

PHL

Master Plan Executive Summary



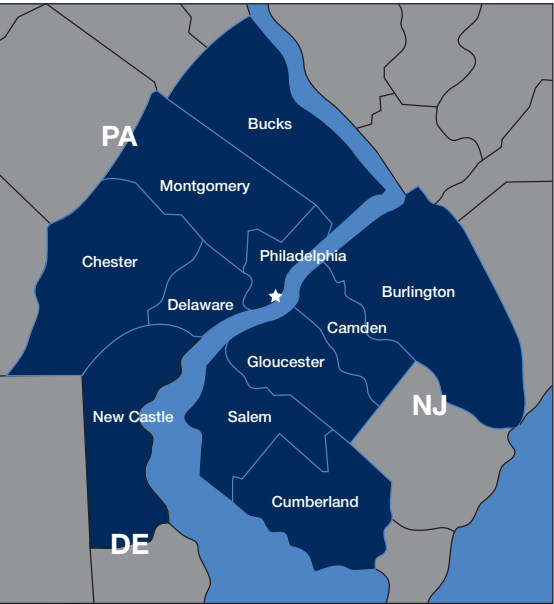


The City of Philadelphia's Division of Aviation owns and operates Philadelphia International Airport (PHL). Six million people in 11 counties rely on PHL for their air travel needs. PHL is host to 30 airlines flying 621 nonstop daily and seasonal flights to 124 cities including 62 nonstop international flights to 36 international cities.

The Federal Aviation Administration (FAA) has identified PHL as one of eight pacing airports in the nation, which makes the efficient operation of this Airport vital to the movement of passengers and goods within the United States and across North America by air.

Enhancements to the airfield and other airport facilities are necessary to sustain the future demand at PHL. Therefore, the Division of Aviation initiated a Master Plan to explore ways in which the Airport can enhance its role in the region's economic growth and remain a premiere transportation facility.

In 1994 and 1997, prior Airport Master Plans were completed. These resulted in the development of Runway 8-26, Regional Terminal F (38 additional gates), and International Terminal A-West (13 additional gates).



PHL serves an 11 county region that is home to 6 million people.

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1 Overview and Background

1.1 Airport Setting

PHL is the Philadelphia metropolitan area's largest airport serving an 11 county region that expands beyond Pennsylvania to include New Jersey and Delaware. Interstates 76, 95, and 476 provide regional access to the Airport, which is located approximately 7 miles southwest from downtown Philadelphia. The Airport is situated on approximately 2,300 acres of land in Philadelphia County and Delaware County.



1.2 Airport Role

Philadelphia International Airport is Pennsylvania's busiest airport and primarily serves origin and destination (O&D) traffic with 63% of annual enplaned passengers originating in Philadelphia. PHL continues to position itself as a premier gateway both internationally and domestically with terminal additions and improvements, increased destination offerings and service by low fare carriers.

PHL has been ranked in the top ten busiest airports in the nation in terms of passenger traffic for the past decade. PHL also serves as a major cargo hub for United Parcel Service, which accounts for almost 50 percent of the cargo shipped through the Airport.

PHL is classified as a primary commercial service airport and a large hub as it accounts for greater than one percent of total United States passenger enplanements.

The Airport is a self-sustaining entity that operates without the use of local tax dollars. It is one of the largest economic engines in Pennsylvania, generating an estimated \$14 billion in spending to the regional economy, and accounts for more than 141,000 jobs within the region. Additionally, the Airport generates millions in annual tax revenue for Philadelphia and the region and contributes to billions in annual spending throughout the Commonwealth.

1.3 Airport History

In 1922, Philadelphia officials selected a 125-acre parcel in the City of Philadelphia as the site for a new municipal airport. The Pennsylvania National Guard used the Airport through the 1920's. In 1930, the City purchased an adjacent 1,000-acre parcel for expansion. The Airport formally opened on June 20, 1940 as the Philadelphia Municipal Airport. Commercial service was initiated on June 26, 1945 when the Airport reopened after military closure during World War II.

Construction in the 1950's included a \$15 million terminal building, a cargo processing facility and an extension of Runway 9L-27R. In 1972, Runway 9R-27L was commissioned and in 1973, a \$3 million Overseas Terminal was opened for international and charter flights. The \$300 million modernization of the domestic terminal area was completed in 1977 with four terminals and two multi-level parking garages.



In March 1991, the Richardson Dilworth International Terminal A replaced the Overseas Terminal. Runway 8-26 was opened in 1999. In June 2001, commuter facility Terminal F opened with 38 new gates.

International Terminal A-West was opened in May 2003 providing 13 international wide-body gates, 56 Immigration and Naturalization Service positions and 60 new ticket counter positions.

1.4 Master Plan Objectives

Given the history and current status of the Airport, anticipated future demands on airport facilities, and the recognition that PHL must grow responsibly, the goal of the Master Plan was to provide wide-ranging facility development guidelines that fulfill airfield capacity demands over the planning horizon.

1.5 Community Involvement

Development of the PHL Master Plan was guided by four Advisory Committees, which convened six times over the course of the study. Fifty-eight agencies participated in the development of the Master Plan through one of the four committees:

1. the Community Advisory Committee
2. the Environmental Advisory Committee
3. the Technical Advisory Committee, or
4. the Tenants/Users Advisory Committee

Committee members included representatives of government, business, tourism, transportation, environmental agencies and neighboring jurisdictions.

Members of the neighboring Chambers of Commerce as well as representatives from the communities immediately adjacent to the Airport participated on the Community Advisory Committee. The Committee provided guidance and feedback on Airport operations and proposed concepts, and assessed how each concept could affect the neighboring jurisdictions going forward.

Federal, state and local environmental regulatory agencies participated in the Environmental Advisory Committee. The purpose of this committee was to gain input on the environmental issues, potential environmental impacts and probable permitting requirements related to proposed airport development.

Federal and state transportation agencies, regional and local planning officials, aviation users and aviation industry experts participated on the Technical Advisory Committee. The goal of the committee was to review, critique, and provide a regional planning vision to the Master Planning process.

Representatives from the airlines, concessionaires, and parking/ground transportation organizations participated on the Tenants/Users Advisory Committee. The purpose of this committee was to provide insight and guidance on the proposed concepts to improve airside and landside operations and capacity.

In addition to Committee involvement, a number of focused coordination meetings were held during the preparation of the Master Plan with key stakeholders integral to the implementation of the plan. Four parties in particular, United Parcel Service, US Army Corps of Engineers, Sunoco Logistics and Freight Rail operators met regularly with Airport and FAA officials to develop acceptable mitigation plans that would ultimately become elements of the Master Plan alternatives.

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2 Aviation Activity Forecasts

2.1 Methodology

National and global aviation trends help to influence and predict the anticipated capacity that will be necessary to ensure that future demand is met at Philadelphia International Airport.

The forecasts of aviation demand at Philadelphia International Airport were prepared using a standard methodology, summarized as follows:

- Analysis of historical growth trends
- Assumptions regarding future annual growth rates
- Assumptions regarding the likely future trend in key ratios, such as average aircraft size and boarding load factors

2.2 Enplaned Passenger Forecasts

Historical enplaned passenger statistics were utilized in the development of passenger forecasts. From 1980 to 2000, total enplaned passengers at the Airport increased at an average annual rate of 4.9 percent, compared with a national average growth rate of 4.0 percent.

Growth at the Airport through 2000 was attributed to increases in local demand due to economic growth, the development of the US Airways hub, and the increase in international service provided.

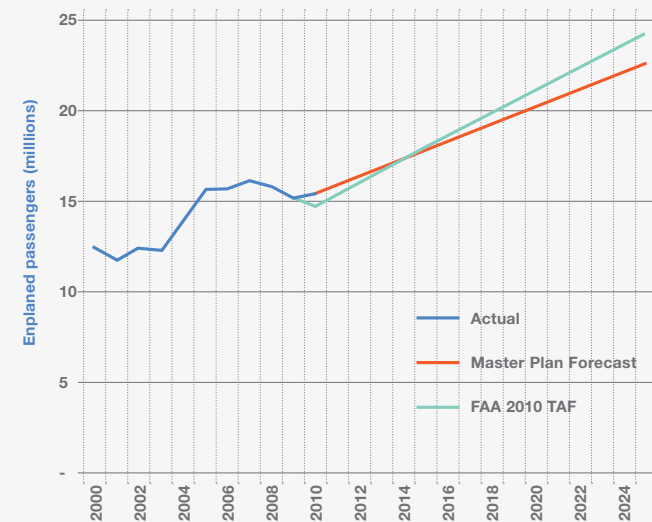
Passenger traffic at the Airport has experienced continual growth while passenger traffic nationwide has declined. Low cost carriers such as Southwest Airlines and Frontier Airlines have contributed to the steady passenger traffic at PHL.

Passenger enplanements at PHL are forecast to increase to 22.6 million in 2020, with an average annual growth rate of 3.4 percent.

PHL Enplaned Passengers Forecasts

In 2020 passenger enplanements are estimated to increase at an average annual growth rate of:

+3.4%
to 22,550,000



2.3 Aircraft Operations Forecast

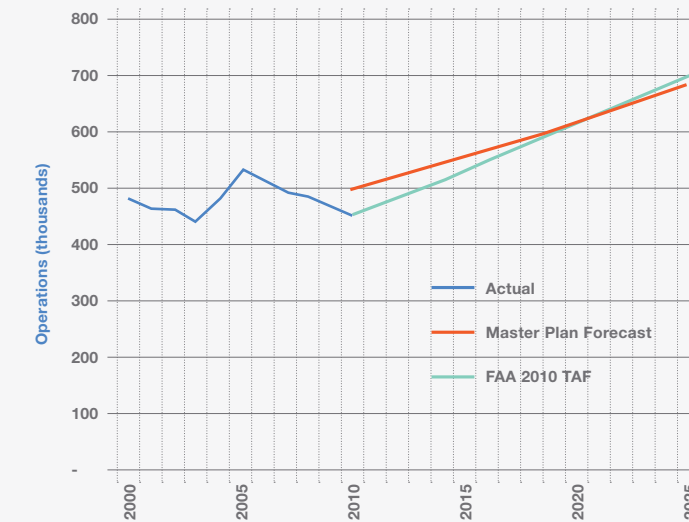
Aircraft operations include takeoffs and landings of air carrier, commuter/air taxi, general aviation, and military aircraft.

The forecast for aircraft operations is based on a low, base, and high forecast range. The high end of the range reflects a higher level of operations that could occur due to higher passenger demand levels and/or lesser average aircraft size. The low end of the range reflects a lower level of operations that could occur due to lower passenger demand levels and/or greater average aircraft size.

PHL Operations Forecasts

In 2020, aircraft operations are estimated to increase at an average annual growth rate of

+2.2% to
686,000



2.4 Air Cargo Forecasts

Cargo is projected to increase at a rate of 4.0 percent annually to 1.2 million tons in 2020. The forecast long-term growth rate for cargo tonnage at the Airport is lower than the long-term historical growth rate of 6.0 percent over a 20-year period. This is considered reasonable given the decline in cargo activity in the past few years. Additionally, certain unique factors, including development of express air cargo nationwide and the initial development of UPS hubbing operations at PHL, contributed to historical growth that would not be expected to produce the same growth pattern in the future.

2.5 FAA Approved Forecasts

As part of the planning process, the Federal Aviation Administration's Terminal Area Forecast (TAF) is compared to the Base Forecast scenarios developed for PHL. Enplaned passengers established by the Master Plan forecasts are anticipated to increase at an average annual growth rate of 3.4% to an estimated 22,550,000 passengers in 2020. FAA's TAF estimates a 3.9% average annual increase to a 23,286,118 passengers in 2020. There is an overall 3% variation between the Master Plan base forecast and the FAA TAF.

Aircraft operations are estimated to increase at an average annual growth rate of 2.2% to 686,000 in 2020 based on the Master Plan base forecast. The FAA TAF for 2020 is 674,773, which is a 2.1% increase. There is an overall 2% variation between the Master Plan base forecast and the FAA TAF. A ten percent variation between airport planning forecasts and the TAF is considered acceptable for planning purposes.

3 Alternatives Evaluation

3.1 Alternatives Analysis

The initial step of the Master Plan alternatives analysis focused on the airside features, because this system requires the greatest commitment of land area. The primary goal of the airfield alternatives analysis was the identification of runway/taxiway alternatives that would best meet airfield capacity and demand requirements. Once a preferred airfield concept was identified, terminal area alternatives, support/ancillary facility alternatives, and ground access alternatives were considered and integrated into the preferred airfield concept.

Study Advisory Committee members participated in a sketch planning session along with the Master Plan team to develop airfield-planning concepts that would increase operational efficiency and reduce delay at PHL. Needs were divided into airfield needs, terminal needs and supporting landside/access needs as follows:

- PHL will require a significant increase in all-weather airfield capacity to meet current and forecasted demand
- PHL will require more passenger terminal area and aircraft gates than the current complex can provide
- PHL will require better passenger terminal access and additional automobile parking facilities

The Master Plan airfield alternatives were limited in scope to maximizing the existing facilities in a way that would best meet the current and future needs of the region's air travel demands through the year 2020.

In all, the planning team generated 29 build concepts and a no action concept that included:

- concepts with two, three or four runways aligned with the existing primary runways
- concepts with two or three parallel runways
- concepts with one perpendicular cross-wind runway
- concepts with skewed runways
- concepts with two pairs of parallel runways rotated 30 degrees from existing runways.

Additionally, several combinations of runway orientations were identified, including concepts that proposed paving the entire existing airfield for maximum flexibility and constructing a runway south of the Delaware River in New Jersey.



The 29 preliminary airfield concepts were evaluated using a three-round screening process. The first round examined all concepts in relation to airfield facility requirements and sensitive environmental/land-use constraints. Fifteen concepts met the initial criteria and were then evaluated in a second round, which examined long-term capacity and impacts to challenging features, such as Interstate-95. The second round eliminated 10 concepts.

During the third round, each of the five remaining concepts were evaluated to assess the impact of construction phasing on airfield capacity. The critical phases of construction for each scenario were typically those which required closure or significant reduction in utility of an existing runway(s) for an extended period of time (greater than six months).

Through this screening process, it was determined that:

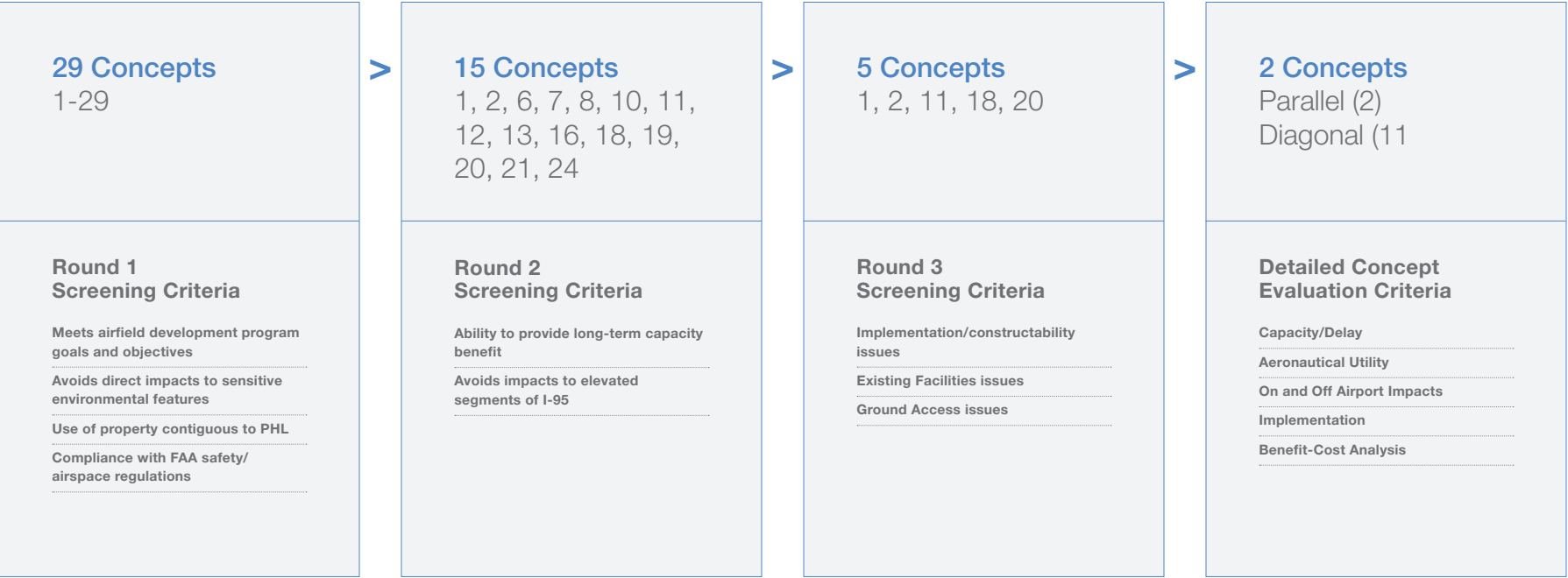
- Concepts which required the demolition of most, or all, of the existing terminal complex before any significant capacity benefits would be realized (i.e. before a runway can be developed) were unacceptable
- Concepts which are dependent upon the relocation of most or all of the existing terminal/gate facilities early in the development program were undesirable
- Concepts which are dependent upon the relocation or closure of most or all of the existing roadways in the vicinity of the airport early in the development program were undesirable

It was concluded that the airfield could not maintain an acceptable operating level if more than one of the existing runways were removed from operation at a given time.

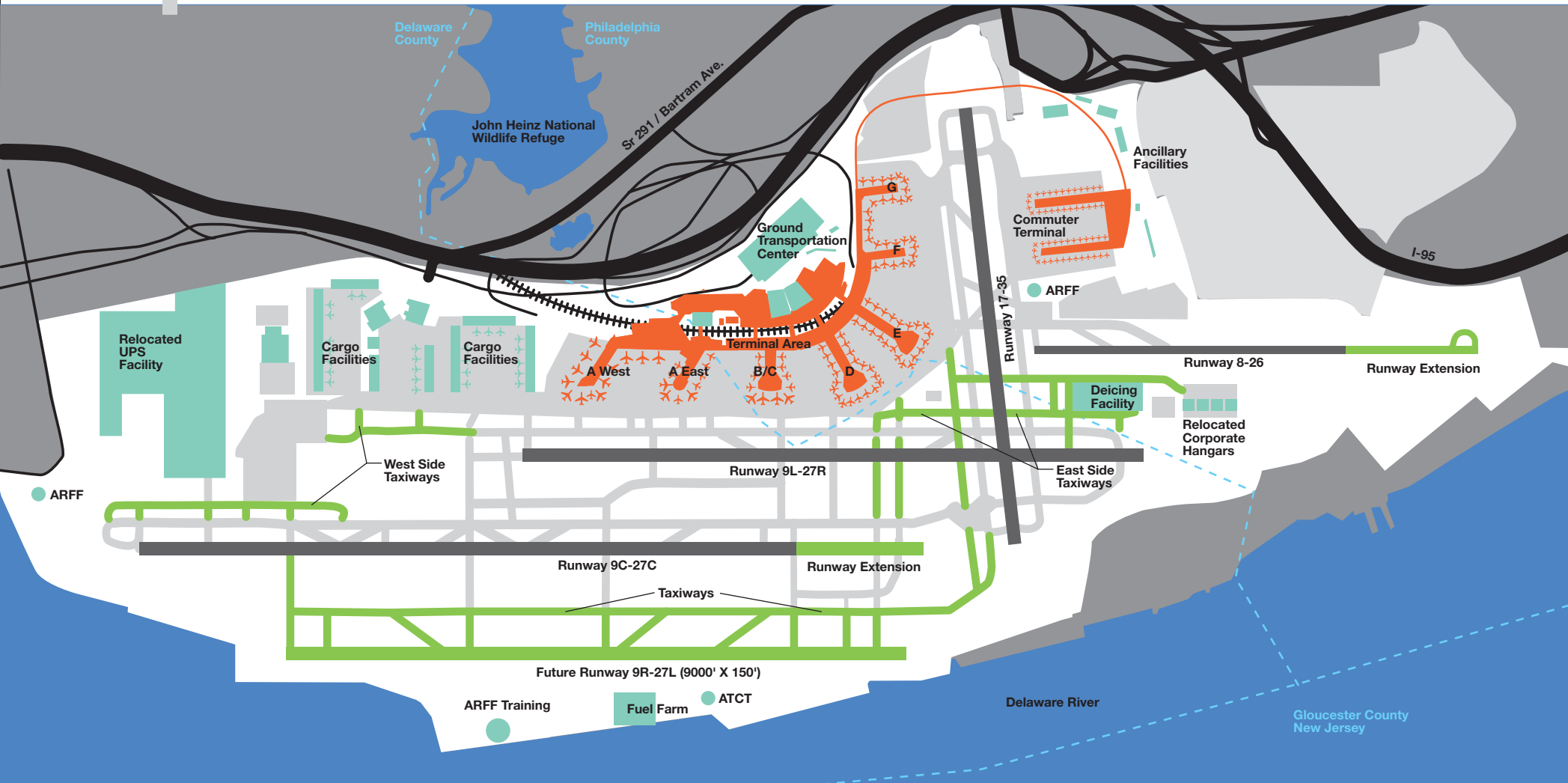
Terminal expansion required to accommodate the airfield capacity enhancements also needs to be phased accordingly. Similar to airfield operations, existing terminal/gate operations could not be compromised during project implementation. It was assumed that construction phasing solutions such as gate sharing, temporary airline relocations, maximizing gate utilization, etc., would allow for some reduction in gate availability without compromising operations or flight schedules.

Based on the third round of analysis, two concepts that were reasonable from an implementation and operational standpoint were recommended for further study. The FAA examined these in their Environmental Impact Statement (EIS). Of the two finalists, the City of Philadelphia Division of Aviation’s preferred concept maintained the existing airfield configuration and met the facility and demand requirements for long term capacity enhancement.

Master Plan Preliminary Alternatives Analysis Process



4 Preferred Alternative



4.1 Preferred Development Plan

The alternative recommended as the preferred development plan meets the facility demand requirements for the planning horizon as well as provides long-term (beyond 2020) opportunities for enhancement.

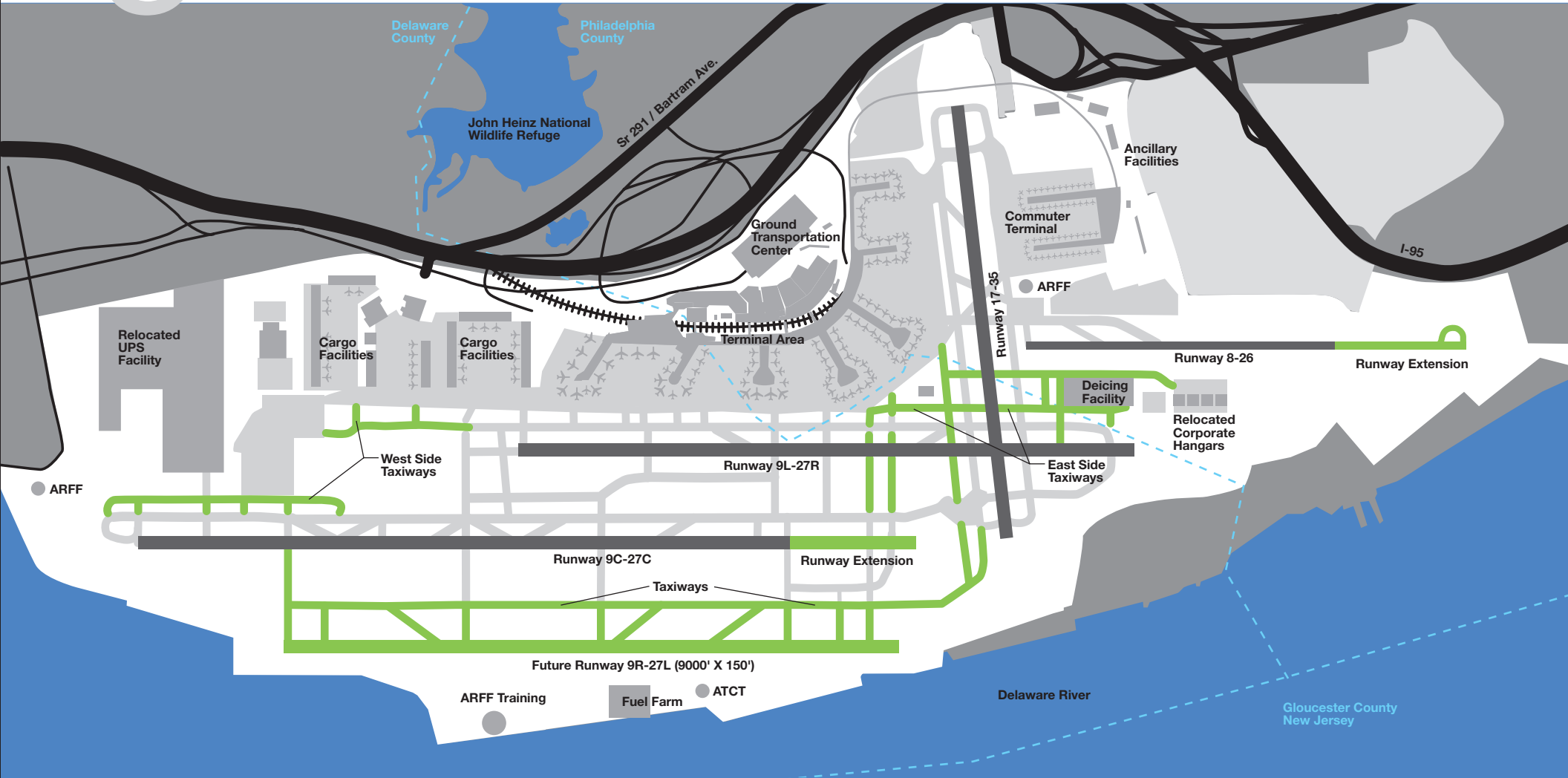
4.2 Property Acquisition & Mitigation

Several off-airport acquisitions are needed to implement the Preferred Alternative including United Parcel Service (UPS), Sunoco, Conrail's 60th Street Industrial Track, and the U.S. Army Corps of Engineers (USACE) confined dredge disposal facility. Coordination with the affected property owners is ongoing to develop plans that would be acceptable to offset the impacts to their facilities.



Property Acquisition

5 Airfield Elements



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| The following improvements were recommended for airfield development at PHL: | Construction of a new runway to support independent, simultaneous arrivals | Extensions of the existing runways to enhance operational utilization | A more efficient taxiway network | Sufficient instrumentation and all-weather approach lighting |
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3.1 Existing Airfield

The two primary runways at PHL are Runways 9L-27R and 9R-27L. They measure 9,500 feet and 10,506 feet in length, respectively. These two runways are separated by 1,400 feet. Runway 17-35 is 6,500 feet long and is used primarily by turbo-prop commuter and corporate general aviation aircraft. It is located on the airport's east side and intersects Runway 9L-27R. The last runway constructed at PHL was Runway 8-26, which measures 5,000 feet in length and is used exclusively for west-flow arrivals and east-flow departures. General aviation and light commuter aircraft primarily use this runway.

3.2 Airfield Facility Requirements

Given PHL's current level of delay and forecasted future demand, additional arrival and departure capacity is required. Improvements to the taxiway network are required to facilitate the movement of aircraft between the arrival and departure runways and terminal complex. Such improvements will enhance the travel experience for users and equip the Airport with the facilities necessary to accommodate anticipated demand for air travel in the region well into the future.

Airfield Development

The Preferred Airfield Alternative consists of four runway development projects aimed at maximizing each runway's utility. These include the construction of one new runway and the extension of three existing runways. The four runway projects are:

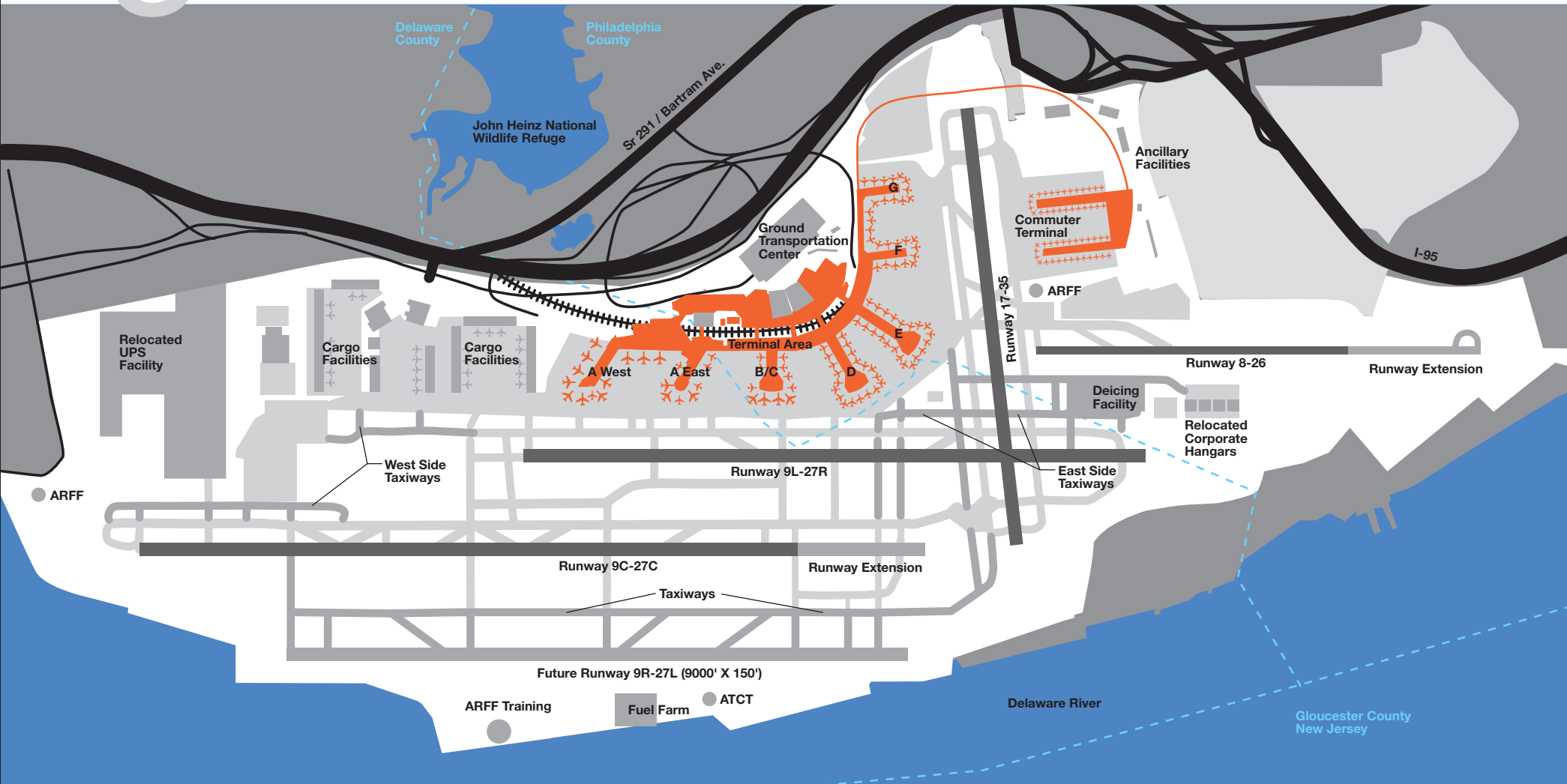
- Extend Runway 17-35
- Extend Runway 8-26
- Extend Runway 9R-27L (re-designated as Runway 9C-27C)
- Construct future Runway 9R-27L

Additionally, several taxiway improvements are recommended to provide access to new/extended runways, improve the efficiency of the existing taxiway network, and comply with recent modifications to regulations/federal guidance.



Given PHL's current level of delay and forecasted future demand, additional arrival and departure capacity is required.

6 Terminal Elements



As passenger volume increases, the need for additional terminal space grows. This space includes airline processor areas, holdrooms, baggage claim, public space, security, and concessions.

6.1 Existing Terminals

The 240-acre passenger terminal area lies at the northern portion of the Airport and is bordered to the north by I-95; to the east by Runway 17-35; to the south by Runway 9L-27R; and to the west by Cargo City and the International Plaza office complex. The passenger terminal facilities, rental car properties, Southeastern Pennsylvania Transportation Authority (SEPTA) Airport Line, parking garages, and economy parking are also located in this area.

The existing passenger terminal area contains 100 domestic gates and 20 international gates distributed throughout seven terminals. There is approximately 3,000,000 square feet of passenger terminal space available with terminals connected through second level pedestrian walkways.

6.2 Terminal Facility Requirements

Thirty airlines currently operate at PHL from seven different terminals. During the next 20 years passengers boarding departing flights at PHL will increase an average of 3.4 percent per year to 22,550,000 enplanements in 2020.

As passenger volume increases, the need for additional terminal space grows. This space includes airline processor areas, holdrooms, baggage claim, public space, security, and concessions. The developments

of Terminal F, Terminal A-West and the expansion of Concourse E have satisfied the Airports' immediate need for additional space. However, the capacity of those terminals will be insufficient to meet the growing demand. Similar to terminal space requirements, the existing 120 gates meet current demand but it is anticipated that more than 150 gates will be required to meet the 2020 demand.

6.3 Terminal Development

The Preferred Alternative provides over 150 gates at PHL positioned on nine concourses. Similar to the existing terminal landside configuration, the Preferred Alternative depicts an at-grade, horizontally separated arrangement for departing and arriving passengers. Departing passenger functions such as ticketing and departure lounges are located on the airside of the Departures Road. Arriving passenger functions, such as baggage claim and proposed ground transportation facilities, are located on the opposite side of the road and rail line. The two segments connect on the second level via pedestrian bridges.

The plan proposes connecting the concourses and expanding over the lower level ticketing functions to provide for increased security checkpoint queuing, concessions, and other amenities. In the early phases of the proposed terminal redevelopment, an expansion of Concourse E and new domestic Concourse G is proposed to facilitate projected increases in gate requirements. In addition, a new commuter satellite terminal, proposed east of Runway 17-35, allows for

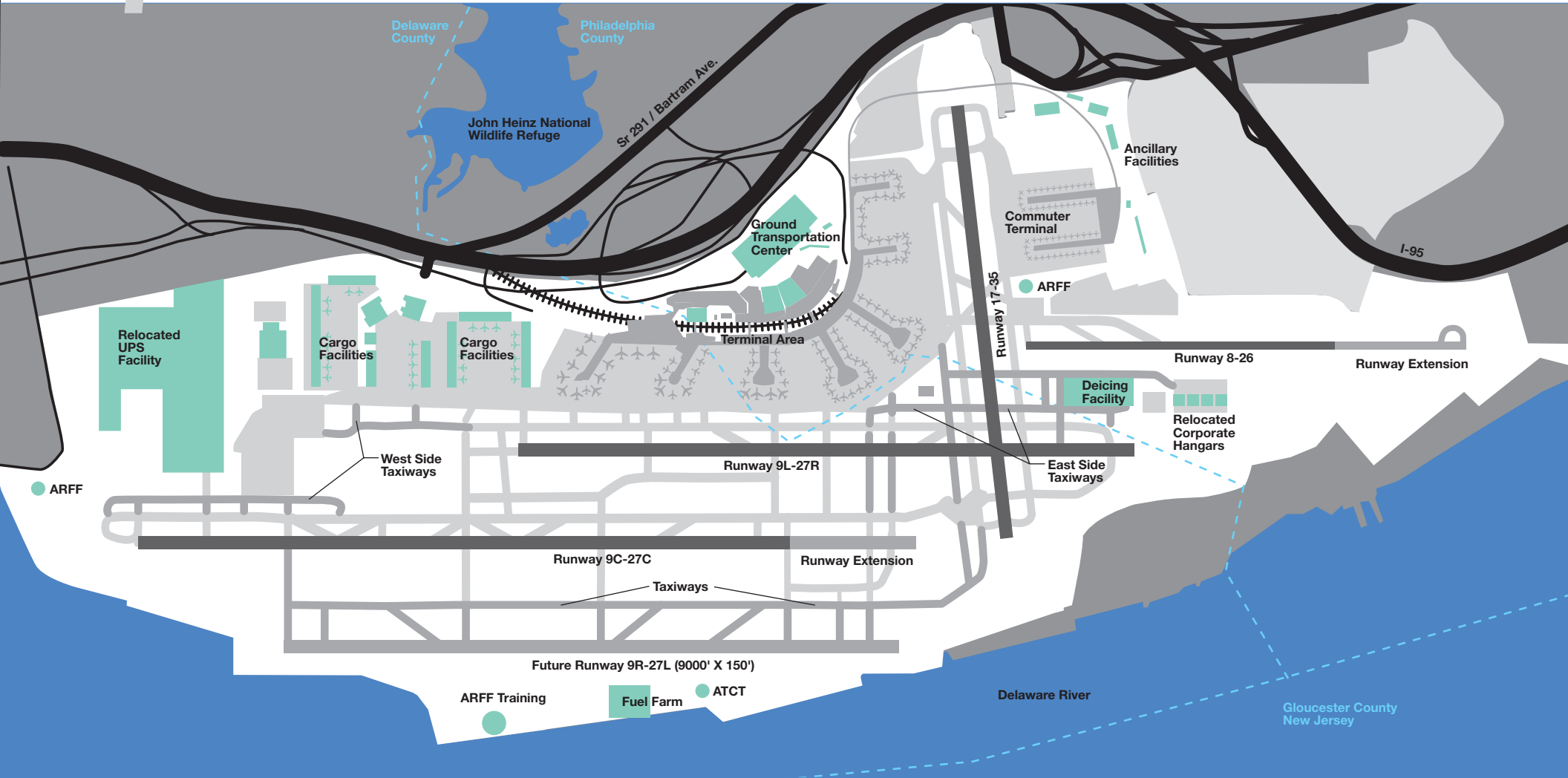
the development of a new domestic Concourse F in place of the existing commuter facility. Other proposed expansion projects include extending and widening Concourse D, consolidation of existing Concourses B and C and a further extension of Concourse E. An opportunity also exists for an additional Concourse H north of proposed Concourse G.



During the next 20 years passengers boarding departing flights at PHL will increase an average of:

+3.4% per year

7 Ancillary and Landside Planning



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| Key projects outlined for improving ancillary facilities to meet demand during the planning horizon include: | A new aircraft maintenance hangar and Ground Service Equipment (GSE) maintenance building | Added fuel farm storage for increased aviation operations | A new aircraft rescue and firefighting facility |
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7.1 Ancillary Facilities

Ancillary facilities include those that are owned and operated by the Division of Aviation such as airport maintenance facilities as well as those that are operated by tenants including fuel storage facilities, general aviation and cargo handling facilities. The preferred development plan provides a location for each of these facilities to continue to operate efficiently and safely.

The FAA air traffic control tower is also considered an ancillary support facility. While the Division of Aviation works with the FAA to identify a location agreeable to both parties, the FAA will ultimately conduct its own site selection study to finalize the location of the new airport traffic control tower and other features, as necessary.

7.2 Ground Transportation Requirements

Airport ground transportation facilities are intended to provide safe, quick, clear, and affordable access to the range of airport origins/destinations.

Improvements to the landside facilities and ground transportation system include:

- Roadway improvements on the Departures Roadway
- Improving terminal curbside capacity for arriving and departing passengers
- Second rental car facility or a consolidated rental car facility
- Additional parking facilities to accommodate future demand



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| An intermodal ground transportation center (GTC) | An additional deicing pad on the east side of the airfield | FAA Airport Traffic Control Tower (ATCT) relocation | A consolidated airport maintenance complex to house vehicle/equipment storage, maintenance support, personnel/technical services, and fleet maintenance |
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8 Project Implementation

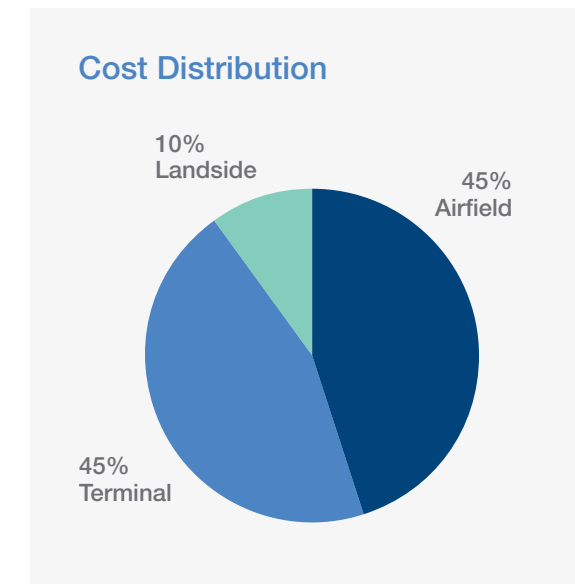
Implementing the Preferred Alternative requires a sequence of construction phasing, design, administrative actions, and funding commitments. A systematic approach is essential to initiating each project such that airport operations are not hindered.

8.1 Schedule

Implementation of the Preferred Alternative is planned to be phased over a 13-year period and project completion is timed to meet demand. The Airside Projects and the Terminal/Landside Projects are most sensitive in terms of scheduling, as many cannot begin without preceding actions being completed.

8.2 Cost Estimates

Cost estimates for the Preferred Alternative were developed based on a planning level of detail. Project soft costs include design, program/construction management, and administration. The total cost estimate for the Capital Improvement projects in the Master Plan is \$6.4 billion. These project costs will be distributed between the airfield (45%), terminal (45%), and landside (10%).



8.3 Funding

A Financial Plan has been developed to identify sources and uses of funds necessary to finance the projects recommended in the Master Plan. The financial plan distributes costs between airfield, terminal, and landside projects and aligns funding sources with development priorities. Funding would come from a number of sources including airport revenue bonds, passenger facility charges (PFCs), Airport Improvement Program (AIP) discretionary grants, third party funds, customer facility charges (CFCs), AIP entitlement grants, Pennsylvania Department of Transportation (PennDOT) grants, and Airport funds.



PHL

Philadelphia International Airport must expand to accommodate growing demands. The Master Plan presents a cohesive and comprehensive program of improvements to ensure the Airport continues to serve as an economic engine for the Greater Philadelphia region and maintains its high level of customer services and convenience well into the future.

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