

APPENDIX I

**THREE  
SISTERS  
BRIDGE**

**The Board of Commissioners  
District of Columbia**

PHOTOGRAPH OF AN ARTIST'S RENDERING OF THE PROPOSED THREE SISTERS BRIDGE AS SEEN FROM THE VIRGINIA SIDE



## THREE SISTERS BRIDGE

In connection with the conference between conferees of the House and Senate relating to the Fiscal Year 1963 District of Columbia Appropriations, the President of the Board of Commissioners, D. C., on October 10, 1962, addressed a letter to The Honorable Carl Hayden, Chairman, Committee on Appropriations, U. S. Senate, wherein he stated that "before the Commissioners proceed with the construction of the Three Sisters Bridge, they will give most careful consideration to any recommendations pertaining thereto that may appear in the report of the National Capital Transportation Agency." Attached, as Exhibit No. 1, is a copy of the letter. This study is a result of that letter.

### Problem

To review the decision to go ahead with the Three Sisters Bridge in the light of the National Capital Transportation Agency report.

Exhibit No. 2, attached to this report, is a map showing Potomac River crossings in the central area.

### History from Planning Point of View:

The proposal to build a highway bridge at the Three Sisters site is one of long-standing. That fact, while in itself not justification for proceeding with the project, is cited to show that the basic concept has been repeatedly accepted by responsible agencies.

In 1953, a report entitled "Highway Transportation in the Washington Metropolitan Area of Virginia," was prepared for the Virginia State Highway Commission by Wilbur Smith and Associates.<sup>(1)</sup> Origin and destination data were analyzed and projected to 1973. The consultant evaluated a system of expressways following alignments described in the Comprehensive Plan of the National Capital Planning Commission. Among other things, the consultant recommended a bridge across the Potomac River at the Three Sisters site.

Incident to the preparation of the MTS Plan of 1959, exhaustive traffic studies were undertaken and analyses were made by Wilbur Smith and Associates, with the result that the report<sup>(2)</sup> recommended construction of the Three Sisters Bridge.

Other studies recommended additional bridges in the central area in addition to the Theodore Roosevelt Bridge, without specifying location.<sup>(3)</sup>

Thus, over a period of almost ten years, consultants making studies for the State of Virginia, the National Capital Planning Commission, and for the Board of Commissioners of the District of Columbia, have repeatedly recommended additional river crossings in the central city area, and, specifically in the Three Sisters location.

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- (1) Highway Transportation in the Washington Metropolitan Area of Virginia
  - (2) The Mass Transportation Survey Report - 1959
  - (3) Report on Potomac River Bridges, Washington, D.C., by Modjeski and Masters, Engineers, with Lloyd B. Reid, Traffic Consultant, July, 1952.

Congressional History:

The appropriation of District of Columbia funds for the Three Sisters Bridge has been favorably considered by the Congress on two occasions. In the budget for Fiscal Year 1962, the Congress appropriated funds for financing the District of Columbia share of the cost of construction plans for the proposed Three Sisters Bridge. In the budget for Fiscal Year 1963, the Congress appropriated District of Columbia funds to finance the substructure of the proposed Three Sisters Bridge. During the course of the Congressional hearings on this latter appropriation, the subcommittees of the Congress exhaustively reviewed the pros and cons of the project before recommending appropriation of funds to proceed with the construction.

In a report on the Fiscal Year 1963 budget of the District of Columbia (Report No. 2548) the conferees reported on the Three Sisters Bridge as follows:

"The committee of conference is agreed that construction of the Three Sisters Bridge should proceed according to the plan set forth in the budget in the amount of \$300,000 as provided in the bill."

Planning Approvals:

On 13 July 1961, the National Capital Planning Commission approved, in principle, the alignment of the Three Sisters Bridge. (NCPC Plan #104.1-517) \*\*

The Virginia Department of Highways and the Department of Highways and Traffic of the District of Columbia requested, and the U. S. Bureau of

\*\* On November 3, 1960 the NCPC approved the 1962 D.C. Budget which included a request for preliminary engineering money for the Three Sisters Bridge. On October 5, 1961, the NCPC approved the 1963 Capital Outlay Budget which included a request for partial construction of the Three Sisters Bridge.



Public Roads agreed to add to the Interstate Highway System of the Nation the following route to be designated FAI-266:

"From the intersection with FAI-66 in Arlington County, Virginia across the Potomac River via the Three Sisters Bridge to a junction with FAI-66 in the District of Columbia in the vicinity of 31st and K Streets, N.W."

The National Capital Transportation Agency Report

Only that part of the NCTA report which relates directly to the central area bridges will be referred to here. Under the topic, "Three Sisters Island Bridge," which begins near the bottom of Page 25 of the NCTA report, the Agency presents narrative statements, tables, and a graph purporting to question the need for the Three Sisters Bridge. The following reflects the points included in the report with reference to the Three Sisters Bridge. Each point is assigned a number and will be discussed separately later in this report:

Point (1) The report includes the following sentence: "Standing alone, the only purpose of Three Sisters would be to bring trucks and additional auto traffic from Fairfax and Arlington Counties into downtown. For that purpose the bridge is not required."

Point (2) The table on Page 26 of the NCTA report indicates the number of bridge lanes across the Potomac River which were in place in 1957 and a separate column shows the number of bridge lanes under construction or recently opened, including the Woodrow Wilson and Cabin John Bridges.

Point (3) The Agency proposes two rail transit lines to Virginia; one of which would serve the Three Sisters Bridge corridor. This is in contrast to the MTS Plan of 1959 which contemplated express bus service in this corridor. The Agency apparently assumes that without rail transit, all of the increased trips from Virginia into the District of Columbia would be handled by private passenger cars. This assumption is in sharp contrast to the MTS Plan of 1959.

Point (4) Figure No. 14 is included in the top half of Page 27 of the NCTA report. This graph and a corrected graph will be included under the discussion portion of this report and will deal with the matter of projected Potomac River traffic in the central area.

Point (5) The bottom half of Page 27 of the NCTA report includes a table showing total Potomac River vehicular crossings in 1980, with a balance between demand and capacity in the central area without the Three Sisters Bridge. This table will be discussed in detail later.

Point (6) The Agency assumes (Page 28) that the construction of the Three Sisters Bridge would "create traffic pressure that would tend to force construction of highways that would otherwise be unnecessary."

Point (7) In order to sustain the position opposing the Three Sisters Bridge, something had to be done with the truck traffic in the Interstate Route 66 corridor. Therefore, the Agency assumes that the Shirley Highway "will have capacity sufficient to handle Route 66 truck traffic."

Discussion

The Philosophy of Planning Urban Transportation:

The Year 2000 Plan

Only a few weeks ago, the President, in a memorandum to the heads of Government departments and agencies and to the District Commissioners stated in part: "The corridor cities concept recommended by the Year 2000 Plan, prepared by the National Capital Planning Commission and the National Capital Regional Planning Council in 1961, shall be supported by agencies of the Executive branch as the basic development scheme for the National Capital Region." He further stipulated that "Planning to meet future transportation requirements for the region shall assume the need for a coordinated system including both efficient highway and mass transit facilities, and making full use of the advantages of each mode of transportation." (underlining supplied) The President requested each department and agency head concerned to give full consideration to these policies in all activities relating to the planning and development of the National Capital region, and to work closely with the planning bodies which have responsibilities for the sound and orderly development of the entire area.

The President's message to the Congress on February 28, 1961, relative to the Federal Pay-As-You-Go Highway Program, stated in part, as follows:



"It has always struck me as ironic that so many of our citizens -- so ingenious in quickly devising ways of ending almost every minor irritant -- would so readily tolerate every morning and evening the incredible congestion of our antiquated highways that takes a heavy toll in automotive costs and depreciation, to say nothing of human nerves and tempers. By 1975 -- and the Interstate System is required by Congress to have enough lanes to move safely all the vehicles expected in 1975 -- there will be an estimated two or three times as many vehicles as use those roads today. Even though some expressways now seem excessively large, an emergency program then will be too late -- we must continue to build those highways now at a steady rate sufficient to assure completion on schedule."

On April 5, 1962, the President sent a message to the Congress on the transportation system of our Nation, wherein he stated, in part, as follows:

"Higher incomes coupled with the increasing availability of the automobile have enabled more and more American families, particularly younger ones with children, to seek their own homes in suburban areas. Simultaneously, changes and improvements in freight transportation, made possible by the development of modern highways and the trucking industry, have reduced the dependence of manufacturers on central locations near port facilities or railroad terminals. The development of improved production techniques that require spacious, one-story plant layouts have impelled many industries to move to the periphery of urban areas. At the same time the importance of the central city is increasing for trade, financial, governmental, and cultural activities."

"One result of these changes in location patterns has been a change in the patterns of urban travel. Formerly people traveled mainly along high density corridors radiating to and from downtown. Today traffic patterns are increasingly diverse. Added to traditional suburb-to-city movements are large crosstown flows which existing mass transportation systems are often not geared to handle. Also, the increasing use of automobiles to meet urban transportation needs has resulted in increasing highway congestion, and this has greatly impeded mass transportation service using those highways."

"Highways are an instrumental part of any coordinated urban transportation program, and must be an integral part of any comprehensive community development plan."

"Highway planning should be broadened to include adequate traffic control systems, parking facilities, and circulation systems on city

streets commensurate with the traffic forecasts used to justify free-ways and major arterial roadways. Provision for transit and highway facilities in the same roadway, permissible under present law and already tested in several cases, should be encouraged whenever more effective transportation will result. Moreover, I have requested the Secretary of Commerce to consider favorably the reservation of special highway lanes for buses during peak traffic hours whenever comprehensive transportation plans indicate that this is desirable."

The Metropolitan Transportation Survey Plan of 1959 and the National Capital Transportation Agency Report of 1962

There is a sharp contrast in the philosophy applied to the collection, analyses and presentation of data and findings in the MTS Plan of 1959 and in the NCTA report of 1962. The Board of Commissioners of the District of Columbia feels that it is imperative that this distinction be recognized early in the discussion of the NCTA report.

Basically, the distinction can be summarized succinctly. On the one hand the MTS Plan of 1959 was based on frequent and open discussion with all agencies and groups interested in transportation in the region. The resultant plan was responsive to the clientele it would serve. The NCTA plan was prepared unilaterally. It alleges (Chapter IV) that "The heart of the transportation system will be a modern subway." At the same time, the subway system, even by optimistic estimates, will not serve more than 25 percent of the trips in the region. At first glance, and on the basis of information thus far available, there is considerable question as to the ability of the transportation system proposed by the NCTA to serve the remaining 75 percent of the trips expected in the area in 1980. There is attached as Exhibit No. 2-A a copy of an editorial from the Washington Post of January 17, 1963 which reflects considerable concern over the assumptions used by the NCTA in the preparation of its report.

Philosophically, there appears to be a distinction in the two plans. The NCTA plan appears to resolve questionable areas in favor of transit tending to create a paper need for transit at the expense of highway travelers. This appears to be evident in consideration of bridge requirements in the central area. Should it result in an inadequate balance, the area will suffer. This matter was discussed in studies undertaken by Doctor Leon N. Moses at Northwestern University. <sup>(4)</sup> He states that it is not a question solely of driving the private car or riding a prescribed form of transit. There is a third part of the equation, as reflected by Doctor Moses' research, namely, that pressures will be brought to bear to move the job elsewhere. A transportation system not responsive to the needs and desires of our people could seriously influence the future of the Nation's Capital Region.

In the Federal Aid Highway Act of 1956, the Congress stipulated that the geometrics and construction standards adopted for the Interstate System shall be adequate to accommodate the types and volumes of traffic forecast for the year 1975. During approximately the past thirty years, the Highway Departments have been collecting data with reference to actual traffic volumes. Initially, this data was collected on an individual project or highway basis. In 1944, for the first time, data was collected on a regional basis because it became apparent that the highway system must be treated as a regional entity. The provision, or lack of provision, for a facility at one point, or the creation

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(4) Page 10 of a paper entitled "Urban Transportation Subsidies and the Problems of Mature Central Cities" by Doctor Leon N. Moses, before the 1962 annual meeting of the American Society of Planning Officials.

of a facility elsewhere causes substantial adjustment in trip habits. Accordingly, data was first collected in this region, on a regional basis, in 1948. It was updated in 1955 and partially updated again in 1962. Insofar as basic data is concerned with reference to trips, it is reasonably sound.

All of the Highway Departments and the U. S. Bureau of Public Roads have been wrestling with the problem of forecasting trip requirements for 1975 and beyond. In order to cope better with this problem, the District of Columbia Department of Highways and Traffic, the States of Maryland and Virginia, and the U. S. Bureau of Public Roads cooperatively developed a program during the last few years intended to assist the Highway Departments in predicting future traffic volumes. The basic program thus developed, as modified by certain studies apparently undertaken by or for the Agency, has been used by the National Capital Transportation Agency in forecasting transit trips. The point of the aforementioned discussion is this. The programs developed by the Highway Departments for traffic forecasting are a tool to be used as a general guide. The Nation's highway officials are not satisfied that results of the program thus far developed can be accepted as an accurate mathematical conclusion. Almost all iterations carried through the computers require adjustments because the output from the computer invariably produces traffic volumes which are not reasonable. For example, the output may show an estimated volume in 1980 which is less than the volume using the corridor today. This, therefore, generally is cause for adjustment based on judgment.



Another example of the influence of the human factor in estimating future traffic requirements relates to the selection of mode of transportation. To date, the body of knowledge and experience with reference to predictions in the selection of mode of transit is very limited.<sup>(5)</sup> In the event this region is willing to assume that some percentage of the trips destined to the downtown area in a peak hour might be made by transit, it should be recognized by all that the answer is just that -- it is an assumption.

Another very important area of guess-work and opinion relates to non-downtown trips. When the NCTA program, with built-in but yet unknown assumptions with reference to modal split, was run through the computer, the results indicated that 16.7 to 23.8 percent of all non-downtown trips would be made by transit. It was apparently decided by the NCTA staff that these percentages were too high, and "compensatory factors" were put into the computer program, including protracted transfer delays up to 600 minutes on a certain body of non-downtown trips. This "judgment" correction was applied to results produced by the same basic curves used in estimating transit trips to downtown. The manual adjustment had the effect of throwing certain non-downtown oriented trips onto the highway and freeway system. Naturally, this adjustment raises certain questions. By what device or on the basis of what knowledge were the percentages considered too high? More importantly, by what device was it determined that roughly 13 percent of the non-downtown oriented trips is an appropriate figure to assign to transit? Is there any experience elsewhere in

<sup>(5)</sup> Page 57 of the NCTA Report



the United States that could tend to support such an assumption under similar circumstances? The NCTA plan is based upon 7,000 transit trips in the A. M. peak hour from Virginia, crossing the river and destined beyond downtown. Suppose that this figure turns out to be something less. Then, such trips would be made by highway and freeway. Accordingly, the supposedly finite figures included in the NCTA report on demand and capacity of vehicular trips across the river disappear.

Most important of the questions raised by the adjustment of non-downtown trips is the reliability of the forecast of the trips to downtown by transit. There are attached Exhibits No. 3 and No. 4 which reflect predicted traffic volumes in the vicinity of Key Bridge. Exhibit No. 3 shows the adjusted volume assignments to Key Bridge, major roads, freeways and streets in the Georgetown area. Exhibit No. 4 shows the vehicle assignments to the same system as they appeared direct from the computer link data. A discussion of several of these figures will indicate what happens between data produced by the computer and manual adjustments. For example, the predicted volume on the Potomac River Freeway above Key Bridge was adjusted downward from 6,900 during the A. M. peak hour to 4,700. The volume for the same time on M Street was adjusted downward from 2,600 to 1,500. The volume on the Potomac River Freeway was adjusted downward from 3,400 to 2,700. No explanation is given as to what happened to this traffic, and there is no justification as to why there should be such relatively large volumes of traffic on the Potomac River Freeway above Key Bridge and such relatively small volumes below Key Bridge. For a matter of fact, the adjusted volume on the Potomac River Freeway below Key Bridge approximates the peak hour volumes already using this freeway.

The NCTA report does not present data which invalidates the need for the Three Sisters Bridge. Earlier in this report (beginning on Page 4) there are listed seven points or statements presented in the NCTA report with reference to the Three Sisters Bridge. These points will now be discussed in the order listed.

#### Modern Freeway Planning

##### POINT (1):

The Three Sisters Bridge does not stand alone. In modern highway and freeway planning, bridges, even minor ones, do not stand alone. They are systematically planned and scheduled as parts of highway systems. The Three Sisters Bridge is no exception. The Three Sisters Bridge is an example of modern integrated freeway and bridge planning in that it will be carefully laid out to assure that the approaches will be free-flowing so that obstructions on the approaches to the main river crossing will not act to create stoppages or delay on the river crossing. The bridge is not being constructed solely to bring trucks and additional auto traffic from Fairfax and Arlington Counties into the downtown. A recent study by the District of Columbia Department of Highways and Traffic, attached as Exhibit No. 5, shows the classification of vehicles by license plates over the Potomac River bridges during counts made in August of 1962. It is interesting to observe that approximately fifty percent of the traffic crossing the river bridges at that time bore Virginia license plates. The other fifty percent is divided

thusly: Maryland, 12 percent; District of Columbia, 15 percent; others, 12.5 percent; trucks, 8 percent; buses, 1.5 percent. There is no reason to assume that the family of vehicles using a bridge at Three Sisters would materially deviate from this composition. The 12.5 percent grouped under "others" includes some new residents of the area, some traffic passing through the area, but, more significantly, it includes those tourists visiting the area. (6)

#### Number of Bridge Lanes

##### POINT (2):

Point (2) referred to previously relates to the number of bridge lanes in being or under construction. While the table referred to near the top of Page 26 of the NCTA report is essentially correct, a question necessarily arises as to its significance. For example, the Woodrow Wilson and Cabin John Bridges, when all necessary parts of the Beltway are in place, will serve a different function from the bridges in the central city area. In addition, all forecasts show these two peripheral bridges will be overloaded by 1980.

#### Mass Transit in Interstate Route 66 Corridor

##### POINT (3):

The next to the last paragraph on Page 26 of the NCTA report is an example of extremes. On the one hand, the narrative statement assumes

(6) It is estimated that the number of tourists in this area will increase from about 15,000,000 today to 35,000,000 in 1980. Exhibit No. 6 shows the past record and trends in mode of inter-city transit -- more than 89% of such trips are by private car.

that if the two rail rapid transit lines are provided in Virginia, as proposed by NCTA, about 28,000 people would use public transportation in the morning peak hour. This total incidentally includes 7,000 trips crossing the river but not destined to the expanded downtown Sector Zero. The expanded Sector Zero includes the downtown area bounded by the Potomac River on the west, S Street on the north, 4th Street, N. E. and S. E. on the east, and the Southeast and Southwest Freeways on the south, plus the Naval Weapons Plant, the Navy Annex and the Pentagon. By the same token, the Agency apparently assumes that without such rail transit, no part of the increased trip load would be handled by buses. This is contrary to the MTS Plan of 1959 and contrary to the planning which has been done to date with reference to transportation in this area.

#### Projected Potomac River Highway Traffic

##### POINT (4):

Figure 14 of the NCTA report is duplicated as Exhibit No. 7. The NCTA report includes a diagram which it identifies as Figure 14. This diagram purports to show the difference in probable growth of highway traffic across the Potomac River with the NCTA system, and without it. Speaking first of the NCTA system, the result depicted by the solid line in the diagram would be obtained only if people used fixed rail transit in the numbers postulated. The dashed line, which is intended to show river crossings if transit is not

improved, is without foundation. The MTS Plan of 1959 contemplated the provision of express bus transit on Interstate Route 66. A check of the MTS Plan indicates that express bus service, even under NCTA assumptions, would handle more than two-thirds as many peak hour transit trips as are contemplated by the rail transit system.

With reference to Figure 14, we know of no mathematical, statistical, or analytical basis for drawing the graph as the Agency has done. Instead, it is far more practicable to draw a graph as proposed by Exhibit No. 8. Under this approach, it is estimated that the total number of vehicles crossing the Potomac River in the peak hour in 1980 would be approximately 25,000. This figure closely approximates a corrected estimate presented on Page 18 of this report.

Demand and Capacity - - Potomac River Vehicular Crossings

POINT (5):

The table on the lower half of Page 27 of the NCTA report is as follows:

Bridges	<u>Peak Hour one direction</u>	
	<u>Demand</u>	<u>Capacity</u>
Central Area .....	21,500	21,500
Key Theodore Roosevelt Memorial 14th Street		
Westerly .....	7,000	6,500
Cabin John Chain		
Southerly .....	6,800	4,500
Woodrow Wilson		



This table shows a balance between demand and capacity for the bridges in the central area. It shows a peak hour flow of 21,500 vehicles in one direction on the bridges in the central area. The total number of lanes in one direction now proposed on the four bridges in question is thirteen. Dividing 21,500 by 13, the Agency would thus assign an average of 1,650 vehicles per lane per hour for the thirteen lanes. In the event two reversible lanes are placed on the old 14th Street Bridge, the average assignment would be 1,430 vehicles per lane. The following discussion will indicate some of the points in question:

Bridge Demand:

First of all, the precision of 21,500 A. M. peak hour vehicle trips across the central bridges in 1980 is questionable. This appears to be the A. M. peak hour volume based upon an average of the so-called "sprawl" and corridor land use plans. Inasmuch as the President directed the agencies of the Executive Branch to support the corridor plan, then that concept should also be used in estimating the highway traffic requirements. On this basis, the figure would be 22,900 instead of 21,500.

The NCTA report also minimizes factors which drastically affect the highway picture. For example, the NCTA has based its estimates for transit needs on the A. M. peak hour. However, experience has demonstrated that the peak hour for highway traffic is in the P. M. period. Recognizing this factor would increase the figure by about three percent, or approximately 700 vehicles.

Further allowances must be made for truck traffic since a truck, in effect, requires two to four times as much space as a passenger car. Using a factor of two for converting trucks to equivalent numbers of passenger cars would increase the total by 800.

Experience with the origin and destination data over the years has shown that origin and destination summaries do not check actual volumes. There is some slippage. The same pattern has applied in this metropolitan region and shows that the number of trips across the Potomac River developed by the O&D were only 92 percent of the trips actually taking place. Therefore, the average daily traffic computed on the basis of the O&D data was 8 percent under actual daily traffic. Converting to a peak hour figure makes this correction approximately 4 percent or about 1,000 vehicles. Accumulating the above corrections, we find that we have the following total: 22,900 plus 700 plus 800 plus 1,000, or a total of 25,400. This 25,400 compared to 21,500 amounts to a 18 percent correction in a critical figure. The assignment of 25,400 vehicles to thirteen bridge lanes would impose an average load of about 1,900 vehicles for every bridge lane. Should the 14th Street Bridge be converted to two reversible lanes, the average assignment to every bridge lane would be about 1,700 vehicles. It is the practice of the Highway Departments across the land to design urban freeway facilities on the basis of 1,500 vehicles per lane per hour. (7) On some freeway lanes, under certain

(7) Table C-2 entitled "Lane Design Capacity for Urban Freeways," Page 125 of the Policy on Arterial Highways in Urban Areas by the American Association of State Highway Officials.

conditions, and with certain combinations of vehicles, we do get higher volumes. However, 1,500 is considered a practicable figure for design purposes, and for average conditions on urban freeways. With the expectation that Interstate freeways approaching this metropolitan area will be designed on the basis of estimated volumes of 1,500 vehicles per lane per hour, it follows that the bridges across the Potomac River, and the extensions of the freeways into and through the metropolitan area, should be designed in the same manner. All of us should be extremely careful to avoid the possibility that bridges may constitute a bottleneck in the free flow of traffic.

It should be recognized, however, that Key Bridge and Memorial Bridge are not to be designed with full freeway approaches, and that changes are in the offing with reference to both of these river crossings.

Key Bridge and the Effect on Georgetown:

It is physically possible to provide free-flowing ramp connections between the Potomac River Freeway and Key Bridge. However, to do so requires major surgery on Key Bridge and on the approaches on the Georgetown end of that structure. It is not practicable from either an engineering or economic standpoint to provide free-flowing connections meeting Interstate standards over this bridge.

The area could not tolerate a major disruption of the service now provided by Key Bridge. The Board of Commissioners should not endorse a proposal which would entail the expenditure of at least as much money for the

reconstruction of Key Bridge as would be required for a new eight-lane bridge.\*\*

In terms of service, the reconstruction and strengthening of Key Bridge would result in an estimated peak hour capacity of about 5,000 vehicles in one direction.

In considering a major capital improvement, however, certain tests with respect to feasibility and practicability must be applied. An Interstate crossing of the Potomac River at the Key Bridge site is not practicable for the following reasons:

- (1) The bridge should be widened to carry four lanes in each direction. Whether it is widened or not, the superstructure requires reconstruction to carry Interstate loads safely in all lanes;
- (2) Reconstruction, as required under (1) above, would create an impossible situation in handling the approximately 65,000 vehicles now using the bridge each workday;
- (3) It would be impossible to provide necessary deceleration distances on the ramps and free-flowing characteristics without major and objectionable surgery to the Georgetown end of the bridge; and,
- (4) It would cost at least as much to do a reconstruction job on this bridge to bring it and the end connections to Interstate standards as it would to build a new bridge at the Three Sisters site.

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\*\* - The outside lanes of the present Key Bridge were not designed structurally to carry contemplated Interstate Highway truck loads. Routing of the Interstate Highway System over this bridge would require such structural capacity and widening. Such work is estimated to cost about \$5.8 million.

Application of the above test produces the logical conclusion that no connection should be provided between Key Bridge and the proposed Potomac River Freeway. Elimination of the ramp connections between the Freeway and Key Bridge means that, as a local facility, Key Bridge would have a practicable capacity of about 2,700 vehicles in the peak hour in either direction.

By building a new bridge at Three Sisters and reverting Key Bridge to a local facility, the combined peak hour capacity would be in the order of 8,700 vehicles. \*\*

Memorial Bridge:

There is attached as Exhibit No. 9 the plan currently being advanced by the National Park Service for the treatment of the District of Columbia approaches to the Memorial Bridge. At the present time, Memorial Bridge is carrying about 75,000 and 80,000 vehicles per day. Nearly two-thirds of the traffic inbound passes between the Lincoln Memorial and the Reflecting Pool. Under the National Park Service Plan, this route will be eliminated. When this is done, traffic service will be curtailed. In the absence of specific knowledge concerning the National Park Service plan for the construction of roads both north and south of the Reflecting Pool, and in the absence of knowledge as to how highway traffic might be permitted to operate on such roads, it is impossible to make a precise prediction as to the volume of traffic that might be handled on Memorial Bridge in a peak hour in 1980.

\*\* If Key Bridge were widened and strengthened and ramps meeting Interstate requirements were built to connect Key Bridge with the Potomac River Freeway, the reconstructed Key Bridge would have a total capacity of 5,000 vehicles in the direction of the peak flow.



However, on the basis of the plan at hand, we estimate that the maximum figure which safely can be assigned to each lane on Memorial Bridge is about 1,200 per hour, not 1,650 as assumed by NCTA.

Therefore, capacity of central bridges can reasonably be assumed as follows:

14th Street (4 lanes)	6,000
Memorial (3 lanes)	3,600
Theodore Roosevelt (3 lanes)	4,500
Key (3 lanes)	<u>2,700</u>
TOTAL.....	16,800

In applying the above analyses with respect to Memorial and Key Bridges to the total central river crossing problem, it is estimated that the deficiency of river crossing capacity will be 25,400 less 16,800 or 8,600 vehicles per hour. In the event it is assumed that two reversible lanes are constructed on the old 14th Street Bridge piers, and 1,200 vehicles are assigned to each of these two lanes during the peak hours, this difference becomes 6,200 vehicles per hour. This traffic would logically use the Three Sisters Bridge.

Traffic Growth and Estimates:

During approximately the last twenty years, there has been an average increase in traffic across the Potomac River of 10,000 vehicles per day per year. This pattern means that there has been a steady increase in the demand which averages approximately one-half lane in each direction per year.

The Rail Transit System in Virginia:

The entire rail transit system proposed by the NCTA in Virginia amounts to approximately twenty-nine miles. With this relatively extensive fixed transit system, and assuming for the moment that the estimated number of riders predicted by NCTA is reasonably correct, the whole Virginia system would carry fewer transit riders across bridges than can be handled on one freeway lane serving express buses.<sup>(8)</sup> This comparison would indicate elimination of a bridge at Three Sisters to be most questionable.

Lack of Alternate Bridge Sites:

Various bridge sites across the Potomac River between Virginia and the District of Columbia have been studied from time-to-time. Because of topographic conditions and the problems of providing adequate capacity on the approaches, no other site compares in quality with the proposed Three Sisters Bridge site. It makes sense to provide for such a bridge and the necessary approaches and interchanges on both the Virginia and District of Columbia ends of such a structure concurrently with the planning, designing and construction of freeways in the District of Columbia and in Virginia.

Financing Problems:

While the NCTA report appears to support the Potomac River Freeway, the questions which have been raised with reference to the Three Sisters Bridge directly and drastically affect the advancement of the Potomac River Freeway.

<sup>(8)</sup> The Port of New York Authority, without using an entire lane, already is moving in the order of 25,000 to 30,000 people per hour in buses.

The ability, or lack of ability, to finance capital improvements such as a freeway or bridge, are important considerations to the District of Columbia. The 90-10 money has nothing to do with determining the need for the proposed bridge and freeway. Like the National Interstate System, the need existed before the financing was provided. The Federal financing merely provides the District of Columbia, as well as most of the other States, the wherewithal for going ahead with the freeway system.

While some critics are not concerned with finances, the Board of Commissioners of the District of Columbia, the Congress, and the people of the District of Columbia, have a responsibility to concern themselves with this important aspect of highway administration. With the other highway requirements of the District of Columbia which must be financed with 50-50 money, there is no practicable probability that the Potomac River Freeway could be financed with such funds. Without a river crossing acceptable as to geometric and structural requirements, from an Interstate standpoint, there can be no Potomac River Freeway.

#### Three Sisters Bridge and Related Facilities

##### POINT (6):

Under Point (6) the Agency objects to the Three Sisters Bridge because it alleges that the structure would "create traffic pressure that would tend to force construction of highways that would otherwise be unnecessary." The bridge does not create the traffic, but rather, it is a part of the system of highway facilities needed to serve traffic. A key issue that must be discussed

under this point is the difference between the concept of the highway planners that freeways must be properly integrated and continuous versus the unexplained conclusion by the NCTA that certain freeways are "unnecessary." Dealing specifically with the North Leg of the Inner Loop, the NCTA report does not contain reliable data justifying its position. The elimination of the North Leg of the Inner Loop as a freeway, as proposed by the NCTA, and the substitution of something which the Agency describes as an "express street system" or "junior freeway" appears to be a matter of semantics.

On December 31, 1962, the NCTA transmitted to the Board of Commissioners, D.C., a copy of a study<sup>(9)</sup> by a consultant firm of Washington, D.C., containing certain recommendations with reference to the North Leg of the Inner Loop. The consultant apparently recommends that somewhat more than one-half of this facility should be what he describes as a "junior freeway." This part of his proposed facility is essentially a freeway with certain restrictions on dimensions, and, therefore, traffic service value. The consultant recognizes that the "junior freeway" which he proposes would have a capacity of about 3,000 vehicles in the direction of the peak flow. From approximately 20th and S Streets, N.W. to approximately 5th and S Streets, N.W., the consultant proposes a facility which he identifies as a "boulevard." This would require additional right-of-way and would produce a facility

(9) "An Express Street System for the North Corridor of the Inner Loop" prepared for the NCTA by Blair and Stein Associates, Planners, Washington, D.C., October, 1962.

estimated to be able to serve about 800 vehicles per lane per hour, or 2,400 vehicles in each direction in the peak hour. Therefore, the consultant has considered a facility which, on the basis of his estimates, would have a total cost less than the cost of the freeway, but, as he points out in his report, such a facility would not be eligible for Federal participation on a 90-10 basis. It would, therefore, cost the District of Columbia more.

It is not clear whether the NCTA report of November 1st accepts or rejects the findings in the consultant's report. Apparently, the only reference to this matter is that on a part of the proposed "junior freeway" the NCTA proposes two lanes in each direction rather than three, as proposed by the consultant.

#### Truck Traffic

##### POINT (7):

The Agency repeatedly makes paper assignments of traffic "out of corridors" without tracing the highway need through to a conclusion. This applies to truck traffic and all other traffic on Interstate Route 66 and to all traffic on Interstate Route 95 near the Washington, D.C. -Maryland boundary.



Reduced and inadequate capacity on that critical part of Interstate Route 66 between Four Mile Run and the approaches to the river bridges, and on that part of combined I-95 and I-70-S in Northeast Washington, causes congestion, which in turn reduces assumed speeds of operation on the freeway. The result then is that the computer, because of such "input" factors, assigns the trips to transit. This is an arbitrary and unrelated method of planning.

The creation of a highway system, as thus proposed by NCTA, with restrictions on freeways approaching the central city, violates fundamental principles of highway planning. Every traffic survey in the United States has demonstrated again and again that there is an increase in capacity requirements, and not a decrease, as you approach the core of metropolitan areas. "Built-in" congestion and the assumption of low design speeds as proposed by NCTA would mean stop and go traffic even on the freeways. This is not planning for an efficient highway system.

#### The Freeway Program Should Continue

The District of Columbia has been proceeding with the development of freeways, including bridges, in accordance with the Transportation Plan for the National Capital Region, prepared by the National Capital Planning Commission and the National Capital Regional Planning Council.<sup>(2)</sup> The Virginia Department of Highways also has been proceeding with planning, designing and constructing Interstate Route 66 in Arlington and Fairfax Counties in accordance with this same basic plan.

(2) The Mass Transportation Survey Report - 1959

The National Park Service has under construction the parkway on the Maryland shore of the Potomac River between the Cabin John Bridge and the District of Columbia-Maryland boundary. The District of Columbia has under contract the construction of a major part of the proposed interchange in the vicinity of 27th and K Streets, N.W. It logically follows that the National Park Service, the Board of Commissioners of the District of Columbia, and the State of Virginia, should cooperatively and aggressively advance those projects necessary to fill the gaps in this important highway corridor. The proposed Three Sisters Bridge is a significant part of this corridor.

Lack of Flexibility:

The plan recommended by the NCTA with reference to trips across the Potomac River lacks flexibility. The apparent neat balance between capacity and demand is questionable from a technical standpoint. It provides no capacity for expansion, nor flexibility to meet unforeseen demands. The Nation's Capital has previously been exposed to protracted arguments with reference to the need for bridge capacity across the Potomac River, notably in the 14th Street corridor. The need for bridge capacity in this corridor "waxed hot" for years with the highway proponents agruing for two four-lane bridges and the opponents arguing that a lesser capacity was needed. Fortunately for the area, for the significant volumes of north-south traffic along the eastern seaboard of the United States, and for the city, the highway proponents won. These two bridges are now carrying in the order of 120,000 vehicles each workday.

Furthermore, despite a vast background of data with reference to traffic volumes, the Highway Departments across the land have repeatedly been too low in their estimates with respect to future forecasts. It has been almost impossible to date to accurately predict the rate at which Americans desire to buy and operate motor vehicles. In summary, some 76 million vehicle owners and approximately 110 million licensed drivers "can't be wrong."

The Board of Commissioners, D. C. should not push aside lightly the thoughtful studies and investigations which have been made over the years, as well as some of the solid established trends. Furthermore, in the absence of conclusive evidence concerning assumptions, methods, and other relevant factors, the Board of Commissioners, D. C. must be reluctant to accept at face value the data presented by the National Capital Transportation Agency.

In the case of the Three Sisters Bridge, the Board of Commissioners, D. C. has indicated in the introductory part of this brochure that over the years studies made for the National Capital Planning Commission, the State of Virginia and for the Board of Commissioners, D. C. by expert consultants in transportation planning have recommended the construction of an additional central area bridge either at the Three Sisters site or at some alternate site in the central area. The Board of Commissioners is impressed with the fact that over approximately the past twenty years, the traffic volumes in peak

hours have increased at an average rate which requires the addition of about one-half free-flowing lane per year in the direction of the peak flow.

### SUMMARY

The Board of Commissioners, D.C. has carefully weighed the pros and cons with respect to the Three Sisters Bridge. It recognizes that the Congress, the Board, and others were asked more than a year ago to defer a decision on the bridge until the NCTA report was available. This has been done, but to date, we can find no solid data in the NCTA publications on which to justify further deferral of the project. Our reasons, in summary, are these:

- (1) The need for additional bridge capacity is clear and justified by experience.
- (2) There is no other practical bridge site for a new bridge which would give adequate service.
- (3) The possible conversion of Key Bridge to serve the same purposes would be too costly and disruptive of values in Georgetown. For approximately the same cost, additional capacity can be provided at Three Sisters.

### DECISION

In view of the above, the Board of Commissioners, D.C. has decided to proceed with the Three Sisters Bridge.

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October 10, 1962

Hon. Carl Hayden  
Chairman, Committee on Appropriations,  
U. S. Senate  
Washington, D. C.

Dear Senator Hayden:

In connection with the conference now going forward between conferees of the House and Senate relating to the 1963 appropriations bill for the District of Columbia, this is to advise you that before the Commissioners proceed with the construction of the Three Sisters Bridge, they will give most careful consideration to any recommendations pertaining thereto that may appear in the report of the National Capital Transportation Agency, which is expected to be delivered to the President on November 1, 1962.

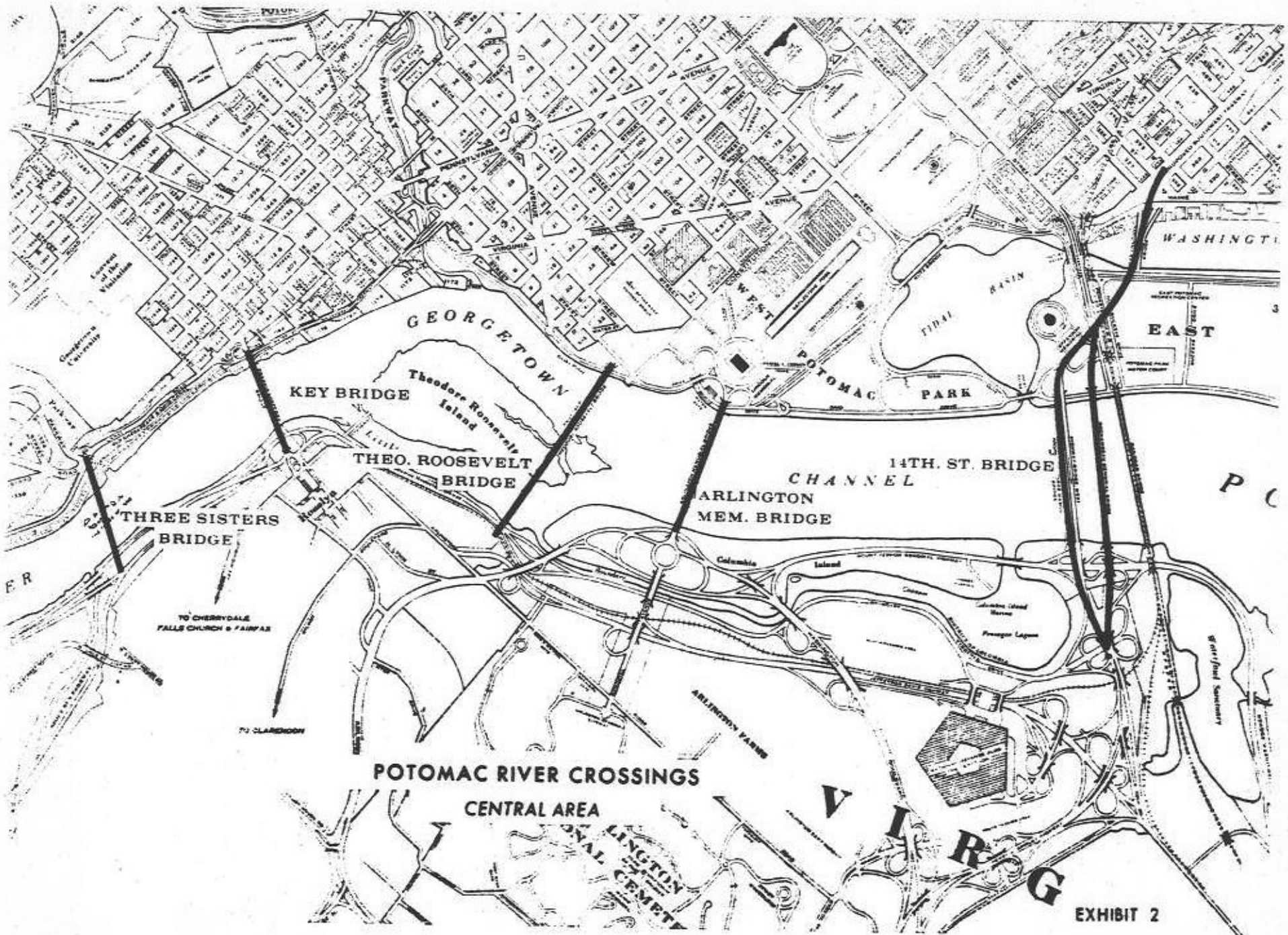
With kindest personal regards, I am

Sincerely yours,

WALTER N. TOBRINER  
President, Board of Commissioners, DC

EXHIBIT 1





**POTOMAC RIVER CROSSINGS**

**CENTRAL AREA**

From the Washington Post, January 17, 1963

WITH FRIENDS LIKE THESE

Washington needs rapid transit. The question now is whether the idea of a transit system can survive the National Capital Transportation Agency's peculiar statistics.

The Agency is an incorrigible believer in the hard sell. It is incapable of letting a good case speak for itself. Every comparative must be sharpened to a superlative, at whatever cost to credibility. The six technical appendices to the Agency's November report have at last appeared, and they are not technical appendices at all in the engineer's use of the term. They are advertisements, written for laymen.

The appendices make public some of the assumptions upon which the Agency bases its recommendation for a bigger subway than previously planned, and fewer highways. In the face of overwhelming historical evidence to the contrary, the Agency assumes that rising income levels will not tend to diminish subway traffic. The Agency assumes that parking costs will rise but transit fares will not; and yet the median transit fare in this country has doubled since 1950. Experience suggests that the necessity of making transfers cuts traffic; the Agency assumes that they do not.

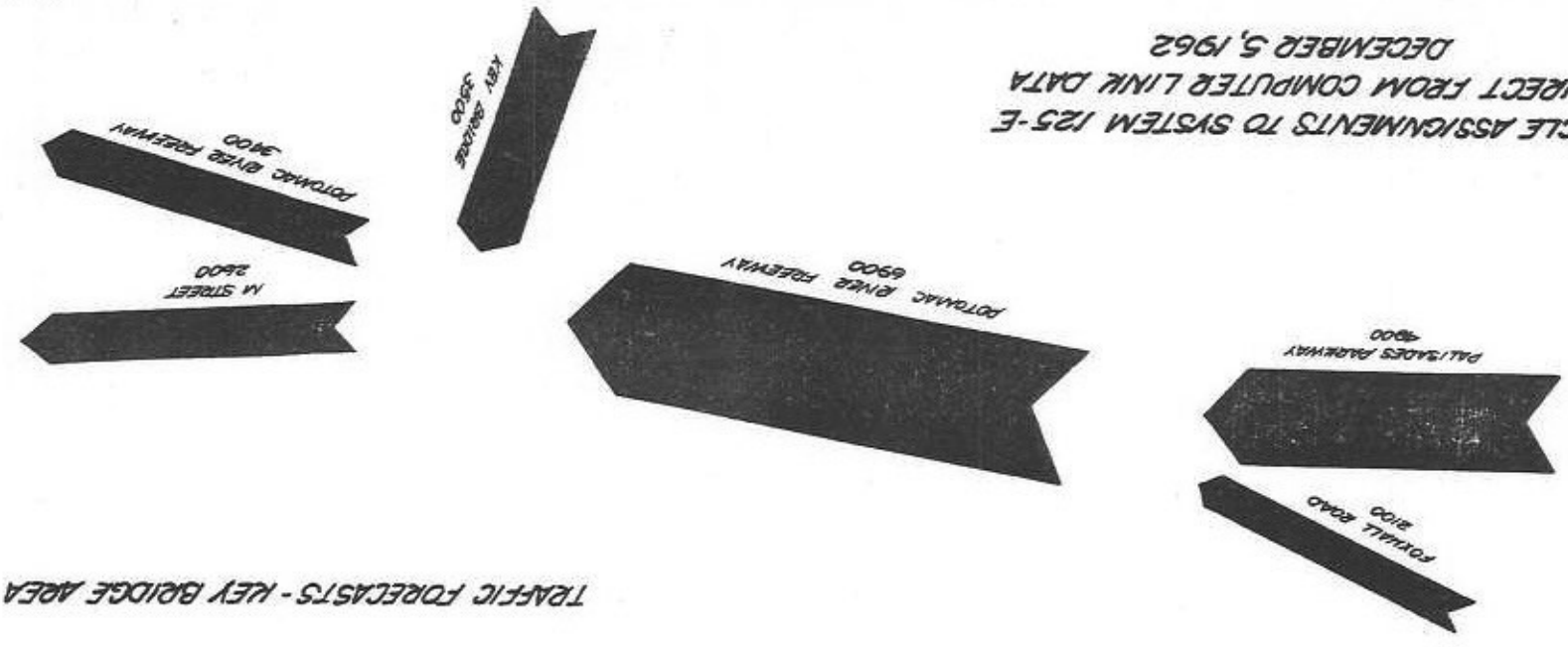
No one really knows that will happen when a new subway is opened in an American metropolis that has grown up around the private automobile. The best that engineers can do is to make guesses, and very often one guess is as good as another. The Agency's own computations suggest that its chief target, the 1959 transportation plan with its much smaller subway and its reliance upon express buses, would divert approximately the same number of downtown commuters to public transit. Forecasts in this untried field are inherently loose and highly conditional.

The root of the Agency's exaggerations lies in a political misjudgment. The Agency is convinced that the city will build no subway at all unless it becomes a weapon for killing several imminent highway construction projects. And that is why the Agency considers necessary a forecast, however vulnerable, that the automobile traffic into downtown Washington will actually decline as the city grows.

A rapid transit system does not have to pay off its capital investment to be economically justified. It does not have to effect an absolute decline in automobile traffic to benefit immeasurably the city and its commuters. By vastly overinflating its hopes and by bending its arithmetic to its preconceptions, the National Capital Transportation Agency is obscuring the sound and reasonable case for a rapid transit system to serve Washington.

EXHIBIT 2-A

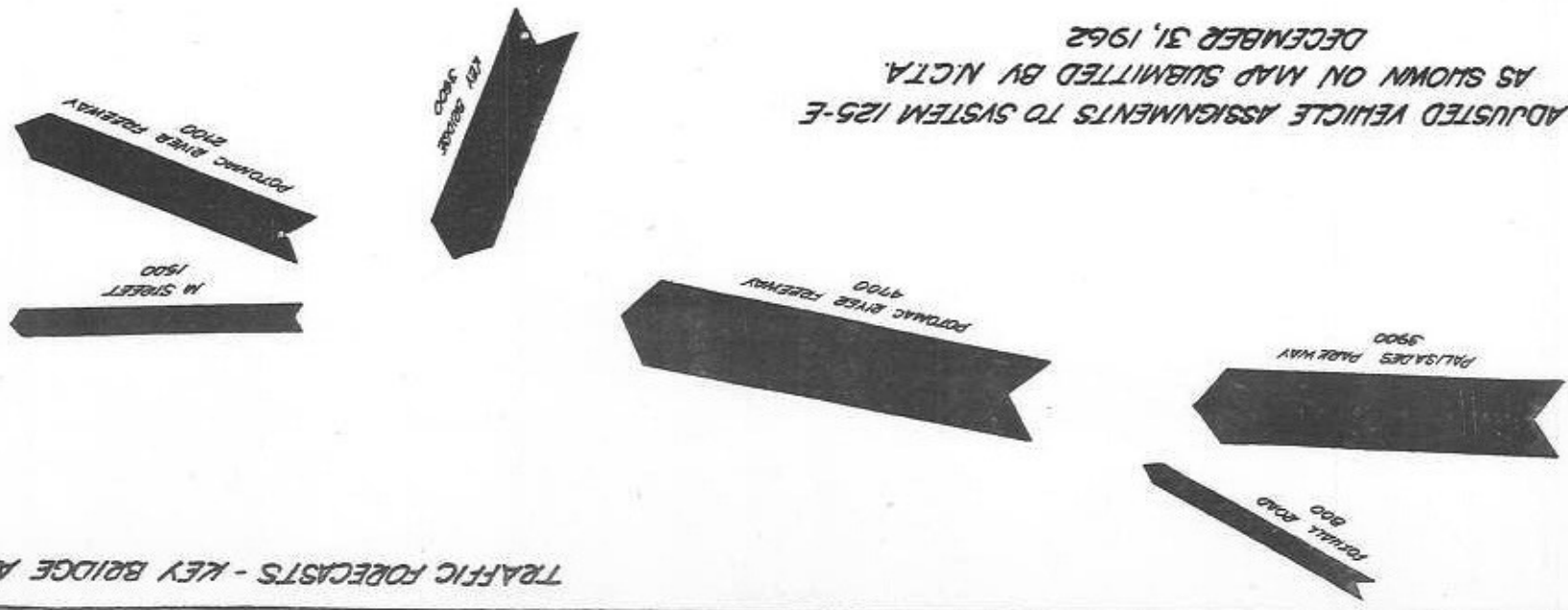
VEHICLE ASSIGNMENTS TO SYSTEM 125-E  
DIRECT FROM COMPUTER LINK DATA  
DECEMBER 5, 1962



TRAFFIC FORECASTS - KEY BRIDGE AREA

EXHIBIT 4

ADJUSTED VEHICLE ASSIGNMENTS TO SYSTEM 125-E  
AS SHOWN ON MAP SUBMITTED BY N.C.T.A.  
DECEMBER 31, 1962

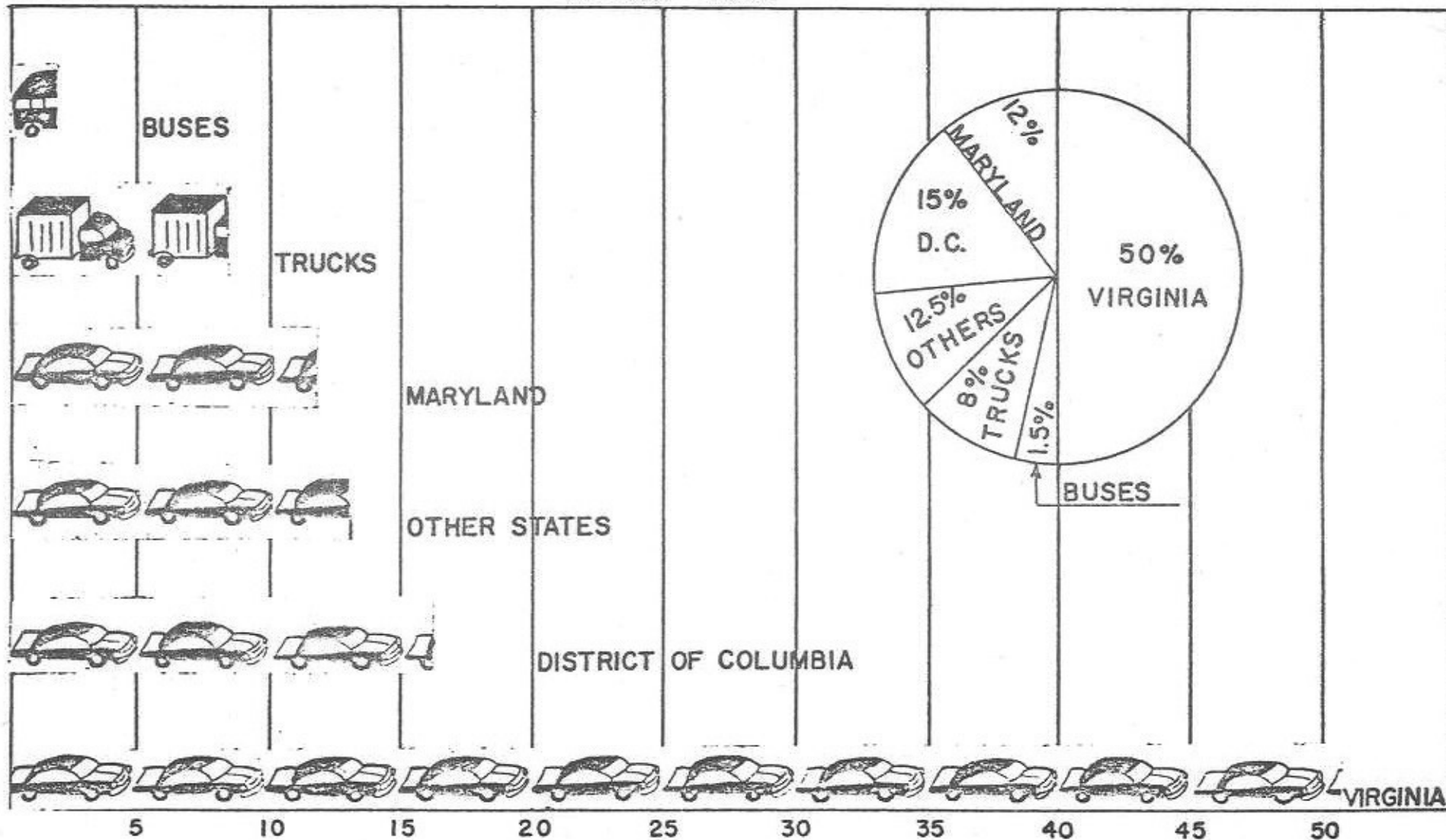


TRAFFIC FORECASTS - KEY BRIDGE AREA

EXHIBIT 3

# CLASSIFICATION OF INBOUND VEHICLES OVER THE POTOMAC RIVER BRIDGES BY TYPE AND STATE REGISTRATION

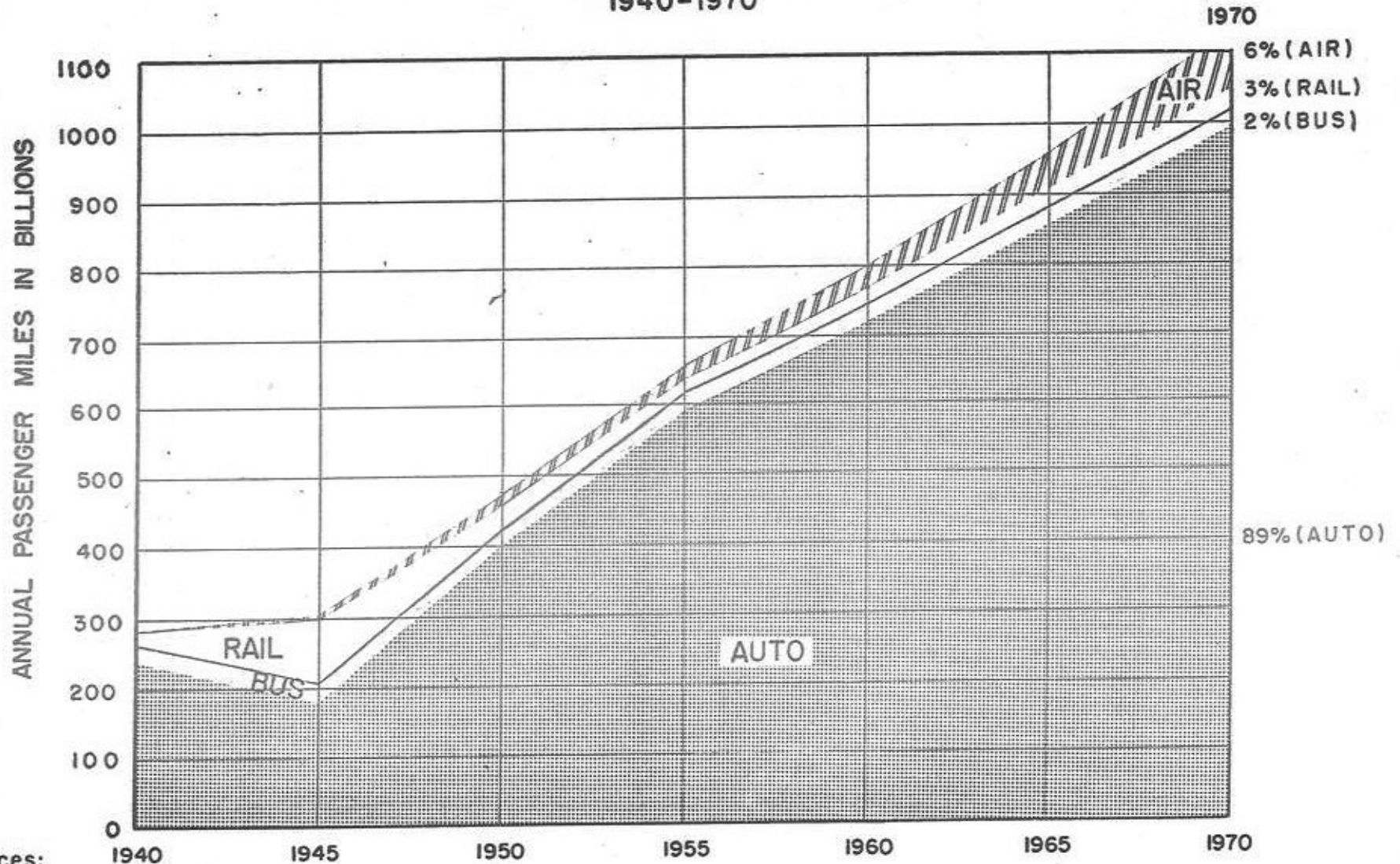
(Passenger cars only are classified by state registration)  
AUGUST 1962



VOLUME OF MOTOR VEHICLES  
TEN HOUR VOLUME FROM 7:00 A.M. TO 6:00 P.M.  
ONE SYMBOL = 5,000 VEHICLES



**INTER-CITY TRAVEL BY MODE OF CARRIAGE  
THE UNITED STATES  
1940-1970**



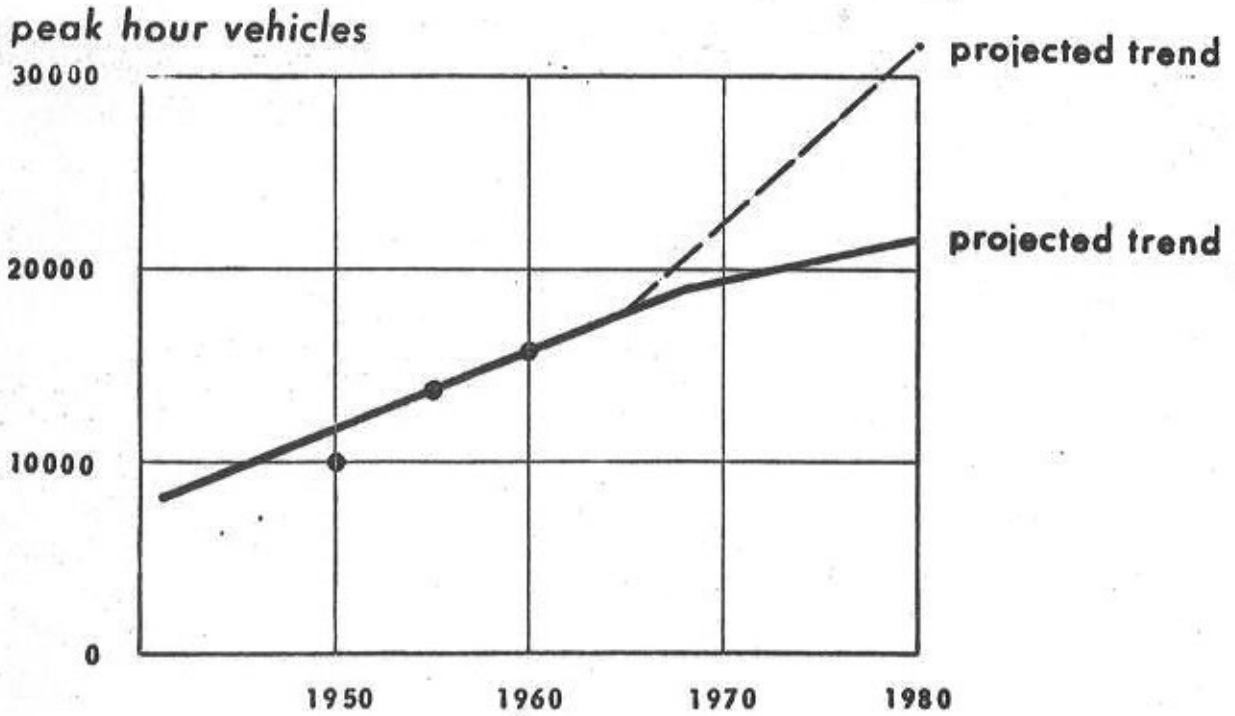
**Data Sources:**

- Auto - Auto. Mfgs. Assoc. & U.S. Bureau of Public Roads
- Bus - Nat'l. Assoc. Motor Bus Operators
- Rail - Assoc. of American Railroads
- Air - Civil Aeronautics Board

1958



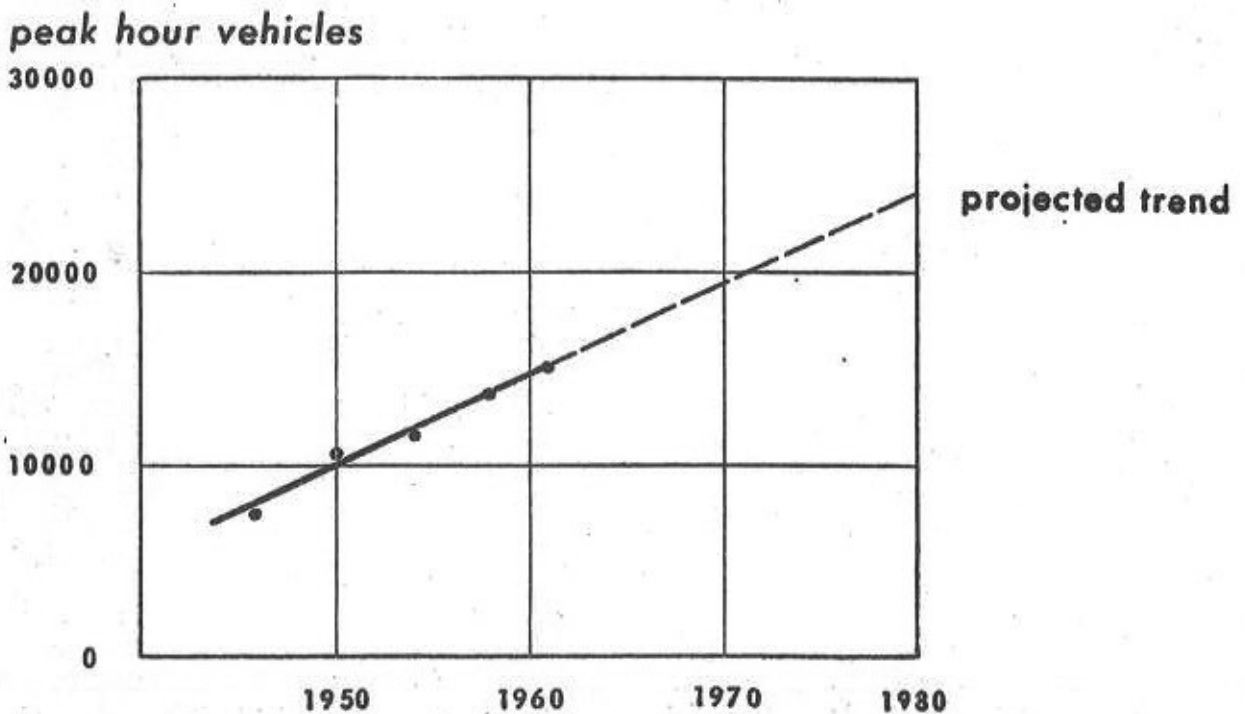
### POTOMAC RIVER TRAFFIC IN CENTRAL AREA



Reproduction Of Figure 14, Page 27 NCTA Report

EXHIBIT 7

### POTOMAC RIVER TRAFFIC IN CENTRAL AREA



Future Need Based Upon Historical Trend

EXHIBIT 8

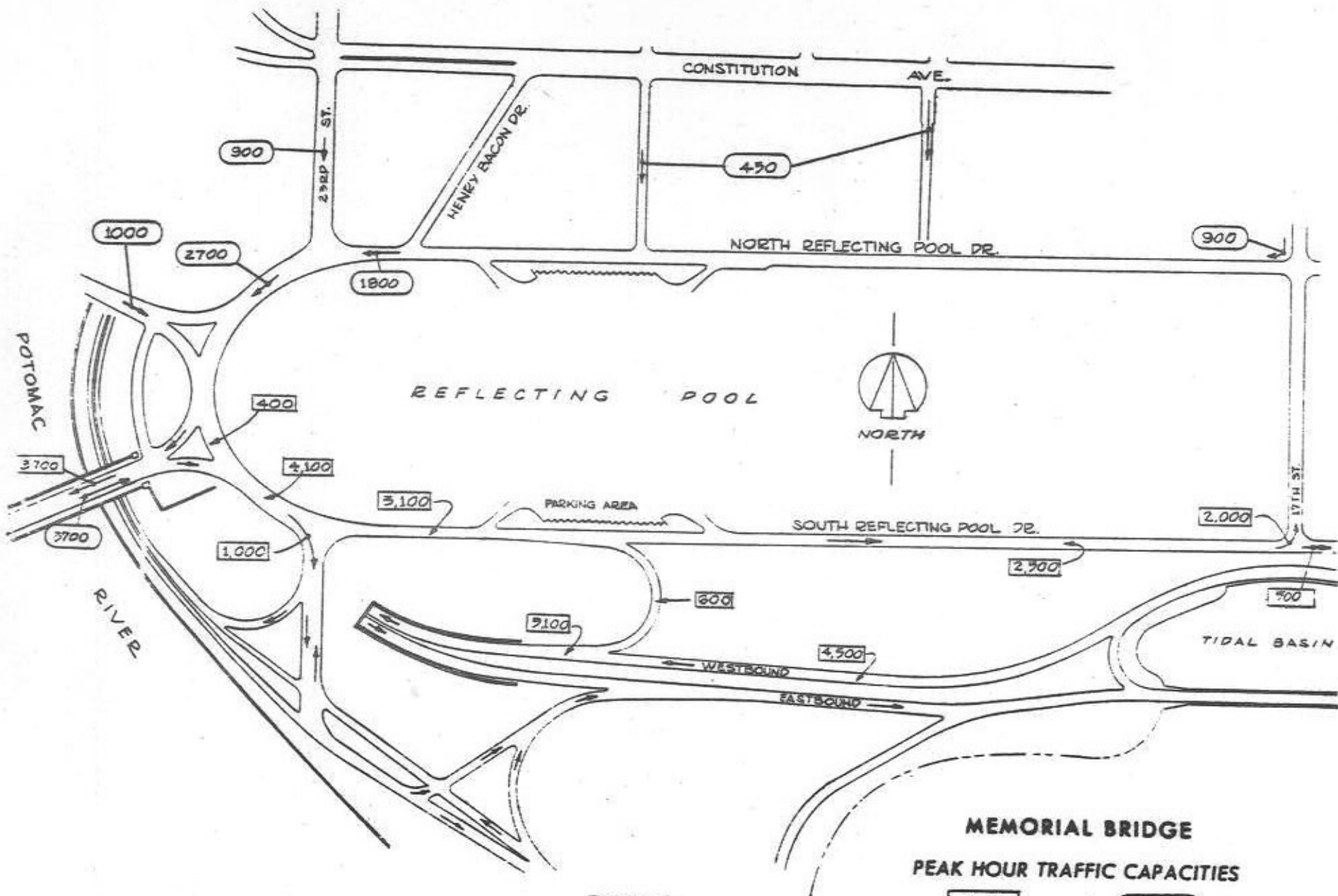


EXHIBIT 9

**MEMORIAL BRIDGE**  
**PEAK HOUR TRAFFIC CAPACITIES**  
 AM PM