

Potential Research Projects

FOCUS AREA		TOPIC	PROBLEM	NOTES
DELIVERY	1	Improve highway design methods for desert storms	Caltrans does not have effective design methods to handle desert storm runoff. Better design tools are needed to prevent flooding on desert highways.	
DELIVERY	2	Conceptual study for reconstruction and widening of 395 in San Bernardino and Kern Counties as a tolled facility.	Realistically 395 will not be widened and relocated (near Adelanto) without "non-tax" revenues becoming available for a sizeable portion of the cost.	
DELIVERY	3	Analysis of experience of NEPA delegation to states.	Tea-Lou authorized, on a demonstration basis, EPA to delegate NEPA to some states, including California as a way to expedite project development without compromising environmental standards. What has been experience to date? What has been learned? How has the delegated oversight process worked?	
DELIVERY	4	"Best practices" for coordination and responsibilities between Caltrans and local agencies.	Cities sometimes complain that coordination with Caltrans for implementation of local projects is difficult; Caltrans often feels that cities do not understand or have expertise to deliver projects. This project would survey city and Caltrans concerns and complaints and recommend policies or procedures which improve coordination and project delivery.	
STEWARDSHIP	1	Develop a conceptual benefit/cost model or framework which would rank mitigation transportation related strategies and investments to reduce air, water and climate impacts and which also take congestion cost into account.	It is not an exaggeration to say that pollution and congestion strategies are implemented most often on a "it's a good idea" basis without fully understanding the total cost and total benefit of such investments or policies and with no understanding of multiplier effects (positive or negative) specific strategies have on other mitigation goals, such as water or air quality. Even when the cost and benefit for a particular intervention are understood (rarely) the positive or negative impacts on achieving other mitigation goals are not understood. This study would establish a framework leading to a more complete understanding of all costs and benefits of various mitigation strategies. With the coming pressure to reduce carbon use such a framework becomes even more important.	
STEWARDSHIP	2	Examine Caltrans sale of excess right of way policies.	Cities have complained that Caltrans sale of excess r/w do not take into account economic benefit of local areas. This study would assess the nature of these concerns and recommend possible changes in Caltrans policies to address the issues.	
STEWARDSHIP	3	Regional Transportation Plan (RTP)	The Federally mandated requirement for Metropolitan Planning Organizations (MPO's) to adopt a conforming RTP each three years may be sound in principle but leads to an unresolved conflict between mobility goals and air quality goals. By requiring that transportation projects reduce emissions (or by assuming that all public transit investments yield air quality improvements) decisions are made which do not optimize congestion reduction strategies and probably lead to very small return in regard to air quality reduction versus alternative (i.e. non-transportation) air quality mitigation efforts. The objective of this study would be to recommend a different approach to the conformity issue which would encourage congestion relief projects and maximize air pollution reduction investments. This is a hot potato issue but one which merits serious attention before the next TEA renewal cycle.	
STEWARDSHIP	4	Public agency role in electric hybrid use	It appears that electric-assisted hybrid cars will become the next generation of hybrids. Is there a role for public agencies to assist in the usage of such vehicles?	

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STEWARDSHIP	5	GIS applications for system operation and project design.	GIS technology for managing the system and for project development may be underutilized by Inland Empire transportation agencies. This project would assess the regions GIS "performance" and make recommendations for increased GIS applications if needed.	
STEWARDSHIP	6	Alternative fuels(e.g. bio-biesel, hydrogen power)	Although many are working in these problem area alternative fuels research is one of the Governor's initiatives in his effort to find technologies to curb greenhouse gas emitions.	
MOBILITY	1	Traffic Management Center (TMC)	To identify issues among state DOT's regarding TMC operations.	
MOBILITY	2	Corridor management issues	There are a number of traffic monitoring, information, and ITS issues and needs, particularly in the Inland Empire. It is extremely difficult to assess the performance of the system with little integration with other counties. The implementation of an intergovernmental infrastructure for the regions is considered a high priority area by Caltrans, SANBAG, RCTC.	
MOBILITY	3	Reducing trip generation though e-commerce	Are there cost beneficial strategies for e-commerce to reduce trip generation?	
MOBILITY	4	Satellite based maps and traveler information	Districts need to share ITS information across district lines. The public wants this information as well. This project puts ITS information on readily available satellite-based mapping applications for all to use.	
MOBILITY	5	Replicate District 6 (?) Orange County "test bed" project to provide real time information for freeway segments and monitoring of city streets.	This project was a collective effort of UC Irvine, the District and the cities.	
MOBILITY	6	Public perception of user-based fees and tolls to finance transportation improvements.	A barrier to implementation of user based fees and tolls has been negative public perception and perhaps a lack of information about the benefits of such proposals. This study would assess public perceptions with the objective of determining what information may lead to a more positive public acceptance of such proposals. This study might also examine recent toll projects throughout the country to asses public acceptance or lack thereof.	
MOBILITY	7	Project selection to minimize traffic delay.	Regional transportation agencies lack a "best practices" guide to evaluating and selecting projects which will lead to the greatest increase in mobility. This project would provide a methodology for such evaluation for use by regional transportation agencies and Caltrans.	
MOBILITY	8	Hybrid access to HOV lanes	At least two states (California and Virginia) have been granted Federal approval to allow hybrid cars access to HOV lanes. Critics charge that this has compromised the efficiency of the lanes, resulted in higher fuel consumption per passenger mile, allocated very expensive freeway space to the most affluent. This project would evaluate the pros and cons of the hybrid priority programs which have been implemented.	

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MOBILITY	1	Shifting Cost of Driving from Fixed to Marginal Costs	Economists view the fact that the auto user perceives the marginal cost of driving as being very low compared to their fixed costs. Thus, it is argued, there is a hidden incentive to drive more because the perceived cost to the driver of each extra mile driven is very low compared to the actual cost per mile driven. This study would review ways in which fixed costs of driving can become marginal costs so that drivers can save more money for each mile not driven than is now experienced. Mileage based insurance rates, mileage based gas tax and vehicle license fees are among the candidates.	
TRANSPORTATION FINANCE	2	Collection, allocation and spending of transportation mitigation fees by local transportation agencies.	There has been a substantial increase in the implementation transportation mitigation fees in recent year, particularly by Regional Transportation Agencies. There has yet to be a study of the number of issues relating to collection and spending of such fees, including benefit allocation, borrowing on such funds, integrating mitigation fees with other revenues on specific projects, dealing with the timing problem resulting from the long term collection period (to build out) and the need to construct projects now. This study could provide helpful information to agencies which presently impose such fees and to agencies considering such in the future.	
GOODS MOVEMENT	1	Smart parking for trucks	Lack of available parking near State highways, driver fatigue, and idling. Assess technology to improve truck parking management.	
GOODS MOVEMENT	2	Axle-based truck fees	Experience in other countries and research has demonstrated many benefits (reduced roadway maintenance costs) of imposing axle-based fees in lieu of total weight fees on trucks. In fact very few measures would produce such savings. This study would develop an implementation plan for California to implement such fees, with special attention to reducing transition costs on the trucking industry.	
GOODS MOVEMENT	3	Homeland Security	Caltrans lacks inventory of vulnerable transportation infrastructure and database of best practices to prevent or mitigate attack.	
GOODS MOVEMENT	4	Decision-making process/structure for resolution of goods movement issues in Southern California	In spite of increased recognition of the problems little progress has been made to resolve a variety of goods movement issues and challenges in Southern California such as mitigation of diesel pollution, rail freight capacity, truck induced congestion, lack of grade separations, freeway capacity for truck movements etc. There is no effective governance of the system, institutional arrangement, forum or "table" at which the private and public interests can discuss and negotiate a joint approach. This study would review decision-making and governance models in other countries and regions and make recommendations on what structure would be helpful. SCAG has done some preliminary work in this area.	

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GOODS MOVEMENT	5	Imposition of container fees	The burden of mitigating traffic and environmental effects from the LA and Long Beach seaports is immense and falls heavily on the Inland Empire. One source of funds potentially available may be container fees. Though at this point not in support it is generally felt that if a portion of the fees were allocated to construction facilities which enabled more efficient throughput from the shipper and distributor point of view that the goods movement industry may be able to support container fees. This study would examine how container fees could most equitably and efficiently be implemented and make recommendations for their imposition. Such a study might be used to engage the transportation community in discussion of goods movement mitigation issues.	
GOODS MOVEMENT	6	Freight questions needing answers	See separate attachment	"Freight Questions"
GOODS MOVEMENT	7	Short haul freight rail feasibility and impact analysis	Short haul rail is promoted by some as being a way to move freight off highways. Several studies are underway, ranging from evaluating possibility of meglev to an elevated container movement system. It appears, however, that little attention is being paid to the actual traffic effects of short haul alternatives. For instance it is possible that short haul rail would simply shift truck traffic from one corridor to others. A number of other possible research needs related to short haul rail are likely to be recognized.	
GOODS MOVEMENT	8	Origin and destination information about freight movements by mode.	There is insufficient origin/destination information on freight movement through Southern California and this has inhibited the development of systematic modeling and forecasting. This project would assess and make recommendations to improve the region's access to such information.	
GOODS MOVEMENT	9	Intermodal and multimodal research and development projects.	See US DOT Office of Intermodalism suggestions on possible intermodal studies	US DOT Office of Intermodalism suggestions for intermodal research.
GOODS MOVEMENT	10	Options for benchmarking performance improvements achieved from construction of freight mobility projects.	This study would take the Washington State Transportation Center study to the next level and focus specifically on the Southern California context.	
GOODS MOVEMENT	11	Truck-only toll highway in the Inland Empire	Currently the only truck only toll facility in the US lies within part of the New Jersey Turnpike, outside NYC, but such things are being proposed for various major corridors - See Reason Foundation Policy Study 316 (http://www.reason.org/ps316.pdf).	
PUBLIC TRANSIT	1	BRT in dedicated bus lanes - evaluation of cost-effective planning and design options.	Should a dedicated BRT bus way be operated with two dedicated bus lanes with one lane per direction or single dedicated bi-directional bus lane with turnouts? There are other BRT issues relative to portions of the Inland Empire which may be good research projects with opportunity for implementation.	

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PUBLIC TRANSIT	2	When senior drivers can't drive: Who should pay for their mobility?	The operating assumption in the of transit operators is that the public transit system should absorb the cost and provision of transportation senior citizens who no longer can drive. Such assumption will lead to greatly increased subsidy costs and may exclude feasible alternative modes. This project would examine equity issues (such as requiring co-pay from those who are now "saving" money by not owning a car) and evaluate alternative service providers and modes (such as taxi service, vans etc.) to deal with the increasing demand for senior mobility.	
PUBLIC TRANSIT	3	Analysis of inter-city rail in California	There has been no independent analysis of the benefit/cost of the state's intercity rail program or of the proposed expansion program. Previous analysis of the system done several years ago (N.King) indicated an extremely high state subsidy per rider and very high costs with minimal return for proposed expansion.	
PUBLIC TRANSIT	4	SCAG Meglev proposal	SCAG has proposed (and included such in the region's RTP) the construction of a maglev system connecting much of southern California (this is not the proposed state high speed rail proposal) This study would independently examine the forecasting, financial projection, and engineering design parameters and make findings regarding feasibility of such a system.	
ADDITIONAL RESEARCH IDEA LISTS	1	Research Suggestions	1. " Research Agenda", Office of Transportation Policy (DOT), April 11, 2006	
ADDITIONAL RESEARCH IDEA LISTS	2	Research Suggestions	2. "UTC Studies" RITA - June, 2006	
ADDITIONAL RESEARCH IDEA LISTS	3	Research Suggestions	3. "Federal Highway Administration - Research Focus Areas"	
ADDITIONAL RESEARCH IDEA LISTS	4	Research Suggestions	4. California Department of Transportation "Strategic Research Direction/Strategic Focus Areas"	
ADDITIONAL RESEARCH IDEA LISTS	5	Research Suggestions	5. "Research and Technology Transfer Ideas for the Leonard University Transportation Center", provided by the Division of Research and Innovation, California Department of Transportation, December 2006	
ADDITIONAL RESEARCH IDEA LISTS	6	Research Suggestions	6. TRB Critical Issues in Transportation (2005)	

Freight Questions

Freight Questions

- 1) What is the geographic and modal distribution of freight-related trips carrying both port-related and locally-generated goods to in-basin and out-of-basin destinations today?
- 2) Absent major policy intervention (e.g., large-scale infrastructure initiatives, fiscal incentives, or regulatory change), how will that distribution change over time (i.e., what is the freight movement baseline) and what factors contribute to the change?
- 3) How will increasing congestion and deteriorating reliability impact use of truck vs rail? How will constrained freight rail capacity affect same? How will these factors affect the feasibility of short-haul rail?
- 4) What are the optimal infrastructure and operational strategies to reduce delay and improve reliability for long-haul trucking, where should these strategies be implemented, and how should they be funded? [In my view, this is the question the original East-West study would have attempted to answer.]
- 5) What rail capacity additions are needed for rail to retain/increase its market share? What other improvements are needed to meet the demands of short-haul rail? What is the appropriate role of public participation or investment in these improvements? [Some of these questions should be addressed by the LAEDC/SCAG freight rail study.]
- 6) What are the mode shift implications of the truck and rail capacity additions contemplated in Nos. 5 and 6 above? If significant mode shift would result, is it consistent with the public interest?
- 7) Is public sector neutrality between modes appropriate, or is it clearly in the public interest to facilitate a mode shift because of public cost savings, improved transportation performance, or environmental quality?
- 8) If a mode shift (e.g., from truck to rail) is deemed to be in the public interest, what combination of investments, incentives, and regulations is most appropriate to accomplish it?
- 9) How would these strategy alternatives redistribute traffic on highways and roads, and what would be the impact? How would each strategy affect the siting of freight-related land uses and land use patterns in general?
- 10) What institutional arrangements are needed to advocate for, finance, and implement the public share of the regional freight strategy?

US Office of Intermodalism Suggestions for Intermodal Research

As you know, the Research and Innovative Technology Administration (RITA) is trying to enhance the direct value of the UTC program to the research needs of the Department. In particular, they are trying to identify opportunities where the research interests of the universities directly relate to a particular need of the DOT. As you develop your strategic plans for your center and begin to implement your research agenda, I would like to call your attention to one the important research needs that the DOT has.

Section 4149 of SAFTEA-LU directs the Office of Intermodalism within RITA to prepare a *National Intermodal System Improvement Plan (NISIP)*. An important component of that plan is "a description of recommended intermodal and multimodal research and development projects;" The university centers are one of the greatest resources of research and development in the intermodal and multimodal areas. And because this research tends to be spread across the spectrum of the purview of DOT Operating Administrations you are being asked to consider how your research agenda in the next year or two could support the development of the NISIP.

Specifically, we would like you to report to us on studies completed, underway or planned within your center that meet the broad definition below. An intermodal and multimodal research and development study should be considered for inclusion if it falls within any of the following broad guidelines:

1. An assessment or forecast of the national intermodal transportation system's impact on mobility, safety, energy consumption, the environment, technology, international trade, economic activity, and quality of life in the United States;
2. An assessment of the operational and economic attributes of each passenger and freight mode of transportation and the optimal role of each mode in the national intermodal transportation system;
3. A description of emerging trends that have an impact on the national intermodal transportation system;
4. Proposal for improving intermodal policy, transportation decision-making, and financing to maximize mobility and the return on investment of spending on transportation;
5. An estimate of the impact of current Federal and State transportation policy on the national intermodal transportation system;
6. Development of measures to compare transportation investment decisions across the various modes of transportation; and
7. Formulation of a methodology for measuring the impact of intermodal transportation on the environment, public health and welfare, energy consumption, the operation and efficiency of the transportation system, congestion, including congestion at the Nation's ports, and the economy and employment.

Please send your information directly to Ms. M. J. Fiocco, Office of Intermodalism, RITAS, U.S. Department of Transportation, MJFiocco@dot.gov and John MacGowan, jmacgowan@gcnetmail.net

Thank you for your assistance in developing this important plan.