

# O'Hare Airport Expansion Project

## Costs: Errors or Lies

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### 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<sup>1</sup>.

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<sup>2</sup>.

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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<sup>1</sup> Aug. 12, 2003, Daily Herald, By Robert McCoppin Daily Herald Staff Writer (ref. Appendix C here).

<sup>2</sup> 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 and over again because they “understand” how to present the view of their client to help them get the political project started. Once the project 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”<sup>3</sup>, 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<sup>4</sup> by Flyvbjerg, 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 concluded that lies were the predominant reason! 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).
- 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.

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<sup>3</sup> “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.

<sup>4</sup> 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>

- 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

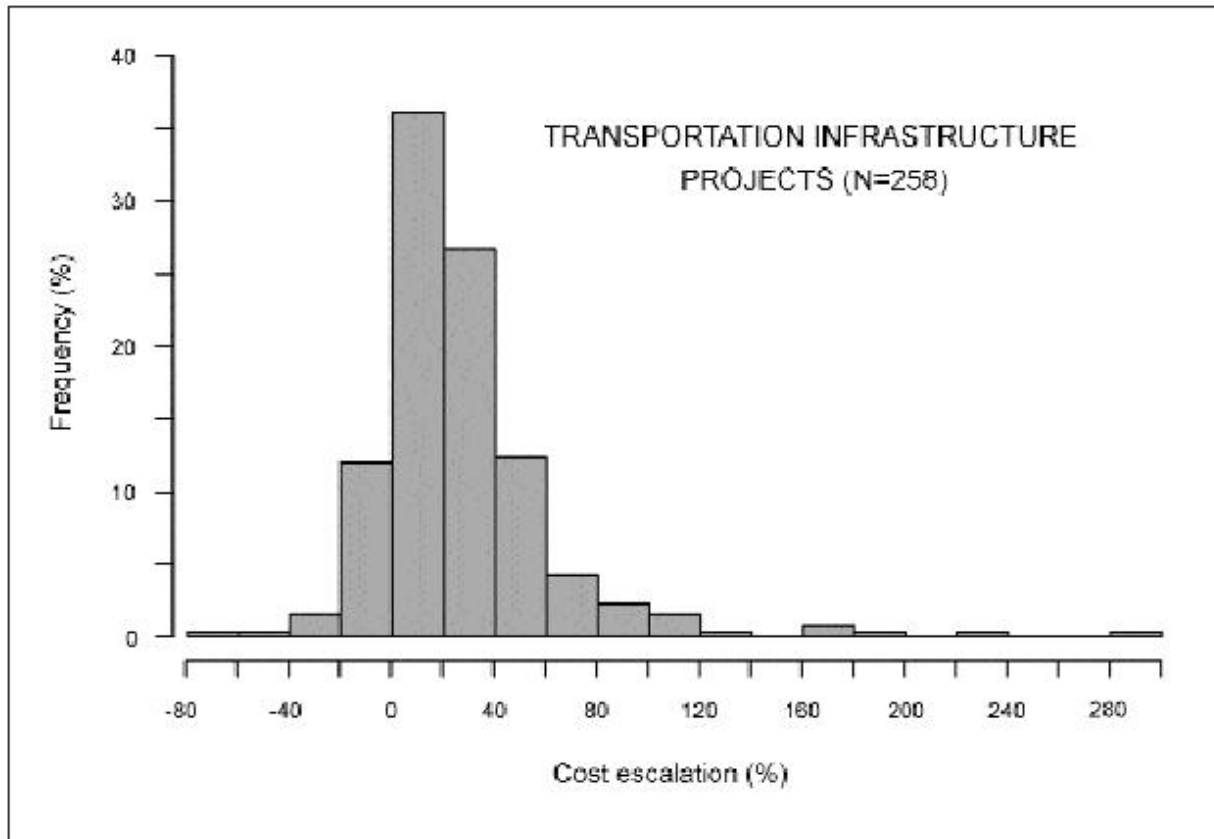


FIGURE 1. Inaccuracy of cost estimates in 258 transportation infrastructure projects (fixed prices).

**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 should not trust the cost estimates presented by

infrastructure promoters and forecasters. 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.”]<sup>5</sup>

#### 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.”<sup>6</sup>

- \*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.,

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<sup>5</sup> Dec. 2001, GAO-02-185

<sup>6</sup> Page VII-13 of the plan.

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:

SEGMENT*	TOTAL COST (\$B)	SOURCES OF FUNDING		
		PAY-AS-YOU- GO %	AIP GRANTS %	BONDS and FINANCING %
OMP	6.6 (1)	2	9	89
CIP	4.13 (2)	11	6	83
WGP	2.64 (3)	0	0	100
<b>TOTAL</b>	<b>13.37 (4)</b>	<b>\$586M</b>	<b>\$842M</b>	<b>\$11.94B</b>

\*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 1<sup>st</sup>/2<sup>nd</sup>/3<sup>rd</sup> lien bonds outstanding.

The most critical point to observe is that O’Hare project “cost” statements consistently leave out financing costs!<sup>7</sup> 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”.

<sup>7</sup> 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!

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<sup>8</sup> here allows for an average 30% overrun<sup>9</sup>. Many projects of this scope have experienced cost 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<sup>10</sup> 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.]

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

Key Assumptions

Interest cost rate = 6%. Discount rate = inflation rate =3%. IPO cost=1%.

<sup>8</sup> Excel spreadsheet analysis available by request.

<sup>9</sup> 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%.

<sup>10</sup> 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.

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

Program	Sources of Funds (Percentages)						Total <sup>3/</sup>
	FAA AIP Grants		Passenger Facility Charge		Airport Revenue Bonds	Third-Party Financing <sup>2/</sup>	
	Entitlement	Discretionary <sup>1/</sup>	Pay-As-You-Go	Bond Funds			
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	<u>0</u>	<u>(6,775)</u>	<u>13,340</u>	<u>23,152</u>	<u>45,522</u>	<u>462,790</u>	<u>974,028</u>
Total Projected Net Debt Service Requirements <sup>1/</sup>	\$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	<u>8.931</u>	<u>9.844</u>	<u>9.764</u>	<u>10.378</u>	<u>12.045</u>	<u>23.241</u>	<u>42.014</u>
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 <sup>1/</sup>	\$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 damages, 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 Brinckerhoff 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 Millennium 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.