San Antonio International Airport
Terminal A Assessment &
Cost Comparison of Terminal A and C
Order IOTA #51

Final Report
March 8 2017

RS&H
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San Antonio, TX 78232
EXECUTIVE SUMMARY

RS&H is pleased to submit this report *Terminal A Assessment and Cost Comparison of Terminal C* to the San Antonio Aviation Department. The goal of the report is to compare the costs of upgrading and maintaining Terminal A to the costs of building a new Terminal C.

**Terminal A Assessment**

The San Antonio International Airport Master Plan Vision 2050, completed in December 2010, identifies the Terminal A renovation and renewal as a key project to “create a memorable gateway to the region with enhanced customer service and the ability to accommodate future increases of passenger traffic.” In 2011 RS&H was retained to provide an assessment of the condition of Terminal A, which would then be used to provide a baseline to identify, evaluate, quantify, and estimate project costs for further enhancements/improvements to Terminal A. From that exercise, a list of priorities was developed and the top 16 were included in the Terminal A Renovations project, which started in 2012 and was largely completed in 2014 at a cost of approximately $35 million. This report is intended to capture that project scope and costs that accounted for the Terminal A Renovation project together with the items from the 2011 assessment report that did not become part of the project and any future identifiable need for Terminal A and provide a high level cost estimate that could identify the cost of maintaining Terminal A for the next 30 years.

There are approximately 27 repair and upgrade items remaining from the 2011 assessment report. Working with the staff at SAT, RS&H has identified approximately 40 additional upgrades that would allow Terminal A to serve the residents of San Antonio through the target date of 2050. These newly identified upgrades are largely required to handle the projected passenger levels through this target date and therefore were not identified in the 2011 assessment report, which focused on repairs and systems upgrades to maintain Terminal A near term.

The updated cost estimate for the items outlined in the 2011 report that were not addressed in Terminal A Renovations Project is approximately $29 million in 2017 dollars.

The cost of the additional upgrades to Terminal A is approximately $43 million. An escalation factor of 3% per year should be added until the date the upgrade is made.

Major enhancements identified in the Capital Improvement Plan (CIP) to the existing facilities required to maintain the existing passenger level of service are the Terminal A-B Connector and the Renovation and Expansion of FIS in Terminal A. These two projects are estimated to cost as much as $105 million.

Combining the total costs of upgrading Terminal A, enhancing Terminals A and B, and providing a nominal level of passenger service over the next 30 years is expected to be approximately $177 million.
The location and configuration of Terminal A make it impossible to expand the facility sufficiently to provide the required square footage to maintain a fiscally viable facility with an acceptable level of passenger service. There is simply not enough real estate available to do so. A cost should be added to account for lost revenue due to insufficient leasable space in Terminal A. An additional study would be required quantify that cost accurately.

**Terminal A Useful Life Expectancy**

Determining when an existing terminal will reach its full capacity is a comprehensive task involving computations based on forecasted aircraft operations, detailed flight schedules, number of forecasted enplanements, gate requirements, etc. Establishing gate demand is a critical step in this process, and is affected by several key factors, such as total passenger volume, the frequency of flights, the type of aircraft serving the airport, physical constraints that limit the size and types of aircraft that can park at each gate, operational parameters regarding the amount of time typically required for gating and towing operations, buffer time assumptions, etc.

Such a detailed analysis is outside the scope of this four week study. However, a high-level, preliminary analysis was conducted to determine when Terminal A could no longer meet passenger and tenant level of service requirements, and the airport would, therefore, require the construction of a new terminal facility (Terminal C). Utilizing information provided by the FAA’s *TAF and URS Corporation, 2016 Revised Working Paper A Forecast and Demand* as well as the *2010 Master Plan Document*, the RS&H Planning Team analyzed two potential Terminal A gate utilization scenarios: preferential gates and common-use gates.

**Scenario 1 – Preferential Gates**

Based on the latest available forecast information, a high-level, preliminary assessment concludes that the in this scenario the existing Terminal A will reach its maximum capacity in **2024-2025**.

The assumptions utilized were as follows:
- All existing gates will operate as preferential gates
- The Terminal A enhancements (described in detail in the RS&H analysis) will not include widening of existing concourses, as proposed by the 2010 masterplan, or any other major Terminal A functional area expansion

**Scenario 2 – Common-Use Gates**

A common-use gate operation scenario at Terminal A would result in an increased gate use rate, and therefore, would reduce overall gate demand. Common use will also support a critical strategic goal of Aviation for attracting new airline service. Specifically, common use will allow a new airline to quickly enter the market without all the constraints of the traditional IT connectivity delays. New entrants often seek to test a market without a lot of initial expense in proprietary terminal infrastructure improvement and common use provides this flexibility.
Based on preliminary calculations, the existing 16 or 17 preferential gate operation could be replaced by a 12-13 gate common use operation. Converting all of the existing 16 or 17 preferential gates to common use will cause a significant increase in gate capacity, thus prolonging the need for new terminal construction (Terminal C). In this scenario, the total number of existing common use gates at SAT (Terminal A plus Terminal B gates) would be 24 to 25 gates.

Strictly from a gate requirement perspective, with a 24 to 25 gate common use operation, the useful life of Terminal A could be extended to about 2032. Similar to the preferential gate scenario assessment, the high-level common use assessment was based on computing data and assumptions found in the 2010 Master Plan Document, and the recent FAA, TAF, and URS Corporation’s 2016 Revised Working Paper A Forecast and Demand. Additional detailed studies utilizing flight schedules may even be able to “stretch the rubber band”—strictly from a gate utilization perspective—to 2033-2034.

However, as previously stated, the existing Terminal A configuration will not be able to support the passenger load that the additional gate operations would generate without significant capital improvements, i.e. expansion of the overall terminal area. A more detailed study is required to determine which areas of the terminal will have to be expanded and by how many SF, and which functional improvements have to be implemented to bring the Terminal A customer experience to a level of service comparable to that of Terminal B.

In summary, strictly from a gate utilization perspective, the implementation of common use operations at all Terminal A and Terminal B gates would result in the extension of the useful life of the existing Terminal A by about 15-17 years. Nevertheless, the existing Terminal A facilities (processing functional components as well as amenities) are not adequate to accommodate forecasted growth for the same period of time. Attempting to maximize gate utilization at Terminal A will in all probability result in adverse impacts on passenger level of service as well as airline, TSA and CBP operations. There is also the probability that increased population in the Terminal A concourse would stress or even exceed the life safety components of the building. At some point in the near future—to be determined by a more detailed study—Terminal A will exceed its functional capacity and therefore its useful functional life.

**Terminal C**

As an alternative to the refurbishment and enhancement of the existing Terminal A, the RS&H Planning Team developed a high-level Terminal C/D feasibility study with the goal of optimizing the airfield configuration and functionality to support growing short- and long-term airport demand.

The Terminal C/D development analysis focused primarily on determining how the existing terminal apron area would accommodate gate demand through the 2050 planning period (Terminal C), as well as on the development of various terminal expansion alternatives beyond the 2050 planning period (Terminal D). In addition, the RS&H Planning Team also developed Terminal A replacement alternatives, and
addressed potential landside improvements. The alternatives considered modifications and impacts associated with the construction of a new terminal, such as airfield and terminal operations, entrance roadway, access to parking garages and CONRAC, apron modifications, interior terminal connections, and implementation and construction phasing.

During the planning effort, COSA Aviation and the RS&H Planning Team held a series of meetings / workshops in San Antonio or via web conferences. In order to aid the City of San Antonio in determining the next steps of terminal development at San Antonio International Airport and ensure that those actions maximize the current and future role of the Airport in the development of the City and region, COSA Aviation defined a comprehensive set of goals and objectives during these workshops. These goals and objectives guided the RS&H planning effort. They included:

- Optimizing terminal complex configuration and functionality to support 2050 SAT demand and beyond
- Enhancing passenger and tenant access to the Airport
- Maximizing safety, flexibility and operational efficiency
- Allowing for incremental implementation
- Providing opportunity to serve as a regional Gateway

The RS&H Planning Team developed a series of nine alternatives, which included airside, terminal and landside configurations, as well as phasing and future expansion options. Based on COSA Aviation’s comments and additional considerations, the Planning Team developed subsequently the Terminal C “Bookend” Concept, described in detail in the Task 5 section of this report.

Terminal C is designed to meet SAT’s 2050 demand. The proposed terminal layout locates Terminal C landside parallel to the existing roadway and adjacent and connected to the existing Terminal B. Terminal C will have 23 common use gates; three additional gates could be added when required. The existing Terminal A is replaced with a state-of-the art new terminal which will become an extension or Terminal B and will have eight new common use gates. All terminals will be connected by wide pre- and post-security corridors, which will allow passengers to circulate through the entire terminal development, therefore creating a unified terminal complex.

The Terminal C design allows for maximum flexibility. While the design aircraft I group II, every gate can accommodate Group IV aircraft. Moreover, every single gate is a swing gate, allowing for both international and domestic operations as needed. All proposed taxilanes are designed to accommodate Group IV aircraft.

Terminal C implementation includes the following phases:

**Phase 1A**
Construct Terminal C (Number of gates equivalent to existing Terminal A gates)

**Phase 1B**
Demolish south side of Terminal A concourse
Realign access roadway
Construct full Terminal C
Phase 2
Reconstruct Terminal A to meet latest requirements

Phase 3
Relocate cargo facilities
Construct Terminal D
Expand frontage roadways

The Planning Team also developed various Terminal D expansion alternatives for Phase 3—i.e. beyond the 2050 planning horizon.

Some of the benefits of the proposed Terminal C “Bookend” Concept are listed below:

- **Regional Socioeconomic Benefits**
  - Optimizes airfield and terminal configuration and functionality
  - Meets 2050 capacity requirements
  - Incorporates a sizeable Customs and Border protection facility (FIS)
  - Enhances passenger and tenant access to the Airport
  - Allows for several long-term expansion configurations of terminal and airfield
  - Provides opportunity to serve as a regional Gateway
  - Allows for future connectivity between the Airport and rail transit

- **Safety, Flexibility and Efficiency**
  - Maximizes airside and terminal operational efficiency
  - Common use terminal processors and common use gates
  - 100% gate flexibility
  - All Terminal C gates are swing gates
  - All taxilanes are Group IV
  - Incremental expansion capability

- **Customer Service**
  - Provides a high level of passenger service
  - Proposes centralized concessions opportunities
  - Offers various opportunities to incorporate the San Antonio experience
  - Allows easy access to rental car facilities, garage and future rail line

- **Financial Feasibility**
  - Capital investment requirement
  - Ability to develop incrementally as required by growing demand
  - Maximizes opportunities for concessions and other nonairline revenues

Consequently, the proposed Terminal C concept optimizes terminal capacity, safety, efficiency, and flexibility, and emphasizes convenience and customer satisfaction for Airport passengers, airlines, and tenants. The concept has the potential to create a “Legacy Terminal”—a memorable gateway to the region with enhanced customer service and the ability to accommodate future increases in passenger traffic.
**Terminal A Enhancement vs Terminal C Cost Comparison**

The cost comparison of the Terminal A enhancement alternative to the new Terminal C alternative consisted of assessing the location and configuration of future Terminal C for best immediate and long term use.

Considerations included:
- Available location
- Accommodating the optimal aircraft size
- Maximizing contact gates for flexibility, including swing gates
- Including an international arrivals facility
- Incorporating a Hold Baggage Screening system for all Terminals
- Centralized and convenient concessions in a mall type atmosphere
- Ability to maintain all building systems with proper mechanical, plumbing and IT facilities
- World-class terminal architecture
- Infrastructure enhancement to roadway, parking and utilities
- Minimizing impact to existing operations through phased construction

The team developed cost estimates for the following “Bookend” options:

**Option 1: $177,077,991**
- Sustain and enhance Terminal A
- Construct Terminal A - Terminal B Connector

**Option 2: $1,573,667,200**
- New Terminal C
- New Terminal A
- Airside and landside improvements

Option 2 cost includes the following components:
- Terminal A replacement – 8 gates: $250,800,000
- Terminal C – 26 gates: $1,102,400,000
- Landside improvements: $220,467,200
- Airside improvements: included in terminal costs

While the cost estimate developed for Option 1 is very detailed, the Option 2 cost is a high-level, order of magnitude capital development cost estimate. Option 2 preliminary cost estimates were based on conceptual drawings, and were developed to determine approximate development costs, calculated in 2017 dollars.

Capital costs for Option 2 are significantly higher than those for Option 1. However, the Terminal C Bookend alternative described in this report proposes a state-of-the-art, world class terminal development, offering a greatly enhanced passenger experience as compared to that afforded by the existing Terminal A. Moreover, the proposed Bookend concept ensures that construction of the new terminal(s) could be incrementally implemented as demand materializes, thus reducing initial capital costs.
Task 1

Revisit SAIA Terminal A - Phase 1 Assessment Report and update cost estimates using a high level of detail.

RS&H identified items in the 2011 SAIA Terminal A - Phase 1 Assessment Report, extracted the items that were not included in the Terminal A Renovation project, verified items that had been completed since, and updated the construction cost estimates to 2017 dollars.

A primary reason the complete Terminal A facility assessment was undertaken in 2011 was due to the deteriorated state of condition of many of the building systems. The assessment identified 128 different conditions that needed correction. The faulty conditions ranged from non-ADA compliant restroom fixtures to failure of HVAC air handler units. The project identified as Terminal A Renovations was started in January of 2012 and largely completed in April 2014 at a total cost of nearly $34 million.

<table>
<thead>
<tr>
<th>No.</th>
<th>Discipline</th>
<th>Description</th>
<th>Notes</th>
<th>2017 Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Plumbing</td>
<td>Provide additional grease interceptors and relocate existing grease interceptors for ease of cleaning and for aid in elimination odor issues in public spaces.</td>
<td>$187,000</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Electrical</td>
<td>Due to the age and current condition of the generator, replacement is recommended which would require separation of the loads by adding multiple output breakers on the generator, multiple transfer switches, and related panels in order to comply with the code. As part of this upgrade, the combination fire pump controller/automatic transfer switch would need to be added, additional feeders required, and an associated breaker on the generator. IMP New Generator has been installed by Maintenance no improvements to ATS</td>
<td>$136,000</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Electrical</td>
<td>If any major improvements are made to Terminal A that may increase the power demand, we would recommend a service upgrade including the CPS Energy transformers, service entrance, and new switchgear replacement. Otherwise, Terminal A power distribution would not be fully redundant if the demand load was in excess of 2500 kVA. IMP No Improvements as date</td>
<td>$597,550</td>
<td></td>
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<tr>
<td>10</td>
<td>ADA</td>
<td>Provide compliant passenger Loading/Unloading Zones on the arrival and departure levels of Terminal A.</td>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mechanical</td>
<td>Replace Damaged Ductwork and Ductwork and Hydronic piping Insulation. Complete replacement</td>
<td>$10,877,285</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing</td>
<td>Replace sanitary sewer piping with new piping for eliminating leaks and Replace existing Galvanized water supply piping with copper piping.</td>
<td>$341,464</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Electrical</td>
<td>Fire caulk all penetrations in electrical rooms. CMP Improvements have been made</td>
<td>$68,000</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Electrical</td>
<td>Closely examine all pylon fixtures along the aircraft parking apron for their structural integrity, and replace any non-working lamps and/or ballasts. CMP No improvement made to date</td>
<td>$481,000</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Electrical</td>
<td>Test all GFCI outlets and breakers and replace as needed. CMP No improvement made to date</td>
<td>$14,800</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Electrical</td>
<td>Install additional fixtures as required in electrical and mechanical rooms such that adequate lighting is provided. Some Improvements have been made</td>
<td>$453,400</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Architectural</td>
<td>Provide impact resistant serviceable finishes in the service corridor access from the exterior to Food and Concession service areas.</td>
<td>$40,000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Architectural</td>
<td>Investigate area of overhead concrete spalling to determine cause and correct in Gate Area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Architectural</td>
<td>Replace curtain walls at Gates and Concourse with higher performance system for improved lighting and heat gain control.</td>
<td>$3,630,000</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Architectural</td>
<td>Clean debris out of skylight panels in vaulted ceiling at Ticketing Concourse.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>ADA</td>
<td>Provide compliant height signage for the current accessible parking, and provide an appropriate number of van accessible spaces per requirements of TAS.</td>
<td>$62,000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>ADA</td>
<td>Update the mezzanine restrooms need to include an accessible stall in each (and an accessible stall in the men’s rooms)</td>
<td>$682,000</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ADA</td>
<td>Replace all knob type (which is non-compliant) door hardware where ever found throughout Terminal A</td>
<td>$590,000</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>ADA</td>
<td>Provide correct configuration of grab bars in locations where incorrect/existent grab bars currently exist. These are mostly found in the employee areas of the airlines and in the mezzanine.</td>
<td>$41,000</td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>Category</td>
<td>Description</td>
<td>Cost</td>
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<td>----</td>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>0</td>
<td></td>
<td></td>
<td>$324,000</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Civil</td>
<td>Further analyze existing RCP storm sewer system with respect to increased drainage in some areas and for advances in hydrological analysis.</td>
<td>$267,000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Building Envelope</td>
<td>Remove and replace deteriorated sealant joint materials. Short term, replace sealant joints above recent repairs that used the extruded silicone bridge sealant materials.</td>
<td>$2,000,000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Building Envelope</td>
<td>Correct finish and drainage concerns associated with the aluminum metal panel systems. Develop, evaluate, and prioritize options that may include: a. Remove and replace metal panel cladding system with a rain screen system. b. Clean and restore metal panels c. Clean and restore metal panels especially at public arrival and departure areas. d. Remove lower panels, repair gypsum wall board sheathing if necessary and install flashing and weeps to facilitate drainage.</td>
<td>$5,971,000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Building Envelope</td>
<td>At the precast masonry unit (PMA) cladding systems, install flashing and weeps to facilitate drainage. Clean corrosion, replace or treat steel that is corroding necessary.</td>
<td>$324,000</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Building Envelope</td>
<td>Remove and replace deteriorated expansion joint materials.</td>
<td>$47,000</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Building Envelope</td>
<td>After water intrusion issues are corrected with the metal wall cladding remove and replace damaged EIFS soffit areas. Apply a new finish coat for the entire soft.</td>
<td>$607,000</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Building Envelope</td>
<td>Above suspended ceiling soffit areas at concourse ‘in-fill’ areas. a. Assess need for insulation and add if necessary. b. Assess need for clips or other means to improve wind resistance. c. After plumbing drain issues are corrected, remove and replace damaged ceiling tile.</td>
<td>$710,000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Building Envelope</td>
<td>Clean and paint exposed trusses.</td>
<td>$100,000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Building Envelope</td>
<td>If the skylights are not removed during future renovations, replacements should be considered given the age and apparent condition of the skylights. If future renovations include skylights in the concourse areas of Terminal A, the former openings in the structural concrete roof slab should be used if at all possible.</td>
<td>$998,000</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Sanitary sewer is undersized-replace from G7-G15-R31 above</td>
<td></td>
<td>$452,003</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Replace Metal barrel roof</td>
<td></td>
<td>$8,500,000</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Insufficient emergency power</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>VAV boxes need replacement (in control replacement)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>AHU 8,10 need replacing</td>
<td></td>
<td>$685,000</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Piping to main from mechanical rooms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Plumbing chases with access for maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Replace Membrane roof that has damage from hailstorm</td>
<td></td>
<td>$900,000</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Ceiling inside barrel roof/replace metal panels</td>
<td></td>
<td>$2,685,837</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Replace E.J. covers at roadway</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Replace Glass at concourse with high performance system</td>
<td></td>
<td>$1,701,000</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Metal panels on exterior of building</td>
<td></td>
<td>$3,828,725</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Waterproofing at exterior CMU</td>
<td></td>
<td>$457,320</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Terminal A-B Connector</td>
<td></td>
<td>$85,082,781</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Terminal A Curbside Canopies</td>
<td></td>
<td>$53,177</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Terminal A Curbside Canopy (370 feet) inc sprinkler, lighting, drainage</td>
<td></td>
<td>$2,743,920</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Renovate and expand FIS</td>
<td></td>
<td>$19,685,383</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Room ID package</td>
<td></td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Fire Pump Replacement</td>
<td></td>
<td>$957,181</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>HVAC pneumatic controls not replaced in TA Renovations (20)</td>
<td></td>
<td>$638,000</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>HVAC additional capacity (hydronics) include distribution lines to/from CUP</td>
<td></td>
<td>$421,800</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Exterior sidewalk resurfacing</td>
<td></td>
<td>$957,181</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Add bridge extensions to Term A loading bridges to accommodate Group IV aircraft</td>
<td></td>
<td>$1,276,242</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Back up sewer lift station</td>
<td></td>
<td>$1,405,993</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Paging upgrade for Terminal A</td>
<td></td>
<td>$1,276,242</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Terminal A concourse column covers - add 3'-6&quot; to top</td>
<td></td>
<td>$1,050,000</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Lighting (LED) at glass ceilings in concourse</td>
<td></td>
<td>$63,812</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Stair door/hardware replacement</td>
<td></td>
<td>$42,541</td>
<td></td>
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<tr>
<td>38</td>
<td>Elevator and repurpose the RAC counter area in bag claim</td>
<td></td>
<td>$595,579</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Provide IT cutovers to decommission old IDF’s and re-cable to new IDF’s</td>
<td></td>
<td>$3,084,251</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Replace flat roof areas near curbfront</td>
<td></td>
<td>$212,707</td>
<td></td>
</tr>
</tbody>
</table>
The following spreadsheet identifies 70 items within Terminal A requiring replacement or upgrade. These items either did not make it into the 2012 project or have been added to the list since.

The costs in the above list were for the most part taken from high-level project descriptions and lack sufficient detail for a refined estimate. The costs include factors for contractor mark up and professional design fees.

The estimated costs for a Terminal C are addressed in the Task 8 section of this report.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Add roadway lane in order to accommodate ADA dropoff area at curb</td>
<td>$9,146,399</td>
</tr>
<tr>
<td>42</td>
<td>Add Lower level roadway fire sprinkler system</td>
<td>$191,436</td>
</tr>
<tr>
<td>43</td>
<td>Add wheelchair alcoves to concourse A</td>
<td>$790,000</td>
</tr>
<tr>
<td>44</td>
<td>Install a return air fan and controls for the TA Southwest Gates</td>
<td>$120,000</td>
</tr>
<tr>
<td>45</td>
<td>TA Trash Compactor</td>
<td>$130,000</td>
</tr>
<tr>
<td>46</td>
<td>Install Return Air Fan from A10-A14 and Gervins</td>
<td>$120,000</td>
</tr>
<tr>
<td>47</td>
<td>Replace TA Tug lane Drainage</td>
<td>$200,000</td>
</tr>
<tr>
<td>48</td>
<td>Muffin Monster for TA lift station and Vaughn pump replacement</td>
<td>$160,000</td>
</tr>
<tr>
<td>49</td>
<td>TA Basement Concourse Mainline Clean out Install</td>
<td>$60,000</td>
</tr>
<tr>
<td>50</td>
<td>TSA Break room in TA ADA Compliant</td>
<td>$35,000</td>
</tr>
<tr>
<td>51</td>
<td>TA Gate 30 Sewer Bypass</td>
<td>$40,000</td>
</tr>
<tr>
<td>52</td>
<td>Repairs to address odor issue in IT office located in TA</td>
<td>$58,000</td>
</tr>
<tr>
<td>53</td>
<td>Replace automatic doors at TA</td>
<td>$119,750</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>$177,077,991</strong></td>
</tr>
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</table>
Task 2

Review SAIA’s latest Master Plan Update for high level terminal planning and forecasts

The limited timeframe allotted to this study did not allow for in-depth forecast analysis or assessment of planning parameters. Such comprehensive analyses will be undertaken in greater detail by the next Master Plan Update project.

In order to determine 2050 high level forecasts as well as terminal planning parameters and requirements, the RS&H Planning Team utilized the following documents:

- FAA’s TAF and URS Corporation, 2016 Revised Working Paper A Forecast and Demand
- 2010 Master Plan Document

The FAA’s TAF and URS Corporation, 2016 Revised Working Paper A Forecast and Demand document provides forecast numbers up to 2035. Since this document includes the most recent forecast analysis, the RS&H Planning Team used this document as a basis to forecast, by means of extrapolation, SAT annual enplanements and number of passenger airline aircraft operations through 2050. Subsequently, the Planning Team utilized the 2010 Master Plan Document methodology to calculate gate requirements.

Utilizing a similar approach, the RS&H Planning Team calculated SAT 2050 parking requirements.

The results of these various computations are further discussed in Task 5 of this report.
Task 3

Investigate any possible upgrades to Terminal A that would allow it to align with the service level of Terminal B including continuing pursuit of Terminal A-B Connector, exterior building envelope repairs and upgrades and maximizing concessions with current constraints.

Terminal A opened for business in 1984 and is approaching its 34th year of service. There is presently no airside connection between Terminal A concourse and Terminal B concourse, keeping the post-security separated and not allowing for shared airside concessions or other amenities. Also there is limited room for much needed expansion at the TSA Passenger Security Checkpoint. A concept design for a Terminal A-B Connector project was submitted by RS&H in 2014 and would allow for such airside connection and the relocation of the TSA Passenger Checkpoint along with added concession and airline club space.

Exterior repairs and enhancements for Terminal A are itemized in a Chapter 1 and total nearly $25 million. These repairs and enhancements would address building envelope flaws including water infiltration issues presently apparent at Terminal A. It would be the intent of such enhancements to allow for a similar architectural finish to match Terminal B; a stone, metal panel system and high performance glass and aluminum curtainwall fenestration.

The curbside at Terminal A is very much undersized by today’s standards and is in much need of an update, however the space available for updating the curbside on both departures and arrivals levels is severely limited. Meeting current ADA codes is difficult in part due to the structural design of the roadway/sidewalk system. The curb and sidewalk structure is integral to the structural girder system of the roadway, which limits how improvements can be made in order to comply with ADA drop-off areas. One method would be to take portions of the inside lane and dedicating that lane to a drop-off area. The Terminal A Renovation project provided a design for the drop-off areas that would meet the requirements, but that portion of the project was delayed pending future alternate solutions. Currently the departures level does not have dedicated commercial and private vehicle lanes, thus adding to the efficiency and safety issues.

Given the location of the new CONRAC, there is insufficient space for the addition of multiple lanes of roadway. The addition of one lane is a very expensive option and the costs for that is included in Chapter 1.

There are many ways to improve Terminal A; projects that will improve the functionality of the building systems, such as the replacement of HVAC air-handling units and controls, replacement of plumbing piping and lighting upgrades as were part of Terminal A Renovations. In addition, there are multiple projects that are more noticeable to the traveling public, such as the upgrading of restrooms and the replacement of the wall, floor and ceiling finishes in the public areas of Terminal A. While each of these projects is worthwhile individually, the costs eventually add up.

What is harder to measure are the intangibles, such as the limited square footage in Terminal A to provide a level of passenger service expected at modern airport terminals.
The narrow concourse causes departing passengers to spill into concourse walkways, there is not enough storage space for the needs of concessionaires or the Airport Plumbing chases are inadequate to allow maintenance to building infrastructure. All of these are shortcomings of Terminal A, and there is not enough space to adequately provide solutions for these concerns.
Task 4

Look at any imminent planned upgrades to Terminal A and assess cost impact including Terminal A-B Connector costs

A request for qualifications for the Terminal A-B Connector project was solicited by the City of San Antonio in January 2016. At this time the project is on hold. Cost estimates of the project range from $56 million to $80 million, depending on the final program.

Aviation is currently looking to add two lanes to the TSA Passenger Security Checkpoint in order to alleviate current congestion at peek screening times throughout the day. This will be accomplished at the cost of displacing the Dunkin Donuts concession. Currently Aviation is looking for available space, with the option of new second level shell space a likely scenario. A preliminary cost estimate for relocating Dunkin Donuts and readying the space for the TSA is $2.78 million.

Other cost impacts affecting the continued utilization of Terminal A are identified for the repairs and upgrades stated in Chapter 1.
Task 5

Assess configuration of Terminal C geometry for best immediate and long term use. Considerations include maximizing contact gates, aircraft size and airline equipment.

As an alternative to the refurbishment and enhancement of the existing Terminal A—a structure that lacks expansion capacity and whose useful life is nearing its end—the RS&H Planning Team developed a high-level Terminal C/D feasibility study with the goal of optimizing the airfield configuration and functionality to support growing immediate and long-term airport demand.

Guided by SAT’s mission to innovatively manage the airport to provide a positive customer experience while supporting economic development, the RS&H Planning Team developed Terminal C/D alternatives that consider modifications and impacts associated with the construction of a new terminal such as airfield and terminal operations, entrance roadway, access to parking garages and CONRAC, apron modifications, interior terminal connections, as well as implementation/ construction phasing.

The Terminal C/D development analysis focused primarily on determining how the existing terminal apron area would accommodate gate demand through the 2050 planning period (Terminal C), as well as on the development of various terminal expansion alternatives beyond the 2050 planning period (Terminal D). In addition, the RS&H Planning Team also developed Terminal A replacement alternatives, and addressed potential landside improvements.

Exhibit #1 illustrates airport areas analyzed during this high-level study.
5.1 Planning Assumptions and Parameters

5.1.1 Planning Criteria

During the four-week planning effort, COSA Aviation and the RS&H Planning Team held a series of meetings/workshops in San Antonio or via web conferences. In order to aid the City of San Antonio in determining the next steps of terminal development at San Antonio International Airport and ensure that those actions maximize the current and future role of the Airport in the development of the City and region, COSA Aviation defined a comprehensive set of goals and objectives during these workshops. These goals and objectives guided the RS&H planning effort.

During the February 8-9 2017 SAT meetings as well as the February 20 2017 web conference, key decisions made with respect to planning goals, assumptions, criteria and parameters were as follows:

- **Key Planning / Design Goals**
  - Efficiency
  - Maximizing number of gates
  - Expansion capability
  - Modern design

- **Terminal C Considerations**
  - *Planning Horizon*
    - 2050
  - *Terminal Key Areas to be Optimized*
    - Capacity
    - Safety, efficiency, and flexibility
    - Honor airport design
  - *Functional Considerations*
    - Assume common use
    - Number of gates: at minimum an equivalent number of gates to that of existing Terminal A
    - 100% flexibility, with new gates capable of accommodating Group IV aircraft
    - Accommodate wide body aircraft at 1-2 gates
    - New FIS at Terminal C
    - All Terminal C gates should be swing gates
  - *Operational Considerations*
    - Safety
      - Jet blast initial thrust and power out
      - Minimize aircraft parking congestion at terminal corners ("pinch points")
      - Assess need for a Ramp Tower
    - Efficiency
      - Require dual Group IV aircraft in all areas
- Aircraft hold areas for delayed, mechanical, or other scheduling reason
- Taxilane flow

- **Terminal D**
  - Long term Terminal expansion could extend into cargo area

- **Terminal A**
  - Develop Terminal A replacement alternatives

- **Landside Improvements**
  - Mitigate existing traffic congestion
  - Expand parking structure
  - Allow for future high speed rail connection

- **Phasing / Implementation**

  *Phase 1A*
  Construct Terminal C (Number of gates equivalent to existing Terminal A gates)

  *Phase 1B*
  Demolish south side of Terminal A concourse
  Realign access roadway
  Construct full Terminal C

  *Phase 2*
  Reconstruct Terminal A to meet latest requirements

  *Phase 3*
  Relocate cargo facilities
  Construct Terminal D
  Expand frontage roadways

5.1.2 **Terminal C Gate Requirements**

In order to determine 2050 gate requirements, the Planning Team utilized the following forecast analysis documents:

- FAA's TAF and URS Corporation, 2016 *Revised Working Paper A Forecast and Demand*
- 2010 Master Plan Document

The FAA's TAF and URS Corporation, 2016 *Revised Working Paper A Forecast and Demand* document provides forecast numbers up to 2035. Since this document includes the most recent forecast analysis, the RS&H Planning Team used this document as a basis to forecast, by means of extrapolation, SAT annual enplanements and number of passenger airline aircraft operations through 2050. Subsequently, the Planning Team utilized the 2010 Master Plan Document methodology to calculate gate requirements.
As a result, based on this high-level analysis of the two documents, the RS&H Planning Team determined that the forecasted SAT 2050 gate requirements are:

- **Scenario 1**: 42 Preferential Gates
- **Scenario 2**: 36 Common Use Gates

Exhibit #2 illustrates forecast assumptions.

<table>
<thead>
<tr>
<th>Summary of Forecasts</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2050</th>
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<tr>
<td>Forecast Element</td>
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<td>111,381</td>
<td>123,463</td>
<td>137,360</td>
<td>137,360</td>
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<td>Air Taxi</td>
<td>23,178</td>
<td>24,086</td>
<td>24,949</td>
<td>26,225</td>
<td>27,567</td>
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<td>General Aviation</td>
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<td>49,843</td>
<td>50,093</td>
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<td>Military</td>
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<td>5,258</td>
<td>5,258</td>
<td>5,258</td>
<td>5,258</td>
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<td>Total</td>
<td>168,092</td>
<td>177,181</td>
<td>191,431</td>
<td>205,039</td>
<td>220,528</td>
<td>220,528</td>
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<td>Instrument Approaches</td>
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<td>17,973</td>
<td>19,588</td>
<td>21,119</td>
<td>22,866</td>
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<tr>
<td>Peaking Characteristics</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Peak Month</td>
<td>14,903</td>
<td>15,944</td>
<td>17,229</td>
<td>18,454</td>
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<td>514</td>
<td>556</td>
<td>595</td>
<td>640</td>
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</tr>
<tr>
<td>Peak Hour</td>
<td>-</td>
<td>44</td>
<td>48</td>
<td>51</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Based Aircraft</td>
<td>218</td>
<td>238</td>
<td>265</td>
<td>295</td>
<td>326</td>
<td>326</td>
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<tr>
<td>Passenger Enplanements</td>
<td>4,257,688</td>
<td>4,415,649</td>
<td>4,866,950</td>
<td>5,549,144</td>
<td>6,190,030</td>
<td>8,511,500</td>
</tr>
<tr>
<td>Total Number of Gates (Terminals A, B &amp; C)</td>
<td>24 Gates</td>
<td>25 Gates</td>
<td>26 Gates</td>
<td>29 Gates</td>
<td>36 Gates</td>
<td>42 Gates</td>
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<tr>
<td>Preferential</td>
<td>18 Gates</td>
<td>20 Gates</td>
<td>22 Gates</td>
<td>25 Gates</td>
<td>36 Gates</td>
<td>42 Gates</td>
</tr>
<tr>
<td>Common Use</td>
<td>26 Gates</td>
<td>29 Gates</td>
<td>36 Gates</td>
<td>42 Gates</td>
<td>60 Gates</td>
<td>74 Gates</td>
</tr>
</tbody>
</table>

Sources: FAA’s TAF and URS Corporation, 2016.

5.2 Concept Development

Based on the criteria described above, the RS&H Planning Team developed eight high-level alternatives, which were presented to COSA Aviation on February 17, 2017. Each of these concepts met established requirements, such as airside flexibility / Group IV aircraft capability at every new gate; Group V gates at strategic locations; terminal functional and operational requirements; landside and access roadway improvements; Terminal A replacement alternatives; maintaining Group V aircraft access to cargo area in first phase of terminal development; as well as expansion ability beyond the planning horizon. In addition, each concept ensured that gate capacity could be incrementally increased as demand materializes, while minimizing impacts on existing operations.

While all eight options met the basic criteria established by COSA Aviation, the alternatives proposed different geometric configurations, leading to various airside and terminal attributes.

5.2.1 Alternative #1

Terminal C consists of a headhouse expansion adjacent to existing Terminal B (which includes processing functions, holdrooms and other gate functions) as well as a pier-shaped concourse. A dual Group III taxilane system separates the cargo area from the new Terminal C. A Terminal A replacement
with a pier configuration is also proposed. Terminal D will consist of the expansion of the headhouse as well as either the addition of a long pier, or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxi lane.

Alternative #1 TC/D with Group III aircraft parking is illustrated by Exhibit #3.

Exhibit #3 - Alternative #1

Exhibit #4 illustrates Alternative #1 with Group IV aircraft parking at every new gate.

Future expansion options for Alternative #1 are illustrated by Exhibit #5 - Pier Expansion and Exhibit #6 - Satellite expansion.

Exhibit #4 - Group IV Aircraft Parking

Exhibit #5 – Terminal D Pier

Exhibit #6 – Terminal D Satellite
Pros
Terminal C
- Yields highest number of gates within existing apron limits
  - +/- 25 Group III Gates
- Maintains Group V access to Cargo area
- Lowest SF of new construction per gate
- Maintains Utility Plant in Phase 1
- Roadway improvements

Terminal D
- Allows for various future expansion configurations

Cons
Terminal C
- Headhouse depth: acceptable, but not ideal
- Dual Group III taxilanes between belly cargo and Terminal C pier
- Aircraft maneuvering challenges at several gates
- Limited RON opportunities within existing apron limits

5.2.2 Alternative #2

Alternative #2 / Terminal C / D configuration is illustrated by Exhibit #7. Terminal D will consist of the expansion of the headhouse as well as either the addition of a long pier, or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane. A second Terminal A replacement configuration is also proposed.

Exhibit #7 - Alternative #2

Pros
Terminal C
- Yields high number of gates within existing apron limits
  - +/- 23 Group III Gates
- Maintains Group V access to Cargo area
- Adequate Headhouse depth
- Maintains Utility plant in Phase 1
- Roadway improvements

Terminal D
- Allows for various future expansion configurations

Cons
Terminal C
- SF of new construction per gate higher than Alternative #1
- Dual Group III taxilanes between belly cargo and Terminal C pier
• Aircraft maneuvering challenges at a few gates
• No RON opportunities within existing apron limits

5.2.3 Alternative #3

This concept proposes a Terminal C configuration that includes a pier parallel to the existing Terminal B pier, as illustrated by Exhibit #8. A third Terminal A replacement configuration is also proposed.

Similar to the other concepts, Terminal D (expansion beyond the 2050 planning horizon) will consist of the expansion of the headhouse as well as either the addition of a long pier or the construction of a satellite which will be accessed from the headhouse via tunnel or a high bridge spanning over the taxi lane.

Exhibit #8 - Alternative #3

**Pros**

**Terminal C**
- Dual Group IV taxilanes between belly cargo and Terminal C pier
- Maintains Group V access to Cargo area
- Compact footprint, Shorter walking distances
- RON opportunities within existing apron limits
- Maintains Utility plant in Phase 1
- Roadway improvements

**Terminal D**
- Allows for various future expansion configurations

**Cons**

**Terminal C**
- Yields fewer number of gates within existing apron limits
  - +/-15 Group III Gates
- Aircraft maneuvering challenges at certain gates
5.2.4 Alternative #4

This concept proposes a Terminal C configuration that includes a pier parallel to the existing belly cargo. A dual Group IV taxilane system separates the cargo area from the new Terminal C.

Terminal D will consist of the expansion of the headhouse as well as either the addition of a long pier, or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane.

Alternative #4 / Terminal C / D configuration is illustrated by Exhibit #9.

Exhibit #9 - Alternative #4

**Pros**

**Terminal C**
- Dual Group IV taxilanes between belly cargo and Terminal C pier
- Compact footprint/ Shorter walking distances
- Low SF of new construction per gate
- Maintains Group V access to Cargo area
- Maintains Utility plant in Phase 1
- Roadway improvements

**Terminal D**
- Allows for various future expansion configurations

**Cons**

**Terminal C**
- Yields fewer number of gates within existing apron limits compared to Alternatives 1 & 2
  - +/- 16 Group III Gates
- Aircraft maneuvering challenges at certain gates
- No / Very limited RON opportunities
- No / Very limited RON opportunities
5.2.5 Alternative #5

This concept proposes a Terminal C configuration that affords an improved aircraft movement by minimizing number of “pinch points” at gates. The concept also allows for improved passenger level of service by providing centralized concession opportunities at strategic locations.

Terminal D will consist of the expansion of the headhouse as well as either the addition of a long pier, or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane.

Alternative #5 / Terminal C / D configuration is illustrated by Exhibit #10.

Exhibit #10 - Alternative #5

Pro's
Terminal C
• Dual Group IV taxilanes between belly cargo and Terminal C
• Maintains Group V access to Cargo area
• Compact terminal footprint
• Concessions opportunities at end gates
• Shorter walking distances
• Maintains Utility Plant in Phase 1
• Roadway improvements

Terminal D
• Allows for various future expansion configurations

Con's
Terminal C
• Yields fewer number of gates within existing apron limits compared to Alternatives 1 & 2
  • +/- 15 Group III Gates
• Very limited RON opportunities within existing apron limits
5.2.6 Alternative #6

This concept proposes a very different Terminal C configuration that affords extremely efficient aircraft maneuvering. The concept also allows for a superior level of customer satisfaction by providing the shortest walking distances from curb to gate as well as centralized concessions opportunities with maximum exposure to all departing passengers. In addition, this concept affords unique architectural design opportunities. However, this terminal configuration yields fewer gates than alternatives 1 and 2.

Alternative #6 Terminal C / D configuration is illustrated by Exhibit #11.

Terminal D will consist of the expansion of the headhouse as well as either the addition of a long pier or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane.

Pros
Terminal C
• Dual Group IV taxilanes between belly cargo and Terminal C
• Compact terminal footprint; Shortest walking distances
• Centralized concessions opportunities
• Unique architectural design opportunities
• Efficient aircraft maneuvering
• RON opportunities
• Maintains Group V access to Cargo area
• Maintains Utility Plant in Phase 1
• Roadway improvements

Terminal D
• Allows for various future expansion configurations

Cons
Terminal C
• Yields fewer number of gates within existing apron limits compared to Alternatives 1 & 2 (+/- 13 G III Gates)
5.2.7 Alternative #7

This concept proposes yet another Terminal C configuration that affords a very high level of passenger service as well as unique architectural design opportunities. However, this terminal configuration yields fewer gates than alternatives 1 and 2.

Alternative #7 - Terminal C configuration is illustrated by Exhibit #12.

Similar to other options, Terminal D will consist of the expansion of the headhouse as well as either the addition of a long pier, or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane.

**Pros**

**Terminal C**
- Dual Group IV taxilanes between belly cargo and Terminal C
- Efficient aircraft maneuvering
- Relatively compact footprint; Shorter walking distances
- Centralized concessions opportunities
- Unique architectural design opportunities
- Centralized concession opportunities
- RON opportunities within existing apron limits
- Maintains Group V access to Hangars
- Maintains Utility Plant in Phase 1
- Roadway improvements

**Terminal D**
- Allows for various future expansion configurations

**Cons**

**Terminal C**
- Yields fewer number of gates within existing apron limits compared to Alternatives 1&2 (+/- 17 G III Gates)
5.2.8 Alternative #8

This concept proposes yet another Terminal C configuration that affords a very high level of passenger service as well as unique architectural design opportunities. However, this terminal configuration yields fewer gates than alternatives 1 and 2.

Alternative #8 - Terminal C configuration is illustrated by Exhibit #13.

Terminal D will consist of the expansion of the headhouse as well as either the addition of a long pier, or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane.

**Pros**

**Terminal C**
- Dual Group IV taxilanes between belly cargo and Terminal C
- Efficient aircraft maneuvering
- Compact footprint
- Centralized concessions opportunities / exposure to all gates
- Unique architectural design opportunities
- Most RON opportunities
- Maintains Group V access to Hangars
- Maintains Utility Plant in Phase 1
- Roadway improvements

**Terminal D**
- Allows for various future expansion configurations

**Cons**

**Terminal C**
- Yields fewer number of gates within existing apron limits compared to Alternatives 1&2 (+/- 13 G III Gates)

A summary of the eight alternatives presented to COSA Aviation on February 17 2017 is illustrated by Exhibit #14.
5.2.9 Alternative #9

As directed by COSA Aviation, the proposed Alternative #9 Terminal C configuration combines the strengths of Alternatives #3 and #4, while maximizing airside flexibility and efficiency as well as customer service.

Alternative #9 - Terminal C configuration is illustrated by Exhibit #15.

Alternative #9 RON opportunities are depicted by Exhibit #16, while Group IV aircraft parking at all gates is illustrated by Exhibit #17.
Exhibit #16 - RON Opportunities

Exhibit #17 - Group IV Aircraft Parking

Exhibit #19 - TD Satellite – Group III Gates

Exhibit #20 - TD Satellite – Group IV Gates

Exhibit #18 - Alternative #9 – Phase 2B / Double CBP Capacity
Terminal D expansion will consist of the expansion of the headhouse as well as either the addition of a long pier (Exhibits #21 and #22), or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane. (Exhibits #19 and #20)

Exhibit #21 - TD Pier – Group III Gates
Exhibit #22 - TD Pier – Group IV Gates

In addition to the construction of Terminal C and a potential future Terminal D (which will expand into the present cargo area), Alternative #9 also proposes the demolition of the existing Terminal A and its replacement with a new, state-of-the art terminal structure—as depicted by Exhibit #18. The Terminal A replacement will become an extension of the existing Terminal B, with expanded processing areas for both departures and arrivals passengers, as well as with an seven new additional Group III gates (each new gate being capable of accommodating Group IV aircraft when necessary). These new gates will be linked with the existing Terminal B gates via an internal airside connector.

Alternative #9 Phasing Diagrams

The RS&H Planning Team prepared also Alternative #9 high level phasing / implementation plans, which are summarized by Exhibit #23.

Terminal C Phasing

Future Expansion Alternatives

Exhibit #23 - Terminal C/D High Level Phasing
Alternative #9 Terminal Layouts / Functional Diagrams

In addition, the RS&H Planning Team presented to COSA Aviation Terminal C functional diagrams, as illustrated by Exhibit #24.

Exhibit #23 - Terminal Functional Diagrams

5.3 Terminal C “Bookend” Concept

5.3.1 Terminal C “Bookend” Concept Description

Based on these additional considerations, the RS&H Planning Team developed the Terminal C “Bookend” Concept, which is illustrated by Exhibit #25.

Exhibit #25 - Terminal C “Bookend” Concept
Terminal C configuration consists of an inverted T shape, with passenger processing functions located landside, and gates displayed around three concourses—a dual loaded concourse centrally located, and two single loaded concourses wrapping around the headhouse. A dual Group IV taxilane system separates the cargo area from the new Terminal C.

Below are some of the concept features and attributes:

- **Airside**
  - Design aircraft Group III
  - All taxilanes Group IV
  - Each gate capable to accommodate Group IV aircraft (illustrated by Exhibit #26)
  - 2+ gates capable to accommodate Group V aircraft
  - Efficient aircraft maneuvering
    - Every aircraft has two ways of maneuvering in and out at each gate
    - Minimized “pinch point” congestion
  - Total number of gates:
    - 38 Group III common use gates
      - Terminal A 8 Group III gates (or 6 Group IV gates)
      - Terminal B 7 gates
      - Terminal C 23 Group III gates (illustrated by Exhibit #25) or 18 Group IV gates (illustrated by Exhibit #26)
    - Exceeds number of gate requirements for 2050 (Requirements are: 36 common use gates needed in 2050 per Exhibit #2 discussed earlier)
  - Ramp control tower strategically located
  - “Tail of stand” service road at all gates
  - Group V aircraft access to cargo area maintained
  - RON opportunities
    - 4+ RONs south of Terminal A
    - 4+ RONs between Terminal B and Terminal C
    - +/- 10 RONs adjacent to existing belly cargo, as depicted in Exhibit #16 (i.e. in lieu of dual Group IV taxilanes between belly cargo and Terminal C Pier, consider allowing single Group V taxilane during periods of time when RON need is high)
  - Proposed airside layout allows for various future expansion configurations (Exhibits #27 through #31)
Exhibit #26 - Terminal C “Bookend” Concept – Group IV Aircraft Parking -18 Gates

- Terminal
  - Terminal C
    - Efficient, flexible, common use terminal
    - Terminal configuration allows for the development of a world-class, state-of-the-art terminal
    - Adequate dimensioning of all functional components
    - Secure and non-secure connection to Terminal B
      - Non-secure Ticket Lobby and Meeter Greeter Hall connection (shown by Exhibit #32 and #33)
      - Post-security connection between Terminal B and Terminal C gates (shown by Exhibit #32)
    - Customs and Border protection facility (FIS) sized for 3,000 passengers per hour
    - International and Domestic flexibility
      - Every gate is a swing gate (allows for international as well as domestic operations)
      - “Gateway” architectural design opportunities
    - Proposed terminal footprint allows for various future expansion configurations (Exhibits #26 through #30)
  - Terminal A
    - Efficient, flexible, Common use domestic terminal
    - Adequate dimensioning of all functional components
    - Becomes an extension of existing terminal B
    - 8 Group III common use gates
    - 4+ RONs
- Centralized “Shopping Mall” opportunities due to footprint configuration

- **Landside**
  - Connector to CONRAC, Garage and future Rail System
  - Garage expansion
  - Roadway improvements
    - Access roadway realigned/ Existing peak hour traffic congestion mitigated
    - Additional lane at departures roadway to further decrease congestion during peak hour
    - Roadway and curb frontage expansion
  - Utility plant relocated

### 5.3.2 Terminal Future Expansion - Terminal D

When addressing the long term future expansion of the terminal complex, the RS&H Planning Team took a “big picture,” long-range planning approach.

If at some point in the future increased passenger / airline operations demand as well as regional socioeconomic conditions would require a significant growth of the terminal development at the SAT site, the existing cargo area could be relocated to a different site, thus allowing for the terminal complex to expand towards west.

In this scenario, the proposed “Bookend” concept allows for a variety of future expansion configurations.

As a first step, a relatively small modification to the cargo area (demolition of one existing hangar structure) would allow for an addition of 3 gates to Terminal C, thus bringing the total number of Terminal C gates to 26 Group III gates, as depicted by Exhibit #27. Each of these gates is designed to accommodate Group IV aircraft when required.

Exhibit #27 - Terminal C – 26 Group III Gates

Two potential terminal expansions into the existing cargo area are illustrated by Exhibits #28 and #29.
Terminal D will consist of the expansion of the Terminal C headhouse as well as either the addition of a long pier (Exhibit #29) or the construction of a satellite which will be accessed from the headhouse via a tunnel or a high bridge spanning over the taxilane (Exhibit #28).

Exhibit #28 - Terminal D - Satellite - 64 Gates  
Exhibit #29 – Terminal D – Pier – 70 Gates

Other potential future expansion configurations include the expansion of Terminal C headhouse towards south, wrapped around the expanded roadway, as well as the addition of a long pier parallel to the expanded headhouse, as illustrated diagrammatically by Exhibit #30.

A similar approach could be used for the further expansion of the Satellite option, illustrated diagrammatically by Exhibit #31.

Exhibit #30 - Terminal D Pier+: 80+ Gates  
Exhibit #31 - Terminal D Satellite+: 80+ Gates

These future expansion diagrams demonstrate that the addition of the west side airport real estate area to the terminal complex would allow for the development of a world-class terminal that will consist of a total of 80+ gates.
Task 6

Consider all apparent facility modifications and impacts associated with a new Terminal C including but not limited to entrance roadway, access to parking garages and CONRAC, apron modifications, interior terminal connections.

This report highlights a high-level approach to airside and landside improvements. A more detailed analysis is beyond the scope of this four-week feasibility planning study, and should be undertaken during the next Master Plan project phase.

- **6.1 Airside Impacts**

The airside impacts have been described in the previous section, and include upgrades to several existing taxilanes and taxiways, and construction of new taxilanes, taxiway cuts, service roads, etc.

The landside impacts include garage and at-grade parking considerations, connectors to the garage, CONRAC and rail system, roadway access to garage and CONRAC, as well as roadway system improvements.

- **6.2 Parking Impacts**

In order to determine 2050 garage requirements, the RS&H Planning Team utilized the same forecast analysis documents employed when computing the 2050 gate requirements:

  - FAA’s TAF and URS Corporation, 2016 Revised Working Paper A Forecast and Demand
  - 2010 Master Plan Document

As previously stated, the FAA’s TAF and URS Corporation, 2016 Revised Working Paper A Forecast and Demand document provides forecast numbers up to 2035. Since this document includes the most recent forecast analysis, the RS&H Planning Team used this document as a basis to forecast, by means of extrapolation, SAT annual enplanements and number of passenger airline aircraft operations through 2050. Subsequently, the Planning Team utilized the 2010 Master Plan Document methodology to calculate parking space requirements.

As a result, based on this high-level analysis of the two documents, the RS&H Planning Team determined that the forecasted SAT 2050 parking requirements total 11,700 parking spaces. The existing garage and at grade parking consist of 8,940 parking spaces. Therefore, an additional 2,760 parking spaces need to be constructed to meet 2050 parking requirements. Additional studies—not included in the scope of work of this high-level study—will be required to develop garage expansion alternatives, improved roadway access to garage and CONRAC, etc.

- **6.3 Roadway System Impacts**

Roadway improvements proposed by the “Bookend” Concept include:
- Improved roadway access to terminal complex, which provides a wider roadway radius and thus minimizes congestion at peak hour times
- Additional lane at departures roadway to further decrease congestion during peak hour at departures curb frontage

The last phase of the Terminal C development proposes the expansion of the departures and arrivals frontage roadways, resulting in a significant increase in curb frontage and an improved passenger level of service. This will require further study for future interface of exit roadways with the existing city roadway system.

As previously mentioned, additional studies—not included in the scope of work of this high-level study—will be required to develop detailed improvements roadway geometry and design, utility requirements, demolition and relocation of the existing utility plant, etc.

- A connector to CONRAC and parking structure is centrally located at the front of Terminal C
  - The same connector could link the terminal to the future rail system
- Roadway improvements proposed by the “Bookend” Concept include:
  - Improved roadway access to terminal complex
  - Additional lane at departures roadway
  - Expansion of the departures and arrivals frontage roadways during the last phase of the Terminal C development
  - Improved roadway access and exit to / from garage and CONRAC
- The parking structure will be expanded by 2,760 spaces to meet 2050 demand
- Cargo area west and south of Terminal C will continue to be accessed via a Group V taxilane
- Utility plant needs to be relocated

6.3 Terminal Impacts

With the purpose of assessing all potential impacts on the Terminal C development, as well as with the purpose of validating that the proposed “Bookend” Terminal C concept is adequately configured and sized in order to be developed into a world class terminal, the RS&H Planning Team prepared high-level terminal functional diagrams, which are illustrated by Exhibits #32, #33 and #34. As demonstrated by the exhibits and associated narrative, the proposed terminal is a highly functional, flexible, common-use facility.

6.3.1 Departures Level

As depicted by Exhibit #32, passengers will arrive at Terminal C departures level via a widened elevated roadway, and will be dropped-off at an adequately sized departures curb. Passengers driving to the airport and parking their cars in the garage or dropping-off cars at CONRAC will access the terminal via an elevated connector, and will descend to processing areas by means of escalators, elevators and stairs located adjacent to the connector, at the front of the new terminal. The same connector would link the terminal to the future rail system.
Passengers entering the generously sized Check-in Lobby will check-in and check their bags either at e-kiosks or at rectilinearly arranged check-in counters. They will then proceed to a centralized security checkpoint, which is sized with the goal to make this process as comfortable and efficient as possible.

The linear check-in counters are backed by ATOs (airline ticket offices). Several pre-security concessions are located throughout the Check-in Lobby. A generous pre-security connection links Terminal C’s Check-in Lobby with that of the existing Terminal B.

The proposed functional layout allows for efficient passenger processing and affords an optimal passenger experience, by providing open sight lines, intuitive wayfinding, ample queuing areas, and clear and efficient passenger flows.

Exhibit #32 - Departures Level

After being processed through the security checkpoint area, passengers will enter a state-of-the-art “shopping mall” and marketplace area, consisting of a large assortment of food, beverage and retail concessions. The “shopping mall” is strategically located in order to allow maximum concession exposure to all en计划ng passengers—which will result in increased concession revenues.

Two consolidated airline lounges (first class and business class) are conveniently located adjacent to the shopping mall. The proposed post-security terminal configuration includes three gate concourses: a pier/ double loaded gate concourse in the center, and two single-loaded gate concourses towards east and west. Adequately sized holdrooms serve all gates, and additional
concessions as well as restrooms and other support spaces are placed throughout the three concourse areas. With the goal of further increasing customer satisfaction, the north end of the double loaded concourse is slightly enlarged, to allow for additional concessions adjacent to the far end gates.

The proposed terminal concept affords maximum operational flexibility. Every gate is a swing gate, allowing for both international as well as domestic operations. Each pair of gates is provided with a vertical circulation node (either a ramp system or a set of escalators, elevator plus stair) which links the departures level to the sterile corridor located at a mezzanine level.

All departures will evidently occur at the departures level. Arrivals will occur as follows:

International arriving passengers will be directed from the aircraft bridges to the sterile corridor located at the mezzanine level, while domestic arriving passengers will go to the domestic bag claim area via departures concourses and circulation nodes leading to the arrivals level. (These vertical circulation nodes are depicted by blue circles on the attached functional diagrams.)

The new gates and RONs are controlled by a ramp control tower strategically located over the main concourse.

6.3.2 Arrivals Level

As depicted by Exhibit #33, the arrivals passenger processing area is divided into two broad sections: domestic arrivals and international arrivals.

The domestic arrivals area includes the domestic Baggage Claim Hall, with seven baggage carousels sized for Group IV aircraft, as well as a Meeter Greeter Hall.

The international arrivals area consists of a FIS facility sized to support 3,000 passengers per hour. An international Baggage Claim Hall is located at the west side of the terminal and comprises two large carousels sized for Group V aircraft arrivals, and four carousels sized for group IV aircraft. A generously sized Meeter Greeter area allows for a large number of friends and family members to congregate while waiting for passenger arrivals. Several concessions are provided for this often neglected customer group, in view of the fact that while they wait, meeters and greeters offer a large potential for airports to generate landside revenues.

The Meeter Greeter Lobby size and shape also affords opportunities for displays of the rich San Antonio cultural and historic heritage, as well as for spotlighting contemporary local artists. A musical performance stage could also be located within this space, allowing local musicians to welcome arriving passengers and entertain meeters and greeters. Consequently, the terminal has the potential to become a showplace of functionality and design that reflects the local feel and uniqueness of San Antonio.

Two vertical circulation nodes lead customers to the connector which links the terminal with the CONRAC and garage structures, and potentially to the future rail system.
The back-of house spaces include international and domestic inbound bag rooms; baggage screening room; baggage make-up rooms; operations, MEP, and other support spaces; several drive-throughs; and shadow space (covered, open space) for GSE equipment and other purposes.

![Exhibit #33 - Arrivals Level](image)

### 6.3.3 Mezzanine Level

As depicted by Exhibit #33, the mezzanine level includes a sterile corridor for arriving international passengers, as well as a landside, post-security connector allowing passenger flows between Terminal C and the garage structure, CONRAC, and a future rail system.

International arriving passengers will board the planes and proceed to the sterile corridor by means of a vertical circulation node (either a ramp system or a set of escalators, elevator and stair) located adjacent to their respective arrival gate—a circulation node that links the departures level to the sterile corridor located at a mezzanine level. Passengers will then proceed to the Customs and Border Protection facility (FIS) located at the arrivals level, two levels below the sterile corridor.

The functional layouts described hereby demonstrate that the proposed Terminal C “Bookend” Concept has the potential to become the world-class, state-of-the-art terminal San Antonio so richly deserves.
Exhibit #34 - Mezzanine Level
Task 7

Consider construction phasing impacts

7.1 Terminal C Phasing

The RS&H Planning Team prepared high level phasing and implementation plans, which are illustrated by Exhibit #35. The phasing approach described below seeks to minimize adverse impacts on ongoing airport operations during the construction of the new terminal(s) and associated infrastructure.

Phase 1A

- Demolition and relocation of utility plant
- Construct first phase of Terminal C
  - 560,000SF of new terminal
  - Number of new gates (14 new common use gates, including one Terminal B relocated gate) is equivalent to number of existing Terminal A gates (17 preferential gates)
- Construct connector to CONRAC
- During Terminal C construction, Terminal A continues existing operations at all gates
- Number of gates
  - Total Terminal A+B+C number of gates: 38 gates
    - 14 common use gates
    - 24 preferential gates
- RONs
  - Between Terminal B and Terminal C
  - North of Terminal C
- Apron work as required
- Extend roadway system
- Group V aircraft access to cargo area maintained (276’ wide taxilane)

Phase 1B

- Demolish south side of Terminal A concourse
- Realign access roadway to mitigate traffic congestion
- Construct second phase of Terminal C
  - 360,000SF additional terminal area
  - West end of terminal will be constructed in Phase 2A
  - 10 additional common use gates
- Number of gates
  - Total Terminal A+B+C: 41 gates
    - 23 common use gates @TC
    - 18 preferential gates
      - Terminal A: 11 gates
      - Terminal B: 7 gates
- RONs
  - South side of Terminal A
  - Between Terminal B and Terminal C
- Apron work as required
- Group V aircraft access to cargo area maintained

Exhibit #35 / Phasing Diagrams

**Phase 2A**

- Demolish existing Terminal A
- Reconstruct new Terminal A
  - 320,000 SF new terminal
  - 8 new common use gates
  - Terminal A will become an extension of existing Terminal B
    - Unified Terminal A and TB processors
    - All gates TA/ TB connected via a post-security concourse
- Complete construction of Terminal C – 120,000 SF
- Number of gates
  - Total Terminal A+B +C: 38 gates
    - Terminal A: 8 common use gates
    - Terminal B: 7 preferential (or common use) gates
    - Terminal C: 23 common use gates
- RONs
  - South side of Terminal A
  - Between Terminal B and Terminal C
- Start garage structure expansion (1,200 new parking spaces)
- Apron work as required
Group V aircraft access to cargo area maintained

**Phase 2B**

- Demolish existing maintenance hangar located adjacent to Terminal C
- Add three gates at Terminal C
- Total Terminal A+B +C: 41 gates
  - Terminal A: 8 common use gates
  - Terminal B: 7 common use gates
  - Terminal C: 26 common use gates
- Construct entire garage expansion (an additional 1,560 parking spaces)
- Apron work as required
- Group V aircraft access to cargo area maintained

It should be noted that the phasing alternatives described in this section represent multiple construction scenarios from which SAT and the City of San Antonio could make one or multiple selections, depending on numerous factors (e.g., immediate needs, priorities, forecasts, cost, etc.). As such, these phasing alternatives could be implemented in smaller increments to meet capacity growth for specific functions, or could be implemented simultaneously if justified by unanticipated rapid growth in airport operations.

- **7.2 Long-Term Terminal Expansion**

**Phase 3**

As previously described, if in the future increased passenger/airline operations demand as well as regional socioeconomic conditions would require a significant growth of the terminal development at the SAT site, the existing cargo area could be moved to a different location, thus allowing for the terminal complex to expand towards west.

In this scenario, the proposed “Bookend” concept allows for a variety of future expansion configurations.

**Terminal C “Bookend” Concept - Summary**

Benefits of the proposed Terminal C “Bookend” Concept are listed below:

- **Regional Socioeconomic Benefits**
  - Balances airside and landside facility development and maximizes the use of available property
  - Optimizes the airfield configuration and functionality to support the level of airline service needed by the region in the future
  - Meets (exceeds) 2050 capacity requirements (41 common use gates provided versus 36 common use gates required)
• Incorporates a sizeable Customs and Border protection facility (FIS)
• Enhances passenger and tenant access to the Airport
• Ensures convenience and accessibility across the entire terminal development
• Allows for several long-term expansion configurations of terminal and airfield
• Provides opportunity to serve as a regional Gateway
• Allows for future connectivity between the Airport and rail transit

• **Safety / Flexibility / Efficiency**
  
  • Efficiency
    ▪ Maximizes airside and terminal operational efficiency
    ▪ Landside improvements include roadways, curbside, parking to meet 2050 capacity needs
    ▪ Minimizes adverse impacts on ongoing operations during construction phasing
    ▪ Provides various RON opportunities
    ▪ Group V aircraft access to cargo area maintained

• **Customer Service**
  
  • Provides a high level of passenger service
    ▪ Functional layout allows for:
      • Open sight lines
      • Intuitive wayfinding
      • Ample queuing areas
      • Clear and efficient passenger flows
  
  • Centralized concessions opportunities
    ▪ “Shopping Mall” concept
    ▪ Maximum concession exposure to all enplaning passengers
    ▪ Offers various opportunities to incorporate the San Antonio experience
    ▪ The use of public music and arts program, excellent local restaurants, and retail opportunities could make the Airport a destination place in itself
  
  • Allows easy access to rental car facilities, garage and future rail line

• **Honor Airport Design**
  
  • Terminal configuration provides opportunities for a “Legacy Terminal”
    ▪ First-Class Gateway Terminal
    ▪ Distinctive, modern design
    ▪ Aesthetics related to functionality
    ▪ Sustainable design
  
  • Potential to
    ▪ Ensure a high quality of design at the Airport.
    ▪ Create a positive and lasting first and last impression of San Antonio
- **Financial Feasibility**
  
  - Capital investment requirement
  - Ability to develop incrementally as required by growing demand

Maximizes opportunities for concessions and other nonairline revenues

Exhibit #37 depicts some thumb nail sketches attempting to suggest the limitless architectural design potential of the proposed terminal configuration.

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*Exhibit #37 / “Legacy Terminal” Architectural Design Opportunities*

Consequently, the proposed Terminal C concept optimizes terminal capacity, safety, efficiency, and flexibility—and emphasizes convenience and customer service for Airport passengers, airlines, and tenants. The concept has the potential to create a “Legacy Terminal”—a memorable gateway to the region with enhanced customer service and the ability to accommodate future increases in passenger traffic.
Task 8 Cost Estimates

8.1 Terminal A Replacement + Terminal C

High-level, order of magnitude capital improvements cost estimates were prepared for Terminal C, for a new Terminal A, as well as for airside and landside improvements. Preliminary cost estimates were based on conceptual drawings, and were developed to determine approximate development costs, calculated in 2017 dollars.

The estimating methodology employed for the cost estimates is as follows:
- The unit costs are based on current cost information – calculated in 1Q 2017 $.
- The estimated costs include passenger boarding bridges and the furniture, fixtures, and equipment.
- An allowance for baggage handling equipment is included.
- Escalation is not included in the unit costs.

Exhibit # 36 depicts preliminary Terminal C, a new Terminal A, as well as airside and landside improvements cost estimates.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Terminal A</td>
<td>$ 250,800,000</td>
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<tr>
<td>Terminal C</td>
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<tr>
<td>Taxilanes</td>
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<tr>
<td>Parking Garage</td>
<td>$ 106,867,200</td>
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<tr>
<td>Elevated Roadway</td>
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<tr>
<td>Roadway at Grade</td>
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<tr>
<td>CEP</td>
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<tr>
<td>Utilities</td>
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<tr>
<td>Misc Demolition</td>
<td>$ 5,000,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$ 1,573,667,200</strong></td>
</tr>
</tbody>
</table>

Exhibit #36

The Planning Team developed also high-level, order of magnitude cost estimates for each of the four construction phases (for the construction of Terminal C plus a new Terminal A) depicted in the Phasing chapter.

These costs are broken down as described below:
Cost Estimate Phase 1A: $687,000,000

This phase includes the following:
- Construct Terminal C – 14 gates / 560,000SF: $595,000,000 (includes connector to CONRAC and airfield costs)
- Demolition/ Relocation of Utility Plant: $61,000,000
- Extend roadway system: $25,000,000
- Utilities: $6,000,000

Cost Estimate Phase 1B: $394,000,000
This phase includes the following:

- Construct Terminal C – 9 gates / 360,000SF: $380,000,000 (includes airfield costs)
- Demolition of Terminal A south concourse: $1,000,000
- Realign access roadway: $13,000,000

Cost Estimate Phase 2A: $432,000,000

This phase includes the following:

- Complete Terminal C – 120,000 SF: $124,000,000 (includes airfield costs)
- Construct New Terminal A - 8 gates / 320,000SF: $251,000,000 (includes airfield costs)
- Demolition of Terminal A: $3,000,000
- Garage expansion 1,200 parking spaces: $50,000,000 (includes enabling projects)
- Utilities: $4,000,000
Cost Estimate Phase 2B: $60,000,000

This phase includes the following:

- Demolish existing maintenance hangar: $1,000,000 (relocation not included)
- Add last 3 gates @ Terminal C: $3,000,000 (includes airfield costs)
- Garage expansion 1,560 parking spaces: $57,000,000 (includes enabling projects)

As stated in the phasing section of this report, it should be noted that the phasing alternatives described above represent multiple construction scenarios from which SAT and the City of San Antonio could make one or multiple selections, depending on numerous factors (e.g., immediate needs, priorities, forecasts, cost, etc.). As such, these phasing alternatives could be implemented in smaller increments to meet capacity growth for specific functions, or could be implemented simultaneously if justified by unanticipated rapid growth in airport operations.

8.2 Cost Comparison: Terminal A Replacement vs. Terminal C

The cost comparison of the Terminal A enhancement alternative to the new Terminal C alternative consisted of assessing the location and configuration of future Terminal C for best immediate and long term use.

Considerations included:

- Available location
- Accommodating the optimal aircraft size
- Maximizing contact gates for flexibility, including swing gates
- Including an international arrivals facility
- Incorporating a Hold Baggage Screening system for all Terminals
- Centralized and convenient concessions in a mall type atmosphere
- Ability to maintain all building systems with proper mechanical, plumbing and IT facilities
- World-class terminal architecture
- Infrastructure enhancement to roadway, parking and utilities
- Minimizing impact to existing operations through phased construction

As previously described, the cost estimates developed by the Planning Team for the two “Bookend” options are as follows:

**Option 1: $177,077,991**
- Sustain and enhance Terminal A
- Construct Terminal A - Terminal B Connector

**Option 2: $1,573,667,200**
- New Terminal C
- New Terminal A
- Airside and landside improvements

Capital costs for Option 2 are significantly higher than those for Option 1. However, the Terminal C Bookend alternative described in this report proposes a state-of-the-art, world class terminal development, offering a greatly enhanced passenger experience as compared to that afforded by the existing Terminal A. Moreover, the proposed Bookend concept ensures that construction of the new terminal(s) could be incrementally implemented as demand materializes, thus reducing initial capital costs.