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- UCLA EXTENSION PUBLIC POLICY PROGRAM
- UCLA INSTITUTE OF TRANSPORTATION STUDIES

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CONFERENCE SUMMARY

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CONFERENCE SUMMARY

TRAFFIC CONGESTION: ISSUES AND OPTIONS

June 26-27, 2003
Washington, D.C.

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TABLE OF CONTENTS

Introduction		1
Session I:	Understanding Traffic Congestion	3
Session II:	Addressing Congestion with Capacity Improvements	7
Session III:	The Federal Role in Addressing Traffic Congestion	10
Session IV:	Improving Goods Movement in Congested Areas	11
Session V:	Using New Technologies and Information to Better Manage Multimodal Traffic Flow	14
Session VI:	Views from Capitol Hill on Traffic Congestion and TEA-21 Reauthorization	17
Session VII:	The Roles of Land Use Planning and Improved Public Transit in Relieving Congestion	17
Session VIII:	Traffic Congestion and Air Quality	20
Session IX:	Addressing the Policy and Institutional Challenges to Tackling Traffic Congestion	22
Session X:	The Prospects for Market-Oriented Solutions to Congestion	24
Session XI:	Synthesis	26
Appendix A:	Conference Program	30
Appendix B:	Conference Sponsors and Cooperating Organizations	37
Appendix C:	Participants	38

INTRODUCTION

In 2003, elected officials on Capitol Hill will outline the national transportation legislation that will define and fund transportation investments throughout the country for the next six years, directly affecting how metropolitan regions will respond to traffic congestion, one of the most enduring and vexing public policy issues facing the nation. With the current federal surface transportation legislation, the Transportation Efficiency Act for the 21st Century (TEA-21), set to expire September 30, 2003, serious debate about reauthorization is well underway, and politicians, transportation agency leaders and service providers, industry officials, states and local community representatives all have a keen stake in the outcome.

An electronic visit to any national news index shows that communities across the country are grappling with congestion. In some areas, proposed housing and commercial developments live or die by the additional traffic they may create, as communities increasingly associate growing traffic with declining quality of life. Consumers acting on ordinary preferences for spacious single family housing often pay the price with long, congested daily commutes, and businesses cite the high costs and lost productivity imposed on their operations by congestion-related delays. Additionally, regional transportation providers and the elected officials to whom they answer are increasingly frustrated by both recurrent traffic at bottlenecks and other hot spots, as well as non-recurrent incident-related jams that without warning can disrupt or even cripple regional transportation networks for hours during peak periods.

With a focus on the policy issues relevant to the upcoming TEA-21 reauthorization, the University of California at Los Angeles (UCLA) organized a conference on *Traffic Congestion: Issues and Options* in Washington, D.C. on June 26 - 27 to assess the severity of the congestion problem, to discuss its causes and consequences, and to explore feasible technical, institutional, and policy strategies for mitigating congestion. The conference brought together transportation agency and industry leaders, policymakers, opinion leaders, practitioners, and researchers to debate how congestion and its impacts may be quantified most accurately, and what congestion-related goals are realistic: reducing congestion, emphasizing increased reliability over increased speeds, simply preventing worsening of congestion, or simply learning to live with it.

Speakers agreed that enough evidence exists on the costs of congestion to suggest that transportation decision makers and professionals must intervene. However, participants expressed a wide range of views about exactly what could and should be done, how, by whom, and with what funding. Most agreed that there is no single silver bullet that will eliminate congestion, and that we have to employ many strategies to tackle congestion problems. Many also acknowledged that different strategies will work best in different settings, and that no one strategy will fit all situations.

The following summary presents the conference proceeding session by session, capturing the major threads of each session and the discussions that followed, and emphasizing the key issues underlying the debates. The discussions demonstrate the complexity both of congestion as a physical phenomenon, with myriad causes, consequences and solutions, as well as of the metropolitan contexts where decision makers ultimately must choose what to do about it.

Amidst the diversity of views and the complexity of metropolitan scenarios, one encouraging theme emerges: elected officials and transportation policymakers and planners do have many potentially effective tools at their disposal to address congestion. The answers range from traditional approaches that add capacity or supply, to newer solutions that rely on technology, to changes in land use and development, to transportation pricing to influence transportation demand. Each has its place and its promise. Policymakers facing reauthorization of the federal surface transportation legislation this year have the opportunity to ensure not only that local communities, transportation agencies and service providers have choices for responding to congestion but also that the decisions and investments employed reflect the unique metropolitan context, result from equitable processes that consider the range of congestion solutions, promise to be cost effective, support environmental goals, and deliver measurable and meaningful results.

The conference was convened by the UCLA Extension Public Policy Program and the UCLA Institute of Transportation Studies. UCLA worked closely with a number of sponsoring and cooperating organizations in planning and presenting the conference. Sponsors were: the American Association of State Highway and Transportation Officials (AASHTO); American Public Transportation Association (APTA); American Road & Transportation Builders Association –Transportation Development Foundation (ARTBA–TDF); Federal Highway Administration (FHWA); National Cooperative Highway Research Program (NCHRP); U.S. Environmental Protection Agency (US EPA); and University of California Transportation Center (UCTC). Cooperating organizations were: the Association of Metropolitan Planning Organizations (AMPO); Eno Transportation Foundation; PB Consult, Inc.; Transportation Research Board (TRB); and UC Berkeley Institute of Transportation Studies.

This report was prepared for UCLA by Gian-Claudia Sciara, Senior Transportation Planner, Parsons Brinckerhoff.

Joanne Freilich, Director of the UCLA Extension Public Policy Program, opened the conference with an account of the conference's genesis. The well known and successful Lake Arrowhead Conference, a series hosted annually by UCLA in California, provided inspiration for this two-day Washington D.C. program to address traffic congestion in the context of reauthorization of federal transportation legislation. The assembled group of policy leaders, practitioners from government agencies, private business representatives, environmental advocates, and university scholars have been invited to consider traffic congestion from many perspectives.

UCLA has played a central role in convening conferences and symposia that bring together transportation researchers, policymakers and practitioners so each may learn from one another. The objective in launching this conference in Washington, D.C. was to contribute to more informed decision making in the reauthorization debate, including a deeper understanding of the causes and consequences of congestion, as well as a rethinking of traditional approaches to deal with traffic congestion. The conference was planned to allow ample time for discussion, as the healthy exchange of ideas, experiences and points of view is paramount as the transportation community faces the reauthorization of transportation legislation that will shape transportation investment in the U.S. over the next six years.

SESSION I: UNDERSTANDING TRAFFIC CONGESTION

Brian D. Taylor, Associate Professor and Vice Chair of Urban Planning; Director, UCLA Institute of Transportation Studies
Martin Wachs, Roy W. Carlson Distinguished Professor of Civil & Environmental Engineering and Professor of City & Regional Planning; Director, UC Berkeley Institute of Transportation Studies
Tim Lomax, Research Engineer, Texas Transportation Institute, Texas A&M University

Session I set the stage for the eleven sessions of the conference, providing perspectives on the persistence of traffic congestion as a problem, insights into the fundamental mechanics of traffic congestion as a physical phenomenon, and measures of the extent and cost of congestion. Brian Taylor painted a compelling picture of the challenge facing transportation professionals and policymakers today.

While traffic congestion is perceived as a tremendous problem by the public at large, media, and elected officials, Taylor invited the audience to rethink conventional wisdoms about congestion as a sign of metropolitan failure. Taylor likened congestion to death and taxes as a common part of metropolitan life. He reminded participants that while drivers feel that congestion today is at its worst, congestion has been a vexing problem for centuries and was in fact the subject of the very first city planning conference convened in the U.S.

Public officials see programs to reduce congestion as worthy and important objects of public spending, and various policy groups and coalitions argue for increased money for a variety of approaches to the problem. Often overlooked in these discussions, however, is the fact that traffic congestion is evidence of social and economic vitality and that the most congested cities also are often the most vibrant. While elected leaders focus on traffic congestion as a persistent problem with terrible costs, is it possible that those costs are overestimated? Is it possible that the desirable metropolitan condition that spawns congestion – namely, high levels of access to a wide variety of economic and social transactions – is largely overlooked?

Taylor offered several additional propositions as opportunities to rethink traffic congestion. These include the following:

Conventional measures of congestion focusing on freeway network delay are incomplete because they ignore the effects of congestion on individuals and firms.

Private automobiles provide tremendous utility to individuals, and they are likely to remain central to metropolitan life.

Capacity expansion that fosters congestion relief, however short-lived, supplies the undeniable benefit of accommodating more activity.

The correlation between compact development and walking and transit trips is complex and unclear. Compact urban form may in itself have little influence on travel behavior.

The best way to get more people walking and riding transit is by making driving slow, uncertain and expensive.

As Taylor outlined the agenda for the next two days, he encouraged participants to consider carefully the causes and consequences of traffic congestion and to discuss the best ways to address it. Rather than simply providing a platform for diverse stakeholders to articulate their positions on reauthorization, the conference sessions were designed to explore the issues underlying traditional debates about congestion in the hopes of informing decisions for more effective policies and programs to address it.

Martin Wachs illuminated the historical and political context surrounding traffic congestion. Wachs described congestion as a longstanding issue that has manifested itself in different forms in different times – from cart and pedestrian conflicts in Ancient Rome, to the nuisance of parked carriages and horses on the main streets in Charles II's London, to early 20th century American cities where on-street trolley networks provoked congestion complaints prior to the advent of grade separation. In the twists and turns of history, congestion has been socially defined by the times. Whereas automobiles were once viewed as the solution to crowded cities, they are now viewed as the cause.

His presentation also emphasized the values and constraints from which politicians approach traffic congestion. While elected officials welcome the growth and economic activity that bring about traffic congestion, they also eschew congestion itself and support measures to control or reduce it. If congestion worsens, it might drive businesses and economic activity to less congested locations. By the same token, measures that could cure congestion – such as pricing the entry of automobiles into CBDs or enacting stringent parking limits or fees – could also drive away business. Politicians are afraid to kill the goose that laid the golden egg, and political strategies tend more to accommodate congestion than to regulate it.

For centuries, those pursuing fiscal resources and varied political agendas have claimed that without action, the streets will choke and the economy will stagnate. Wachs challenged the argument that worsening congestion justifies spending money because the threat of gridlock is, allegedly, always just around the corner. Why, asked Wachs, do we think money can solve the problem if it has not done so before?

Wachs offered that congestion will always be with us and will remain a salient political issue. But because politicians have to deal with traffic congestion in a politically and publicly acceptable manner that is not too draconian, congestion is not likely to be completely solved though it will be addressed. He contended that innovations will always be part of the solutions advanced, and today's rapid development of information technology applications within transportation networks offers one of the most promising means to address congestion. Real time traffic monitoring and management, traveler information systems, and electronic and variable tolling represent a few of today's opportunities. Still, while the innovations used to manage congestion vary over time, the determination of what to do will always remain a political one.

Stepping in for **Kara Kockelman**, **Tim Lomax** presented Kockelman's overview of traffic congestion fundamentals. Lomax explained a speed-flow diagram showing the non-linear relationship between speed, traffic density, and flow. Traffic flow on highway lanes destabilizes when demand for the facility exceeds capacity and speeds deteriorate. When a facility nears overuse, small increases in traffic volume can cause big increases in traffic congestion and delay. For example, the last 100 people to enter a facility nearing capacity can cause traffic flow to deteriorate from 60 mph to 20 mph.

In considering solutions to congestion, Kockelman's presentation outlined several key concepts regarding congestion dynamics:

Where imperfect markets exist and demand exceeds supply, additional road users impose delays on others. This concept is one fundamental principle underlying congestion pricing, where road users are asked to pay for the marginal cost of their trip, as it impacts others.

Marginal adjustments that reduce congestion can yield big returns, particularly when measured in travel time.

Integrating land use and transportation, as one response to congestion, may yield significant changes over the long term.

Lomax also described Kockelman's current research on Credit Based Congestion Pricing, a concept similar to the FAIR lanes discussed by Patrick DeCorla-Souza of FHWA in Session X. This proposal combines credits and fees to shift some people's routes or time of travel in order to improve the level of service (LOS) on a facility. This credit-based road pricing scheme seeks to be revenue neutral by giving free credits at the beginning of each month to all regular users of congested roads. During rush hours, all users are charged to use such roads, with the charge electronically deducted from their monthly credits. Drivers who exceed their credit limit in a month pay "out of pocket" to drive during rush hour. For drivers with credits remaining at the end of the month, the credits carry-over, for later use, or may be traded for their cash value.

Drawing from his own experience producing the annual *Urban Mobility Report* at the Texas Transportation Institute, Tim Lomax focused attention on the measurement of congestion. He outlined three prominent measures of urban mobility: 1) Delay per person, measured in hours per year; 2) the Travel Time Index, the ratio of peak period travel time to free flow travel time; and 3) the Buffer Time Index, a measure of travel time reliability indicating how much of a time buffer one needs to arrive within the average travel time for a given trip.

Lomax described some broad conclusions of the *Urban Mobility Report*, produced annually since 1982:

Using the travel time index, congestion has continued to worsen over time.

Delay per person is also growing, though not as sharply in urban areas with population under 3 million.

While travel times in urban areas normally vary somewhat from average travel times, the variation during peak periods is substantial. To arrive on-time, travelers must budget for as much as three times the normal trip time.

Additionally, the TTI estimates that congestion costs the nation $68 billion in time delay and extra fuel consumed, wasting 3.6 billion hours per year and 5.7 billion gallons of fuel. It also degrades business productivity, air quality, and the accessibility of workers, markets and suppliers.

Lomax summarized the variety of solutions that urban areas may pursue, from building more capacity, to diversifying development patterns, to managing travel demand to increasing transportation system efficiency, and noted <u>all</u> must be considered. For instance, TTI data show that adding roads helps, but it would be difficult to add enough lane miles to solve the problem if that were the only solution. Or, to pursue transit solutions exclusively, the amount of service needed to accommodate growing population would equate to a whole D.C. Metro system every 4 years. Striking a theme that many would repeat throughout the conference, Lomax reminded the audience that there is no silver bullet and that consensus will be needed to successfully stop the growth of congestion, improve travel reliability, and provide more travel options.

Discussion

The panelists and audience discussed how to enlarge the transportation debate to include a full range of approaches to alleviating congestion. Wachs noted that the U.S. democratic political system was a societal asset in that it allows various interests to argue for the solutions they support. He said it was necessary for those with special interests to voice their concerns in public debate, as the bicycling community has done in the Bay Area. Taylor cautioned that politically strategic decision makers may respond to the various interests with a range of options, including transit, land use and/or pricing. He continued that great care needs to be taken to ensure that one intervention does not undermine another and actually make congestion worse.

Frank Randak, President of Advanced Vehicle Transport based in Southern California, maintained that the solution to traffic congestion will perpetually elude the transportation community unless the federal government invests in advanced vehicle technologies such as the DualMode technology. DualMode transportation features vehicles that can be driven on

conventional streets but can also operate on a high speed automated guideway. The U.S. government supported DualMode research in the late '60s and early '70s, said Randak, but those efforts stalled when funding dried up. He urged that today, it is more important than ever to focus on the great potential of this technology.

Susan Liss of the FHWA noted that a congestion measure that addressed users' perceptions was needed. Panelists responded that any user-oriented measure would probably relate to travel time and to safety, but that more work would be needed to calibrate available system level measures of congestion with measures of users' expected travel times.

SESSION II: ADDRESSING CONGESTION WITH CAPACITY IMPROVEMENTS

Don Pickrell, Chief Economist, John A. Volpe Transportation Systems Center
Alan E. Pisarski, Consultant
David Lewis, President**,** HLB Decision Economics
Robert Noland, Lecturer in Transport and the Environment, Centre for Transport Studies, Imperial College, London

Panelists in Session II addressed one of the most heated debates associated with metropolitan traffic congestion, namely what role should the expansion of system capacity have? While some argue that expansion of highway capacity – through new facilities, new lanes, or operational improvements garnered via ITS applications – is the most logical answer to congested roadway facilities, others discredit capacity expansion as a long term solution, citing induced demand effects that ultimately leave the facility with congestion at levels similar to those prior to the alleged improvement.

Don Pickrell of the Volpe Center shed light on this vexing debate by emphasizing three points: 1) the short- and long-term behavioral responses of drivers to added capacity on a facility; 2) the difference between induced demand for a facility and increased demand for a facility due to growing population or economic expansion; and 3) the real issues underlying debates on capacity expansion's merits and on the induced demand phenomenon.

First, Pickrell defined the travel behavior responses that produce induced demand when a facility's capacity is improved. When speed on the expanded facility initially rises, in the short-term travel is diverted to it from other parallel facilities or routes, from trips previously made at other times of day, and from other modes – a phenomenon that Anthony Downs called *triple convergence*. Longer term responses include more household trips, less household trip-chaining and more frequent business generated orders and shipments. These responses mean that, from the expanded facility's opening day, usage increases and speeds decrease. Second, Pickrell was emphatic about distinguishing these induced effects (demand generated by capacity improvements to the facility) from increased demand from other factors, such as rapid population growth or irreversible cuts in transit service.

Finally, Pickrell showed that other issues are at play in the capacity expansion debate. He argued that induced demand alone could not eliminate the benefits of increased capacity or make congestion worse. When capacity investments are made where roadway demand is increasing due to exogenous factors, however, it may appear to lay observers that the new capacity has exacerbated congestion. What drives critics to fight highway capacity expansion with the induced demand argument may relate more to underlying problems such as the environmental and safety consequences of more driving, the continued dispersion of land uses, and continued growth in travel demand. While these issues and their solutions are more complex, involving vehicle technology, transportation pricing, housing subsidies, fuel taxes and more, they are the underlying challenges in infrastructure planning and finance that need to be addressed most—even more than congestion itself.

Alan Pisarski contributed to the discussion by making a strong case for expanding roadway facilities and for the additional mobility that such expansion can accommodate. Pisarski underscored both the great strides achieved in the U.S. to reduce the influence of distance on its economic future and the tremendous benefits that accrue to individuals from unsurpassed personal mobility provided by a vast road network. Would America be America without its high levels of individual mobility or without its trademark access to consumer products – from roses to spring water – shipped from points around the globe? If all trips are understood as a rational means to accomplish some transaction of social or economic value, then congestion itself may assume a different hue. Defined by Pisarski, congestion is nothing more than "People with the economic means to act on their social and economic interests getting in the way of other people with the means to act on theirs." Pointing to a 70 million increase in auto users from 1960 to 2000, Pisarski argued that market preferences support the *personal* vehicle and the personal vehicle road system – where the owner determines where and when it goes and who comes along.

Pisarski showed that some factors affecting future travel demand may be stabilizing, with the number of workers added per decade declining, the daily person trip rate leveling off, and the gap between women's and men's annual vehicle miles traveled (VMT) holding constant. Rising income, however, may be the real driver that fuels more trips and more travel. As income rises, household transportation spending increases, as does the mode split favoring the single occupant vehicle. Given rising affluence, growing vehicle access among minority groups, and increasing value placed on time, travel reliability and responsiveness, the key attributes of future transportation systems will include personal rather than mass transportation service, demand rather than scheduled service, and time-sensitive rather than cost-sensitive travel. These trends all support personal vehicle travel, which Pisarski noted may well include the bicycle.

In making a final case for capacity expansion as the most plausible answer to congestion, Pisarski explained that added capacity may be achieved in a variety of ways, including improved traffic controls and signalization, re-arterialization of highways and streets, intelligent transportation system (ITS) improvements, reversible lanes, as well as new lane capacity and new roadways. Pisarski's point suggested that no single silver bullet will resolve congestion, a theme repeated by many throughout the symposium. Other modes can also help to accommodate growing travel demand, said Pisarski, but they should do so by being better than personal vehicle travel, not by making highway congestion worse. While advocates for transit, carpooling, bicycling, walking, and smart growth support congestion to further their own agendas, shunning

investment in the highway system would prevent the nation from meeting the mobility challenges that lie ahead.

Although capacity expansion is often understood as synonymous with *roadway* expansion, **David Lewis** asked whether a case can be made for expanding *transit* capacity to mitigate congestion and explored several aspects of this question. First, because highway investment options and transit investment options are evaluated within very different frameworks, it is difficult to determine what are the most promising transit or intermodal projects, or to perform any head-to-head comparison between highway and transit alternatives. Highway projects are typically evaluated considering lifecycle costs and benefits, net present value, return on investment, appropriate discount rates, and various external costs and benefits. But with transit's legacy of commercial failure, transit projects are appraised on ridership rather than economic outcomes. Without common yardsticks for transit and highway investments, said Lewis, it will be difficult to judge which better addresses congestion relief.

Lewis noted that assessing the benefits of transit operating expenses and the benefits of transit capital investment were separate questions. He then discussed the "second best" rationale for public subsidy of transit fare revenues: because private vehicle users are not charged their full marginal social costs in congested conditions, holding down transit fares may encourages marginal car users to switch modes. Explaining the quantitative test for this argument (involving the social marginal cost of auto use, cross-elasticities between modes, and calculations for the optimum fare level), Lewis concluded that current levels of transit operating subsidy in the U.S. are about right.

To determine whether transit capital investments were competitive with highway investments, Lewis said case-by-case evaluations of returns on investment were needed. In Cincinnati's I-75 corridor, transit capital investment appears viable, with light rail transit boasting a higher internal rate of return than most other options considered. On a corridor-by-corridor basis, Lewis concluded, transit can outperform highway returns on investment, particularly in highly congested urban corridors. According to Lewis' hypothesized convergence effect, if travel time is most important in determining travel choices and if roughly 10 percent of travelers are, in logistics parlance, "explorers" shuffling between modes to find the best commute, then an equilibrating mechanism causes travel time on *highways* to converge to the same as on *transit* (rail or bus rapid transit). Because highway speeds and travel times are sensitive to the speed/flow dynamic whereas rail transit times are fixed, door-to-door highway travel time converges to an equilibrium established at the transit performance level. Thus, under the right conditions, transit can be employed as the pacing mode for sustainable travel times in congested corridors. In such cases, the case for investment in transit may be strong.

Reviewing the recent empirical and theoretical evidence for induced travel, **Robert Noland** reflected on the implications for transportation and environmental policy and concluded that the induced demand debate is clearly linked to choices about urban growth, sprawl and centralization. Research in the U.S. and the United Kingdom since 1993 suggests that induced demand is a real phenomenon, supported by econometric and travel demand models. Though different studies reveal different elasticity values associated with travel, and though it is difficult to control for the impact of population growth, general consensus suggests that 15 to 30 percent

of VMT growth may be attributed to new capacity, making induced demand an important driver of VMT growth.

Because it undercuts the travel time savings usually associated with capacity expansion, induced demand complicates measuring the benefits of added capacity. Rather than focusing on reduced travel time and increased mobility for current users, Noland recommended that planners consider instead the appreciation in land values that accrues from increased accessibility of added road capacity. To avoid double counting, any assessment of benefits should count either travel time changes or land value changes, but not both. Travel time benefits accrue to travelers in the corridor, while access and land appreciation benefits accrue to land holders and consumers. Noland argued that long term travel effects from induced demand (e.g. home and business relocations to newly accessible places, or development of auto-oriented locations) suggest that any assessment of added capacity should focus on land values and accessibility, implying a reorientation of transportation policy away from reducing congestion and toward directing growth in urbanized areas.

Discussing a host of policy implications, Noland noted most pointedly that Environmental Impact Statements that cite "congestion reduction" to meet federal requirements for project justification may be misguided. If congestion reduction is not feasible, alternative justifications such as the increase in mobility and accessibility to various developments may be more appropriate. He added that if so, the central question in such assessments becomes, "How do we want urban areas to grow? Centralized or decentralized?"

Discussion

Subsequent discussion on this session reflected the breadth of issues addressed by presenters. Questions followed about the role of roadway pricing in Lewis' equilibrium dynamic, the importance of travel time reliability in assessing congestion relief, and the place for air quality considerations in the discussion. Addressing the themes raised by Noland, Jonathan Levine of the University of Michigan noted that people travel to access destinations, and that accessibility—not mobility—matters most. Although induced demand cannot erase the benefits of added capacity as Pisarski argued, Levine suggested that added capacity may increase a traveler's cost per destination by facilitating decentralized land development, or sprawl—a low accessibility metropolitan form.

SESSION III: THE FEDERAL ROLE IN ADDRESSING TRAFFIC CONGESTION

Mary Peters, Administrator, Federal Highway Administration, U.S. Department of Transportation

In the luncheon keynote address, Mary Peters, FHWA Administrator and former Director of the Arizona Department of Transportation, described the environment facing the nation as it approaches the second reauthorization of federal transportation legislation since ISTEA's initial passage in 1991. Peters also outlined the administration's newly released reauthorization proposal, SAFETEA (the Safe, Accountable, Flexible, and Efficient Transportation Equity Act).

Likening the confluence of current societal, environmental, and political factors to the convergence of meteorological systems to create "a perfect storm," Peters conveyed the urgency of the reauthorization debate. Peters noted the great pressure placed on the nation's transportation system from population growth, rising VMT, growing numbers of drivers and vehicles, rising truck travel, increasing affluence, and employment. These pressures coincide with a shrinking financial capacity among local governments and increasing competition for dwindling revenue sources. Peters compared the surface transportation system to a shaky boat, badly in need of system repair and replacement.

The involvement of the public, business groups, private firms, universities and elected officials is essential to confront transportation challenges and to understand the trade-offs various solutions entail. Among those challenges are questions about where and when to build new capacity, what role operations strategies and roadway pricing should play, how to preserve the environment, and – most critically – how to pay for it all while also supporting education, health care and other national priorities? The need for public involvement in and consensus building around these transportation decisions is crucial.

Peters introduced the SAFETEA proposal to the audience and described some of its notable features, including its provision for $247 billion in spending over 6 years; the maintenance of funding guarantees based on Highway Trust Fund (HTF) receipts; redirection of 2.5% of the gasohol tax to the Highway Trust Fund; and increased flexibility in local decisions. While there is no "silver bullet" to solve congestion, Peters said that traffic congestion and transportation systems could be more effectively managed to be more reliable and predictable. She pointed to SAFETEA incentives for ITS applications in vehicles, management and operations; a "freight gateways" program; and efforts for operational improvements like better incident and work zone management, and deployment of regional traveler information systems via a 511 system. First and foremost among the administration's concern, however, improving safety and saving lives were called out as the administration's top SAFETEA priorities.

Discussion

In the discussion session that followed, Frank Randak of Advanced Vehicle Transportation countered that a silver bullet could indeed solve congestion; he emphasized the promise of DualMode vehicle technology and encouraged the federal government to issue a request for proposals from the aerospace industry to develop the concept. Another participant asked whether, in light of rapid VMT growth and associated climate change impacts, tempering VMT growth should be a goal of SAFETEA. Peters responded that she was a strong believer in the ability of Americans to make the travel decisions they want to, and that the same concerns could be addressed by broadening the transportation solutions available.

SESSION IV: IMPROVING GOODS MOVEMENT IN CONGESTED AREAS

Michael Gallis, Principal, Michael Gallis & Associates
Bob Bergman, Vice President of Public Affairs, United Parcel Service
Peter Beaulieu, Facilitator, Regional Freight Mobility Roundtable, Puget Sound Regional Council

Tom Norton, Executive Director, Colorado Department of Transportation

While most public discussions of congestion concern commuting and personal travel, goods movement is increasing at an even faster pace. The transfer and distribution of freight grows increasingly time sensitive at the same time that metropolitan congestion worsens in many areas. This session explored congestion impacts on goods movement and options for improving freight movement in congested metropolitan areas. Session moderator **Tom Downs,** President of the Eno Transportation Foundation, introduced what many see as the most significant revolution in goods movement today: the elimination of warehousing and the substitution of transportation for inventory control. Products now flow more directly from provider to consumer, and the national economy depends increasingly on efficiencies in goods movement.

Michael Gallis further detailed the global shipping revolution. Globalization of the marketplace has increased both consumers and the resource base, with more products and materials coming from more places and going to more consumers. This increase in goods movement through the global network increases the density of the network and the velocity of its flows, colliding in some places with congested metropolitan networks.

Today's market demands and depends on the highly coordinated delivery of multiple products to single points. Gallis described how in the new economy, products are ordered to arrive "just in time" to avoid warehousing costs, and manufacturers now respond to the technologically enabled consumer's new ability to directly order or "pull" highly customized products, making "order to delivery" an important consideration for shippers. More things need to move more rapidly, with more coordination throughout the entire multi-modal transportation and logistics network. The freight industry has also witnessed a radical reformulation of global trading blocks since the collapse of the Iron Curtain and the rise of NAFTA. The new economic geography creates a new distribution of trading activities over broader global space and also changes global hub and subhub structures. The three nations of North America are now integrated in a single trading bloc, for instance, forming a continental grid with new corridors, hubs and flow patterns.

How should transportation professionals respond to these changing conditions? Drawing on case studies from Detroit, Charlotte / Douglas International Airport, and the Northeast's I-95 Corridor, Gallis said the success of metropolitan areas will depend on the response to changing patterns and flows of global, continental and regional linkages. He recommended a metropolitan strategy that addresses pressing needs for:

- Increased system capacities and efficiencies;
- Improved system configurations, with higher level and seamless multi-modal connections;
- Reconfiguration of the metropolitan logistics infrastructure;
- Land use coordination; and
- Better public understanding of freight issues.

Bob Bergman of United Parcel Service provided the unique perspective of one of the nation's largest package delivery services, a firm whose day-to-day operations are intimately entwined in the global supply chain.

Bergman described the complexity of UPS' role as a synchronizer of global commerce, coordinating flows of information, goods, and funds. Each day, UPS picks up and delivers 13 million packages. Its trucks log 2 billion road miles per year, and its aircraft fleet is the 11th largest in the world. In the U.S., UPS is the largest single railroad user; rail carries 25 percent of its packages. With 1,750 operating facilities and a variety of customized products—from same day to next day to second day and so on—UPS' delivery business is far more complex than most imagine and is involved in a variety of supply chain events.

Noting the scale of UPS operations and intense competitive pressures for on-time delivery, Bergman emphasized that "congestion affects us immensely. We guarantee these products, and we pay if we don't deliver." The rise of time-definite services, where predictability and speed are paramount to consumers, makes streamlined supply chains critical. "Congestion can interrupt those supply chains," noted Bergman; with its entire operation built around time, UPS can suffer significant service failures when any event—such as traffic congestion—intervenes.

For coping with congestion, UPS focuses on things within its control. Its delivery trucks heading from New Jersey to Manhattan each morning approach the Hudson River tunnels at a specific time to avoid serious traffic delays. Delivery routes in congested urban centers like New York minimize truck movements. Additionally, experienced route- and neighborhood-savvy drivers are an important firm asset. While UPS does plan around normal or recurrent congestion, incidental congestion is more problematic, triggering costly recovery actions to avoid service failures. When asked what that congestion costs UPS, Bergman replied that the firm has not yet calculated it.

Peter Beaulieu and **Tom Norton** presented, respectively, regional and state perspectives on improving goods movement in congested urban and rural corridors. **Beaulieu** noted the incongruity in scale between supply chains and the metropolitan regions planning for freight. How can metropolitan areas address freight and supply chain issues when these networks, as geographic units of analysis, extend far beyond metropolitan boundaries? Additionally, the multimodal nature of supply chains mean that planners must address congestion and trip time reliability in a multimodal context in order to facilitate the ability of businesses to respond to the "pull economy."

Beaulieu described the Puget Sound region's FAST Corridor program. Its informal roundtable of shipping interests and federal, state and regional agencies work to advance projects and actions to move freight through the Northwest's major trade corridor, address bottlenecks, and increase the competitiveness of Puget Sound ports. The program includes rail grade separations, port access projects, roadways, and ITS applications all designed to improve the region's performance as a node in intermodal and global supply chains. The program also emphasizes system gaps where no single entity "owns" the problem but where FAST partners combine funds and efforts to fix the gap.

Norton described how the Central U.S., particularly the Colorado Front Range area, faces many of the same congestion-related freight challenges examined by previous speakers. Moreover, the lack of integration of transit and highway systems and the absence of MPO awareness of freight issues are particular problems, Norton noted. Though a variety of stakeholders are impacted by

congestion, including DOTs, MPOs, trucking and tourism industries, coordination among them is insufficient to solve the problem.

Strategies to ease goods movement in light of significant metropolitan congestion should include potential removal of freight terminals and facilities from urban areas, removal of bottlenecks from the national freight system, and MPO planning efforts to coordinate freight movements and people movements with the aim of improving on-time delivery performance.

Discussion

For the remainder of the session participants discussed the potential for ensuring that the rapid freight growth predicted will be carried by rail rather than by truck. Beaulieu explained that attracting Wall Street investment in railroads is difficult given the modest rate of return on such investments. While railroads have greatly improved efficiency over the last 20 years, they do not have capital to put on the table, and this poses a challenge to any significant mode shift from road to rail.

Participants also discussed the potential for shipping industry support of congestion pricing in the crowded metro areas they serve. Bergman noted that UPS has taken no position on whether to advocate congestion fees, as they have not analyzed whether pricing would produce commensurate value for their operations. Beaulieu said the Puget Sound's freight roundtable, in considering HOT lanes, has discussed pricing issues and possible discretionary tolls, depending on the value of a particular trip to a particular company.

SESSION V: USING NEW TECHNOLOGIES AND INFORMATION TO BETTER MANAGE MULTIMODAL TRAFFIC FLOW

Jeffrey Paniati, Associate Administrator for Operations and Acting Director, ITS Joint Program Office, Federal Highway Administration
Richard Margiotta, Principal, Cambridge Systematics
Pravin Varaiya, Nortel Networks Distinguished Professor of Electrical Engineering & Computer Science, UC Berkeley
Steve Lockwood, Vice President, Parsons Brinckerhoff

This session considered how new technologies and information are changing the management of transportation systems. Panelists identified the types and causes of congestion, various ways to measure it, and a range of responses to it, including a new technologically based orientation toward infrastructure management and operations.

Jeff Paniati began by outlining the causes of recurring congestion (e.g. insufficient capacity, unrestrained demand, and ineffective roadway management like poor signal timing) and the causes of non-recurring congestion (e.g. traffic incidents, work zones, extreme weather, and special events.) With the share of total congestion split about 50-50 between recurring and non-recurring congestion, Paniati said all approaches to congestion have a place in addressing the problem. Depending on the specific problem, answers may include building more capacity, removing bottlenecks, managing demand, better managing traffic with technology, implementing incident management, using work zone mobility plans, and managing special events.

Focusing on the operational approaches, Paniati introduced the mission of the FHWA Office of Operations. The office's goal is to institute a different approach to transportation system operations, one that uses 21st century technology, is proactive and customer oriented, views regional systems comprehensively, supplies 24/7 service and real time information, and measures performance. Operations applications promoted by the office include work zone management and information technologies. With up to 20 percent of the National Highway System under construction at any one time in summer, work zone management can improve traffic flow when system repair necessitates lane and roadway closures. Incident management with specific response and clearance procedures can also provide relief, as roadway incidents cause 25 percent of congestion and create 4 minutes of delay for every minute a traffic lane is blocked. Advanced information technologies can also counter congestion. Real time information about snow and ice conditions, electronic tolls and managed lanes, a national 511 traveler information system, and a "WiFi Highway" that exchanges information between vehicles and systems are all initiatives Paniati's office supports. Information alone will not solve congestion, but it allows transportation system users to better plan for trips and can increase user satisfaction.

Richard Margiotta discussed the role of performance measures in monitoring congestion. Margiotta argued that measuring congestion performance is a sound business practice that can enable transportation agencies to better serve customers and to assess returns on system investments. Decision makers and the public are becoming increasingly more interested in how well transportation systems are functioning. Measuring congestion performance provides greater accountability.

In transportation planning, performance measures have traditionally been used simply for reporting volume to capacity ratios or studying delay. Margiotta outlined an alternative approach to performance measurement that addresses 1) ***congestion*** on facilities; 2) ***mobility*** of users, or how users experience the transportation system, and 3) ***accessibility***, or how human activities and opportunities interact with the transportation system. Multiple metrics are needed to fully capture performance and both the user and corridor experience, but all transportation performance measures share travel time as the common denominator.

Margiotta showed that performance measures encompassing three dimensions (time, distance, and source of congestion) would be most useful for decisions about real time operations, as well as short- and long-term investments. Additionally, performance measures should address travel time reliability, or "the ability of travelers to predict travel time for a trip and to arrive at destinations within an 'on-time' window." Surrogate performance measures like incident duration or clearance time for snowy roads are more easily developed, but they do not get to this bottom line as effectively as travel time measures.

Pravin Varaiya used his study of Los Angeles freeways to present important conclusions about the nature of congestion, its causes and remedies. Varaiya found that during peak periods over 70 percent of freeway congestion is recurrent and less than 30 percent is non-recurrent. Varaiya also concluded that freeway congestion is due more to inefficiency of operations than to excess demand, and that a few incidents account for a very large portion of non-recurrent congestion. These findings impact how ITS may be used to address congestion.

First, Varaiya showed that effective ramp metering schemes can maintain free flow, and improve freeway operations to reduce overall travel time and travel time variability. Current convention considers lower speeds optimal, but Varaiya's showed that efficient freeway operations occur under free flow conditions achieved at 60 mph. This may change how congestion is measured in some cases; the California Department of Transportation, for example, defines total delay in a freeway section based on the reference speed of 35 mph.

Second, Varaiya described the potential of the freeway Performance Evaluation Monitoring System (PeMS) developed by his UC Berkeley research team to provide travelers with real time travel time estimates. PeMS converts freeway monitoring data into real-time traffic updates. The PeMS website displays real-time conditions on the freeway system and provides travel time estimates for user provided origin and destination pairs. Ten minutes in advance of departing for a trip, a user can predict the trip time within 90 percent, allowing travelers to make informed travel decisions.

Steve Lockwood examined how to mainstream a systems operations and management approach to congestion within transportation agencies. He defined operations and management (O&M) as the "active management of the existing transportation system to maintain customer-related performance in the face of congestion, incidents and other service disruptions." Several factors make the pursuit of O&M to manage congestion and improve level of service (LOS) on roadways more attractive today. The causes of and cures for congestion are better understood; there is increased accountability for system performance yet limited funding for new capacity; and roadway pricing alternatives have political limitations.

O&M is a politically and financially feasible response to congestion, and it is effective. Ramp metering in Minneapolis decreased mainline travel times 22 percent, supplying capacity equal to an additional freeway lane. Albuquerque's Big I work zone management program reduced average clearance times by 44 percent. Also incident management efforts in various cities have reduced clearance times from 20 to 50 percent while also reducing secondary accidents by 30 percent.

Though O&M strategies provide visible benefits, are quickly implemented (2-4 years), cause little environmental impacts, and provoke no community opposition, significant institutional barriers challenge their more widespread and aggressive adoption:

The state-level policy commitment to O&M is unclear.
O&M is rarely a core program (part of other programs) within a DOT budget.
DOT district heads seldom have an interest in O&M.
There is limited central accountability for system performance.
DOTs have minimal relationships with private vehicle & service providers.

Lockwood outlined the conditions of a mainstreamed O&M approach and argued that such conditions will better position state DOTs to deliver a 21st century operations culture that focuses on outcomes (mobility) and customers, integrates the metropolitan region, and operates 24/7. Under this scenario,

- Legislative support for O&M would show in funding or reporting requirements.
- O&M would be explicitly identified as an agency responsibility.

- O&M would be identifiable as a budget line item(s).
- The chain of command with DOTs would place system operations under single person at the second level, rather at the project level.

Discussion

In the subsequent discussion, audience members addressed a range of issues from the session, including the potentially significant environmental benefits of achieving operational improvements. Lockwood talked about O&M's place in SAFETEA, noting that the bill is an important start to formalizing O&M in the federal aid program, but that it might imply a prickly debate about the relative merits of capacity vs. operational tactics. Other participants discussed the institutional barriers to getting system operators to collect and archive the data needed to assess and improve daily performance in the ways outlined by several presenters.

SESSION VI: VIEWS FROM CAPITOL HILL ON TRAFFIC CONGESTION AND TEA-21 REAUTHORIZATION

Jonathan Upchurch, Congressional Fellow, House Transportation and Infrastructure Committee

Filling in for Congressman James Oberstar (D-Minn.), ranking member of the House Transportation and Infrastructure Committee, Jon Upchurch used his experience as a Congressional Fellow in the Transportation and Infrastructure Committee to reflect on traffic congestion and reauthorization of TEA-21. Upchurch pointed to an increase in economic activity and a decrease in the pace of infrastructure investment as the primary causes of congestion. Congestion has wide effects on commuters, businesses and freight, and weighs on the economy like a ball and chain. Its effects on business productivity can mean staggering losses in revenue to private firms.

Echoing the "no magic silver bullet" theme, Upchurch endorsed an array of solutions that many speakers before him had described. These include increased investment, systems operation and management measures, value pricing, and intelligent transportation systems. Many of these approaches have a proven track record around the country. Chicago reduced accident clearance time by 50 percent with its incident management program. Southern California's HOT lanes have paved the forefront of value pricing, and Minnesota has used ramp metering successfully for decades. Congestion is a multi-faceted problem, and responses to it must consider its technical, economic and political aspects.

Upchurch described House proposals to increase current transportation spending proposals to $375 billion over 6 years. Potential sources for increased funding include increasing taxes on ethanol, regaining interest in the Highway Trust Fund (HTF), indexing the gasoline tax to inflation, and spending the balance in the HTF.

SESSION VII: THE ROLES OF LAND USE PLANNING AND IMPROVED PUBLIC TRANSIT IN RELIEVING CONGESTION

Anne P. Canby, President, Surface Transportation Policy Project
Robert T. Dunphy, Senior Resident Fellow, The Urban Land Institute
Jonathan Levine, Associate Professor of Urban & Regional Planning, University of Michigan at Ann Arbor

What role should land use planning and public transit service play in addressing traffic congestion? Many argue that these strategies have been given short shrift in congestion mitigation, while others see the role of land use and transit planning in mitigating congestion as relatively modest. Panelists supplied different perspectives on the question.

Moderator **Sarah Campbell** of TransManagement, Inc. launched the discussion with a case study of the Rosslyn-Ballston corridor in Arlington, Virginia, a corridor planning effort that focused on Metrorail as a catalyst for investment and that is a successful example of transit oriented development. According to Campbell, good planning, mixed use development, density and improved design helped to create a thriving community while reducing land use and resource consumption and making walking attractive. The walking mode share for Metro station access in Arlington is 73 percent, compared with 60 percent for Metro overall, and 15 percent for some suburban stations on the Orange Line. Campbell argued that such transit oriented development also compels robust economic growth. The area surrounding the Rosslyn-Ballston Metro stations has experienced growth in population, households, and employment; provides a solid residential and commercial tax base; and has maintained high office occupancy rates even when other regional office markets faltered.

Anne Canby reflected on the traditional relationship between state departments of transportation and land use issues, making the case that DOTs have unfortunately shied away from land use issues, pursuing highway investments that feed congestion. DOT directors often acquiesce to pressure from politicians and developers for new highway access, fueling auto-oriented land development that further feeds demand for roadways. This circular pattern, said Canby, creates inequities and inefficiencies. Land development spurred by new highway capacity drives VMT upward and is hard for transit to serve. Moreover, households must spend more on transportation, an expense that hits lower income families harder. Households earning in the lowest quintile can pay over 40 percent of their income for transportation.

Pointing to indications that the public is increasingly interested in more compact, convenient, mixed use development with transit access and pedestrian amenities, Canby outlined several steps that could better integrate land use and transportation planning. These efforts, she suggested, could enhance the prospects for transit supportive land use and the ability of transit to serve growing communities. They include:

- Establishing performance goals to improve land use and transportation integration.
- Changing funding formulas to reward behavior changes rather than VMT and lane miles, (e.g. tallying jobs served by transit).
- Supporting community scenario and vision planning.
- Addressing the transportation (state controlled) and land use (locally controlled) decision-making disconnect by letting local governments decide infrastructure priorities.
- Adopting a fix-it first approach to transportation spending.
- Re-examining LOS definitions and trip generation rates.

Robert Dunphy challenged the notion that nothing can be done about congestion and suggested a middle-way approach to acknowledge both the realities of consumer choice and the need to prevent worsening congestion. Framing the discussion with the transportation and land use connection, Dunphy showed how congestion is linked to the successes of American society. Dunphy also showcased land-use oriented approaches in the potential solutions he reviewed.

Though congestion is widely acknowledged as a significant problem, it exists for a reason. Dunphy pointed to factors fueling the disconnect between residential locations and employment centers. Single-family detached homes have been a prime component of the American dream while central cities have been the nations' primary economic engines. The nation's interstate highway system has enabled consumers to exercise choice, commonly favoring large house and lot sizes and lower home prices over proximity to work or transportation services. Dunphy captured the trade off between a lower mortgage and a longer commute to the suburbs and exurbs as, "Drive till you qualify." The ubiquity of retail development in the U.S. also spurs many trips. Congestion results from the economic success and consumer choice that communities value, and communities may simply have to tolerate some level of congestion.

On the other hand, Dunphy said communities should not ignore congestion. Rapid demographic shifts, land use that is outpacing population growth, and an increasingly service-oriented economy suggest that congestion—left untended—will indeed worsen. Acknowledging the divergence in opinions about the need for additional roads to fix traffic problems, Dunphy emphasized the need for consensus on regional growth and transportation issues. While there is little public support for new roads on the fringe, Dunphy said the proposition that "We can't build our way out of congestion" was a misconception, and that communities face the difficult question, "What level of congestion is tolerable and affordable?" Approaches that consider land use and transportation do have a role to play, including better planned edge growth, exurbs that are "transit ready", walkable communities and also selective road improvements made on timely basis to assure appropriate levels of mobility. However, the worst way to deal with congestion is to ignore it or to allow public inaction and political gridlock to prevent needed interventions. The best way to deal with congestion is "Being There," making proximity to desired destinations the biggest asset.

Exploring the role of transit and transit oriented development (TOD) in the context of congestion relief, **Jonathan Levine** concluded that transportation planning and policy has focused too much on congestion mitigation and too little on metropolitan accessibility. While there is cause for both optimism and doubt that transit can help to relieve congestion, Levine argued that transit—and transit supportive land use and development—serve the more important function of facilitating access to destinations in metropolitan regions.

Levine carefully distinguished mobility and accessibility as separate goals in transportation planning. While mobility improvements reduce the costs of transportation per mile, accessibility improvements reduce the costs of transportation per destination. Congestion mitigations target improved mobility, but faster moving traffic does not necessarily improve access to destinations. Levine argued that transportation policy should prefer accessibility over fast traffic because transportation itself is a "derived demand," i.e. consumer demand for transportation is directly dependent on consumer demand for access to the final destinations that transportation is used to

access. Mobility is seldom an end in itself; people want to get from place to place to access social and economic opportunities.

Unlike sprawl, characterized by relatively poor accessibility of land uses to one another, urban concentration offers high accessibility to many social and economic opportunities (e.g. employment). Transit plays a tremendous role in providing access to downtowns, witnessed by transit's large modal share for downtown commutes to urban centers across the nation, from Queens to Minneapolis to San Francisco. If transit did not serve these centers, congestion would escalate in the short term. In the long term, the lost accessibility would change a center's function, diminishing its urban and economic vitality; benefits to both transit users and non-transit users would be lost. Thus, if we want to maintain accessibility to metropolitan areas, transportation policy should focus on the integration of transit and land use plans less for congestion relief than for accessibility.

Discussion

In the question and answer session, conference participants explored the relationship among the four actors in any transportation-land use scenario: transportation agencies, development interests, land use planning and land use/environmental regulation. Anne Canby proposed that transportation investments can be used to leverage developer investment and to steer land use regulation. Additionally, regulatory permits issued to the highway system ought to be used effectively to ensure that transportation investments are not undermined by land use decisions.

SESSION VIII: TRAFFIC CONGESTION AND AIR QUALITY

Elizabeth Deakin, Associate Professor of City & Regional Planning, UC Berkeley; Director, University of California Transportation Center
Ken Adler, Policy Analyst, Office of Transportation & Air Quality, U.S. Environmental Protection Agency
Michael Morris, Transportation Director, North Central Texas Council of Governments

Vehicles stuck in traffic waste time and energy resources and produce air pollution, and speakers in this session explored the environmental rationale for reducing congestion.
Ken Adler presented general trends in air quality as related to vehicular sources and also discussed the cost effectiveness of various transportation control measures that have been pursued via the Congestion Mitigation and Air Quality (CMAQ) Program.

One primary observation shared by Adler was that improvements in vehicle technology have helped to disconnect VMT growth from emissions. National average levels of volatile organic compounds, the precursors to smog, have fallen significantly since the 1970s, Adler noted. Additionally, after a long period of stagnation in NOx levels, projections show that NOx emissions are headed downward, even though VMT continues to grow.

Adler also placed some national emissions trends in context, explaining that while national data seem promising, emissions analyses face limitations. Considered individually, some cities have more severe NOx problems than national data indicate. Currently, over 130 million Americans live in counties where national standards for specific pollutants have been exceeded. Also, with

growing recognition of the serious health impacts of particulate matter (PM 2.5), Adler emphasized that controls on diesel (e.g. retrofitted engines and anti-idling devices) are important complements to new heavy duty diesel air quality regulations.

Finally, although CMAQ projects are often pursued for their air quality benefits, Adler explained that our ability to measure the emissions results of different CMAQ projects is limited. Results are modeled, not empirical, and study designs are inconsistent, making conclusions difficult. In addition, emission reduction benefits from projects that reduce congestion may be limited if vehicle speeds increase beyond certain levels. Reflecting on these factors, Adler argued that transportation control measures under CMAQ should not be evaluated on air quality improvements alone. Instead, Adler suggested, any assessment should consider other CMAQ project benefits, including reduced congestion, increased travel options or choice, support for smart growth goals, and improved accessibility for the young, old, and disabled.

Elizabeth Deakin presented important findings about how improving traffic flow improves air quality. First, Deakin showed how emissions are related to vehicle miles traveled (VMT), traffic speeds, stops, delays, and even travel patterns. Because of high emissions associated with cold starts, rapid acceleration and deceleration, emissions are not a simple function of VMT or speed. Route choice and location also effect emissions, as freeways, arterials and local streets have different acceleration and deceleration patterns and different speeds.

Deakin surveyed various interventions to improve traffic flow and their emissions impacts. These included traffic signal timing; reducing traffic frictions, using separate turn lanes or restricting parking or pedestrian crossings, for example; ramp metering and flow metering on freeways, to flatten surges of vehicles entering a facility; and congestion pricing approaches, like the cordon pricing schemes used in London and Norway's Trondheim, the HOT lanes in Southern California, and peak/off peak differential tolls seen on some New York City bridges. All else remaining equal, these actions can improve vehicle flow and can reduce emissions. But such interventions may create negative impacts that undercut benefits, including diversion problems, back-ups to local streets, and the attraction of new travelers to the improved facility.

Deakin concluded that: 1) Though traffic flow improvements can create opposite impacts, evidence shows that such improvements can reduce travel time, delay, stop and go traffic and that emissions reductions generally do result. 2) Because high speed operations produce high emissions, the fact that most traffic flow interventions produce modest benefits rather than high speeds is an asset. 3) Induced travel is not a big factor in undercutting traffic flow benefits. Time savings realized per traveler are too small to encourage mode shifts or more travel on the facility. But the sum of these small changes can make the difference between heavy but moving traffic and a complete jam. 4) Emissions reductions do not always improve air quality. Emissions are measured per "grid cell" or monitoring device. Instead, localized emission measures based on individual inhalation and exposure are needed.

Michael Morris presented the findings of the Committee for the Evaluation of the Congestion Mitigation and Air Quality Improvement Program, the group convened by the Transportation Research Board to assess the nation's CMAQ experience since its start with the passage of ISTEA. The group endorsed reauthorization of the CMAQ program, finding that while its benefits overall are small, the program is critical for helping regions with poor air quality to

conform to 1990 Clean Air Act mandates. The case was also made for maintaining the program focus on air quality, by continuing restrictions on capacity projects and by supporting congestion projects that reduce emissions.
The group also suggested changes to the CMAQ program that would make more efforts eligible for funding and that would improve program administration. These include increasing participation by local and state air quality agencies in project evaluations; addressing all regulated pollutants in CMAQ eligibility criteria and funding allocations; supporting a broader array of projects that reduce mobile source emissions, including vehicle scrappage; relaxing restrictions on operating expenses, a move that would help transit providers; and enhancing the use of CMAQ funds for land use actions. The group also called for streamlined project selection and federal project approval processes and for incentives to conduct more evaluations of CMAQ funded projects.

Other findings underscored the difficulty in determining how to assess costs and benefits of federal policies like CMAQ. First, the outcomes of CMAQ projects are projected not measured. This echoed Deakin and Adler's point that analyses based on average emissions and models are not as useful as analysis of emissions in actual modes of vehicle operation. Second, the group found that technology approaches to air quality are more cost-effective, and that the cost-effectiveness of CMAQ strategies may be reduced over time. What should this mean to the program? Finally, CMAQ has democratizing effects, promoting broad participation in the program and the pursuit of nontraditional transportation projects; these outcomes are positive, but are perhaps less directly related to air quality improvements.

SESSION IX: ADDRESSING THE POLICY AND INSTITUTIONAL CHALLENGES TO TACKLING TRAFFIC CONGESTION

Neil Pederson, Administrator, Maryland State Highway Administration
William Millar, President, American Public Transportation Association
T. Peter Ruane, President & CEO, American Road and Transportation Builders Association
Ron Kirby, Transportation Director, Metropolitan Washington Council of Governments

Moderated by **Catherine Ross**, former director of the Georgia Regional Transportation Authority (GRTA) and current Director of Georgia Tech's Center for Quality Growth and Regional Development, this panel discussion provided perspectives from state, transit, private industry, and regional planning leaders on the policy challenges involved in tackling congestion. Ross began by noting the need to bring equity and accountability to bear in transportation decisions; the public deserves to know how expenditures on transportation will impact them. While transportation institutions have far to go to achieve a customer focus, public education is also needed to promote reasonable community expectations about congestion mitigation. Congestion is a tough nut to crack, and agencies should not over-promise what they can deliver.

Representing the state point of view, **Pederson** emphasized the importance of comprehensive and multimodal approaches to congestion, arguing that all tools in the toolbox must be brought to bear, from supply side interventions like adding capacity to demand side measures like pricing. Transit is an important component of that toolbox, Pederson said. Additionally, the players responsible for the nation's transportation system have not lived up to the ideal of institutional

coordination, collaboration and cooperation outlined in ISTEA. Stronger partnerships between State DOTs and metropolitan planning organizations (MPOs) are needed. Additionally, transportation leaders need to take a proactive role in helping elected officials understand how best to address congestion problems.

Kirby described the contentious environment in which MPOs must build regional consensus. The arguments for smart growth and for highway widening to address congestion are well articulated, and finding common ground is very difficult. Yet, the stakes for doing so are high. In the D.C. region, serious congestion exists on portions of the freeway system, and even minor incidents have major traffic impacts on road and transit users alike. Although the MPO's task is not easy, some bright spots exist: there is general consensus about the value of traffic management, signal coordination, and value pricing as strategies to address congestion. Moreover, a high level of public interest is fostering more civic involvement in decisions. Land use initiatives also deserved support, Kirby said.

Providing transit's perspective, **Millar** argued that a history of government investments in inefficient transportation solutions have sapped resources. Transportation decision makers today ought to ask how they can best accommodate Americans' desire for freedom of movement and travel choice. While a mixture of modes is important, investments in rail, rapid transit, bus rapid transit and transit supportive land uses can provide more transportation choices more efficiently.

Representing the transportation builder industry, **Ruane** attacked the proposition that adding capacity is not part of the solution to congestion and criticized what he called the "axis of ignorance" blocking important capacity investment: irresolute politicians, a misinformed public, and ideology. He pointed to several major investments in capacity, including Boston's Big Dig and the Alameda Corridor, which have brought benefits for local communities and for congestion.

Discussion

The subsequent discussion delved into the limited ability of extant institutional structures to address congestion or to work collaboratively, the likelihood of increased funding for the administration's SAFETEA proposal, and the persistence of congestion as a political issue. While Ruane declared that elected officials often obstructed value pricing efforts, Kirby countered that recent experiences in Northern Virginia demonstrate a political willingness to consider demand management and pricing to answer longstanding congestion problems.

Observing that decision makers were missing from this discussion and that local and state elected officials will largely decide how congestion is addressed, John Mason of SAIC reflected on elected officials' role in the congestion debate. Drawing on his past experience as a mayor in Northern Virginia and a member and chairman of the region's MPO, Mason noted several facts of life of local electeds that may shed light on their motivations in transportation policy decisions. First, though local politicians often bear the brunt of criticism, largely they are well intentioned and they represent constituencies who expect results. For local electeds, taxpayer accountability is critical. Performance measures, therefore, may be key to changing thinking about transportation investments, and Mason advocated requiring annual MPO progress reports on regional congestion goals. Second, Mason also pointed out the importance to local officials

of retaining control over land use, as this is how they can affect the economy and the quality of life of their communities (by paying for local services).

Mason also reminded the group of some basic constraints of local officials. First, they generally wish to be re-elected. They also face competing priorities and have limited time for any one issue. Thus, traffic congestion competes with public safety, education, social services, and other issues for a leader's attention. Mason further suggested that elected officials are driven by process and incentives, and that compliance with federal and state transportation planning requirements is important to them.

SESSION X: THE PROSPECTS FOR MARKET-ORIENTED SOLUTIONS TO CONGESTION

Robert W. Poole, Jr., Director of Transportation Studies and Founder, The Reason Foundation
Gary Gallegos, Executive Director, San Diego Association of Governments
Rob Atkinson, Vice President and Director of the Technology and New Economy Project, The Progressive Policy Institute

The use and general acceptance of market-oriented answers to congestion, such as road pricing, has grown in recent years. This session explored the results of these efforts, and examined whether initial efforts need to be refined or if we are ready to expand them in the near future. Key policy challenges to adopting market-oriented congestion management solutions were discussed, and the speakers agreed that pricing strategies may hold the most promise for reducing congestion provided the challenges to their adoption can be overcome.

Session moderator Ken Orski, Editor/Publisher of *Innovation Briefs*, reflected on the increase in public acceptance of road pricing schemes, praising Mary Peters as one of the first US DOT officials to endorse congestion pricing. Dramatic shifts in attitudes about pricing stem from growing realizations that the HTF is insufficient for paying for the nation's transportation needs as Congress searches for new revenues. Additionally, pricing projects like the HOT lanes experience in Southern California have helped build support and given visibility to the concept that people will pay a premium to avoid congestion and to reach their destination faster.

Bob Poole reviewed the lessons learned from road pricing projects around the world. A small but growing body of evidence from cordon area pricing in Singapore, Norway, Rome, and London show that tolls charged for automobile access to the CBD during daytime hours can reduce peak hour traffic as well as the volume of cars in the CBD. Initial results from London, which introduced cordon pricing in February 2003, show that 20 percent fewer cars have been entering the CBD.

Also, the U.S. has seen a small movement toward variable tolls on existing toll roads, a strategy first used in France to reduce weekender traffic to and from Paris. Differential or variable pricing make peak hour tolls more costly than off-peak and have shown that peak hour traffic reductions can result. Encouraging results have been reported on Lee County, Florida toll bridges; on the New Jersey Turnpike; and Port Authority bridges and tunnels in the New York-New Jersey metro region. Applications where drivers may choose to pay to use a price-

controlled facility or to remain in free general purpose lanes, as on the SR-91 or I-15 high occupancy toll (HOT) lanes in Southern California, also show significant willingness by some people to pay to bypass congestion. Smart cards and electronic tolling technology now makes these applications possible.

While technical lessons learned show that congestion pricing does encourage behavior changes and reduce traffic, it is difficult to secure above 25 percent of the public's approval for pricing. Public approval rates for HOT lane initiatives, however, can be twice as high, indicating people are willing to accept pricing when they are getting something (e.g. a more reliable commute time) in return. Poole concluded that pricing initiatives may be politically most feasible when they are combined with transit, as has been done on I-15 in San Diego. Poole suggested marrying Bus Rapid Transit and HOT lanes in an interconnected regional network that would make both bus service and HOT lanes more attractive, and the capital cost of which could be met by toll payments.

Gallegos presented a case study of congestion pricing on the I-15 in San Diego, where two reversible express lanes are reserved for carpools, buses, and paying single-occupant vehicles in the median of the 8-lane freeway. The heavily used corridor connects commuters to jobs in San Diego, and the express lanes are the only U.S. facility to use dynamic pricing, whereby tolls for single-occupant vehicles are adjusted every 6 minutes to maintain acceptable traffic flow in the lanes. Revenues from the lane have been used to fund the Inland Breeze, a new express bus service in the corridor, which has helped to win political support for the facility. In addition to attracting additional HOV commuters, who travel free in the lanes, the median facility has also tempered congestion somewhat in the I-15's main lanes.

A planned expansion of the facility would increase the express lanes from 2 to 4 lanes and extend them in length from 8 to 20 miles, with multiple access points and with fully integrated transit access, bus rapid transit stations and park-n-rides. While MPOs and DOTs are unused to planning for a facility of this scale, Gallegos noted that if it is built flexibly, it may be used to serve any number of transportation uses in the future, including freight flows from the maquilliadora industry in Mexico.

Gallegos emphasized the importance of thorough public outreach when planning and implementing priced facilities like the I-15 Express Lanes. For the initial express facility, its continued operations and the planned expansion, market studies, focus groups, and surveys have been key to assessing public receptiveness toward the facility. Agency stakeholders and their staffs were broadly included so that there were no surprises. Gallegos also noted that public champions who can shepherd such projects through agency bureaucracies and many levels of politics can also be instrumental in realizing similar projects.

Atkinson reviewed the obstacles that have made for slow progress on congestion pricing initiatives in the U.S. and made a case for specific legislative changes to facilitate pricing. The federal ban on tolling interstates is one reason that few pricing initiatives have been launched. A current proposal to allow tolling interstates, provided that new lanes are added and that tolls are temporary, may open the door for new pricing applications. Additionally Atkinson said that bureaucratic inertia and resistance from cautious elected officials has also impeded

progress. Public misconceptions about pricing and fairness issues have fed officials' fears that pricing will provoke public outcry.

Atkinson proposed giving states direct incentives to implement pricing, by changing federal funding formulas to increase the federal share of toll roads to 90 percent instead of 80 percent. Atkinson noted that the administration's reauthorization budget included no pilot program for HOT networks, which would encourage states to do more with pricing. He also proposed connecting federal funds with measures of state accountability for reducing congestion; holding states accountable for improving congestion relative to the national average while controlling for local growth would spur state DOTs to use more market-oriented approaches on their transportation systems.

Discussion

The audience discussed various ways to help congestion pricing initiatives gain more public and political acceptability. Robert Warren of EPA observed that good pricing can be very equitable, by using revenues to increase transit service for the lowest income sector of society. Patrick DeCorla-Souza of FHWA said the FAIR lanes concept could address equity concerns, by allowing paying FAIR lane drivers to bypass congestion but also by granting credits to non-paying drivers who choose to defer their travel on the facility.

To prevent perceptions that pricing is taxation, Poole stressed that in the U.S. it ought to be introduced as "value pricing," where Americans feel it will provide more transportation options and better service. Poole also noted that conservativism in the finance community contributes to reluctance to alter toll schedules. If the finance community perceives a pricing project as high risk, it may suffer high debt service.

SESSION XI: SYNTHESIS

Michael D. Meyer, Professor of Civil & Environmental Engineering, Georgia Institute of Technology

Introducing the final session, Brian Taylor emphasized that, although some are less optimistic about the potential for solving congestion, transportation decision makers and professionals need to challenge themselves to do better than to simply prevent congestion from getting worse. While no silver bullet will solve congestion, Taylor noted that the answer to congestion is not to use a little bit of every strategy in every location but rather to differentiate where distinct approaches will have the greatest effect.

To this end, Michael Meyer provided a critical synthesis of the ideas, information, conclusions and arguments presented about traffic congestion during the two-day conference. He wove together threads of discussion presented by over 30 speakers to formulate a cohesive vision of what traffic congestion is, how people perceive it, and how transportation professionals should respond.

What is Congestion?

To begin, Meyer reviewed how various speakers defined congestion. Several interesting definitions suggest that congestion, its causes and its remedies, all involve tensions and trade-offs among numerous articulated and implicit goals of metropolitan centers.

Congestion is:

> A symptom of the success of economic and social activities. In simple terms, it is people with economic means acting on their social and economic interests getting in the way of other people with the means to act on theirs;
>
> A function of how society locates activities in space and time;
>
> A function of how we design, operate and manage our transportation system: and
>
> A political problem, as its solutions will always involve some political calculus.

Indeed, any elected official would find it difficult to answer the questions that naturally follow from these definitions: If congestion results from successful economic development, should cities seek to curb it? How do we determine what and whose trips should be deferred or redirected so that other trips may be accomplished under less congested conditions? To what extent should we try to control where or when people seek to accomplish certain activities, or does this undercut the freedoms of movement and location that are highly prized in American society? Indeed, the answers to these questions are tricky, as the potential outcomes could create winners and losers.

These definitions also remind us of the complexity of the congestion problem. Urban form is by design concentrated, and so – as was the case in Ancient Rome, 17th century European trading centers, and early 20th century New York – congested streets may be the only option in some cases. Additionally, if we look at how goods and people move through the transportation system today, we find that people travel from increasingly diverse origins and destinations and that freight movements are happening across a much broader global space in far more complicated ways than just a decade ago. Finally, the public perceives government as provider of the transportation system and expects the government to solve congestion; thus, it may be more difficult for transportation agencies and leaders to pursue newer solutions that convey a market-orientation.

Dimensions of Congestion: Meyer's Definition

Meyer used his own definition of congestion to delineate its specific dimensions. According to Meyer, congestion is that characteristic of network performance in which some component(s) of the network are unable to handle the demand at desired levels of service over a specified period of time. Meyer's definition provides an organizational framework for thinking about how to identify, measure and respond to congestion, as well as many of the key concepts and issues discussed during the conference.

Congested network performance shows itself in slow speeds, poor travel time reliability, and long travel times. Well-designed networks not only provide sufficient capacity, but also sufficient redundancy, so that demand may be rerouted to another path when conditions along one path or network component (due, for example, to an accident) become unbearable.

Meyer argued that measures of congestion, indicating the level of performance or service, should be customer oriented, reflecting what the community wants from the transportation system. Typical measures of congestion such as average minutes of delay or average travel times disguise the wide variation in facility performance that can mean a 16 minute commute one day and a 40 minute commute the next. Such congestion measures as travel time reliability that focus more on the individual and the trip than the network are more meaningful. Additionally, related air quality measures also ought to emphasize the individual, strategically targeting emissions from gross polluting older vehicles and weighing impacts by individual human inhalation.

Time is also an important dimension of congestion. Human society has organized its functions so that many of us to want to be someplace more or less at the same time of day. The result is travel demand peaking that is characterized by congested facilities and long delays. For a transportation facility that is unable to handle demand, solutions may range from increasing efficiency of a network or facility; diverting vehicles to other routes; shifting travelers to other modes; lowering vehicle demand but increasing people throughput by increasing persons per vehicle; shifting trips to other times; telecommuting; and reducing overall trips made. While many plans could reduce congestion levels, the challenge is to integrate these plans with other societal goals and funding needs.

The Congestion Toolbox

Meyer commented that perhaps the most important conclusion drawn by several speakers during the symposium is that no one solution fits all situations. Symposium speakers described a plethora of tools to address congestion, but the best application in any one situation will depend largely on the unique context and circumstances. For example, *added capacity* may play a more important role in metropolitan regions' outer rings than inner rings, where mature built environments often make the cost of new highway lanes or transportation facilities prohibitive. Conversely, *demand management* strategies may be more appropriate for metropolitan centers, where demand is high for a constrained supply of transportation facilities and services.

Meyer summarized three major approaches to addressing congestion:

1. ***Supply management*** includes all measures that increase the number of people and trips served by the transportation system. These can include traditional highway capacity additions, but also ITS applications, intermodal facilities and freight services, operational improvements, transit facilities and services, and also bicycle and pedestrian facilities. While the induced demand debate makes adding capacity controversial, the underlying issues at stake are the externalities associated with additional travel and land consumption.
2. ***Land use management*** strategies seek to avert future congestion through growth management, planning and zoning, and urban design that mix uses and promote local density, so that trips may be accomplished more easily by transit, walking or bicycling. Local areas may become more dense and congested, but the region at large may face less roadway congestion overall than under sprawling growth patterns. Still, the land use-urban design relationship is a complex one, and the effects of such strategies are difficult to generalize.

3. ***Demand management*** includes the (largely financial) incentives and disincentives to shift people's trips to different routes, different times and different modes, or to defer those trips entirely. Strategies promote alternative work schedules, alternative work locations, and alternative modes. Pricing, however, may often have the biggest impact. Though pricing is generally most difficult to implement, it also has political legitimacy as a funding source for transportation improvements.

What to Do?

Meyer suggested a progression of considerations to formulate a community-defined approach to congestion. The ultimate goal, he stressed, is to ***provide transportation choice***. The major steps include:

Begin with a vision of what the community wants to be and where transportation fits into this vision;

Understand the market-driven forces, motivations and interchanges at play in the metropolitan area, and – considering the public purpose – identify the priorities;

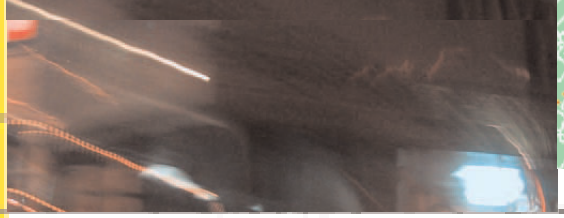
Outline what actions may be taken to influence travel behavior, land use and urban design;

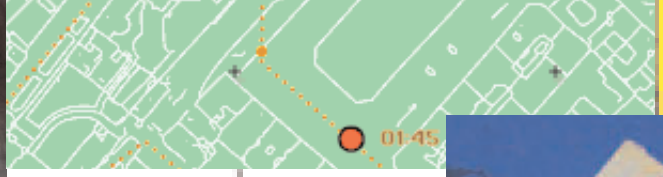
Develop a series of regional scenarios, including a) a strategic operations approach, minimizing infrastructure capacity investment, b) a strategic capacity approach, emphasizing bottlenecks and minimizing operations, and c) permutations in between. Then, determine the best strategy, given all the other issues facing the metropolitan area.

Meyer also endorsed several ***guiding principles*** for making decisions in the process:

Target well-defined travel markets and traveler groups, such as corridors, ports, and major employment centers;
Build support for pricing through targeted opportunities like managed lanes;
Develop institutions whose structure and focus is operations- and market-oriented, community-serving, and ecologically-sensitive;
Develop funding mechanisms that equitably distribute revenues and create decision making processes that focus on the most cost effective investments;
Weigh the desired quality of life and environmental quality characteristics of a region;
And, perhaps most importantly, make the planning and decision making process accountable and performance-oriented.

The task of reducing congestion can seem formidable: the physical phenomenon itself is highly complex, and the metropolitan regions that congestion affects are home to diverse constituencies, industries, and interests with different goals. Metropolitan congestion directly impacts how, *and if*, citizens and businesses accomplish their goals on a daily basis, and seldom will one solution satisfy all interests. For these reasons, Meyer's final synthesis is critically important. Dispensing with doctrine, Meyer presented a process that all regions can follow to determine independently how best to address congestion while also benefiting from the knowledge and experience that transportation researchers, practitioners, and policymakers have accumulated throughout the country to date.





Traffic Congestion: Issues and Options

June 26 - 27, 2003

Gallaudet University
Kellogg Conference Center,
Washington, D.C.

A conference convened by
- UCLA Extension Public Policy Program &
- UCLA Institute of Transportation Studies

PROGRAM

Congestion is among the most enduring and vexing public policy issues. Many studies show that chronic traffic congestion is a significant drag on the economy, costing American households and businesses billions of dollars each year. Vehicles stuck in traffic exacerbate air quality problems, consume excess energy, and many people believe that time spent in congestion significantly deteriorates quality-of-life. Some point to the long history of congestion in cities, and argue that congestion is an inevitable product of population and employment growth and prevailing development and travel patterns. But others believe that congestion can be meaningfully reduced by increasing transportation capacity. Still others argue that the key to addressing congestion is in changing the location and travel behavior of individuals and firms through, for example, land use changes and transportation pricing.

Addressing traffic congestion was a central theme of both ISTEA and TEA-21, and will be central to many of the deliberations over the re-authorization of TEA-21 in the coming months. Stakeholders in the reauthorization process often have widely differing views on the causes, consequences, and especially, the cures for traffic congestion; these differing views of congestion, in turn, underlie many of the debates over re-authorization. The goal of this conference is to examine these differing views of congestion by promoting dialogue on the causes and consequences of congestion, and examining the various institutional, policy, and technical strategies for mitigating congestion.

UCLA has worked with several sponsoring and cooperating organizations in planning and organizing this conference: the American Association of State Highway and Transportation Officials, American Public Transportation Association, American Road and Transportation Builders Association–Transportation Development Foundation, Association of Metropolitan Planning Organizations, Eno Transportation Foundation, Federal Highway Administration, PB Consult, Inc., Transportation Research Board, UC Berkeley Institute of Transportation Studies, University of California Transportation Center, and the U.S. Environmental Protection Agency.

To bring balance and a diversity of viewpoints to the conference, organizations and individuals representing a wide range of interests are included on the program. In carefully developed sessions examining different facets of traffic congestion and its policy implications, policymakers, opinion leaders, practitioners, and researchers will make short, substantive presentations, followed by discussion and exchange by all conference participants. The goal of the conference is to contribute to more informed decision-making by increasing our understanding of the traffic congestion problem, and by identifying and discussing the wide array of strategies for addressing congestion.

7:15 AM

- **Conference Check-In and Continental Breakfast**

8:00 AM

- **Welcome**
  Joanne Freilich, Director, UCLA Extension Public Policy Program

Session I

> UNDERSTANDING TRAFFIC CONGESTION

This opening session builds a common understanding of the causes and consequences of traffic congestion for the sessions to follow. Presentations discuss the history of congestion in cities, the congestion-related basics of traffic engineering, and the distribution and costs of traffic congestion in the U.S. today.

- **TRAFFIC CONGESTION: ISSUES AND OPTIONS**
  Brian D. Taylor, Associate Professor and Vice Chair of Urban Planning; Director, UCLA Institute of Transportation Studies

- **THE PAST, PRESENT, AND FUTURE OF TRAFFIC CONGESTION IN THE U.S.**
  Martin Wachs, Roy W. Carlson Distinguished Professor of Civil & Environmental Engineering and Professor of City & Regional Planning; Director, UC Berkeley Institute of Transportation Studies

- **ANALYZING THE CAUSES OF TRAFFIC CONGESTION**
  Kara M. Kockelman, Clare Boothe Luce Assistant Professor of Civil Engineering, University of Texas at Austin

- **MEASURING THE DISTRIBUTION AND COSTS OF TRAFFIC CONGESTION**
  Tim Lomax, Research Engineer, Texas Transportation Institute, Texas A&M University

9:45 AM
Break

10:00 AM

Session II

> ADDRESSING CONGESTION WITH CAPACITY IMPROVEMENTS

How do capacity improvements affect congestion? This question is hotly debated in many transportation policy circles today. This session examines this question from several philosophical and modal perspectives.

- **WHAT HAPPENS TO TRAFFIC WHEN WE EXPAND CAPACITY?: AN APPRAISAL**
  Don Pickrell, Chief Economist, John A. Volpe Transportation Systems Center

- **EXPANDING ROADS TO KEEP PACE WITH GROWING TRAFFIC: THE CASE FOR ADDING CAPACITY**
  Alan E. Pisarski, Consultant

- **THE CASE FOR INCREASING TRANSIT CAPACITY TO MITIGATE CONGESTION**
  David Lewis, President, HLB Decision Economics, Inc.

- **COMMENTARY: RESEARCH ON THE EFFECTS OF CAPACITY EXPANSION—IMPLICATIONS FOR POLICY AND PRACTICE**
  Robert Noland, Lecturer in Transport and the Environment, Centre for Transport Studies, Imperial College, London

11:45 AM

Session III

Lunch

Keynote Address:

THE FEDERAL ROLE IN ADDRESSING TRAFFIC CONGESTION

THE HONORABLE NORMAN Y. MINETA, Secretary of Transportation, U.S. Department of Transportation (Invited)

1:15 PM

Session IV

> IMPROVING GOODS MOVEMENT IN CONGESTED AREAS

While most public discussions of congestion concern commuting and personal travel, goods movement is increasing at an even faster pace. The transfer and distribution of freight is increasingly time-sensitive, even as metropolitan congestion worsens in many areas. Accordingly, this session explores how congestion affects goods movement, and the options for improving the flow of goods in congested areas.

- **EMERGING TRENDS IN SHIPPING: CHALLENGES TO IMPROVING INTER-REGIONAL GOODS MOVEMENT**
  Michael Gallis, Principal, Michael Gallis & Associates

- **COPING WITH METROPOLITAN TRAFFIC CONGESTION: A SHIPPER'S PERSPECTIVE**
  Bob Bergman, Vice President of Public Affairs, United Parcel Service

- **COMMENTARIES: IMPROVING GOODS MOVEMENT IN CONGESTED URBAN AND RURAL CORRIDORS—A MULTI-MODAL PERSPECTIVE**
  Peter Beaulieu, Facilitator, Regional Freight Mobility Roundtable, Puget Sound Regional Council
  Tom Norton, Executive Director, Colorado Department of Transportation

3:00 PM
Break

3:15 PM

Session V

> **USING NEW TECHNOLOGIES AND INFORMATION TO BETTER MANAGE MULTI-MODAL TRAFFIC FLOW**

How are new technologies changing the management of transportation systems? Do these changes promise modest or substantial improvements to traffic flow? These questions are explored as well as the policy and institutional issues involved in using new technologies and information to reduce congestion.

- **USING ITS (INTELLIGENT TRANSPORTATION SYSTEM) TECHNOLOGIES AND STRATEGIES TO BETTER MANAGE CONGESTION: AN ASSESSMENT**
  Jeffrey F. Paniati, Associate Administrator of Operations and Acting Director, ITS Joint Program Office, Federal Highway Administration

- **GUIDING TRANSPORTATION INVESTMENTS WITH TRANSPORTATION SYSTEMS PERFORMANCE MEASURES**
  Richard Margiotta, Principal, Cambridge Systematics, Inc.

- **REDUCING DELAYS USING ITS TO MANAGE TRAFFIC AND INCIDENTS**
  Pravin Varaiya, Nortel Networks Distinguished Professor of Electrical Engineering & Computer Science, UC Berkeley

- **REMOVING INSTITUTIONAL BARRIERS TO IMPLEMENTING OPERATIONAL IMPROVEMENTS**
  Steve Lockwood, Vice President, Parsons Brinckerhoff

5:00 PM

Reception

6:00 PM

Session VI

Dinner

Keynote Addresses:

VIEWS FROM CAPITOL HILL ON TRAFFIC CONGESTION AND TEA-21 REAUTHORIZATION

THE HONORABLE PAUL SARBANES (D-Maryland), Ranking Member, Senate Committee on Banking, Housing & Urban Affairs (Invited)

THE HONORABLE THOMAS PETRI (R-Wisconsin), Vice Chairman, House Committee on Transportation & Infrastructure (Invited)

8:00 PM

Adjournment of Day 1

7:15 AM

■ **Continental Breakfast**

8:00 AM

Session VII

> THE ROLES OF LAND USE PLANNING AND IMPROVED PUBLIC TRANSIT IN RELIEVING CONGESTION

What roles should land use planning and improved public transit service play in addressing traffic congestion? Many argue that these strategies have for too long been given short shrift in efforts to mitigate congestion. Others see the roles of land use and transit in mitigating congestion as relatively modest. This session examines this issue from three perspectives: public policy, land use planning, and public transit planning.

□ **POLICY OPTIONS FOR BETTER INTEGRATING LAND USE AND TRANSPORTATION PLANNING**
Anne P. Canby, President, Surface Transportation Policy Project

□ **LOCAL LAND USE PLANNING: IS IT PART OF THE PROBLEM? CAN IT BE PART OF THE SOLUTION?**
Robert T. Dunphy, Senior Resident Fellow, The Urban Land Institute

□ **INVESTING IN TRANSIT AND TRANSIT-ORIENTED DEVELOPMENT TO MITIGATE CONGESTION**
Jonathan Levine, Associate Professor of Urban & Regional Planning, University of Michigan at Ann Arbor

9:45 AM
Break

10:00 AM

Session VIII

> TRAFFIC CONGESTION AND AIR QUALITY

Vehicles stuck in traffic waste time and energy resources and produce air pollution. Indeed, an important rationale for reducing congestion is environmental. This session examines (1) how traffic flow improvements affect air quality, (2) the environmental effects of different congestion mitigation strategies, and (3) the influence of federal policies on these mitigation efforts.

□ **DOES IMPROVING TRAFFIC FLOW IMPROVE AIR QUALITY?**
Elizabeth Deakin, Associate Professor of City & Regional Planning, UC Berkeley; Director, University of California Transportation Center

□ **EVALUATING CONGESTION MITIGATION STRATEGIES: WHICH PRODUCE THE MOST ENVIRONMENTAL BENEFITS?**
Ken Adler, Policy Analyst, Office of Transportation & Air Quality, U.S. Environmental Protection Agency

□ **WHAT CHANGES IN CMAQ AND OTHER FEDERAL PROGRAMS ARE NEEDED TO REDUCE BOTH CONGESTION AND EMISSIONS?**
Michael Morris, Transportation Director, North Central Texas Council of Governments (Invited)

11:45 AM
Lunch

Session IX

> **ADDRESSING THE POLICY AND INSTITUTIONAL CHALLENGES TO TACKLING TRAFFIC CONGESTION**

PANEL:

- **STATE PERSPECTIVE**
  Neil Pedersen, Acting Administrator, Maryland State Highway Administration
- **TRANSIT PERSPECTIVE**
  William Millar, President, American Public Transportation Association
- **PRIVATE INDUSTRY PERSPECTIVE**
  T. Peter Ruane, President & CEO, American Road and Transportation Builders Association

1:45 PM

Session X

> **THE PROSPECTS FOR MARKET-ORIENTED SOLUTIONS TO CONGESTION**

Market-oriented congestion management strategies such as road pricing have grown in recent years. What have been the results of these efforts? Should we continue to test and refine these initial programs, or are we ready to significantly expand them in the near future? This session examines these questions and discusses the key policy challenges to adopting market-oriented congestion management solutions.

- **CONGESTION PRICING IN PRACTICE:**
  WHAT ARE ITS EFFECTS ON TRAVEL BEHAVIOR AND TRAFFIC FLOW?
  Robert W. Poole, Jr., Director of Transportation Studies and Founder, The Reason Foundation
- **CONGESTION PRICING IN PRACTICE:**
  POLITICAL AND MANAGERIAL LESSONS, AND NEXT STEPS
  Gary Gallegos, Executive Director, San Diego Association of Governments
- **ARE LEGISLATIVE CHANGES NEEDED TO FACILITATE MARKET-ORIENTED SOLUTIONS TO TRAFFIC CONGESTION?**
  Steve Heminger, Executive Director, Metropolitan Transportation Commission (Invited)

3:30 PM
Break

3:45 PM

Session XI

> PUTTING IT ALL TOGETHER: COMPREHENSIVELY ADDRESSING TRAFFIC CONGESTION

In this final session, the speaker synthesizes the two days of presentations and discussions on issues and options for addressing traffic congestion, and summarizes his views on the lessons learned. Areas of agreement and common understanding are highlighted, as are points of disagreement. The challenges before us—in policy, practice, and research—are outlined, and the next steps to be taken will be discussed by all in attendance.

Michael D. Meyer, Professor, School of Civil & Environmental Engineering, Georgia Institute of Technology

5:15 PM

Adjournment

APPENDIX B:
CONFERENCE SPONSORS AND COOPERATING ORGANIZATIONS

UCLA gratefully acknowledges the several sponsors and cooperating organizations with whom it worked in developing and organizing this conference.

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COOPERATING ORGANIZATIONS

Association of Metropolitan Planning Organizations (AMPO)

Eno Transportation Foundation

PB Consult, Inc.

Transportation Research Board (TRB)

UC Berkeley Institute of Transportation Studies

APPENDIX C:
PARTICIPANT ROSTER

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