Supporting Documentation: Mid-Term Review & Planning Process Memos

The purpose of this resource document is to provide information that was relied on to formulate the Mid-Term Review and Planning Process Memo (Seven Step Process Proposal, Master Plan Section, and Land Use Section.) Much of this information such as the Forecast and Facility Requirements have been presented to the PAG in the past and can be provided in full form. Many of the subjects included in this document are executive summaries of major follow-on studies from the 2000 Master Plan.

AIRPORT FUTURES - PROJECT HISTORICAL BACKGROUND

The April 2000 Regional Air Transportation Task Force had 4 recommendations:

a. Direct Port staff to engage in an ongoing airport planning and management process with quality of life/environmental quality initiatives, regional system initiatives, maximum use of existing capacity, and master plan improvement studies.
b. Play a leadership role in developing new relationships between planning and management of PDX and other local, state and federal processes.
c. Maintain PDX as a viable facility.
d. Develop a means for ongoing dialogue about and oversight for the implementation of these recommendations.
e. It also noted, "If commitments to master plan improvements do not need to be made today, then keeping as many doors open as possible, for as long as possible, holds out the best hope for meeting demand in the future with the least impact."

In 2000, the Port Adopted the Master Plan and the City approved a conditional use permit for the airport in 2003. It was an 8-year Conditional Use Master Plan with approval of 37 building and site improvement projects, etc. Additionally, the Portland City Council and Port Commission jointly resolved to replace the current conditional use process with a legislative process to properly address the complex issues of growth at the airport.

Since then, the Port has conducted several Follow-On studies designed to further inform the Master Plan process.

From 2001 through 2007, the Port and the City entered into a series of Intergovernmental Agreements to create the Airport Futures process. The noted purpose was:

a. An evaluation of two full build-out alternative developments for PDX (and various sub-alternatives), along with a no-build alternative, with the intention of determining a single direction of the airport's overall development. (However, the 3rd runway was not something that was anticipated for construction in the next 20-30 years. Any final decision on the 3rd runway would be made in the future and the Port would not be requesting City Council approval in the near term.)
b. Because the current conditional use permit will expire in 2011, create an integrated City legislative plan to replace the current conditional use mechanism.
c. Adoption of the master plan by the Port Commission and a land use plan by City Council upon completion of the planning effort.

In 2007, the City and Port launched Airport Futures and the Planning Advisory Group (PAG) was created. Collaboration Principles, Vision and Values, Project Assumptions, Forecast and Facility Requirements have been completed.

AIRPORT FUTURES 2008 FORECAST

The Forecast was "unconstrained," and therefore, did not include specific assumptions about the future capacity of the Airport. The probabilistic forecasts were prepared for four future demand years: 2012, 2017, 2027, and 2035, each using 2006 as the base year. Compared to the last Master Plan, the 2008 Forecast found:

Forecast activity is shifted 15 years or more into the future for all categories—passengers, air cargo, and total operations:

PDX total passengers are forecast to reach 27 Million Annual Passengers (MAP) in 2035.
An average increase of 2.3% per year between 2006 and 2035 in the median or 50 percentile forecast. The 2000 Master Plan forecasted 27 MAP in 2020.

PDX total air cargo is forecast to reach 732,000 tons in 2035
An average increase of 3.3% per year between 2006 and 2035 in the median or 50 percentile forecast. The 2000 Master Plan forecasted 957,500 tons in 2020.

PDX total aircraft operations are forecast to reach 378,000 in 2035
An average increase of 1.3% per year between 2006 and 2035 in the median or 50 percentile forecast. The 2000 Master Plan forecasted 485,000 in 2020.

FACILITY REQUIREMENTS ASSUMPTIONS

The Facilities Requirements were predicted upon the following assumptions and conclusions:

- Annual Service Volume (ASV) of airfield is 425,000 aircraft operations (based on 2004 FAA Baseline Capacities)
- ASV is not a hard upper limit on annual aircraft operations
- Delay levels at PDX will remain low to moderate through 2035 (378,000 operations forecast)
- No immediate need for significant capacity enhancements
- Existing domestic gates
  - Are utilized at rate of 4.3 turns per gate per day
  - By increasing utilization to 6 turns per gate per day, the number of existing gates will be adequate through 2035
- Adding international capability to domestic gates (i.e., connection to international facilities) need not increase gate count
- Increased gate utilization will allow passenger facilities to remain within the existing terminal envelope longer
- FIS facilities will remain on the "airside"
- FIS facilities capacity
  - Available in off-peak periods
  - Not available in peak periods
- The need for increased capacity will be driven by the need to accommodate increased peak period demand

- Implications of delay on airport roadway system are significantly greater than on regional roadways
- Objectives
  - Facilitate passenger loading and unloading
  - Minimize vehicle queues
- Approach results in earlier need for additional lanes on certain roadways and ramps
- Dwell time assumption for deplaning roadway is aggressive (1 ½ minutes) compared with previous master plan (6 minutes) and results in significantly reduced curbside requirements
- Requirements are for midday need during 30th busiest day of year
- Planned increase in public parking facilities is significant
- Strategy for providing public parking is closely linked with
  - Demand on other facilities (e.g., curbsides)
  - Revenue strategy
  - Assumptions related to off-Airport parking
- On-Airport facilities deliver higher level of service
- Rental car market share planned to be accommodated on-Airport
  - 80% through 2022
  - 100% for 2027 and beyond

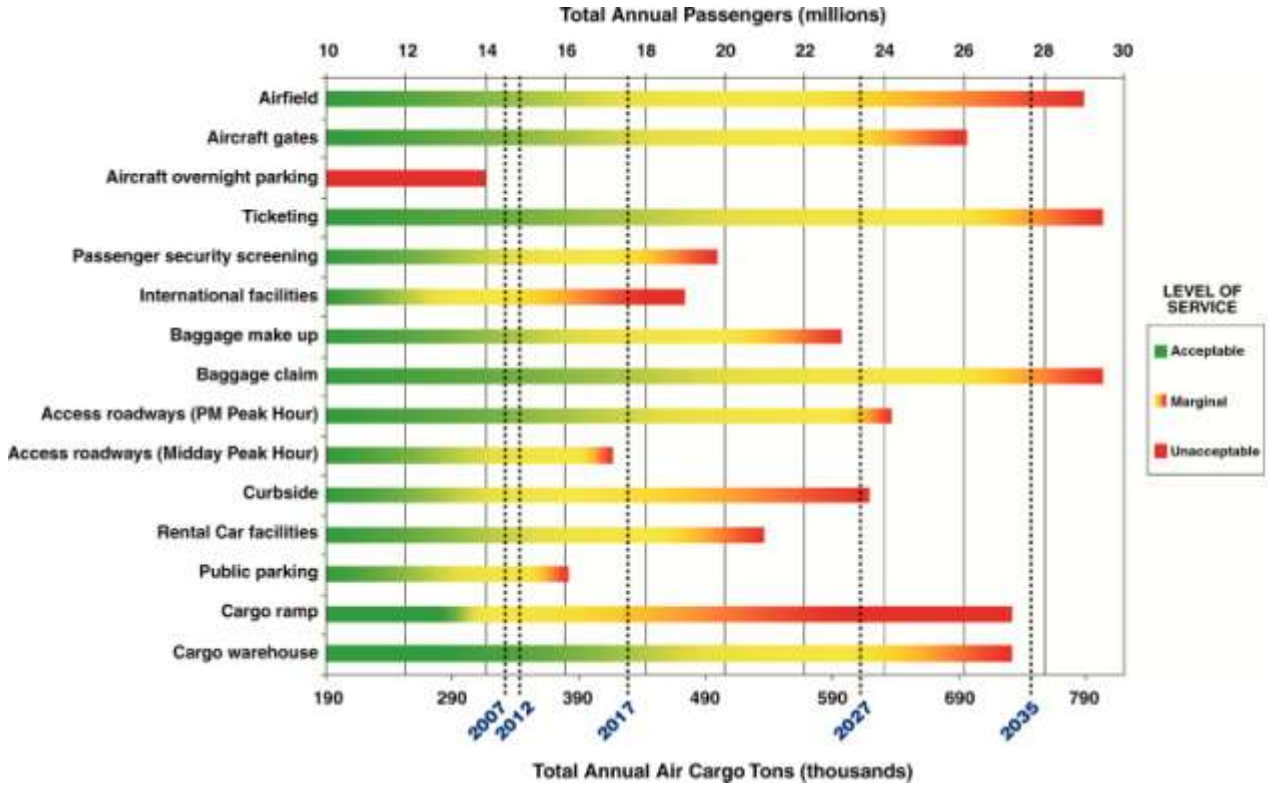
CURRENT FACILITIES REQUIREMENTS COMPARTED TO LAST MASTER PLAN

Comparison with Previous Master Plan

		Requirements from	
BASIS OF REQUIREMENTS	**Existing Conditions**	**Previous Master Plan (2020)**	**Current Master Plan (2035)**
Total annual passengers (million)	14.7	27	27
Aircraft operations	265,000	485,000	378,000
Total cargo (annual tons)	280,000	958,000	732,000
AIRFIELD			
Capacity (annual operations; current procedures)	-	410,000	425,000
Number of parallel runways	2	3	2
Critical aircraft		A380-200	B747-400
TERMINAL			
Gates	67	107	67
Increased building area	-	50%	-
GROUND TRANSPORTATION AND PARKING			
Public parking spaces (on-Airport)	15,000	25,000	28,000
Employee parking spaces	2,500	3,000	3,100
Enplaning, curbside (linear feet)	930	1,035	1,200
Deplaning, curbside (linear feet)	500	2,240	730
AIR CARGO			
Building area (square feet)	649,000	823,000	1,100,000
Ramp (square yards)	256,000	336,000	565,000

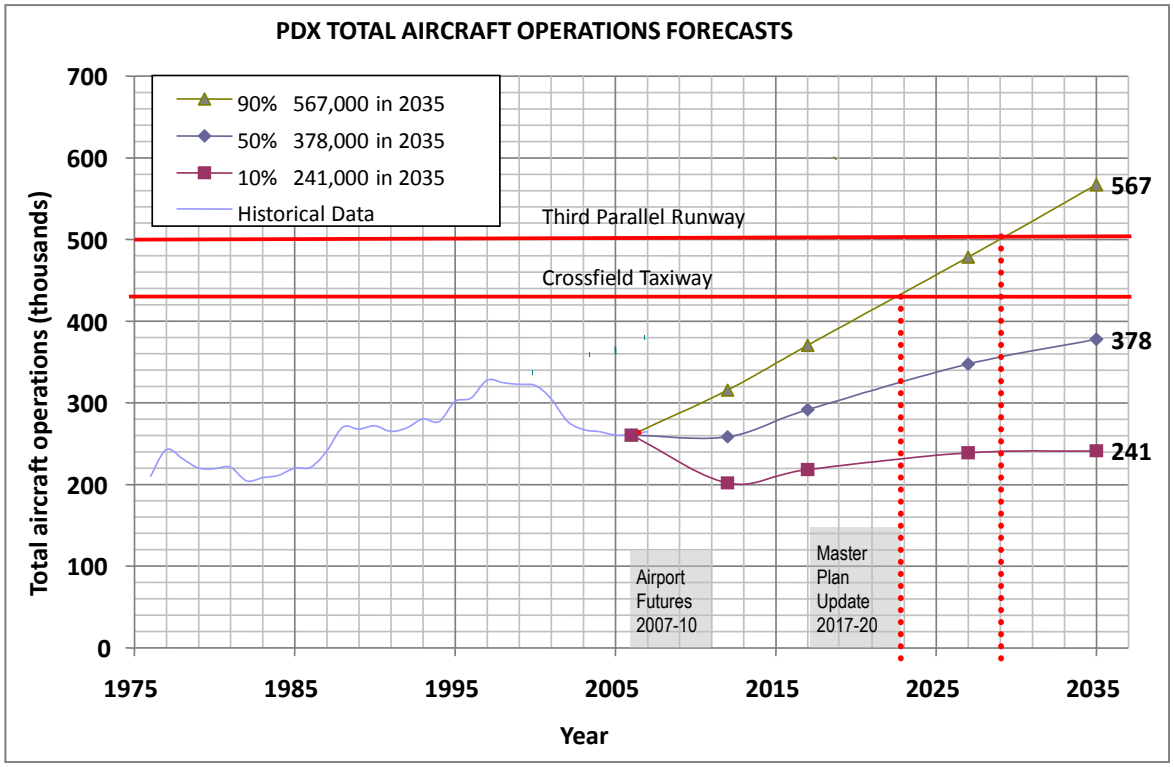
“STOP LIGHT” CAPACITY ASSESSMENT

CAPACITY ASSESSMENT OF SELECTED PASSENGER AND CARGO FACILITIES



TIMELINE SHOWING WHEN FACILITIES MAY BE NEEDED

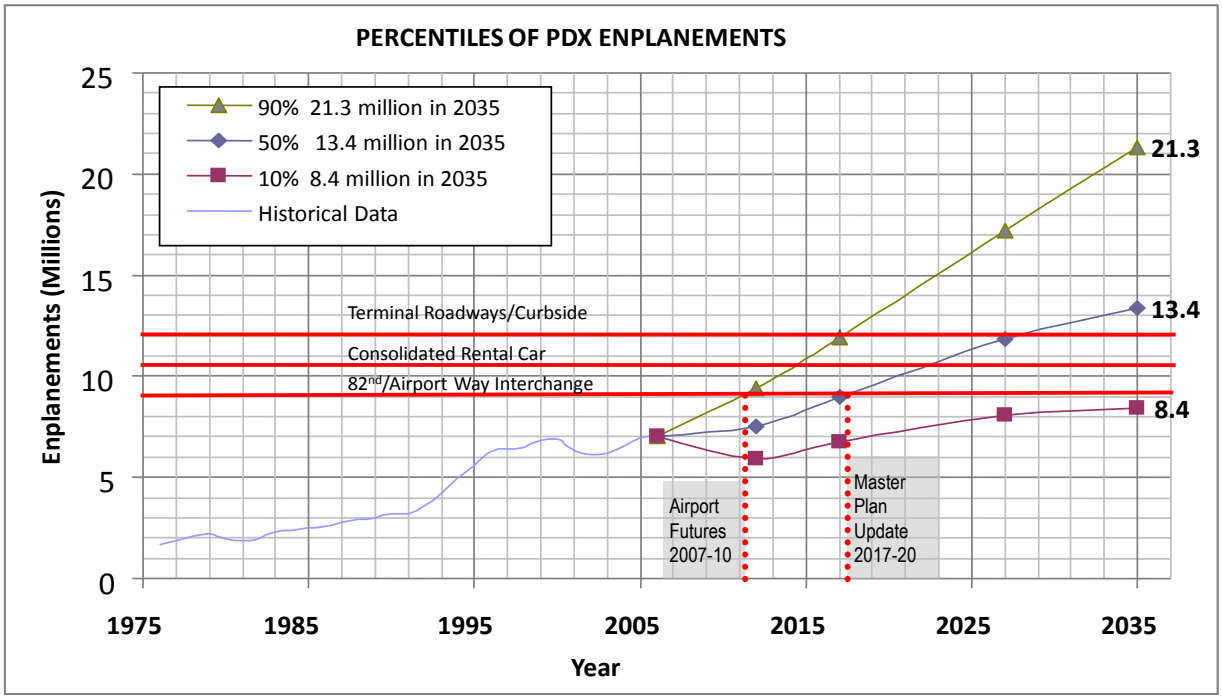
2035 Forecasts and Interim Infrastructure Investment Decisions Related to Operations



The graph above shows the potential timing for two projects. The top red line indicates that the 3rd parallel runway might be needed around 2028 if growth occurred on the 90th percentile growth curve (the highest growth curve created in the recently completed forecast. At this time, no one thinks that has much of any chance of happening. The graph also shows that it would not be needed within the 2035 timeframe based on the 50th and 10th percentile growth forecasts.

The second red line illustrates the potential timing of a cross airfield taxiway. This would connect the existing north and south runways with a taxiway that would cross Airport Way east of the terminal building in the vicinity of Flightcraft and the Post Office. The chart shows that this facility might be needed around 2023 if growth occurred on the 90th percentile growth curve. It would not be needed with either the 50th or 10th percentile growth forecasts.

2035 Forecasts and Interim Infrastructure Investment Decisions Related to Passengers



Although large scale projects, such as a 3rd parallel runway or cross field taxiway, are unlikely in the planning period, several important decisions may need to be made before the next Master Plan Update. Fore example, the location of rental car facilities and improvements to the SE 82nd/Airport Way Interchange.

2000 MASTER PLAN COST ESTIMATE

20 Year Capital Costs

	Decentralized	Centralized
Terminals	$1,477.80	$1,140.10
Parking	$ 489.40	$ 424.80
Runway	$ 526.10	$ 412.70
Land	$ 353.10	$ 266.20
Military Move	$ 409.50	$ 0
Other	$ 165.70	$ 148.30
Roads/Transit	$ 141.30	$ 104.60
Total	$3,562.90	$2,496.70

Costs reported in present value dollars (Millions) from 2000 Master Plan.

STRATEGIC ENVIRONMENTAL EVALUATION – SUMMARY REPORT

Project Need:

Following the Port of Portland Commission's acceptance of the Portland International Airport (PDX) 2000 Master Plan, the Port acknowledged that additional studies were necessary to more fully evaluate the viability of the alternatives presented in the Master Plan. This "follow-on study" entails conducting **preliminary** environmental analyses for the centralized terminal and decentralized terminal alternatives which both include a new 3rd parallel runway. For purposes of the alternatives analysis, a short 3rd runway configuration [7,000 feet] and a long 3rd runway configuration [11,000 feet] were analyzed for each terminal alternative. This analysis carries the name Strategic Environmental Evaluation (SEE).

Project Goals:

The primary project goal was to begin analyzing potential air quality, water quality and natural resource impacts of the centralized and decentralized alternatives and a proposed 3rd parallel runway with an emphasis on cumulative impacts. The project goals are summarized as follows:

1) Uphold commitments from the 2000 Master Plan;
2) Prepare for the next PDX Master Plan Update [scheduled 2006 – 2010];
3) Implement Port Environmental Policy;
4) Integrate and coordinate PDX master planning with City of Portland land use permitting;
5) Assist the City of Portland with development of a plan district or airport zone;
6) Uphold commitments from the 2002 Conditional Use Master Plan; and
7) Uphold the commitments from the September 2004 Intergovernmental Agreement between the Port of Portland and the City of Portland.

Study Area:

The study area includes the boundaries proposed under the decentralized and centralized terminal alternatives shown in the 2000 PDX Master Plan report and the 3rd parallel runway depicted on the Federal Aviation Administration (FAA) approved PDX Airport Layout Plan (ALP). The boundaries of the study area vary by topic as a result of the differences in how and where the impacts occur. Offsite impacts were considered to the degree practicable.

Structure and Level of Detail for SEE:

The environmental analysis conducted for the SEE was more in-depth than that conducted for the 2000 PDX Master Plan but was not as detailed as what would normally be required by the National Environmental Policy Act (NEPA). A key consideration was to evaluate cumulative impacts that would occur if all of the features contemplated on the ALP were constructed. However, significant data gaps greatly impede evaluation of cumulative impacts as defined under NEPA. As a result, the term "cumulative impact" is defined differently for SEE than under NEPA. The SEE will not address the impacts of other entities nor will background conditions resulting from activities or development of other entities be considered. "Cumulative impacts" for SEE means Port baseline conditions plus full build-out of Port projects.

The figure below illustrates the NEPA definition of cumulative impact. It also notes available data, data currently being collected and unavailable data. The intent is to convey the difficulty in conducting a credible cumulative impacts analysis for a project that would not be constructed for decades.

Cumulative Impacts are the sum of:

Background concentrations (under evaluation)

PDX Current Activities (known impacts)

Future PDX Activities (under evaluation)

Current activities of businesses and municipalities (unknown)

+ Future activities of businesses and municipalities (unknown)

= Cumulative Impacts

Air Quality:

The air quality evaluation consists of build vs. no-build comparisons for the 3rd runway with centralized and decentralized terminal alternatives. The development alternatives were evaluated separately and compared to the baseline/existing condition. An emissions inventory of particulate matter, carbon monoxide, oxides of nitrogen, sulfur dioxide and hydrocarbons was compiled for the 20 source types shown in **Table SR-1**. All airport-related sources (mobile and stationary) were included. Emissions from all airport-related activity were calculated including those activities conducted off airport property. The analysis includes Port, tenant and passenger activities. Emissions were calculated in tons per year for each pollutant from each source type. Emission factors from the Environmental Protection Agency (EPA), FAA, Department of Environmental Quality (DEQ), and Metro were used to calculate emission rates.

Ambient pollutant concentrations were not measured or modeled. The evaluation relied on existing data. The collection of new data and emissions testing are beyond the scope of this project.

Table SR-1 **PDX Emission Sources**	
Passenger aircraft	Passenger ground service equipment
Freight aircraft	Freight ground service equipment
Passenger vehicles	Rental cars
Courtesy shuttles	Port shuttle buses
Commercial vans	Port maintenance vehicles
Cargo vans	Fuel handling
Ground run-ups	Cargo trucks
Military aircraft	Military ground service equipment
Employee vehicles	Stationary sources
Construction equipment	Taxis

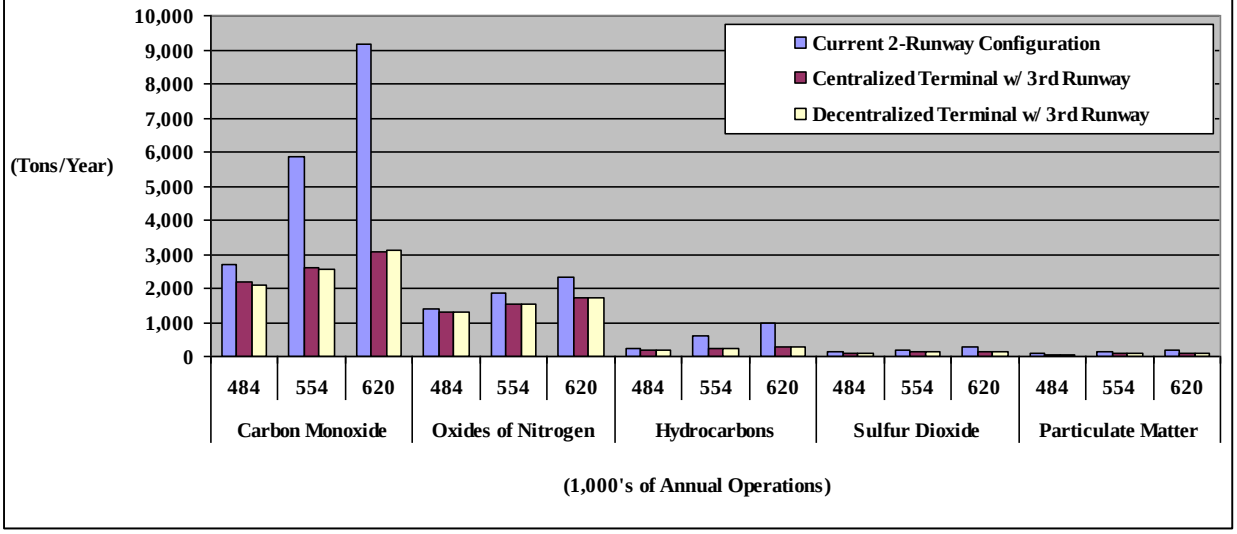
Emissions estimates were prepared for a no-build scenario to provide a basis for comparison. Through this process it became clear that the emissions from most equipment would not be effected by runway and terminal configuration and would occur regardless of which alternative was eventually constructed. The exception to this was aircraft taxi time which is highly sensitive to facility layout. As a result, taxi times and the resultant emission rates are the basis for comparison of alternatives.

Key Findings:

- The largest sources of emissions of criteria air contaminants and their precursors are passenger vehicles followed by passenger ground service equipment and passenger aircraft;
- Despite the high activity levels associated with PDX, the overall emissions are a small contribution to the region's emissions [less than 3% for any one pollutant]; and
- The FAA conducted Tactical Initiative 5 as a component of their Capacity Enhancement Study [another "follow-on study from the 2000 PDX Master Plan Update] for PDX. FAA staff used an airfield simulation computer model to estimate taxi times for the various terminal and 3rd parallel runway configurations and compared them to a no-action

scenario where the existing two parallel runways were used to accommodate future aircraft traffic. The taxi times were then used to calculate annual aircraft emission rates. This analysis demonstrates that emissions of all air contaminants would be markedly higher under the 2-runway scenario for all future aircraft operation levels studied compared to either 3-runway scenario. This is attributable to the increased taxi times associated with the anticipated congestion of the 2-runway configuration. Much of the delay is expected to occur in the departure queue. The results are summarized in **Figure SR-2**. Emissions from taxi, takeoff, climb out to 3,000 feet and approach/descent from 3,000 feet are included in the calculations. Only taxi time varies between the alternatives.

Figure SR-2
Aircraft Emissions Comparison



Water Quality:

The water quality analysis consists of build vs. no-build comparisons for the 3rd runway with centralized and decentralized terminal alternatives. Runway lengths of 7,000 feet and 11,000 feet were evaluated. Each development scenario was evaluated separately and compared to the existing baseline condition. The stormwater effluent properties including stormwater volume, pollutant concentrations and pollutant loads from each drainage basin were characterized. All airport-related sources, activities and development were considered including tenant operations and passenger activities. This preliminary evaluation does not include a receiving water study nor does it include modeling of in-stream effects. Downstream and offsite effects are not estimated or modeled. The evaluation relies on existing monitoring data.

Table SR-3

Annual Stormwater Volume Comparison

Development Scenario	Impervious Surface	Total Mean Annual Flow
	(Acres)	(Millions of Gallons)
Existing Configuration	1,370	1,091
Decentralized Terminal w/ 7,000 Foot Runway	2,197	1,866
Decentralized Terminal w/ 11,000 Foot Runway	2,241	1,921
Centralized Terminal w/ 7,000 Foot Runway	2,016	1,716
Centralized Terminal w/ 11,000 Foot Runway	2,048	1,751

The water quality analysis was conducted using two computer simulation models. Water quality impacts were assessed by quantifying changes in land uses and impervious surfaces for each development alternative. Existing drainage basins were mapped in Geographic Information Systems (GIS) format. Layers showing future development were overlain on the drainage basin map to quantify the amount of new impervious surface and associated land uses. Stormwater volumes were estimated using the EPA Stormwater Management Model (SWMM) which considers 30 years of weather data, flow direction, amount of impervious and pervious surfaces, area, slope and land uses. This phase of the analysis determined that terminal configuration has a greater influence on stormwater volume than runway length. The predicted annual stormwater volumes are shown in **Table SR-3**.

Annual pollutant loading and concentrations at each of the nine outfalls from the PDX drainage basins were then estimated using a spreadsheet model. This model uses annual stormwater volume, land uses and Best Management Practices (BMPs) to predict pollutant loads and pollutant concentrations. BMPs are control systems, structures and practices used to reduce or prevent the discharge of contaminants. This modeling tool provides a means to evaluate the effectiveness of various BMP configurations and to determine which BMPs will be needed in the future to ensure continued compliance with water quality requirements. Future concentrations and annual loads for ten pollutants were estimated. The results are summarized in **Table SR-4**. Predicted pollutant loads and pollutant concentrations were compared to current benchmarks which are based on Total Maximum Daily Load (TMDL) allocations that were established to meet water quality standards.

Table SR-4 Stormwater Pollutant Load and Concentration Summary

		Constituent*									
Model Scenario	**Annual Average**	**TSS**	**BOD_5**	**TKN**	**NO_3**	**Total P**	**Ortho P**	**Oil & Grease**	**Cu**	**Pb ***	**Zn**
Current Baseline	Load (kg)	103,531	116,605	3,912	2,345	378	300	11,000	55	54	296
Existing 3 runways	Concentration (mg/l)	25	28	0.95	0.57	0.09	0.07	2.66	0.01	**0.013**	0.07
Decentralized 11,000' rwy	Load (kg)	180,061	225,204	5,132	3,825	532	437	18,950	80	90	499
	Concentration (mg/l)	25	31	0.71	0.53	0.07	0.06	2.61	0.01	**0.012**	0.07
Decentralized 7,000' rwy	Load (kg)	171,612	217,473	4,949	3,723	497	419	18,404	76	87	474
	Concentration (mg/l)	24	31	0.70	0.53	0.07	0.06	2.61	0.01	**0.012**	0.07
Central 11,000' rwy	Load (kg)	172,743	203,602	4,774	3,489	511	406	17,303	75	86	476
	Concentration (mg/l)	26	31	0.72	0.53	0.08	0.06	2.61	0.01	**0.013**	0.07
Central 7,000' rwy	Load (kg)	170,181	199,429	4,693	3,418	505	399	16,978	74	85	469
	Concentration (mg/l)	26	31	0.72	0.53	0.08	0.06	2.61	0.01	**0.013**	0.07
Stormwater Permit Benchmarks (mg/l)		**50**	**33**	**-**	**-**	**0.16**	**-**	**10**	**0.036**	**0.006**	**0.24**

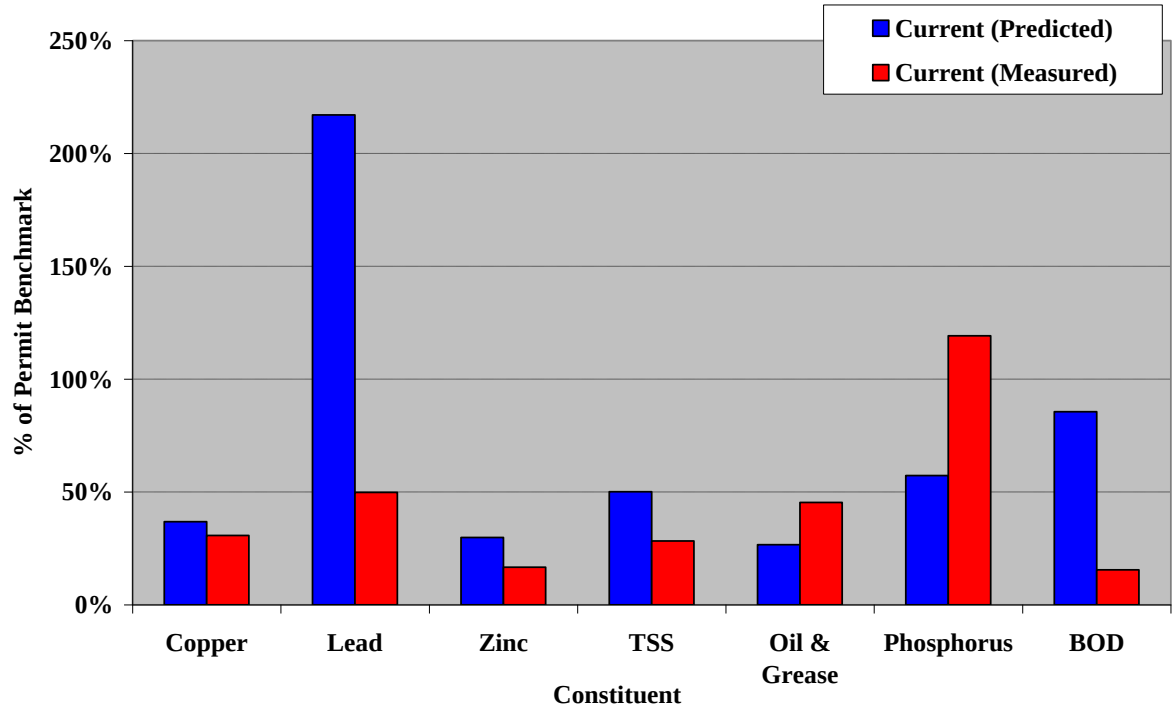
* Values in bold indicate predicted concentration exceeds storm water permit benchmark.

TSS –Total Suspended Solids, BOD–Biological Oxygen Demand, TKN–Total Kjehldahl Nitrogen, **NO_3**-N-Nitrate Nitrogen, Total P–Total Phosphorus, Ortho P–Ortho Phosphate, CU-Copper, Pb-Lead, Zn-Zink

As a quality control measure for the model, the predicted results were compared to monitoring results for the baseline scenario. The comparison is shown in **Figure SR-5**. Where predicted concentrations were in close alignment with measured values, the model was deemed adequate for use in predicting future effluent properties. Further refinement of stormwater models is required for pollutants where predicted concentrations were markedly different than measurements.

Lead and phosphorus are two pollutants that had poor agreement between measured and modeled results. The predicted lead concentrations greatly exceeded measured values and the benchmark concentration. It is believed that the pollutant load factor for lead, which was derived from non-aviation activities, is not representative of conditions at PDX. The measured phosphorus concentration was approximately twice as high as what the model predicted. The groundwater at PDX exceeds the benchmark for phosphorus due to natural soil characteristics. Since PDX is in a former flood plain, a large portion of the stormwater is ground water which elevates the phosphorus concentration. This phenomenon is expected regardless of activity levels and land uses. This phenomenon has also been observed at Portland International Center which is located in a drainage basin where there is little or no development and no aviation-related land uses.

Figure SR-5 Annual Stormwater Effluent Concentrations
Predicted Values vs. Measurement Results



Key Findings - General:

1) Either terminal configuration and either length runway could be developed without exceeding the annual benchmark concentrations and TMDL allocations in current water quality permits;
2) Terminal configuration has a greater effect on stormwater volume than runway length;
3) The 7,000 foot runway with a centralized terminal has the least water quality impact of the alternatives evaluated; and
4) The 11,000 foot runway with a decentralized terminal has the greatest water quality impact of the alternatives evaluated.

Key Findings – Limitations of the Preliminary Analysis and Improvements Identified for Consideration During the Update of the PDX Master Plan:

1) Many BMP pollutant reduction values area based on limited data and could be improved;
2) The model may produce falsely high BMP reduction values when BMPs are combined;
3) Some BMPs actually increase pollutant loading (i.e. grassy swales and Phosphorus);
4) Certain pollutant load factors are not representative of airport operations and could be improved since they were derived from non-airport studies;
5) The lead loading rate is not representative since it does not match the measured concentrations;
6) The preliminary modeling relied solely on land use to determine pollutant loading without consideration of land use intensity or activity level;
7) The ground water phosphorus level exceeds the benchmark concentration; and
8) The water quality analysis was limited to annual averages. Development of the capability to evaluate concentrations and loads from single storm events should be considered.

Natural Resources:

The original commitment to review impacts from the 2000 PDX Master Plan was narrowly focused and limited to evaluation of potential wetlands impacts. The analysis was to rely on existing information and cover decentralized and centralized terminal configurations with a new parallel 11,000 foot runway. However, the scope of the evaluation was expanded to include a variety of natural resource impacts in addition to wetlands. As noted earlier, a 7,000 foot runway scenario was also evaluated. The Port's Natural Resource Inventory (NRI) database was expanded by approximately 626 acres to ensure a more complete analysis.

The natural resources evaluation consists of a series of maps depicting the various development alternatives in relation to the existing inventoried natural resources. The maps and analyses were generated by Port staff using Geographic Information System (GIS) software. The development alternatives are compared to a baseline condition. Each area of potential impact is identified by its location, its characteristics (including federal, state, regional and local regulatory constraints) and the type of change anticipated to occur due to airport development.

Natural Resources Analyses:

Potential natural resource impacts were analyzed using two different data sets to ensure completeness of the evaluation. The data sets are described as follows:

1) City of Portland, Bureau of Environmental Services (BES) natural resource areas of interest; and
2) Port of Portland Natural Resource Inventory (NRI) data.

The BES "natural resource areas of interest" include the following:

1) Statewide Planning Goal 5 Areas;
2) BES Habitats of Concern for Protection and Restoration;
3) BES Active Revegetation Sites; and
4) Columbia Slough with 50-Foot Riparian Buffer.

Parks, mitigation sites and properties not owned by the Port that may potentially be acquired in the future were added by Port staff to complete the analysis. An example of the analysis using BES data is provided in Exhibit NR-4. The differences between the potential impacts associated with runway lengths and terminal configuration are highlighted in Exhibit NR-6.

A second analysis was conducted using the Port of Portland Natural Resource Inventory (NRI). This dataset provides the Port with a means to:

1) Scientifically characterize existing natural resources in the context of the built environment;
2) Evaluate potential impacts of future development;
3) Make informed planning decisions;
4) Ensure land use compatibility; and
5) Work effectively with agencies having regulatory authority.

NRI is an inventory of surveyed land cover that includes vegetation types as well as built structures. Most habitat classification methodologies in use in the Portland area are based on regulatory programs and may not accurately reflect actual habitat characteristics. The NRI dataset is 100% field-verified for all Port properties allowing for consideration of land management activities and uses as well as regulatory constraints. An example of the analysis using NRI is provided in Exhibit NR-11.

Key Findings – Similarities between alternatives:

1) Most natural resource impacts are common to all alternatives;
2) New impacts are smaller in acreage than the existing impacts;
3) Generally speaking, there are few and slight differences between alternatives. There are more similarities than differences in terms of natural resource impacts and changes; and
4) All of the development alternatives were deemed feasible given existing environmental requirements and regulations. However, the mitigation requirements could vary substantially between alternatives.

Key Findings – Differences between alternatives:

1) The centralized terminal configuration impacts fewer natural resources than the decentralized alternative;
2) A 7,000-foot runway impacts fewer resources than an 11,000-foot runway;
3) The centralized terminal with a 7,000-foot runway has the least acreage of new impact, requires the least amount of land acquisition and the least amount of wetland mitigation;
4) Both 7,000 and 11,000-foot runway scenarios will impact existing Port of Portland mitigation areas;
5) Both terminal configurations require decommissioning of Runway 3/21 which would greatly reduce primary zone impacts at certain natural resource areas of interest to the south of the airfield; and
6) Tree topping at new locations may be necessary to protect airspace as a result of relocation and/or expansion of primary and secondary zone boundaries.

Key Findings – Procedural Issues:

Of all of the various habitat assessment and resource classification schemes, NRI is most suited for making informed land use decisions due to its specificity, versatility and comprehensive field verification. Field verification allows consideration of land uses as well as management practices.

Key Findings – Limitations of the Preliminary Analysis and Improvements Identified for Consideration During the Update of the PDX Master Plan:

1) Based on current FAA demand forecasts, the need for a 3rd parallel runway and additional passenger terminal are well beyond the 20-year planning horizon generally used for master planning purposes making this analysis highly speculative in nature.
2) It is highly probable that environmental regulations and approval processes will change significantly between now and when a 3rd runway is actually needed.
3) It is highly probable that technological advancements in aviation navigation equipment as well as airport/airline operational changes could significantly postpone, influence or otherwise modify the timing and/or selection of various capacity enhancing measures.
4) Data used in this evaluation are from various sources and are of various vintages. All data should be reviewed and updated, where appropriate. Additional field surveys should be conducted to ensure the accuracy of the information acquired via remote sensing techniques.

5) The 2000 PDX Master Plan did not identify a new location for the deicing system pump stations, concentrate tank and dilute detention basin. These features are critical to maintaining safe aircraft operations and meeting water quality permit requirements. Locations for these features are being address through the Port's Deicing System Enhancement Project.

AIRPORT CAPACITY ENHANCEMENT PLAN – SUMMARY REPORT

Capacity Enhancement Plan Update

Periodically the FAA prepares a report commonly referred to as a Capacity Enhancement Plan (CEP) for select airports. This report is prepared either at the request of an airport owner or based on the FAA's own analysis of that particular airport's handling capabilities or capacity. For PDX, the most recently published CEP study (October 2004) was conducted in two separate phases. This CEP updated the initial 1996 CEP study which identified and evaluated alternatives to enhance existing airport and airspace capacity.

The results of Phase I were published in October 2001. This portion of the overall CEP study assessed the technical merits of the proposed airfield enhancements presented in the PDX Master Plan Update of 2000. The Phase II CEP was initiated in 2003 and evaluated the potential benefits of the two terminal options - centralized and decentralized for two and three runway scenarios.

This two-phased technical study identified the operational benefits or delay-related cost savings of capacity enhancement alternatives. It did not result in decisions, recommendations, or policies, nor did it establish procedures. Additional studies will be needed to assess environmental, social, economic, or political issues.

In Phase I, the following airfield and operational alternatives were identified by the Capacity Team and were simulated using a standard computer model developed by the FAA:

1. 3rd Parallel Runway – All Aircraft.

2. 3rd Parallel Runway – Propeller Aircraft Only.

3. North/South Taxiway Connecting East Ends of the Existing Parallel Runways.

4. Simultaneous (Independent) CAT I Approaches to the Existing Parallel Runways.

5. No Departure Noise Restrictions for Turboprops and Biz Jets in Both Flow Directions.

6. No Departure Noise Restrictions for Any Aircraft.

The Phase II CEP Update was initiated in 2003 and evaluated the potential benefits of the two terminal options – centralized and decentralized* for two and three runway cases. The study examined aircraft travel times, runway crossings, and operational procedures associated with both terminal options. The team identified and assessed various improvement alternatives to determine their impact on capacity and delay.

To compare the aircraft movement efficiency of the two master-plan identified terminal options, the study simulated the following alternatives with standard departure procedures (divergent turns):

(A) Centralized Terminal with Two Parallel Runways

(B) Decentralized Terminal with Two Parallel Runways

(C) 3rd Parallel Runway – simulated as part of other alternatives

(C+A) Centralized Terminal with Three Parallel Runways

(C+B) Decentralized Terminal with Three Parallel Runways

Different activity levels were chosen to represent growth in aircraft operations in order to compare the merits of each alternative. These annual activity levels are referred to throughout this report as:

Baseline 322,000 operations**

Future 1 (F1) 484,000 operations

Future 1.5 (F1.5) 554,000 operations

Future 2 (F2) 620,000 operations

* Travel times include air and ground delay.

** Not simulated because the new terminal will not be needed.

In the Two Parallel Runway Case, the results can be summarized as follows:

- The Centralized Terminal Option has lower ground travel times, no runway crossings, balanced use of the runways, and less arrival and departure runway delay.
- The Decentralized Terminal Option has significantly higher travel times and more runway crossings.

In the Three Parallel Runway Case, the results can be summarized as follows:

Both terminal options have:

- Comparable travel times and delay
- Comparable runway crossings
- The Decentralized Terminal Option is more efficient during East Flow operations.

Conclusions:

The Centralized Terminal Option is more efficient than the Decentralized Terminal Option in the Two Parallel Runway Case.

The Centralized and Decentralized Terminal Options are similar in operational efficiencies in the Three Parallel Runway Case.