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AReCO

THE ALLIANCE OF RESIDENTS CONCERNING O'HARE, Inc. A Not-for-Profit Corporation

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"To achieve a balance between public health and the economy"

October 12, 2005

Via listed modes

Barry Cooper, Manager
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Federal Aviation Administration
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Dear Mr. Cooper:

Attached are our comments on the OMP cost benefit (proposed O'Hare airport expansion and renovation project).

Please contact me if you have any questions.

Thank you,

Jack Saporito
Executive Director

c: Honorable Henry J. Hyde
Honorable Jessie Jackson Jr.
Marion C. Blakey, Administrator
Kenneth Meade, Inspector General
Richard Kula, FAA Community Planner for the Chicago Airport District Office
Stephen L. Jones, OIG
Staci-lee Sherwood
Others and file

Alliance of Residents Concerning O'Hare, Inc. (AReCO) Comments on O'Hare Airport OMP (Expansion) Cost-Benefit Study
October 12, 2005

Chicago's O'Hare Airport administration submitted (3/1/04, updated 2/15/05), in the form of a request for letter-of-intent from the FAA, a detailed cost-benefit analysis of "Phase 1" of the proposed OMP, in order to attempt to secure Airport Improvement Program (AIP) grant-in-aid and other funding.

Chicago continues its historical strategy of piecemeal program approaches in order to gain overall final approval of a seriously flawed program, attempting to show that each "piece" is cost-benefit favorable and thus the whole must also be. Thus, this Phase 1 selectively includes and excludes certain proposed overall OMP aspect in order to "make the case", leaving other aspects to later Phase 2 or 3 characterizations or perhaps permanent non-discussion.

Thus, we are resubmitting a partial audit[1] of the O'Hare expansion project (OMP) that was first submitted to the FAA on April 4, 2004. It demonstrates the realistic costs of the airport expansion and its airport and landside projects (not a complete list) costing at a minimum of $22 billion and more realistically, in excess of $67 billion (see attachment). Also note, that the O'Hare side of the cost of the National Airspace System redesign should also be included. These projects and the audit indicate the true costs of the huge expansion project and must be included.

Furthermore, projects that are a part of the airport expansion project that have already been completed under Chicago's piece-mealing scheme must be included in any analysis and investigated fully, as to if and what laws, rules, regulations, taxpayer deception, etc. have been broken (i.e., Bessie Coleman Drive, northern drainage projects that were part of the Illinois EPA demand for the north runway construction, Manheim Road, Kennedy Expressway expansion projects, etc.).

Additionally, it is clear that the objective and design of this voluminous document is to be able to show a positive benefit/cost ratio, rather than to analyze costs and benefits in a complete an unbiased, undistorted manner. This is not surprising as this is "the nature of the beast" when dealing with government entity justifications of huge projects. And the O'Hare OMP will certainly be even more than huge, particularly after ALL costs are expended and cost "over-runs" incorporated. Here, in "Phase 1", we are exposed to only about $2 billion in purported costs (2001 dollars), while the overall program will cost between about $20-70 billion[2], after all is done.

The well-worn "voodoo economics" characterization applies to this study, beginning with its selectivity in choosing cost and benefit groups. Proper analysis procedures would dictate that if a group is included and characterized for benefits, that same group's cost impacts should also be

[1] All parts of the project were not included in earlier submissions by Chicago.
[2] The OMP "cost" was originally stated by Chicago to be around $6.7 billion; this balloons to near $16-20 billion when associated and necessary other infrastructure costs are included (e.g. roads, bridges, etc.) and approaches $70 billion when historically demonstrable cost over-run allowances and finance charges are included.

included. Yet this is not the case here for the apparent included groups of "airport operators", airlines (airport users) and passengers. Also, groups that might incur costs and/or benefits are specifically excluded from analyses, such as air-system controllers, airline employee groups (pilots, flight attendants, ground crew, etc.), federal groups such as security operations, Chicago and suburban public safety groups, surrounding suburban city administrations (e.g. loss of taxes due to real estate devaluation), etc.

In the case of the included passenger group, the accrued benefits of reduced delays comprise a major portion of the net "benefits" value (determined by calculating the total minutes saving and multiplying by an average time-value for passengers - $0.54/minute[3]). However, there are no associated passenger costs included. These costs would include increased ticket costs needed to pay for the airport improvements, including PFC assessments and airline price increases (to cover their increased costs). These are indeed costs directly associated with the proposed airport "improvements" and must be included as costs. Passengers might incur additional costs, such as delays due to construction, etc. and these need to be included.

Another very significant benefit value is included in the study for "downstream passenger delay reductions", i.e. reduction in delays "propagated throughout the NAS." Without any analysis or discussion of the applicability to the specific O'Hare situation, the analysis incorporates the "general-purpose value of 0.8 for the downstream multiplier, as published in the [1997] paper."[4] This in effect takes all the calculated direct airport "improvement" passenger delay benefits (dollars) and increases them (multiplies) by a factor of 1.8, almost doubling whatever direct benefit/cost ratio exists without employing this factor. Since this impact is so huge, its use and proper value must be seriously considered by the FAA, based on substantially broadened research and more timely data (the cited/utilized study/data is 10 years old…this O'Hare study projects its conclusions forward another 25 years!).

Furthermore, the claimed delay benefits are based on smoke-and-mirrors interpretations wherein (1) the "downstream delay benefit" is already factored in by claiming reduced delays from assumed improvements to the entire National Airspace System (NAS)…double-counting, and (2) burying increased passenger delay into "uninhibited travel times" on the ground at O'Hare (directly caused by the "modernized" parallel runway configuration)…deceit.

Increased road congestion delays are excluded from the calculations.[5] Passengers and freight trucks attempting to gain access to the airport experience substantially increased road delays in doing so, bordering on "grid-lock", and these additional delays should be included as a definitive cost to passengers and freight operations. FAA/O'Hare assumptions that delays are only to be measured from airport gate to airport gate in a flight are ridiculous. Passengers perceive delays as including those due to traffic, being forced to park in remote lots and "commuting" to the terminals, security delays, etc. Cargo carriers have similar perceptions.

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[3] Use of this figure is probably arguable on numerous grounds, including the fact that it is determined by APO Bulletin in 2000 dollars, which means pre-"dot-com" crash, implying that, at minimum, business percentage use in the "average" determination is now significantly less/different.

[4] "Analysis of Downstream Impacts of Air Traffic Delay", 1997, Massachusetts Institute of Technology's Lincoln Laboratory.

[5] FAA airport "clients", such as O'Hare, take shelter in these areas by referring to FAA guidelines, which can be (unacceptably) interpreted as allowing such exclusions.

Alternately, the costs associated with rebuilding the surrounding road infrastructure to alleviate such expansion-caused congestion should be included, but again are not. ["Piece-mealing" the overall program is again an O'Hare method of hiding these costs.] These costs fall squarely on the taxpayers (which includes passengers and cargo companies; thus, business and end users) and generally include a significant portion (e.g. 70%) of federal funds. The perspective that massive airport rehabilitation programs, such as this, have no cost connection with the surrounding transportation infrastructure is seriously flawed. Even the FAA itself recognizes this by analyzing environmental impacts (EIS) of expected changes in these off-airport areas (e.g. air pollution from increased traffic on surrounding roadways).

The new airport configuration ("Alternative C") will cause an increase of runway crossings (incursions) by a factor of 25 overall, including the assumed use of substantial "land and hold short" operations to allow aircraft to cross in front. This represents a large safety risk increase to passengers and crews and must be considered as a cost and factored in. Perhaps this would be done by assuming a "one-in-a-million" increased risk, resulting in one additional major aircraft crash per year and, using the FAA's guidelines of about $3M "cost" per killed passenger, including an additional cost of about $270M/year (90 passengers and crew per crash).

For the airline group, the analyses use an operations delay reduction factor of approximately $30/minute,[6] calculating benefits by multiplying minutes saved by delay reduction, times the cost factor. Here again, the airline group is portrayed as accruing these significant benefits without any associated costs. In fact, the airlines, including freighters, will incur increased costs imposed by the airport operator (Chicago) in the form of landing and other fee increases, increased rental charges, etc. Though some of these costs have already been included in the analyses (e.g. runway construction costs, etc.) without specific identification to the airline group, airlines will likely incur additional costs not included, such as delay costs associated with construction, operational slow-downs under VFR conditions due to the close spacing of the new 10C/28C runway to the existing 10L/28R runway, etc. Furthermore, there are internal financial burdens (costs) that increase in non-linear fashion to the two major airlines at O'Hare (United and American) due to these additional imposed costs, such as airline debt (bonds) derating[7] in the marketplace. These are serious costs that can drive American further toward bankruptcy or prevent United from coming out of bankruptcy and subsequently maintaining long-term solvency.

In the case of the airport operator group (City of Chicago), it is presumed that they have done an adequate job of including various costs. However, a myriad of indirect benefits are likely not included, for good reason, such as airport profits, "sweet-heart" construction and consultant contracts, election votes garnering, etc., etc.

In the non-included groups category, air controllers costs and benefits should be included in the analyses, as they are likely to be affected by any major change to the airfield and airspace use reconfiguration. For example, their jobs may become more difficult due to increased runway crossings, land-and-hold-shorts, taxiing complexities, etc. Airspace controllers may incur

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[6] "Variable aircraft operating costs consist of costs for crew, fuel and oil, taxes, and maintenance."

[7] By such as Moody's, Standard and Poors, etc.

changes in costs/benefits due to reconfigured approach/takeoff flyways and interactions with other regional airport traffic. Error risks will increase, resulting in controller impacts that should be evaluated and included. Controller impact of close-spacing runways 10L28R and 10C/28C, along with the immensely increased runway crossings (25 times increase) needs to be included in the cost evaluations.

Airline employees groups incur an indirect cost to the extent that their employing airline incurs additional costs of operating at O'Hare, in that their employer might choose to recoup the additional costs through reduction of employee benefits, such as salaries, pensions, medical plans, etc. These reductions (costs) might not occur if the employing airlines were operating significantly "in the black", but they aren't. Instead, they are significantly "in the red", perpetually losing money and either in or near bankruptcy. Thus, since airline managements' main objective is to reduce (and ideally eliminate) the financial hemorrhaging, any increase in costs (airport operations) will result in a compensating attempt to reduce costs elsewhere in the company. Since "labor" (including associated benefit costs) is the major cost factor for these airlines, employees will bear the brunt of the compensating actions. [Most already have their livelihoods under attack due to the airlines' endemic financial problems, made worse by doubled fuel costs, which are not likely to see future decreases, notwithstanding the FAA's continued use of $30/barrel oil assumptions in their future air transportation business projections.]

Suburban municipal groups comprised of city/town/county administrations and business/residents within are excluded, as if they incur no costs (and perhaps a modicum of benefits) from O'Hare airport rehabilitations, even though the O'Hare study pointedly drags out listings of many of them as "supporters" of the OMP. [One would have to believe that they saw some potential benefits at least, in order to be included on the list.] Chicago includes a continuing cost factor for "noise mitigation" of $20 million/year, which largely goes to surrounding residential (and other "noise sensitive" facilities e.g. schools) areas, within a radius of about 5 miles.

The real "cost" of increased noise to these communities is NOT being properly calculated…the $20 million/year is a compensating partial-payment made against these costs. Its amount is set by the project sponsor and airport operator (Chicago) based not on what is needed but what is "available", where the definition of "available" is set by the noise-producer (Chicago O'Hare). In fact, at a minimum, correct noise impact costs should be determined and calculated by using the World Health Organization's criteria, which is 55dB DNL instead of 65dB DNL. If the FAA, in concert with Chicago/O'Hare, decides to only compensate those within 65dB DNL contours, that does not reflect the real cost calculation. The FAA must here decide to agree that it is totally illogical to define noise impacts as substantial on one side of a (65dB DNL) contour line and non-existent on the other side and include the correct impact costs in this cost-benefit analysis.

The costs of noise impacts on non-residential areas are not included. It is one thing to formally exclude such impacts in allowing only residential and (some) institutional properties in noise mitigation programs; it is quite another to extend this distorted thought process into the assumption that "noise costs" are not incurred anywhere else. In fact, business sections of communities incur substantial costs due to increased aircraft noise.

For example, Park Ridge will experience huge noise increases over its southern area, which includes on-going business district upgrades designed to attract and retain business enterprises in the city. The advent of such noise will cost Park Ridge business plans dearly. Another example is Bensenville. The planned southern runway, after massive acquisition of properties, will point directly down the "throat" of Bensenville's town center (generally along Green St./Irving Pk. Rd.). The huge increase in noise and pollution will both drive existing business' away and act to thwart attempts to attract new business.

An additional cost incurred by municipalities is the loss of tax revenues by removal of tax generating facilities from their roles through airport land/property acquisitions ad indirect losses due to devaluation of real estate assessed valuations as a result of reductions in air quality or increases in noise from airport operations. These costs and any planned compensations should be included in the cost-benefit analysis.[8] Estimates of future losses should also be included for cities' decrease in "attractiveness" to new business' and residences, as a result of changed airport operations. In specific instances of major impact on municipalities, such as Bensenville and Elk Grove, substantial direct and indirect costs of long-term, serious city injury must be included. These include loss of "attractiveness", disruption of family lives, personal impacts due to cemetery relocations, relocation costs, elimination of recreation facilities, etc. Again, the FAA is reminded that these costs must be calculated independent of any compensating payments, as they are not the same and will be in all probability not equal in dollar terms (generally, compensations will be less than real costs). Net cost is the difference between the two.

The full social costs of forced residential evictions through property acquisition are understated, as is the social costs of cemetery relocations. In the case of Bensenville, many of the evicted persons are of lower income, minority or senior citizen status. Their ability to acquire new, affordable housing, in similar proximity to existing job locations, services or family/community associations is limited. Many of these evictees are renters and will accrue little or no benefit from forced evictions. All of these eviction/dislocation costs need to be identified properly characterized and included.[9]

Public and employee health and medical cost increases are not recognized or estimated for inclusion in the analyses. O'Hare, with FAA support, will claim that there are no increased impacts due to worsened pollution conditions, the process for which begins with an implicit "coloring" presumption that today's O'Hare operations have no such impact. The follow-on claim will then be made that the EIS analyses demonstrate no environmental standards violations as a result of airport expansions. However, these claims have been rebutted on numerous bases and, further, societal costs of emissions ($/kg) have been researched and specified, allowing costs to be attached to all such O'Hare emissions.[10]

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[8] Economic studies exist that characterize such devaluations and costs.

[9] Whereas rental property and business owners may be able to negotiate reasonable compensation for relocation, renters and employees are excluded from such negotiations and are generally not compensated from resulting loss of jobs and/or forced relocations.

[10] For instance, Cleaning the Air and Improving Health with Hydrogen Fuel-Cell Vehicles, M. Z. Jacobson, W. G. Colella, D. M. Golden, SCIENCE VOL 308, 24 JUNE 2005 and earlier citations from the Journal of Transportation Economics, 33,259 (1999) and 34,135 (2000).

While the FAA and O'Hare dispute, side-step, or even fail to recognize/discuss these rebuttals, they nevertheless remain and must be included in any consideration of societal costs of airport expansion. Examples include:
* The fact that air quality degradation and toxics exposures to airline employees, both on the ground and crew, are not considered at all.
* The fact that air quality degradation and toxics exposures to passengers in a "buttoned-up" aircraft while on the ground, are not considered.
* The fact that particulate matter (PM), especially the ultra-fine PM2.5, emissions and resulting exposures are incorrectly estimated (too small).
* The fact that airport emissions impacts on local/regional ozone conditions is not calculated.
* The fact that toxic exposures to passengers, employees and the public are not calculated at all, since the FAA decided that it "is not appropriate to do so at this time."
* The ongoing and unresolved dispute that the FAA's calculations of NAAQS emissions inventories are too low, exacerbated by the FAA's refusals to publish sufficient information and data to allow proper independent audits.
* The fact that the FAA's atmospheric dispersion model (within EDMS) discards any results associated with meteorological conditions normally causing worse case air quality degradations (calm wind conditions).
* The fact that the FAA's selection of the "worst year" of meteorological conditions to use for the (EDMS) analyses, chosen from a very limited data set, has little probability of being a reasonable representation of future "worst case" meteorological conditions.
* Etc.

Financing charges, (e.g. bond repayment interest costs, bond sales costs, bond insurance costs, etc.) associated with the project are excluded in the cost-benefit analyses. Though there is a reason to accept some aspects of these exclusions (e.g. use "present-worth" discounting methods instead of interest charges), other aspects are not acceptable.

The exact costs of issuance of the airport's municipal bonds are not identified or included. Specifically, the bonds sellers (usually financial institutions) charge a fee for their services, which can be substantial. Additionally, in order for Chicago to sell the bonds at a reasonable rate (e.g. 5-6%) and to limit future city liability to default, in a financial environment of failing or bankrupt airlines, they must be insured bonds. These insurance costs of are not identified.

The cost impacts and possible further financial degradations of increased debt service to the airlines are not included. Though disregarding debt interest payments through discounting methods may be reasonable in determining present-worths for alternative comparisons, it is not reasonable to assume that the airlines do not have to carry the debt repayment burden and to suffer whatever business cost impacts they may bring. These costs, directly or indirectly (e.g. increased gate lease costs) charged to them, may be subsequently reflected as reduced stock valuations, increased passenger or freight charges, reduced employee salary/benefits, etc.

Opportunity costs are not recognized. The FAA's guidelines identify this area (costs of lost opportunities by doing the project) but the FAA itself is complicit in this disregarding process, by defining all of the significant alternatives to O'Hare expansion as "not meeting the need", where the "need" was circuitously defined as the "O'Hare need".

Numerous opportunity costs need to be included, such as:
* "Doing the project" will adversely affect the region's ability to successfully implement any new airports, such as the planned south-side Peotone facility. The extreme drain of available capital funds, subsidies, state/taxpayer funds and FAA funds will likely cause failure or an extreme lengthening of time-to-implement. Sinking or significantly limiting the Peotone airport program will have huge social implications and associated costs, including continuing severe south side unemployment, falling heavily on the backs of African-American minorities, lack of airport access to rapidly expanding south/southwesterly communities, populations and business', etc.
* Continuing to plow huge funds into airport expansion/rehabilitation programs instead of directing such funds to improved rail systems, including but not limited to High Speed Rail connections between airports and cities, will bankrupt the region's and nation's transportation resources and deny, perhaps forever, valuable alternative rail transportation systems, with commensurate social losses of jobs, technological leadership and transportation connections to rural areas (which are being abandoned by the airlines).
* Other regional airports, such as Rockford and Milwaukee, will be "starved out" by continuing and expanding predatory O'Hare competitive practices, instead of properly balancing the air transportation needs amongst the various airports.
* The lost opportunity practice of maintaining the legacy airports forever is greatly enhanced by the FAA's returning of all passenger facility charges (PFC's) to the existing legacy airports, instead of directing a portion of those federal trust funds to new and improved airport implementations.
* The "benefit" of having, and expanding, non-passenger, private enterprises on airport property is not offset by costs of lost opportunities. For example, private freighting operations within O'Hare boundaries could instead be used for actual passenger air transportation purposes instead, reducing or eliminating altogether the need for additional O'Hare property acquisitions.
* The planned remodeling of O'Hare is not "modernization" at all but is "more of the same", eliminating the opportunity real, imaginative, modernizations, probably at less cost. For example, all gate building structures (as well as terminals and parking) could be buried below grade, opening up considerable surface space for runways, etc. Aircraft would taxi in and out via similarly below grade areas and the total gate/approach areas would be "roofed", opening up more surface area[11] and allowing elimination of deicing requirements, providing for emissions capture and disposal (via ventilation system), allowing smaller or transient aircraft boarding/deplaning to the now weather-protected tarmac, etc. Chicago's unimaginative plan must be evaluated against the lost opportunity costs of such true modernization approaches.

Construction costs are understated due to high fuel and materials costs. The very high fuel costs already in existence will stay high and probably go even higher. This is not officially recognized by the FAA, as judged by their total lack of response to AReCO's earlier petition for the FAA to

[11] Which could be used for overhead fueling and other (surface buried) infrastructure needs e.g. electrical, ventilation and A/C, waste disposal, inter-terminal transportation, runway aprons, etc.

produce a mid-year correction to their spring 2005 10-year flight activity projections. Similarly, these high costs will result in greatly increased costs of fuels (gasoline, diesel) and construction materials (concrete, asphalt, lumber, copper, etc.) used by airport construction crews.

The O'Hare OMP Phase 1 cost-benefit analysis is purposely biased, with comparison of the proposed airport project ("Alternative C") made at the same number of yearly operations as the "constrained" Base Case, both assumed at 974,000 ops/year. .[12] This approach is taken supposedly to simplify analyses, in that if the proposed "project" was compared at its "unconstrained level," EIS stated as about 1.2 million ops/year in year 2018 (full OMP build-out + 5 years), it would necessitate making assumptions and placing values on the increased passenger counts, and that "The effect of these passengers could be difficult to quantify."

In fact, it would be easy to quantify the value of these additional benefits, but doing so would adversely affect the calculated benefit-to-cost ratios. This is because (1) delay differences would be reduced between the (constrained) Base Case and the (unconstrained) Phase 1 proposal, driving down calculated delay-difference benefits and (2) the added "value" of these additional passengers would in-fact be negative, in that the two major airlines (United and American) are currently operating at a loss and will probably continue to do so in the foreseeable future. This might not be true if the current operating planes were loaded to substantially less than, say, 85% capacity (an approximate average maximum), thereby allowing substantial passenger capacity increases through increased per-plane loading i.e. more passengers for the same number of operations...but this is not the case. Planes are basically full, both from increased demand and decreased number of flights (airlines attempting to minimize costs). Thus, increased passengers will directly correspond to increased number of operations and the airline loss-per-passenger will remain constant.

To calculate the (negative) value of additional passengers, simply calculate the amount of loss-per-passenger currently experienced by each airline operating at O'Hare and sum up all airlines values by proportioning to the totals, projecting these values into the future and then discounting back to NPV. It is expected that Chicago will retort that expert consultants are incapable of making such future projections of airline financial health, and that the FAA itself might support this view. Our retort to that is that if the financial characterization of O'Hare airlines is impossible and that this impossibility is echoed by the FAA, then the OMP program should not be approved and this grant-in-aid request should be denied, under the "money down a rat-hole" principle.
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[12] The justification for this approach is presented on page IV-12.

APPENDIX

O'Hare Airport Expansion Project

Costs: Errors or Lies

R. E. Ruthenberg 4/20/2004

Executive Summary

Chicago's cost projections for its O'Hare Expansion project have most recently been presented as being approximately $13.4B. Other examiners have pointed out that even these exorbitant costs are understated by several billions of dollars[13].

The primary reasons for why these costs continue to grow, each time they are examined, is largely because the project principals and protagonists lie, as is abundantly documented in the study "Underestimating Costs in Public Works Projects, Error or Lie?" by Flyvbjerg, Holm, and Buhl. Continuing Chicago O'Hare fiscal chicanery is what leads most such projects to experience so-called huge cost "overruns" and is what will also lead to the same end for the O'Hare project, if it is allowed to go forward[14].

But continuing to exclude the associated costs of financing further minimalizes the probable end-result costs of this huge project. Unlike astute citizens who consider finance charges on their home mortgages or credit card bills to represent real costs to their budgets, the O'Hare project seems to again purposely deceive by never mentioning these extremely high expenses in the context of "costs".

Once such finance expenses are brought out and included as costs, and a 30% low-end cost overrun factor is included, it is seen that the O'Hare Expansion costs will most likely be in the range of **$40-67 billion dollars** (including the probable future Terminal 2 and associated road infrastructure costs of at least $7B, with financing).

Introduction

Chicago's proposed O'Hare Expansion project is without question a huge and extremely complex project. The overall project includes major rebuilding of existing facilities, additions, removals, relocations and infrastructure interface changes (e.g., between airport and mass-transit), in four major categories: airside, landside, terminals and support facilities. These sometimes simultaneous, parallel renovations are ALL required in order to stand a chance of achieving the supposed ultimate objective of increased capacity.

The project is made even more complex due to the fact that it is basically a "rehab" job within a highly populated and built-out area, in contrast to building a brand new reliever airport in a low population area. This means that a myriad of unknowns enter the costing equations, unknowns that would not be seen or at least be very minimal in a new project. These unknowns all tend to increase risks and costs beyond projections, as history continues to demonstrate.

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[13] Aug. 12, 2003, Daily Herald, By Robert McCoppin Daily Herald Staff Writer (ref. Appendix C here).

[14] While some of the cost overruns are from honest miscalculations, the costs of public works are virtually always well underestimated, not overestimated. If it were honest and balanced reporting by government there would be as many projects underestimated, as there are overestimated. This is not the case.

Most often, admission of such undefined future risks and costs is not forthcoming from the responsible officials and politicians, beyond bland statements alluding to contingency inclusions and "conservative estimates". Additionally, most of the major costs are estimated by contract consultants who, in order to please their paying clients, tend to suppress pessimism. It is typical for government agencies to use the same consultants over an over again because they "understand" how to present the view of their client to help them get the political project started. Once the projected is started they all seem to be completed no matter how much the cost overruns end up being.

Furthermore, huge projects are projected over many decades, which make many of the "assumptions" used in analysis more like fortune telling than factual science. Finally, the project protagonists and backers are already biased towards achieving project approval and putting on "good faces" toward funding sources e.g., bond sales in order to ensure a successful launch.

These issues and many more were brought forth in an earlier report, "Vicious Cycle"[15], which was written before the "final" cost estimates by O'Hare's project managers were placed in public view as part of their final Airport Layout Plan (ALP) submission to the Federal Aviation Administration (FAA). This report examines these final costs and rationales in detail in an attempt to assess what the probable minimum real costs will turn out to be, before any final FAA decisions are made. *[The FAA and other federal agencies e.g., Environmental Protection Agency (EPA), Department of Transportation (DOT), etc. must by law consider project alternatives, which by definition includes cost comparisons between proposed projects and alternatives. Building a new major reliever airport south of the city has been estimated to cost, at full build out, approximately $5B, which would probably be around $10B, including financing costs. A startup reliever airport in its first phase would be approximately $500 million.]*

Errors or Lies?

An excellent study[16] by Flyvberg, Holm and Buhl was done to address the serious questions surrounding the chronic costing errors in public works projects, including identifying how much deviation from projections was typical and the specifics of the major causes for these deviations. The study <u>concluded that lies were the predominant reason!</u> Quoting:

"The main findings from the study reported in this article—all highly significant and most likely
conservative—are as follows:

- In 9 out of 10 transportation infrastructure projects, costs are underestimated.
- For rail projects, actual costs are on average 45% higher than estimated costs (sd=38).
- For fixed-link projects (tunnels and bridges), actual costs are on average 34% higher than estimated costs (sd=62).
- For road projects, actual costs are on average 20% higher than estimated costs (sd=30).

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[15] "A Vicious Cycle: How Can the Government Justify Expanding Airport Capacity to Solve an Overcapacity Problem?" Peter Martin and Alan Martin, Oct. 30, 2003. Cost of O'Hare Expansion estimated at $16B principal plus $16B financing, for a total of $32B.

[16] Underestimating Costs in Public Works Projects Error or Lie? Bent Flyvbjerg, Mette Skamris Holm, and Søren Buhl Journal of the American Planning Association, Chicago, IL., Vol. 68, No. 3, Summer 2002. http://www.planning.org/japa/publicworks.htm or http://www.planning.org/japa/pdf/JAPAFlyvbjerg.pdf

• For all project types, actual costs are on average 28% higher than estimated costs (sd=39).
• Cost underestimation exists across 20 nations and 5 continents; it appears to be a global phenomenon.
• Cost underestimation appears to be more pronounced in developing nations than in North America and Europe (data for rail projects only).
• Cost underestimation has not decreased over the past 70 years. No learning that would improve cost estimate accuracy seems to take place.
• Cost underestimation cannot be explained by error and seems to be best explained by strategic misrepresentation, i.e., lying.
• Transportation infrastructure projects do not appear to be more prone to cost underestimation than are other types of large projects.

We conclude that the cost estimates used in public debates, media coverage, and decision making for transportation infrastructure development are highly, systematically, and significantly deceptive. So are the cost-benefit analyses into which cost estimates are routinely fed to calculate the viability and ranking of projects. The misrepresentation of costs is likely to lead to the misallocation of scarce resources, which, in turn, will produce losers among those financing and using infrastructure, be they taxpayers or private investors." [Emphasis added.]

These statistical results are seen in Figure 1 and Table 1 below from the study. It is critical to note that this is a relatively large sample of projects (258; Rail (58), Fixed-Link (33), Road (167)).

Figure 1

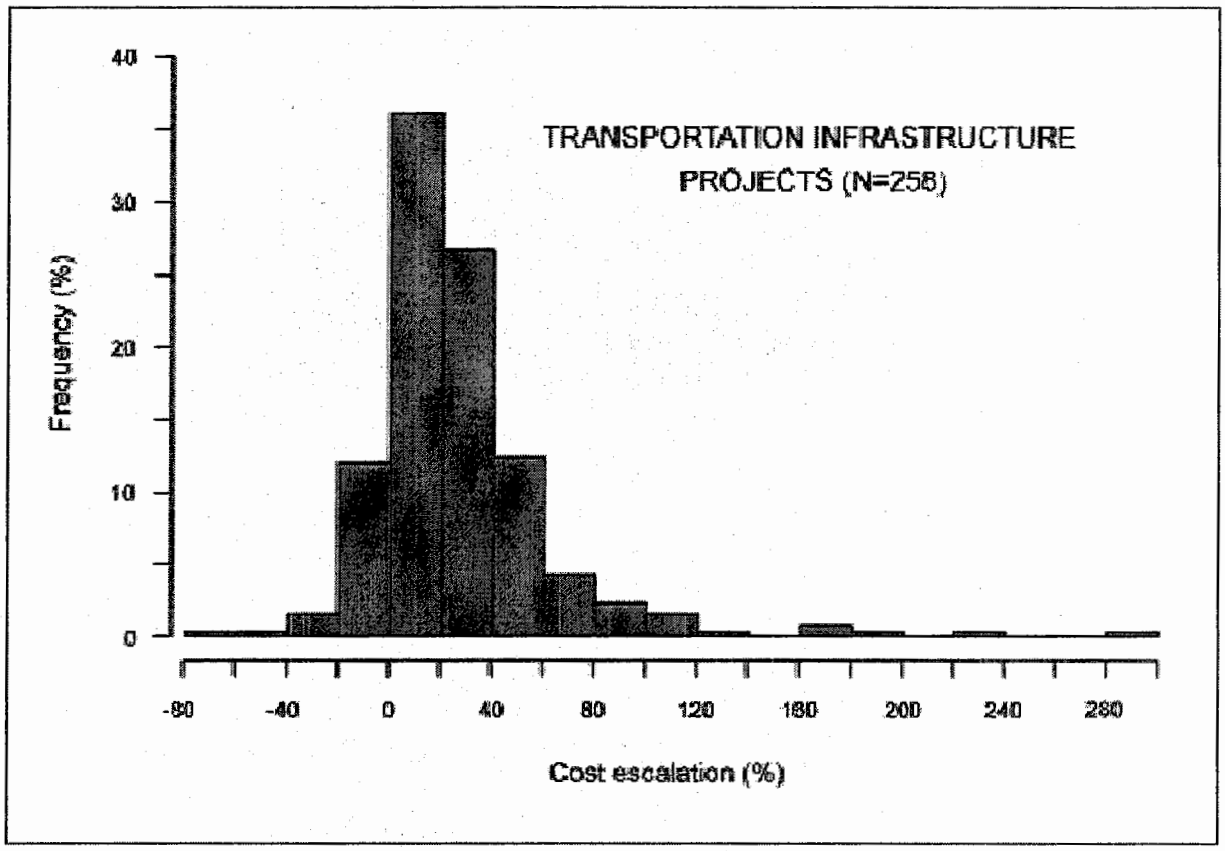

FIGURE 1. Inaccuracy of cost estimates in 258 transportation infrastructure projects (fixed prices).

TABLE 1. Inaccuracy of transportation project cost estimates by type of project (fixed prices).

Project type	Number of cases (N)	Average cost escalation (%)	Standard deviation	Level of significance (p)
Rail	58	44.7	38.4	<0.001
Fixed-link	33	33.8	62.4	<0.004
Road	167	20.4	29.9	<0.001
All projects	258	27.6	38.7	<0.001

The study (Underestimating Costs in Public Works Projects: Error or Lie?) examines for best fit the possible explanations of the chronic underestimations in four different categories: technical, economic, psychological, and political. The definition of lying is important, as it can occur in any of the categories:

"If we now define a lie in the conventional fashion as making a statement intended to deceive others (Bok, 1979, p. 14; Cliffe et al., 2000, p. 3), we see that deliberate cost underestimation is lying, and we arrive at one of the most basic explanations of lying, and of cost underestimation, that exists: Lying pays off, or at least economic agents believe it does."

Most deception is based on some degree of self-interest, both on a personal and organizational level.
"Economic self-interest also exists at the level of cities and states. Here, too, it may explain cost underestimation. Pickrell (1990, 1992) pointed out that transit capital investment projects in the U.S. compete for discretionary grants from a limited federal budget each year. This creates an incentive for cities to make their projects look better, or else some other city may get the money."

This grant situation, along with the inherent need to achieve FAA approval, applies directly to U.S. airports and specifically to the O'Hare Expansion project:
"The use of deception and lying as tactics in power struggles aimed at getting projects started and at making a profit appear to best explain why costs are highly and systematically underestimated in transportation infrastructure projects."

Additionally:
"Flyvbjerg, Bruzelius, and Rothengatter (in press) document for a large number of projects that the Everything-Goes-According-to-Plan type of deception used for the Channel tunnel is common. Such deception is, in fact, so widespread that in a report on infrastructure and development, the World Bank (1994, pp. ii, 22) found reason to coin a special term for it: the "EGAP-principle." Cost estimation following the EGAP-principle simply disregards the risk of cost escalation resulting from delays, accidents, project changes, etc. This is a major problem in project development and appraisal, according to the World Bank."

Finally:
"The key policy implication for this consequential and highly expensive field of public policy is that those legislators, administrators, bankers, media representatives, and members of the public who value honest numbers <u>should not trust the cost estimates presented by infrastructure promoters and forecasters</u>. Another important implication is that institutional checks and balances— including financial, professional, or even criminal penalties for consistent or foreseeable estimation errors—should be developed to ensure the production of less deceptive cost estimates."

Thus, we conclude, to a high probability, that the public is being lied to by the promoters and forecasters of the O'Hare Expansion project (a conclusion generally reached already by many others). This is not an unknown phenomenon in Chicago, as exemplified by past projects such as Millennium Park (which has expanded to near $400M from the original $150M estimate). This conclusion generally applies as well to supportive organizations such as the Chamber of Commerce (especially local chapters e.g., Chicago), FAA, DOT and to Illinois state government (which in the recent past transferred all state O'Hare airport regulatory authority to Chicago), often due to the much greater political pressures to "expand" existing facilities than to make hard decisions in favor of better long-term capacity alternatives e.g., new airports, new rail services, etc. [See related U.S. Government Accounting Office report, "Long-Term Capacity Planning Needed Despite Recent Reduction in Flight Delays."][17]

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[17] Dec. 2001, GAO-02-185

O'Hare Expansion Project Costs and Assumptions
[See Appendix A for relevant detailed cost/assumption excerpts from the O'Hare plan.]

Examination of the O'Hare Expansion "prospectus" seems to clearly indicate that, amongst other factors, the "Everything-Goes-According-to-Plan" deception is active. This "plan" turns on a schedule that basically starts in 2004 and completes everything by 2013. This seems deceptively optimistic to begin with. "Going according to plan" seems to become very suspect in ephemeral areas such as:

*Reconstruction of the Irving Park/York Rd./RR crossing, including tunneling Irving under the RR crossing. Chicago admits that this sub-project "...is not under the jurisdiction of the City of Chicago."[18]

*Relocating St. Johannes and Resthaven cemeteries (to unstated locations).

*Relocating Irving Park Rd., south of the airport.

*Major acquisition of Bensenville properties.

*Realignment of Mt. Prospect Rd., Willow Creek and a 90" Joint Action Water Agency water main (all on the airport's north end).

Additionally, areas of missing or suspect costs and delays include:

*Western Terminal and access, including (taxpayer funded) major road facilities to the west of the airport e.g., Thorndale Rd. and the I-90 to I-294 bypass, which in itself then involves additional Bensenville property acquisitions. [Illinois Department of Transportation (IDOT) earlier estimate of $2.3B.]

*Future Terminal 2 "reconfiguration" costs (originally an approximate $1.1B part of the Gateway Project).

*Terminal costs associated with handling of the future giant French Airbus A-380 (500+ passengers, double-decker terminal interface, 80,000 gallons of fuel) and other even more massive future aircraft.

*Additional land/property acquisitions necessitated by FAA mandated safety issues (e.g., approach/departure "buffer zones", etc.).

*Rapid transit improvement (taxpayer) costs.

*Increased real estate tax costs. Increased personnel costs.

*Costs and delays of lawsuits.

*Environment cleanup and protection costs.

*Public health costs.

*Other "unforeseen" costs and delays.

Summarizing the overall cost estimates for the Expansion Project, from the O'Hare Plan:

		SOURCES	OF	FUNDING
SEGMENT*	TOTAL COST ($B)	PAY-AS-YOU-GO %	AIP GRANTS %	BONDS and FINANCING %
OMP	6.6 (1)	2	9	89
CIP	4.13 (2)	11	6	83

[18] Page VII-13 of the plan.

WGP	2.64 (3)	0	0	100
TOTAL	13.37 (4)	$586M	$842M	$11.94B

*OMP= O'Hare Modernization Program CIP=Capital Improvement Program WGP= World Gateway Project
(1) In 2001 dollars (2) In "escalated" dollars (3) In 1999 dollars (4) In mixed dollars
Note: O'Hare has $879M of existing PFC backed and $3.2B of 1st/2nd/3rd lien bonds outstanding.

The most critical point to observe is that O'Hare project "cost" statements consistently leave out financing costs![19] This is akin to a homeowner considering his mortgage interest to not be a cost to him, even though he pays it every month out of his pocket. This would also imply that folks don't have to worry about credit card interest charges, as they are not "cost"! Obviously ridiculous and therefore any characterization of O'Hare project costs must include any bond interest costs and financing charges. The following analysis includes such costs.

Another cost calculation factor that becomes important once long term bonding/financing interest costs are accounted for is the assumed costing period. O'Hare's "plan" shows only a 20 year period of analysis, even though it states that all bonds are assumed to be 30 year duration. This analysis extends basically to 30 years beyond assumed bond issuances. [Exact information on amount and issue date were not found in the O'Hare plan; this analysis makes logical assumptions in this regard.]

Total (undiscounted) costs provide an "out-of-pocket" perspective i.e., it's what needs to be paid. However, economics analysis often is served by taking inflation i.e., dollar devaluation into consideration to provide a "present value" cost that reflects future costs and revenues based on devalued dollars. In other words, the present value or discounted value of a cost stream is reduced from the undiscounted stream or stream total. Here, total costs are stated both undiscounted and in "2004 dollars".

Another factor in the cost issue is that, as noted above, the various sub-project costs are stated in different year-dollars i.e., OMP in 2001 dollars, WGP in 1999 dollars and CIP in "escalated" dollars. Thus, given O'Hare's assumed 3%/year average inflation rate, these costs need to be inflated appropriate to the date of assumed bond issuance ($7.65B in 2006 and $3.55B in 2009 for the OMP and WGP, respectively). Though it is unclear, it is assumed that stated "escalated" dollars for the CIP means that they already have inflation factored into planned future CIP yearly costs.

Finally, as previously discussed and documented, the probability of cost overrun due to deception/lies is very high and must be factored in to cost projections. The analysis[20] here allows for an average 30% overrun[21]. Many projects of this scope have experienced cost

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[19] This approach of not repaying bond principal for 30 years (and even the it will probably be "rolled over") is quite imperative for the O'Hare project because the airline "repayers" comprise an industry that has shown a net loss in operations since in began in the 1940's and has lost close to $30 billion dollars over the last several years. Therefore, there is no chance the airlines would be able to repay the loans from excess cashflow that does not exist!
[20] Excel spreadsheet analysis available by request.
[21] The statistics from "Underestimating Costs in Public Works Projects Error or Lie?" place the mean cost overrun for all projects at +27.6%. There is a 47.5% probability that overruns will exceed 30%.

overruns substantially greater than 30%, such as Boston's infamous "Big Dig" project (at least 100% overrun, ref. Appendix B). O'Hare's official project costs include only a 4% contingency!

Table 2 summarizes the results of analysis of all[22] these costs and assumptions, with relevant key points below the table.

Table 2 O'Hare Expansion Project Cost Analysis Summary
[Discounting "brings back" all costs to year 2004 present value.]

WITHOUT OVERRUN	**$B**
BOND ISSUANCE COST+FINANCING	$26.06
TOTAL GRANT+PAY-AS-YOU-GO	$2.18
BOND FACE VALUE REPAYMENT	$16.87
TOTAL COST	$45.11
DISCOUNTED ISSUE+FINANCE COST	$14.98
DISCOUNTED GRANT/PAG	$1.49
DISCOUNTED BOND REPAYMENT	$10.30
TOTAL DISCOUNTED.COST	$25.29
WITH 30% OVERRUN	
BOND ISSUANCE COST+FINANCING	$34.56
TOTAL GRANT+PAY-AS-YOU-GO	$2.18
BOND FACE VALUE REPAYMENT	$22.46
TOTAL COST	**$59.20**
DISCOUNTED ISSUE+FINANCE COST	$19.63
DISCOUNTED GRANT/PAG	$1.49
DISCOUNTED BOND REPAYMENT	$13.41
TOTAL DISCOUNTED.COST	**$33.04**

Key Assumptions

[22] O'Hare may claim that the CIP costs would be required even if Expansion did not occur, but a cost comparison of with vs. without expansion does not exist to validate this view. Massively expanded facilities would logically seem to require similarly massively expanded CIP costs.

Interest cost rate = 6%. Discount rate = inflation rate =3%. IPO cost=1%.
2% reserve deposit rate not included in costs (i.e., assumes never spent).
All bonds 30 years. Project costed from 2004-2044 (to cover bond repayments).
OMP bonded 2006 @89% of cost (9% AIP grants and 2% "pay-as-you-go").
WGP bonded in 2009 @ 100% of cost.
CIP bonds issued yearly from 2007 on @ $4.13B/20 per year cost, bonded @83% (6% AIP and 11% "pay- as-you-go").
Cost overrun applied to all base costs 2 years after issue.
O'Hare OMP $6.6B in 2001 dollars cost inflated @3%/yr to assumed date of bond issuance (2006).
O'Hare WGP $2.64B in 1999 dollars cost inflated @3%/yr to assumed date of bond issuance (2009).
O'Hare CIP $4.13B (20 year period) in "escalated" dollars applied yearly at $0.2065B/yr beginning 2007.
Discounted values represent project present values at 2004, discounted at assumed 3% (inflation) rate.

Conclusions
From Table 2, it is seen that the $13.37B oft-stated "cost" of the O'Hare Expansion project, as adjusted to $16.87B in year 2004 costs, is actually $45.1B in "out-of-pocket" costs over a 30-year project period and, even when discounted to 2004 dollars, is still $25.3B! With an assumed 30% nominal cost overrun, the costs will rise to $59.2B and $33.1B discounted!

Including the probable future Terminal 2 and necessary road infrastructure costs would add at least another $7B in costs, including financing, bringing the total to $40B-$67B! Thus, the O'Hare Expansion project should be evaluated on the basis of costing $40-67 billion dollars rather than about $14B dollars.

It is also seen that the amount of funds from federal grants is a relatively small part of the total (part of the "Grant + pay-as-you-go" total), which highlights the fact that the airline users of the airport will basically be the ones "on the hook" for bond repayments. This is in itself a highly speculative area of consideration, as the major airlines are all in great on-going financial difficulties and "low cost" airlines that may be interested in stepping up to take their place will not be able to shoulder such financial burdens and still remain competitively "low cost".

Finally, this kind of exorbitant airport expansion is underway to one degree or another at most of the 2000-3000 U.S. airports (450 major ones), generally driven by similar kinds of lies and abetted by the air industry's government representatives e.g., FAA, DOT, etc. The net fiscal effect on the citizenry will be painful, but equally important, the impact of these deceptions will result in long-term denial of vital alternate transportation modes, improved aviation mode implementations and a near total neglect of investment in new transportation technology and job opportunities (while other countries continue toward domination of these technologies). [It is also highly probable that the last U.S. commercial aircraft manufacturer, Boeing, will cease to manufacture such aircraft, in defeat to the European Airbus interests.]
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APPENDIX A

From the O'Hare Plan (Appendix D – Section VII: Implementation Plan Assumptions):

Assumptions included in Section VII: Implementation Plan include the following:

Original Project Cost Estimates

· OMP Source: TOK, LLC and AOR, 2002 dollars discounted to 2001 dollars.

· CIP Source: City of Chicago Department of Aviation, escalated dollars.

· WGP Source: Landrum & Brown, 1999 dollars. Current estimates vary from original cost estimate due to the deletion of Terminal 2 projects by Ricondo & Associates, Inc. for purposes of this analysis only.

Funding Sources

· Discretionary grants: $600 million discretionary grant paid $60 million annually, except for $100 million in 2012 and $20 million in 2013.

· Noise discretionary grants: $5 million annually from 2004 through 2012.

· Passenger facility charges: $4.50 per eligible enplaned passenger from 2003-2010 with forfeiture of 75% of passenger entitlement grants.

· Passenger facility charges: $6.00 per eligible enplaned passenger from 2011-2022 with forfeiture of 100% of passenger entitlement grants.

· Passenger facility charges: 85.1% of enplaned passengers are PFC-eligible enplaned passengers.

· Bond assumptions:

--GARB {General Airport revenue Bonds, ed.} rate: 6.00% (except for 2003, which was 5.50%)

--Debt Service Reserve Fund investment rate: 2.0%

--Construction Fund investment rate: 1.00%

--Capitalized Interest Fund investment rate: 1.00%

--Costs of issuance: 1.00%

--Debt service coverage ratio (Third Lien): 1.10

Forecast

· Source (2003-2015): FAA, 2001 Terminal Area Forecast, converted by Ricondo & Associates, Inc. from enplanements in a Federal Fiscal Year (ending September 30) to enplanements in an Airport Fiscal Year (ending December 31).

· Source (2016-2022): Ricondo & Associates, Inc., as extrapolated from the FAA 2001 Terminal Area Forecast through 2015.

Non-Airline Revenue (Existing)

· Annual inflation rate: 3.0%

· Net parking revenues increase 5% per year.

· Automobile rental revenues increase at the inflation rate plus the increase in O&D passengers.

· Restaurant revenues increase at the inflation rate plus the increase in enplanements.

· News & gifts increase at the inflation rate plus the increase in enplanements.

· Other increases at the inflation rate plus the increase in enplanements.

O&M Expenses (Existing)

· All compounded annual growth rates (CAGRs) are for the 20-year period 2003-2022.

· Personnel expenses increase at the annual rate of 5.5% and CAGR of 6.6%.

· Repairs & Maintenance increase at the annual rate of 5.5% and CAGR of 7.0%.

· Energy increases at the annual rate of 4.5% and CAGR of 6.0%.

· Engineering & Professional Services increase at the annual rate of 5.5% and CAGR of 5.9%.

· Other Operating Expenses increase at the annual rate of 5.0% and CAGR of 6.3%. Non-Airline Revenue (Incremental)
· Non-airline revenues increase at the inflation rate and the number of O&D passengers or enplanements, whichever is applicable.
O&M Expenses (Incremental)
· Terminal Area incremental O&M Expenses are assumed to be 35% of the total unit cost of existing Terminal Area O&M Expenses.
· Airfield Area incremental O&M Expenses are assumed to be 75% of the total unit cost of existing Airfield Area O&M Expenses.

Table VII-2
OMP Project Cost Estimates (2001 Dollars, $000s)
Program Wide Requirements:
Program Wide Requirements $58,277
Preliminary Engineering 43,689
Wetlands Mitigation 24,272
Noise Mitigation (OMP-Phase 1) 220,000
Land Acquisition 339,296
Land/Environmental Contingency 223,301
Subtotal – Program Wide Requirements Costs $908,835
Other Program Costs:
Miscellaneous Operations Budget $19,418
Program Contingency 301,660
Subtotal – Other Program Costs $321,078
Airfield (Design and Construction/Decommission):
Runway 9L-27R $548,543
Runway 10L Extension 494,175
Runway 10C-28C 908,739
Runway 18-36 Decommission 2,322
Runway 9R Extension 138,032
Runway 9C-27C 642,789
Runway 14L-32R Decommission 1,422
Runway 10R-28L 365,166
Runway 14R-32L Decommission/Taxiway Conversion 110,157
Subtotal – Airfield Costs $3,211,345
West Terminal Complex (Design and Construction):
Western Airside Concourse $579,832
Energy Plant 59,307
Fuel Storage and Distribution Improvements 61,168
Western Terminal 918,297
Parking Facilities 108,115
Subtotal – West Terminal Complex Costs $1,726,719
On-Airport Circulation (Design and Construction):
People Mover $418,903
Maintenance Facility 13,120
Subtotal – On-Airport Circulation Costs $432,023

Total OMP Costs (2001 dollars) $6,600,000

Table VII-3
[20-year] CIP Project Cost Estimates (Escalated Dollars, $000s)
Five-Year CIP (2003-2007)
Terminal Support Improvements $200,264
Terminal Improvements 425,622
Airfield Improvements 372,198
Heating and Refrigeration 102,761
Noise Mitigation Projects 37,305
Fueling System 98,934
Safety and Security 145,734
Planning and Other Projects 3,333
Subtotal – Five-Year CIP $1,386,151
Subtotal – Subsequent Years (2008-2022) $2,742,121
Total 20-Year CIP Cost (escalated dollars) $4,128,274

Table VII-4
WGP Project Cost Estimates (1999 Dollars, $000s)
Airport-wide, Airfield, and Airside Projects $243,830
Terminal 2 FIS Facilities $78,680
Terminal 4:
Enabling Projects $99,130
Apron and Fueling 88,680
Roadway/Access/ATS 79,030
Terminal 639,490
Utilities 62,050
Subtotal – Terminal 4 $968,380
Terminal 6
Enabling Projects $70,560
Apron and Fueling 48,340
Northern Extension 108,980
Parking Structure 114,220
Roadway/Access/ATS 244,450
Tenant Relocations 35,510
Terminal 546,550
Utilities 184,300
Subtotal – Terminal 6 $1,352,910
Total WGP Cost (1999 dollars) $2,643,800

Financing Plan (section 7.4.2)
Funding sources for the Master Plan include the following:
•Federal grants-in-aid under the Airport Improvement Program (AIP)
•Passenger facility charges (PFCs)
•General airport revenue bonds (GARBs)

•Third-party financing
The actual amount of funding available from certain of these sources will depend primarily on future levels of aviation activity at the Airport, future federal reauthorizations, and future airline approvals.
Table VII-5 shows the estimated amount of Master Plan funding sources. [As of January 1, 2004, the Airport has outstanding approximately $3.2 billion of First Lien, Second Lien, and Third Lien GARBs.]

Table VII-5
Estimated Sources of Funds

	Sources of Funds (Percentages)						
	FAA AIP Grants		Passenger Facility Charge		Airport Revenue Bonds	Third-Party Financing[2/]	
Program	Entitlement	Discretionary[1/]	Pay-As-You-Go	Bond Funds			Total[3/]
OMP	1%	8%	2%	20%	59%	10%	100%
CIP	0%	6%	11%	30%	54%	0	100%
WGP	0	0	0	0	78%	22%	100%

1/ Includes discretionary LOI funds, discretionary noise funds, and assumed funding for safety and security projects.

2/ Assumes that 33.3 percent of terminal project costs are eligible for third-party financing resulting in 10 percent of OMP total project cost and 22 percent of WGP total project cost.

3/ Totals may not add due to rounding.

Debt Service (section 7.4.3)
Table VII-6 presents total projected Net Debt Service Requirements, including existing debt service
and estimated future debt service, less savings from future refundings and restructurings. All amounts reflect certain adjustments required to be made under the Airport Use Agreements for the
purpose of calculating airline fees, rentals, and charges.

Table VII-6
Projected Annual Net Debt Service Requirements ($000s)

	Short Term					Intermediate Term	Long Term
	2003	2004	2005	2006	2007	2012	2022
Existing Debt Service	$132,688	$179,800	$198,386	$198,102	$201,611	$217,513	$43,865
Future Debt Service Less Savings from Future Refundings and Restructurings	0	(6,775)	13,340	23,152	45,522	462,790	974,028
Total Projected Net Debt Service Requirements[1/]	$132,688	$173,025	$211,726	$221,255	$247,134	$680,303	$1,017,894

1/ Totals may not add due to rounding.

Estimated future debt service is based on the following allowances and assumptions:

•30-year maturities 6.0 percent interest rate
•Capitalized interest for the OMP and WGP No capitalized interest for the CIP
•Funding of the Debt Service Reserve Fund Debt service coverage of 1.10 times debt service
•Allowances for costs of issuance (underwriters' discount, bond insurance, and other costs)

Estimated savings from future refundings and restructurings are based on the following allowances and assumptions:

•30-year maturities with amortization beginning January 1, 2019 6.0 percent interest rate
•No capitalized interest Surety for the Debt Service Reserve Fund
•Allowances for the costs of issuance (underwriters' discount, bond insurance, and other costs)

Table VII-9

Projected Airline Cost Per Enplaned Passenger ($000s) for Fiscal Years Ending December 31

	Short Term					Intermediate Term	Long Term
	Estimated	Estimated	Projected			Projected	Projected
	2003	2004	2005	2006	2007	2012	2022
Net Signatory Airline Requirement	$292,669	$325,501	$367,775	$383,302	$421,201	$914,764	$1,519,556
Non-Signatory Airline Requirement	8,931	9,844	9,764	10,378	12,045	23,241	42,014
Total Airline Requirement	$301,600	$335,345	$377,539	$393,680	$433,246	$938,005	$1,561,570
Total Projected Enplaned Passengers	32,628	37,735	38,825	39,914	41,003	46,450	57,356
Total Airline Cost Per Enplaned Passenger	$9.24	$8.89	$9.72	$9.86	$10.57	$20.19	$27.23
2003 Constant Dollars[1/]	$9.24	$8.63	$9.17	$9.03	$9.39	$15.48	$15.53

1/ Inflation rate assumed at 3.0 percent.

Source: 2003 Total Projected Enplaned Passengers – Ricondo & Associates, Inc.; 2004-2015 Total Projected Enplaned Passengers – FAA, 2001 Terminal Area Forecast; and 2016-2022 Total Projected Enplaned Passengers – Ricondo & Associates, Inc. as extrapolated from the FAA, 2001 Terminal Area Forecast. All FAA TAF enplaned passengers stated in FFY (ending September 30) have been converted to enplaned passengers stated in Airport Fiscal Years (ending December 31).
Prepared by: Ricondo & Associates, Inc.

APPENDIX B [Boston's "Big Dig" Cost Overruns and Management/Officials Lies]
State sues 2 Big Dig companies for $146m By Sean P. Murphy, Globe Staff, 3/18/2004

Calling management of the Big Dig a financial "shell game," state lawyers filed a $146 million lawsuit against Bechtel Corp. and Parsons Brinckerhoff Inc., saying the project's private-sector managers concealed true cost estimates from state officials to keep the project moving forward.

Lawyers for the state and the Massachusetts Turnpike Authority, who first publicly disclosed their intention to file suit in December, accuse Bechtel/Parsons Brinckerhoff of repeatedly making inaccurate cost estimates in public, while privately being well aware of the escalating costs of the highway and tunnel project.

The 29-page complaint filed Tuesday in Suffolk Superior Court seeks as much as $146 million in dam ages, the estimated profits and incentive fees for Bechtel/Parsons Brinckerhoff on the $14.6 billion project, which is overseen by the Turnpike Authority.

"The defendants utilized their superior knowledge and expertise to conceal project cost overruns in order to continue, for their own improper benefit and by improper means, the highly lucrative contracts with the Commonwealth," the suit says.

Had accurate estimates been made public in 1994, the suit says, state officials might have reassessed whether to go ahead with the project, which is now largely completed. Bechtel/Parsons Brickerhoff was hired in 1985. Yesterday, Bechtel/Parsons Brinckerhoff officials declined to be interviewed and issued a written response: "This lawsuit is without merit. It has no basis in fact, in our contract, or in the law. It ignores years of exhaustive disclosures that B/PB made to state agencies about project costs. We are confident that a fair and open legal process will decisively repudiate these baseless allegations."

Edward M. Ginsburg, a retired state judge who heads a team of lawyers and engineers seeking refunds for overruns on the project, declined yesterday to address Bechtel/Parsons Brinckerhoff's assertion that state officials were informed about project costs.

Ginsburg's team was appointed last year by Matthew J. Amorello, chairman of the Turnpike Authority, to review the work of design and management consultants who worked on the Big Dig and decide whether and how to pursue refunds in light of the project's large cost overruns. The team's lawsuit was approved by state Attorney General Thomas F. Reilly before it was filed.

Ginsburg's team says in the suit that Bechtel/Parsons Brinckerhoff in 1994 estimated the eventual cost of the project to be almost double the $7.7 billion then approved for the project by the state. The federal government paid up to 80 percent of the cost of portions of the project.

The suit says the project managers told the state about the revised estimates in 1994 but "upon further review [Bechtel/Parsons Brinckerhoff] reassessed their prior estimates and advised and recommended to the Commonwealth that the project could be completed for $7.998 billion."

The suit says that subsequently, "contrary to the assurances and advice provided, however, [Bechtel/Parsons Brinckerhoff] became aware . . . that the construction of the project could not be completed within the approved budget as to which they had given recommendations and assurances.
"In breach of trust reposed in [Bechtel/Parsons Brinckerhoff] and in breach of their duty to make full disclosure, Bechtel/Parsons Brinckerhoff continued to employ what they had previously described as a `shell game' to obscure anticipated costs."

In reports filed with state and federal agencies from 1994 to 2000, the project managers repeatedly provided inaccurate cost estimates, even after the management team "prepared internal estimates confirming that the total cost of the project had risen substantially," the suit says.

However, a state inspector general's report in 2001 said Bechtel/Parsons Brinckerhoff informed at least one state official. According to that report, Bechtel/Parsons Brinckerhoff told then-governor William F. Weld in 1994 that the Big Dig's cost would be $14 billion. C. Matthew Wiley,
Bechtel's top project official, testified in April before a legislative committee that Bechtel officials met with Weld in 1994 with the sole purpose of informing him of the firm's potentially disastrous cost estimate. He said it was his understanding that Weld refused to accept a document detailing
the financial picture. Weld has said he does not recall any figure Bechtel/Parsons officials cited.

APPENDIX C

O'Hare costs: $16 billion or $6 billion? written by Various
Tue Aug 12, 2003 Daily Herald
By Robert McCoppin Daily Herald Staff Writer

The true cost of expanding O'Hare International Airport may be billions of dollars more than Chicago has estimated, according to an analysis done for suburban opponents of expansion.

Expanding the O'Hare airfield alone would cost almost $16 billion, not the $6.6 billion city officials estimated, according to opponents.

The additional expense means the cost per passenger would more than double to about $20, making it far more expensive than other airports, the consultants concluded.

The analysis was done by the Infrastructure Management Group Inc., technical and financial consultants for Bensenville and Elk Grove Village, which are fighting the expansion in favor a new airport at Peotone, south of Chicago.

"The mayor's numbers have undergone very little scrutiny," Infrastructure President Steve Steckler said. "They're based on a relatively brief press release with no supporting information. The city's numbers were neither credible nor inclusive of the total costs."

The difference between cost estimates lays primarily with related costs that Chicago officials did not include.

In the airfield costs alone, Infrastructure added $500 million for relocation of utilities such as electrical lines, water, sewer and fuel lines.

It was in other areas that the cost ballooned significantly.

The consultants added $3.8 billion for the World Gateway program, Chicago's plan to add two new terminals and expand existing terminals, which the city suspended last year after the airlines said they couldn't afford it.

The cost of World Gateway itself was originally estimated at $1 billion, but the city's own estimates grew to $3.7 billion.

World Gateway should not be included in the costs of expansion, O'Hare spokeswoman Monique Bond said, because it was meant to improve efficiencies at the airfield as it is, and is not part of the expansion plan.

"Those are two separate projects," Bond said.

The expansion plan calls for one other new terminal, on the west end of the airfield, with 60 gates.

But Steckler maintained more terminals will be needed to handle Chicago's forecasted 78 percent increase in flight capacity, to 1.6 million flights a year.

Also included in the group's cost calculations were $2.1 billion for O'Hare's existing capital improvement program, which Chicago officials say should be counted separately because it would be needed with or without the expansion.

The final extra cost the consultants added was $2.7 billion for additional work, including extra expenses for nighttime pay, which would be necessary to minimize conflicts with flights.

That also includes extra costs for security to supervise hundreds of workers on an operating airfield, and unknown contingency costs typically added to construction projects.

The study's authors, Infrastructure Management, based in Washington, D.C., does financial feasibility studies for airports and transportation departments, and does an annual survey of airport expenses for the American Association of Airport Executives.

In addition, the Illinois Department of Transportation has estimated airport users would need $2.3 billion in related roadway improvements, such as a new western access to the airport, a new bypass expressway around the west side of the airport, and more lanes on existing expressways to the airport.

Chicago Mayor Richard Daley called western access "vital" to the project, but has never included its cost in his project, arguing that it's the state's responsibility.

Daley has promised that no local or state taxpayer money would go to the expansion. It is to be paid by passenger and airline fees and federal grants.

There will also be additional uncalculated federal costs, for the 30 percent more personnel and four new radar sites air traffic controllers say will be needed.

Bond, O'Hare's spokeswoman, could not comment specifically on the rival cost estimates because she had not seen them. But she said O'Hare planners stand by their cost estimates. "We're sticking with our figures," she said.

Those who've studied such large-scale projects have found a pattern of cost overruns.

In his book, "Megaprojects and Risk," Brent Flyvbjerg studied multibillion-dollar construction projects worldwide and found about nine out of 10 went over budget, with many running 40 percent over original estimates.

Flyvbjerg, a professor of development and planning at Aalborg University in Denmark, concluded that sponsors of such projects systematically underestimate costs and environmental impacts, and overestimate revenues to win approval of their projects.

A classic recent example of a megaproject that ran far over budget is the Big Dig tunnel that opened this year under Boston Harbor.

The cost more than quadrupled from when Congress approved it to almost $15 billion.

Denver International Airport more than doubled in cost from when it received voter approval to when it opened six years later.

Closer to home, recent Chicago projects such as Millenium Park and the renovation of Soldier Field have reportedly gone significantly over original estimates.

Alan Altshuler, a professor in the Kennedy School of Government at Harvard University, and co-author of his own book called "Megaprojects," said multibillion-dollar projects are so big and complex that supporters may simply choose the more optimistic of a range of cost estimates.

Once under way, backed by powerful coalitions of business, labor, activists and government, the projects reach a "point of no return," Altshuler said, when it's too late to stop them despite rising costs.

"There is a tendency for big projects to cost more than originally estimated," Altshuler said. "There are such powerful political incentives to underestimate costs when you're trying to sell projects, that people just come in low."

Altshuler urged "fiscal sobriety" and close public oversight.

O'Hare Project Analysis Worksheet

IPO COST	0.01	NOTE: O'Hare costed the OMP @ $6.6B in 2001 dollars and the WGP @ $2.64B in 1999 dollars.
INTEREST RATE=	0.06	This program inflation adjusts those to dollars in whatever year the bonds are assumed to be issued.
INFLATION RATE=	0.03	NOTE: Assumed 89% of OMP and 84% of CIP bonded (9/2% and 6/11%

COST OVERUN %	30	{Assumed injected 2 years after any bond issuance}	AIP Grants/"pay-as-go"). 100% WGP bonded.								
YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
OMP COST				7.65							
WGP COST							3.55				
CIP COST					0.2065	0.2065	0.2065	0.2065	0.2065	0.2065	0.2065
OMP&WGP BONDS ISSUED		0.00	0.00	6.81	0.00	0.00	3.55	0.00	0.00	0.00	0.00
CIP BONDS ISSUED		0.00	0.00	0.00	0.17	0.17	0.17	0.17	0.17	0.17	0.17

COST OVERUN BONDS ISSUED			0.00	0.00	0.00	2.30	0.06	0.06	1.13	0.06	0.06
TOTAL BONDS ISSUED	0.00	0.00	0.00	6.81	0.17	2.47	3.78	0.23	1.30	0.23	0.23
BONDS REPAYED	0.00										
BOND OUTSTANDING	0.00	0.00	0.00	6.81	6.98	9.45	13.23	13.46	14.76	14.99	15.23
IPO COST		0.00	0.00	0.07	0.00	0.02	0.04	0.00	0.01	0.00	0.00
GRANT+PAY-AS-GO COST		0.00	0.00	0.84	0.04	0.04	0.04	0.04	0.04	0.04	0.04
INTEREST+IPO EXPENSE	0.00	0.00	0.00	0.48	0.42	0.59	0.83	0.81	0.90	0.90	0.92
TOTAL YR COST	0.00	0.00	0.00	1.32	0.46	0.63	0.87	0.85	0.93	0.94	0.95

REF.O'Hare Plan Int. Costs	0.00	-0.01	0.01	0.02	0.05	0.46	0.46	0.46	0.46	0.46	0.46

TOTAL INT. +IPO COST	$34.56
TOT. GRANT+PAY-AS-GO	$2.18
TOTAL BOND COST	$22.46
TOTAL COST	$59.20
PRESENT VALUE INT+IPO COST	$19.63
PV GRANT+PAY-AS-GO	$1.49
PRESENT VALUE BOND COST	$13.41
TOTAL PV COSTS	$33.04

WITHOUT OVERUN	$B
TOTAL INT. +IPO COST	$26.06
TOT. GRANT+PAY-AS-GO	$2.18
TOTAL BOND COST	$16.87

TOTAL COST	$45.11
DISCOUNTED INT/IPO COST	$14.98
DISCOUNTED GRANT/PAG	$1.49
DISCOUNTED BOND COST	$10.30
TOTAL DISCOUNTED.COST	$25.29

WITH OVERUN

TOTAL INT. +IPO COST	$34.56
TOT. GRANT+PAY-AS-GO	$2.18
TOTAL BOND COST	$22.46
TOTAL COST	$59.20
DISCOUNTED INT/IPO COST	$19.63
DISCOUNTED GRANT/PAG	$1.49
DISCOUNTED BOND COST	$13.41
TOTAL DISCOUNTED.COST	$33.04