

Clearwater Airpark

Working Paper #3
Alternatives Analysis

City of Clearwater

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Prepared for:

City of Clearwater
Marine and Aviation Department
Clearwater Beach Marina
25 Causeway Blvd.
Clearwater, FL 33767

Prepared by:

AECOM
7650 West Courtney Campbell Causeway
Suite 700
Tampa, FL, 33607
www.aecom.com

in association with:

RDM International, Inc.
2454 N. McMullen Booth Road
Suite 712
Clearwater, FL 33759
484.432.1831
bwitaconis@rdmintlinc.com
www.rdmintlinc.com

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Introduction

The City of Clearwater ("City") is updating the Airport Layout Plan (ALP) and Capital Improvement Program (CIP) for the Clearwater Airpark (CLW or Airpark) based on existing and anticipated demand. The Airpark has experienced increasing demand for use of their facilities over the past few years and has identified an immediate need for additional and/or improved facilities, including aircraft storage and terminal facilities. The purpose of this report is to identify and evaluate development alternatives recommended to accommodate the facility requirements provided in Working Paper #2, which included:

- Obtain control of unowned parcels with the Approach Runway Protection Zone (APRZ) and Departure Runway Protection Zone (DPRZ) to the extent practical
- Mitigate non-standard taxiway configurations
- Rehabilitate pavement per the Florida Department of Transportation (FDOT) pavement management report
- Provide blast pads for both runway ends
- Maximize operational safety of aircraft parking areas through aircraft wingspan restrictions on taxilanes or relocation/reconfiguration of parking positions
- Provide 8 additional transient parking positions and 56 total aircraft parking positions
- 15 additional T-Hangar units
- 2 additional conventional hangars
- Expand the terminal building to roughly 12,500 Square Feet (SF)
- Increase the number of vehicle parking spaces from 25 to 104
- Provide a new secured maintenance shed for storage of the recently purchased tractor
- Provide a new Airport Rotating Beacon
- Reserve the 75-acre site currently occupied by The Landings Golf Club for aeronautical / non-aeronautical purposes

Evaluation Criteria

The FAA recommends a standard set of criteria to evaluate development alternatives according to an airport's unique situation. The evaluation process should feature "generally accepted planning principles, be replicable, consistently applied, and well documented."¹ Similarly, the Florida Department of Transportation (FDOT) 2016 Guidebook for Airport Master Planning states "a set list of selection criteria or influencing factors should be identified to help evaluate and select the recommended plan." Accordingly, a set of evaluation criteria were established for use in the alternatives analysis. The criteria are strategic, qualitative, and quantitative to ensure that the evaluation process remained at a master planning level of detail.

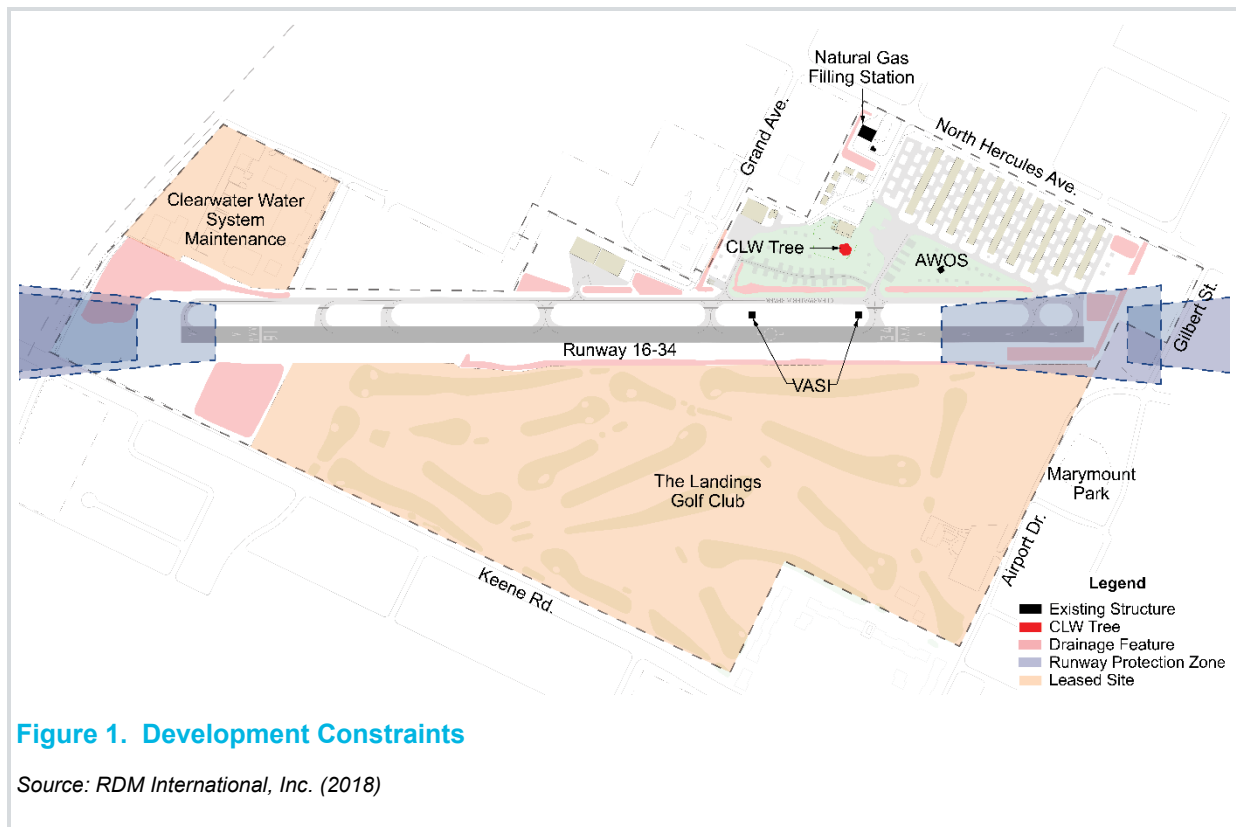
The selected criteria include the following:

1. **Achievement of the Objective:** This is primarily based on achieving the specific need identified in the Facility Requirements. Alternatives are assessed and ranked based on the degree to which it satisfies the objective.
2. **Airport Design Standards:** The proposed development should satisfy all applicable airport design standards and maintain or improve the safety and efficiency of the Airpark.
3. **Flexibility:** The alternative should support a reasonable level of flexibility to accommodate changes in demand, including the ability to be expanded in the future.
4. **Collateral Impacts:** This evaluates the extent to which an alternative requires changes or improvements to existing Airpark facilities which otherwise would not require changes or improvements. For example, mitigation of existing stormwater drainage features due to a proposed structure.

Development Constraints

Certain features or operational factors of the Airpark represent constraints to development due to the costs associated with impacts, political and/or socioeconomic factors, and/or operational safety. Within the existing property boundary of CLW, these constraints include existing infrastructure and environmental features as depicted in **Figure 1**.

¹ FAA Advisory Circular 150/5070-6B, *Airport Master Plans*, paragraph 904



Infrastructure Constraints

Existing infrastructure constraints at CLW include:

- Clearwater Gas System Natural Gas Filling Station located at the entrance of the Airpark on North Hercules Avenue
- Existing Automated Weather Observation System (AWOS) located within the aircraft hardstand parking area adjacent to the T-Hangars
- Existing Visual Approach Slope Indicator (VASI) system components at the Runway 34 end
- The City of Clearwater Water System Maintenance complex at the north end of the Airpark
- The Landings Golf Club west of the airfield (while this land may be available for development at some time in the future, no development was proposed on this site for this planning period)

Environmental Constraints

The primary environmental constraints at CLW include existing drainage features. While these drainage features can be mitigated to accommodate new development, there are typically high costs associated with mitigation requirements.

Additionally, an existing 100 plus year-old tree located just outside the existing terminal was also considered a development constraint as it is a widely recognized and valued feature of the Airpark.

Operational Constraints

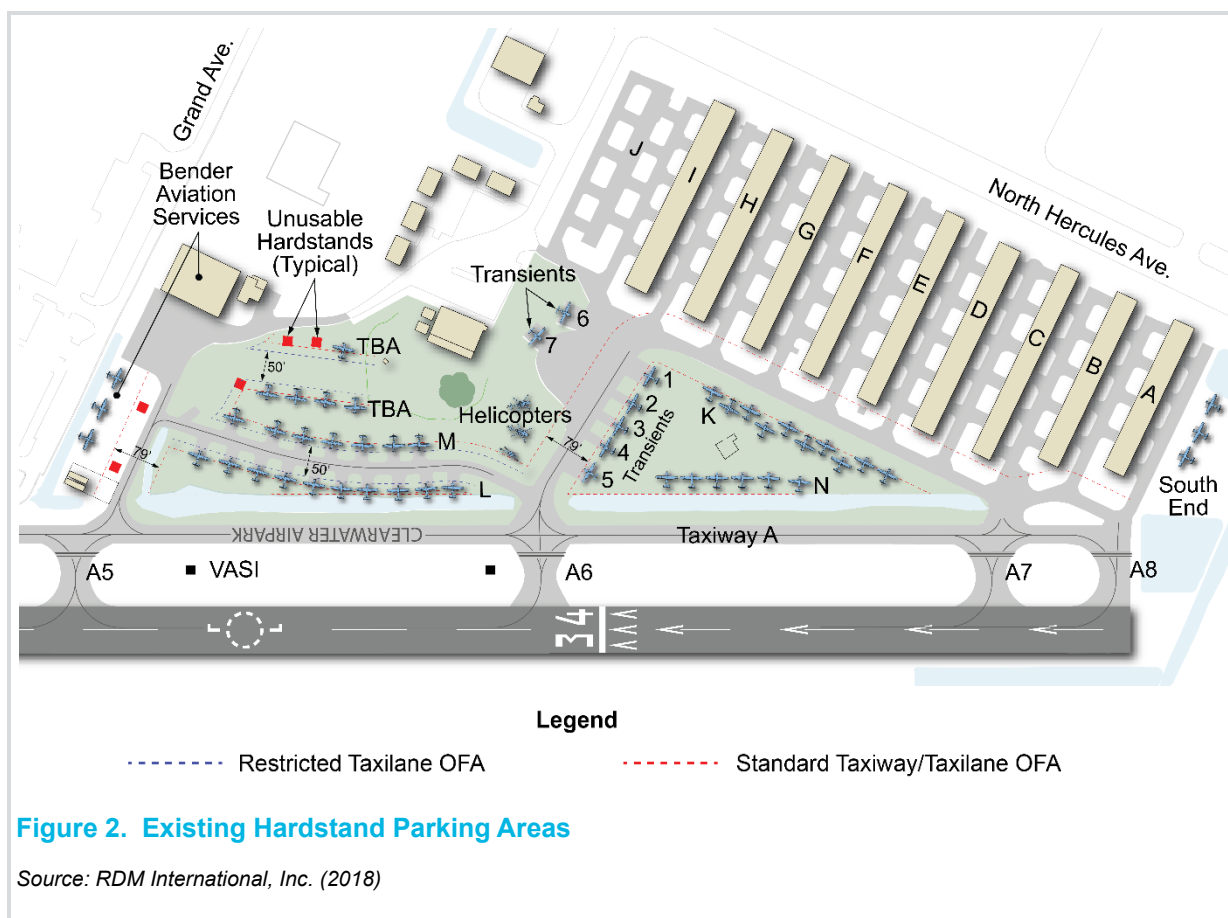
Operational constraints, other than those associated with aircraft movement safety areas such as the taxiway object free area, include the Runway Protection Zones (RPZs). Based on current FAA design guidelines, no development is proposed inside the RPZs.

Development Alternatives

This section evaluates several alternatives to address the capacity, efficiency, and safety requirements previously summarized. However, some improvements were not subject to an alternatives analysis if they were recommended to satisfy FAA design standards or restricted by the development constraints summarized in the previous section, including:

- Blast pads at both runway ends
- Mitigation of direct access from the aircraft hardstand parking area to the runway
- Aircraft hardstand parking reconfiguration

Key elements of the existing hardstand parking area are illustrated in **Figure 2**.



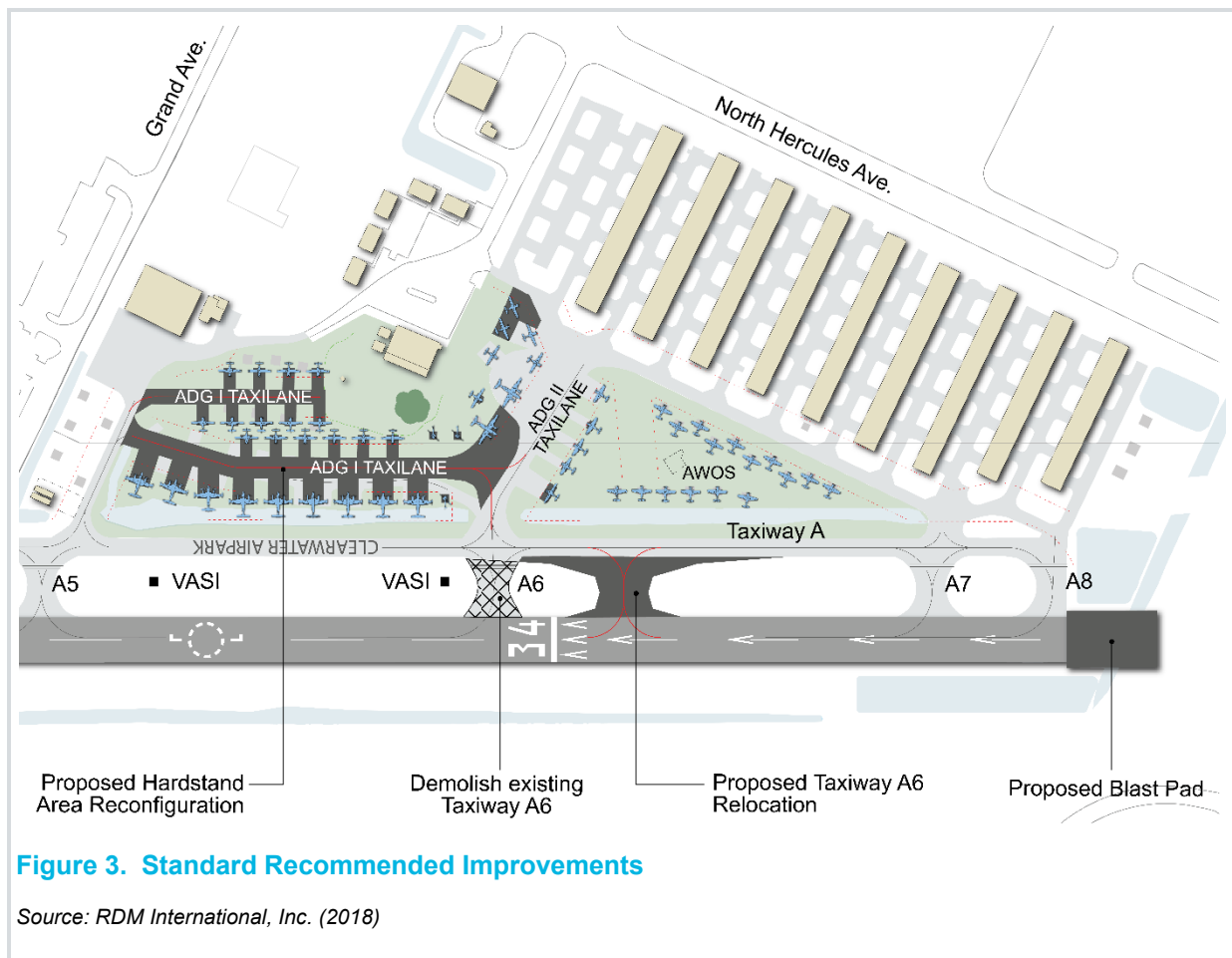
The existing taxilane from the transient hardstand positions allows for direct access to the runway via Taxiway A6. To mitigate this condition, relocation of the taxiway connector between Taxiway A and Runway 16-34 is recommended. The existing VASI system restricts relocation of this connector to the south. Therefore, it is proposed that the existing connector is removed, and a new connector is constructed south of the existing connector as illustrated in **Figure 3**.

Reconfiguration of the hardstand parking Rows K and N (16 positions), as well as transient parking positions 1-5, is restricted by the existing AWOS and drainage ditch parallel to Taxiway A. Therefore, it is

recommended the existing condition is maintained due to cost associated with mitigating these restrictions.

Similarly, the reconfiguration of existing hardstand parking Rows M and L as well as the Tampa Bay Aviation positions are restricted by the existing tree outside the terminal and a drainage ditch parallel to Taxiway A. However, reconfiguration of this area is recommended to maximize the number of aircraft hardstand positions and operational safety. As illustrated in **Figure 3**, reconfiguration of this area includes realignment and expansion of the hardstand parking rows, relocation of helicopter pads, and new transient parking hardstand pads. The taxilane accessing transient parking positions will provide ADG II aircraft access which requires an expansion of the transient hardstand pads 2-5 to maintain adequate wingtip clearance. A total of 56 aircraft hardstand parking positions is provided.

Three new hardstand parking positions east of the existing fuel farm are also proposed for use by Bender Aviation. These will replace the two existing unusable positions that are currently within the taxilane object free area. These positions are used exclusively by Bender Aviation and are not included in the total number of aircraft parking positions available for based or transient aircraft.



T-Hangars

The anticipated demand within the planning horizon indicates an additional 15 T-Hangar units can be supported at the Airpark. Each T-Hangar structure can accommodate multiple units. For the purposes of this analysis, two T-Hangar structures are proposed to accommodate the recommended 15 additional units.

Alternative 1

The first alternative (**Figure 4**) includes the construction of a new structure on existing Row J, currently an uncovered aircraft parking area accommodating 9 positions. Utilizing existing Row J eliminates the need to construct new pavement for access to each unit. However, it is recommended this includes the realignment of the airport security fence to maximize aircraft wingtip clearance on the north side of the structure.

A new 10-unit structure is also proposed south of existing T-Hangar A and parallel to North Hercules Boulevard. This option eliminates 2 existing hardstand positions and requires mitigation of impacts to an existing retention pond, drainage canal, and potentially a berm inside airport property along Gilbert Street.

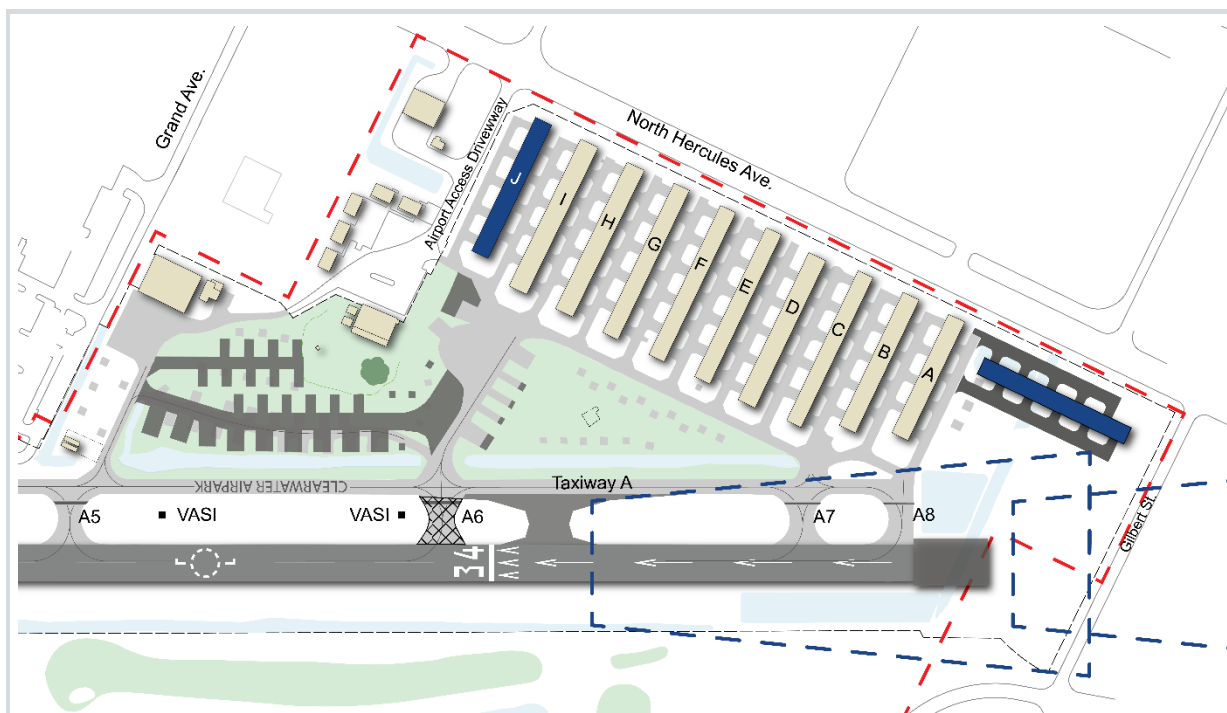


Figure 4. T-Hangars - Alternative 1

Source: RDM International, Inc. (2018)

Alternative 2

The second alternative (**Figure 5**) also includes the construction of a new T-Hangar on existing Row J as in Alternative 1 and a new T-Hangar south of existing T-Hangar A. However, the new T-Hangar south of existing T-Hangar A is aligned to eliminate the need to mitigate the existing retention pond and minimize impacts to the existing drainage canal while also avoiding impacts to the Runway 34 Protection Zones and airspace.



Figure 5. T-Hangars - Alternative 2

Source: RDM International, Inc. (2018)

T-Hangar Alternatives Evaluation

Table 1 summarizes and compares the alternatives according to the evaluation criteria previously identified in this chapter. Based on the evaluation, Alternative 1 is the recommended alternative.

Table 1. T-Hangar Alternatives Evaluation

| Criteria | Alternative | |
|------------------------------|-------------|---------|
| | 1 | 2 |
| Achievement of the Objective | Yes | Yes |
| Airport Design Standards | Partial | Partial |
| Flexibility | Yes | No |
| Collateral Impacts | Poor | Fair |

Source: RDM International, Inc.

Achievement of the Objective

The primary objective is to provide 15 additional T-Hangar units. Both alternatives can provide approximately 19 units.

Airport Design Standards

The construction of a new covered structure on Row J utilizes the existing pavement which does not in each alternative adheres to FAA design standards.

Flexibility

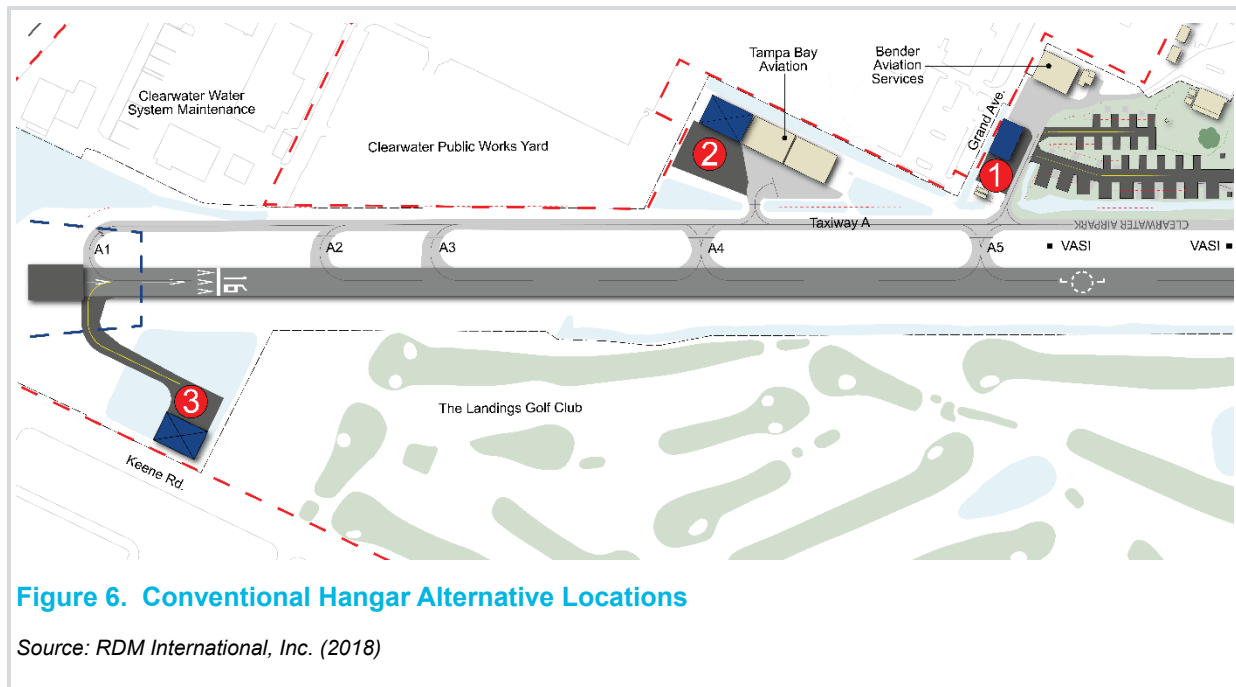
The new structure proposed south of existing T-Hangar A in Alternative 1 can accommodate an expansion of the structure as well as additional hardstand pads without resulting in additional impacts. However, the structure proposed in Alternative 2 cannot accommodate an expansion while maintaining adequate clearance from existing infrastructure.

Collateral Impacts

Each alternative requires mitigation of existing stormwater drainage features. However, Alternative 2 minimizes the impacts and the associated costs.

Conventional Hangars

The anticipated demand within the planning horizon indicates an additional 2 Conventional Hangar units can be supported at the Airpark. The existing Tampa Bay Aviation conventional hangars are approximately 10,000 SF. A 10,000 SF hangar can accommodate approximately 98% of aircraft categorized as ADG I or II². Therefore, a 10,000 SF hangar is recommended to maximize flexibility for the number and type of aircraft that can be stored in the hangar. Three potential locations were identified for development of additional hangars, as illustrated in **Figure 6**.



Alternative 1

The first potential location for a new conventional hangar is south of the existing Bender Aviation Services hangar and north of the existing fuel tanks. This location can accommodate a conventional hangar outside of the taxilane object free area, but the aircraft parking area must be located south of the proposed hangar structure. Additionally, the size of the hangar structure is limited to approximately 6,000 Square Feet (SF) hangar and the aircraft parking apron is restricted to approximately 1,200 Square Yards (SY) due to existing infrastructure. Three existing hardstand pads utilized by Bender Aviation Services are eliminated in this alternative.

Alternative 2

The second potential location utilizes a vacant site adjacent to the existing Tampa Bay Aviation hangars. The site can accommodate a 10,000 SF hangar (same as the existing hangars) and an 1,800 SY expansion of the existing aircraft parking apron (the existing apron is approximately 2,300 SY).

Alternative 3

The third potential location is along Keene Road on the west side of Runway 16, north of the existing fence line of The Landings Golf Club. Similar to Alternative 2, this site can also accommodate a 10,000 SF hangar and 1,800 SY aircraft parking apron. The site provides easy access from Keene Road and

² Airport Cooperative Research Program (ACRP) Report 113, Guidebook on General Aviation Facility Planning

flexibility to construct additional hangars and aircraft parking apron in the future if needed. However, this site requires a new taxiway for access to Runway 16-34 and Taxiway A as well as mitigation of an existing retention pond.

Conventional Hangar Alternatives Evaluation

Table 2 summarizes and compares the alternatives according to the evaluation criteria previously identified in this chapter. Based on the evaluation, Alternative 2 and Alternative 3 are the recommended alternatives for the recommended 2 future hangars.

Table 2. Conventional Hangar Alternatives Evaluation

| Criteria | Alternative | | |
|------------------------------|-------------|------|-----------|
| | 1 | 2 | 3 |
| Achievement of the Objective | Partial | Yes | Yes |
| Airport Design Standards | Yes | Yes | Yes |
| Flexibility | No | No | Yes |
| Collateral Impacts | Fair | Good | Very Poor |

Source: RDM International, Inc.

Achievement of the Objective

Alternative 2 and Alternative 3 each can accommodate a 10,000 SF hangar. Since the size of the hangar in Alternative 1 is restricted, it is considered to only partially achieve the objective.

Airport Design Standards

Each of the proposed locations can accommodate a new hangar and aircraft parking area without impacting safety areas.

Flexibility

Alternative 3 is the only location that can accommodate future expansion. Alternative 1 is restricted by the existing taxilane, Bender Aviation Services facility, the fuel farm, and Grand Avenue. Alternative 2 is restricted by Taxiway A, an existing drainage ditch, and other existing off-airport infrastructure.

Collateral Impacts

Alternative 1 and Alternative 2 can be constructed without significant mitigation of existing drainage features. However, Alternative 3 is located within an existing retention pond constructed for runoff from Keene Road when it was widened in the mid-2000s and will require extensive mitigation. Furthermore, the Alternative 3 site is within a parcel zoned as Open Space / Recreational and would require a significant rezoning effort before it can be implemented.

Terminal

A larger terminal building, maintenance shed, and vehicle parking area is recommended. Due to existing constraints and recommended developments summarized in the preceding sections, it is recommended the existing terminal site is utilized for a future terminal building and automobile parking area. Two alternatives were identified and evaluated for the future terminal.

Figure 7 illustrates the existing terminal and proposed aircraft parking area for reference. There are 5 existing trailers (each approximately 1,000 SF) used by the Civil Air Patrol (CAP), a vehicle parking lot with 25 spaces, and a 3,800 SF terminal structure.

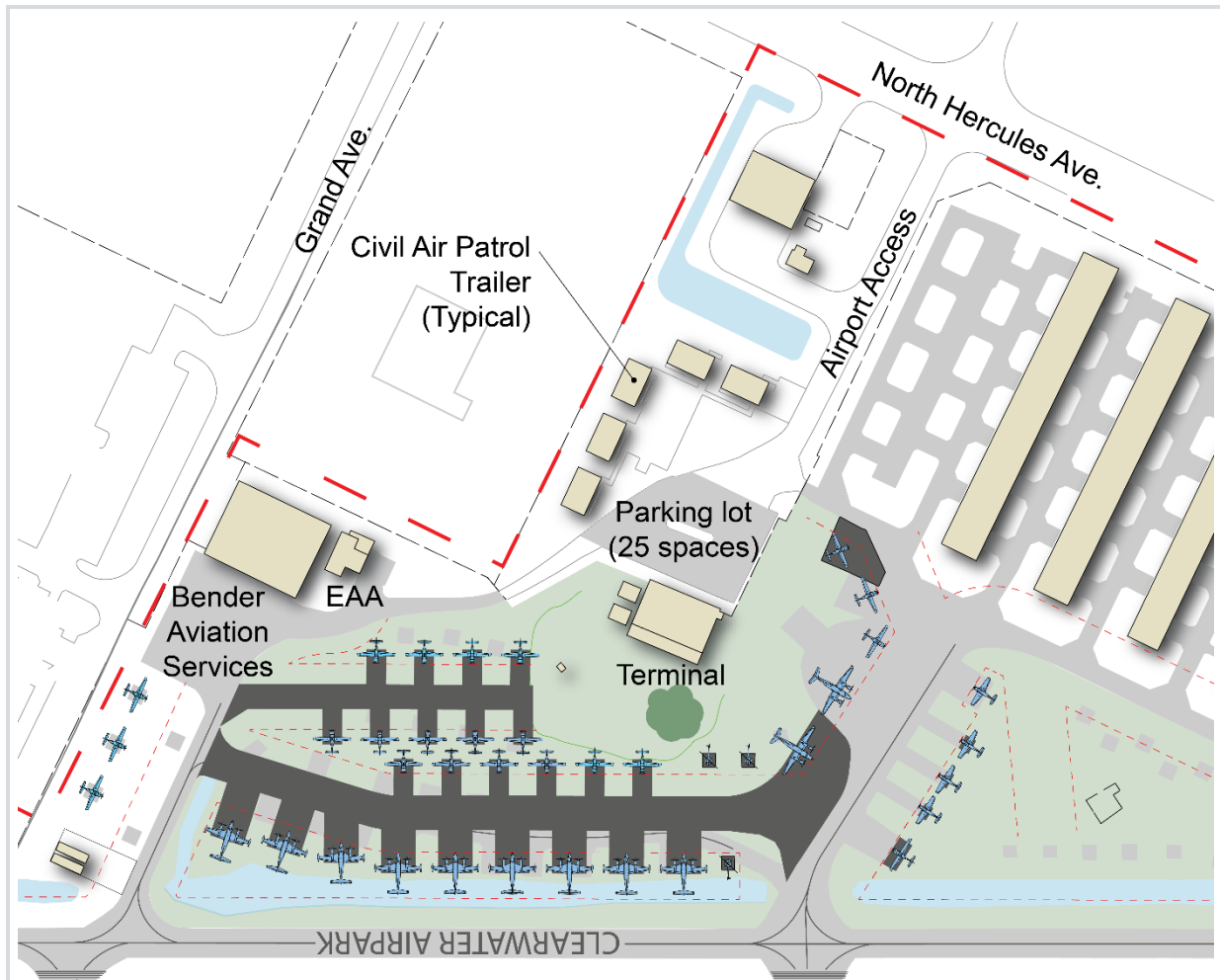


Figure 7. Terminal Area

Source: RDM International, Inc. (2018)

Alternative 1

The first alternative (**Figure 8**) expands the terminal in its existing location and maintains 3 of the existing 5 CAP trailers. To accommodate an expansion of the vehicle parking lot, one of the remaining CAP trailers will be relocated and the other removed. The proposed 12,500 SF single-story terminal structure is sized based on anticipated demand in 2038. A second-story may be necessary to accommodate other features such as a restaurant and/or conference room. Additionally, a temporary building will be required during construction of the proposed terminal.

The proposed expansion of the existing vehicle parking lot is restricted by the CAP trailers and an existing drainage ditch. Therefore, the expansion can only accommodate 94 parking spaces, 11 short of the 105 spaces recommended based on anticipated demand.

A new maintenance shed is proposed adjacent to the EAA facility.

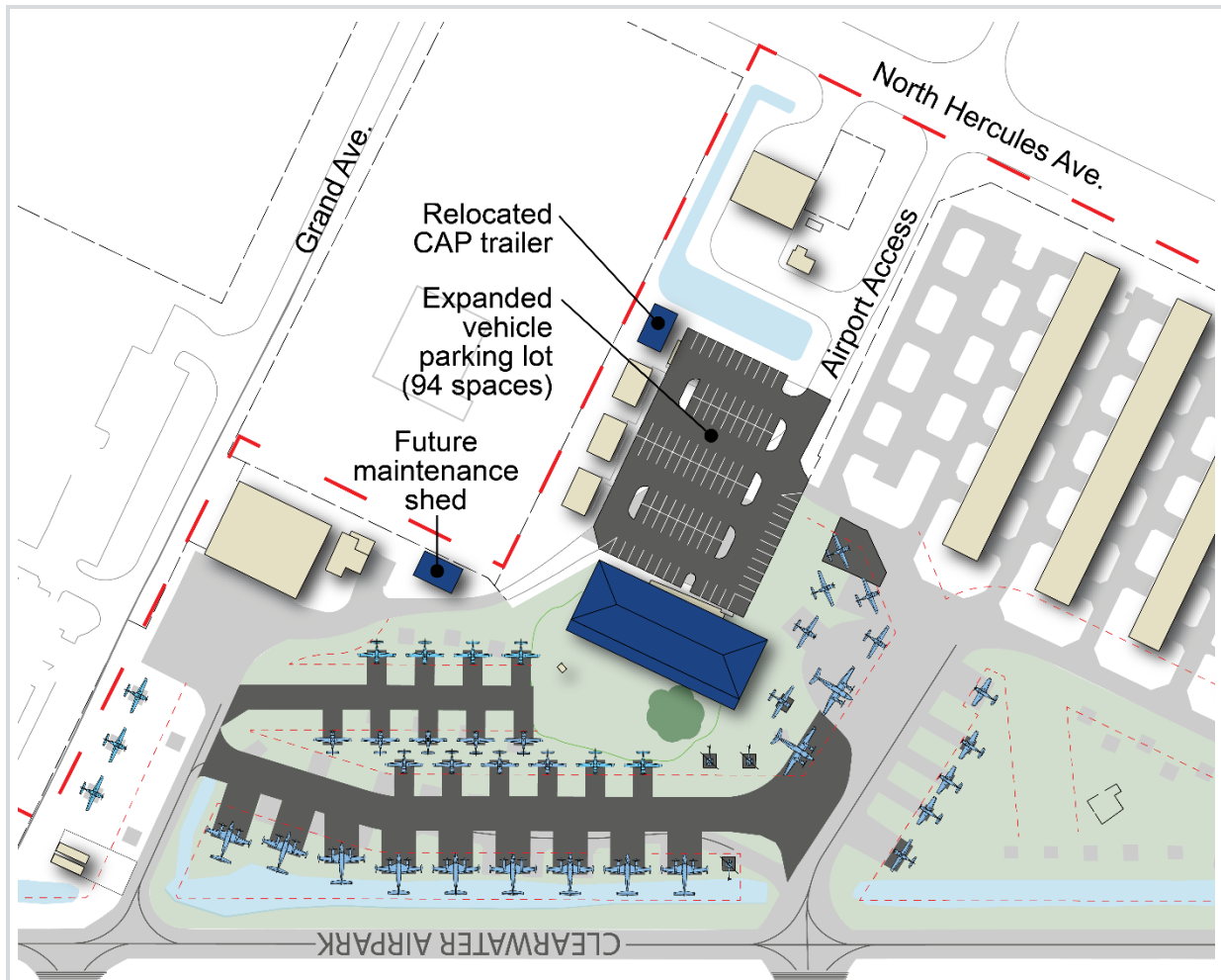


Figure 8. Terminal Expansion - Alternative 1

Source: RDM International, Inc. (2018)

Alternative 2A

Alternative 2A proposes a 14,500 SF single-story terminal structure and removes all the existing CAP trailers to maximize the number of vehicle parking spaces (105 in this alternative). It is anticipated that CAP activities will be accommodated in the future terminal. It is also intended that the terminal will be constructed in phases to eliminate impacts to airport operations.

A new maintenance shed is proposed adjacent to the future terminal.

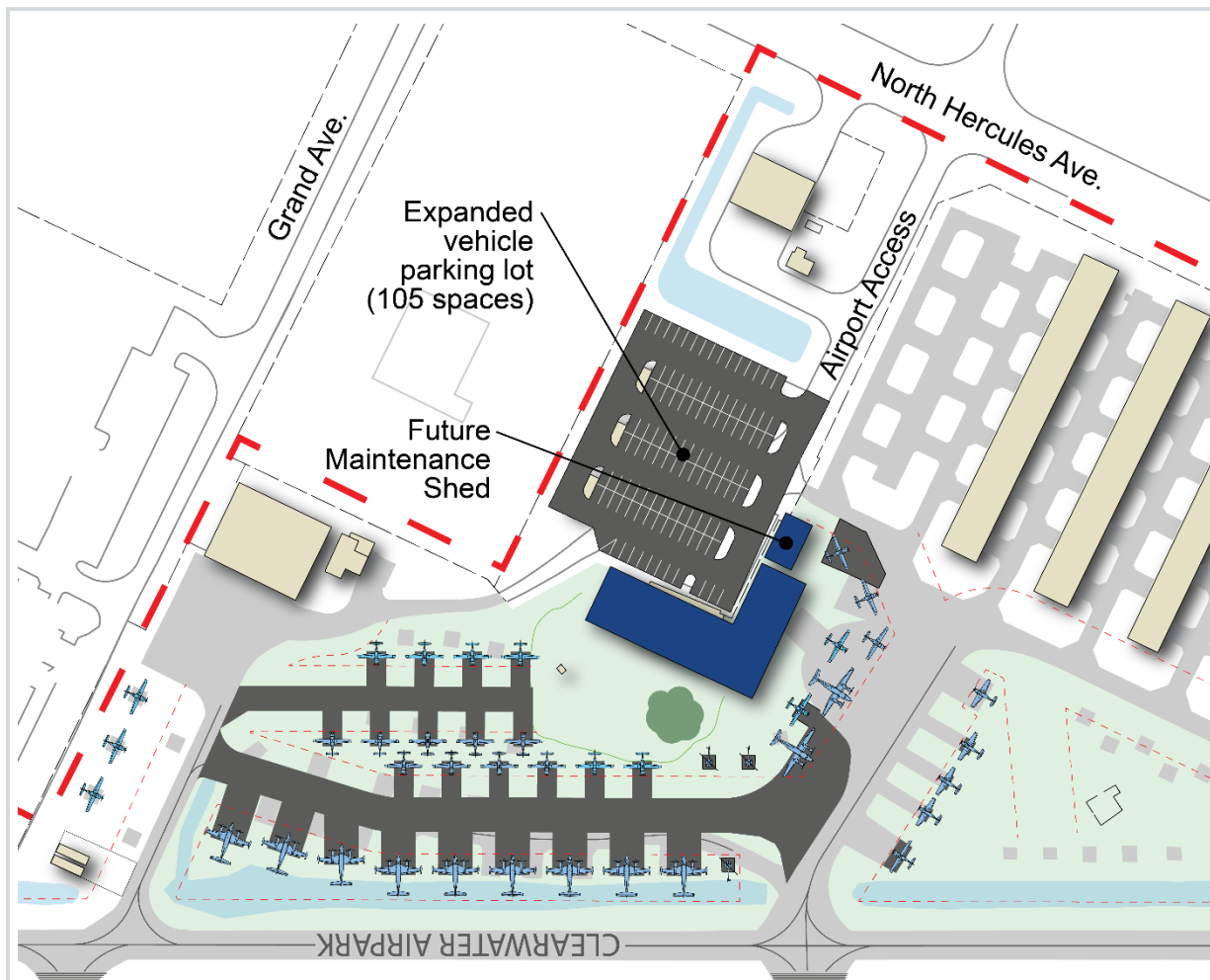


Figure 9. Terminal Expansion - Alternative 2A

Source: RDM International, Inc. (2018)

Alternative 2B

Alternative 2B is similar to Alternative 2A in that the existing CAP trailers are removed to maximize the number of vehicle parking spaces (also 105 in this alternative). However, this alternative proposes a two-story structure to minimize the footprint of the terminal. As the proposed terminal is 10,500 SF, only a partial second floor is required to accommodate anticipated demand. Similar to Alternative 2A, it is also intended that the terminal will be constructed in phases to eliminate impacts to airport operations.

A new maintenance shed is proposed adjacent to the future terminal.

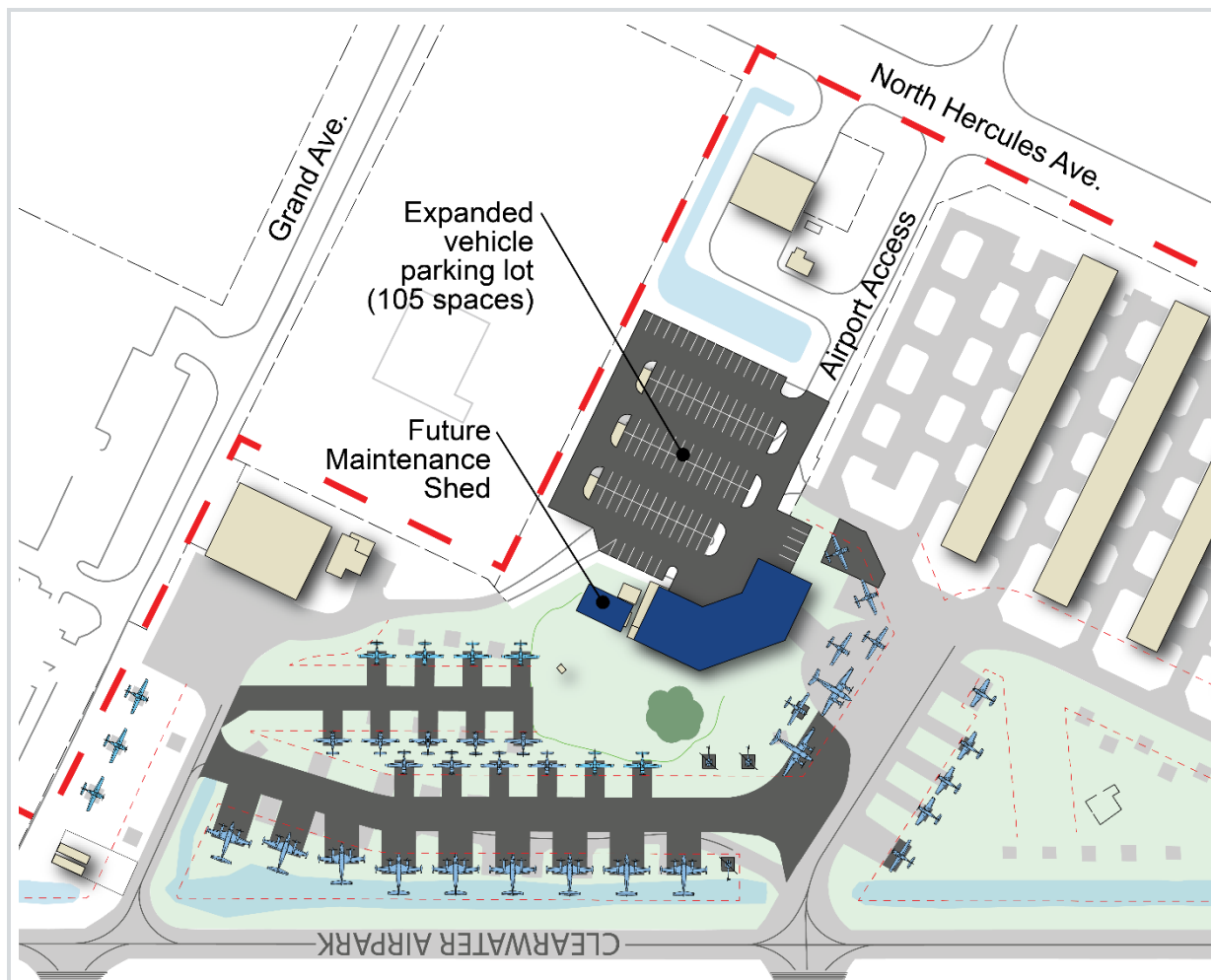


Figure 10. Terminal Expansion - Alternative 2B

Source: RDM International, Inc. (2018)

Terminal Alternatives Evaluation

Table 3 summarizes and compares the alternatives according to the evaluation criteria previously identified in this chapter. Based on the evaluation, Alternative 2A is the recommended alternative for the future terminal structure.

Table 3. Terminal Alternatives Evaluation

| Criteria | Alternative | | |
|------------------------------|-------------|---------|---------|
| | 1 | 2A | 2B |
| Achievement of the Objective | Partial | Yes | Yes |
| Airport Design Standards | Yes | Yes | Yes |
| Flexibility | Partial | Partial | Partial |
| Collateral Impacts | Good | Fair | Fair |

Source: RDM International, Inc.

Achievement of the Objective

Alternative 1 only partially achieves the objective since it does not provide the recommended number of vehicle parking spaces. Alternatives 2 and 3 can accommodate all recommended improvements.

Airport Design Standards

None of the alternatives include non-standard conditions.

Flexibility

Each of the alternatives provides partial flexibility as the terminal building can be expanded by adding and/or expanding a second level; however, the proposed vehicle parking areas cannot accommodate an expansion.

Collateral Impacts

Alternative 1 maintains most of the existing CAP trailers while the other two alternatives remove all of them. It is intended CAP functions can be accommodated in the new terminal building but this

Navigational Aids

The Clearwater Airpark provide Medium Intensity Runway Lights (MIRL). Per FAA Advisory Circular 150/5300-13A (*Change 1*), *Airport Design*, airport rotating beacons are required for any airport with runway edge lights. Accordingly, a rotating beacon is recommended for the Airpark.

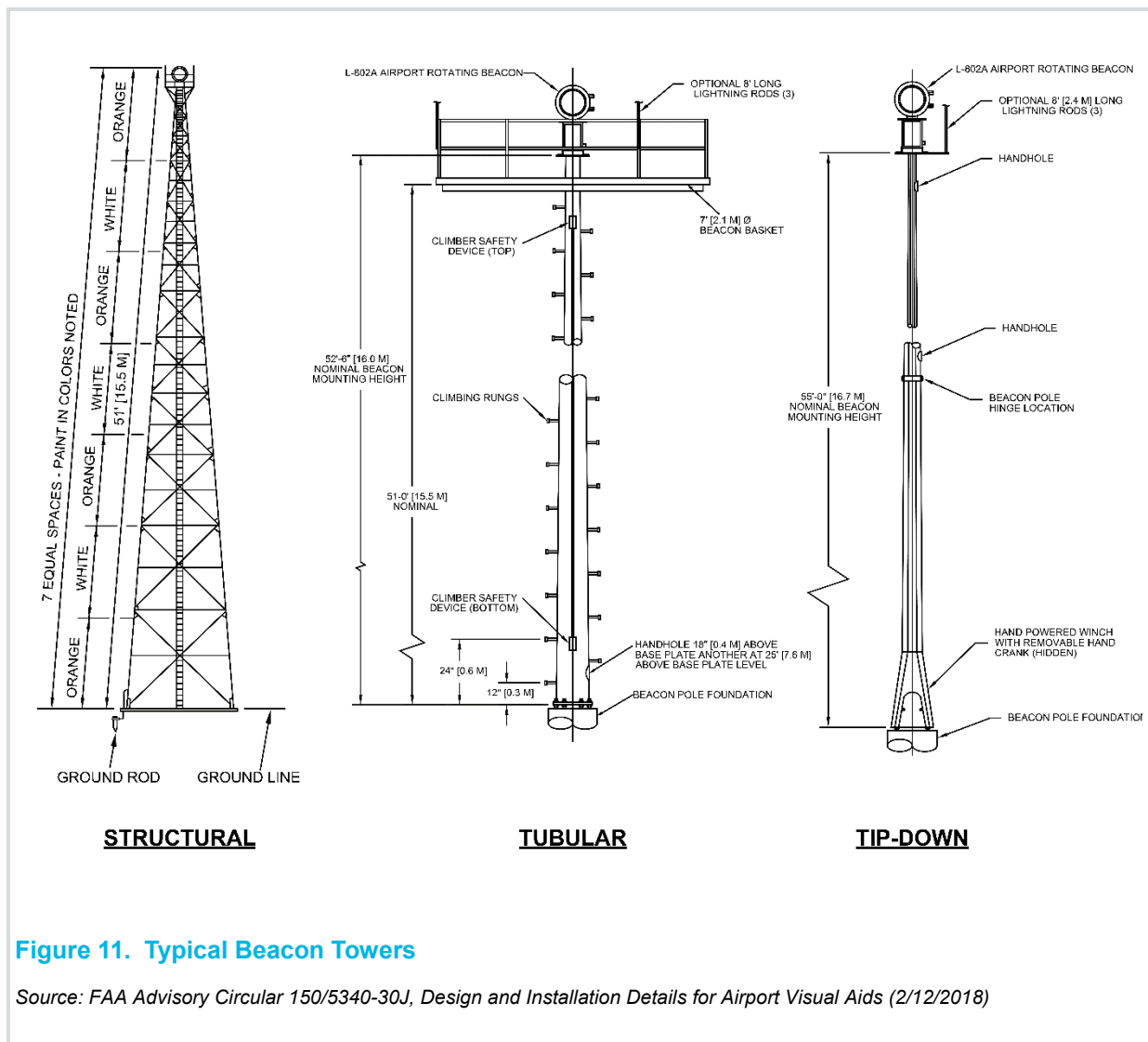
The main purpose of the beacon is to indicate the location of a lighted airport. Siting and installation of a rotating beacon is based on the following guidelines:

- Located within 5,000 feet of a runway
- Mount all airport rotating beacons higher than any surrounding obstructions so that the bottom edge of the beacon's light beam, when adjusted correctly, will clear all obstructions
 - Mounted high enough above the surface so that the beam sweep, aimed 2 degrees or more above the horizon, is not blocked by any natural or manmade object

- May be mounted on the roof of hangars or other buildings or on wooden power pole towers and metal towers

Three different beacon tower structures are available. These include the Structural Steel Towers, Tubular Steel Towers, and Tip-Down Pole Towers.

Structural Steel Towers are available in heights of 51, 62, 75, 91, 108, 129, and 152 feet. Tubular Steel Towers consist of different lengths of low alloy, high strength tubular steel sections welded together to obtain a basic tower height of 51 feet. Tip-Down Pole Towers consist of a two-section octagonal tapered structure with a counterweight and hinge that allow the top section to be easily raised and lowered by one person using an internal hand-operated winch for maintenance. These towers are typically available at lengths up to 55 feet. **Figure 11** illustrates these three tower types.



Three potential locations for the new beacon are identified for future evaluation. These sites are illustrated in **Figure 12** as part of the following section and are adjacent to the proposed terminal, the fuel farm, and the proposed conventional hangar at the existing Tampa Bay Aviation hangars site.

Recommended Development Plan

Figure 12 illustrates the recommended development plan based on the analyses summarized in this chapter.

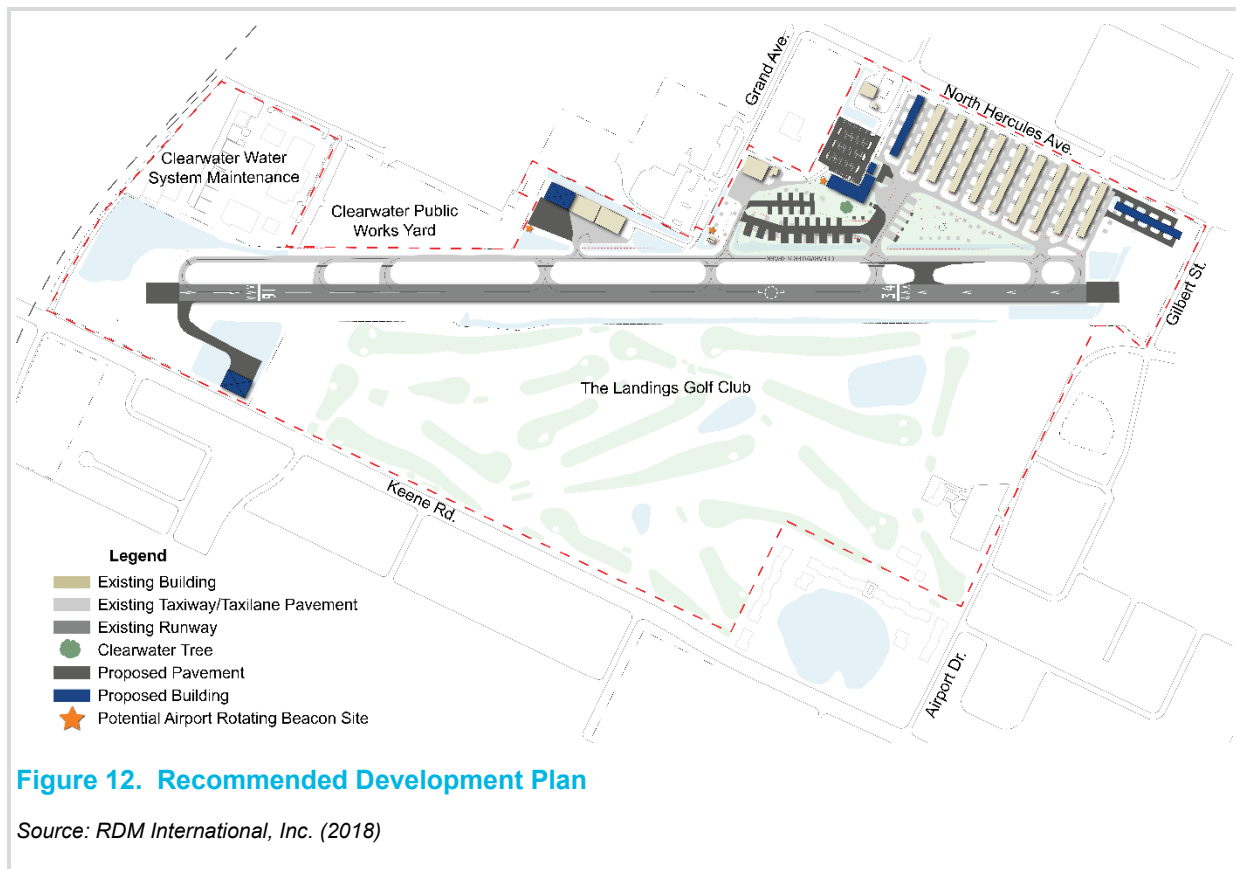


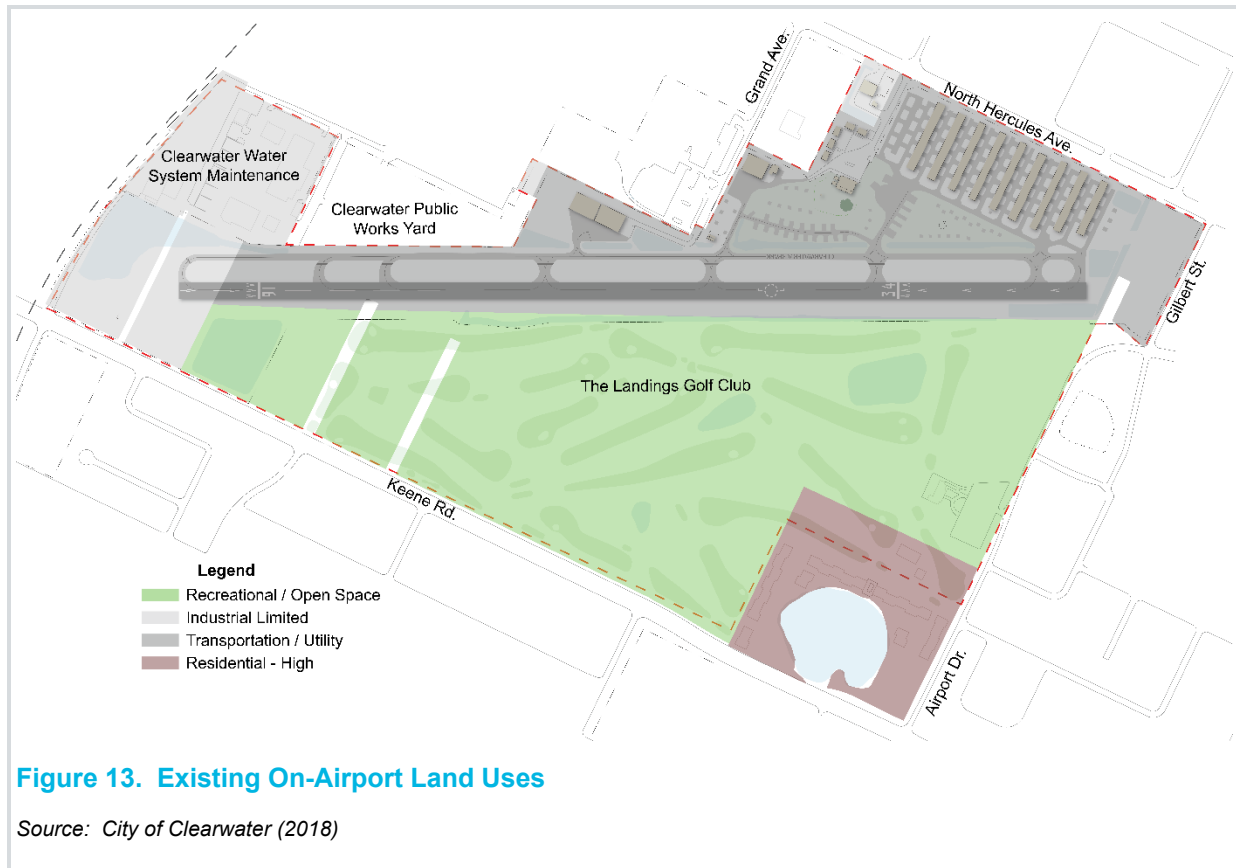
Figure 12. Recommended Development Plan

Source: RDM International, Inc. (2018)

Land Use

On-airport and off-airport land uses are a key consideration for airports. Protecting the airspace on parcels outside of airport property maximizes the operational safety of aircraft as well as people and property on the ground. Establishing land uses on airport property allows the airport to allocate limited resources for specific functions and maximize the long-term benefit and financial sustainability of the airport, whether aviation related functions or non-aviation development.

The existing on-airport land uses as defined by the City of Clearwater are illustrated in **Figure 13**.



The majority of Airpark property is designated as Transportation / Utility while The Landings Golf Club (over 300 acres) is designated as Recreational / Open Space. The parcel occupied by the City of Clearwater Water System Maintenance is classified as Industrial Limited as is the parcel north of the Runway 16 end.

For the purposes of this analysis, and in the event The Landings Golf Club ceases operations, potential land uses are identified, for discussion purposes only, in **Figure 14**.



Areas supporting general aviation activities such as hangar storage and terminal areas are classified as General Aviation. The runway and taxiways, including safety areas and protection zones, maintain the Transportation / Utility classification. However, an area on the west side of the runway is preserved for a potential future parallel taxiway.

The existing Landings Golf Club site is split into 3 parcels. West of the runway is a large parcel allocated for future General Aviation purposes, including hangar storage and other general aviation related functions.

Another parcel east of the existing residential area at the intersection of Keene Road and Airport Drive is maintained as Recreational / Open Space.

A parcel immediately adjacent to Keene Road is classified as non-aviation development. While this could include commercial development to maximize airport revenues, one of the goals and objectives of the City of Clearwater's Land Use policy is to maintain the residential character of the Keene Road corridor by limiting commercial development. Therefore, this parcel may be best utilized for residential development.

These potential land use reclassifications are for discussion purposes only. A change to existing zoning classifications requires a review and approval process that includes public hearings. Any changes to the existing land use and zoning classifications on airport property should adhere to the processes defined by the City of Clearwater.