

# Memories of 499

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## Memories of 499

by Lee Mertz

499 was 499 Pennsylvania Avenue in Washington, D.C., where I used to work. Many things happened there and these are my recollections.

499 was the headquarters of the Regional Highway Planning Committee, an operation funded and directed by the States of Virginia and Maryland and the District of Columbia to do highway planning for the Washington metropolitan area. The D.C. Highway Department was the housekeeper and all the employees were D.C. Highways personnel.

The Committee had a long history. It was not uncommon in the early days of the Highway Planning and Research (HPR) program for U.S. Bureau of Public Roads (BPR) employees to actually staff and run the Planning Survey operation for a State. A.C. Taylor, who retired as Regional Administrator in Ft. Worth, ran the operation during the 1940s. Under his leadership, the 1948 origin-and-destination (O&D) study was run and an arterial plan for metropolitan Washington was published.

It was realized soon after that the arterial plan would not be suitable for the Interstate routes that were then being designated. For example, the cordon line was far inside the beltway. So it was decided that a new O&D study was necessary which was actually carried out in 1955. By that time, another BPR employee was running the operation, G. E. Marple, who retired in about 1971 as the Associate Administrator for Planning. It was his goal to use the 1955 O&D data to prepare a new arterial plan using the most modern techniques available. This was not to be, however, because of other factors.

The National Capitol Park and Planning Commission was chaired by Harland Bartholomew, a city planner of international repute. He had served on the Interregional Highway Committee chaired by BPR Commissioner Thomas H. MacDonald that developed the report *Interegional Highways* that led to the Congress establishing the Interstate System in 1944. He was, if not pro highway, a friend of the highway program. He was also concerned about transit. Because of his work on the Interstates, he knew that the metropolitan area was going to be well taken care of as far as highways were concerned. He was worried about achieving some sort of balance. He, therefore, caused the Commission to sponsor a transit study and hire a consultant, Ken Hoover, to do it.

Being well aware of the data collected in the 1955 O&D study, which was then being key punched, Bartholomew made overtures to obtain it. This was in 1955, shortly after I came into Planning in the Washington office of BPR to work for Gordon Sharpe.

Ted Holmes, one of BPR's top researchers who would become Planning Director, advocated a total transportation study rather than one limited to transit. So a deal was struck. In return for the O&D data and other considerations, the study was expanded, and a highway consultant retained. This was Wilbur Smith. Hugh Wynn was the study director. Marple was not overjoyed by these developments. Here they were waiting for his brand new O&D cards when he had not finished editing them and the total transportation study cast a shadow over the development of his new arterial plan. Nevertheless, he persevered.

The total transportation study was published in 1959 as the "MTS" study. It called for an extensive freeway system and something like a thirty-eight mile subway system.

During these years, 1955 to 1959, I was becoming something of a computer nut. In fact, I got started by hanging around Dr. Blanche, Wilbur Smith's computer consultant who was doing the MTS on the old Univac I located at the Bureau of the Census. He taught me the mysteries of binary. About that time, I was able to talk Gordon Sharpe and John Lynch, his boss, into sending me to a two-week IBM 705 computer school. The 705 was not out yet but was supposed to be the hottest thing ever for the business world. On completion, I was naturally looking for a computer programming job to do.

A research job that BPR wanted done was the evaluation of the "growth factor methods" of distributing future traffic zone trip ends to all other O&D zones based on the O&D survey pattern. The "Fratar" method had just been developed and used on the Cleveland study. Glen Brokke had just returned to BPR from the consulting firm that did the study. Tom Fratar, the developer of the method, also worked for the firm. The method was supposed to be a take off from the Hardy Cross method of structural analysis. There were about four other growth factor methods around. BPR wanted to find out which was best. This was of particular interest to Marple who was faced with forecasting the 1955 O&D data to develop the new arterial plan. Hugh Wynn and Wilbur Smith had already decided to use (for the first time) the "gravity" model for the MTS. This was frowned upon by BPR because in its view, the method cut all ties to the distribution patterns of the O&D survey.

It was decided that I would be sent to the National Bureau of Standards (NBS) computer lab as an apprentice to learn more about computers, and, at the same time, I would do the programming for the research evaluation. I was assigned to Dr. Sally Peavey, mathematician-programmer, who became my mentor.

The only computer the NBS had then was their own home-made SEAC. It was in the next room from where my desk was. It was a magnificent thing. To input-output programs, wire cassettes were used. The cassettes were somewhat larger than the present VCR cassettes and the two reels were wound with wire instead of tape. It was a common sight to see a scientist walking across the campus carrying one or more cassettes. The computer was all vacuum tubes, of course. The memory was half Williams tube and half mercury delay like the Univac I. It had two tape drives that were used only for intermediate storage. The tapes were metal and there were no reels. The tape simply reposed in a waste basket. When it was read or written on, it simply passed by the read-write heads and into another waste basket. Vice versa for rewind. Output was punched paper tape which was printed out from teletype machines off line. I believe the memory was something on the order of half a K.

Even though I learned to program and operate the SEAC, it was soon apparent that our job was too much for it since it involved a lot of input and output. We decided to go for the big one-the IBM 705. One was being installed in Treasury to reconcile government checks after cashing. It was to be the huge version with 40,000 characters of core memory, and it could read while it wrote while it calculated. WOW.

Altogether, I spent over eight months at NBS developing that program. Access to the Treasury machine didn't work out, so what to do? The DuPont company had a brand new one at its headquarters in Wilmington. It just so happened that the Commissioner of Public Roads was Francis V. DuPont. He opened the door for me. For a while, I caught the eight o'clock train to Wilmington every morning.

Success at last, the program was debugged and run and the evaluation duly reported as a technical paper to HRB. Meanwhile, I had changed jobs. The Federal-Aid Highway Act of 1956 had just passed. BPR was in a snit trying to figure out how to administer the huge new program with no more people. Everything was being looked at to streamline processes. One of the great conceptual breakthroughs was the decision to delegate authority to the field. Up until that time, all projects came into Washington twice for approval. The old system simply would not work with the new program. Other things being looked at were all kinds of automation, and, of course, computers fell into that category. A new Office of Development was set up under Les Schureman. He recruited me to work on computer programs.

By this time, BPR and Marple had decided that they favored the Fratar method. Now a production version of the research program was needed. I was loaned back to Planning to do the job, then back to Wilmington with Marple. About this time he was called home to head up the new Urban Planning Division.

For a while, I traveled around the country running the Fratar program for various O&D studies. We used the Buick Motor Company machine in Flint, Michigan, and the Curtiss Publishing Company machine in Philadelphia, among others.

Now a new player came on the scene, Ted Morawski, who retired as Division Administrator of North Carolina. At the time, he was the Planning and Programming engineer in the D.C. Division. He came to headquarters looking for help. The D.C. Interstate was being designed at a great rate. Part of the task assigned to design consultants was to forecast travel for each segment as the basis for design. Designs of contiguous segments were coming in with differing numbers of lanes-- an impossible situation. Ted was looking for some computer program that could do the job for all consultants to use. There was nothing. The only stuff around was crude single route diversion-curve programs. I advised that there was some work under development in Chicago at the Chicago Area Transportation Study (CATS) under Doug Carroll.

He had contracted with Armour Research Institute to find some way of routing traffic through a network. Building on work done by Moore and Danzig in the development of automatic switching for long distance telephone dialing, they had developed a crude minimum path program for a network of about twenty intersections.

Mort Schneider at CATS had taken this and extended it to cover a portion of the real highway system of Chicago. Doug Carroll was convinced that the whole city could be done and was looking around for a machine large enough. I had been out there several times following the developments. Doug enlisted my help in finding a machine. This is where Ted Morawski walked in.

The IBM 704 was the only machine with potential for that sort of thing. Some of the 64 K giants were on order but were not in service yet. That size was necessary to accommodate the network of an entire metropolitan area. Lloyd Rivard, a trainee classmate, was head of planning for D.C. Highways and thus was the housekeeper and director of the Regional Highway Planning Committee. Between the three highway departments, there were scads of HPR funds lying unused. (Remember the huge leap in the size of the program.) Rivard very much wanted to solve Ted Morawski's problem and offered to finance development of the traffic assignment system. To make a long story short, Brokke and I were made the project managers of Lloyd Rivard's development program. Marple insisted that the system use the diversion methodology and be amenable to growth factor distribution methods. Doug Carroll had decided on a "synthetic" distribution method and the technique of all-or-nothing assignment to the minimum path. So the development paths diverged.

The General Electric Company in Phoenix, Arizona, was selected as the contractor. It had a 704 installation at the University in Tempe, and it had been used for processing the Phoenix O&D study. Several of the 64 K giants had been ordered for use in the G.E. empire. A Mr. Paul Jennings was assigned to the project, a truly talented man. By late 1959, we finally had a working traffic assignment system for the District of Columbia. Rivard and Morawski were eager to put it to heavy use. At first we had to journey to Lynn, Massachusetts, to use the G.E. 64k 704 there, but soon my old Alma Mater, the NBS, installed one in a quonset hut on Connecticut Avenue.

It turned out that I was the only one other than Paul Jennings who could operate the program, so Lloyd Rivard offered me the Directorship of the Regional Highway Planning Committee. We were housed on the mezzanine floor of the D.C. Public Library located at 499 Pennsylvania Avenue. It was 1960.

We expanded the staff and were very very busy. Maryland and Virginia also sought our services extensively. Marple was very much interested in the new development and sent a steady supply of young trainees down to learn the ropes. We were making changes in the program rapidly. We began having classes every Tuesday afternoon. Marple would send practically his whole staff. Soon technicians from other cities began journeying in to attend. Some of the names of the staff-Bill Boardman, Ed Sullivan, Geoff Brown, Fred Hood. Some of the trainees from BPR- Dick Cowdery, Les Lamm, Norm Mueller, Art Balek, Bob Puckett, Gene Muhich, Jim McDonnell, Joe Manning, Art Sossiau and more. I call all of these people the 499 Club. Gee it was hot on that mezzanine. That building was torn down about five years ago. It was sad to see it go.

Another activity that went on there was the Pentagon Network Study. This was done by Marple's office. Jim McDonnell was the project leader. This study was brought about by unusual circumstances. The Shirley Highway was originally built from the 14th Street Bridge to Route 7 in Arlington County by BPR as part of the original Pentagon Network associated with the building of the Pentagon. The intent was to turn it over to the State of Virginia. They wouldn't take it. This was a source of embarrassment to BPR for years. We were forced to establish maintenance forces and shops at Columbia Pike. As the Interstate came along, the Shirley obviously needed rebuilding if it was going to be I-95 as planned. The Pentagon Network Study was established to do the planning and preliminary design. Jim and his team did many traffic assignments and geometric design trials. He was responsible for the reversible center lanes concept. He didn't have in mind H.O.V. however. Virginia was still standing aloof. They were finally persuaded to accept the Shirley Highway after special legislation was passed making the Federal share of the cost of Shirley Highway 95 percent.

After the publication of the MTS Study, the congress established the National Capitol Transportation Agency (NCTA). Some thought it was created to build the subway system called for in the MTS. Others thought it was to plan a whole new transportation system from scratch. In any case, Darwin Stolzenbach was appointed as its head by President Kennedy. Bob Keith was made head of transportation planning and a new face from Nashville, Tom Deen, was made head of highway planning. The highway community viewed the new agency askance since it defined its mission as including highway planning as well as transit. After all, the Interstate was well underway and no interruptions would be welcomed.

Again, as in the MTS, the availability of data became an issue. Ted Holmes reentered the picture with the position that the highway people and the transit folks might differ in policies, but there should be no disagreement on the basic facts, and hopefully forecasts. This idea was accepted and so, for all intents and purposes, we integrated the staffs of the two agencies. In addition, Marple supplied help from his office. NCTA hired the Traffic Research Corporation to work on a modal split model, the weakest link in our combined bag of tools. Further, Marple wanted a full evaluation of the Gravity Model against O&D data before he could feel comfortable in approving its use in Federal-aid work. We also made that a team effort. Marple assigned Walt Hanson, while Tom Deen assigned Ralph Schofer, son of Gus Schofer, Regional Administrator in Baltimore. We also conducted a new cordon-line survey. It was my first experience in being chewed out by a Congressman delayed on his way to Friendship Airport (now BWI) in Baltimore.

1960 and 1961 were two busy years. We did a lot of work. We spent a lot of money. The joint activity resulted in some congressional hearings in the summer of 1962. I remember appearing before the Senate District Committee chaired by Senator Byrd from West Virginia. I sat a whole week waiting to "go on." Finally, about 4.00 p.m., Friday afternoon I was called. But I was ready. I had prepared beautiful graphics in color. I had rehearsed many times. I was confident. I began strongly, using the charts. Senator Byrd gaveled me to a stop to explain that the hearing recorder could not record my references to the charts and make any sense. I began again, trying to articulate everything but my confidence was shot. He gaveled me to a stop again and instructed the recorder to erase the record to the beginning and that we would begin again at 9:00 a.m. the next morning, a Saturday. I was ready the next morning. I appreciated him going out of his way on his day off to give me another chance.

During another hearing where I was present, the main witnesses were the heads of D.C. Highways and NCTA. On a Saturday morning, one of the Congressmen came in waving a newspaper article quoting BPR as saying that if all the D.C. Interstate were not built, D.C. would have to pay the money back. The Congressman wanted to know, "Who put this gun at our head when we are trying to deliberate the question?" The Chairman said, "Let's find out". and ordered the Sergeant-at-Arms to bring in the Federal Highway Administrator. They found Rex Whitton on the golf course about 11:00 a.m. He was able to convince them that it was a routine response and in no way was aimed at influencing the Committee. "Besides," he said, "I'm not ready to go home to Missouri yet."

NCTA made their required report to Congress in November. The congress passed Section 134 of title 23 requiring Comprehensive Urban Planning and Doug Carroll and I allowed ourselves to be talked into going to New York to solve it. The BPR imported the computer package and made it available to transportation studies nationwide. In the 1970s, it became the joint property of FHWA and UMTA and acquired such names as Planpac and others. But I digress. I said farewell to 499 in the fall of 1962 and headed for New York City to conduct the largest transportation study ever done.

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