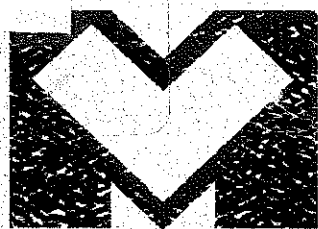


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Mississippi Valley Conference of State
Highway and Transportation Departments

**STANDING COMMITTEE ON PLANNING
TECHNICAL SEMINAR
PROCEEDINGS**

Detroit, Michigan
November 2-3, 1989

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Bureau of Transportation Planning
425 West Ottawa Street
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***To the Participants of the 1989 MVC Standing Committee on Planning
Technical Seminar:***

It was a pleasure for the Michigan Department of Transportation to host the first mid-year technical seminar of the MVC Standing Committee on Planning.

The seminar provided us the opportunity to explore technical issues confronting us on a daily basis. These issues included urban transportation planning - where is it going in the 90's, resource allocation and acquisition, modal policy changes and their impacts, to name a few.

Your active participation help initiate a pro-active role of SCOP in identifying, developing, and implementing transportation strategies for the member states of the Mississippi Valley Conference. Your continued enthusiastic participation will ensure a SCOP which is supportive of its members.

This document covers the proceedings of the 1989 seminar and includes topics recommended for future SCOP technical seminars in the closing session.

Thank you to all who provided input to this document and to the seminar.

A handwritten signature in cursive script that reads "Gloria J. Jeff".

Gloria J. Jeff, Assistant Deputy Director
Bureau of Transportation Planning

MISSISSIPPI VALLEY CONFERENCE OF STATE HIGHWAY AND TRANSPORTATION DEPARTMENTS

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PRESENTATIONS

NATIONAL TRANSPORTATION STRATEGIC PLAN

Eugene McCormick, Deputy Administrator
Federal Highway Administration

The federal government is in the process of updating its strategic plan. Today, I will give you an update of -

- What seems to be happening in Washington
- The department's national transportation policy effort
- Our efforts toward a reauthorization bill, and
- Finally, I'm going to give you a quiz before I leave. I appreciate this opportunity to hear and learn from you. I'm going to ask questions, and I would like your frank, objective reactions.

With that, let me get into a few things that are going on in Washington right now. As you all know, a little over two weeks ago there was an unusual situation in California. The damage to the highway and road system as a result of the earthquake was extensive. Congress passed a billion dollar emergency relief authorization for the state of California in response to that issue. I wanted to make sure all of you had a clear understanding of where that billion dollars came from. It was a FY90 authorization and appropriation. It, in essence, is a billion dollar appropriation from the balance of the highway trust fund. That balance today is about \$10.6 billion which in recent years has been growing at the rate of about \$1 billion to \$1.5 billion per year. In essence, the billion dollars came out of the remaining balance in the highway trust fund. There is, therefore, no immediate impact in terms of the FY90 budget. However, it seems clear that it will result in a spending increase in FY90 that may well be a question in future years' budgets and appropriations. So, while there is no immediate impact in terms of your federal funds here in the Mississippi Valley region, I would suggest that in the long term, somewhere down the line, there is an impact.

Where is our FY90 budget? As you know, we are now working under the second continuing resolution during this federal fiscal year. We distributed apportionment tables to you on October 1, the beginning of the fiscal year. Those apportionment tables were based on what at that point was the lower of the two obligation ceilings in the house and senate. In that particular case, it happened to be the senate level of obligation ceiling, further discounted to allow for sequestration. So we withheld about 5.4 percent

in all apportionment categories to allow for what ultimately happened in terms of sequestration, also discounted by about .43 percent to allow for future funding of the drug bill. Those two discounts were made in the apportionment tables. Our appropriation bill came out of the House yesterday. It is expected to come out of the Senate today. The obligation ceiling after the House and Senate have reconciled their differences, resulted in a \$12.2 billion obligation ceiling. It is an obligation ceiling that is a little higher than the obligation ceiling upon which our apportionments were earlier based. Therefore, if Congress ultimately adopts an overall budget which avoids the sequestration and which funds the expanded drug program from other than transportation taking its relative share, you can ultimately see your FY90 apportionments increase about eight percent. The best case scenario in terms of what's yet to be seen for FY90 would be an eight percent increase in the apportionments from which you're presently working.

I cannot predict whether or not sequestration will be avoided. Appropriation bills are moving into the pipeline, moving through the process. The existing continuing resolution, which is basically funding federal government operations, carries through November 15. Our goal would be that the series of appropriation bills that fund federal government would be passed in the meantime; that there would be a reconciliation to avoid sequestration, and that as of November 15 we're back on a normal federal fiscal year cycle. However, as I said earlier, it is presently unclear whether that will happen.

There have also been interesting things happening in terms of a gas tax increase in the last week. It was approximately a week ago today at a senate hearing where Senator Moynihan basically stated, "Given the highway and bridge damage in the state of California and our fragile infrastructure, it's time to raise the gas tax to address the infrastructure needs in this country." Senator Moynihan had proposed a composite infrastructure fund and program earlier. It's also interesting to note, that last Sunday on Meet the Press, Senator Dole said the same thing. Congressman Rossenkowski, Chairman of the Ways and Means committee, and Speaker of the House Foley have remarked similarly. I would like to be convinced that perhaps those individuals and many others are convinced of the true need, but what I haven't heard anyone say, is why don't we first spend down the balance in the Highway Trust Fund toward the problem if we're convinced that we need a tax increase to fund the problem.

My word of caution would be that when people talk about gas taxes, particularly for highways and bridges, and if they're not saying spend down the Trust Fund balance first as a way to get there, then perhaps there are other motives in mind. If there is a tax increase, perhaps the balance would not be spent or perhaps the entire tax increase would not be dedicated to the user fee concept that we've all respected over the years. I add a word of caution to the recent discussions on gas tax increases, even though now they are not being characterized in deficit reduction terms, I suspect in the back of the minds of those that are espousing there may be that thought. So, I caution you to jump for glee in the sense some leaders of Congress are beginning to talk about it for the purposes that we have all come to love and respect, the user fee concept in the Highway Trust Fund.

When is the FHWA going to announce the discretionary bridge grants and public land grants as well as discretionary I4R and discretionary I completion funding? Assuming our appropriation bill comes out of the Senate today, I would assume both the discretionary bridge grants and the public land discretionary grants would be made within the next week or two. I think those are fairly imminent, assuming our appropriation bill comes out of the Senate the way it's expected. Interstate grants will more likely be announced approximately mid-December.

Let me now turn to the national transportation policy effort. When Secretary Skinner first took office, he stated it was incumbent for this nation to have a clear understanding of what its future should be for transportation and that decisions which are made in the short term should have some bearing or focus on a longer term objective for transportation. We, in the department, have been taking this effort very seriously since early spring.

It's a three-step process. We're using the strategic planning process and published a document called "Moving America." It frames the issues and scans the environment in terms of what the major transportation issues are which face us. We undertook a very extensive effort later this summer and early this fall that we called Outreach. This was a series of about 100 events throughout the country -- public hearings, forums, seminars -- where we were trying to give states, the industry and the public at large, the opportunity to share with us their perception of the future of the transportation system. It has been, in my opinion, a very productive exercise. I participated extensively in this program. I also participated extensively two years ago in the 2020 effort of AASHTO, among others. Some may ask why we did it over again. In my view, it was further enlightening. Two conclusions come to mind in terms of what I personally sense this year relative to two years ago.

First, the transportation problems we face in this nation are worse today than they were two years ago. That may not come as a surprise to any of us. That's the bad news. The good news, on the other hand, was a much broader understanding from outside the transportation community sharing in that problem, being concerned about that problem, and wanting to help solve that problem.

The third phase of the national transportation policy effort is actually framing the policy and developing the policy itself. That is where we're at right now. We are on target and fully expect that policy will be announced on January 7. We, in FHWA, feel blessed since our administrator, Tom Larson, is wearing two hats these days; not only as the administrator of FHWA, but also leading the effort for the Secretary in the overall development of that policy statement.

I might also mention that the policy effort is in the context of reauthorizing the highway program which expires less than two years from now; the transit program less than two years from now; and the airport program, having two components, one expiring next year and one two years thereafter. This policy is not only going to be a policy. It is being directly linked to what we will be proposing as an administration proposal next spring. It will begin the debate in terms of reauthorizing the highway and transit programs, particularly from our individual modal standpoint. It's not just a policy for policy sake, it's a policy for implementation.

I'd like to get into the reauthorization bill and share with you a few directions of where we're headed.

I heard some discussion earlier about planning data and planning statistics. A 20-year snapshot from 1968 to 1988 suggests that we've seen a very small growth in the extended system over the last 20 years. It's roughly a five percent increase in miles that increase comes primarily from two sources: completion of the interstate system and the continuing development in our suburban areas, ex-urban areas, and metropolitan areas.

It's interesting to note that the change in licensed drivers and the change in motor fuel consumption is roughly the same, about a 55 to 56 percent increase over those 20 years. Today, we have approximately 160 million licensed drivers in this country and we've seen an increase of more than 55 percent over the last 20 years. Actual motor fuel consumption is approximately 56 percent. It is interesting to note that, in terms of motor vehicles, we have seen a sharper increase, roughly 83 percent. Today, we have about 180 million vehicles in this country - more vehicles than drivers. Our country has come to love its mobility, and the car is the vehicle that provides us with this mobility.

Vehicle travel, demand on the system, over the last 20 years, has nearly doubled. I suspect in most of your states the statistics are very similar. One interesting comparison to make is the difference between motor fuel consumption and vehicle travel. It is interesting to note that travel has increased twice as much as consumption. In other words, our efforts toward fleet efficiency during the 70s, in particular, has been largely successful. It also tells us something in terms of our financial base, in the fact that most states depend upon a cent per gallon gas tax. The federal gas tax is a 9.1 cent per gallon gas tax. It suggests, therefore, that our funding mechanism has not kept pace with our demand on the system. As a matter of fact, it's only approximately half the demand on the system.

Perhaps the most foreboding of all the statistics, are the constant dollar outlays on our highway system. We have actually seen a near ten percent reduction, in a constant dollar sense, on our highway system throughout the country. We, as a nation, are investing in the maintenance, operation and improvement to our system by about \$67 billion per year. A ten percent reduction in the constant dollar investment level, during the same time interval, in which we've seen a doubling in the demand placed on that system.

Let's take a closer look at the expenditure side of things. Who's responsible for the disinvestment in the highway system? We, as the federal government, have to assume the primary responsibility. Looking over the past 20 years, the level of federal dollars invested in the highway system, from a constant dollar standpoint, has declined by 21 percent. You, at the state level, and the local governments within your states have almost held the line -- only a 3.4 percent reduction in the level of investment. When I say held the line, I would qualify that by the fact that the demand on the system has

doubled, but held the line in a constant dollars standpoint. If you take the total investment and segregate it into two elements -- capital investment and maintenance outlays -- it tells you a different picture. The capital investment side of the equation is almost an 18 percent reduction. Meanwhile, from a maintenance outlay standpoint, you see a 14 percent increase. We should not interpret that as good news in the sense that we've seen a 14 percent increase in maintenance. What I would suggest is that the reason we've seen this increase in the level of maintenance is the fact that we're falling behind from a capital standpoint. We're grasping short term measures to try to maintain the serviceability on our system the best way we can. Anyway, it results in a total disinvestment in the system in a constant dollar sense of about 9.2 percent reduction.

Going back to the state and local column, congratulations to the states are in order. During this last year, 27 states have increased their funding for the highway program, mostly associated with gas tax, legislative initiatives and, in some cases, indexing mechanisms. The bottom line is that over the years of declining resources and increasing pressures from a demand side, the states have been more successful in terms of meeting those financing challenges at the state level.

Let me now talk about what our overriding goals are in terms of our shaping the reauthorization bill. Incidentally, I think you'll see a lot of commonality between these goals and the ones that Mike Meyer shared with us earlier this afternoon. We're looking for a transportation system that improves the productivity of this nation and its world competitiveness. That is an overriding objective in terms of how we're looking at the highway program, its reauthorization, as well as other modal programs. We obviously must address the urban congestion problems, and increase mobility throughout our country. The transportation system must be more proactive in terms of contributing to the quality of life of our citizens. Perhaps it has been too reactive in the past. We must reinvigorate transportation partnerships.

How do we improve productivity and competitiveness? To begin with, we must have a program that recognizes the need to preserve the existing physical integrity both on our roads and certainly on our bridges. We have to look for ways to improve system efficiency and make that system work better for us. We have to remove barriers to basically increase private productivity, toll roads, private participation where private benefits are significant on our system, private participation in our research programs, private providers and private interest at large.

We need to increase mobility and reduce congestion. I think the key is in improving operations and looking for ways to achieve that. Earlier this week the AASHTO committee on transportation operations held its first meeting in Baltimore. About 40 to 45 states were present. They were very motivated, enthused, and looking for ways to determine how we can make our system work more efficiently and effectively. I think Mike Meyer made the point that you, from a planning standpoint, ought to be concerned about operations. I would endorse that 100 percent. I would endorse all

of you to work closely with your representative on that AASHTO committee. I think that's a key AASHTO committee and I commend AASHTO for creating it. The committee reports to the standing committee on highways. They are taking a broader look than just highways and trying to introduce transit and multi-modal aspects into their efforts as well. We must recognize the continuing need to enhance the accessibility to rural America.

Safety on our system must be a matter of concern. We kill about 47,000 Americans a year on our highway system ... 47,000! We must look for ways to reduce that. In recent years we have seen a significant reduction in the fatality rate. But that's happened during a time that we've developed an interstate system ... the safest system in this world. If we look at a future that perhaps does not have that continued advancement, I get particularly frightened when I think of continued increased growth of traffic on the system as well as the fact that it is on a basically constrained system. We have to look at the improved quality of life and I think we should look at incentive sorts of provisions rather than mandates and sanctions. Of course, air quality in our urban areas is a prime example that is being discussed now.

How do we reinvigorate transportation partnerships? Perhaps one of the fundamental goals and objectives that we're working toward is how do we re-establish credibility in the Highway Trust Fund. As the balance has grown to its current level of \$10.6 billion, I think we, as highway system users and tax payers, certainly have had our credibility in the Trust Fund concept eroded. We have to find ways to re-establish that credibility and ways to spend that balance. I think we have to work more actively in terms of involving public interest in a very cooperative spirit and certainly in the decision-making part of the process. We must reassert science and technology leadership. The statistics are frightening if you look back in recent years at the level of investment to support research and development and the real technological advancement we have seriously disinvested in the entire effort. We must renew an adequate level of investment and in a cooperative spirit with private industry. We've heard a couple of comments today about smart cars and smart roads, and I think that is one very good example that we all must look toward to determine ways to work with the big three auto-makers. We believe that must be a key part of our future authorization bill.

We also need to restructure the federal role in the highway program. With respect to the federal/state partnership I valued it from a state perspective when I was in Illinois, and I certainly value it from my perspective now with the FHWA. I think that, in general, that partnership has served the nation well over the years. We want to build upon that.

We, within FHWA, fully agree with the AASHTO position in terms of the myriad of categories within the program is in fact self-defeating and preempts to a certain degree your flexibility to address your problems in your state the way they should be. We basically believe in two things -- build upon the federal/state partnership and provide you more flexibility you need to administer the program. Those are the two fundamental

philosophies in our view of restructuring the federal role. So collectively we have identified a system of national significance, and believe it is a good tool to target the future federal program. The second level of program and consolidating at the state and local level, or what you call the flexible program level would allow a much higher degree of flexibility there. We think that provides for a more streamlined highway program delivery system and can, in fact, provide more effective, efficient investments and will lead to enhanced productivity and competitiveness.

Another question is how to increase mobility, reduce congestion, and merge highway and transit funding, from a decision-making standpoint and from a planning standpoint, and assure everyone that we're taking a broad transportation outlook. The times we live in and the problems we face have become extremely complex, and we have to encourage ways to make sure we look at all options. There has to be a growing awareness to make sure we have the intermodal connectivity that we should have in our overall transportation system, and, again, encourage private participation.

How do we improve the quality of life? I've touched upon the safety program before in the sense that trying to develop incentives through sound management approaches, similar to the pavement and bridge management systems, suggest that safety objectives need to be looked at in that same regard. Again, we need to expand funding, leadership in the advancement of technology, and expand research and development programs.

And again I'll come back to some of the key points -- reinvigorate our transportation partnerships, building credibility for the Highway Trust Fund, improving planning and decision making, and two percent HPR funds. I would agree with Mike Meyer in theory of his answer to the question of increased funding for planning, and I would make funding for research equally important. But I would ask the question, why do we have planning and research? Why do we force ourselves to make a trade-off between what we need as adequate planning levels and what we need as adequate research levels? We ought to fully fund both and not force them into a situation where you have to trade off one for the other.

That gives you an overview of some of the concepts and notions that we're thinking of in terms of our program. Our program is not exactly as tailored as AASHTO's, but I would suggest that, at this point, it is following a similar direction.

Now I'd like to ask you some questions.

1. One difference we have from AASHTO is bridges and the fact that we think it's necessary to maintain a separate apportioned bridge program in addition to the discretionary bridge program. I'd like to hear any thoughts pro or con on that issue. Should there be a separate bridge program?

Response: So you're basically suggesting as an example the 15 to 35 percent of the existing apportioned formula that goes to that should not go to that, it's not in the federal interest.

2. Do you as states have the credibility with your respective local governments that if you have a program similar to what AASHTO calls a flexible program or what we call a state/local program do you have the credibility with local governments that assures them that they will be treated equitably in that process? Is it practical if you don't think you've got that credibility?

I believe that if states do not work to develop that credibility, and develop that solution, I think you ought to be concerned because at the federal level, you'll get the one sized shoe. My basic conviction is that our goal and our objective would provide you the flexibility to solve the problem, and my only point being that you have to be very active in solving that problem, otherwise it may be solved for you.

3. What about the MPO process? Is it working, not working, what should the new reauthorization bill suggest in terms of the MPO process? Does it need to be eliminated, strengthened in the more metropolitan areas, strengthened at all, broaden to include the whole state?

Response: I think the MPO process is certainly the most productive in the larger metropolitan areas. I don't know if that 100,000 or 200,000, but the process in Illinois basically provided a forum which still must be nurtured and developed, but a forum that encouraged broader transportation decision making. In that sense I think it is particularly relevant in our larger metropolitan areas.

Even if we do not focus on the smaller areas, it would certainly not be anything preempted that says build upon what's working in your respective states.

Thank you.

AASHTO 2020 and Report on TAG Activities

**David Clawson
American Association of State Highway
and Transportation Officials**

The American Association of State Highway and Transportation Officials (AASHTO) is actively involved in the Transportation 2020 effort to develop a transportation strategy serving the needs of the United States well into the 21st century. Following is a progress report on the many activities associated with this effort.

- Concerned with long range issues as well as 1991 legislation.
- Includes all modes of transportation and linkages.
- Seeks a consensus to be implemented at federal, state, and local levels.

- Phase 1 - Information gathering.
- Phase 2 - Identifying alternatives.
- Phase 3 - Seek agreement on best program.
- Phase 4 - Seek enactment of program.

Major Products

- Beyond Gridlock
- The Bottom Line
- TRB Special Report: Year 2020
- Discussion Papers
- New Transportation Report

- The "Bottom Line" report approved September 1988 for highways and transits.
- Research report completed and submitted through approval process.
- Needs report for air and rail transportation approved by AASHTO Policy Committee in October 1989.
- Needs report for water transportation under development.

NEW CONCEPTS REPORT

- Purpose of Report: To make Transportation 2020 related recommendations for consideration by TAG and others in Consensus Transportation Program.
- Report contains policy recommendations.
- AASHTO policy changes require separate action at some future date.
- Initial report approved by Policy Committee in Wichita in December 1988.
- Revisions approved by Policy Committee in February and July 1989.
- Additional work approved October 1989 Policy Committee meeting.
- Chapter 1 - Economy
- Chapter 2 - Aviation
- Chapter 3 - Highways and Public Transportation
- Chapter 4 - Railroads
- Chapter 5 - Water Transportation
- Chapter 6 - Research/Development/Technology
- Focus on systems of national significance - Categorical Program.
- Flexibility for issues of national significance - Flexible Program.

HIGHWAYS - CATEGORICAL

- National Highway System (HSNS).
- Continue 1/2 percent minimum.
- Retain 85% minimum allocation.
- 1991 hold-harmless plus possible increase.
- Match ratio of 85/15 percent.

HSNS to include interstate system and a portion of the Principal Arterial System (PAS) as redefined:

- States submitted proposed revisions to the PAS by July 1989.
- States submitted proposed HSNS by September 1989.

NATIONAL HIGHWAY SYSTEM

- All 50 states submitted a redefined PAS for July 1 deadline.
- Forty-nine states submitted one or more HSNS alternatives for September 1 deadline.
- Two HSNS alternatives mapped by Texas are available for information purposes.
- Establishment of National Highway System should be a cooperative effort between the states and FHWA after reauthorization is enacted.
- Consultation should occur with local governments and private sector users in defining system.

HIGHWAYS - FLEXIBLE

- Flexible grant to fund urban and rural highway needs beyond National Highway System.
- Funding to address national issues - urban mobility, suburban congestion, rural access and modal interlinks.
- 100 percent return of funds.
- Matching share determined by state.

TRANSIT - PROGRAM

- Structure of UMTA program would remain unchanged.
- Would include discretionary (categorical) and formula (flexible) programs.
- Supports continuation of Mass Transit Account and general funds for transit.

TRANSIT - CATEGORICAL

- This discretionary program would fund:
 - major bus/rail rehabilitation
 - new starts
 - elderly and handicapped transportation
 - transit planning and research
- Program would be funded from Mass Transit Account (MTA).

TRANSIT - FLEXIBLE

- Flexible program would include general funds, and MTA funds beyond discretionary program.
- General funds distributed using current Section 9 and 18 formulas.
- For MTA flexible funds, eligible projects would be broadened to allow funding for a wider range of high occupancy, shared ride and commuter rail capital projects.
- MTA funds for the flexible program would be distributed 50 percent on existing Section 9 formula and 50 percent on total population, after any reductions in general fund appropriations have been held harmless.

FUNDING - HIGHWAYS

- Increase highway funding from \$18 billion in FY 1992 to \$26 billion in FY 1995.
- 50-50 percent split between categorical and flexible programs with 20 percent transfer provision either way.

FUNDING - TRANSIT

- Increase transit capital funding from \$3.5 billion in FY 1992 to \$5 billion in FY 1995.
- Transit funding recipients would remain the same.

NATIONAL TRANSPORTATION POLICY

- AASHTO staff and member departments participating in U.S. Department of Transportation's National Transportation Policy initiative.
- AASHTO Transportation 2020 documents have been forwarded to U.S. DOT for use by six transportation market cluster groups.

ACTION IN CONGRESS

- AASHTO periodically updates members of Congress and committee staff about the progress of Transportation 2020.
- Field hearings held August 21 and 22 in Idaho by Water Resources, Transportation and Infrastructure Subcommittee of the Senate Environment and Public Works Committee.
- Congressional reauthorization hearings expected to begin in Washington, D.C., in spring 1990.
- AASHTO Administrative Subcommittee on Public Affairs is formulating a plan for a public information effort to increase public awareness of the nation's transportation needs and the AASHTO proposed program.
- AASHTO working with TAG members to reach consensus of future program.
- TAG also includes large number of organizations serving on Chairman's Advisory Council.
- TAG working from general toward specific areas of consensus.

TRANSPORTATION ALTERNATIVES GROUP

- TAG consists of 12 organizations concerned with transportation policy issues.
- TAG members include AASHTO, AAA, APTA, APWA, ATA, HUF, NACO, NARC, NCSL, NGA, NLC, and USCM.

- Member organizations working toward the development of consensus.
- TAG staff level workshops held during summer 1989 to move toward consensus.
- Leadership of TAG organizations met October 13-14, 1989, to discuss and further refine consensus.

TAG CONSENSUS

- Program orientation:
 - Federal Program Focus/Priority
 - Federal-Aid Program Structure
 - Nature and Extent of National Highway System
 - Flexibility of urban, suburban and rural programs
 - Specific program issues
- Specific program issues:
 - Safety
 - Bridge Replacement & Rehabilitation
 - Systems Productivity
 - Freight/Trucking Operations
 - Intermodal Access and Integration
 - Air Quality
 - Scenic Byways
 - Intercity Passenger Rail and Bus
 - Research and Technology
- Intergovernmental roles and responsibilities:
 - Decision-making
 - Funding allocation and recipients
- Investment level and resources:
 - Level of federal investment and state/local matching

TRANSPORTATION 2020

- America's future depends on it.

MOBILITY IN THE 1990's

The Land Use Alternative

Dr. Robert Cervero
University of California, Berkeley

The connection between current land use development patterns and transportation problems is explored in this paper. Four land use strategies are discussed that could enhance future mobility -- densification, mixed-use development, jobs-housing balance, and pedestrian-friendly site designs. The harsh realities of why it is difficult to coordinate transportation and land use planning and how we might overcome built-in resistance is also discussed.

Land-use initiatives represent the most fundamental and potentially effective tools available for coping with the kinds of mobility problems that America's cities will face in the 1990s and indeed the coming century. Here, I use the term "land-use" loosely, meant to convey more than how land is simply put to use. As used here, land-use refers to the overall built environment -- the size and density of projects, the degree to which uses are segregated or commingled, site design features, tenant mixes, levels of jobs/housing balance, and so on. In that all of these attributes of the built environment influence travel behavior, this broader notion of land-use is more compelling.

The link between transportation and land use can best be appreciated by comparing cities. Mass transit works best where high-density nodes are linearly aligned along corridors, much like pearls on a string. Ideally, major developments such as office clusters and residential towers anchor the ends of a line. Concentrations of both residential and employment land-uses are essential if balanced flows are to be achieved. Cities like Stockholm, Copenhagen, and Toronto have such built environments and, as a result, boast world-class transit systems (Holmgren, 1966; Dunn, 1981; Goldsack, 1982; Pill, 1983; Smith, 1984; Downey, 1985). At the other extreme, in low-density, decentralized environments, the automobile has few competitors. Areas like Los Angeles, Phoenix, and Orange County (California and Florida) are testaments to this.

Clearly, there are fundamental lifestyle trade-offs associated with one built form versus another. While Stockholm's Tunnelbana transit line conserves energy, reduces pollution, and equalizes the opportunity of everyone to travel, it has given rise to a dense, mixed-use urban form that restricts the ability of families to live in single dwelling units and own cars. Thus, despite the high standard-of-living that most Stockholmers enjoy, a transit-oriented city has meant restraints to personal freedoms (Thomson, 1978). The automobile city, on the other hand, maximizes personal freedom (Schaeffer and Sclar, 1980). Surveys show that 95 percent of Americans prefer living in single-family homes

(Altshuler, 1981). As Elasar (1966) noted, most Americans want to combine as much of a rural lifestyle as possible with their urban occupational roles -- they want to live like farmers but earn the wages of stockbrokers. Under a free market, pluralist system, such lifestyle preferences have not surprisingly produced low-density, auto-reliant urban forms.

Thus, the notion of planning for a transit-oriented Stockholm-like city, an auto-oriented Phoenix-like city, or whatever, is subsumed by the larger cultural question of lifestyle preferences. Given the opportunity, most Americans vote with their feet and opt for low-density living. Of course, society at-large bears the cost of such choices in the form of air pollution, energy depletion, and traffic snarls. The first-best solution would be to price low-density living in the form of higher property taxes, fuel taxes, and congestion fees. Set high enough, such surcharges would certainly bring about the kinds of densities and mixed-use environments that would support mass transit. It is not coincidence that where fuel prices are over \$3 per gallon, such as in most of Europe, transit modal splits tend to be four to five times higher than those found in comparable-size American cities (Pucher, 1988). Because of equity concerns and political inertia, congestion charges and "sprawl" taxes have failed to materialize in the U.S. This, then, leaves land-use practices as more or less a second-best solution to the problem. If they cannot price sprawl and congestion, then planners need to begin focusing on various regulatory, zoning, and design tools and incentives that might shape the kinds of built environments that are consonant with high levels of mobility.

The time is ripe for rejuvenating joint transportation/land use planning. Numerous economic and demographic changes -- the growth in service industries, the feminization of the work force, shrinking household sizes -- are dramatically changing the landscape of America and, accordingly, travel behavior. All are macro-forces, or "megatrends", that planners have little influence over (Fisher, 1984). Such is not the case with land use planning. Through the plan review and permitting process, land development is the one area where planners have some degree of leverage over. Obviously, planners cannot directly influence how many cars families buy or household sizes; they can, however, influence what is built, at what density, and at what location. Planners must seize the opportunity to shape land development while powerful macro-changes continue to unfold. Otherwise, in the era of LULUs (locally unwanted land uses) and NIMBYs (not in my backyard), growth moratoria are apt to be the principle land use tools in dealing with such nuisances as traffic congestion. All too often, post-hoc responses like growth controls exacerbate the very problem by pushing new development farther out on the urban fringes and driving up the cost of housing. As long as congestion fees and sprawl taxes remain taboo, closer coordination of land use and transportation is the next best antidote.

In this paper, I initially explore the connection between current development patterns and transportation problems. Next, four land use strategies are discussed that could enhance future mobility -- densification, mixed-use development, jobs-housing balance, and pedestrian-friendly site designs. Last, I discuss some of the harsh realities of why it is difficult to coordinate transportation and land use planning and how we might overcome built-in resistance.

THE NEW FACE OF TRAFFIC CONGESTION

What is so alarming about traffic congestion in recent years is its pervasiveness -- it seems to affect all Americans to some degree. Spatially, it is no longer confined to downtowns; temporally it is no longer limited to 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Statistics abound on the problem. The California Transportation Commission (1987) estimates that traffic congestion results in 75 million lost hours annually with the state - the equivalent of 8,000 Californians spending an entire year in a freeway standstill. On the other side of the continent, average speeds on Washington's beltway dropped from 54 mph to 45 mph between 1982 and 1987 (Kirby, 1989). Perhaps the growing frustration over traffic is best reflected by public opinion polls; residents of San Diego, Washington, Houston, Phoenix, San Jose, and dozens of other cities have repeatedly cited congestion as the worst problem facing their regions in recent years.

The costs of traffic congestion are indeed mounting, not only in the way of lost leisure time, but also in terms of increased day-to-day stress, declining worker productivity, and a deteriorating quality of life. Consider the plight of more and more two wage-earner households today. Each parent has jobs in a different part of the region, thus each drives to work. At 6:45 a.m., they bid farewell. The wife swings by the child care center on the way to work (since there isn't one at her work place), while the husband drives the older child to private school. At work, the wife uses the car to keep a lunchtime appointment, since the office park has no restaurants within walking distance. The husband needs his car to get to the bank near the shopping mall. On the way home, the wife swings by school and the child care center to pick up both children and then proceeds to fight 50 minutes of traffic. The husband stops by the supermarket before heading home. Finally, at 7:30 p.m. after more than twelve hours at work and on the road, the family gathers around the table for dinner and some "quality time". Invariably, someone is in a foul mood and begins to blame their hectic life on the traffic. In actuality, it is the land-use pattern of their community, shaped by theirs' and others' lifestyle preferences, which forces them to rely on the automobile and spend so much time on freeways. Traffic is simply the most visible manifestation of their community's land-use arrangements.

Today, some of the worst traffic conditions are found in the suburbs (Cervero, 1984; Orski, 1985; Cervero, 1989A). By and large, the suburbanization of congestion has paralleled the suburbanization of jobs. Because of cheaper land, closer access to workers, telecommunication advances, and other factors, corporate America has moved en masse to the suburbs in recent years (Office of Technology Assessment, 1988). Currently, over 60 percent of all office floor space in the U.S. is outside of downtown cores (Cervero, 1989A). In metropolitan Phoenix and Houston, the share exceeds 80 percent (Urban Land Institute, 1988). One outcome of this trend has been a dramatic increase in suburb-to-suburb commuting, which makes up over one-half of all journeys to work in U.S. metropolitan areas today (Cervero, 1989A). Increasingly, the "desire line"

maps of today look like tens of thousands of pick-up sticks dropped on the floor -- like Brownian motion, trips flow from everywhere to everywhere. This poses a fundamental mismatch problem, the first of several discussed in this paper. Increasingly, there is a mismatch between the geography of commuting and the geometry of regional highway networks. Spatially, while most commuters want to make lateral and criss-cross trips, most road networks were designed to funnel commuters downtown along radial links. Consequently, more and more commuters are forced onto secondary roads and distributors that were never designed or oriented to accommodate large volumes of cross-haul trips. The suburbs, of course, are not mass transit's natural habitat. In 1980, only 1.6 percent of all journeys-to-work made within suburbs were via bus transit (Fulton, P., 1986). Clearly, changing travel patterns, combined with what some might call functionally obsolete roadway networks, are giving rise to unprecedented levels of suburban congestion. Surely other factors bear some of the blame as well -- the slow down in new highway investments, demographic trends that result in higher trip-making rates per capita; e.g., more working women, maturation of "baby boomers", the lack of affordable housing near employment centers, among others. Still, the emergence of suburbs as the dominant work place lies at the heart of changing regional commute patterns and, because of our inability to respond by building adequate highways, worsening suburban congestion.

TYPES OF SUBURBAN WORK PLACES

Land-use initiatives that will yield the highest mobility dividends in coming years will be those that affect the suburban work place of tomorrow. Many of today's mobility problems can be directly traced to the built environment of today's work place. In general, three main types of suburban work environments have emerged in recent years, each one of which suggests a different set of remedial land-use policy responses.

One type of suburban work place is the business park. These are highly controlled, master planned environments, typically with coordinated building designs, a campus-like setting, and attractive landscaping. The hallmarks of business parks are:

1. Extremely low employment densities, often at a fraction of those found in most downtowns;
2. A single predominant land use normally with 90 percent or more of all floor space devoted to offices; and
3. Abundant, free surface parking, zoned normally at more than one space per worker (which no double becomes a self-fulfilling prophecy -- given a free parking slot, most suburban workers solo commute).

With suburban parking lots averaging 350 square feet per space (include aisles and driveways) and with roughly four spaces provided per 1,000 gross square feet of floor space, there is usually around 1,400 square feet of parking for every 1,000 square feet of building space. This means surface parking typically consumes 40 percent more land than the footprint of buildings. To pedestrians, such a built environment usually creates annoyingly long walking distances.

By design, most business parks openly invite single-occupant auto-commuting, earning them such monikers as "pedestrian hostile" environments among critics. Moreover, while traffic flows freely, once inside business parks, connecting roads are frequently jammed several miles upstream and downstream. Quite often, business parks with the best on-site circulation have the worst off-site congestion (Cervero, 1989A).

At the other extreme is a second type of suburban work place, varyingly referred to as suburban downtowns, megacenters, and urban villages. These tend to be clusters of office and commercial developments that resemble the downtowns of many medium-sized cities in both scale and density (Orski, 1986). Tyson's Corner in the Virginia suburbs of Washington, D.C. and Las Colinas west of downtown Dallas are oft-cited examples. While traditional downtowns have evolved gradually, allowing a build-up of road improvements over time, many suburban downtowns have witnessed the addition of five or so million square feet of new office-commercial floor space in as few as three years. All too often, these "instant" downtowns have produced "instant congestion". Not surprisingly, it is around suburban downtowns where residents have been most vocal in their opposition to rapid growth, such as in Walnut Creek, a suburb of San Francisco, where citizens passed a no-growth referendum several years ago in response to worsening congestion near several mid-rise office towers that were constructed around a BART rail transit station.

Perhaps the most common form of suburban commercial development is the "strip", ranging from "auto rows" and "fast food alleys" to "silicon strips", the latter referring to the assemblage of high-tech corridors such as along Route 1 near Princeton, New Jersey or the Kate Freeway, west of Houston (Fulton, W., 1986). As a work environment, strips normally consist of independent office buildings that are aligned along axial roadways intermixed with an alphabet soup of retail plazas, hotels, theater triplexes, restaurants, and other uses. While the affect of any one building on traffic flows tends to be modest, the cumulative impacts of numerous autonomous, unrelated projects have frequently clogged the "strip" and roads leading to it. It is along such strips where coordinated site designs could yield high mobility dividends.

LAND-USE STRATEGIES FOR PRESERVING MOBILITY

In this section, four land use initiatives that offer promise for enhancing mobility in coming years are discussed: (1) Densification; (2) Mixed-use development; (3) Jobs-housing balance; and (4) Pedestrian-friendly site designs.

Densification

Most suburban work places in the U.S. are being built at floor area ratios (FARs) of around 0.3 to 0.4 -- that is, total floor space comprises around 30 to 40 percent of total land area (Cervero, 1986; 1989). In general, such densities are intrinsically dysfunctional from a transportation standpoint. They are generally too low to support viable mass transit services, yet high enough to cause congestion problems along connecting roads (Orski, 1988). Studies show that moderate levels of transit service which could achieve mode splits in the 15 to 20 percent range can be supported at densities of 50 workers per acre or more (Pushkarev and Zupan, 1977; Seattle Metro, 1987). This generally corresponds to FARs of 2.0 and above. My own research shows that density is the single most important land use factor affecting mode choice in the suburbs (Cervero, 1989A). Two of the densest suburban work places in the U.S. -- Bellevue, Washington and Uptown (Post Oak), Texas -- testify to this point. Bellevue averages an office FAR of around 7.5. Presently, around 27 percent of its workers arrive to work by bus, carpool, or vanpool (Cervero, 1989A). Density alone, however, has not produced these mode splits. Bellevue has also placed an unprecedented cap on parking of two spaces per 1,000 square feet of building area and is also a major transit center with Seattle Metro's pioneering regional timed-transfer bus network. Uptown, some six miles west of downtown Houston, averages an office FAR of around 5. Presently, 22 percent of its work force carpools or vanpools each weekday. In addition to the Uptown area's unusual high-rise profile, the Houston region's extensive network of reserved High Occupancy Vehicle (HOV) lanes has encouraged many workers to share rides. In both cases, the lesson appears to be that densification of suburban work places works the best when combined with other programs -- in the case of Bellevue, constraints are placed on auto usage through parking caps, while in Houston, high-quality vanpool services are available to many suburban workers.

In addition, density must be achieved at both ends of the commute trip -- the residential as well as the employment ends -- if reasonably high shares of non-auto commuting are to be achieved in suburbia. In Scandinavian cities like Stockholm and Copenhagen, where as many as two-thirds of suburban workers arrive to work by some means other than the private automobile, high transit ridership stems partly from the fact that high-rise towers house both residents and workers throughout the region (Thomson, 1978; Goldsack, 1982). The placement of high-rise suburban apartment towers within walking distance of Toronto's transit line has likewise been a key to its success (Pill, 1983). By contrast, one of the chief reasons why fewer than five percent of those who work at offices near suburban rail stations in greater Washington, D.C. and the San Francisco Bay Area patronize transit is because lines do not go anywhere close to where most live (Gannon and Dear, 1975; Webber, 1976, Baker, 1983). Indeed, one of the major disappointments of recent-generation rail systems in the U.S. has been their inability to shape suburban growth in general and ignite new apartment construction around station areas in specific.

Zoning is the standard tool for increasing employment and residential densities. Of course, a market demand must exist as well. Congestion pricing (such as tolls and impact fees) and sprawl taxes would no doubt increase the demand for denser work places and apartments. Typically, impact fees and exactions charge developers of dense projects the most. While such projects often worsen traffic conditions on roads immediate to a site, in principle, they could be expected to exert less pressure on the regional network than a lower density project with comparable numbers of workers who exclusively drive to work. To the extent denser projects encourage transit commuting and ridesharing, the regional highway network will be better off. Thus, while a local impact fee program might charge developers of dense projects more, regional impact fee programs, if they existed, would ideally charge them less. Thus, herein lies a second mismatch -- a mismatch between the level at which land is controlled and impact fees are charged (the local level) and the level at which the overall traffic effects of projects are felt (the regional level). Clearly, if we were smarter in how we charged impact fees, denser living and working environments would emerge. Besides zoning, such land-use tools as transfer development rights (TDRs) and joint public-private development would also increase average densities.

Mixed-Use Developments

The commingling of offices, shops, restaurants, banks, and other activities in America's suburbs would likewise help ease congestion. Mixed-use, it should be noted, is not the same as multi-use. Indeed, most highway strips feature multiple uses. Mixed-use relates more to the idea of commingling -- placing compatible activities side-by-side so that they mutually benefit from one another, such as creating a pleasant pedestrian milieu or allowing the sharing of parking spaces. While in the industrial era there was a logic to separating shops, homes, and other uses from smokestacks, rendering plants, and the like, in today's environment of clean, non-polluting offices, the rationale for segregating suburban activities by miles of arterial is less clear. Traditional zoning should be "turned on its head" to encourage the integration rather than segregation of uses. Today, suburbia's biggest nuisance seems to be traffic congestion, suggesting that if zoning is to play its nuisance-reducing role, it should promote fusion rather than exclusion.

In suburbia, mixed-use developments would yield a number of tangible benefits (Cervero, 1988):

1. Walk trips would increase. More trips would be internalized within a compound (i.e., on-site rather than off-site). Thus, what otherwise might be a midday auto trip to a bank becomes a midday stroll a block away, or perhaps a simple elevator ride to the ground-level bank within the comforts of one's own office building.

2. Trip-making would be more evenly distributed throughout the day and week. With 90 or more percent of floor space limited to office uses, the majority of trips often occur from 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m., Monday through Friday. With a mixture of shops, restaurants, offices, and ancillary uses, trips are spread more evenly throughout the day and week. Thus, mixed uses reduce peaking and make fuller use of the roadway capacity already in place.
3. Shared-use parking is possible. When offices, shops, and theaters are side-by-side, parking spaces can be shared since the peak parking demands for these uses fall at different times. The same parking facility used by office workers from 8:00 to 5:00 Mondays through Fridays can serve restaurant and movie-goers during the evening and on weekends. Share parking, moreover, can shrink the scale of many suburban parking lots by as much as 20 percent, leading to a more compact, pedestrian-friendly built environment (Barton-Aschman, Inc., 1983; Cervero, 1989A).
4. Workers are more likely to share rides. One of the major deterrents to carpooling and vanpooling in many business parks is the fear of being stranded without a car. In these settings, a car becomes absolutely essential for meeting a colleague at a restaurant during the noon hour or running personal errands. In downtowns, office workers can patronize transit and still be accessible to many activities. In most suburban work environments, such is not the case. Thus, mixed uses not only cut down on midday motorized traffic, they induce workers to commute in some manner other than the drive-alone automobile as well, thus relieving peak period congestion.

My own research found that every 20 percent increase in the share of floor space that is devoted to retail and commercial uses in suburban office developments is associated with a 4.5 percent increase in the share of trips by carpool, vanpool, and transit (Cervero, 1989). Although this evidence is based on data which measure the short-term impacts of land-use mixing, the figures nonetheless suggest that there is a reasonable degree of elasticity between land-use planning and commuting choices in America's suburbs.

Tools which can promote land-use mixing in suburbia include inclusionary zoning, conditional use zoning, and various financial incentives, such as the granting of credits against impact fee obligations (since in principle mixed-use developments reduce the need for additional road capacity). As practiced in suburbia today, traditional zoning is largely counterproductive from a mobility standpoint. One might even argue that no zoning would be preferable to the exclusionary practices that characterize suburbia. Witness zoningless Houston, Texas, the city with perhaps the most mixed-use suburban environment in the U.S. (Hazlett, 1983; Cervero, 1989A).

Jobs-Housing Balance

Most urbanized regions around the country suffer a jobs-housing imbalance. This discordance between job and housing growth has perhaps been the most crippling of all mismatches in terms of mobility. Santa Clara County, California, home of the Silicon Valley, is a classic example of jobs-housing imbalance. Most communities at the northern end of the county, like Santa Clara and Cupertino, have jobs-to-housing ratios in the 2 to 4 ranges. Towns at the southern end of the county, on the other hand, are veritable bedroom communities, averaging four to five times as many homes as jobs (Cervero, 1989B). Partly because of these mismatches, Santa Clara County experiences more hours of delay per capita than any county in the Bay Area, including San Francisco (Cervero, 1989A).

Evidence suggests that more American's are finding it difficult to reside in the community where they work than ever before. In 1968, 36 percent of all Arlington, Virginia workers resided within the community; by 1988, the share had fallen to 19 percent (Wickstrom, 1989). A host of factors, such as rising housing costs, fiscal zoning, and the increase in dual wage-earner households, are reducing the opportunities of more and more American's to reside as close to their work place as they would like (Cervero, 1989B). Besides shortening trips and encouraging both cycling and walking, jobs-housing balance would reduce the clashes between through and local traffic. Traffic patterns generally represent scores of overlapping commuter sheds between homes and major work centers. To the extent commuter sheds can be shrunk through jobs-housing balance, and thus the amount of overlap reduced, congestion would decline.

Jobs-housing balance does not mean the ushering in of an era of cottage industries, apartments above shops, or live-work neighborhoods. Rather, the spirit of jobs-housing balancing is to provide opportunities to live reasonable close to work places for those who would like to by breaking down exclusionary barriers. Among the tools available to planners for doing so are: inclusionary zoning; office-housing linkage programs (such as currently practiced in San Francisco, Boston, and Orange County, California); growth phasing; and regional initiatives, such as tax-base sharing and the enforcement of various fair-share housing and anti-discrimination laws. Both New Jersey and Minnesota have passed authorizing legislation which encourages regional jobs-housing balance through such fair-share programs. In California and Florida, moreover, state infrastructure funds are tied to coordinated transportation and land-use planning. Incentive strategies can also be adopted. Bellevue, Washington, for instance, allows developers to increase their office floor space by four square feet for every one square foot of housing built in the central core. Additionally, impact fee credits can be granted to office developers who provide either on-site or near-site housing opportunities.

Site Planning and Design Practices

More pedestrian-friendly work environments could attract large numbers of suburban employees to vanpools, carpools, and transit. The idea is less one of encouraging people to work or cycle to work and more one of creating the kind of pedestrian environment where workers no longer mind giving up their cars. At the extreme, workers might even prefer to vanpool if pedestrians are given clear priority over motorists. Design treatments that would make working and cycling more pleasurable include: narrowing building setbacks; placing parking at the rear of buildings; providing sidewalks and trail paths with attractive landscaping and visually interesting surroundings (which might very well include adding mixed-use activities); providing on-site shower and locker facilities for cyclists; and reducing parking. Transit-friendly designs likewise are needed, involving such practices as: providing front door loading/drop-off zones; avoiding branch roads and cul-de-sacs which require buses to retrace their tracks; and placing sheltered bus stops near building complexes. From a design standpoint, all of these treatments aim to create "a level playing field" in the sense of providing non-motorists with the same levels of convenience enjoyed by motorists.

At least three west coast transit agencies have prepared reports that promote specific sets of design criteria. Metro in Seattle, AC Transit in Oakland, California, and the Orange County Transit District in Southern California all have guidelines that are aggressively promoted whenever new developments are proposed within their respective districts (Institute of Traffic Engineers, 1989). Normally, staff planners meet with developers to encourage the adoption of design standards which accommodate buses on-site when plans are being reviewed.

Of course, many of the regulatory and incentive tools previously discussed would also promote pedestrian-oriented designs, such as the granting of density bonuses or constraints on parking. Indeed, all of the land-use initiatives discussed in this section are mutually reinforcing. Higher densities invite more mixed-use development and create pedestrian-friendly environments. Jobs-housing balance and improved working conditions are likewise consonant. Accordingly, any particular strategy -- be it densification or jobs-housing balance -- stand the greatest chance for success, both politically and economically, to the extent that it is packaged with other compatible land-use measures.

Overcoming Resistance

Considerable resistance stands in the way of implementing many of the ideas espoused in this essay. Gridlock within our institutions and political systems is every bit as imposing as gridlock on our streets.

In this section, a number of factors which impede the ability to coordinate land use and transportation planning are discussed. Possible approaches to overcoming these barriers are also addressed.

1. Institutional mismatches for dealing with the problem. Almost universally, land-use planning is the prerogative of local governments. Yet the traffic impacts of municipal land-use decisions are felt regionally. One can no more plan for transportation on a local basis than air quality. Like pollution, transportation transcends jurisdictional boundaries. As a consequence, most transportation planning is carried out by state agencies or regional planning authorities. Thus, there is a fundamental mismatch between the levels of government where land use decisions are made and where transportation planning is conducted. By and large, land use and transportation planning are carried out as separate functions. Because of the competitive, self-survival instincts of most institutions, each with separate boards, bureaus, and budgets, coordination is inherently difficult. The mismatch is even found within the transportation sector itself. Normally, the lion's share of public investment in highways is planning and programmed by state departments whereas mass transit falls within the purview of special-purpose regional authorities.

Deakin (1987) argues that even the professional orientation of state and local staffers are vastly different. State Department of Highways tend to be dominated by engineers whereas local planning offices are staffed primarily by social scientists. Basic differences in how these disciplines look at the world make coordination difficult. Quite often, local and state officials view each other as competitors. Local planners frequently treat suburban freeways as "Main Streets", allowing new development near interchanges to the point where traffic overwhelms capacity. All too often, the amount of development permitted under local land use plans is inconsistent with state planned highway capacity (Deakin, 1987). Even implementation mechanisms differ fundamentally at the local and state levels. Land use changes often occur through a series of amendments, rezonings, and approved variances. Thus, land uses evolve gradually in an ad hoc fashion. Once a transportation project enters a Five-Year Capital Improvements Program, however, it is usually there to stay, regardless of what land use changes have occurred. Thus, highway projects that are already programmed rarely adjust to land use changes.

Currently, then, localities play a limited role in guiding transportation development. And larger levels of government play a limited role in guiding land-use development. In general, pressure to coordinate land-use and transportation must come from the top -- in the form of clubs, not sticks. In the case of the few states where some degree of coordinated planning is taking place, notably Florida and New Jersey, it took strong leadership and legislative mandates at the state level to start the momentum. By linking state aid and infrastructure funds to coordinated planning and by enforcing federal laws regarding environmental protection and anti-housing discrimination, these and other states are beginning to force a structure of coordinated planning upon localities, regional agencies, and their own state bureaus. The challenge is to build regional coalitions of the type where it is in the interest of local elected officials to think regionally as much as locally. Peremptory regulations and requirements appear necessary to start the process.

2. Land-use planning should guide transportation. Regions should be devising land-use plans that reflect the kinds of built and natural environments residents want to live in. In response, transportation should be designed to accommodate and support planned growth. Again, we consume transport not for its own sake, but rather to access places. Thus, it is places that matter. All too often, regional planning authorities get this backwards. Lured by federal and state capital subsidies, dozens of metropolitan areas around the country have plans to build fixed-guideway rail systems. In many of these cases, efforts are made to adapt land-use plans so they are consistent with rail investments. Transportation should be serving land-use, not vice versa.

Besides the fact that there is more federal funding support, one reason why transportation planning dominates land-use planning is that it is easier to build consensus around the former. Developing a comprehensive, long-range land-use plan is painstakingly difficult in any pluralistic system. While some urbanites prefer dense, mixed-use environments, other value rural-like settings. In the absence of any unitary public interest, comprehensive planning has been supplanted by the marketplace in mediating the lifestyle preferences of Americans. Thus, while it is possible to develop a regional transportation plan, given current institutional arrangements, it is next to impossible to develop a detailed regional land use plan. Thus, almost by default, transportation guides land-use. For better or worse, our democratic, free market approach places the transportation cart before the land-use horse.

3. Political competition impedes regional land use planning. Local competition for tax base has generally thwarted efforts to coordinate land use and transportation. The fiscalization of zoning has fractured the land use patterns of numerous regions around the country (Rolleston, 1987; Cervero, 1989B). Zoning for office and commercial development at the expense of housing worsens the jobs-housing gap and consequently, traffic conditions. Left to fend for themselves because of federal and state cuts in local programs, municipalities are continually vying for attractive land developments. As long as such competition exists, few inroads will be made in linking land use and transportation. Should a particular municipality behave responsibly and revamp its zoning to allow dense, mixed-use work environments, a neighboring jurisdiction is likely to exploit the situation by allowing more highway-oriented development than it otherwise would have -- a classic tragedy of the commons. Short of regional governance, perhaps the most effective way of lessening fiscal competition would be through tax-base sharing, such as currently practiced in the Minneapolis-St. Paul region. Clearly, any successful joint land use/transportation planning effort will hinge on finding ways of moderating the competitive and parochial instincts of local governments.

4. Land use initiatives are long term propositions. The benefits of coordinated land use planning are typically not enjoyed until five to ten years in the future, or even longer. Thus, land use planning is inherently at odds with a political system that demands short-term payoffs. Naturally, local elected officials are going to be more interested in a road project built within the next two years than some jobs-housing balance initiative that might yield mobility dividends five or more years after they leave office. This suggests that long-use strategies which offer more near-term benefits should be emphasized. Longer term strategies should aim to provide a consistent set of policy guides and avoid unnecessary costs in the future, such as by protecting rights-of-way far in advance of need. Additionally, institutional reforms are needed that reward politicians for thinking beyond the two to four year periods in which they are re-elected.

5. NIMBYs and LULUs. Many of the land use initiatives discussed in this essay are eschewed by Americans. Most suburbanites disdain higher densities and mixed-use living environments, fearing their neighborhoods will be tarnished and their property values will

plummet if such changes are allowed. As long as society at large subsidizes low-density, auto-reliant living, such attitudes will prevail. In an era of NIMBYisms and LULUisms, any measures which threaten to change traditional suburban living are apt to be squashed, either politically, through the courts, or via the ballot box.

Besides congestion charges and sprawl taxes, the idea of higher density, mixed-use suburban living could profit from better marketing. Balanced suburban growth need not mean three-story apartments abutting mid-rise office towers. Through the careful layering of densities and the juxtaposition of compatible uses, in tandem with some attention to landscaping, attractive and moderately dense mixed-use suburban environments can be created (Bookout and Wentling, 1988). There is a dire need for better examples of dense, mixed-use suburban environments of a high quality. This is an area where federal demonstration grants might be worthwhile investments.

Closing

One of the saving graces of traffic congestion is that it is self-regulating. This is perhaps best supported by the fact that the average journey-to-work travel time in U.S. metropolitan areas has remained more or less constant since the 1950 census -- in the range of 20 to 22 minutes each way (Pisarski, 1987). This suggests that there is a window of acceptable commuting times for most urban Americans. To the extent that average commuting speeds slow down and longer travel times are incurred, structural changes begin to occur -- often in the form of locational changes. Those with the least tolerance for congestion either move closer to their work places, switch jobs, or, at the extreme, move to a less crowded region. Where people relocate, so do businesses. Congestion also stimulates telecommunications advances, allowing increasing numbers of Americans to work at home or at neighborhood job centers. In general, such market-driven responses are likely to continue to shape metropolitan growth over the long term more than any concerted regional planning effort, barring the introduction of major institutional and pricing reforms.

One market-driven response has been the trend toward increased densities and the addition of mixed-use projects at some of the nation's more established suburban office centers. The Denver Technological Center east of downtown Denver is a classic example. Because of market pressures, its FARs have increased by a factor of eight and its share of total floor space devoted to offices has fallen from 90 percent to around 64 percent since 1970 (Galehouse, 1984; Cervero, 1986). Clearly, suburban environments are malleable. One of our challenges is to capitalize on the demonstrated ability of suburban work places to adapt and evolve.

In close, the coordination of transportation and land use efforts will be pivotal to good planning practice in the 1990s, perhaps more so than any time over the past several decades. The obstacles are considerable, but given the political will, some foresight, inventive planning, and, of course, money, the rewards can be considerable as well.

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SUMMARY OF REMARKS TO THE MISSISSIPPI VALLEY STANDING COMMITTEE ON PLANNING

**Professor Michael Meyer
Georgia Institute of Technology**

I have been asked to identify the key issues that transportation planners will likely face in the 21st century. This "issue scanning" is often portrayed as a process of anticipating the problems that might occur at some future date and to then assess alternative strategies for dealing with these problems. Although the identification of problems is certainly an important component of developing a strategic perspective of the future, I think we should also view these issues as possible opportunities for improving the position of transportation viz a viz the rest of the world. With this in mind, let us now turn to the issues.

I think it is useful to divide these issues into three categories relating to policy, planning, and methodology. State planning directors need to deal with all three, and yet each will require a different perspective regarding managerial oversight and resource allocation.

Policy Issues

Twenty years from now many of the policy issues facing state managers will be the same as those we face today. In several cases, they will either be more or less important depending on what happens in the interim. It seems clear to me though that there is one policy trend that will become even more pronounced - the political justification for program investment in transportation will be increasingly tied to non-transportation issues. By this I mean that those who provide the funds for building, operating, and maintaining our transportation systems (legislators or even the voters themselves) will be making their decisions based on the perceived benefits of such investment to society (e.g., enhanced economic development or improved quality of life). I suspect that the more successful of us in the year 2000 will be those who have drawn this linkage.

The key state transportation policy issues at the turn of the century will certainly include the following:

- **Safety** - My guess is that society will be focussing greater attention to safety both in the design of vehicles and in the design, operation, and regulation of facilities. In particular, this will be a concern in those areas where new facilities (roads, airports, etc.) will not be built. As the existing systems thus become more saturated, system users are likely to demand more from the use of the transportation system. This will be especially true for air travel, but safety considerations will also play an increasingly more important role in the justification of highway investment.
- **Economic Development** - The role of transportation in enhancing and promoting economic development will continue to be an important issue. This concern will not only be associated with major metropolitan areas, but also with smaller and medium-sized urban areas enjoying their share of a state's economic growth. Transportation investment will likely be increasingly evaluated on the basis of economic development potential and number of jobs created.
- **Economic Productivity** - With the economic world changing, (i.e., new Europe and continued economic challenges from the Pacific nations), national and state leaders will focus on those factors that influence U.S. competitiveness. One of these factors will be transportation, both the movement of resources to the manufacturing location and of the finished goods to the world market. In particular, the lost time and productivity that occurs at intermodal transfer points (e.g., ports and airports) will be of great concern.
- **Environmental Quality** - Public opinion polls consistently show strong support for efforts to preserve our natural environment. Last year's economic summit of world leaders spent a large amount of time addressing these types of issues. This summit is just a reflection of the underlying environmental concerns which are found in much of the western world. In the U.S., two environmental issues -- enhanced air quality and preservation of wetland -- will still be important concerns to state transportation officials 10 years from now.
- **Urban Form** - The results of the 1990 Census will show some interesting trends, and continuation of past trends, that are typical of U.S. metropolitan areas. There will likely be continued evidence of suburbanization in most metropolitan areas, although I suspect there will also be evidence to suggest that denser urban-type environments are being created in the suburbs and that many urban areas are experiencing population increases within the central city limits. How to serve these centers with reasonable levels of transportation service while also providing necessary services for the growth areas on the urban fringe will be a challenge facing many states. The appropriate use of state transportation investment or of other state powers (e.g., driveway permits) to influence development problems to achieve some "desirable" urban form could potentially be an important issue to 21st century state transportation officials.

- **Equity** - There are two types of equity issues that will be of some concern -- equitable distribution of state resources among subregions in a state, and how to provide social and economic equity to those (primarily in the center city) who have not benefited from economic growth. This will be of great interest in the continuing debate on the appropriate role for public transportation in metropolitan areas, and on the state role in providing such service.
- **Quality of Life** - Many of the above issues (e.g., environmental quality) can be considered part of quality of life. However, quality of life means different things to different people and is often used in its own right as a justification for investment of public funds and for individual life style behavior. Transportation, and in particular ease of transportation, is considered by many as an important component of quality of life.

Note that I have not said anything about two issues that are usually thought of as critical problems -- congestion and finance. I did not identify them purposely as separate topics because both are part of the problem definition and possible solutions of most of the issues identified above. Providing mobility (or in today's terms, not providing mobility at perceived reasonable levels of service, i.e., congestion) clearly relates to such issues as economic development, economic productivity, environmental quality, equity, and urban form. Finance, and the respective roles of the public and private sectors, is critical to doing anything with transportation. Both will be issues of concern in the future.

Planning Issues

The policy concerns described above provide some useful directions on identifying future planning issues. The following list is not intended to be all-inclusive and certainly should not be considered as being in any order of significance. However, given some of the above policy issues, the corresponding planning issues are likely to be the following:

- **Growth Management:** How should governments try to influence the intensity, location and timing of growth? Who should pay what for the necessary services to support such growth?
- **Access Management:** How can state DOT's use their authority over access to state highways to preserve highway operational capacity? How can access management techniques be used in combination with growth management strategies to provide an effective growth management program?

- **Facility/System Condition:** How should we monitor and rehabilitate transportation facilities? In particular, how are we going to provide the necessary resources to rehabilitate our fixed plant in transit, an issue that will likely surface in the near future?
- **Funding:** How are we going to obtain adequate planning funds (PL and HPR) to do all the planning that is necessary?
- **Multiple Objectives:** Given the importance of non-transportation purposes in investment decisions, how should such purposes be included in program/project analysis and evaluation? For example, the institutional structure for air quality and transportation planning in most areas is currently not conducive to a coordinated planning process. How should the planning process be modified, or the institutional structure changed, to allow for a better linkage?
- **Ageing Society:** How are we going to deal with a rapidly aging society and all that means for the design and operation of transportation systems. These issues range from licensing requirements to physical design of the facility.
- **Operations Focus:** How do we provide a closer linkage between planning and operations (e.g., traffic engineering or incident management/surveillance)?
- **Goods Movement:** How do we better incorporate goods movement into our planning procedures? Importantly, how do we involve the private sector in the planning process?
- **Vehicle Segregation:** How do we provide segregation of vehicle types and trips in our system designs and operations? For example, how would we provide truck-only roads in our metropolitan areas? Or how could we segregate through trips from local trips?
- **Intermodal Planning:** How can we more effectively provide for intermodal movement of people and goods? Similar to vehicle segregation, this issue has both a design and an operations component.
- **Mobility Planning:** How do we provide a multimodal perspective to planning and investment decisions? How do we look at non-work trips and their importance to system effectiveness? Mobility for whom? How do we look at different parts of the transportation system, e.g., major arterials, and determine from an overall tripmaking perspective what role they have in the system.

- **Relationship to Programming:** Given the importance of linking transportation investment to other policy objectives, how do we incorporate these concerns into project prioritization and programming? For example, how do we quantify, in a realistic sense, the economic development benefits of highway investments?
- **New Facilities Planning:** In some areas, new transportation facilities will be built. Have we learned anything from the past on how to plan and construct these facilities?
- **Technology:** What impact will advances in technology have on the way transportation systems operate and are used? Of interest is not only transportation system technologies (i.e., "smart" highways and cars) but also the so-called substitute technologies (i.e., telecommunications).

These planning issues are clearly not the only ones that will face future state transportation planners. However, they should provide you with a point of departure in your own discussions of what planning issues you will likely face.

Methodology Issues

The planning issues identified above suggest several areas of methodological development that will be of concern to state officials ten years hence. Again, those areas listed below are not intended to be all-inclusive, but rather a suggestion of what future state planners will be facing.

- **Data Collection:** The ability of planning to provide useful input into policy decisions depends to a large extent on the existence of good data. Many of our current transportation data bases are nothing more than sample-based updates of origin-destination studies of the 1960's and 1970's. I suspect that we will become to rely more and more on the U.S. Census for our data, especially now that such data will be provided in the geocoded format of TIGER files. Even with this data, however, I foresee many of us looking at very expensive requests for data collection, either from regional or local agencies or from your own staffs. My guess is that many of these requests will be valid and worthwhile endeavors, and that we will all be hardpressed to find the resources necessary to fulfill them.
- **Geographic Information Systems:** Geographic Information Systems (GIS) will be to the 1990's what microcomputers were to the 1980's. These type of systems, especially in connection with the census TIGER files, will heavily influence the way we do analysis. In particular, those systems which provide user friendly graphics capabilities will give analysts unprecedented capability to illustrate problem solutions in a manner easily conveyed to decision-makers. There will be a proliferation of GIS-based transportation software in the beginning of the 1990's,

corresponding not surprisingly with the release of the 1990 census data. You should be looking at your own operations now to see where GIS could aid in your analysis and evaluation.

- **Evaluation Measures:** The benefits of transportation improvements are often measured in three major categories - savings in travel time, reduction in the number of accidents and decreased vehicle operating costs. There is likely to be increased attention in the next ten years on how one measures these benefits. In particular, the value of time savings and the value of human life saved will be examined and re-examined many times, simply because of their important contribution to the benefits estimate in the benefit cost calculus associated with specific improvements. In addition, and perhaps of greater difficulty, planners will be concerned with the quantitative and monetary estimate of non-transportation benefits. For example, how does one include economic development benefits in the benefit-cost estimates for projects? And, alternatively, how does one incorporate into evaluation the non-monetary estimates associated with such things as equity?
- **Database Management:** With limited resources devoted to data collection, it seems likely that there will be greater attention given to integrated data bases for states and metropolitan areas that can serve many organizational users. This coordinated data management will be spurred on by the Census TIGER files and the corresponding increased use of GIS. One integrated, geo-coded database could serve the planning, design, maintenance, and administrative needs of most transportation agencies in a state.
- **Simple Methods:** Microcomputers have revolutionized the approach to transportation planning. (Indeed, in another speech last year I argued that the advent of microcomputer use in transportation planning "saved" the profession). My sense is that there will be a strong desire in future years for planning methods that are simple to use and understand. The methods will likely be computer-based and the software will be designed to work with the analyst in defining the problem and identifying possible solutions (i.e., expert systems). I think this will be a predominant pattern of planning in small- and medium-sized cities.
- **Resource Constraints:** Because of constrained resources, much of our planning methodology will be focussed on identifying those projects which provide the greatest return to society. In particular, methods to improve priority setting or otherwise improve the project programming process will be of great interest to state transportation planners. This issue relates of course to "evaluation measures" mentioned above.

Let me leave you with three important thoughts regarding the future of state transportation planning. First, we live in a rapidly changing world. Paul Kennedy, in his book, The Rise and Fall of the Great Powers, documents the fortunes of the great empires in world history and extends his analysis to possible futures for the U.S. I would do this monumental work great injustice if I could claim to summarize in a few words the lessons learned from his analysis. However, if there is one observation I take away from this historical perspective it is that the decline of great empires began when the societies focussed inward, on themselves, rather than acknowledging the changing world surrounding them and asking how they too should change. The economic structure of the world is changing. We need to acknowledge that and assess our own situation accordingly. To borrow a phrase from this year's national conference on the future of statewide multimodal transportation planning, we need to think globally, and act locally.

Second, I suspect we may see some radically different institutional arrangements in the provision of 21st century transportation services. We are already experiencing a rather important shift to the private sector in the funding and provision of transportation. In some cities, there is serious consideration being given to a regional "super" agency that can cut through the bureaucratic jungle of program delivery. Steve Lockwood, in a speech before this year's national conference on the future of state transportation planning presented a hypothetical, but certainly plausible, scenario of major corporations building and operating the high-tech highways of tomorrow. State transportation agencies, in this scenario, were mainly regulators. Institutional change will likely be a major part of our future. We need to anticipate the need for such change, and be creative in developing the institutional arrangements that will provide the transportation services in the 21st century.

My final thought relates to an important aspect of your future - funds for planning. You are aware of the massive efforts that have been undertaken by AASHTO and others regarding future national transportation programs. Not once have I heard in the debate or read in the literature any discussion of the future of PL and HPR funds. Now is the time for state transportation planners to start proposing alternatives to assure that reasonable funding levels and allocation formulas are part of any federal transportation program. At a recent conference on data needs, I proposed that a future federal transportation program should provide at a minimum funds equal to five percent of all federal transportation dollars going into a state. This includes highways, transit, and aviation funds. I proposed such an approach not based on any formal assessment of need, but rather based on my own feeling of what is required. It was clear from the audience reaction that not many had given much thought to where future planning funds would come from. Now is the time to think and act.

CHICAGO-KANSAS CITY CORRIDOR

Districts 1, 3, 4, and 6

Daniel Dees
Illinois Department of Transportation

The United States Department of Transportation, in cooperation with the state of Illinois and the State of Missouri, is required to study "the feasibility and necessity of constructing a toll expressway between Chicago, Illinois, and Kansas City, Missouri," pursuant to Section 350(a) of the FY 1988 Final Continuing Resolution. The purpose of the study is to examine the traffic and revenue potential of the proposed facility. The study will include the identification and examination of alternative and innovative financing options. By combining traffic revenue and financial aspects with project cost estimates, the study will provide a meaningful evaluation of the feasibility of the proposed project, with special attention toward the possibility of private sector financing of the proposed toll road.

The Illinois Department of Transportation is the lead agency for the study. Consultants have been retained to perform independent financial and engineering analysis of the proposed project. Their work is being supervised by a policy committee of elected officials and a representative of the transportation department from each state. The total cost of the study is expected to approach \$500,000. The study began on March 23, 1989, and is expected to be completed by December 1989. The total cost of the approximately 400-mile route from Chicago to Kansas City is estimated at \$2.5 billion.

Generalized alignments, proposed design standards, cost estimates, and traffic projections have been developed, as well as an analysis of optimum toll rates. The financial analysis has investigated alternative revenue sources and financing methods, value capture and special tax techniques, and incentives for investment by the private sector. Potential legal issues have also been explored. Analysis of alternative financing methods, the econometric modelling of preferred alternatives, and evaluation of economic impact, both favorable and unfavorable, have been combined with alignment alternatives and costs to produce a number of scenarios for the evaluation of feasibility. This evaluation is under way. The study is now approximately 80 percent complete.

WHY GOAL PROGRAMMING?

**Dean Landman
Kansas Department of Transportation**

The following is a summary of Resource Allocation/Resource Acquisition and Goal Programming from the Transportation Planning standpoint.

Prioritization has four basic weaknesses.

1. All management objectives cannot be included in one formula.
2. Always takes "worst first."
3. Associated work may not contribute towards any objective.
4. Slow response to changing objectives.

NOTE: Contact Dean Landman at 507/564-7433 for further information.

SAMPLE L.P. PROBLEM

MIN:

$$25X + 50Y$$

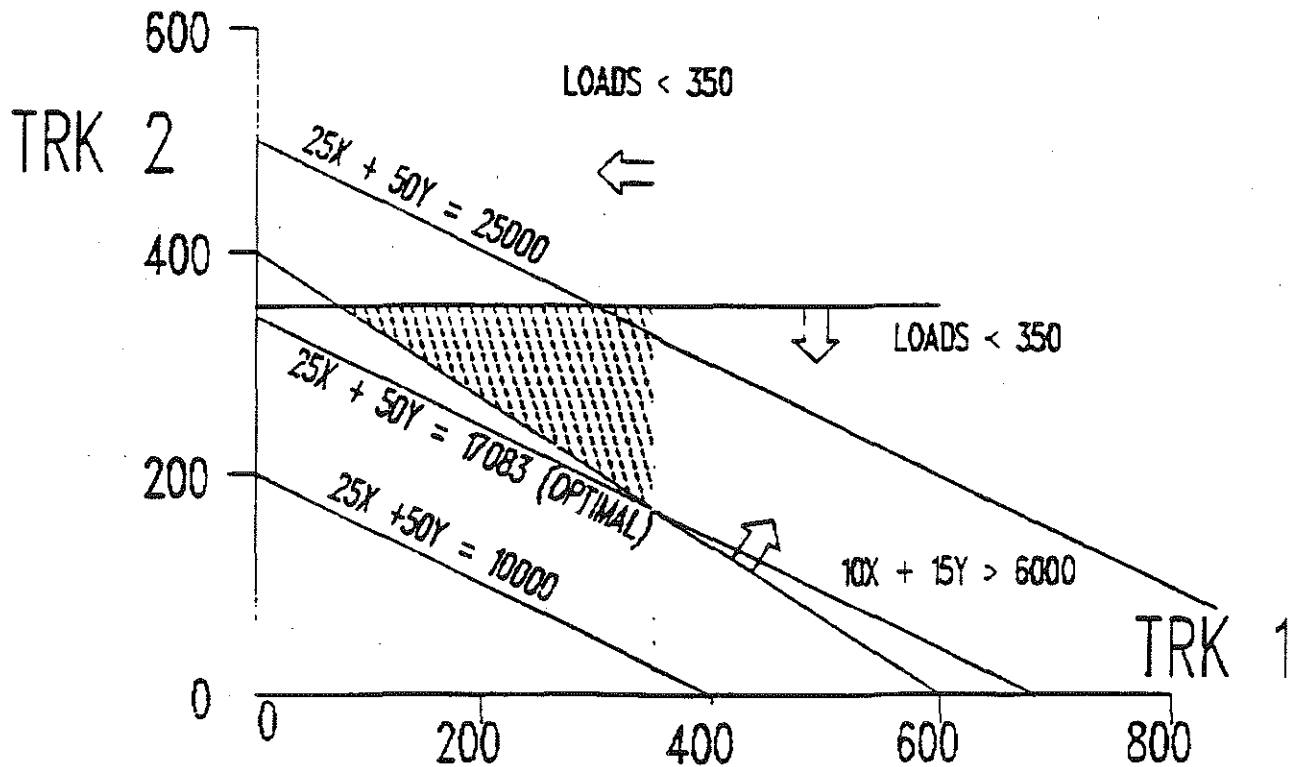
SUBJECT TO:

$$X \leq 350 \text{ LOADS (10 LDS/DAY * 35 DAYS)}$$

$$Y \leq 350 \text{ LOADS (10 LDS/DAY * 35 DAYS)}$$

$$10X + 15Y \geq 6000 \text{ TONS}$$

SAMPLE L.P. PROBLEM



PROBLEM:

MINIMIZE COST TO HAUL AT LEAST 6000 TON OF MATERIAL
 1- 10 TON TRUCK AT \$1/MILE (TRK 1)
 1- 15 TON TRUCK AT \$2/MILE (TRK 2)
 25 MILES ROUND TRIP - 10 TRIPS/DAY
 JOB MUST BE COMPLETED IN 35 DAYS

SAMPLE L.P. PROBLEM

	<u>TRK1</u>	<u>TRK2</u>		<u>R.H.S</u>
TONS	10	15	\geq	6000
TRK1	0.1	0	\leq	35
TRK2	0	0.1	\leq	35
OBJ. FCNT:	25	50		

SAMPLE G.P. PROBLEM

	TRK1 X	TRK2 Y	TRK1 OV UN	TRK2 OV UN	COST OV	R.H.S.
TONS	10	15				6000
TRK1	0.1	0	-1 1			35
TRK2	0	0.1		-1 1		35
COST	25	50			-1	0
OBJ. FCNT.	0	0	100	100		

ASSUME: \$100 PER PENALTY FOR DAYS EXCEEDING 35

MATHEMATICAL FORMULATION

OBJECTIVE FUNCTION:

$$\sum \sum (w*u + y*v) + \sum z*v$$

PROJECT BALANCE CONSTRAINTS:

$$\sum \sum \sum x = 1$$

PERFORMANCE MEASURES:

$$\sum \sum \sum a*x - v + u = g$$

NEED COMPONENT:

$$\sum p*x - v = 0$$

FUNDING CONSTRAINTS:

$$\sum \sum \sum c*x \leq f$$

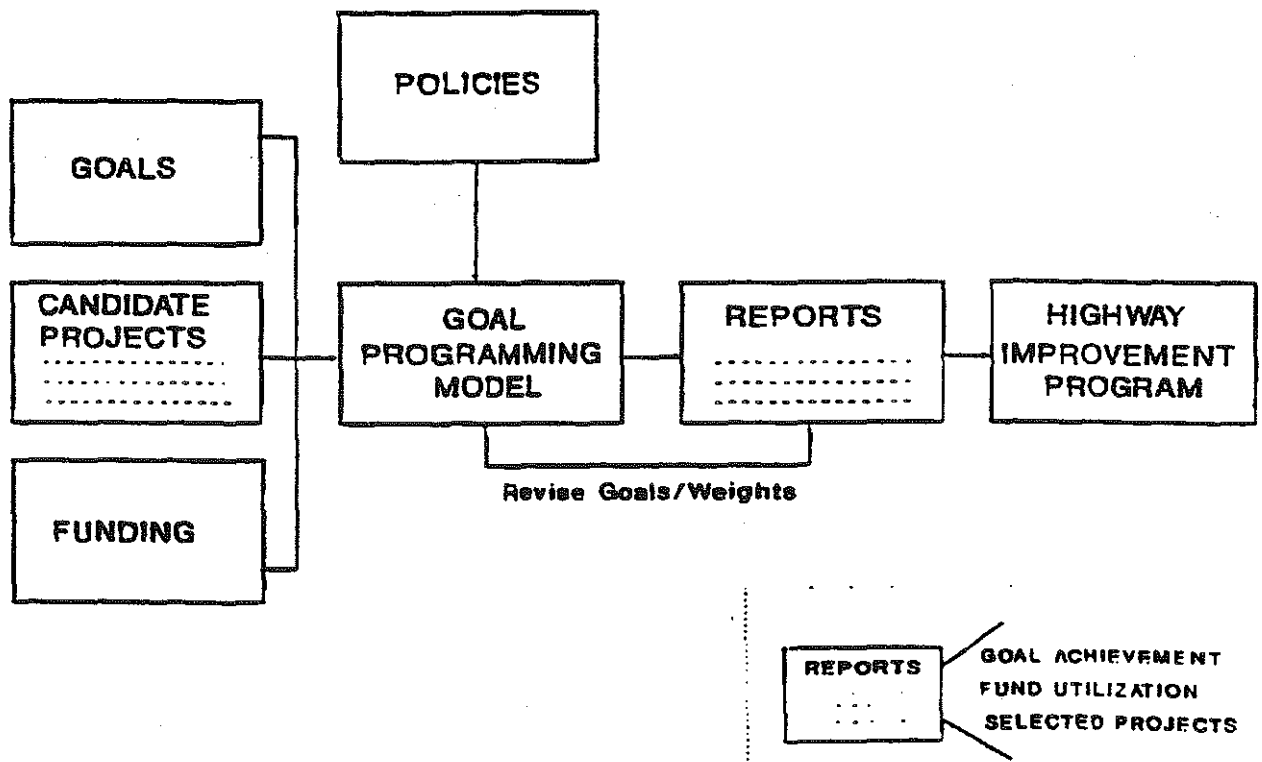
PROGRAM/OPTIMIZATION MODEL SCHEMATIC

	PROGRAMS/PROJECTS	GOAL DEVIATIONS	GOALS LIMITS
PROJECT BALANCE	1 1 1 1 1 1 1	1 1 1 1	1 1 1
FUNDING CONSTRAINTS	X X X X X X X X X	X X X X X X	\$ \$ \$
PERFORMANCE MEASURES	X X X X X X X	X X X X X	G G G
NEED COMPONENT	X X	X X X X -1	G G G
OBJECTIVE FUNCTION		W W W W W W W W W	O

PROGRAM/OPTIMIZATION MODEL SCHEMATIC

		PROGRAMS/PROJECTS				GOAL DEVIATIONS		GOALS/ LIMITS
PROJECT BALANCE	PRJ1	1	1				=	1
	PRJ2			1	1		=	1
FUNDING CONSTRAINTS	PRM	750	0				≤	20000
	BRG			400	0		≤	12000
	ST	250	0	100	0		≤	25000
PERFORMANCE MEASURES	SFLF	100	0			-1 1	=	9400
	BRYR			50	0	-1 1	=	4700
	MI	10				-1 1	=	250
	ACRD			.15		-1 1	=	15
NEED COMPONENT			255		173 -1		=	0
OBJECTIVE FUNCTION						.1 0 8 0 6 0 4 0 9		

PROGRAM OPTIMIZATION OVERVIEW

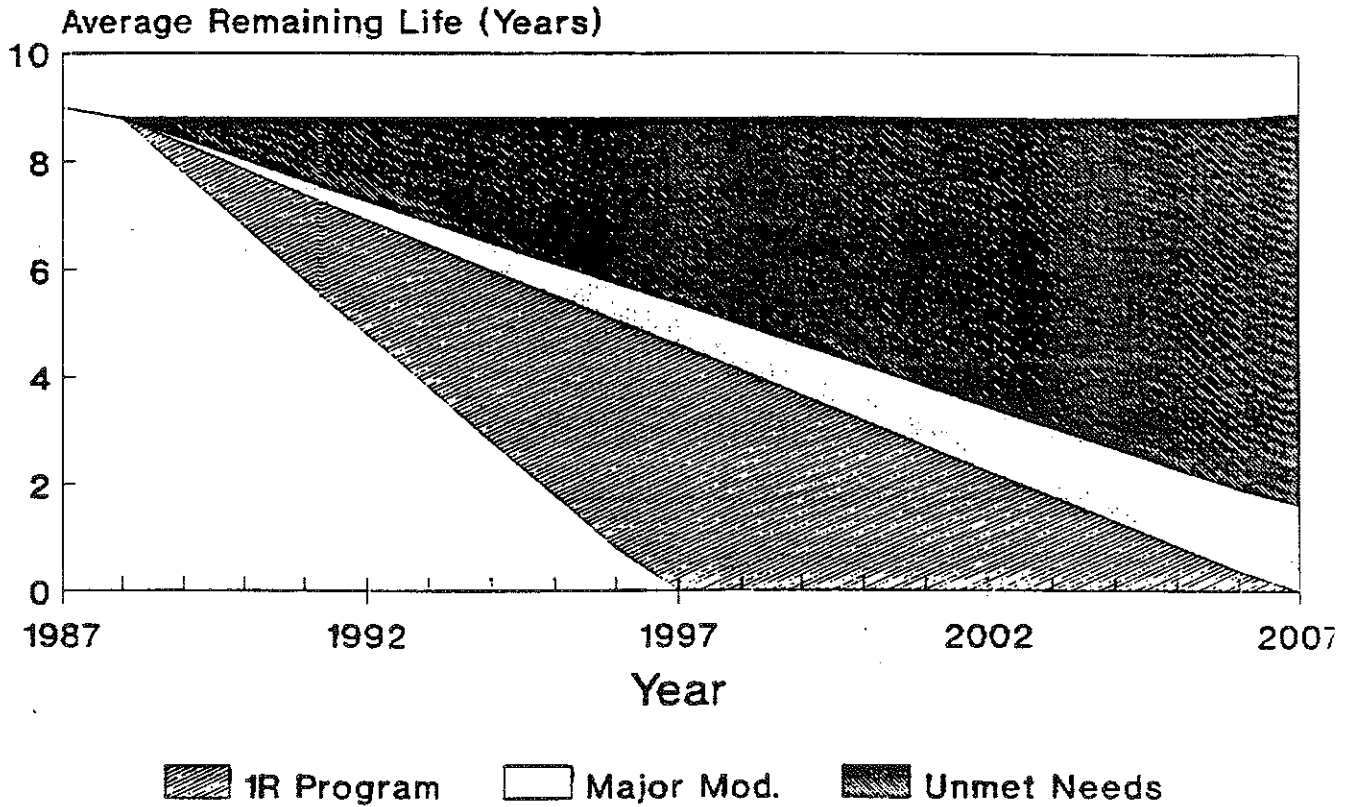


GOALS

- **Levels to Attain**
- **Levels Not to Exceed**
- **"Bean Counters"**
- **Spend the Money**

SURFACING NEEDS - AVERAGE LIFE

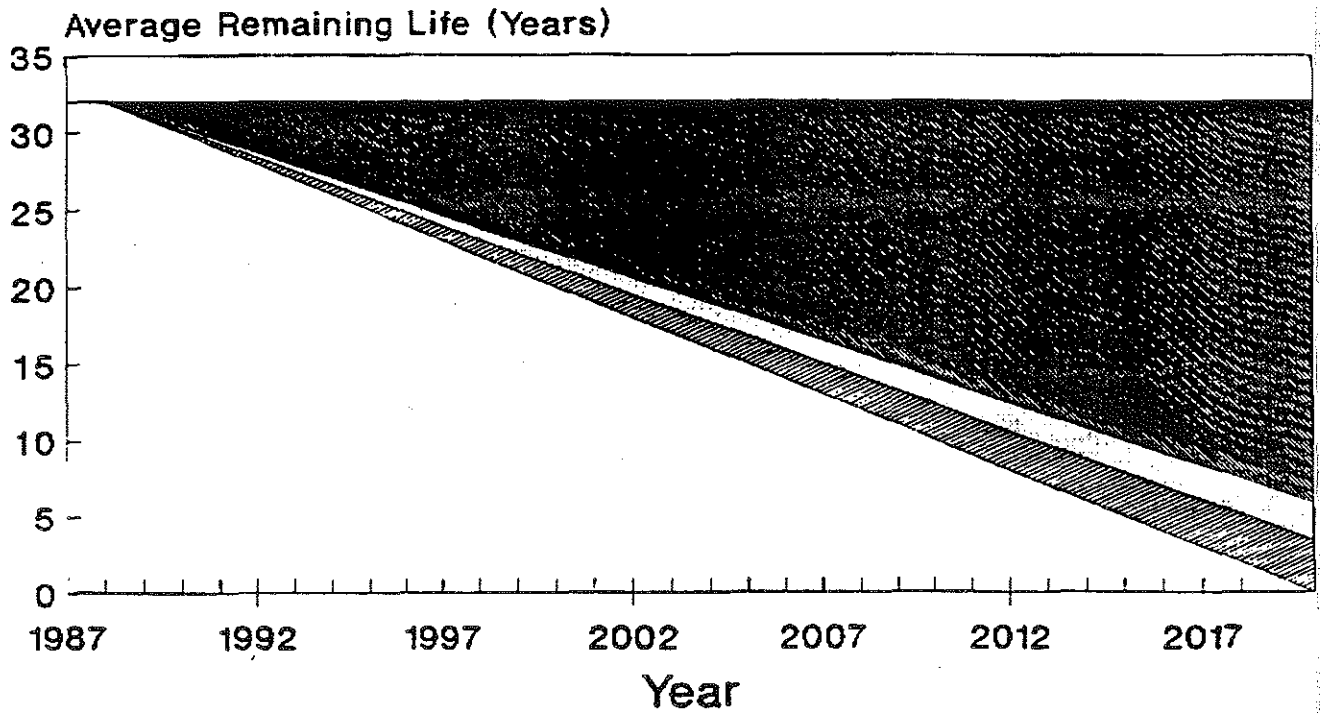
Comparison of Loss to Amount Added



Assumes adequate funding to sustain
1990-1993 Program Level

BRIDGE NEEDS - AVERAGE LIFE

Comparison of Loss to Amount Added



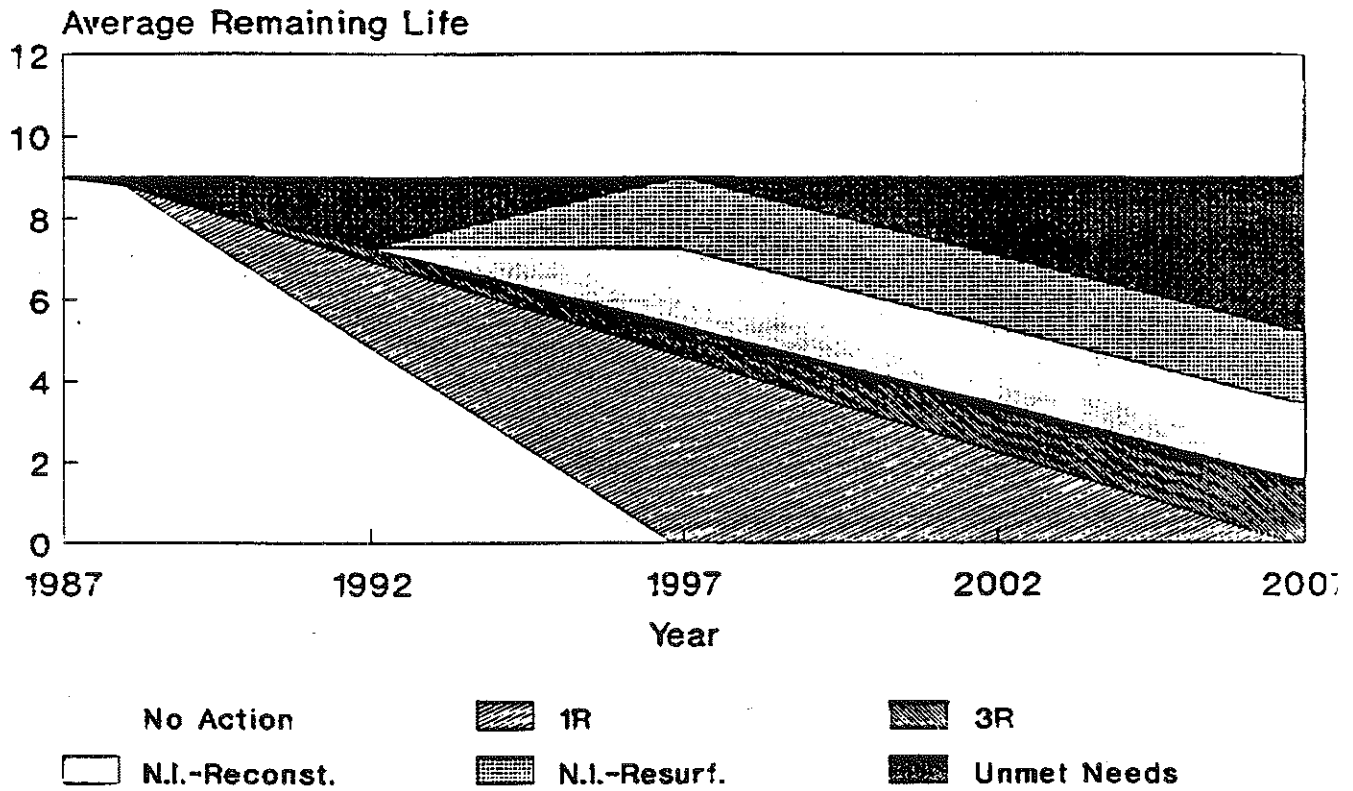
Reconstruction

 Deck Overlay

 Unmet Needs

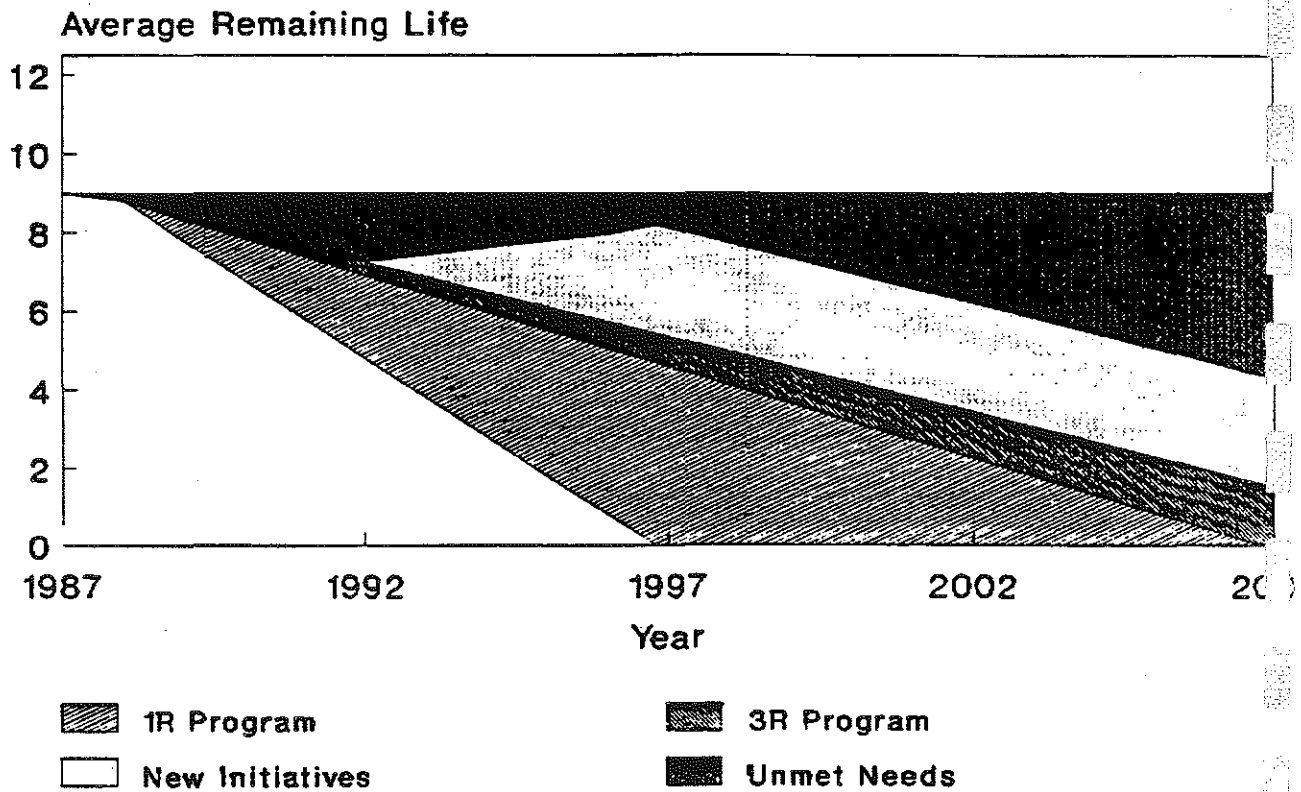
Assumes adequate funding to sustain
1990-1993 Program Level

SURFACE LIFE DETERIORATION N.I. - Comb. Reconst./Resurf.



Assumes New Initiative Funding 1993-1997

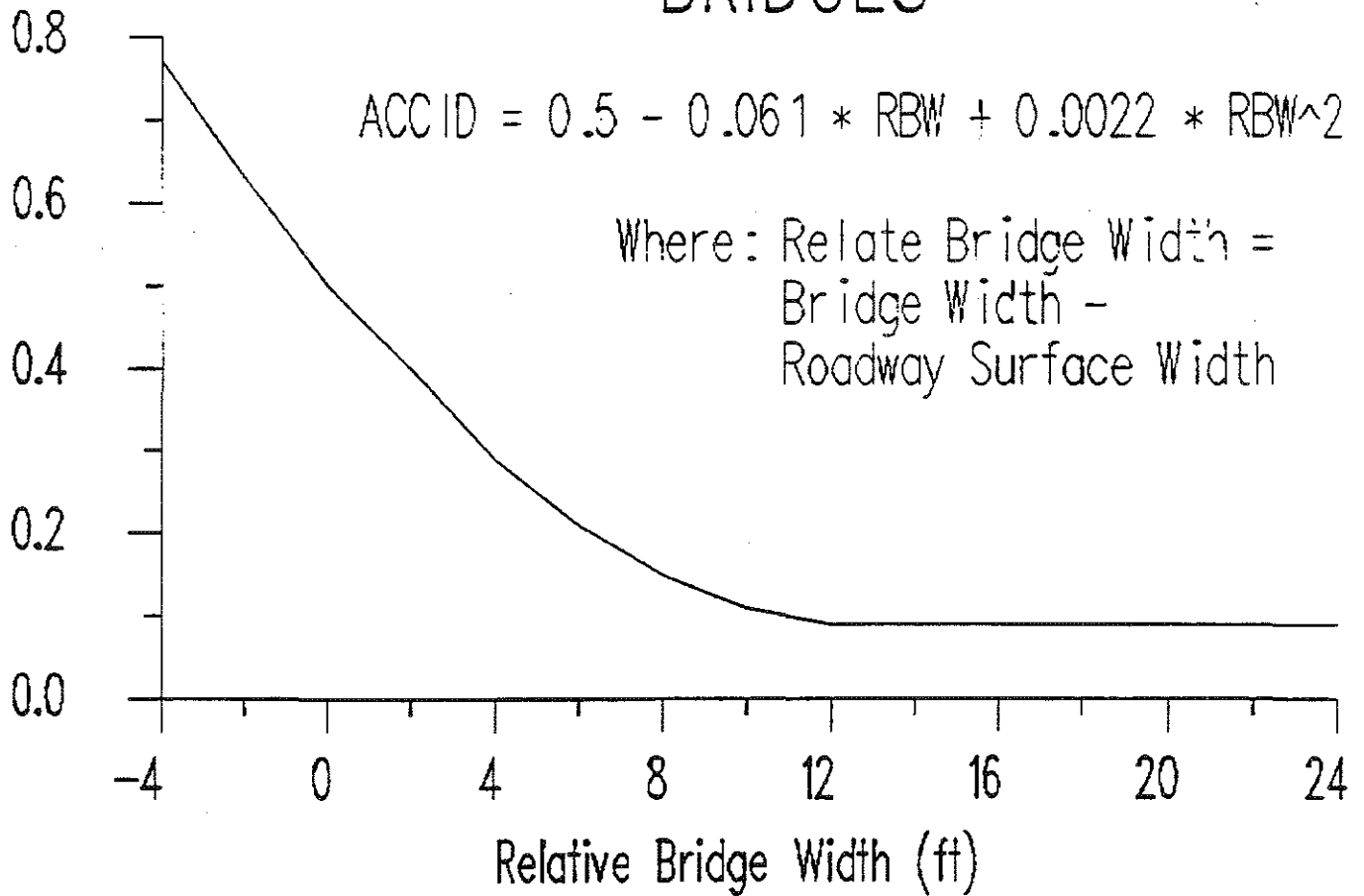
SURFACE LIFE DETERIORATION N.I. - Reconst. by Priority Formula



Assumes New Initiative Funding 1993-9

ACCIDENT RATE BRIDGES

Accid/Mill. Veh



FUNDING

- **Fund Classes**
- **State/Local**
- **Program Period**
- **Obligation Auth.**

CANDIDATE PROJECTS

- **Current Program**

 - Firm**
 - Tentative**

- **Candidate Projects**

 - Priority**
 - Selected**
 - Deck Overlay**
 - Heavy Resurfacing**
 - Shoulder Stabilization**

POLICIES

- **Do Nothing**
- **Associated Work**
- **Fund Carry Over**
- **Inflation**
- **Matching Funds**

REPORTS

- **Goal Achievement**
- **Fund Utilization**
- **Selected Projects**

PROGRAM/ OPTIMIZATION MODEL SCHEMATIC

	PROGRAM/ PROJECTS	CON. COEFFS	ROWS/ EQNS
PROJECT	1 1 1 1		1
BALANCE	1 1 1 1		1
FUNDING	1 1 1 1		1
CONSTRAINTS	1 1 1 1		1
PERFORMANCE	1 1 1 1	-1 -1 -1 -1	C
MEASURES	1 1 1 1		C
REV	1 1 1 1		C
COMPONENT	1 1 1 1		0
OBJECTIVE			0

	P	P	P	P	P	P	P	P	R
	1	1	2	2	3	3	4	4	H
		N		N		N		N	S
BAL 1	1	1							1
BAL 2			1	1					1
BAL 3					1	1			1
BAL 4							1	1	1

BUILD - NO BUILD

PROGRAM/ OPTIMIZATION MODEL SCHEMATIC

	PROBLEMS/ PROJECTS	ROW INDICATORS	COLUMNS/ LIMITS
PROJECT	1 1 1 1 1 1 1 1 1		1
BALANCE	1 1 1 1 1 1 1 1 1		1
FUNCTION	1 1 1 1 1 1 1 1 1		1
CONSTRAINTS	1 1 1 1 1 1 1 1 1		1
PERFORMANCE	1 1 1 1 1 1 1 1 1	-1	B
MEASURES	1 1 1 1 1 1 1 1 1	-1	C
KEY	1 1 1 1 1 1 1 1 1	-1	C
COMPARISON	1 1 1 1 1 1 1 1 1	-1	C
OBJECTIVE	1 1 1 1 1 1 1 1 1	-1	C
FUNCTION	1 1 1 1 1 1 1 1 1	-1	C

	P	P	P	P	P	P	P	P		
	1	1	1	1	1	1	1	1		R
	Y	Y	Y	Y	Y	Y	Y	Y		H
	1	1	1	2	2	2	N	N		S
	C	B	B	C	B	B	C	B		
	.	1	2	.	1	2	.	1	2	
BAL IC.	1			1			1			1
BAL B1	1	1		1	1			1		1
BAL B2	1		1			1			1	1

ASSOCIATED BRIDGES

PROGRAM/ OPTIMIZATION MODEL SCHEMATIC

	PROBLEMS/ PROJECTS	REAL VARIABLES	CONSTRAINTS
PROJECT BALANCE	1111	1111	1111
PERFORM. CONSTRAINTS	1111	1111	1111
PERFORMANCE OBJECTIVES	1111	1111	1111
INFO COMPONENT	1111	1111	1111
FORMING FUNCTION	1111	1111	1111

	P	P	P	P	P	P	P	P	P	RHS
	1	1	1	1	1	1	1	1	1	
	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	1	1	1	2	2	2	N	N	N	
	C	B	B	C	B	B	C	B	B	
	.	1	2	.	1	2	.	1	2	
BAL 1C.	1			1			1			1
BAL 1B1	1	1		1	1			1		1
BAL 1B2	1		1			1			1	1
PRIM	80			88			0			200
BR ID	24	16	8	26	17	9		0	0	120
STATE	26			28			0		0	500
OB AUTH	104	16	8	114	17	9	0	0	0	300

ASSOCIATED BRIDGES - FUNDING

PROGRAM/ OPTIMIZATION MODEL SCHEMATIC

	PERFORMANCE/ PROJECTS	DATA OPERATIONS	RESULTS/ LIMITS
PRIORITY	1 1 1		1
BUDGET	1 1 1		1
FUNDING	1 1 1		1
CONSTRAINTS	1 1 1		1
PERFORMANCE	1 1 1		1
MEASURES	1 1 1		1
OPT	1 1 1		1
COMPONENT	1 1 1		1
OBJECTIVE	1 1 1		1
FUNCTION	1 1 1		1

	C	C	C	C	R
	O	O	O	O	H
	V	V	V	V	S
PROJECTS	P	B	S	O	
.....					
PR IM...1	1				200
BR ID...1		1			120
STATE..1			1		500
OB AUTH1				1	300
PR IM...2	-1				200
BR ID...2		-1			120
STATE..2			-1		550
OB AUTH2				-1	300

CARRY OVER - FUNDING

PROGRAM/ OPTIMIZATION MODEL SCHEMATIC

	PERFORMANCE/ PROJECTS	DEAL OPERATIONS	DEALS/ LIMITS
PROJECT BALANCE	1000	1000	1000
PERFORM. OVER PERFORMS	1000	1000	1000
OPERATIONAL MEASURES	1000	1000	1000
DEAL COMPONENT	1000	1000	1000
DEALMENT FUNCTION	1000	1000	1000

PROJECTS	S H R T	S H R T	S H R T	S H R T	R H S
.....	A L	A N	.	W Y	
CNTY..AL	210		38		≥ 2500
CNTY..AN	80	100		38	≥ 2500
..					
CNTY..WY		6000		38	≥ 2500

COUNTY SHORTFALL - MILES OVERLAY

NATIONAL FUNCTIONAL CLASSIFICATION SURVEY HIGHLIGHTS

Gloria J. Jeff
Michigan Department of Transportation

The Michigan Department of Transportation (MDOT) through the Bureau of Transportation Planning has initiated an analysis to review issues relating to jurisdictional responsibility and transportation revenue distribution. This analysis includes an evaluation of the functional classification of the state's highway, road, and street systems, and an assessment of current and future revenue responsibilities.

Michigan is exploring the potential for using functional classification to communicate the need to restructure transportation, and the degree to which it can be effectively integrated into the planning process. To provide a background for the analysis, MDOT conducted a survey of the other states' procedures and applications of functional classification. The survey collected responses from all 50 states.

The survey results indicated that the states recognize that federal initiatives in functional classification will realign federal responsibilities, and that functional classification can be a helpful tool in restructuring roles among transportation jurisdictions and public and private agencies. The majority of the states suggested that the federal guidelines for classifications should be more flexible, but most of the states said that functional classification is functioning as intended.

Most states currently use functional classification for data collection and design criteria, although they suggested potential applications for functional classification that are not presently being addressed:

- 1) Prediction of future classification;
- 2) Distribution of federal aid between state and local units;
- 3) Basis for restructuring of responsibilities between state/federal and state/local jurisdictions.

Forty percent of the states do not determine future classifications of their highway, road, and street systems with the federal functional classification process. In many states traffic projections for developing future functional classification come from the 3C long range planning process or needs studies. Michigan and thirty-eight of the states indicated a relationship between functional classification and long range planning. Only a few states use functional classification as a basis for jurisdictional responsibility.

A comparative analysis of the states' responses to eight critical questions concerning the use of functional classification was made to determine the degree that functional classification is integrated into the states' total planning process. Most of the questions related to the use of functional classification beyond the basic federal requirements. Eight states demonstrated the broadest use of functional classification in their activities. These states will be the focus of a more in-depth study of the potential for integrating functional classification into policy planning processes.

NOTE: Contact Gloria J. Jeff at 517/373-2242 for copies of the report.



BREAK-OUT SESSIONS

BREAK-OUT SESSIONS

The break-out sessions were based on the panel presentation "Urban Transportation Planning Process for the 21st Century." The panel members were Michael Meyer, Professor of Civil Engineering, Georgia Institute of Technology, and Dr. Robert Cervero, University of California, Berkeley. E. Keith McGowan, Missouri Highway and Transportation Department, was the moderator.

The panel identified three challenge areas:

1. **POLICY CHALLENGES**
 - A. Economic development/competitiveness
 - B. Quality of life/environmental
2. **PLANNING CHALLENGES**
 - A. Growth management & land use
 - B. Facility system operation
3. **INSTITUTIONAL CHALLENGES**
 - A. Planning relationships
 - B. Structural implementation

The following is a summary of the small groups discussion that were based on these three main challenges:

POLICY CHALLENGES

Transportation planning should take a very proactive role in the areas of economic growth and competitiveness; and clearly lead development vs. following it. The fundamental question of major issues relating to economic development in the 21st century were addressed in a series of questions/answers from the group.

1. **WHO WILL NEED TRANSPORTATION IN THE FUTURE?**

Technology will reduce the traditional commuting patterns of people in the future, and it is felt that there will be a higher concentration of goods movement within the system.

Mississippi Valley SCOP states are recommended to address this situation on a more regional basis, because of many parallel circumstances and constraints common to our states.

2. WHAT WILL BE THE ROLE OF PLANNERS IN LOCATION DECISIONS?

Transportation planners need to be proactive or at least adaptive in their role as a team member on the economic development task force.

It was also felt that planners need be brought in earlier to the decision making process. Early contact with those making the final decision is imperative for economic growth. It was recommended that the SCOP meet with public/private industry developers and location groups to determine:

- The factors influencing final location decisions.
- The role transportation systems plays in the decision.
- How transportation planners can participate earlier in the decision-making process.

3. WILL MAJOR REHABILITATION OF THE SYSTEM TAKE PRIORITY, OR WILL NEW CONSTRUCTION APPEAR TO BE THE SOLUTION?

It was felt the rehabilitation of the system should take priority over new construction. A concern was discussed on how rehabilitation could take place without injuriously affecting the economy and potential growth of the area; however, it was felt that any hurdles involved in the solution would be achievable and worthwhile.

Infrastructure development/maintenance should go hand-in-hand with a controlled economic growth of the area. Transportation planners should be involved in the very early stages of economic development.

4. WHAT TOOLS NEED TO BE DEVELOPED BY THE PARTIES INVOLVED IN THE DECISION MAKING PROCESS?

Initially, the policy makers need to be identified, and discussions with them need to deal with the following:

- A closer integration of land use and transportation planning goals.
- Although the goals of the various decision makers may be quite different, depending upon which discipline they represent, the planners will need to be adaptive in their solutions.
- Planners and developers will need to work closer together at a very early stage of the decision-making process.

5. WHAT WILL PLANNERS NEED TO DO TO IMPROVE INTERNAL AND EXTERNAL LINKAGES TO IMPROVE GROWTH?

- It is recommended that the Mississippi Valley states move to an international market, with efficient linkages.
- Planners should take a more global, aggregate approach to improvements and strategies.
- There should be a promotion of goods movement.
- Technology improvements should become a priority in facing the challenges of the future.

6. WHAT AREAS SHOULD AASHTO RESEARCH FURTHER?

- Improving communications with the private and political sectors.
- Factors affecting business decisions on location.
- Work toward a more global competitiveness.
- Identify and work with location specialists.
- Are people rediscovering smaller cities and how will this affect transportation planning.

7. WHAT TRANSPORTATION RELATED FACTORS WILL AFFECT THE QUALITY OF LIFE AND ENVIRONMENT IN THE FUTURE?

It was felt that although the Midwestern States maintain a comparatively low congestion factor, we need to continue to develop an innovative and cost effective transportation system to maintain our current quality of life.

8. WHAT ARE THE KEY ISSUES INVOLVED IN THE QUALITY OF LIFE CHALLENGE FOR THE FUTURE?

- Although the rebuilding of the infrastructure is more difficult than building new, it needs to be done.
- There needs to be an infrastructure rehabilitation of all modes of transportation.
- Arterial upgrading is necessary to preserve high quality facilities.
- We need to address the air quality problem before the anti-auto forces do.
- Promotion of the mass transit systems are vital for a number of reasons.
- Improve statewide planning with quality data that is credible, user friendly, and easily accessible.

PLANNING CHALLENGES

What can be done at the State and National level that would be alternatives to putting down more pavement?

- DOTs must get out of the quick-fix/reactionary style of thinking and become more proactive.
- Encourage the earmarking of user fees for specific needs that are identified.
- DOTs consider marketing of the transportation service from an educational and public relations standpoint.
- Better manage facility capacity by placing more emphasis on arterial system and mass transit systems.
- Planners need to leave the back room and go to the front line.
- Market and educate the users and producers of the benefits of planning the transportation system.
- Planners should be brought in earlier and be a more visible part of the development team.
- Possible factors of the solution to look at:
 - aging infrastructure rehabilitation
 - getting best use out of the existing system
 - recognition of the aging population
 - vehicle segregation
 - road costs sharing programs should be implemented
 - make transportation needs known through better communication
 - stop reacting
 - increasing Highway Planning Research (HPR) funds for planning activities
 - recognize goods movement will be increasing
 - operations and planning should work hand-in-hand
 - develop intermodal planning with efficient transfer points
 - promotion of transportation technology and substitute technology

INSTITUTIONAL CHALLENGES

Transportation planning and the institutional framework of transportation planning, as it has existed for many years is undergoing and will undergo significant changes. As originally envisioned in the 1963 Federal-Aid Highway Act, transportation and land use planning were intricately linked together with a major emphasis on the need for traditional land use planning in conjunction with transportation planning.

In many states and metropolitan areas, the direct linkage of transportation and land use planning has been de-emphasized to the extent that the land use planning function is minor in nature. This has meant that transportation planners have lost the ability to use land use planning as an effective tool to solve transportation problems. Additionally, the economic recession earlier in the decade which particularly impacted the midwest, caused a significant shifting of planning emphasis to economic development. In many cases, transportation and land use planning issues took a back seat to concerns for economic development and the resulting jobs.

The nation and the midwest as well are now experiencing significant economic growth. Many urban areas are bustling centers of economic activity, and population is on the upswing. Even in these areas which are not growing in total populations, we still see a redistribution of land use and population in response to renewed economic viability.

Growing urban congestion has become a major issue in many areas of our country, particularly in the burgeoning suburbs. This urban congestion has been translated into a growing awareness of a decline in the overall quality of life for many area residents.

Growth management has become an issue in many areas. Many communities which have welcomed growth in the past are now realizing the down side of the growth scenario, and are now looking for ways to control or direct growth.

Transportation planners are becoming more and more involved in many of the issues shaping our transportation system and land use development. However, many of the old tools used previously in transportation planning are no longer adequate to do the job.

Dollars for planning are in short supply and with the 1990 Census bringing many more sunbelt urbanized areas into the arena, Section 112 PL and Section 8 federal transportation planning funds will become even scarcer.

Many state and local laws are inadequate to deal with the issue of growth management and, indeed, there is not even community consensus of what needs to be done on this issue.

SMALL GROUP RECOMMENDATIONS

- Re-emphasize land use planning in conjunction with transportation planning.
- There continues to be a legitimate federal role in cooperation with state and local agencies in transportation/land use planning and its exact form needs to be better defined.
- Additional funds at the federal and state level need to be made available to adequately address the planning issues.
- Federal legislation should strengthen the role of the metropolitan planning organization in growth management and land use planning.
- Continue the "3C" urbanized area planning requirements for all urbanized areas over 50,000 population, including those of 50,000 to 200,000 population.
- Explore avenues to inform people, public agencies, and private entities about the need and benefits of transportation/land use planning.
- Begin to lobby for an increase in HPR funds for planning activities.
- Work together on an interjurisdictional level for a coordinated, mutually beneficial system.
- Maintain a global level of thinking while implementing a local level of action.

**STATE
BRAGGING SESSIONS**

ILLINOIS

**Dan Dees, Deputy Director
Planning and Programming**

Operation Green Light is the comprehensive plan of the Northeast Illinois Region, coordinated by the Chicago Area Transportation Study (CATS) for the transportation implementing agencies and the local units of government, designed to attack urban congestion problems. In addition to making progress on major transportation facilities, this program also focuses on innovative, smaller scale approaches to address congestion problems to prevent gridlock while planning and engineering is undertaken on long-term solutions. Over the next five years the transit and highway agencies throughout the region propose to invest \$1.2 billion in projects to ease congestion.

- **Major New Transportation Facilities**

- Substantial work continues on major transportation facilities in the region. Additionally, plans are under way to invest \$1 billion more during the next five years on major facilities identified in CATS 2010 Plan, the region's long-range transportation plan. Highlights of this work follow.
- Construction of the new \$410 million Southwest Transit Line is under way and on schedule for an October 1992 opening. The Southwest Transit Line is a new 9.3 mile CTA rapid transit line to a previously unserved part of the city of Chicago from Midway Airport to the Loop. This project will help relieve congestion in the corridor served by this new line.
- Additionally, a \$157 million rapid transit project will connect the northside Howard Line with the southside Dan Ryan Line, the city's two heaviest used lines. This project which will greatly expand capacity on these two lines is under construction and is scheduled to open in November 1991.
- Planning is under way for the Chicago Central Area Distributor project, a new transit project to connect the downtown commuter rail stations with Chicago's growing central area including north Michigan Avenue, Navy Pier and McCormick Place. The state has agreed to provide up to \$20 million to fund one-third of the planning, engineering and design costs for this project, with local and federal sources expected to split the remaining costs. The entire project could cost \$600 million to construct.

- Thorndale Avenue will provide westerly access to O'Hare Airport and serve a corridor of rapid expansion that has become severely congested; \$180 million will be provided by the department to construct Thorndale Avenue from I-290 to US-20 (Lake Street). Discussions are under way with the Illinois State Toll Highway Authority to cooperatively construct a ring road around O'Hare from I-90 to I-294 and a westerly connection to I-290. Construction of this facility is dependent upon an agreement being reached, by this fall, between the City of Chicago and adjacent suburbs on the alignment of the new highway.
- The Illinois 53 corridor is being developed as an outer loop for Chicago and serves an area of dramatic population increase and economic growth. the construction of a toll facility from Army Trail Road south to I-55 is nearing completion at a cost of \$475 million. The department has a \$19 million extension from Dundee Road to Lake-Cook Road and a \$32 million add lanes project from Army Trail Road north to I-290 currently under construction. Also included in the department's five-year program is the construction of a new interchange at Beisterfield Road which will include additional through lanes on Rohlwing Road at a cost of \$10.2 million. Finally, the department is providing \$7 million for the preparation of Environmental Impact Statements for future extension of this corridor; south from I-55 to I-80 and north from Lake-Cook Road to I-94.
- CATS 2010 Plan identifies corridors for major new expressway facilities; \$39 million is programmed over the next five years for protective buying of right-of-way to preserve these corridors.
- The Fox Valley corridor serves an emerging area on the outskirts of the Chicago urban area; alignments will be studied that will lead to the recording of a centerline in this corridor. Eight million dollars is contained in the five-year program for the EIS on this corridor.
- FAP 420 will connect the north end of the Illinois 53 corridor to US-12 in Wisconsin and will serve Lake and McHenry Counties. A \$700,000 study to find an acceptable alignment around the Volo Bog area will be conducted by the department.
- Lakefront highway provides a direct connection from the Amstutz Highway to I-94 and would stimulate economic growth in this Lake County corridor. Stage one of this two-stage project provides for the improvement of Buckley Road from I-94 to Sheridan Road; the construction of a freeway section from Buckley Road north to Greenwood Avenue; and a direct connection from the south end of the Amstutz to Sheridan Road at 24th Street. Sixteen million dollars is in

the five-year program to complete stage-one work. Stage two, which currently is not included in the five-year program, will complete the freeway link between 24th Street and Genessee Street at an estimated cost of \$70 million.

- In addition to these activities directed at major new transportation facilities, an integral part of Operation Green Light is to preserve and improve existing major facilities. Rehabilitation of the Edens Expressway (I-94) at \$100 million and Eisenhower Expressway (I-290) at \$205 million have been completed and the Dan Ryan Expressway (I-94) at \$250 million is nearing completion. The upcoming five-year program includes rehabilitation of the Kennedy Expressway (I-90/I-94) at an anticipated cost of \$400 million; \$70 million is directed to significant safety and operational improvements for the express lanes as part of Operation Green Light.

- **Strategic Regional Arterial (SRA) Network**

- A network of SRA highways is identified in the CATS 2010 Plan. This network of over 1,300 miles of state, county and local jurisdiction roadways is intended to accommodate a large percentage of the long-distance, regional traffic that the freeways cannot handle. The SRA network will become the backbone of the region's efforts to deal with problems associated with congestion.
- IDOT has set aside \$15 million to conduct engineering feasibility studies on the entire 1,300 mile network, to identify developmental strategies, estimate land acquisition needs on a route-by-route basis and determine the scope cost and timing of needed capital improvement.
- The first of these studies, which looks at approximately 250 miles showing the greatest need from the standpoint of traffic demand and/or developmental pressures, has already been initiated. This first study will set the stage for subsequent studies by developing innovative concepts on how to increase capacity, reduce demand, effectively incorporate transit, preserve corridors and involve the private sector in the development of the SRA network. The entire SRA system will be studied over the five-year period resulting in an integrated plan including costs and right-of-way needs. In the City of Chicago, the emphasis on the SRAs will be to improve capacity within existing right-of-way by removing physical bottlenecks. Intersection improvements, curb management techniques and improvements to low clearance viaducts are some of the methods available.

- In total, IDOT has \$390 million targeted in the five-year program to address the needs of the SRA network. Of this total, \$20 million will be used for protective land acquisition for the network.
- **Other Arterial Improvements**
 - CATS has organized a subcommittee composed of federal, state, regional and local officials to identify and plan for the five, ten, and 20-year transportation needs not specifically addressed by the freeways and the SRA network. The focus of this subcommittee is to address the improvements necessary for access to and movement between commercial and business properties.
 - IDOT's five-year program contains \$190 million for improvements to these facilities.
- **Improved Freeway Traffic Management**
 - One of the most effective methods to reduce congestion levels is to make better use of our existing freeway system. Strategies to accomplish this include expanding the limits of the freeway surveillance system, eliminating freeway bottlenecks and improving the flow of real time information about traffic conditions to motorists.
 - Twenty million dollars is currently set aside to extend the limits of our state of the art surveillance system to include the entire freeway network in northeastern Illinois and to improve motorist communication systems over the next five years. Discussions have been ongoing with the Illinois State Toll Highway Authority (ISTHA) to include their network in the system. Also, the Indiana Department of Transportation has been contacted regarding the possible inclusion of the freeway system in northwest Indiana. A new VAX computer needed to operate the expanded system is included in this year's program. Additional changeable message signs to advise motorists of traffic conditions and allow them to avoid particularly congested areas are included in the five-year program.
 - Twenty-five million dollars is earmarked for the elimination of freeway bottlenecks which will allow the system to operate more efficiently. IDOT and ISTHA have initiated preliminary engineering on a joint project to improve the East-West Tollway/Eisenhower Expressway connection as a first step in the effort.

- In addition, research projects are being developed which are designed to determine the feasibility, scope and cost of advanced vehicle information systems in the northwest corridor of Chicago suburbs and to help the department identify significant policy issues relative to congestion management including a study of how travelers use real time information about congestion.

- **Improved Arterial Traffic Management**
 - Traffic signal modernization is one of the most effective and most immediate tools available in our effort to reduce congestion. Interconnection of signals and computerization of systems will allow and increase in the capacity of the highway network with little investment in pavement or land acquisition.

 - \$45 million is contained in the five-year program to interconnect a total of 427 signals into 48 signals systems. The first set of systems will be implemented next summer with 101 signals being interconnected into 12 systems. The implementation of this five-year program should significantly reduce delays along the targeted routes and should provide noticeable congestion relief.

- **Strategic Transit Improvements**
 - The department has programmed \$75 million in transit bonds as part of Operation Green Light. This funding will go for Metra and CTA rail improvements as well as for CTA and Pace bus service enhancements which offer promise for relieving congestion in and around transit facilities and for making transit a more attractive alternative. CATS has established a transit planning task force to identify and examine potential improvement types and sites such as bus pullouts and turnarounds, traffic signal pre-emption and improved crossing signals, signage and access at train stations.

 - Over the five-year period, \$20 million in highway funds will be made available for two additional programs. The first program will provide \$10 million for highway projects, identified by the department's Division of Public Transportation, that benefit public transportation, such as access improvements at rail stations. The second program will provide \$10 million for improvements to commuter rail grade crossings on Metra-owned lines. These projects will be identified by Division of Public Transportation in cooperation with the CATS Regional Council of Mayors.

- **Improved Demand Management and Environmental Considerations**

- CATS has organized a task force to look at expanding current demand management measures such as alternative work schedules, increased ridesharing and off-peak truck deliveries. In particular, the task force will concentrate its efforts in corridors as part of the SRA feasibility studies.
- Any long-term strategy for addressing congestion must include an assessment of the impact that the proposed projects have on the environment. All of the strategies outlined in Operation Green Light have the potential to greatly reduce vehicle emissions which, in turn, should have a positive impact on air quality.
- Studies will identify areas in need of noise protection along selected freeways and then recommend noise abatement measures appropriate for a land-use type and roadway environment.
- A systematic approach to aesthetic design is proposed for all new expressway rehabilitation projects. Methods to identify locations along the arterial network in need of scenic enhancement and sight screening are being developed. The first pilot project to improve highway aesthetics will be the EIS for the Illinois 53 expressway extension into Lake County.

CATS has established a number of work groups composed of interested public agencies, private companies and individuals to improve the coordination of Operation Green Light activities. These groups are investigating the issues of Strategic Regional Arterials, Supplemental Arterials, roadway operations, local development policies, transit highway interface and demand management to help the region manage its transportation resources and reduce congestion.

INDIANA

Dennis E. Faulkenberg, Chief
Division of Planning and Budget

I. REORGANIZATION OF TRANSPORTATION

- A. INDOT formed in 1989
- B. Consolidated all modes of transportation
 - 1. Highways
 - 2. Rail
 - 3. Aviation
 - 4. Transit
 - 5. Abolished Transportation Planning Office
- C. Provide for integration of all modes of transportation
 - 1. Provides opportunity for true intermodal planning.
 - 2. We are now beginning development of the department's first long range plan.

II. SOUTHWEST INDIANA HIGHWAY FEASIBILITY STUDY

- A. Study feasibility of highway between Evansville (pop. 100,000) and State Capitol.
 - 1. Evansville is largest city in Indiana not connected to Capitol by Interstate.
 - 2. Six studies done in past.
 - a. Not feasible due to cost.
 - b. This study would include potential economic benefit.
- B. Consultant team was chosen to do \$500,000 study.
 - 1. Prepared sketch plans of three alternate routes.
 - 2. Projected future traffic volumes of each.
 - 3. Prepared forecasts of economic development of each route.
 - 4. Calculate cost/benefit ratios for each alternative.

C. Public meetings were held throughout the Region.

1. Attended by over 2,000 people.
2. More than 400 persons testified.
3. Only two persons opposed the road.

D. Cost of the route drove down the cost/benefit ratio.

1. Cost of almost \$700 million.
2. Ratio of 1.25 - 1.50 resulted.
 - a. A lot less than we had hoped for.
3. A coalition of local and state officials will proceed to seek funding to build the route.

KANSAS

Mokhtee Ahmad, Assistant Bureau Chief of Transportation Planning

In May 1989, Governor Mike Hayden signed into law, a highway bill (H.B. 2014) providing for an enhanced eight-year highway program (FY 1990 through FY 1997). In order to provide for construction and reconstruction of a modern and efficient highway system, the Secretary of the Department of Transportation, (KDOT) is authorized to initiate a program which includes highway and bridge projects the Secretary selects in accord with the KDOT selection method. It is the intent of the accelerated building program, as nearly as possible, to address the top 16 percent of existing state highway system needs, as determined by the KDOT prioritization method; to increase priority bridge projects of about 20 percent over the program period; and to expend about \$600 million for enhancement projects.

Additionally, the Secretary is directed to include in the highway program the following:

- Increase in substantial maintenance to a level which arrests and reverses the decline in road and bridge surface conditions (known as the "adequate" level of maintenance);
- Maximum use by the State of available federal highway funds;
- Increase of the state partnership with cities and counties, including geometric improvements on city connecting links, city connecting link payments, and economic development projects;
- Improvement in transportation programs to aid the elderly and handicapped (\$390,000 annually);
- System enhancement projects which improve safety, relieve congestion, improve access, or enhance economic development;
- During the period July 1, 1989, through June 30 1997, at least \$2.5 million is required to be expended for highway, bridge, and substantial maintenance projects in each county of the State from revenue produced under the bill; and
- The state payment to cities for maintenance of streets and highways designated by the Secretary of Transportation as city connecting links is increased as of January 1, 1990, from \$1,250 to \$2,000 per lane mile.

These expenditures are to be financed by the following revenue provisions:

- ***Bonding and Investment Authority.*** The Secretary is authorized to issue bonds, including refunding bonds, for the highway program. However, no such bonds can be issued before July 1, 1991. The total principal amount of such bonds may not exceed \$890 million. The maturity date of such bonds cannot exceed 20 years. The highway bonds do not constitute a debt of the State but are an obligation of the State Highway Fund, they are exempt from state income taxes, they are approved investment instruments for public bodies and financial institutions, and they may be used as pledged securities by financial institutions seeking the deposit of public funds. Investment of bond proceeds and other revenues to the State Highway Fund are subject to the prudent person rule (except that investment in common stocks is prohibited). The Secretary may recommend investment policies; however, all investments are made by the Pooled Money Investment Board. All interest earnings of the State Highway Fund will be deposited in such fund.

Enabling language permits the Secretary to refund the freeway bonds. Refunding can occur before July 1, 1991. Such refunding bonds are not counted toward the \$890 million cap.

- ***Registration and Related Fee Increases.*** Vehicle registration fees are increased generally as follows: the registration fees for automobiles 4,500 pounds or less are increased from \$13 to \$16.25 and \$19.50 to \$25; those over 4,500 pounds are increased from \$26 to \$35; pickup trucks generally are increased from \$25 to \$35; regular trucks are increased in a range from \$75 to \$100 (12,001 to 16,000 pounds) to \$1,475 to \$1,925 (80,001 to 85,500 pounds); local and 6,000 mile trucks are increased in a range from \$47 to \$60 (12,001 to 16,000 pounds) from \$775 to \$1,000 (80,001 to 85,500 pounds); and farm trucks are increased in a range from \$25 to \$35 (farm pickups less than 16,000 pounds) to \$500 to \$600 (66,001 pounds and over).

Commensurate changes also are made affecting the following: motorized bicycles (\$5 to \$10); motorcycles (\$10 to \$15); certain electrically propelled vehicles (\$6.50 to \$13); license plate fees for vehicles being delivered by the drive-away method (\$39 to \$44 for the first set and \$13 to \$18 for additional sets); trailers (\$10 to \$15 for 8,000 pounds or less, \$15 to \$25 for 8,001 to 12,000 pounds and \$25 to \$35 for 12,001 pounds and over); 30-day temporary

registrations (\$2 to \$3); intrastate 30-day truck operator permits (\$20 to \$26); nonreciprocal 72-hour truck permits (\$20 to \$26); farm truck 30-day intrastate permits (\$20 to \$26); initial antique vehicle registration (\$15 to \$40); special interest vehicles and street rods (\$20 to \$26); first dealer license plates (\$250 to \$275); and 30-day temporary dealer registration permits (\$2 to \$3).

(H.B. 2177 exempts certain nonhighway mobile homes and trailers from registration.)

- Motor fuel taxes are increased by seven cents per gallon, as follows: 4 cents per gallon beginning on July 1, 1989, 1 cent per gallon beginning on July 1, 1990, one cent per gallon beginning on July 1, 1991, and 1 cent per gallon on July 1, 1992. The following fuel tax rates per gallon will be in effect on July 1, 1992, when the increases contained in the bill are fully phased in: gasoline, 18 cents; special fuels, 20 cents; and LP-gas, 17 cents. Existing provisions of law impose an inventory tax on dealers holding fuels which have been taxed at the prior rate. The alternative LP-gas tax schedules are adjusted commensurately with the per gallon fuel tax increases. Interstate motor fuel trip permits are increased from \$6.50 to \$8.50 on July 1, 1989, to \$9.00 on July 1, 1990, to \$9.50 on July 1, 1991, and to \$10.00 on July 1, 1992.

The fuel tax indexation provision of the prior law is repealed.

Local units retain their allocation of 40.5 percent fuel taxes through the Special City and County Highway Fund (SCCHF). The distribution formula for revenues produced by the current fuel tax rates is unchanged. Distributions of revenue produced by the increased rates are based on a three-factor formula -- average daily vehicle miles traveled in the county, motor vehicle registration fees collected in the county, and total road miles in the county. These factors are equally weighted.

- ***Sales Tax Transfer from State General Fund to State Highway Fund.*** The sales tax transfer from the State General Fund to the State Highway Fund is increased to 10 percent, beginning with October 1, 1989. The transfer is based on the present 4 percent sales tax rate.
- ***Sales and Compensating Tax Increase.*** The present sales and compensating tax (4 percent) is increased beginning on July 1, 1989, by 0.25 percent (to 4.25 percent). The proceeds attributable to such increase go to the State Highway Fund.

**Highway Plan--Proposed Revenue and Expenditure
Enhancements for Fiscal Years 1990-1997
(In Millions)**

REVENUE ENHANCEMENTS

Motor Fuel Tax	\$ 444 ^a
Registration Fees	227
SGF (Sales Tax Transfer)	223
Retail Sales and Compensating Tax	474
Interest on Funds	<u>65</u>
Subtotal Revenue Enhancements	\$ 1,433
Net from Bond Sales (proceeds and interest)	<u>913</u>
Total Enhanced Revenues	\$ 2,346

EXPENDITURE ENHANCEMENTS

Offset Shortfall in State Highway Fund and Provide Adequate Ending Balance in FY 1997	\$ 694 ^b
Reconstruction, Improvement, Priority Bridges and Systems Enhancements	1,537 ^{c,d}
Elderly and Handicapped	3
City Connecting Links	7
New Debt Service	<u>105</u>
Total Enhanced Expenditures	\$ 2,346

NOTE: Debt service is based on the issuance of \$890 million in 20 year bonds at 8.25 percent. Debt service beyond 1997 is estimated at \$1,742 billion.

- ^a Because this table includes only State Highway Fund revenues, the fuel tax distribution to the SCCHF (\$302 million) is not included.
- ^b Shortfall: \$500 million; ending balance: \$194 million.
- ^c Additional 3 percent for state operations is included in the program.
- ^d This is the payout cash flow during the period. The payout beyond FY 1997 would be \$325 million.

KENTUCKY

Dwayne Clemons
Steve Williams
Transportation Planning Engineers

Kentucky's Small Urban Area Transportation Planning and Travel Model Process.

Good morning, it's a pleasure to be here. Today, I'm going to briefly talk about some things Kentucky has been doing recently regarding Small Urban Area Travel Modeling as it relates to urban transportation planning. Kentucky is known more as a rural state, but the need for urban transportation planning is as real as in any other state.

Kentucky has 38 small urban areas. A small urban area, as defined by the Bureau of Census, has a total population between 5,000 and 50,000 people. The Transportation Cabinet's Division of Mass Transportation, where I work, is responsible for the preparation of transportation studies and computerized traffic prediction models for these areas. The division has a total of six Professional Engineers (P.E.) and Engineer-In-Training (E.I.T) positions dedicated to urban transportation planning, although we have been operating with as few as three people from time to time. About one-half of work time is spent on small urban area planning.

The average study process takes six to seven months to complete. If we are short of time or staff, or if the need for a formal study is not urgent, we may decide to just build the traffic model for a particular area. This process has most of the same major components of the formal study process, but only takes three to four months. We use this process primarily to have the traffic model ready to test proposed highway improvements for their traffic impact on the highway network. If a study of this area were needed in the next few years (four to five), we can use what we have done for the traffic model and complete the study in a very short time.

Since 1985, when we began using our current microcomputer software programs, we have developed ten urban studies, are working on three others, and maintain 17 other small urban area travel models. We also maintain the traffic models of two of our metropolitan areas - Owensboro and Ashland. Since early 1987, we have collected new socio-economic data in 29 small urban areas, plus two MPO areas. We have established statewide consistency in traffic modeling application, through the use of MINUTP, with the exception of the Cincinnati Metropolitan Area.

The specific prediction model we use is MINUTP. MINUTP is the trade name for the computer traffic simulation programs which we use. We have four IBM compatible 386 series microcomputers to run the MINUTP software programs. Here's an example of the speed with which the MINUTP-driven models can be run. One of our metropolitan areas has 80,000 people. It takes seven minutes to run the model on the 386 microcomputer, about twenty-three minutes on an AT-compatible machine, and about one hour and twenty minutes on an XT-compatible PC.

In the past year, we have begun to use the graphics capability of MINUTP. The graphics package allows the interactive, on-screen manipulation of computerized networks. Highway network plots containing various data can be plotted from the data files; and we have our own plotter within the division.

In April 1989 we presented a technical document entitled "Small Urban Area Travel Modeling Using MINUTP" at the National Planning Conference in Orlando, Florida. Our staff wrote this document, which explains our study process.

Our traffic modeling process uses as variables the zonal population and employment. This data is collected by our Area Development Districts, who also help forecast the data and distribute by zone to a future level. Our Division of Planning handles the traffic counting for us, while the Cabinet's District offices supply us with cost estimates for potential future projects for the studies.

In the next three to four years we hope to have either a transportation study or an updated traffic model for all small urban areas. We expect to add a few small urban areas as a result of the 1990 Census. Our goal is to update each small urban area travel model every ten years.

Our efficiency and capability in the urban transportation study and traffic model process is improving all the time. We're looking forward to the role we will play in forecasting Kentucky's future urban highway problems and in helping to develop workable solutions.

MICHIGAN

E. W. Bailey
Systems Planning Administrator

INTRODUCTION

- I'm sure that you're all aware, as we here in Michigan are, of the recognition of the partnership that has been formed between transportation and economic development.
- Michigan has shown remarkable economic growth over the past several years. Economists have stated that the economy cannot continue to grow and prosper unless a suitable transportation network is in place to effectively move both people and goods.
- We have told you all about Michigan's Transportation Economic Development Fund before. Today, I'd like to take this opportunity to describe some of our noteworthy work involving nonroadway modes.
- \$5.23 billion is a number that the Michigan Department of Transportation is rather proud. It is the total economic activity generated by aviation in our state. This number was the result of an eighteen-month study undertaken by Michigan with a grant from the Federal Aviation Administration.
- The study is called the Value of Airports to Their Communities - Economic Benefits of Aviation. With a name like that, you can understand why we just call it VATCEBA.
- With VATCEBA we set out to determine the total benefits derived by a community from its airport.
- We knew that different segments of our economy were generating economic activity in terms of expenditures of money, household incomes and employment.
- This was, and is, true of manufacturing, agriculture, tourism and even governmental units.

- Aviation, as measured by airport facilities, turned out to be a bit different. Not only did the airports support all segments of the state economy, they turned out to be an important part of the activity generated by the transportation segment itself.
- But the total benefits were not limited to just generated economic activity. We found that some benefits derived from a community airport could not have a dollar value placed on them. So that led us to divide the study into economic benefits and noneconomic benefits.
- The primary reason for the study was to inform people outside the aviation field about the importance of facility development.
- Residents of communities contemplating airport development are quick to ascertain the negative aspects of a project to them personally.
- And we didn't find too many people who contested the need for Detroit Metro Airport, our largest facility.
- On the other hand, pointing out to people that airports which were exclusively general aviation and even smaller air carrier facilities contributed to the quality of their lives, was difficult to say the least.
- VATCEBA has provided us with an educational tool. VATCEBA also gives us a handle on costs versus benefits. Not only can individuals gauge the value of airport development, the federal, state and local governments can, too.
- What did we find? As I have said, Michigan airports annually generate \$5.23 billion in economic activity in the state. Detroit Metropolitan Airport, not surprisingly, is responsible for a major share of this; \$4.08 billion or just over three fourths.
- The remaining airports with scheduled air carrier service account for \$780 million in annual economic activity; or about 15 percent.
- From the perspective of educating our citizens, perhaps the most important slice of this pie is the last one; the airports which are exclusively general aviation. These facilities generate \$370 million annually in economic activity.

- Of this total economic activity, \$1.7 billion flows directly through Michigan households. The spending, saving and tax flows resulting from this are significant. The study also attributes over 100,000 full time equivalent jobs to airports in Michigan.
- VATCEBA was able to survey the 32 airports with results which varied according to the size of airport. These sites varied with regard to operational levels, numbers of based aircraft, facility configuration, types of service offered, geographical location and economic segment serviced.
- The greatest benefit at a surveyed airport was found at Kent County International Airport in Grand Rapids, Michigan's second largest air carrier airport; \$240 million. The bottom end of the measurable range was found at a privately-owned field in Sandusky; \$3,900.
- These surveyed airports allowed us to estimate with confidence the average annual economic activity generated by facilities of differing type. We found a direct correlation between generated activity and the runway length and configuration classifications we use in our state aviation system plan.
- We can say that, on average, a transport type airport generates \$23.7 million in annual economic activity; a large utility \$1.5 million; and so on.
- But the economic benefits were only part of the picture. I mentioned before that \$3,900 was what we found to be the bottom of the measurable scale. We actually found an airport which generated no discernable economic activity; Zero. Yet this community, Kalkaska, continually supported their airport with up to \$3,500 per year. Why incur this cost without a measurable benefit? It was simple, the benefit was there, you just couldn't put a dollar value on it and run it through an economic model. So we tried to identify the noneconomic benefits which led to continued community support.
- Some examples of the noneconomic benefits we found in Michigan may seem rather obvious to those of us in the transportation field, but we found the need to bring these to the attention of our citizens and local government agencies.
- Michigan now has a methodology in place to repeat this procedure in a consistent way. We foresee the possibility of using this educational tool as a part of the airport master planning process in the same way we use noise and environmental impact studies; to assess who and what is affected and inform the public of the effects of development.

- We feel that this will be an invaluable tool in making airport development less a case of governmental force and more a case of governmental cooperation for citizens and local governments.
- A second item is part of Michigan's approach to consideration of high speed ground transportation for its highest travel corridor: Detroit-Chicago. We call it the **DETROIT-CHICAGO CORRIDOR BLUEPRINT PROJECT**.
- The Blueprint Project brings Michigan to the threshold of major economic development in the Detroit-Chicago corridor. It will achieve this in two ways: 1) by identifying rail improvements designed to reduce travel times between Detroit and Chicago to as low as three hours by attaining speeds up to 125 mph; and, 2) by determining the feasibility of high speed ground transportation for the Detroit-Chicago corridor.
- Initially, this translates into ...
 - Jobs for those working on the infrastructure improvements.
 - Jobs for those providing the additional train trips.
 - More travellers/tourists coming to Michigan, resulting in more money being spent in Michigan commercial establishments.
 - More business being transacted throughout the corridor, particularly in Michigan, triggered by more convenient rail passenger access to existing communities and their businesses, universities, and industry.
 - Expansion of existing, and development of new, business and industry enterprises in the Detroit-Chicago corridor.

The degree to which these will occur depends on service frequency increases and travel time reductions.

- Ultimately, it will result in one of the most beautifully developed corridors in the nation.
- The Blueprint Project identifies a range of rail passenger infrastructure and service improvements in the 80-125 mph and three to five hour travel time ranges.
- It began in September 1988, will span a two-year period, and cost approximately \$1 million.
- The project will be completed in fall 1990, about the time several improvements now in progress will be completed. This will permit immediate implementation of selected proposed improvements and provide a short-range program for implementing others.

The Blueprint Project involves . . .

- The railroad owners (Amtrak and Conrail).
- Three states directly (Illinois, Indiana, and Michigan).
 - Integral part of the blueprint project organizational structure.
 - Tri-state Commission. Legislation has been passed and signed by the Governor in Michigan (August 1988) and Illinois (September 1989).
- Two additional states indirectly through the high speed rail compact (Ohio and Pennsylvania).
- **Optimizing Economic Benefits.** For instance, improved worker access to jobs, more convenient transportation for the business person, and an attractive means of transportation for the tourist.
- Maximize leverage of public and private sector funds.
- **Previous Investment.** Some \$60 million in private and quasi-public funds have been invested in the last 10 years to install continuous welded rail throughout the corridor, as well as \$10 million in State funds to improve the rail passenger stations along the route.
- **Ridership and Revenue Forecasts.** Rail passenger service offers a high capacity, cost effective, energy efficient transportation alternative providing there is sufficient demand. Consequently, ridership forecasts are being developed, as are revenue estimates from passengers and package express.
- **Major Options.** Essentially five options. They constitute sets of improvements, and associated costs, which achieve reduced travel times of approximately 5, 4 1/2, 4, 3 1/2, and 3 hours between Detroit and Chicago.
- **Economic Development.** The economic development potential of these options will be assessed.
- **Investment Strategy.** The means required to fund the development of these options will be determined.
- **Transportation and Economic Development.** This means jobs to build and operate the improved rail service, jobs to build and operate the businesses and industries comprising the economic development, increased tax base, and more income to communities where the economic development occurs.

- **Integration of Detroit Commuter/Suburban Rail Service.** Improved access to jobs and lower user transportation costs should result.
- **Future Beyond 125 MPH.** The higher the rail speed and the shorter the travel time, the greater the potential for economic development adjacent to and near rail passenger stations. The Blueprint Project will examine the potential for high speed, very high speed, and super speed ground transportation in the Detroit-Chicago corridor. Studies to date conducted in other parts of the country indicate that these systems will generate revenues sufficient to cover all operating and some capital costs in the nation's higher demand corridors.
- **New Equipment.** Different locomotives, tilt-bodies, and cab signaling will allow higher speeds. In some cases, the tilt-body feature will achieve the same result as improving track alignment or increasing the superelevation.
- **Magnetic Levitation Train.** This would connect Chicago O'Hare Airport, downtown Chicago, Detroit Metropolitan Airport, and downtown Detroit.
- **1 1/2 Hour Detroit - Chicago Travel Time.** This would be achieved with train speeds up to 300 mph.
- **Redeveloped Downtown Detroit.**
- **Development Beginning to Occur Around Selected Intermediate Stations.** Kalamazoo would be one of the most likely to develop first.

This would be tied into a regional system connecting the Detroit-Chicago corridor with places such as St. Louis to the west and the Northeast Corridor to the east.

It could ultimately be part of a national system extending from coast to coast. Several efforts are under way . . .

- **National Transportation Policy.**
 - Secretary of Transportation developing a National Transportation policy which will hopefully include high speed ground transportation and an expanded role for Amtrak.
 - Federal Railroad Administration (Administrator Gilbert Carmichael) is supportive of high speed ground transportation
- **Research.**
- **Financial Incentives (Tax Free Bonds).**

It's time for us to expand our thinking to achieve a new level of economic development in the Mississippi Valley. Michigan believes one of the ways to do this is the Blueprint Project.

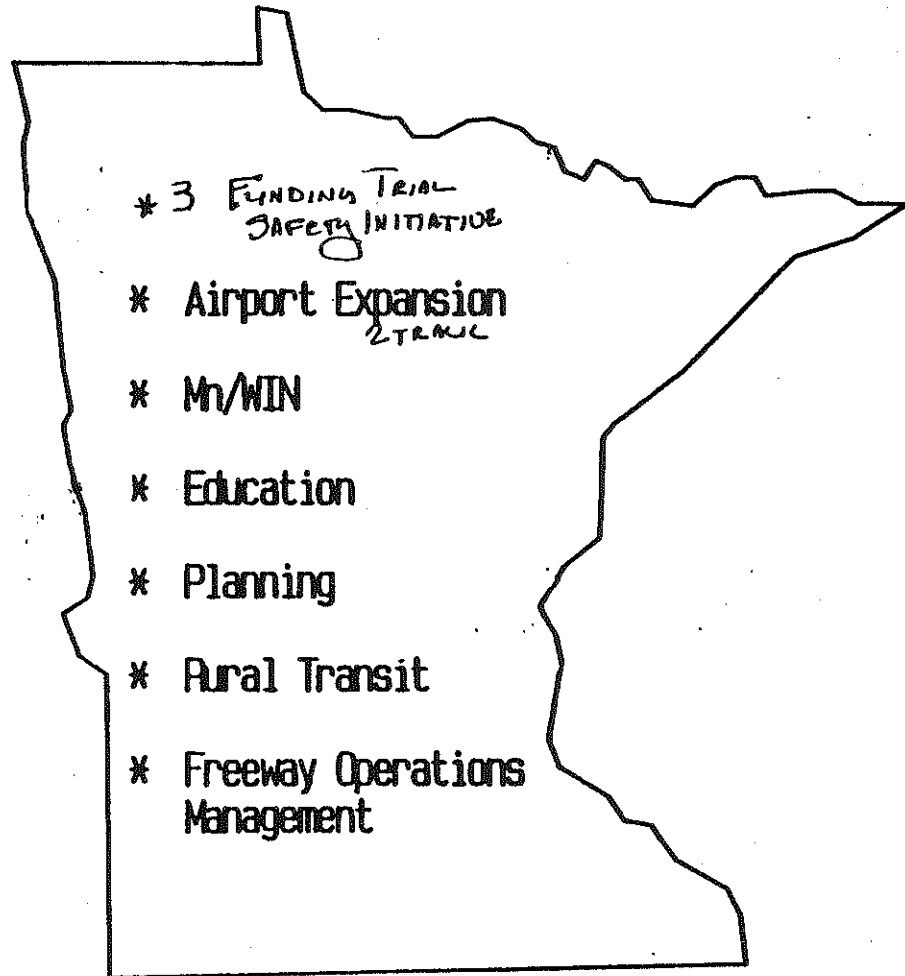
We feel very strongly that the results of the work done on our aviation economic study and our rail blueprint study will produce several very different, but all very useful results.

First, these efforts just described to you will have produced published studies which document a methodology, a process, and describe the results in economic terms.

Second, we can effectively use these products to continue to emphasize transportation - including all of the modes - and economic development as a hand-in-hand process.

Lastly, and perhaps most importantly, we have developed some very useful educational tools that allow us to continue to inform the public about the importance of the highways and the modes, and of the total impacts of this business that is called transportation!

Mn/DOT BRAGGING TIME



MINNESOTA

Jon Bloom, Director
Highway and Area Planning

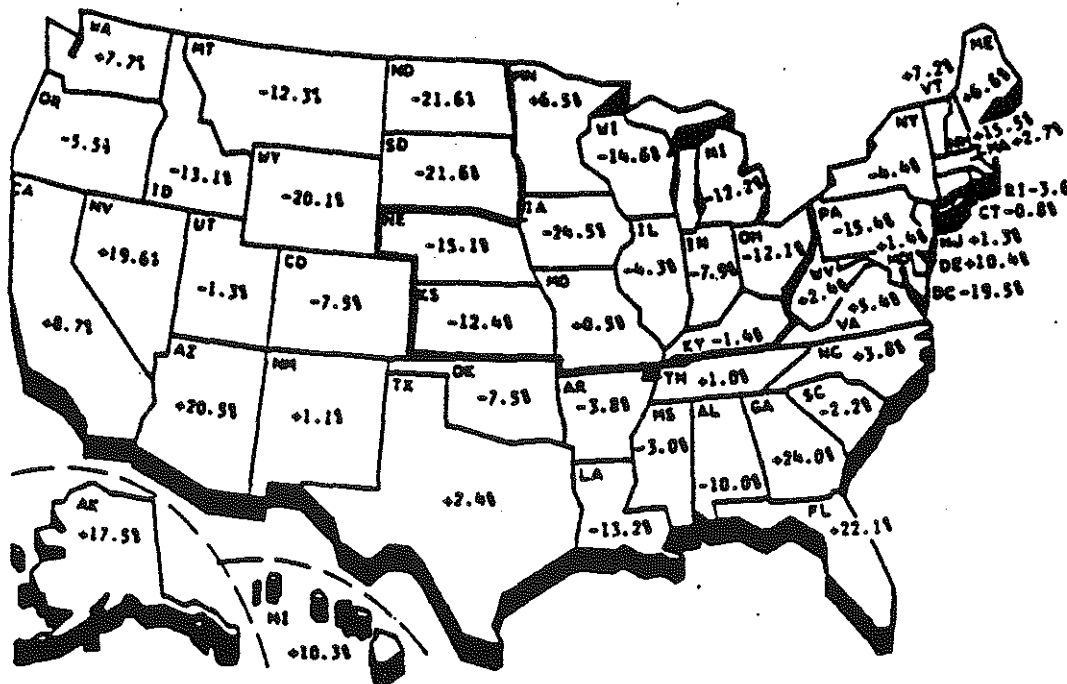


PRELIMINARY HIGHWAY FACTS



OCTOBER 1989

GASOLINE CONSUMPTION 1978-1988



* Taxable sales of gasoline and alcohol blends. 1988 data preliminary
Source: Lundberg Survey, Inc. Share of Market Dept.

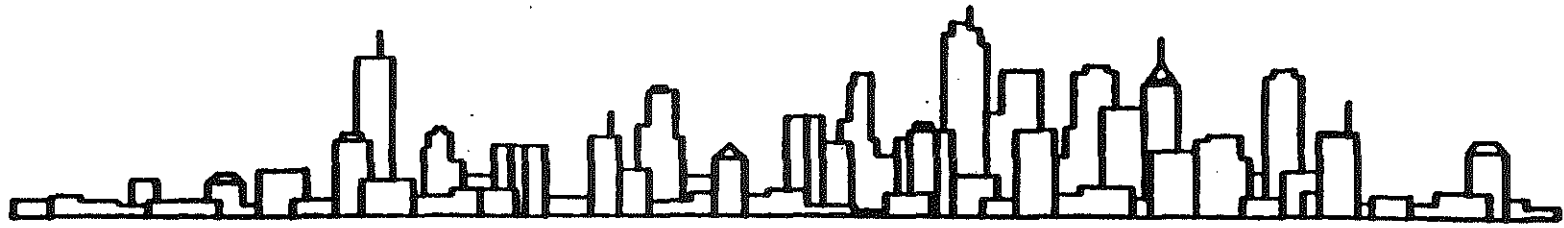
Lundberg Lector Chart

THE ABOVE MAP DETAILS THE PERCENT DIFFERENCE BETWEEN EACH STATE'S 1988 CONSUMPTION AND THAT OF 1978.

TWENTY-THREE STATES, INCLUDING MINNESOTA, CONSUMED MORE GASOLINE IN 1988 THAN THEY DID DURING 1978. IT SHOULD BE NOTED THAT MINNESOTA'S 6.5% INCREASE WAS THE ONLY INCREASE IN THE MIDWEST REGION.

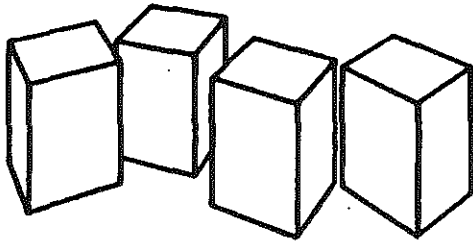
INCREASING GASOLINE CONSUMPTION CAN BE CORRELATED TO INCREASING TRAVEL AND GROWING DEMANDS FOR TRANSPORTATION SERVICES.

OFFICE OF HIGHWAY PROGRAMS



Urban Congestion -- Year 2000

- 3 6 % Increase Vehicle Miles of Travel
- 1 0 % Increase Highway System Capacity
- 8 1 Miles of Minor and Moderate Congestion
- 1 2 5 Miles of Major and Severe Congestion



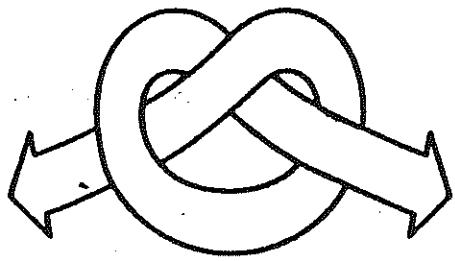
ISSUES

- * System is Maturing
- * Most of the 580 Mile Metro System Will Require Rebuilding by 2010
- * Inflation and Fuel Efficiency Have Reduced Real Funding Increases
- * Stability of Funding
- * Very Limited Funding for System Completion/Expansion
- * Accessibility to Opportunities Will be Reduced

FREEWAY OPERATIONS MANAGEMENT

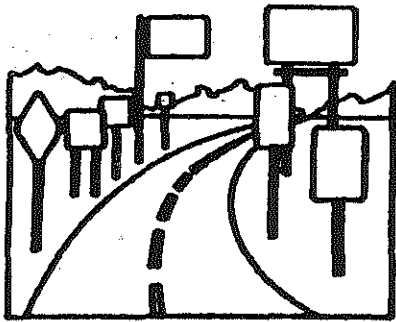
**16TH LARGEST URBAN AREA
230 MILES OF URBAN FREEWAY**





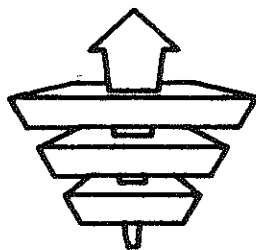
CONGESTION

- * Implement Techniques to Reduce Congestion
- * Apply New Technology
- * Respond to Incidents
- * Support Transit and Rideshare



FREEWAY OPERATIONS MANAGEMENT

- * Freeway Operations
- * Incident Response
- * Freeway Operations Planning
- * Traffic Demand Management
- * Public Affairs



COORDINATION

- * Mn/DOT Metro Districts
- * State Patrol
- * Metropolitan Council
- * Transit Providers
- * Towing Service
- * Local Law Enforcement Officials
- * Cities & Counties
- * Public

MISSOURI

Keith McGowan
Urban Planning Engineer

Missouri is involved in several planning activities which are new to our department.

Pavement Management - We have purchased an ARAN van and have covered almost the entire 32,000 miles of state system with the initial analysis. For the past three years we have been working to obtain reliable data from our WIM equipment. Most of the problems have been resolved and we are beginning to produce what we consider to be acceptable results.

Computer Aided Design Mapping and GIS - Our computer-aided mapping and design system was installed in July 1987. Since that time, we have been developing the necessary refinements to the system to make it responsive to our mapping and GIS needs. Most of our bridge design and some roadway design is now being done by computer-aided drafting and design.

Corridor Studies - Like several other states in the region, we are currently involved in the Kansas City to Chicago and the St. Louis to St. Paul corridor studies.

Urban Planning - The procedures for updating origin and destination survey data in Kansas City and St. Louis are being developed so that data can be collected which is compatible with the 1990 Census data.

Aviation - Missouri has just been notified that the state will receive a \$10 million grant from the FAA to demonstrate the feasibility of block grants to states for small airport capital improvement projects.

Legislation - Several bills were introduced in the house and senate to provide alternative methods of generating income for transportation improvements. These included provisions for transportation development districts, transportation corporations, toll facilities, tax increment financing, and local gas tax. None of these were enacted into law during this past session.

Financial - In 1987, the people of Missouri approved Proposition A which provided for a four cent a gallon increase in the motor fuel tax (from 7 to 11 cents), a cap on the highway user revenues which can be expended by other agencies, an increase in registration fees and several other minor revenue producing items. This was the first increase in fuel taxes in Missouri since 1972. On several occasions, the department had attempted to obtain an increase but had been unsuccessful each time.

Proposition A passed for two significant reasons. The first was that the people were provided a program of specific projects and improvements which could be presented to them and they could be shown where the money from the increase would benefit their specific area. The other reason was the efforts of some business and community leaders which banded together into a group called the Missouri Transportation Development Council (MTD) to promote good transportation facilities in the state. This group was instrumental in carrying the word on highway needs to the people. A chairperson served MTD from each of the ten department districts.

In Missouri, and we suspect other states, motor fuel taxes cannot be increased without a vote of the people. It is essential that the people be informed about needs and specific projects to solve those needs. It's also essential that the commitments made are fulfilled. We are making every effort possible to see that this is done on Proposition A.

Proposition A provided \$6.2 billion of a total estimated \$12.6 billion in needs over the next 15 years. We are currently conducting a needs update which will probably indicate ten year needs of an additional \$5 to \$7 billion. If we are to convince the people to finance these needs, they will once again need to be informed and be a part of the process. In our efforts to secure additional funds to answer these needs, it is our intent to utilize the MTD to get the word to the people.

NEBRASKA

Keith Herbster
Assistant Transportation Planning Engineer

Nebraska's 1988 legislature provided directives that required our agency to make a comprehensive study of the state highway system's needs, review highway standards, and evaluate planning and programming procedures. In following those directives, new design standards were developed. The department then held 16 public hearings throughout the state to apprise Nebraska citizens of the proposed changes and to learn their views.

The changes in standards applied to the rural portions of the state highway system which comprises about 90 per cent of the system's total mileage. Some of the highlights included having 12' lanes on all roads, having bridges the width of the roadway plus shoulder, expanding the old surfaced shoulder system and the development of an expressway system to include a north-south route.

As the hearings progressed, support was nearly unanimous for the proposed changes in standards.

The expressway system was expanded to 609 miles and is made up of the highest traffic roads; highest potential for growth, development and traffic increases; connects cities of 15,000 population to the interstate; or is a road carrying 500 or more heavy commercial vehicles per day.

The surfaced shoulder system was expanded to what is now called the priority commercial system. It is made up of 3,303 miles of highways and will have 10' shoulders of which 8' will be paved.

This system is roughly 500 miles more than the old system. It serves directly all first class and larger cities; serves directly 82 of 123 second class cities; and comes within 10 miles of an additional 23 second class cities.

All of this was then used as part of the needs study. The needs study was completed based on an inventory of existing conditions, projected traffic, geometrics and surface condition.

Based on 1988 dollars, the 20-year needs came to \$3.8 billion.

The program selected to be presented to the appropriations committee was based on the premise the expressway needs would be accomplished in 15 years, other needs in 20 years and the Omaha interstate rehabilitation in ten years with the help of discretionary funding. Also assumed was a mid-range option for inflation factors and funding growth factors.

To fund this, would require an average gas tax increase of 3.5 cents if that were the method used to finance the program. The committee agreed and we were off and running with a fuel tax of 22 cents per gallon.

OHIO

Richard H. Henderson
Assistant Deputy Director

Ohio Brag Session

1. Events leading up to state tax -- Ohio passed tax in 1989 -- five cent increase.
2. Progress in Ohio -- we have a pavement management system, a bridge management system and a project development management system (programming.)
3. Statewide planning initiative -- develop a statewide plan in a statewide concept including all modes.

CLOSING FORUM DISCUSSION AND FUTURE SEMINAR TOPICS.

The closing discussion and comments gave a strong indication that future technical seminars of the MVC Standing Committee on Planning need to occur on a regular basis. The changes resulting from the 1990 census, post 1991 legislation, and our ever changing role as transportation planners, the value of future conferences was highly recommended.

The following topics were suggested by the participants as the potential subject matter of future conferences:

- Concepts in urban planning
- Where are planning problems?
- Geographic Information System (G.I.S.) in transportation planning; future technological developments
- Impact of new Highway Act
- National policy critique
- Pricing mechanism on transportation facilities to regulate demand and replace gas tax as a revenue source
- Strategic Highway Research Program (SHRP) as it has affected transportation departments in terms of workload, data collection requirements
- Relationship between economic development and transportation planning including public/private sectors
- Role of planners in future
- Include significant accomplishments from three other AASHTO planning regions (WASHTO, SASHTO, NASHTO)

TECHNICAL SEMINAR AGENDA

November 2, 1989

- 9:30 Registration
Kent Room, Level 3
- Moderator - Susan Gregory, Michigan DOT**
- 11:00 Opening Session
Kent Room, Level 3
- Welcome - *G. Robert Adams, Chief Deputy Director, Michigan DOT*
- Format/Objectives - *Gloria J. Jeff Michigan DOT*
- 11:20 State Bragging Session
- Illinois
 - Indiana
 - Iowa
 - Kansas
- 12:45 Lunch - Greco Room, Level 4
- Reconvene in Kent Room, Level 3
- 1:45 Panel Discussion: Urban Transportation Planning - Preparing for the 21st Century
- Moderator: *E. Keith McGowan, Missouri Highway and Transportation Department*
- Panelist: *Robert Cervero, University of California, Berkeley*
- Michael Meyer, Georgia Institute of Technology*
- 3:15 Break - Kent Room
- 3:30 National Transportation Strategic Plan
- Eugene McCormick, Deputy Administrator Federal Highway Administration*
- 4:00 AASHTO 2020 and Report on TAG Activities
- David Clawson, AASHTO*
- 4:15 Financial Recommendations on the Truck Tollway Study - Kansas City, Missouri to Chicago, Illinois
- Dan Dees, Illinois DOT*
- 4:45 Slide Tour of the City of Detroit
- Gloria J. Jeff, Michigan DOT*

November 3, 1989

- 7:30 Continental Breakfast - Windsor Room, Level 4
- Moderator - Susan Gregory**
- 8:30 Urban Transportation Planning
Break Out Sessions:
- Monet Room, Level 4
 - Raphael Room, Level 4
 - Renoir Room, Level 4
- 10:00 Break - Kent Room, Level 3
- 10:15 Reports on Break Out Sessions
Kent Room, Level 3
- 10:45 State Bragging Session
- Kentucky
 - Michigan
 - Minnesota
 - Missouri
- 12:15 Lunch - Windsor Room, Level 4
- 1:00 Resource Allocation/Resource Acquisition
Goal Programming
- Dean Landman, Kansas DOT*
- 1:30 State Bragging Session
- Nebraska
 - Ohio
 - Wisconsin
- 2:30 National Functional Classification Survey Highlights
- Gloria J. Jeff, Michigan DOT*
- 3:00 Break - Kent Room, Level 3
- 3:15 Planning for Summer AASHTO SCOP and Possible MVC Annual Meeting Sessions
- Gloria J. Jeff*
- 3:45 Closing Remarks
- G. Robert Adams, Michigan DOT*

MVC SCOP-TECHNICAL SESSION
November 2-3, 1989
Detroit

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