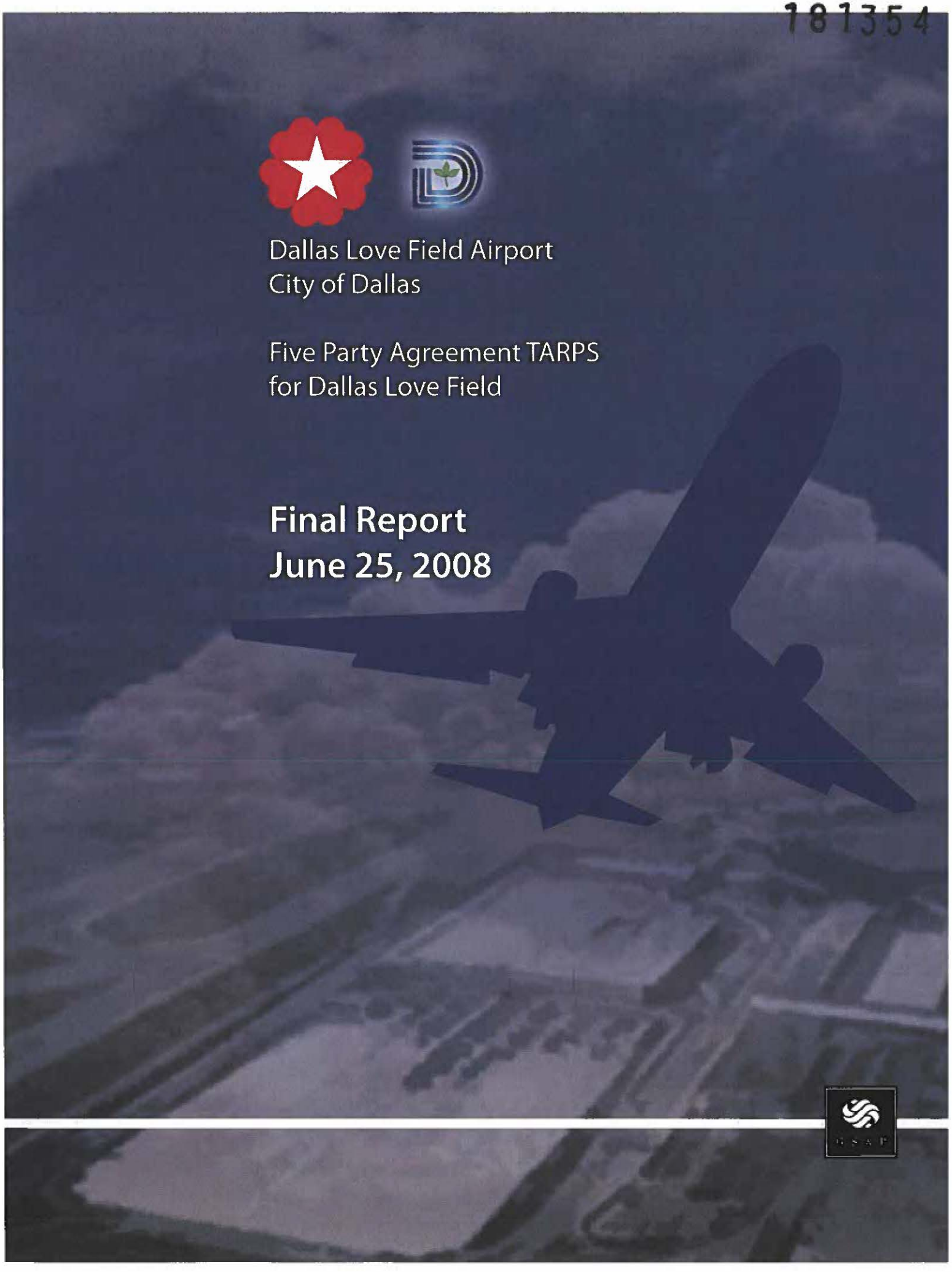
# Appendix I

Five Party Agreement TARPS for Dallas Love Field



Dallas Love Field Airport
City of Dallas

# Five Party Agreement TARPS for Dallas Love Field

## Final Report
## June 25, 2008

# Executive Summary

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## EXECUTIVE SUMMARY – LOVE FIELD TARPS

In July of 2004, the City of Dallas Department of Aviation contracted with Gresham, Smith and Partners (GS&P) to review the 2001 Airport Impact Analysis\Master Plan prepared by DMJM Aviation. The purpose of this review was to validate or recommend revisions to the terminal facility recommendations provided in the report, when this data was compared to post September 11, 2001 aircraft operations and passenger activity levels.

The Terminal Area Redevelopment Program Study (TARPS) and Revised Capital Improvements Program (C.I.P.) was subsequently developed to assist the City of Dallas in planning for future facility growth, and to determine the best practical use of Dallas Love Field within currently accepted Federal Aviation Administration (FAA) guidelines for facility development. The initial draft TARPS and Revised CIP report completed in April 2006 provided recommendations for facility improvements based on activity forecasts with the constraints on the terminal facility posed by the Wright and Shelby Amendments, along with the 2001 Airport Impact Analysis\Master Plan. However, the development of the Five Party Agreement (FPA) to repeal of the Wright Amendment led to the re-evaluation of the information and this report.

The proposed facility improvement scenarios presented within the Five Party Agreement TARPS and Revised C.I.P. report are based on both renovations of the existing terminal facilities and proposed replacement facilities. Both terminal facility scenarios are based on twenty (20) passenger gates that will support ten (10) aircraft operations each day. While the FPA TARPS and Revised CIP focuses on the impacts to the existing terminal facility, the scope included the following:

- Investigate environmental issues and documentation needed
- Verify traffic forecasts of 2001 Master Plan and 2006 Update
- Determine Facility Spatial, Landside Traffic and parking requirements
- Recommend Architectural Standards, Passenger Level of Service Standards and technical Design Standards
- Determine Layout of terminal and Support Facilities in Terminal Area
- Determine Conceptual Layout and potential cost ranges

The TARPS is presented in seven Chapters:

1. Inventory
2. Revised Activity Forecasts
3. Facility Requirements

4. Concept Development
5. Option C – Phasing, Implementation and Cost estimates
6. CAD Standards
7. Design Criteria Manual

This Executive Summary provides an overview of the highlights of the TARPS, including a recommended course of action.

## SECTION 1 - INVENTORY

There were several major factors that initially limited proposed facility growth and improvement recommendations at Dallas Love Field, including the 1979 Wright Amendment, and modified 1997 Shelby Amendment, restricting non-stop commercial air carrier service between the Airport and points beyond Texas and seven states and the 2001 Airport Impact Analysis\Master Plan, which provided a constrained demand analysis limiting operations to a total of 334,000 aircraft operations per year, thirty-two (32) maximum gates and a 6 to 7 minute ground activity delay allowed per aircraft operation.

The Five Party Agreement, signed by the cities of Dallas and Fort Worth, Dallas-Fort Worth International Airport, Southwest Airlines and American Airlines, includes the following highlights:

- Through ticketing and one-stop connecting service immediately offered to destinations within the fifty United States and the District of Columbia
- Commercial air carrier service restrictions eliminated by the year 2014.
- The number of available gates would be reduced from 32 to 20 gates total.
  - Southwest Airlines – 16 gates
  - American Airlines – 2 gates
  - Continental Airlines – 2 gates
- The City must develop the Love Field Modernization program and invest a minimum of $150 million and a maximum of $200 million.

The inventory of existing materials, historical data and reports presented in the original 2001 Airport Impact Analysis\Master Plan and the update, the "2006 Dallas Love Field Impact Analysis Update in the Absence of the Wright Amendment", provides a fairly accurate overview of the current terminal facility and constraints on the terminal facility. This information was utilized to form the foundation for the FPA TARPS and Revised C.I.P. activity forecast and programming requirements, facility utilization recommendations, revenue program recommendations, roadway and curbside system recommendations, air carrier gate utilization and commercial vehicle function and C.I.P. recommendations.

## SECTION 2 – REVISED ACTIVITY FORECASTS

The Forecast Chapter reviews prior activity forecasts for DAL, including the previous master plan study and the FAA's most recent *Terminal Area Forecast* (TAF). The passage of the FPA effectively creates a "gate constrained" environment for DAL and limits the airport's growth potential to that of increased equipment capacity and number of turns per gate. Therefore traditional growth forecasting becomes constrained to the limitations of the facility both current and future as gate expansion is prohibited beyond 20 gates by the FPA. A new 20-gate constrained forecast has been developed and is used as a basis for forecasting proposed flight operations and the formulization of the facility impacts and needs to accommodate these flight operations.

By limiting the number of gates available to carriers serving DAL while removing all flight restrictions on carriers, the airport has become gate constrained with the number of gates driving the maximum capacity of the airport. This constraint can only be modified by two variables:

- Equipment: All equipment used in the calculations of enplanements was based on a Boeing 737-700 with 137 seats. Although American and Continental currently operate 50 seat Regional Jets, the forecast assumes greater demand for larger aircraft when all restrictions phase out in 2014.
- Turns per Gate: Contemporary logic suggests that most air carriers cannot make turns much faster than 20-25 minutes ground times. Ten turns-per-gate is indicative of 20-25 minutes ground time and very much inline with current Southwest Airlines operations at DAL. Fifteen turns-per-gate is indicative of closer to 15 minutes ground time and while presented as a scenario, it is not achievable on a consistent basis.
- By adjusting equipment size and/or turns-per-gate, DAL can manipulate the potential enplanements and operations at the Airport. However, with larger equipment can come slower turn time and therefore, for planning purposes, the 10 Turn-Per-Gate Forecast is presented as the design level forecast for DAL while under the Five Party Agreement.

The following Tables presents a summary of the Forecasts, including the FAA's Terminal Area Forecasts (TAF) and the 10 Turns-Per-Gate projected scenarios for enplaned passengers and air carrier operations, with the following conclusions:

- Consultation with airlines concerning these peak hour passenger levels indicate that they are within a reasonable range Love Field during the forecast period.

- FAA TAF validates the TARPS 10-turn per gate projection for post-Wright Amendment conditions. However, it assumes on-going growth rate, which fails to recognize physical constraint of 20 gates and practical operating constraint of 10 turns per gate, as limiting factors on growth.
- TARPS projection for 10 turns in 2014 constitutes the design level of passenger enplanements.

**Table ES-1**

Design Level Enplanement Forecasts

| | Annual | Peak Month | Average Day | Peak Hour |
|---|---|---|---|---|
| **Historical** | | | | |
| 2006 | 3,439,050 | 311,032 | 10,033 | 1,164 |
| | | 9.04% | 31 Days | 11.60% |
| **TAF Projected** | | | | |
| 2011 | 4,275,602 | 386,691 | 12,474 | 1,447 |
| 2016 | 5,889,779 | 532,679 | 17,183 | 1,993 |
| 2021 | 7,967,466 | 720,588 | 23,245 | 2,696 |
| 2025 | 8,653,965 | 782,675 | 25,248 | 2,929 |
| **10-Turn Projected** | | | | |
| 2014 | 5,865,580 | 697,442 | 22,498 | 2,250 |
| Compounded TAF Annual Growth Rate | | | | |
| 2006-2025 | 4.39% | 4.39% | 4.39% | 4.39% |

Sources: City of Dallas, Department of Aviation (historical annual activity)
FAA Terminal Area Forecast (projected annual air carrier activity)
Ricondo & Associates, Inc. (peak month and peak hour activity)
Gresham, Smith and Partners (update and turn project activity)
Prepared by: Ricondo & Associates, Inc, updated by Gresham, Smith and Partners

**Table ES-2**

Design Level Air Carrier Operations Forecasts

| | Annual | Peak Month | Average Day | Peak Hour |
|---|---|---|---|---|
| **Historical** | | | | |
| 2006 | 86,887 | 7,798 | 252 | 26 |
| | | 9.0% | 31 Days | 10.50% |
| **Projected** | | | | |
| 2011 | 95,978 | 8,614 | 278 | 29 |
| 2016 | 122,394 | 10,985 | 354 | 37 |
| 2021 | 153,449 | 13,772 | 444 | 47 |
| 2025 | 162,569 | 14,590 | 471 | 49 |
| **10-Turn Projected** | | | | |
| 2014 | 135,400 | 12,152 | 392 | 43 |
| Compounded TAF Annual Growth Rate | | | | |
| 2006-2025 | 3.39% | 3.39% | 3.39% | 3.39% |

Sources: City of Dallas, Department of Aviation (historical annual activity)
FAA Terminal Area Forecast (projected annual air carrier activity)
Ricondo & Associates, Inc. (peak month and peak hour activity)
Gresham, Smith and Partners (update and turn project activity)
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## SECTION 3 – FACILITY REQUIREMENTS

The existing landside facilities for Dallas Love Field that have been analyzed as part of the Five Party Agreement TARPS and Revised C.I.P. are limited to the main passenger terminal facility, terminal curbside, roadways, parking structures and vehicle rental facilities. The landside facilities requirements for a 20 gate constrained facility with 10 and 15 turns per gate on average, were developed. Growth rate of passenger traffic for DAL is assumed minimal as the capacity of the facility is constrained by the 20 gate limit. This growth rate may pose a significant impact to the existing facilities today, specifically in Level of Service (LOS) offered, economy of scale of operations, and operational efficiencies.

Level of Service (LOS) is a concept that has been formalized into industry accepted standards utilized by industry professionals and airports worldwide. The defining component of LOS is based on existing system capacity and how well that facility can handle its current as well as increased capacities at different time periods.

Quality of LOS varies from facility to facility and at different times of the day. With mandated security requirements impacting LOS in almost every aspect of facility capacity, new standards and methods for measuring LOS are being developed. The International Air Transport Association (IATA) has established recommended standards and the following information and references to LOS are based on the IATA standard.

***Table ES-3***

| LOS | FLOWS | DELAYS | COMFORT |
|---|---|---|---|
| A – Excellent | Free | None | Excellent |
| B – High | Stable | Very Few | High |
| C – Good* | Stable | Acceptable | Good |
| D – Adequate* | Unstable | Acceptable for Short Periods | Adequate |
| E – Inadequate | Unstable | Unacceptable | Inadequate |
| F – Unacceptable | System Breakdown | Unacceptable | Unacceptable |

***Note:** Level C = standard minimum, Level D = peak periods

As a comparison, LOS **A** means that passengers would be able to move freely through the terminal facility without experiencing any delays in their movements and feel comfortable in doing so and would incur high cots. LOS **E** implies passenger movements would be congested, uncomfortable and delays would be recognized as unacceptable, however costs incurred would

be low. Level of Service C is recommended as the minimum design objective, as it denotes good service at a reasonable cost.

The DAL terminal facility requirements for the 20 gate constrained facility for 10 turns per gate were based on the inventory of existing spaces in the terminal facility and the revised forecasts. Through the use of empirical mathematical formulas for determining spatial requirements, combined with forecasted passenger loads for these critical years, new programs for facility space requirements have been created as depicted below. These proposed space requirements will result in a LOC C.

Table ES-4

**BASIS FOR 10-TURN SPACE PROGRAM CALCULATIONS**

**DALLAS LOVE FIELD**

**LANDSIDE TERMINAL BUILDING**

| Key | Type of space | | Units | Sq.Ft. |
|---|---|---|---|---|
| | **AIRLINE SPACE** | | | |
| | Airline Ticket Counter | | | |
| AS-2 | Ticket counter agent positions | | 15 | |
| AS-2 | Ticket counter ATMs | | 50 | |
| AS-2 | Curbside counter agent positions | | 12 | |
| AS-2 | Ticket counter (lineal feet) | | 187 | |
| AS-3 | Ticket counter (area) | | | 4,121 |
| AS-4 | Ticket counter queuing area | | | 19,051 |
| AS-5 | Ticket counter support office | | | 4,675 |
| AS-6 | Baggage Makeup | 2,250 | | 93,000 |
| | Baggage Claim | | | |
| AS-7 | Number of devices | | 5 | |
| AS-7a | Total lineal feet | | 729 | |
| AS-8 | Bag claim area | | | 12,500 |
| AS-8a | Baggage Claim Input | | | 10,400 |
| AS-9 | Holdrooms | | 25 | 57,097 |
| AS-10 | Clubrooms | | | 1,000 |
| AS-11 | Airline Offices - Landside Terminal | | | 15,178 |
| AS-11a | Airport Administration - Landside Terminal | | | 35,000 |
| AS-12 | Airlines Offices - Airside Terminal | | | 4,000 |
| AS-13 | Airline Operations | | | 60,000 |
| | Subtotal | | | 318,021 |
| | **CONCESSIONS** | | | |
| C-1 | Food & beverage | | | 53,518 |
| C-2 | Rental Car area | | | 3,400 |
| C-3 | News/sundries (5% of Gross Terminal Area) | | | 15,801 |
| | Subtotal | | | 72,719 |
| | **PUBLIC SPACE** | | | |
| PS-1 | Security Checkpoints | | 14 | 14,000 |
| PS-1a | TSA Administration | | | 4,000 |
| PS-2 | Ticket Lobby | | | 8,350 |
| PS-3 | Baggage Claim Lobby | | | 9,200 |
| PS-4 | Restrooms | | | 18,260 |
| PS-5 | Terminal Services | | | 15,600 |
| PS-6 | Concourse Circulation | | | 80,375 |
| PS-7 | Mechanical & Services | | | 60,753 |
| | Subtotal | | | 211,538 |
| | **Curbside and Parking** | | | |
| CS-1 | Curbside - Departures | | | 992 |
| CS-2 | Curbside - Arrivals | | | 1,043 |
| CS-3 | Curbside - Shuttle | | | 568 |
| P-1 | Employee Parking Spaces | | | 1,000 |
| | Subtotal | | | |
| | **TOTAL** | | | 600,276 |

## SECTION 4 – CONCEPT DEVELOPMENT

Multiple alternative concepts were developed for meeting the challenges of future passenger demand at DAL. Although a new terminal site southeast of the existing terminal was examined, space limitations and added cost of new infrastructure made the concept not feasible. Given the constraints of the existing terminal facilities area and the Five Party Agreement, three approaches for meeting the passenger activity levels of a 20 gate constrained concourse with 10 turns per gate were selected for refined analysis. These three concepts allows economic re-use of portions of existing facility, however all three concepts exceed the $200 million cap set forth in the FPA. A summary of each of the concepts is presented below:

### Concept A

- Renovate the existing West Concourse for Southwest Airlines - 16 gates.
- Renovate the existing North Concourse for American and Continental – 4 gates
- Enlarge concession space
- Ticketing and security screening enhancements
- Minimal enhancements to terminal building, bag claim, curbside and roadway
- Lowest cost option: $357 million

### Concept B

- Renovate and expand West Concourse for Southwest – 12 gates
- Demolish North and East Concourses and rebuild in new location for Southwest, American and Continental - 8 Gates
- Build New Ticket Hall
- Terminal Renovation
- Bag Claim and Curbside Expansion
- Curbside Expansion
- Highest cost option: $608 million

### Concept C

- Demolish East, North and West Concourses and replace with one double-loaded concourse - 20 gates
- New Ticket Hall
- Expanded Bag Claim and Curbside
- Terminal Renovation
- Layout efficiency contributes to passenger convenience and Level of Service "C".

- Cost: $571 million

A Concept Development Performance Matrix depicted below summarizes the results of the comparative analysis.

Table ES - 5

| *Performance Requirements* | Performance Target | Existing | Option A | Option B | Option C |
|---|---|---|---|---|---|
| **Terminal Facilities** | | | | | |
| Ticketing Counter Position | 15 | 14 | 14 | 14 | 14 |
| Self-Service Devices | 50 | 24 | 49 | 49 | 49 |
| Ticketing Curbside Positions | 12 | 10 | 10 | 10 | 12 |
| Bag Claim (area – sf) | 12,500 | 19,000 | 19,000 | 23,400 | 23,400 |
| Bag Claim (frontage – lf) | 729 | 450 | 450 | 1000 | 1000 |
| Passenger Security Checkpoints | 14 | 7 | 12 to 14 | 12 to 14 | 12 to 14 |
| EDS Screening Devices | 10 | 9 | 8 to 9 | 10 | 10 |
| Concessions | 72,719 | 20,400 | 29,100 | 73,000 | 75,000 |
| Gate Holdroom (avg. sf/gate) | 2,250 | 1,835 | 1,835 | 2,250 | 2,250 |
| **Landside Facilities** | | | | | |
| Arrivals Curb | 1,043 | 660 | 300 | 600 | 600 |
| Departures Curb | 992 | 530 | 400 | 600 | 600 |
| Commercial Curb | 568 | 100 | 600 | 1000 | 1000 |

- Concept A meets / exceeds the targets for 3 of 12 terminals requirements
- Concept B meets / exceeds the targets for 7 of 12 terminal requirements
- Concept C meets / exceeds the targets for 8 of 12 terminal requirements

The Evaluation Matrix summarized below supports the Concept C as the preferred concept.

**Table ES - 7**

| | Option | | |
|---|---|---|---|
| | **A** | **B** | **C** |
| **Implementation** | | | |
| Time To Implement | 5 | 2 | 3 |
| Operational Complexity | 2 | 1 | 4 |
| Customer Inconvenience | 2 | 1 | 4 |
| Cost of Overall Program | 5 | 2 | 3 |
| **Operations** | | | |
| Operational Efficiency | 4 | 3 | 5 |
| Estimated Relative O&M Cost | 2 | 4 | 5 |
| **Customer Convenience** | | | |
| Curbside | 2 | 4 | 4 |
| Ticketing | 2 | 4 | 4 |
| SSCP | 2 | 4 | 4 |
| Holdrooms | 2 | 5 | 5 |
| Concessions and Amenities | 2 | 5 | 5 |
| Baggage Claim | 4 | 4 | 4 |
| Walk Distance | 3 | 4 | 4 |
| | | | |
| **SUMMARY** | **37** | **43** | **54** |

**Score Range = 1 – 5** **1= least desirable** **5= most desirable**

## SECTION 5 – PHASING IMPLEMENTATION

Concept C

Option C was selected as the preferred expansion concept based on compliance with the Five Party Agreement and a 20 gate constrained concourse, facility requirements, and evaluation

criteria relative to implementation, operational efficiency and passenger Level of Service (LOS). Development of the reconfigured terminal is proposed to be constructed in seven (7) phases and the conceptual drawings for all seven development phases are included in Chapter 5. Detailed phasing will be developed during the Design phase of the project.

## SECTION 6 – CAD STANDARDS

CAD standard has been developed for the City of Dallas Love Field TARPS and Revised Capital Improvements Program to ensure consistency and uniformity. In compiling this standard, several existing standards were analyzed, to be used as a basis, including FAA-STD-002e, National Institute of Building Sciences National CAD Standard and the AIA Standard version 2. Revisions and modifications to these standards were made as required by updated software systems and DAL specific requirements. This standard is to be utilized for all projects started after the acceptance of this standard by the City of Dallas and Dallas Love Field Department of Aviation. The primary objectives of this manual are to:

- Establish consistent quality and uniformity in appearance of CAD products.
- Establish uniform procedures for document control.
- Establish a standard layering system.
- Establish file and sheet naming procedures.
-

Details of the CAD standards are included in Chapter 6

## SECTION 7 – FACILITY DESIGN STANDARDS

This Facility Design Standards has been developed for the FPA TARPS and Revised C.I.P. In compiling this guideline, several existing design and construction standards were reviewed, including other airports. These standards are to be utilized for all projects started after the acceptance of this standard by the City of Dallas and Dallas Love Field Department of Aviation. These criteria shall cover the existing terminal building, terminal building support spaces, parking structures and any new additions to these areas. The primary objectives of this manual are to:

- Establish consistent quality and uniformity in construction and design.
- Establish uniform overall visual continuity.
- Establish standard construction details.
- Establish standard construction materials.

**Building Code Analysis**

Dallas Love Field was originally constructed in 1956 and the terminal facility has experienced growth and expansion of the facilities to accommodate increased passenger demand and related support facilities over the past 50 years. As this growth continued, various Occupancy Use and Construction Type classifications were utilized for the design and construction of the facilities. The City of Dallas has adopted newer governing building codes with City of Dallas amendments to those codes since 1956, the 1997 Uniform Building Code (UBC) was in effect at the time the original draft TARPS was begun. During the development of the draft TARPS, the 2000 International Building Code (IBC) was adopted. Comparisons between the 1997 UBC and 2000 IBC have been made to quantify general code requirements and differences between the two. It is important to note that the 2003 International Existing Building Code with Dallas Amendments, allowed the terminal facility to be classified under the previous code, which at the time was the 1997 UBC. Effective January 1, 2006, the City of Dallas adopted the 2003 International Building Code (IBC) as their governing code for all new and renovated construction within the jurisdiction of the City.