  
 U.S. 281 NORTH AND THE AREA BETWEEN CITY AND RIVER  
 1955

GRAND ISLAND, NEBRASKA  
 PREPARED BY  
 DEPARTMENT OF ROADS AND IRRIGATION  
 PROGRAM AND PLANNING  
 IN COOPERATION WITH  
 U.S. DEPARTMENT OF COMMERCE  
 BUREAU OF PUBLIC ROADS



In Chart No. 4 (page 17) the zones of origin or destination for traffic entering or leaving the area on Nebraska 2 and US 34 east and on Nebraska 2 west of Grand Island are shown. On an average day in 1955 there were 2,400 vehicles per day using Nebraska 2 and US 34 east of US 281, of these 2,219 came from beyond the River. The eastern part of Grand Island served as the terminus for 1,010 or 42 percent of the trips. Traffic to highways beyond the city was also considerable, there being 539 destined to US 30 southwest, 180 to Nebraska 2 west, 191 to US 281 beyond Doniphan and 66 to US 281 north. This accounts for a total of 976 trips or 41 percent of the total using the route. It should be noted that traffic on this route will be affected markedly by the construction of the Interstate highway. It is estimated that of the present traffic slightly over 40 percent will be interested in using the new facility. This very greatly reduces the through traffic particularly that to the west. There is also a reduction of almost 200 in the number of vehicles bound for Grand Island.

Of the 1,600 vehicles per day on Nebraska 2 northwest, 1,130 or 71 percent are bound for Grand Island. The largest through movement is that to Nebraska 2 east of 180 vehicles per day. There are also 64 vehicles per day destined to US 281 south and 86 vehicles per day destined to US 30 northeast of the city.

Chart No. 5 (page 18) presents a picture of the distribution of traffic entering the area from the southwest, largely on US 30. There were 4,720 vehicles per day entering the area from this direction with almost 90 percent from points along US 30 or beyond Alda. You will again note that a high proportion, 56 percent of this traffic, is interested in using the proposed Interstate highway into or through the area. The importance of US 30 in carrying cross country traffic is apparent from this chart. Almost 55 percent of the total traffic entering from the southwest passes through the city to highways beyond without important stops therein. The largest through movement is that of 1,849 vehicles per day to US 30 northeast with 1,798 of these wishing to go beyond the county

CHART 4  
 ORIGIN OR DESTINATION OF TRAFFIC  
 ENTERING OR LEAVING THE AREA ON  
 NEBR. 2 EAST AND NEBR. 2 WEST  
 1955

GRAND ISLAND, NEBRASKA  
 PREPARED BY  
 DEPARTMENT OF ROADS AND IRRIGATION  
 PROGRAM AND PLANNING  
 IN COOPERATION WITH  
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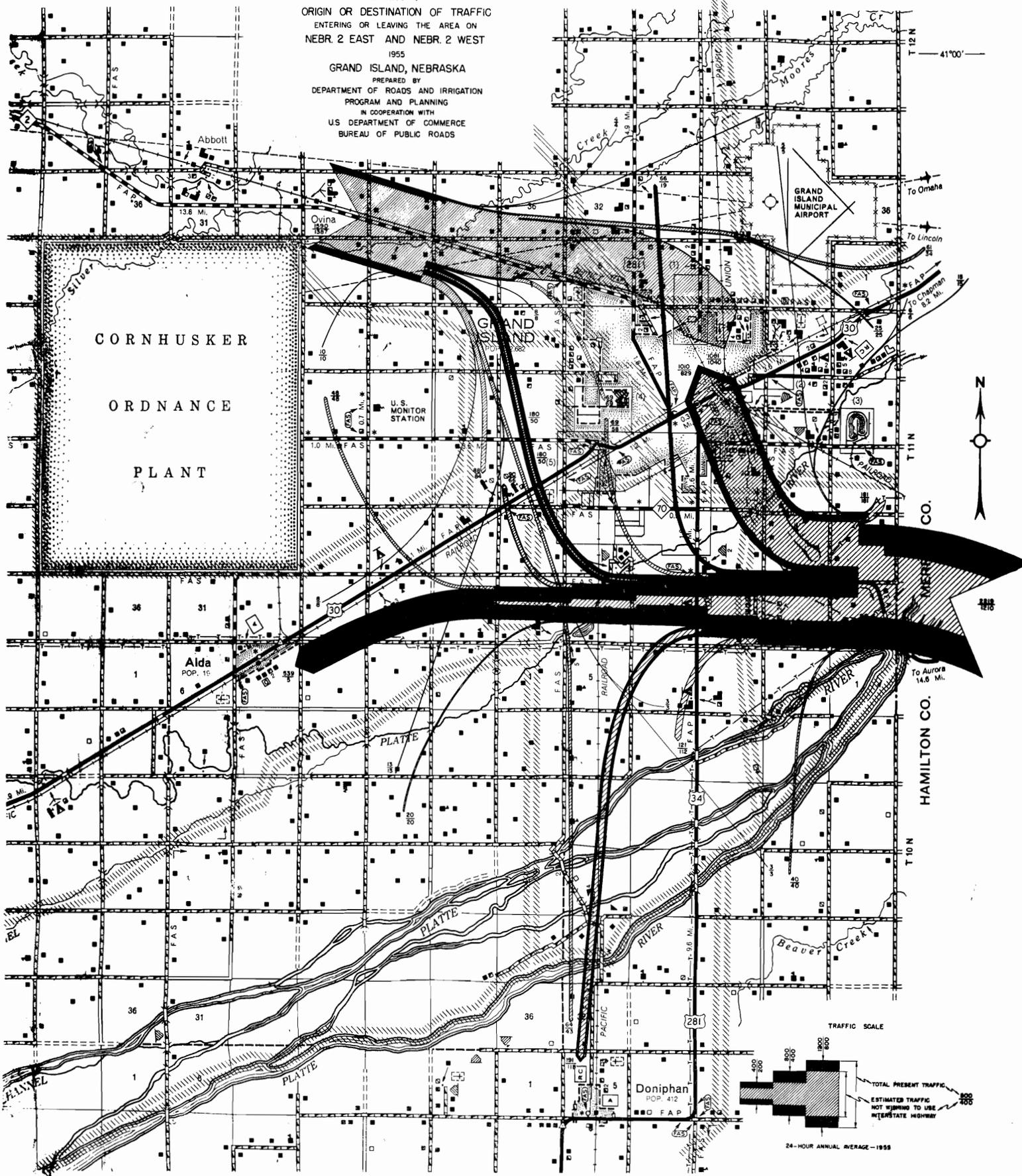
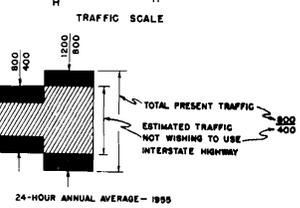
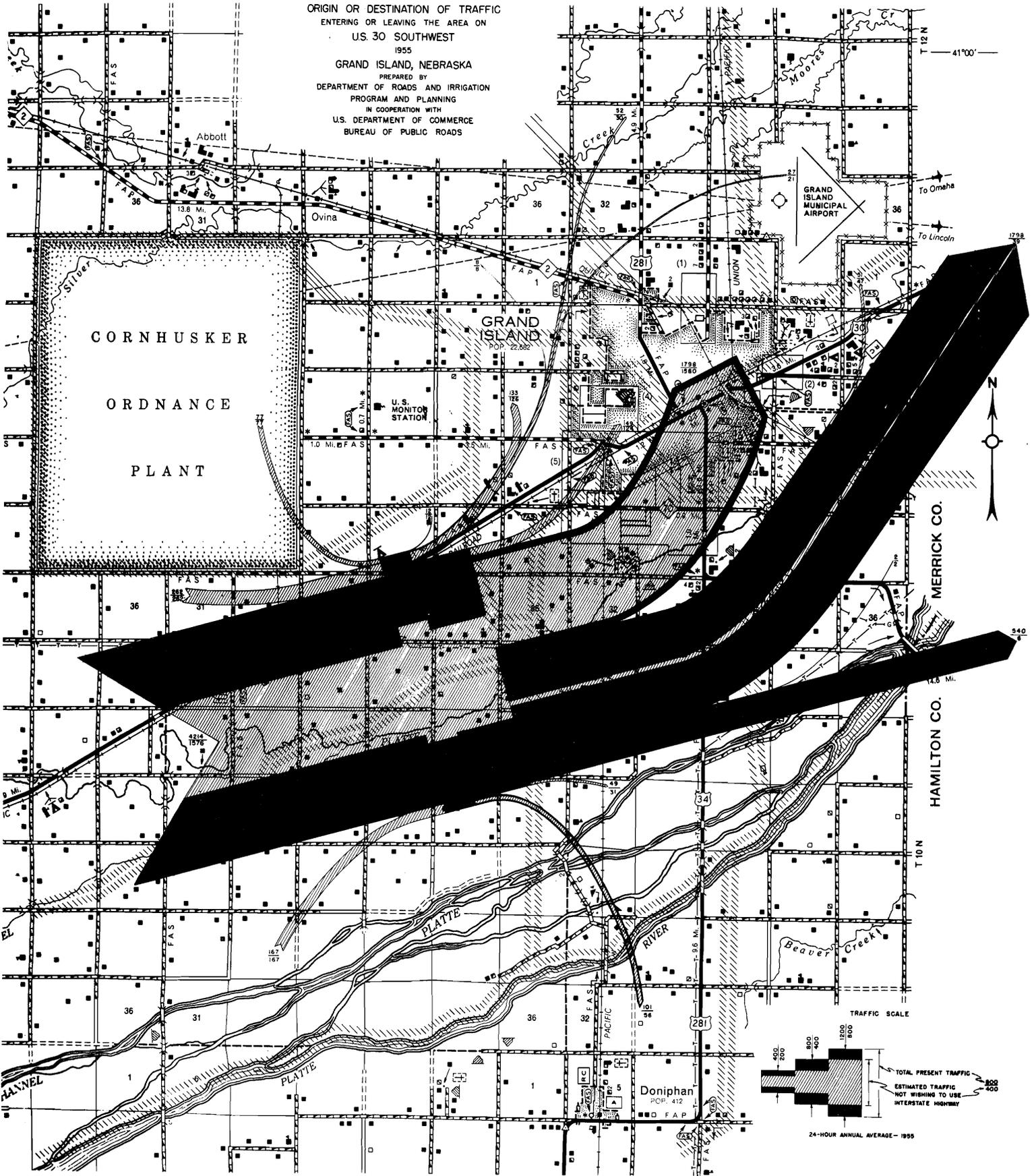


CHART 5  
 ORIGIN OR DESTINATION OF TRAFFIC  
 ENTERING OR LEAVING THE AREA ON  
 U.S. 30 SOUTHWEST  
 1955  
 GRAND ISLAND, NEBRASKA  
 PREPARED BY  
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 BUREAU OF PUBLIC ROADS

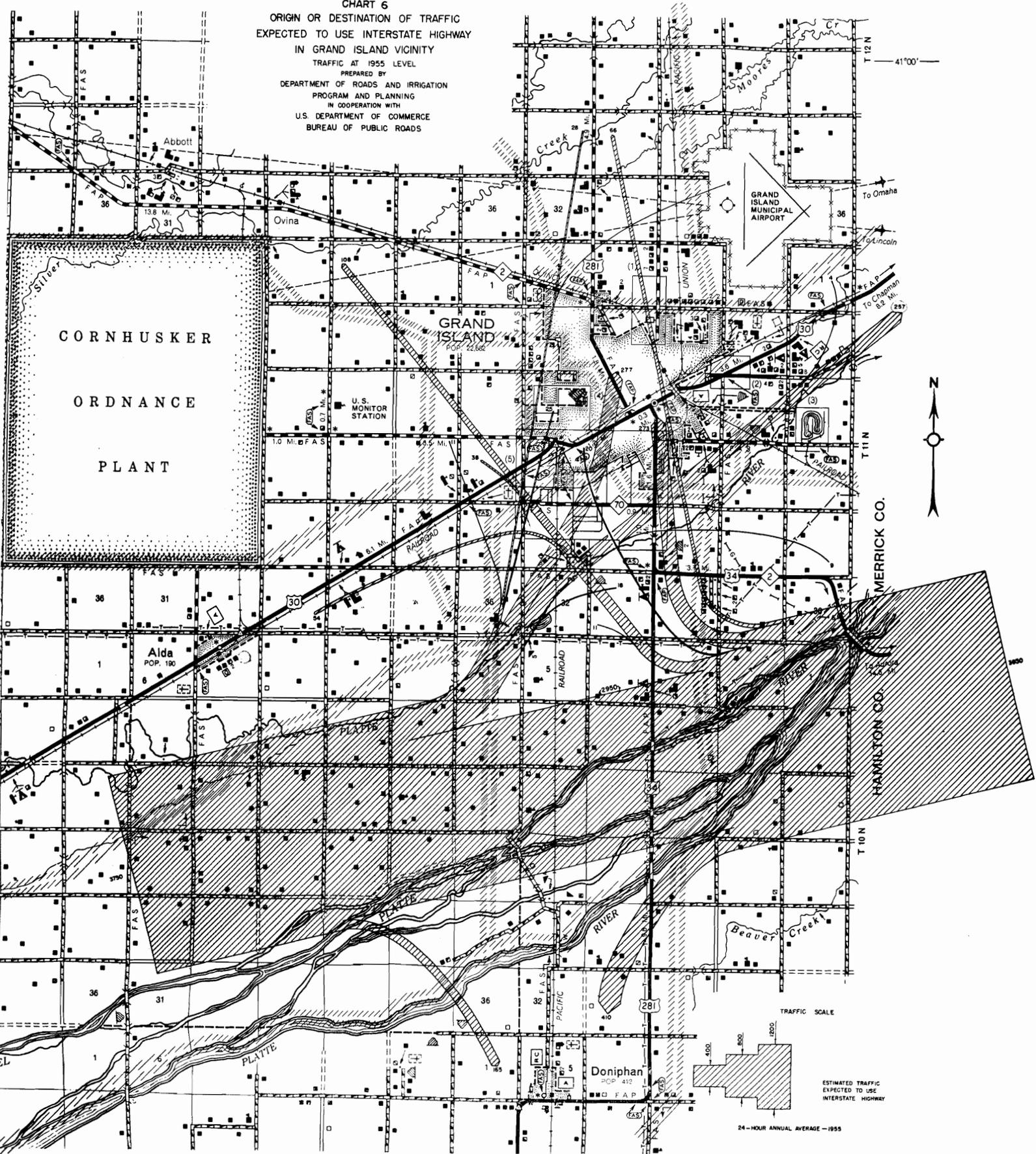


line. The movement of 542 vehicles per day to Nebraska 2 and US 34 east is also worthy of note. You will note that most of this through traffic to the east and northeast is expected to use the new Interstate facility. Grand Island is also an important destination for traffic on this highway, as 1,798 are bound to the eastern section, and 149 to the western section of the city.

In order to properly evaluate the effect of the Interstate highway on highway traffic in this vicinity, it is necessary to have some knowledge of the traffic which may be expected to use that facility. Since our Interstate study in this vicinity is in its infancy, it was necessary that we make preliminary estimates of these movements. We have done this by correlating data as to cross-country traffic collected during our 1955 Interstate study in eastern Nebraska with data on shorter movements collected during this study. These figures are thus tentative and subject to further refinement upon completion of our present study. They should, however, suffice to give a picture of the approximate magnitude of movements desiring access to or from the Interstate in the Grand Island vicinity.

Chart No. 6 (page 20) shows the origin or destination of traffic which may be expected to use the Interstate highway in this vicinity with traffic at the 1955 level. No attempt has been made at this stage to estimate the traffic generated by the facility, although that will undoubtedly be considerable. It is estimated that of 3,930 vehicles using the Interstate east of Grand Island, 2,950 will pass through non-stop, 410 will wish to turn south toward Hastings, and 570 will wish to turn north to Grand Island or points beyond. Of those turning north 273 will be destined for the eastern section of Grand Island, 20 to western Grand Island, 11 to the area south of the city and 266 beyond Grand Island to the north or west. Of the 3,750 vehicles approaching the area on the Interstate facility from the west 165 will desire to turn south to Hastings, the 2,950 previously mentioned will pass through non-stop and 635

CHART 6  
 ORIGIN OR DESTINATION OF TRAFFIC  
 EXPECTED TO USE INTERSTATE HIGHWAY  
 IN GRAND ISLAND VICINITY  
 TRAFFIC AT 1955 LEVEL  
 PREPARED BY  
 DEPARTMENT OF ROADS AND IRRIGATION  
 PROGRAM AND PLANNING  
 IN COOPERATION WITH  
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will turn north toward Grand Island or points beyond. Of these 635 turning north, 277 are bound for eastern and 25 for western Grand Island, 261 wish to pass through the area to US 30 east, 9 to US 34 east, 34 to US 281 north, and 29 to areas south or west of the city. To best serve the traffic leaving the Interstate in this vicinity may very well require two interchanges. The first would serve traffic destined for Hastings, western Grand Island and highways north and west of Grand Island and should be located approximately due north of Doniphan. The second to serve traffic from the east destined for Grand Island and areas east might be located east of the present Platte River bridge on Nebraska 2. This traffic could then use Nebraska 2 as an access route to Grand Island. If only one interchange is provided, some vehicles will of necessity have to travel added distances to their destinations. The rather considerable volume of traffic to eastern Grand Island would then exert an influence in locating the interchange somewhat east of the western location.