Comments on the Alternatives Analysis rail costs and funding.

While we have yet to see details of the City's financing plan that should have been part of the Alternatives Analysis (AA), it is quite obvious that certain costs are understated and, as a whole, the rail transit alternative is severely underfunded.

The 28-mile "full corridor alignment" is likely to cost a billion dollars more than the city estimates. The ½ percent GE tax increase will not cover the bond interest and operating losses. Consequently, bond indebtedness will have climbed to $6 billion in $2006 dollars when the tax expires in 2022.

Construction costs:

The Mayor says that we cannot afford $4.2 billion at this time and that he intends to begin with a 'bare bones' $3.6 billion line (before cost overruns) starting at Kapolei and ending downtown. However, no one pretends that the City will not build the 28-mile "full corridor alignment" from the University of Hawaii at Manoa to Kapolei. Accordingly, for our financial analysis, the full alignment is what we will use.

Our cost estimation method is to base calculations on the $1.85 billion[i] (in $1991) cost difference between the No-Build option and the 15.9-mile Amended Locally Preferred Alternative (ALPA)[ii] in the 1992 Final Environmental Impact Statement (FEIS) prepared by Parsons Brinckerhoff, the City Department of Transportation Services' (DTS) current consultant. More than half of the forecast cost was the contractor's bid and should have been reasonably reliable.

That forecast took into account the additional costs for rail feeder buses, the high costs of Hawaii's labor laws and the political policies affecting construction that are peculiar to Hawaii. It also took into account land acquisition and relocation costs. However, land values have grown much faster than inflation since that time and so there might be significant understatement of that factor.

Both the U.S. Government's *Price Trends for Federal-Aid Highway Construction,*[iii] and the *Civil Works Construction Cost Index System* show a 49 percent increase in costs between 1991 and 2005,[iv] and applying that to the $1.85 billion gives us $2.76 billion in 2005.dollars.

We must also allow for the additional 12 miles difference between the 15.9-mile LPA in the 1992 FEIS and the AA's 28-mile "full corridor alignment." The 15.9 miles of the 1992 route with costs of $2.76 billion in 2005 dollars, amounts to $173 million per mile, or an additional $2.08 billion for the 12-mile addition.

The base cost of $2.76 billion and the $2.08 billion for the addition amounts to $4.84 billion for the Kapolei to UH "full corridor alignment" — before cost overruns.

The City is showing a total cost for this alignment of $5.5 billion, which includes a 33 percent allowance for cost overruns. Our estimate of $4.84 with a 33 percent cost overrun amounts to $6.4 billion.

Cost overruns:

DTS says that most rail lines come in on or under budget. We say most of them come in significantly over budget. Technically, we are both right but here is the difference.

The official U.S. Department of Transportation cost comparison study (Pickrell, Don H. *Urban Rail Transit Projects: Forecast Versus Actual Ridership and Costs.* U.S. Dept. of Transportation. October 1990) "focuses upon the accuracy of projections that were available to local decision-makers at the time the choice among alternative transit improvement projects was actually made." (original emphasis)

DTS, on the other hand, uses cost forecasts that were made much later in the process long after the primary decision had been made. These tend to show much higher costs and therefore show a greater likelihood of coming in "under budget."

The average cost overrun of the eight rail systems studies in the *Pickrell Report* was 43.5 percent. Dr. Pickrell, Chief Economist at the U.S. Department of Transportation's Volpe Center has not updated the report.

However, Northeastern University scholars presented a new study at this year's Transportation Research Board's Annual Conference. (Dantata, Nasiru A., Ali Touran & Donald C. Schneck. *Trends in U.S. Rail Transit Project Cost Overrun*. TRB Annual Meeting 2006). This study uses the Pickrell methodology to compare projected versus actual costs for post-1990 rail projects. They found that cost overruns in the 16 projects studied averaged 28.8 percent.[v] This study has been criticized for not including some of the worst culprits that were over budget. In addition, there is a 2003 "Phase I" report evaluating rail transit cost overruns by the Federal Transit Administration (FTA) that has yet to be released in its entirety. That may have data that are more useful.

Given the above, it would be only prudent to allow for a cost overrun of at least 33 percent.

Operating losses:

The AA uses the Sacramento rail line as the basis to determine rail operating costs:

"Sacramento's Regional Transit District light rail system was determined to be representative of the fixed guideway service, and 2003 to 2004 light rail cost data from that system were used to develop fixed guideway unit costs. The costs were escalated to standardize fixed guideway costs in 2006 dollars and further adjusted upward to account for higher costs in Honolulu, as compared to the Sacramento area." (AA, p. 5-3)

We find that using a true *light* rail line (at grade with overhead power) instead of a *heavy* rail line (totally grade-separated, power from a third rail) may understate operating costs. While Honolulu's elected officials constantly refer to the rail alternative as *light rail*, it meets the exact definition of *heavy rail* as defined by the FTA and the American Public Transportation Association (APTA).[vi]

Instead of using Sacramento, we have calculated likely annual operating losses from the difference between operating expenses less fare revenues for both the No-Build scenario and the LPA, as shown in the 1992 FEIS, p. 6-6. While allowance should be made for cost overruns, these were the projections for 2005 operating costs and revenues at that time in 1991 dollars.

The operating expense difference for 2005 between the No-Build and ALPA alternatives in the 1992 FEIS was $44.6 million in 1991 dollars, which allowing for inflation, amounts to $65.5 million in today's dollars.[vii]

For fares, the 1992 FEIS forecast a $6.8 million difference, in 1991 dollars, between No-Build and LPA fare collections. In 2005 dollars, that amounts to $9.8 million.[viii]

Thus, the projected operating expense for 2005, less fare revenues, amounts to an operating loss of $55.7 million for the 15.9-mile route (1992 FEIS, p. 2-13). Since the "full corridor

alignment" will be 28 miles (AA, p. 6-11), we have increased the operating loss to $98 million in 2005 dollars, which is in direct proportion to the length of the line.

The case could be made that the loss will be even greater since there will be more stations and trains to operate while the fare price will remain the same. The other concern to drive up operating costs is that the additional segment from Waiau to Kapolei has the least population density, and thus the least likely ridership of any part of the rail line.

Notwithstanding the operating losses we are projecting, there is a danger that we may have made insufficient allowance in the calculation for transit police, which is usually a major expense and transit agencies often omit it from their forecasts. Los Angeles pays in excess of $50 million annually for their Transit Police with about three times the rail ridership projected for Honolulu.

We note that is no mention of such costs in the AA.

Replacement and Refurbishing:

> "Establishing that the initial capital expenses of a particular alternative can be funded does not necessarily imply that the long-term operating and maintenance and capital replacement expenses also can be funded. The feasibility of sustaining the investment in an alternative during and after the implementation period was also assessed." (AA p. 5-6)

The City seems to imply that no provision is being made in its financial plan (as yet unseen) for operating and maintenance costs or, what it calls, "capital replacement expenses." This is possibly a new euphemism for replacement and refurbishing.

More importantly, the city does not explicitly warn taxpayers in the AA that virtually all of the rail cars, rail lines and other equipment will have to replaced, or rehabilitated, also known as R&R, within 35 years from the start of operations.

The following are some of the provisions made for R&R by other rail transit lines such as San Francisco's BART, the Chicago Transit Authority's rail transit, and Atlanta's MARTA, as follows:

Chicago Transit Authority capital expenditure plan spells out that:

> "All rail cars rehabilitated at mid-life (12-13 years), overhauled at their quarter-life points (6 and 18 years), and either rehabilitated or replaced at the end of their useful life (25 years)."[ix]

Similarly, the Atlanta Transit Authority concurs:

> "MARTA started work last year to rebuild and upgrade all 48 miles of track. It is an extensive project that will not be complete until mid-2007. Our trains have run every day for over 25 years – this work is necessary to keep the system strong for the next 25 years and beyond. The Track Renovation is part of a major capital program that also includes the overhaul of over 200 of MARTA's rail cars."[x]

Los Angeles plans for R&R using the Peskin model:

> "Projected rehabilitation and replacement costs are based on a methodology developed by Robert Peskin of KMPG Peat Marwick (commonly called Peskin Model). This methodology was developed based on actual costs experienced by the Washington Metropolitan Area Transit Authority (WMATA). Actual WMATA rehabilitation and replacement costs were compared to their original installation capital costs. The MTA rail rehabilitation and replacement costs were calculated in the same manner based on the Metro Blue, Red, Gold and Green Lines original installation capital costs. The rehabilitation and replacement costs are estimated to begin five years after a rail line begins revenue operations. Some limited

> repair is assumed in the forecasting model for the first few years as reflected in the five-year MTA Capital Improvement Program (CIP) and annual budget.

Based on the MTA Office of Management and Budget near term forecast and Peskin Model in the later years the rail rehabilitation and replacement costs through 2025 are:

MTA Facilities Amount[xi]	
Operating/Facilities/Heavy Rehab. & Repl	$4.3 billion
Systemwide	$123.1 million
Vehicle Rail Car Replacement	$251.2 million
Maintenance of Way	$27.0 million
Total Cost	$4.7 billion

BART began its first major repair and rehabilitation plan in 1994 at a cost of $1.2 billion within only 20 years of opening. At the time, their balance sheet showed “Facilities, property and equipment” was $2.4 billion, net of $0.7 billion in depreciation.[xii] Thus, the total invested in this category through 1994 had been $3.1 billion.

The Bay Area’s Transportation and Land Use Coalition[xiii] tells us that the BART Planning Department reported to the Board of Directors meeting on November 9, 2000, that total repair and refurbish requirements for BART during 2001 to 2030 would be $6.8 billion spread across the entire 30-year period.

The San Francisco Bay Area voters were unaware at the time of the BART decision that BART would need to refurbish or replace “facilities, property and equipment” in amounts far exceeding BART’s original cost; they had been sold on the concept that once you have built rail it is there forever.[xiv]

Honolulu’s rail line financial plan should make provision for potential refurbishing liabilities using the Peskin model (or similar) to provide decision-makers with the appropriate financial information detailing likely future financial obligations for replacement, refurbishing and system enhancement. The Peskin Model[xv] is used by the Washington Metro and Los Angeles among other. A useful discussion of the subject is in the *2004 Status of the Nation's Highways, Bridges, and Transit, Chapter 7c*.

While the City needs to establish a more detailed schedule of R&R obligations, the amounts shown in the spreadsheet shows a sample of R&R obligations (in 2005 dollars) that the City is likely to face in future years.

We show an R&R model in our financial projection that starts five years from start of operations, as does the Los Angeles system, increases by 15 percent annually and by 30 years out will have incurred total capital costs of $2.5 billion, somewhat less than half the original cost of the system. This is appropriate since a considerable amount of the original cost will be for equipment that has lives varying from 10-30 years. For example, any equipment with a ten-year life will have been replaced three times during the period.

The city must face up to a future obligation of this magnitude. The Federal Transit Administration (FTA) requires that,

> “Agencies planning major capital investments need to incorporate the [repair and refurbishing] (R&R) of those assets in the later years of the capital plan in addition to the ongoing R&R of the existing asset base.”[xvi]

Bond interest:

There is inadequate provision for bond interest in the city's cost estimates. As an indicator, the 1992 rail transit FEIS, p. 6-8, shows accumulated bond interest of $1.4 billion (in 2005 dollars) through just the first six years of its financial plan. On the other hand, the AA shows $313 million.

The city will have about $900 million cash on hand ($450 million from the accumulated revenues from the ½ percent GE tax increase and $450 million in FTA funds) at the time it begins making significant construction outlays. Therefore, the City will need to sell bonds to raise nearly all of the funds needed to build the rail line.

Were the city to retire the $5.5 billion bond issue ($6.4 billion less $900 million) over 30 years at 5.5 percent, the interest paid during this time would be $7.7 billion in 2006 dollars.

Financing plan:

First, the projected amount of revenues from the ½ percent GE tax is highly speculative. The rules for collecting the tax have yet to be settled largely because it is a General Excise Tax rather than a sales tax and so who pays the tax on inter-county transactions is not known.

Second, no one yet knows how to forecast what the split in county revenues is likely to be.

Third, even if we use the revenues from the ½ percent GE tax hike that were discussed during the recent debate on the issue, that of $150 million annually, net of the state's ten percent, the revenues do not cover both bond interest and operating losses, let alone retiring the capital cost.

Fourth, a prudent financing plan would require that the entire bond issue for the initial capital costs be retired within 25-30 years of the start of operations. The projected date should be determined by a carefully planned R&R schedule. This is important since the city will begin incurring significant R&R costs in the later years.

Clearly, the financial plan is inadequate.

Summary:

We have prepared a spreadsheet available at www.honolulutraffic.com/railfunding13.pdf for the 2005-2042 period, showing all the assumptions made. The period chosen is 30 years beyond the projected start of rail operations in 2012.

Our calculations show that by the time the ½ percent GE tax increase lapses in 2022, outstanding bond debt for the rail line would be $6 billion. During this period, the City would have collected $2.6 billion in additional GE tax, paid $1.4 billion in bond interest, and suffered operating losses of $1.3 billion.

The increase in outstanding bond debt is because the tax revenues do not cover the interest cost and operating losses and so the outstanding debt increases rather than being retired.

Until we see details beyond those contained in the Alternatives Analysis, we must consider that all the costs including those for land acquisition, operating, and refurbishing, are understated. Understating costs are the norm for rail transit projects.

The University of Aalborg, Denmark, conducted the most extensive international study ever of actual versus estimated costs in transportation infrastructure development.[xvii] A summary of the study was published in the American Planning Association Journal. The study concluded:

"Based on a sample of 258 transportation infrastructure projects worth US$90 billion and representing different project types, geographical regions, and historical periods, it is found with overwhelming statistical significance that the cost estimates used to decide whether such projects should be built are highly and systematically misleading. Underestimation cannot be explained by error and is best explained by strategic misrepresentation, that is, lying. The policy implications are clear: legislators, administrators, investors, media representatives, and members of the public who value honest numbers should not trust cost estimates and cost-benefit analyses produced by project promoters and their analysts."

Other distinguished and authoritative transportation experts have warned about cost misrepresentations in rail projects. Dr. John Kain, Chair Emeritus of Harvard's Economics Department, wrote "*Deception in Dallas*," Dr. Don Pickrell, Chief Economist of the U.S Department of Transportation's Volpe Center, wrote what is known as the *Pickrell Report*, Dr. Martin Wachs, Chair Emeritus, Department of Urban Planning, UC-Berkeley, wrote "*When planners lie with numbers*," and there have been many, many others.[xviii] We have listed twenty of these studies in the footnotes.

No one can say that the City Council and its Transit Advisory Task Force have not been warned by these authorities about the likelihood of misrepresented costs.

Prepared by Cliff Slater. rev. 11/26/06.

Footnotes:

[i] 1992 FEIS, pa. 6-6.

[ii] 1992 FEIS, p. S-16.

[iii] http://www.fhwa.dot.gov/programadmin/pt2005q2.pdf

[iv] http://www.usace.army.mil/usace-docs/eng-manuals/em1110-2-1304/entire.pdf

[v] The authors said, "We conclude that there is evidence to suggest that cost overruns for projects completed before 1990 are different from that of projects completed after 1994 (*i.e.*, cost overruns have become smaller), but we do not have sufficient data to statistically prove this at a level of significance of 5%."

[vi] http://www.apta.com/links/transit_by_mode/heavyrail.cfm

http://www.apta.com/links/transit_by_mode/heavyrail.cfm

http://www.fta.dot.gov/about/about_FTA_2434.html

[vii] 1992 FEIS, Table 6.3, p. 6-6.

[viii] 1992 FEIS, p. 4-13.

[ix] http://www.transitchicago.com/business/capitalprogram.html

[x] http://www.itsmarta.com/newsroom/latest_news/singletrack.htm

[xi] Short Range Transportation Plan for Los Angeles County, Technical Document 2003

[xii] Bay Area Rapid Transit, 1972 through 1994 Annual Reports.

[xiii] http://www.transcoalition.org/reports/overext/overextended.html

[xiv] Excerpt from a speech by Todd Litman at the Mayor's Transit Symposium.

[xv] Peskin, Robert L. 1988. "Methodology for Projecting Rail Transit Rehabilitation and Replacement Capital Financing Needs." In: Transportation Research Record 1165. Washington, DC: Transportation Research Board, National Research Council.

[xvi] Source: http://www.fta.dot.gov/printer_friendly/planning_environment_2423.html

8.3.1.1 Rehabilitation and Replacement. The rehabilitation and replacement (R&R) of capital resources is needed for several reasons. First, capital resources wear out. Stations, maintenance facilities, track-way, signal systems, propulsion systems, and vehicles all have distinct useful lives. These assets must be re-capitalized before deterioration leads to service disruptions. Second, technological obsolescence due to the availability of parts or technological advances may spur the replacement of various systems. Old rail cars may become increasingly difficult to maintain and require replacement or agencies may wish to implement communications based train control, automatic train stop, or passenger information systems to improve system reliability and safety. Third, changes in operating or safety policies may require new capital investment. One example is station or vehicle enhancements to assure compliance with the American's with Disabilities Act (ADA).

Prudent capital planning requires an inventory of the agency's assets and an evaluation of the expected useful life of each major component. An R&R cycle is assumed for each of the major assets and annual costs are projected at least 20 years into the future. Agencies planning major capital investments need to incorporate the R&R of those assets in the later years of the capital plan in addition to the ongoing R&R of the existing asset base.

In most cases, the capital costs for R&R will vary markedly from one year to the next due to different cycles and widely varying costs for the numerous components. Agencies typically establish reserve accounts, sometimes called sinking funds, to provide the funds for sudden increases in capital spending. Occasionally, agencies smooth out the R&R cost swings by using a multi-year rolling average as the annual cost estimate.

[xvii] *Underestimating Costs in Public Works Projects Error or Lie?* By Bent Flyvbjerg, Mette Skamris Holm, and Søren Buhl. American Planning Association Journal, Summer 2002.

[xviii] Hall, P. (1980). Great planning disasters. Harmondsworth, UK: Penguin Books. Penguin Books.

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[xviii] Edwards, Chris. Government Just Can't Contain Itself. Cato Institute. September 23, 2003

Cash Flow in constant 2006 millions of dollars for the rail transit project with assumptions list below.

Major Events	Year	Tax Revenues	Interest earnings (expense)	Annual tax Revenues Net of Interest	Operating Losses	Federal funds revenues	Revenues, net of interest & operating losses.	Capital Outlays	Revenues, less interest, losses & capital outlays	Bond Balance	Increase by inflation: Operating Losses	Increase by inflation: Balance to be purchased
	Tax revenue growth rate =	*1.2%*				*Interest costs =*	*2.5%*			*Inflation =*	*0.00%*	
									Operating Loss inflation		*1.8%*	
Columns >	**B**	**C**	**D**		**F**	**G**					**L**	**M**
	2005	**$145.0**									**($98.0)**	
	2006	$146.8									($99.8)	**$6,400.0**
Tax start	2007	$148.6		$148.6			$148.6	($40.0)	$108.6	$108.6	($101.6)	$6,360.0
	2008	$150.5	$2.8	$153.2			$153.2	($40.0)	$113.2	$221.8	($103.5)	$6,320.0
Construction	2009	$152.3	$5.6	$158.0			$158.0	($300.0)	($142.0)	$79.8	($105.4)	$6,020.0
	2010	$154.2	$2.0	$156.2			$156.2	($1,500.0)	($1,343.8)	($1,264.0)	($107.4)	$4,520.0
	2011	$156.1	($32.1)	$124.0		$456.0	$124.0	($1,356.0)	($776.0)	($2,039.9)	($109.3)	$3,164.0
1st Start	2012	$158.1	($51.8)	$106.2	($39.8)		$66.5	($900.0)	($833.5)	($2,873.4)	($111.3)	$2,264.0
	2013	$160.0	($73.0)	$87.0	($81.0)		$6.0	($900.0)	($894.0)	($3,767.4)	($113.4)	$1,364.0
	2014	$162.0	($95.7)	$66.3	($82.5)		($16.2)	($900.0)	($916.2)	($4,683.6)	($115.5)	$464.0
2nd Start	2015	$164.0	($119.0)	$45.1	($84.0)		($38.9)	($464.0)	($502.9)	($5,186.5)	($117.6)	$0.0
	2016	$166.1	($131.7)	$34.3	($119.8)		($85.5)	**Begin R&R**	($85.5)	($5,272.0)	($119.8)	
	2017	$168.1	($133.9)	$34.2	($122.0)		($87.8)	($10.0)	($97.8)	($5,369.7)	($122.0)	
	2018	$170.2	($136.4)	$33.8	($124.2)		($90.4)	($11.5)	($101.9)	($5,471.6)	($124.2)	
	2019	$172.3	($139.0)	$33.3	($126.5)		($93.2)	($13.2)	($106.4)	($5,578.0)	($126.5)	
	2020	$174.4	($141.7)	$32.8	($128.8)		($96.1)	($15.2)	($111.3)	($5,689.3)	($128.8)	
	2021	$176.6	($144.5)	$32.1	($131.2)		($99.1)	($17.5)	($116.6)	($5,805.9)	($131.2)	
Tax ends	2022	$178.8	($147.5)	$31.3	($133.6)		($102.3)	($20.1)	($122.4)	($5,928.3)	($133.6)	
	2023	$181.0	($150.6)	$30.4	($136.1)		($105.6)	($23.1)	($128.8)	($6,057.1)	($136.1)	
	2024	$183.3	($153.8)	$29.4	($138.6)		($109.2)	($26.6)	($135.8)	($6,192.8)	($138.6)	
	2025	$185.5	($157.3)	$28.2	($141.1)		($112.9)	($30.6)	($143.5)	($6,336.3)	($141.1)	
	2026	$187.8	($160.9)	$26.9	($143.7)		($116.8)	($35.2)	($152.0)	($6,488.3)	($143.7)	
	2027	$190.2	($164.8)	$25.4	($146.4)		($121.0)	($40.5)	($161.5)	($6,649.8)	($146.4)	
	2028	$192.5	($168.9)	$23.6	($149.1)		($125.4)	($46.5)	($172.0)	($6,821.8)	($149.1)	
	2029	$194.9	($173.3)	$21.6	($151.8)		($130.2)	($53.5)	($183.7)	($7,005.4)	($151.8)	
	2030	$197.3	($177.9)	$19.4	($154.6)		($135.2)	($61.5)	($196.7)	($7,202.2)	($154.6)	
	2031	$199.8	($182.9)	$16.8	($157.4)		($140.6)	($70.8)	($211.4)	($7,413.5)	($157.4)	
	2032	$202.2	($188.3)	$13.9	($160.3)		($146.4)	($81.4)	($227.8)	($7,641.3)	($160.3)	
	2033	$204.8	($194.1)	$10.7	($163.3)		($152.6)	($93.6)	($246.2)	($7,887.5)	($163.3)	
	2034	$207.3	($200.3)	$6.9	($166.3)		($159.3)	($107.6)	($267.0)	($8,154.4)	($166.3)	
	2035	$209.9	($207.1)	$2.7	($169.3)		($166.6)	($123.8)	($290.4)	($8,444.8)	($169.3)	
	2036	$212.5	($214.5)	($2.0)	($172.5)		($174.5)	($142.3)	($316.8)	($8,761.6)	($172.5)	
	2037	$215.1	($222.5)	($7.4)	($175.6)		($183.1)	($163.7)	($346.7)	($9,108.4)	($175.6)	
	2038	$217.8	($231.4)	($13.6)	($178.9)		($192.5)	($188.2)	($380.7)	($9,489.0)	($178.9)	
	2039	$220.5	($241.0)	($20.6)	($182.2)		($202.7)	($216.4)	($419.2)	($9,908.2)	($182.2)	
	2040	$223.2	($251.7)	($28.5)	($185.5)		($214.0)	($248.9)	($462.9)	($10,371.1)	($185.5)	
	2041	$226.0	($263.4)	($37.5)	($188.9)		($226.4)	($286.3)	($512.6)	($10,883.7)	($188.9)	
	2042	$228.8	($276.4)	($47.7)	($192.4)		($240.1)	($329.2)	($569.3)	($11,453.0)	($192.4)	
Totals		$6,692.5	($5,317.2)		($4,427.3)			($2,457.1)				

Comment: The cost of $6.4 billion is as detailed in our 'Comments on the rails costs and funding' and is that needed to construct the full corridor alignment. The City Included in that number is 33 percent for contingencies and cost overruns. The capital costs for for the basic bus system will be additional. The projection allows for full payoff of construction by 2015, the start of operations for the full system. Operating losses are assumed ot be $98 million in 2005's growing with inflation, reduced by .7143 for the initial 20-mile 2013-2015 and half of that for 2012. The blue highlighted items are numbers and all others are formulas. . Allowance has been made for replacement and rehabilitation (R&R), which by 2042 will have totalled half the cost of the initial system in constant $2006.

Notes: **Col. C:** The 2005 tax revenue amount is the $160 million used by the Council during Bill 40 discussions as the tax revenues in 2005 dollars, less $15 million retained by the state.

Cols. F & L: Operating losses of $98 million annually is the difference between No-Build and Rail alternatives as shown in the 1992 FEIS for 2005.

Col. G: The federal funds contribution is that used in the Draft Oahu Regional Transportation Plan resulting from their discussions with FTA.

Col. I: Payments made for capital costs through row 20 and payments for R&R for rows 22 through 47.

Col L: This column is used to calculate inflation and feed Col. F.

Col. M. is the City forecast of the Kapolei to UH line including cost overruns.

The tax revenue growth rate of 4.2 percent is the average experienced by the state for the last fifteen years, 1989-2004.

The bond interest cost of 5.5 percent is what experts consider the likely average over the next 15 years for the life of GE tax increase.

The rate of inflation shown of 2.96 percent is that forecast by DBEDT for the next five years.