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February 5, 2009

To: Mr. Wayne Y. Yoshioka
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

CC: Mr. Ted Matley
FTA Region IX
201 Mission Street, Suite 1650
San Francisco, CA 94105

RE: General Comments on DEIS

Dear Mr. Yoshioka:

I am by no means an expert on transportation planning and engineering, but as an R&D director (now retired) in a multibillion-dollar high-tech company, do have considerable experience in evaluating complex and risky technology projects, including evaluation of alternative technologies and approaches, assessing technical feasibility of proposed approaches, and evaluating outcome probabilities and economic risks. Surprisingly, the principles and methodologies for evaluating the Honolulu rail transit project are very similar. In both cases an informed decision to proceed (or not) is based on reliable input (existing and projected) and objective analysis based on experience, good judgment, and benchmarking against comparable projects. After initiation of approved projects, similar methodologies are applied to measure progress as new information (results) becomes available.

Based on my analysis of the DEIS and supporting documentation, and researching project history and benchmark information, I have serious reservations about whether the City has made an objective evaluation of all of the alternatives against the key criteria, but rather has conducted the process and presented data and analysis to achieve a predetermined result. The magnitude of the cost of the project and the long-term implications that the wrong choice will have on the aesthetic, environmental, economic, and social welfare of the community is cause to pause and reassess the validity of the whole process.

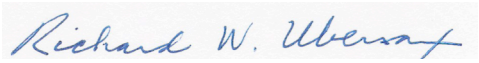
Each Administration has had its own "pet" transit program (just look at the history over the last 20 years), which has resulted in vacillation and delay in moving forward. This has created chaos in the selection process and confusion among the people. The current Administration (and Council) terminated the past Administration's BRT project within days of attaining office and instantly the current program was elevated to the top of the agenda.

I think we all recognize the need for an efficient and cost-effective transit system for the island of Oahu, but we must resist emotional or predetermined decisions and political agendas to dominate the process – rather than a pristinely objective process.

The following examples and discussion are meant to show where I believe there are flaws in the process, data, interpretation of the data, and arguments in favor of the case. There are numerous other examples I could use, but for lack of time and brevity, I have focused on the ones presented. Please take this discourse constructively, even though it may appear highly critical.

Please contact me with any questions.

Respectfully yours,



Richard W. Ubersax

P.S.: I have also sent you an electronic copy in .pdf format.

The purpose of the DEIS is to provide the City and County of Honolulu, the FTA, and the public with information necessary to make an informed decision, based on a full and open analysis of costs, benefits, and environmental impacts of all of the alternatives considered. This project is probably one of the most complex and costly projects ever undertaken in the state of Hawaii; so it is critical for the City administrators and the public to have sufficient and objective information to make informed judgments about the various aspects of the project, distill the information to assess the merits of potential alternatives, and determine how it will affect the island and their personal lives. However, it seems that in some respects, the DEIS is aimed at convincing the pubic (and the FTA) of the benefits of the "Project", rather than to objectively inform about both the benefits and downsides.

The DEIS and the accompanying Technical Reports certainly contain a plethora of information, but there are many areas where important information is missing or difficult to find, where significant changes have been made from the Alternatives Analysis without sufficient explanation, where the validity of data is in serious doubt, and where decisions and choices have been made and rationalized with incredulous explanation. As a result, the credibility of the entire document and process is compromised.

The Administration, FTA, and Oahu taxpayers should be wary of spending over $5 billion on a Project that has been selected on the basis bias, questionable data and judgment, where the risks have not been fully evaluated, and where significant impacts have been summarily dismissed.

In its present form, the DEIS does not meet the criteria set forth in the first sentence of this page. In fact, the City should step back, assess whether they have objectively met all of the criteria and requirements of NEPA and SAFTEA-LU, make the appropriate modifications to ensure compliance, inform the public of their intentions and plan, and then move forward. It is better to take the time now rather than regret unintended consequences in the future.

The following discussion is meant to provide examples where – based on my interpretation and analysis of the information provided in the DEIS, supporting references, and other documentation developed throughout the process – I find that incomplete or ambiguous data has been presented, inappropriate conclusions have been drawn, and/or questionable decisions made.

A. Selection and Evaluation of Alternatives

The DEIS defines the "Project" as a fixed guideway transit system from East Kapolei to Ala Moana Center. Planned extensions are anticipated to West Kapolei, UH Manoa, and Waikiki. The Locally Preferred Alternative selected by City Council includes the Project and the planned extensions. The DEIS considers the following "four" alternatives:

1) No-Build Alternative and
2) Build between East Kapolei and Ala Moana Center, with three variations:
   a) Salt Lake Alternative
   b) Airport Alternative
   c) Salt Lake + Airport Alternative combined

Actually, these distill to two alternatives – No Build and Build. The three "Build" alternatives described in the DEIS are so similar in terms of environmental impact, benefits accrued, and economics that they cannot be truly classified as distinctly different alternatives; to the skeptic, it appears that they were structured as distinct alternatives in the DEIS to satisfy the legal

requirement of due diligence for the selection and evaluation among all reasonable alternatives. If they were truly distinct, City Council would never have been able to make the switch from the Salt Lake Alternative to the Airport Alternative by a simple Council vote without considerable public input.

It is clearly stated in 40CFR1502.14:

The Environmental Impact statement *"should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public. In this section agencies shall:*

(a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

(b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

(c) Include reasonable alternatives not within the jurisdiction of the lead agency.

(d) Include the alternative of no action.

(e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.

(f) Include appropriate mitigation measures not already included in the proposed action or alternatives."

It is clear that since reincarnation of rail transit in 2005, there has been bias towards steel-on-steel rail as the preferred transit mode; other potentially viable alternatives have not been considered seriously, or they have been systematically eliminated during preliminary evaluation. The Locally Preferred Alternative (LPA) from Kapolei to UH Manoa with an extension to Waikiki was selected because the end-points make sense and the route passes through the highly populated east-west corridor where traffic relief is badly needed. When it was realized that the cost of this route was significantly higher than the City could afford, the expedient solution was simply to shorten the route, with the intent to complete the LPA at a later time. Other alternatives, which could be as equally effective – and perhaps lower-cost – appear to have been summarily dismissed without comprehensive, objective evaluation. The explanation of why alternatives were not feasible was based on flawed analysis and on the argument that they did not meet FTA or State criteria for funding. In reality, there are alternative federal funding sources, and the State could easily amend HB 1309 to accommodate other Alternatives. It is clear that the political will was – and continues to be – focused on rail (note restrictions in HB 1309 for counties with population of greater than 500,000), and thus has limited the scope of selection of Alternatives.

The current design of the fixed guideway will cause irreparable disruption of views through and across its path; it would ruin the aesthetics neighborhoods and important historical sites. These visual impacts would be impossible to mitigate. The noise of trains passing every 1.5 to 5 minutes will be physically and emotionally distressing, especially during night-time hours along tight corridors. The FTA guidelines are for exterior noise, and do not consider the open window and door lifestyle of our residents. Many of the receptor sites evaluated in the DEIS would shift

from "no impact" to "moderate impact", or from "moderate impact" to "severe impact" if the criteria were adjusted for our lifestyle. The assessment in the DEIS downplays the severity of noise impacts by not considering L_{max} for instantaneous noise as recommended by FTA guidelines. At present, there are no City or State statutes that regulate noise from mobile sources. Hawaii HAR 11-46 *[not HAR 11-16]* regulates stationary noise sources. It is imperative that such statutes be legislated to protect the peaceful environment to which we are accustomed.

All things considered, we need to step back and objectively evaluate alternatives that could be more cost-effective than elevated rail and could bring lesser environmental impact along its path. The following are examples that should be considered:

a) A more environmentally-friendly rail system. The greatest concerns with an elevated guideway, steel-on-steel rail system is the high cost of the elevated guideway (~3-4 times that of at-grade systems) and significant visual, aesthetic, and noise impacts along the guideway. A potential solution would be to build the system at grade through rural areas where possible for lower cost, and through sensitive urban areas (where noise, visual, and aesthetic impacts are problematical), to build at-grade or underground. Fixed Guideway Alternative 4a (Kapolei Parkway/Kamokila Boulevard/Salt Lake Boulevard/King Street/Hotel Street/Alakea Street/Kapi'olani Boulevard/UH Manoa) from the *Alternatives Screening Memo, October 24, 2006* apparently attempted to do this but was eliminated from consideration late in the evaluation process. It (or optimizations thereof) should be revisited, and perhaps with shortened routes (e.g., an MOS from East Kapolei to Ala Moana Center) for greater affordability.

   This alternative would be expected to have lesser noise and visual impacts east of Iwilei Road since it descends to grade on Hotel Street and goes underground at Alakea Street to Waimanu Street. The cost of this alternative is expected to be less than or comparable to the DEIS Salt Lake Alternative.

b) A bus rapid transit (BRT) system similar to that described in the *"Primary Corridor Transportation Project"* FEIS, *July 2003* and *"Honolulu BRT Project Evaluation", January 2006*. The system began operation in November 2004, but was discontinued in June 2005, supposedly due to poor performance (and coincidental with change in City administration).

   A conclusion of the 2006 "Evaluation" report is: *"Greater benefits in terms of improving ridership, customer satisfaction, capital and operating cost effectiveness, transit supportive land use, and environmental quality may be possible with more significant investments in dedicated running ways, advanced vehicles, stations, ITS elements, and fare collection."* BRT has been proven successful in many U.S. and foreign cities, and could be successful in Honolulu if given the chance. This alternative should be revived and given the necessary planning and engineering resources to make an objective evaluation.

c) A BRT / Managed Lane Alternative (MLA) hybrid, similar to the EZ-Way proposal by Professor Panos Prevedouros and Councilwoman Ann Kobayashi during her mayoral campaign. A major deficiency in the evaluation of the MLA in the Alternatives Analysis is that the design developed by the City did not provide sufficient egress points along the route to enable uncongested flow at exit ramps. This was a major reason for its dismissal from further consideration. However, it is anticipated that with improved design to

overcome this deficiency, the EZ-Way proposal would ascend to become a viable alternative.

All of the above alternatives would be expected to lessen the environmental impacts that a fixed-guideway elevated system will bring to the highly populated urban center of Honolulu.

Finally on the point of objectivity versus political will: the City Administration, City Council, and entire selection process have lost credibility over the Salt Lake Alternative versus Airport Alternative debacle. The initial selection of the Salt Lake Alternative was politically motivated; the change to the Airport Alternative was proposed the week after the election. The net result is that the whole process is now tainted. Let's take the appropriate steps to restore that credibility by giving all potentially viable alternatives an objective assessment. Yes, it will delay the project; but we "can not afford not to do it".

B. Transit User Benefits and Cost Effectiveness of the Project

a) User Benefits:

This is an area where major change has been made in the DEIS versus the AA without sufficient explanation. To most readers of the DEIS, the change probably went unnoticed because of how the DEIS is structured.

"Transit user benefits represent the amount of transit travel-time savings a user would experience with a given transit alternative compared to the No Build Alternative."(DEIS p. 3-36).

Table 3-19 lists the transit-time savings for various transit markets for the three Build Alternatives compared to the No Build Alternative. These represent future projections calculated by the travel demand-forecasting model. The model predicts that the time saved each day for users of the Project will be approximately 50,000 hours per day or 15-16 million hours per year.

During the period between the AA and DEIS, the FTA allowed an additional benefit to transit users – again expressed in terms of time saved (Federal Register Vol. 72, No. 106. June 4, 2007):

"FTA adopts as final its proposal to allow project sponsors that seek to introduce a new transit mode to an area to claim credits (implemented through what is commonly called a mode specific constant) for the user benefits caused by attributes of that mode ***beyond the travel time*** *and cost measures currently available in the local travel model. FTA will continue to work closely with sponsors of projects that have calibrated mode-specific constants to ensure that they are using constants that are generally consistent with the methods and values permitted for sponsors of projects which are new to an area."*

"FTA will assign credits for characteristics in three categories: (1) Guideway-like characteristics (equivalent to a maximum of eight minutes of travel time savings); (2) span of good service (up to three minutes); and (3) passenger amenities (up to four minutes). Further, FTA will define a discount of up to 20 percent on the weight applied to time spent on the transit vehicle. These credits and discount are applied to the calculation of user benefits only; ridership forecasts will not be affected."

This was superficially disclosed in the DEIS on p. 3-36:

"Research indicates that positive attributes (both perceived and real) are associated with the use of a fixed guideway system, which make the system more attractive than general bus transit. These benefits include such things as improved safety, security, visibility, ease of use, comfort, and reliability. These factors or attributes are not captured by the standard travel demand forecasting process. To account for these attributes in this user benefit analysis, FTA has approved an additional factor equivalent to a 14.5 -minute savings of in-vehicle time. The factor was incorporated for riders taking the fixed guideway only. A 5.5 -minute savings of in-vehicle time was incorporated for riders taking feeder buses to the fixed guideway."

Basically what this indicates is that 14.5 minutes is credited to every guideway trip made, and 5.5 minutes to every feeder-bus trip, to end up with an inflated "time" benefit for guideway trips. These "savings" are then multiplied by ridership estimates. Assuming ~90,000 fixed guideway trips each day [Table 3-18], fed by ~63,000 bus trips, this additional factor adds up to a 22,000-hour time credit for fixed guideway use and a 6,000-hour time credit for feeder-bus use – for a **total credit of 28,000 hours each day** of user benefit – or over 8.6 million hours each year. The total user benefit has now increased 56% to approximately 78,000 hours each day. This total amount is nowhere disclosed in the DEIS or Technical Reports. At first glance, this might appear as an innocuous adjustment; but it becomes significant in the calculation of the "Cost-Effectiveness Index" – one of the most significant criteria in the FDA's rating of the Project versus competing projects.

The mode-specific constants are intended to be applied to account for attributes (such as safety, security, reliability, ease of use, etc.) above and beyond the time-savings predicted in the local travel model. However, these factors are subjective and arbitrary, unless they can be validated versus other operating transit systems. The derivation of the values in the DEIS are not explained at all, so appear to be strictly arbitrary values, or values negotiated with FTA. A full and open analysis is certainly missing, and needs to be included: What data supports the claim that trains are safer than other modes? Users of the Project will need to make more transfers than with the No-Build Alternative; does this really improve ease of use?

The Washington Metropolitan Area Transit Authority reports that the incidence of crime is approximately three times greater for train transport than bus:

Crime rate per Million Riders	2004	2005	2006	2007	2008
Rail	1.76	1.65	1.69	2.17	2.76
Parking Lot	4.28	3.55	3.97	4.38	4.40
Bus	0.60	0.68	0.79	0.79	0.95

Reference: http://www.wmata.com/about_metro/transit_police/mtpd_crime_stats03.cfm

Thus, if one assumes a similar trend in Honolulu, the modal-specific constant adjustment for "safety" should be zero or negative. The point is that the modal-specific constants use in the analysis need to be thoroughly explained in the DEIS.

b) Cost-Effectiveness Index:

According to the DEIS (p. 7-9): *"Cost-effectiveness is one of the key criteria that FTA uses to evaluate projects proposed for Section 5309 New Starts funding. The FTA's cost effectiveness*

index is a ratio formed by adding an alternative's annualized capital cost to its year 2030 operating and maintenance cost, and the total is divided by user benefits", in hours saved. Further "The cost-effectiveness indices for the Build Alternatives compared to the baseline fall within the "medium" range established by FTA for its New Starts ratings, which, along with other considerations, is currently required to qualify for New Starts funding." The key criteria for determining the cost-effective index are annualized cost of the project, ridership estimates, and the time benefits realized by the riders.

Any proposed New Starts project receiving less than a "Medium" cost-effectiveness index rating will not be recommended for funding by the FTA. The threshold between a rating of "Medium" and "Medium-Low" is $22.99 per user benefit expressed in dollars per hour of user benefit.

According to the Alternatives Analysis, the cost-effectiveness index for the 20-mile alignment from East Kapolei to Ala Moana Center is $21.34; and for the full project from West Kapolei to UH Manoa with an extension to Waikiki as $27.05. Thus, the full project would not meet the threshold requirement of $22.99, but the 20-mile alignment would.

City ordinance 07-001 defined a Locally Preferred Alternative for a fixed guideway transit system and authorized development of a minimum operable segment (MOS). The North-South Road/Airport option was recommended by Council in the ordinance for several reasons, one of which being that the cost-effectiveness index of $22.56 was below FTA's threshold for receiving the necessary "Medium" or better cost-effectiveness rating needed to qualify for FTA's recommendation for funding. Note again that the threshold is $22.99.

Now, in the DEIS, **the cost-effectiveness index has markedly improved** to a point that is significantly below the FTA threshold of $22.99: **$17.53** for the Salt Lake Alternative, **$17.78** for the Airport Alternative, and **$22.86** for the combined Salt Lake/Airport Alternative (DEIS Table 7-7). Information for the full project with extensions is not available in the DEIS.

We know that the capital cost and O&M costs have not reduced (perhaps have increased slightly), so that the only explanation is that the user benefits have increased significantly. As discussed above, the user benefits have increased significantly because of application of the subjective "mode-specific" time adjustment to the actual time saved. Thus, if one adds the *annualized capital cost* to its year *2030 operating and maintenance costs*, and divides the total by the user benefits (in hours saved), the result is a number that is significantly less than reported in the AA; e.g. $21.34 in the AA (20-mile alignment) versus $17.53 in the DEIS (Salt Lake Alternative).

The application of this change is never clearly explained in the DEIS nor any of the supporting references. In fact, the level of detail in the DEIS on the Cost-effectiveness Index is restricted to Table 7-7. This certainly does not meet the requirement of a full and open analysis so that the public is able to make an informed decision. To the contrary, the City has disguised and concealed this information so that it is difficult to comprehend how Cost-effectiveness Index was calculated.

There is a disclaimer to the validity of the Cost-effectiveness Index calculations in the DEIS as follows:

"*FTA is currently reviewing the estimates made for ridership and user benefits, operating and maintenance costs, and capital costs for the Build Alternatives. If these results hold up through*

*subsequent phases of project development, along with other FTA considerations, the Project would be in the competitive range for funding consideration." (*DEIS p. 7-9)

It is imperative that this whole area be scrutinized by the FTA, so that the merits of the project are accurately determined prior to issuance of an ROD.

It is also noteworthy that the City has not included any discussion of the Cost-effectiveness Index of the Full Project as was done in the AA. One can surmise that it would be significantly higher than for the Project, and was intentionally excluded since it still might exceed the FTA threshold of $22.99 (my estimation is that it would be between $22 and $24).

One final note on Cost-effectiveness Index: Since the Honolulu Project utilizes an elevated guideway along the entire length it would be expected to cost 3 to 4 times as much as an "at-grade" system. Operations and Maintenance costs are expected to be higher than an at-grade system because of the higher infrastructure cost. User benefits (time saved) are expected to be the same as any rail transit system of similar size. Thus, with the significantly higher cost of the elevated system, it is difficult to rationalize how the Honolulu Project could have a Cost-effectiveness Index that is competitive with other projects on the FTA docket.

The discussion in the DEIS needs be expanded to elaborate the derivation of User Benefits data and Cost-effectiveness Index – in detail at least as extensive as in the Alternatives Analysis. The dramatic reduction in the Cost-effectiveness Index reported in the DEIS versus in the AA needs comprehensive explanation, and how this change will influence the FTA's evaluation of the Project. The FTA should explain how this project could be competitive with other projects with respect to this important rating criterion, considering its extremely high capital cost.

C. Validity of Model Predictions and Interpretation:

Many of the conclusions drawn throughout the evaluation process are based on predictive transit and traffic models commonly used for such evaluations. They are commonly used by most large cities for transit planning, and are usually tailored for the specific city or area. It is impossible for the layman to understand the operation of these models and their inputs and outputs (e.g., screenline analysis, vehicle miles traveled, vehicle hours traveled, vehicle hours of delay, transit ridership, transit time saved, etc), so we must rely on what is reported by the users of the models.

In the DEIS, these model predictions are reported as the gospel truth; the results are not reported as ranges, but as specific values; no probabilities are assigned concerning the confidence of the values reported. It is unreasonable that we should be expected to accept these predictions at face value. At a minimum, the DEIS should at least disclose that there is uncertainty around predictive model outputs, and report a range of probable output values that reflects the range of reasonable inputs into the model, and assign a probability of confidence to the values or ranges reported. Within the DEIS and supporting references, the discussion around confidence level or uncertainty around the values is conspicuously absent.

The disparity between model predictions and actual transit ridership validates the need to report model predictions as ranges or to assign confidence probabilities. For the majority of rail transit systems put into operation within the last 30 years, actual ridership has not met ridership predictions; a few have exceeded prediction. For many of these cases, actual ridership might fall within a predicted range , and thus give greater credibility to the entire process.

The "*Honolulu High-Capacity Transit Corridor Project Alternatives Analysis Travel Demand Forecasting Results Report*" (RTD 2008t, October 2008) addresses changes made in the Travel Demand model, but does not address validation of the model. In fact the Report is elusive in describing details. For example in the section on Adjustment of the Mode Choice Model, it says *"The mode choice model was re-calibrated as part of the Draft EIS process; however, the details of it are not discussed in this report"* (p. 1-3). Regarding calibration and validation of the model, the Report states: *"The 2005 model was calibrated as a result of all of the changes discussed. Calibration Target Values were assigned and applied to the model. Details regarding the calibration and validation process, including the specific Calibration Target Values, can be found in the Honolulu High-Capacity Transit Corridor Project Travel Forecasting Methodology Report (RTD 2006)"* (p. 1-5).

There are several examples from the DEIS that prompt one to question the validity of these models or whether the data is being reported accurately:

a) Ridership Model:

DEIS Table 3-17 shows Fixed Guideway ridership for the three Alternatives. It seems inconsistent that ridership for the "Airport & Salt Lake" Alternative (92,710 daily boardings) is less than for the "Air Port" Alternative (95,310). One would certainly think that the Airport & Salt Lake Alternative, with one additional station than the Airport Alternative, would have greater ridership than the Airport Alternative alone. Perhaps there is good rationale for this, but it is certainly not disclosed in the DEIS.

It is also curious that the data in Tables 4-21, 4-22, and 4-23 of the *Travel Demand Forecasting Results Report* (RTD 2008t) are significantly greater than reported in the DEIS (although the data in Appendix A of the Forecasting Results Report (RTD 2008t) are the same).

	DEIS Table 3-17	RTD 2008t Tables 4-21, 22, 23	RTD 2008t Appendix A
Salt Lake:	87,570	102,174	87,571
Airport:	95,310	120,231	95,305
SL & AP	92,710	108,179	92,707

Perhaps there are explanations (that are not obvious to the reader) for this "curious" data, but they are not discussed in the DEIS or Technical report (RTD 2008t).

Side note: As a point of reporting accuracy, there is obviously a gross error in Table 4-11 of the *Travel Demand Forecasting Results Report* (total AM peak hour volume of 93,410 appears to be off by factor of ~10). Perhaps the wrong spreadsheet was inserted.

b) Calculation and Interpretation of Congestion Data:

The *Oahu MPO* Travel Demand Forecasting Model is the primary tool for predicting future traffic patterns and transportation-related effects. The tables below show data extracted from the DEIS for Vehicle Miles Traveled per day (VMT/d), Vehicle Hours Traveled per day (VHT/d), and Vehicle Hours of Delay per day (VHD/d). A primary measure of traffic congestion in the DEIS (and AA) is based on "Vehicle Hours of Delay" (VHD) for each

transportation scenario. It is not clear from the DEIS how VHD is calculated in the model; nonetheless, if we take the data at face value, the following can be concluded:

- In 2030, if the Project were not built, VHD would be 43.2% greater than in 2007 (even with planned roadway improvements); e.g., "congestion" would be 43.2% greater.
- In the build scenarios, congestion in 2030 would be 10.8-13.5% greater than today
- In the build scenarios, congestion in 2030 would be 20.8-22.6% less than the 2030 No Build scenario.

From DEIS Tables 3-9 and 3-14

	VMT/d	VHT/d	VHD/d	% Change from 2007 VMT/d	VHT/d	VHD/d
2007	11,581,000	334,000	74,000			
2030 no-Build	13,583,000	415,000	106,000	17.3%	24.3%	43.2%
2030 Salt Lake	13,096,000	385,000	84,000	13.1%	15.3%	13.5%
2030 Airport	13,086,000	385,000	82,000	13.0%	15.3%	10.8%
2030 Both	13,103,000	386,000	83,000	13.1%	15.6%	12.2%

	% Change from 2030 no build VMT/d	VHT/d	VHD/d
2030 Salt Lake	-3.6%	-7.2%	-20.8%
2030 Airport	-3.7%	-7.2%	-22.6%
2030 Both	-3.5%	-7.0%	-21.7%

Similar data is presented in the AA (below).

From AA Table 3-10

	VMT/d	VHT/d	VHD/d	% change from 2005 VMT/d	VHT/d	VHD/d
2005	11,206,000	305,000	57,000			
2030 no-Build	13,971,000	395,000	82,000	24.7%	29.5%	43.9%
2030 20-Mile	13,539,000	376,000	73,500	20.8%	23.3%	28.9%
2030 MLA Rev	14,034,000	397,000	82,500	25.2%	30.1%	44.7%
2030 MLA* Rev	14,050,000	387,000	72,500	25.4%	26.9%	27.2%

	% Change from No Build VMT/d	VHT/d	VHD/d
2030 20-Mile	-3.1%	-4.8%	-10.4%
2030 MLA Reverse	+0.5%	+0.5%	+0.6%
2030 MLA* Rev	0.6%	-2.0%	-11.6%

**MLA reversible case with H-1 zipper in place (estimated)*

Comparing the DEIS data with the AA data, the following differences stand out:

- VHD for the 2030 No Build case in the DEIS is 29% greater than the 2030 No Build case in the AA (106,000/82000); although VHD for the 2030 Build cases are only ~13% greater than for the 2030 20-mile alternative in the AA (~83,000/73,500).

- Existing condition (2005 or 2007) VHD is 30% greater in the DEIS than in the AA, although VMT is only 3% greater. One would think that the increase in VHD would be much smaller for a 3% increase in cars on the road (VMT).

Ultimately the Build Alternatives provide congestion relief (improvement in VHD) when compared with the No Build Alternatives of 10.4% in the AA and ~21-23% in the DEIS…..or to put it in the Administration's words: "a 100% improvement in congestion." Lacking good explanation in the DEIS, this sudden improvement is difficult to rationalize or understand. The impression that was left with the public is that the benefits of the Build Alternatives are much greater than previously anticipated – just what the Administration intended. Nothing was said about the accuracy or calibration of the models as a possible explanation.

The underlying uncertainty is whether the travel models are providing reliable data. Predictive models calculate future conditions based on the model's algorithms (mathematical manipulations via equations) and input data (including from other models). Algorithms can be optimized to try to better suit local conditions. Overall, getting a predictive model to make accurate predictions (validated) is an extremely difficult undertaking. If the assumptions that go into the model are not validated, the accuracy of the output can be in question. An obvious validation point lies in the comparison of 2005 traffic data (actually measured existing condition) with that predicted for 2007. Unfortunately, I do not believe that "actual" 2007 data has been gathered, and thus, validation is not possible.

To demonstrate the point that it is an easy matter to achieve an entirely different outcome from small, and explainable differences in input data, I have added an "new" alternative into the AA Alternatives evaluation: a Managed Lane Alternative with the reversible lane option, but using the H-1 zipper lane as an added lane (H-1 zipper was not used for the reversible MLA option). I have assumed a reduction in daily delay of 10,000 hours, which is equivalent to a 2.4-minute savings for each of the 250,000 cars that would benefit from this option. This option is included at the bottom of the above table (in gray font). Isn't it amazing that this option reduces congestion 11.6% versus 10.4% for the 20-mile AA Build Alternative! If I had access to the model, I could just as easily have "optimized" inputs and algorithms to get a similar result.

The main point in this example is that even small differences in model predictions can influence data used in making key decisions. In this case, the MLA Alternative looks considerably better than originally portrayed in the AA. Is the congestion relief quoted in the DEIS really 100% greater than in the AA? Certainly not; it is only 12% better (23% minus 11%)…..or maybe not even that…..I really do not know because the accuracy of the model has not been validated!

The magnitude of this Project requires that the City demonstrate through substantive assessment and analysis that all of the information used in the evaluation and selection of alternatives is accurate and can be validated within reasonable confidence levels.

D. Project Risks and Uncertainties

Section 6.5 of the DEIS (Risks and Uncertainties) is designed to explain the financial "risks" associated with the Project; but in reality, it is more a compilation of "uncertainties" rather than a comprehensive analysis of the risks and potential consequences of these uncertainties, and a plan to mitigate their impacts on the Project. As a result, the reader (and thus general public) is

unaware of the impact these financial uncertainties could have on the Project and on the financial stability of the City.

With respect to FTA's *"Risk Analysis Methodologies and Procedures",* June 2004, it appears that the City has completed the first two "Prepare" and "Identify" steps of the risk analysis process, but has neglected to "Quantify" or "Assess" the magnitude of the risks, or established a plan to "Mitigate" the risks). Rather, the City has reserved a large "contingency" in the Project budget to cover the risks and uncertainties. The FTA discourages this approach, and suggests that a comprehensive risk analysis is a tool for better communication and more cost-effective project management, and thus minimizes the need for large contingencies.

The risk assessment should anticipate the following events and a plan to mitigate their consequences:

- GET surcharge fund plus New Starts funding is not sufficient to meet Project capital costs (including interest costs). Right now there is no assurance that the GET revenues will meet the anticipated $4.054 Billion, or New Starts funding will meet expectations. The DEIS states that additional funding would be possible to fund the capital needs of the Project, but does not specifically identify the source except by reference to "complemented by local assistance" (Section 6.2.2). Does this mean local taxes (State and City) will increase to cover the gap? Will the GET be extended beyond 2022? Will funds be transferred from the General and Highway funds (at the expense of other infrastructure projects)? Will the project be stopped short of Ala Moana Center? How will the Extensions be financed?

  The City needs to be more specific in defining sources of additional funds, and if in the form of General Revenue Bonds or "borrowed" from other City funds, how they will be repaid.

- Fare revenues are not sufficient to cover 27 to 33% of O&M costs or total transit subsidies exceed 15% of General and Highway fund revenues. What will be the source of additional funds?

- Construction delays or stoppage by discovery of Archaeological and Cultural Resources; construction impediments caused by concerned groups. Virtually every major construction project on Oahu has been either stopped or significantly delayed because of anticipated or actual discovery of Archaeological Resources. There will be no exception for this project. The City should expect construction delays of uncertain length. The impact of this scenario needs to be addressed in the financial Risk Analysis.

- Operating risks. In addition to those mentioned in the DEIS there is a risk that speeds will have to be reduced or headways extended for a variety of reasons: e.g., longer stops needed at stations, too noisy in sensitive residential neighborhoods. This will have a definite impact on cost. The financial implications of these situations on operating costs and/or cost of mitigation need to be assessed.

A major concern of many residents is the impact that cost over-runs (either capital or operational) will have on quality-of-life programs for the benefit of the general public, such as: parks, recreational facilities, road quality. This concern extends to the impact that higher taxes will have on disposable income, and thus quality-of-life on a daily basis for each individual and family.

FTA guidelines indicate that a comprehensive Risk Analysis has the potential to increase efficiency and reduce project costs. It is imperative the risks associated with this Project be addressed in much greater detail in the SEIS or FEIS.

E. Economic Impact

The DEIS must meet the requirements of both Federal and State EIS standards. It is clear from Hawaii Revised Statutes Chapter 343 that the DEIS should disclose *"the environmental effects of a proposed action, effects of a proposed action on the economic welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects."*

Section 4.2 of the DEIS (*Economic Activity*) assesses the impact of the Project on specific economic elements in the study corridor, but fails to consider the more global economic impacts on the *economic welfare and social welfare* of the community (island of Oahu) either in this section or in cumulative effects. It covers the impact on employment, and the positive and negative impacts the Project will have on property values and tax revenues for properties near the guideway. But it fails to address the Project's impact on property taxes for all property owners on Oahu.

It also fails to assess the impact that capital costs of the Project will have on the long-term *economic and social welfare* of the people, or on other infrastructure projects (e.g., roads, sewers, parks) and social programs. Financing of the Project capital cost via the GET surcharge costs each individual on Oahu ~$125-150 each year (~$500-600 per family) and will continue for 16 years through 2022. In total, each family will contribute ~$20K (YOE $s) towards the capital cost of the project. The 0.5% GET surcharge has already impacted the lives of many residents, and could impact many more because of the economic downturn in the local and national economy. The GET is a regressive tax and thus impacts the economic (and social) welfare of lower-income families more than higher-income families. There is no mention of these effects in the DEIS or supporting references.

Any shortfalls in Operating and Maintenance costs are *"assumed to be funded through City subsidies from its General and Highway Funds"* (DEIS p. 6-10). Today, Operating and Maintenance subsidies represent ~10% of the County's General Fund (which is 70% funded by property tax revenues) and are expected to increase to 14-15% in 2018 (DEIS Fig. 6.3). This translates to an increase of ~$40M to $50M (2008 $), or ~$44 to $55 for each resident each year (~$170 to 220 per family), which will be have to be funded by an increase in property tax of ~5 to 6% (despite the Administration's denial that there will be a need to increase property taxes for this purpose).

Note to correct misstatement in DEIS: To rationalize the curve in Figure 6-3 (resulting in a concomitant lower O&M cost as % of General Fund since 2002), it is stated in the DEIS, p.6-7, that *"City revenues have increased, as a result of large increases in real estate values on O'ahu …."*. This is a statement that the City has used repeatedly to rationalize why real estate taxes (revenues) have increased dramatically over the past five years. The corollary to this statement must also apply: *City revenues will decrease as a result in decreases in real estate value.* But this corollary will prove to be incorrect because of City statute. In reality, real estate revenues have increased because of increases in the City's operating budget (and thus need for additional revenues) proposed by the Administration and approved by City Council; real property taxes, according to the City's ROH Sec. 8-11.1, are determined by the product of real property values times the tax rate – and not real property values alone. In fact if real property values decreased during the same period, statute requires that the tax rate increase to provide sufficient revenue to support the budget.

The City's share of project cost of $4.2 billion (YOE) will be irretrievably lost from other projects (e.g., sewer repair and maintenance, sewage facility upgrades, H-power waste-to-energy expansion, landfill expansion/relocation, road repair and maintenance, etc.), and the community may not have the resources to fund both the Project and these other necessary projects. There should be no dispute that the Project will have a significant impact on the economic and social welfare of residents of Oahu. It is critical that the EIS evaluate these impacts.

F. Omission of Extensions from detailed discussion in the DEIS

The thesis on the first page of this discourse is amplified by the omission of the three "planned extensions" (to West Kapolei, University of Hawaii at Manoa, and Waikiki) from detailed analysis and discussion in the DEIS. The extensions are covered superficially as "cumulative" effects; even though the latter two extensions have greater potential impact on the environment (and cost) than the defined "Project" (Minimum Operable Segment). The Locally Preferred Alternative should not have been segmented into the "Project" plus three extensions for this EIS, but evaluated in its entirety. To cover the extensions as "cumulative" effectives does injustice to the process and the public. The use of the term "First Project" to describe the "Project" indicates full intention to complete the Locally Preferred Alternative at some point. Admittedly, inclusion of the extensions might change the overall conclusions of the DEIS – which is all the more reason for including them.

G. Air Quality (Section 4.8)

This section compares "regional [Oahu] mobile source pollutant burdens" for the three Build Alternates and the No Build.

"Air quality effects predicted to result from the Project's operation are based on the anticipated vehicle miles traveled (VMT) and average network speed for each alternative." (p. 4-94)

"If the electricity used to operate any one of the Build Alternatives is generated by combustion, this may produce additional emissions. However, these emissions would be offset in whole or part by the reductions generated by reduced VMT. Furthermore, power plant emissions may be much more easily controlled than emissions from individual automobiles." (p. 4-95)

These two statements indicate that pollution burdens of the four Alternatives have been calculated based solely on VMT, and that pollution caused by generation of electricity used by the Project is not included. The most audacious and ludicrous statement is that *"power plant*

emissions may be much more easily controlled than emissions from individual automobiles." At the present time there is no cost-effective process to do this, and none is foreseen in the immediate future.

To the best of my knowledge, electricity from the project will come from HECO; 90% of whose energy comes from combustion of fossil fuels and trash. It is unlikely that this situation will change significantly in the future. If one considers this additional pollution source, the pollution generated by all four Alternatives is essentially the same, making the following statement false:

"It is anticipated that the Project would reduce regional pollutant emissions by between 3.2 to 4.0 percent (varying by Build Alternative) compared to the No Build Alternative (Table 4-12)".(p. 4-95)

In addition, the analysis does not reflect or even consider the impact of improved automobile efficiency (which is guaranteed to happen).

H. Downtown Station Location (a curious situation)

The Dillingham Transportation Building is one of the most architecturally and historically significant buildings in downtown Honolulu; it is on the Hawaii Register of Historic Places. Yet, the current plan is to locate the entrance to the Downtown Station in full view of (and partially encroaching into) the building's courtyard. Several alternatives have been considered, but all have been dismissed for a variety of reasons.

However, one of the alternatives requires comment. The "Fort Street" location would move the whole station in the Ewa direction to Fort Street with an entrance at either Walker Park or the Fort Street Mall on the mauka side of Nimitz and an entrance in Irwin Memorial Park on the makai side. A modification to this plan would be to place the mauka entrance *Koko Head* side of Walker Park on private TMK parcel 21013006. This alternative would completely avoid affecting the Dillingham Transportation Building and Walker Park. What is most interesting in the DEIS are the explanations on why this location is not feasible:

"However, this station location would require a 250-foot curve radius to maintain a minimum distance between the edge of the station platform and end of curve. A 250-foot curve radius is substantially less than the Project's design criteria of 500 feet. Such a tight radius would necessitate reducing speeds to 5 to 10 miles per hour, which is substantially below the Project's design speed of 30 miles per hour. This would result in increased travel time and a substantial decrease in user benefits." (p. 5-34) First, the current design radius is 600 feet, and with only slight changes in alignment on Nimitz Avenue, a radius of 500 feet could be maintained. Secondly, this curve is right at the entrance/exit to the station, and all trains should be going less than 10 miles per hour at that point.

"Additionally, placing an entrance makai of Nimitz Highway would impact Section-4(f)- protected Irwin Memorial Park, and a mauka entrance would block either the Fort Street Mall or Walker Park, another Section 4(f) resource." As discussed above locating the entrance on private property on the mauka side of Nimitz eliminates the 4(f) concern there, and even though location of the makai entrance in Irwin Park represents a 4(f) impact, it has less historical and architectural significance than locating it next to the Dillingham Transportation Building.

Thus, this location seems to be pretty attractive. One wonders what the real reason is for locating the station in front of the Dillingham Transportation Building with an entrance in the adjacent courtyard.