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Final Report

Transportation Decision-Making in San Bernardino County
Transportation Decision-Making in Riverside County

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Pilot Study: Transportation Decision-Making in the Inland Empire

Final Report

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INTRODUCTION

The Institute of Applied Research (IAR) at California State University, San Bernardino (CSUSB) is pleased to present its report on the 2009 Pilot Study: Transportation Decision-Making in The Inland Empire (Riverside and San Bernardino Counties). This study represents a partnership between IAR and The Leonard Transportation Center at CSUSB.

RESEARCH OBJECTIVES

As specified in the proposal, this pilot project was undertaken at a time in which California Transportation Commission personnel have estimated that the state is $100 Billion - $200 Billion short to adequately operate, maintain, and rehabilitate the current state transportation system, and expand the system in anticipation of the needs of a growing population. In this budgetary environment, understanding the decision-making process and the interaction between city, county, and state needs, are key.

According to the U.S. Department of Transportation report # HS-043 242, "Transportation decision making has become more decentralized and complex. These changes demand new tools, new competencies, new alliances - in short, a new framework for making decisions - a new transportation policy architecture." But in order to formulate such a new decision-making framework it is first necessary to gain a better understanding of the *current* decision-making process, which is the focus of this current pilot study.

More specifically, as part of this study IAR interviewed key Transportation Planners, City Engineers, Public Works Managers, Traffic Engineers, and elected officials at the city, county, and regional levels in order to gain insight as to how they guide and shape decisions relative to public policy in transportation. In addition, information was gathered regarding ways in which the Leonard Transportation Center can become a better resource for transportation planners in the two-county area.

METHODOLOGY

First, IAR identified four units/levels of analysis for this pilot project: (1) City Transportation Planners (Directors and technical staff), City Engineers, Public Works Directors,

and/or Traffic Engineers; (2) City elected officials; (3) County Transportation Planners and (4) Regional Transportation Planners. The number of respondents interviewed at each level was: 10 people from Level One, two people from Level Two, three from Level Three, and two from Level Four.

To begin the process of selecting the individuals to be interviewed at each of the four levels specified above, IAR identified the four largest cities in each county of interest. Within these cities, transportation planners were identified and interviewed for participation in this project. On the other hand, the Principal Investigators recognized the need to take into account the possible different perspectives of personnel at smaller cities. Within each county, IAR selected small cities and interviewed transportation planners from those cities. Two City elected officials also agreed to participate in the study. Finally, IAR interviewed three individuals who brought to the table a county-wide perspective, and two who represented a regional perspective.

Questionnaire Construction and Survey Implementation:

Initially, IAR established a number of working hypotheses to drive the construction of the questionnaire. These hypotheses were based on a review of the literature and our understanding of the area of transportation. In consultation with Dr. John Wu, Director of the Leonard Transportation Center, IAR constructed a semi-structured interview guide to address the working hypotheses and the research questions articulated above. Most of the interview questions were "open-ended", with the exception of the questions designed to elicit marketing data. This semi-structured interview guide is attached as Appendix I.

The first couple of questions were designed to establish rapport with the respondent and to focus the respondent on particular types of decisions to address. The remaining questions were designed to address the working hypotheses, and during the course of the interview these hypotheses were either supported or rejected and sometimes new hypotheses were established.

IAR's Project Coordinator interviewed individuals at Levels one and two, and the Principal Investigators interviewed individuals at Levels three and four. Each of the selected individuals was contacted and asked to participate in the study. If necessary, an appointment was made for a more convenient time for the interview to take place. At the appointed time, the interviewee was called and asked his/her permission for IAR to tape record the interview so as to obtain complete and accurate information. Following the interview sessions, the tapes were

transcribed by student assistants and the interviewer was asked to provide a brief written report of their insights as to how the data can be used to understand the decision making process.

HIGHLIGHTS OF MAJOR THEMES

The following section outlines the major themes that emerged from this pilot study. The reader is urged to review the complete interview notes which are attached as Appendix II. A list of acronyms is included as Appendix III.

Theme 1: Highly technical people (analysts, engineers, and planners at the City level) predominantly use technical considerations in their decision making, but on occasion take into account political factors and an "aha" experience

As one would expect, Analysts/Planners/Traffic Engineers at the City level (Level One individuals) are mostly concerned with providing City elected officials (Level Two individuals) as well as County and Regional transportation officials (Level Three and Four individuals) with data and recommendations based on technical models and existing standards/laws. Consider the following strips of conversation:

- Traffic Engineer: "We use technical elements to gauge the priority of a project."

- City Planner: "We have street standards; we also have standards for the capacity for intersections that guide when you need to widen it, when it might need stop sign, light, etc. We also have standards for good pedestrian access, good environment for bicyclists, to promote good transit services, flow, public access, traffic controls. "

- Public Works Director: "Operating policies (whether it be public transportation or vehicles on roadways) are mostly governed by accepted standards manuals. Right turn lanes, etc. those are more driven by standards, acceptable highway design standards and traffic operation standards…In contrast, maintenance policies are more public policy driven. A City Council may decide how well we want to maintain our roads and make decisions based on budget that it is available and priorities of how the city wants to spend their money and their feeling of acceptability – what is perceived as acceptable by the general public in terms of maintenance of streets."

- Public Works Director: "I and others in the department make decisions based on standards on daily basis. There are a few of them that are level of importance high

enough or even a level of controversy high enough to go above us and be made at a higher bodied level. We may get in that debate where Engineers will hold to the standard but because of site-specific issues there is a need to compromise. That type of decision can go up to a committee level or a city council level and the decision can be made at that level."

- Public Works Director: "We make decisions 90% on standards and 10% based on political factors."

- Traffic Engineer: "For stop signs we use a manual…MUTCD published by the Federal Highway Administration and also by CalTrans. We use their guidelines and requirements for the installation of stop signs. The same thing for a traffic signal. "

But if there was general consensus among the Level One individuals that their major job was to acquire data and to apply that data in technical models in order to generate recommendations to elected officials who make the decisions, these Level One individuals also agreed that their jobs at times involved considerations beyond the technical concerns.

- Director of Public Works: "I would say it's more on the technical than the political. But definitely the political influence is involved. Maybe it's idealistic to think that it's more technical than political, but I really think it is. In the experience I've had, the politicians want to make decisions based on objective information vs. whatever their whim might be. So I'd say decisions are maybe 75% technical and 25% political. "

- Traffic Engineer: "Both processes (technical and political) are involved to ensure that the solution meets public expectations and are implemented per design and accepted guidelines."

- City Planner: "We use technical information to support recommendations to the decision makers, but it is also a political process to make whatever policies you have. I don't know anyplace that relies only on technical models because there are always choices to be made. Our job is to provide good sound technical information and make our recommendations based on that while keeping in mind the political realities."

- Public Works Director : "It's difficult to differentiate where politics stop and where they let the Engineer take over -- what is the right way to do it. I know this is not a very clear answer, but the decision-making process is not black and white."

In addition, Level One individuals stressed the fact that they need to be aware of the public's ideas and perceptions.

- City Planner: "In 2005 we re-evaluated our existing policies and standards based on knowledge and experience and see what works and what does not, some of which comes

from public involvement, complaints or suggestions from the community, some changes were recommended through the general plan update."

- City Planner: Our general plan is adopted by city council. It is a lengthy process to create a policy, and it includes public participation and community involvement at the grass roots. Then we go through draft policies, take them to the planning commission, and then to city council.

- Traffic Engineer: "We get a lot of ideas from citizen complaints."

- Traffic Engineer: "The public plays a large role. We…have public outreach meetings and get the city's feedback and buyoff on a project. On large projects there is a public meeting. On development projects we have public meetings whenever there are sensitivities to residential areas. "

- Traffic Engineer: "We primarily get citizen input through community meetings or surveys."

- Traffic Engineer: "We get public input via neighborhood meetings, monthly mayor's night out meetings, citizen phone call requests, and committees such as the parking committee and the parking, traffic and streets committee."

- Public Works Director: "We always consider the business and citizens' standpoint. Many times that is what is drives the issue that we are dealing with."

Theme 2: City elected officials have a broader perspective than City technical staff in that they rely on technical models provided by their staff, but also deal directly with political realities.

As previously noted, as one ascends the decision-making hierarchy from Level One to Level Two there is a proportionate increase in sensitivity to political needs and realities. Simply put, City elected officials must take citizen input and political realities into account more than the technical staff. As mentioned by a City Traffic Engineer: "My decisions are technical based. My director and elected officials deal with the political side."

Following are some pertinent quotes from elected officials:

- Mayor: I wish I could say it is not political, but the reality is it is. I try and leave as much political out as I can. But sometimes it is the community that creates the political aspect

for us. So if it is going to be a very negative outcome for some of the residents, it becomes a political decision rather than a technical -- sometimes politics has to weigh as much as the technical side.

- Council: The technical side, that's the easiest one to be dispassionate about. It's either right or it's wrong. It's based upon pure science, there is no emotion there. But you don't give up your heart or your feelings when you get elected. So when you look at the people who are going to be displaced because of eminent domain the first thing you think to yourself is "do we really need to do this? Is this the only option we have?"And if the answer is yes, you say "okay folks, go out and get the appraisals and make sure the offer we are making to these people for their property is appropriate."

Of course, accessing public opinion is vital when dealing in the political realm. The City elected officials we interviewed were eminently aware of the need to directly solicit citizen input about issues and/or to be available for constituents to contact them regarding issues.

- Mayor: We have public hearings during our policy-making process. I get lots of emails. I publish my cell phone and my email and I'm fine with people contacting me. I truly believe that citizens need to have an outlet to be heard. Sometimes their ideas are the best ideas. They might have a different perspective that we're not seeing.

- Councilperson: We have community outreach programs…we sit down with folks in the community and…ask for a representative from Caltrans or a representative from RCTC and then it's mostly listening to people's complaints. "When is somebody going to do something about this terrible situation?" You hold public hearings and tell people what you're contemplating and give them an opportunity to applaud or give us the raspberry or help us restructure because the public is right.

Theme 3: County and Regional Transportation Planners deal more with political realities during decision-making than do City Planners.

It is obvious that decision-making at the City level incorporates knowledge of technical models and standards/laws, an appreciation of the needs and desires of residents, and the political acumen to put it all together. Transportation professionals at county and regional levels also make decisions based on technical models and public input. However, there is disagreement among interviewees as to how much political influence plays a part in decisions. Some of them feel that a lot is politically driven, as seen in the following quotes:

- A *LOT* is political. If we pursue a rail project there are political considerations. One would hope that the political aligns with the technical. We look for consensus. If there is enough desire and political will, it triumphs. At the end of the day, if there isn't the political will, we won't move forward.

- In effect the major decisions are planned by the electorate. We are committed to projects on the ballot (so in that sense, it is the electorate that identifies the issues). The more important question is: What projects can we sell? We tell that through polling. These may not be the highest priority projects from a technical point of view, but at least we can sell them to the public.

But there are those who believe that while political considerations have to be taken into account, it doesn't play a large role in decision making:

- In our county we try to make decisions using technical considerations. Still, every decision has to be looked at with an eye to the political. We craft something based on objective data and then try to make sense of it by the political process. Believe it or not, we are pretty non-partisan. We can get past the politics more easily than people on a city council can. We have a balance of views...a 32 member board.

- Transportation policy succeeds because there is very little political influence and a strong technical aspect.

- Actually, the world is pretty regulated. There are sales tax regulations, etc. The money comes with strings attached, and that's what drives policy.

Theme 4: Most policy decisions come from current laws/regulations, but the "aha" experience still enters in. Note: operational definition of "aha" experience is seeing what works and what doesn't for other cities/regions.

In the social sciences and the hard sciences, the term "aha" experience is often used to describe an individual who has a sudden creative insight. Although it is possible that this kind of "aha" experience may also occur at times for transportation professionals or elected officials, in this research endeavor we chose to define the term as meaning that these people may have read an article or seen something in another city and thought that perhaps that idea could work in his/her own city. Did our respondents report such "aha" experiences? The following individuals clearly describe having an "aha" experience:

- Traffic Engineer: "Recently we wanted to establish stop signs in residential areas and the MUTCD doesn't really have a policy for that. They deal with arterial streets. What we did was use proven criteria from other cities. We designed a policy that we took to our City Council to establish stop signs in residential areas. We gathered information and data from other cities, put together a policy and presented it to our Public Traffic Safety Commission for their concurrence with it and then went to the City Council and that is now part of the neighborhood traffic calming program."

- Mayor: I've had several "aha's" non-transportation related by going to other cities. So I truly believe that sitting in another city or getting a perspective in another city is certainly advantageous. For example, we went to a city which had just gone through an expansion of a bridge to get ideas.

- County/Regional: There are plenty of opportunities for the "aha" moment.

Some see it as simply the use of other sources of information and seeing what works in other cities, but may not think of it as an "aha" experience.

- Public Works Director: Sometimes citizens will suggest building materials that they saw in another city that we weren't considering. Or maybe methods that we weren't considering. Where it may not be "aha" where we're surprised, a suggestion might lead us down a different path than we thought and we found a new solution.

- Traffic Engineer: It's not so much an "aha" experience as "I think that would work here." When I'm out and about I take pictures and notice things that work in other cities and bring it back to the city.

- Councilperson: I'm not sure in this city we would have used the term the 'aha' experience."

- Traffic Engineer: We often talk to other agencies in the surrounding areas to see if they've tried an idea....we have a pretty extensive network. Give us your experience, lessons learned, etc. and then we would apply it to what we're trying to do.

- County/Regional: There are not a lot of "aha" experiences happening. We work on long range planning. It is a step-by-step basis. There are a lot of things considered when making decisions.

And one City Planner said that "the 'aha' experience does not happen that often." He went on to say, "Most of the time when you travel to another country they will notice ideas or what they saw. But how often does that fit back into what they are doing here? Not very often."

Theme 5: Policy decisions are predominantly made by committees/groups, but someone with a passion for their beliefs can make a difference in the outcome of discussion.

There was a general consensus among those interviewed that most policy decisions are made by committees and groups, and while transportation planners obviously bring their own beliefs and values to the table, the impact of those personal beliefs is limited. Decisions are primarily made for the benefit of large groups of constituents rather than a single interest group.

- City Planner: Personal beliefs and values do play in. How often? I guess as needed. But for the most part we have a transportation plan in place, and there are checks and balances. But we get our personal beliefs involved, it is just second nature.

- City Planner: Individual staff people are there to assist in making a good transportation system. We're not here to impose any of our personal beliefs. We don't have personal agendas.

- County/Regional: It's not really *personal* beliefs and values, but rather ***institutional (organizational)*** beliefs and values that are brought into discussions.

- County/Regional: To some extent it is inevitable to bring in your own beliefs and values. We get the input of lots of colleagues…they all have their own feelings and priorities which get balanced.

However, some of the individuals we interviewed believe that individuals can clearly make a large impact by bringing personal beliefs and experiences to the table.

- County/Regional: Decisions are made collaboratively, but an individual can make a huge difference. If they have a passion for an issue, they can make a real difference on a committee in establishing the direction of discussion.

- Traffic Engineer: When we review issues we use some of our personal experience to supplement or complement the decisions that are made based on our own personal experience. So we bring some of that and another colleague will bring some of their knowledge and experience to the table.

- Mayor: Absolutely, we have 5 different personalities and 5 different backgrounds brought to our city council and each of us brings our experiences and talents to the table. That is what makes a good council, by each of us bringing something to the table.

And one individual indicated that "98% of the time it is a value free model with virtually no pressure to 'cook an answer' to match what they already want to do based on political considerations" (County/Regional).

Theme 6: Policy makers rely on a variety of sources of information to help shape their policy decisions.

As we have already discussed, transportation planners use a variety of sources of information to help shape policy. Some of these include technical databases, citizen input, seeing what works in other cities, and utilizing the experiences and personal expertise of individuals in the transportation field. The following individuals describe using all of these sources of information:

- Public Works Director: Technical databases, reading journals, talking to other professionals, years of experience regarding what has worked in other cities and what hasn't, etc. We are always looking for input that has worked or not worked and what is available. We also have a database from the police department on accidents and collisions. And we get public input through community meetings.

- County/Regional: It depends on the issue. We use multiple sources!

- Mayor: It is the staff who are the experts, and residents have to live through whatever decision you make and the elected officials have the history of consequences, so you've got to take all of those into account to make the final decision, weighing each one appropriately.

Probably the main source of information comes from technical data. These next few quotes illustrate the type of technical data and information that is used:

- Traffic Engineer: There's the Institute of Transportation Engineer (ITE), they publish technical databases. We'll research things out like that. When we're looking at criteria for stop signs and signals we use the police department and the collision data we receive from them. Other databases are count data, traffic count data for volumes of things like that which is also required when reviewing criteria for signals and stuff. We also use public input. I also look on the ITE website. There's also a lot of papers published on the effectiveness of traffic signals and stop signs and other traffic controlling devices that are out in the field that are tested on a regular basis so that's a good source to see what's going on and how things work.

- Traffic Engineer: ITE has a really good support type group that, they have email, like a listserv type of service that they provide. ITE is the Institute of Transportation Engineers, a professional group.

- Traffic Engineer: For collision analysis, we would gather collision data from our database which is input by our Police Department. We'd also refer to The Office of Traffic and Safety, they maintain a database as well.

- City Planner: Needs are identified through technical data , ex. level of service at interchanges, are interchanges functioning properly with amount of traffic.

- Public Works Director: We look at traffic counts and traffic studies, statistical information from our traffic signals, accident data and accident history, etc.

In addition, transportation planners use input from local business and citizens, and looking at what works in other cities to help shape policy in their own city.

- Traffic Engineer: Often we talk to other agencies in the surrounding areas to see if they've tried something...we have a pretty extensive network (including through ITE).

- Traffic Engineer: Sometimes we solicit the public for comments.

- Traffic Engineer: I work with other cities who have offered for us to come and see what they've done and we can call them at any time.

- Traffic Engineer: I attend ITE monthly meetings and stay up to date on hot issues in the area and talk to adjacent cities and see what kinds of issues they're dealing with. See how other cities address issues and incorporate that into our decisions.

- Public Works Director: Also, we consider the business' and citizens' standpoint.

- Councilperson: We also rely on our population (their complaints).

- County/Regional: It is important for us to understand what's important to the public. We talk to businesses all the time through personal contacts, radio spots, TV, etc.

- County/Regional: When planning policy we look at other cities/regions to see what they have done.

Finally, city officials will sometimes hire an outside consultant to evaluate what is needed in their city.

- Councilperson: Generally you do not have enough expertise in the city to do that all by yourself, so you hire the outside consulting firms that specialize in traffic management, they come back with recommendations.

HIGHLIGHTS OF MARKETING DATA

Although the major portion of this project dealt with providing a description of the transportation planning process, the other component involved providing the Leonard Transportation Center with some much needed marketing information and data so that the Center can better serve the needs of local transportation agencies.

After the interviews were conducted with transportation planners regarding what influence and shape their transportation decision making, they were asked to comment on which Journals and/or Magazines they read to stay current in their field, and also what professional organizations they belong to.

Firstly, they were asked what journals or magazines they read. The most popular journal is the Institute of Transportation Engineers (ITE) Journal, read by seven of the individuals we interviewed. This was followed by American Society of Civil Engineers (ASCE) (5 people), and American Public works Association (APWA) magazine (4 people). The Transportation Research Board (TRB) Journal, the American Planning Association (APA) Journal and the League of California Cities Western Magazine were read by 3 people each.

Journal / Magazines	Number of People
Institute of Transportation Engineers (ITE)	7
American Society of Civil Engineers (ASCE)	5
American Public Works Association (APWA)	4
Transportation Research Board (TRB)	3
American Planning Association (APA)	3
League of California Cities Western Magazine	3
American Public Works Reporter & Public Works	2
Journal of Intelligent Transportation Systems: Technical, Planning & Operations	1
Construction Standpoint ENR	1
Press Enterprise transportation issues	1
Wall Street Journal Regional and National transportation issues	1
PPIC Publications	1
California Real Estate Journal	1
Urban Land Management Magazine	1
California Planning and Development Report	1
Metro Investment Report	1
UC Publication	1
Planning Journals in general	1
Don't have time to read	3

Secondly, they were asked which professional organizations they belong to. Consistent with what they read, most of the professionals we talked to belong to the Institute of Transportation Engineer (ITE) Chapters and/or the American Society of Civil Engineers (ASCE) (6 people each). Another 5 people belong to the American Public Works Association (APWA).

Professional Organizations	Number of People
Institute of Transportation Engineer Chapters (ITE)	6
American Society of Civil Engineers (ASCE)	6
American Public Works Association (APWA)	5
American Planning Association (APA)	2
Western Riverside Council of Governments (WRCOG)	2
Riverside County Transit Commission (RCTC)	2
International City/County Managers Association (ICCM)	1
Transportation Research Board (TRB)	1
California Association of Councils of Governments (CALCOG)	1
Regional Transportation Planning Agency (RTPA)	1
Redevelopment Association	1
Regional Transportation Authority (RTA)	1
Exploratory Advanced Research Program (EARP)	1
Urban Land Institute	1

Next, they were asked, "If the Transportation Center on campus wanted to spread the word about conferences they are doing or research findings they want to disseminate, what would be the best venue to get to you?" While one person said that direct mail is a better way to spread the word, the majority of individuals (14 out of 15) stated that being on an email distribution list is a good way to receive information. Some of them commented that they would prefer that it was not just a link, but that the important information is in the actual email. However a link to their website for more detailed information would be fine.

Some of them noted that ITE, ASCE, and RCTC are always looking for guest speakers to attend their meetings, and that would be a good source to spread information. One commented that "if these Associations supported your information, the members are more likely to look at the email a second time and take it more seriously."

Lastly, Transportation Planners were asked what specific services they would like the Leonard Transportation Center to offer. While many of the respondents stated that they are unfamiliar with the Center, all respondents provided valuable suggestions about services the Center could offer. The following is a list of suggestions:

- Since I'm not aware of Leonard Transportation Center, any information would be valuable.
- Since safety is paramount...any research about safety improvements, or new strategies for safety improvements.
- Safety strategies, streamline Caltrans process to cut down time to get a project done.
- Most of the associations / societies cover all current issues with guest speakers. So having talks about current events and issues would be fine.
- Perhaps hold a forum on streamlining of Federal to State to Local projects. It takes so much time and money to complete a project because it goes on for so long.
- A regional data source. We here in the city keep our own data, but would it not be great to have a source that has a wider spectrum of the surrounding cities and that would maintain that? By data I mean construction cost, traffic volume, etc. that's more on a regional level and not just within the city.
- Updated traffic models, level of service, ADT counts, planned future projects.
- Training classes similar to what UC Berkley offers in their Institute of Transportation (http://www.its.berkeley.edu). Those training classes are too far away. Training locally in the Riverside/San Bernardino County would be helpful -- it cuts down on cost to the department.
- Community Outreach into public transit. We need to push more towards public transit, carpooling, you can keep building roads but never will be enough. We're trying to get as many cars off the road, so whatever help we can get from various organizations to encourage public transit in our community, I think it's to everyone's advantage because you can only build so many roads.
- Help come up with creative solutions. Every city has a pet project and when they get information it is usually from someone who wants to sell you something. I look at educational institutes in a more favorably light -- I assume is that you are doing research for scientific purposes, so if the Center has transportation engineers working on a project

I am more inclined to listen to their suggestions and then try to apply their suggestions to my county.

- Could CSUSB office help streamline the Caltrans design and environmental process? If you could do one thing, how do you reduce the number of years to the planning of a project to get off the ground, this would cut cost, less issues and problems, less time of always adding and re-inventing the wheel. There are a lot of changes over 10 years that result in the need to continually update and change designs, policies, and documents.

DISCUSSION OF FINDINGS AND CONCLUDING REMARKS

We began this final report by quoting the U.S. Department of Transportation report #HS-043-242 which observed that transportation "decision making has become more decentralized and complex," and that "a new framework for making decisions -- a new transportation architecture" is needed. But the report then went on to note that in order to formulate a new decision-making framework, it is first necessary "to gain a better understanding of the current decision-making process." And it was to this end that this pilot project was undertaken.

Throughout this report we used anecdotal statements derived from our interviews with transportation planners to describe and to document the complexities of the current transportation decision-making process. The "bottom line" is that although some Level One planners acknowledged taking into account political realities and a few indicated that on rare occasions they used an "aha" experience to inform their decisions, it appears that their major job is to simply acquire data and to apply that data in technical models in order to generate recommendations to elected officials who make the decisions. Moreover, transportation planners at the "higher levels" expect Level One planners to focus on the technical aspects of planning, and to provide them with needed data so that they can make their case in the political arena.

There was some disagreement among individuals at the higher levels as to how much their decisions are reached on the basis of purely technical considerations, but there was no disagreement among those individuals that partisan politics, the views of key stakeholders, and public sentiments have to be taken into account in some way. Thus even the most ardent advocates of objective data-driven decision making concede that "we try to make decisions using technical considerations..... Still, every decision has to be looked at with an eye to the political."

Although one could debate the level of complexity of the current transportation decision-making process, there is every reason to believe that future decision-making will become more complex due to the increased sophistication of the growing body of theoretical and technical knowledge. And in turn, it is likely that this expansion of knowledge will hopefully enhance the probability that the recommendations offered by the Level One planners are indeed the "best objective solution" to the problem at hand. From a 20th century point of view, the Level One personnel are in place to provide data for the real decision-makers: Levels Two, Three, and Four people. But in the 21st century, there is every reason to believe that this decision-making process will be transformed such that today's "technicians" will be seen more as professionals with a vital role in shaping public policy. Simply consider the case of global warming. Indeed there is a great deal of partisan politics on all sides of the debate. But increasingly science is playing a major role in shaping public opinion of this highly partisan issue.

Thus this pilot study suggests that the 21st century transportation decision-making architecture will place more power and prestige in the hands of the scientist and the engineer. However, it is unclear how this new framework which relies heavily on scientific solutions to everyday transportation problems will play out in a democratic society which values public discourse and the interplay of various points of view and interests. Future IAR research will investigate these issues.