



AIRPORT DEVELOPMENT ALTERNATIVES

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This section identifies and evaluates various airside development factors at ODO to meet the requirements set forth in the previous section. Airside facilities are, by nature, the focal point of an airport complex. Because of their primary role and the fact that they physically dominate airport land use, airfield facility needs are often the most critical factor in the determination of viable development options. Each functional area interrelates and affects the development potential of the others. Therefore, all areas are examined individually, and then coordinated as a whole, to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors on the airport must be evaluated to determine if the investment in ODO will meet the aviation needs of Ector County and the region, both during and beyond the 20-year planning period.

The alternatives to follow will examine airside improvement opportunities to meet design standards and/or capacity constraints. The primary airside planning issues to be considered in this alternatives analysis are:

- Continuation of the three-runway system or potential closure of one runway, based upon best runway alignments as determined by wind coverage and surrounding land uses
- Meet ultimate RDC C-III-2400 design standards on the primary runway and B-II-5000 design standards on the crosswind and/or 'additional' runway
- Runway extension options to better accommodate turboprop and business jet operations
- Obstruction mitigation in existing/ultimate safety areas (RSA and ROFA) and incompatibility analysis in existing/ultimate RPZs
- Property acquisition (in fee or avigation easement) to maintain control of safety areas (in all forms) for the existing/ultimate condition
- Corrective measures for non-standard taxiway geometry (direct access, high-energy crossings, acute-angled intersections, non-standard holding bays, non-standard taxiway fillets)
- Added/upgraded airfield navigation and lighting equipment
- New and/or improved instrument approach capability

RUNWAY SYSTEM

A primary consideration of this study is an evaluation of the continued need for the existing three-runway system. As outlined in previous sections, the current three-runway system at ODO is being evaluated to determine if three runways are necessary/justified or if a two-runway system is a more appropriate layout. The FAA will not support two crosswind runways, nor will they support a third (additional) runway unless there is enough operational demand to justify it. TxDOT/FAA currently consider only Runways 11-29 and 16-34 eligible for grant funding, while Ector County funds maintenance and improvements to Runway 2-20 (not currently eligible for grant funding).



Exhibit 26, included previously, depicted wind coverage provided by each runway pair during all-weather and IFR conditions. At ODO, a crosswind runway is justified per FAA design standards as no singular runway alignment affords adequate wind coverage (i.e., greater than 95 percent crosswind component); however, a third runway is not justified for federal/state grant funding support. When considering a two-runway system, the best overall wind coverage is provided by the combination of Runway 11-29 and Runway 2-20, which provides 96.37 percent coverage in 10.5-knot conditions and greater than 99.02 percent coverage in 13-knot and above conditions. The next best pairing is Runway 16-34 and Runway 2-20, which provides for 95.25 percent coverage in 10.5-knot conditions and more than 97.85 percent in 13-knot and greater conditions. The combination of Runway 11-29 and Runway 16-34 provides just 91.83 percent coverage in 10.5-knot conditions, which does not meet the 95 percent coverage requirement for 10.5 knots. Thus, this pairing would not be eligible to be selected for federal/state funding since a third runway would still be needed, and two other two-runway pairing options can meet the standard.

The alternatives to follow will include dual runway scenarios that maintain Runways 11-29 and 2-20 and Runways 16-34 and 2-20, as well as the current three-runway system with the understanding that Ector County could continue funding maintenance for the additional runway. A dual runway system maintaining Runway 11-29 and Runway 16-34 is not being considered as this runway pair does not provide the minimum 95 percent wind coverage required by the FAA.

PRIMARY RUNWAY

No singular runway offers significantly better wind coverage than the others at ODO. Historically, two runways have served in the role as the “primary” runway, with Runway 11-29 currently in the role. Selection of the primary runway is important as it will generally have greater funding support and better instrument approach capabilities. As noted, Runway 11-29 is considered the primary runway. It offers the longest and widest operational surface, the lowest approach minimums, and has the most sophisticated visual and navigational aids (i.e., PAPI-4s and MALS on each runway end). However, as shown on **Exhibits 4 and 26**, Runway 11-29 also has the least favorable alignment of the three available, providing only 77.51 percent wind coverage for 10.5-knot crosswind components and 87.44 percent for 13-knot components. Conversely, Runway 16-34 offers 86.87 percent coverage (10.5-knot conditions) and 92.30 percent coverage (13-knot conditions), while Runway 2-20 provides for 87.00 percent coverage (10.5-knot conditions) and 93.43 percent coverage (13-knot conditions).

Based on wind coverage alone, Runway 11-29 is not best oriented to serve as the primary runway. However, other factors must also be considered, including safety area implications, previous investments in the runway, future investments that would be necessary should Runway 16-34 or Runway 2-20 be designated as primary instead, surrounding land uses, and future development opportunities (i.e., extension potential and improved instrument approach capability).

As discussed previously, the primary runway at ODO should be designed to meet C-III-2400 standards in the ultimate condition. Runway 11-29 currently meets these design standards for width (100 feet wide) and safety areas (RSA and ROFA), with the exception of a very small portion of the ROFA that extends beyond airport property to the east and is obstructed by the perimeter fence. There are also incompatible land uses located within the Runway 11 and Runway 29 RPZs (refer to **Exhibit 25**).



Runways 16-34 and 2-20 are both 75 feet wide, not meeting the 100-foot width requirement for an ultimate C-III-2400 runway. In terms of safety area requirements, neither Runway 16-34 nor Runway 2-20 can meet the ultimate C-III RSA/ROFA requirements without significant impacts to surrounding land uses including residential/business, Yukon Road, and Andrews Highway. None of these land uses are allowable within the RSA or ROFA and would need to be removed or declared distances implemented in order to maintain full safety areas. Declared distances function to identify the runway length which is available while meeting the full safety areas for certain operations and will be discussed in more detail later.

Runway 11-29 has also had significant historical investments in the form of pavement, lighting, and nav aids. Decommissioning this runway or reclassifying it as the crosswind could negate many of these benefits and could potentially conflict with grant assurances that the airport sponsor agreed to when federal/state funds were accepted for improvements to the runway.

Finally, the development potential of each runway must also be considered. Runways 11 and 20 offer the best opportunities for extension when factoring surrounding constraining factors. Similarly, the potential for improved instrument approach capability is best on Runways 29 and 20 when considering surrounding land uses.

AIRFIELD DESIGN STANDARDS

ODO is classified as a Regional GA airport in the NPIAS, which means it has a high level of activity, including activity by turboprops and business jets. Thus, the airfield should be designed to accommodate the most demanding regular users of these types of aircraft. As mentioned, the primary runway should meet C-III-2400 design standards, which is reflective of the type of aircraft expected to use the airport most frequently as well as the instrument approach capability. Alternatives to follow will consider safety area impacts as they relate to these standards with the addition of a non-precision GPS approach with ½-mile visibility minimums. For the secondary and/or additional runway, B-II-5000 standards will be depicted on each of the alternatives.

RUNWAY LENGTH

The runway length analysis conducted in the facility requirements section concluded that 100 percent of small aircraft in the national fleet can comfortably operate at maximum takeoff weight (MTOW) during the hottest periods of the summer. However, ODO also regularly serves turboprop and jet traffic, which could require longer runway lengths. To accommodate 75 percent of the business jet fleet at 60 percent useful load, a runway length of 5,800 is recommended, while a length of 7,600 feet is recommended to accommodate 100 percent of the fleet at 60 percent useful load. The projected ultimate critical aircraft, the Gulfstream V, has been calculated to need 6,280 feet of pavement to take off at 70 percent useful load and 6,960 feet to take off at 80 percent useful load during the hottest times of the year at ODO.



A runway extension must also consider impacts to the runway's associated safety areas and RPZs. FAA design standards state that the RSA must be cleared and graded, and the ROFA must be cleared of obstructions. The RPZ off each runway end should also be free of incompatible land uses. The alternatives will present various extension options as well as mitigative actions to eliminate any obstructions or incompatibilities introduced by any proposed runway extension project.

INSTRUMENT APPROACH CAPABILITY

Another issue to be examined is the ultimate instrument approach capability serving the runway system. This is an important consideration that directly impacts the utility of the airport, with lower visibility minimums increasing the functionality of an airport during instrument meteorological conditions (IMC). Although achieving the lowest instrument approach visibility minimums is advantageous for airport operations, there are multiple safety area requirements tied to the level of instrument approach available. As a result, impacts to the airport environment imposed by the ultimate instrument approach visibility minimums need to be weighed carefully.

Currently, ODO offers published instrument approaches to Runway ends 11, 29, and 20. The lowest visibility minimums are provided on each end of Runway 11-29 via the GPS LPV approaches that offer not lower than $\frac{3}{4}$ -mile minimums. Runway 20 provides a GPS LNAV approach with visibility minimums not lower than 1-mile. The airport sponsor and pilots who use ODO have indicated a strong desire for improved instrument approach capability, including the addition of instrument approach procedures to runways not currently offering an approach. As such, each of the alternatives will illustrate new and/or improved instrument approach capabilities, along with associated increases to safety areas (including RPZs) and any mitigative actions necessary to keep these areas in conformance with FAA design standards.

LAND USE

Airport property currently encompasses approximately 790 acres with existing landside facilities concentrated on the west and northwest sides of the field. A significant portion of airport property is undeveloped, with most of this area located on the north, east, and south sides. If the airport sponsor elects to decommission one of the runways, additional property will become available for development opportunities.

Each of the alternatives to follow will depict land use reserve areas that are focused on separating activity levels and maximizing revenue potential from both aeronautical and non-aeronautical land uses. Aeronautical-related uses are typically reserved for property with direct access to the airfield. For property that is segregated from the airfield, an airport should consider non-aeronautical related development. The FAA typically requires airports to receive approval through a land-use release to lease airport-owned land for non-aviation related purposes. The FAA stipulates that all land with reasonable airside access should be used or reserved for aviation purposes. Currently, there are two non-aeronautical enterprises operating on airport property which should be considered for release, and each of the alternatives will reflect this.

In the next section, Recommended Development Concept, specific layouts for hangar development, aircraft parking apron areas, marked aircraft parking, and other landside facilities will be depicted.



AIRPORT ALTERNATIVE 1

Depicted on **Exhibit 31**, Airport Alternative 1 considers a dual runway system that maintains Runway 11-29 as the primary runway, with Runway 2-20 serving as the crosswind runway. Runway 16-34 is proposed to be closed under this alternative. The alternative also includes a 600-foot northwesterly extension to Runway 11-29, reconfiguration of taxiway geometry, and proposed modifications to bring safety areas into compliance with FAA design standards based on the ultimate runway design code (RDC) for each runway. Primary actions associated with this alternative include:

- **Decommission Runway 16-34** — In all weather conditions, the combined wind coverage for Runway 11-29 and Runway 2-20 is 96.37 percent for 10.5-knot crosswind components and greater than 99.02 percent for 13-knot and greater crosswind components²³, thus meeting the FAA’s minimum of 95 percent coverage. With the runway pair of 11-29 and 2-20 providing greater than 95 percent wind coverage, Runway 16-34 would be considered an additional runway by the FAA and thus would not be eligible for federal funding assistance. As mentioned previously, the airport sponsor (Ector County) currently provides funding for the maintenance of Runway 2-20. Under this alternative, Runway 2-20 would become eligible for grant funding assistance as the crosswind runway, while Runway 11-29 would continue to be eligible for funding as the primary runway.
- **Extend Runway 11-29 by 600 feet to the northwest** — To better accommodate the larger jet traffic anticipated to occur at ODO in the future, Airport Alternative 1 proposes a 600-foot extension to Runway 11, bringing the total runway pavement length to 6,800 feet. This is the maximum extension that can be accomplished on this runway while keeping the majority of the RSA and ROFA on existing airport property and without impacting the surrounding road network or implementing declared distances to maintain standard RSA/ROFA (to be discussed). A 0.3-acre portion of the ROFA is proposed to be acquired in fee, as shown on the exhibit.

As stated previously, justification in the form of 500 annual itinerant operations must be present before grant funding assistance will be provided for a runway extension project. While that need may not exist today, planning for the potential is still important so local land use planning measures can be implemented to allow for the extension should demand materialize.

Additional projects related to the proposed extension of Runway 11-29 include an extension of Taxiway G to the Runway 11 threshold, as well as relocation of the MALS and PAPI-4 currently serving Runway 11.

- **Increase pavement strength on Runways 11-29 and Runway 2-20** — The Facility Requirements identified a potential need to increase the pavement strength on the airport’s primary and crosswind and/or additional runways in anticipation of larger, heavier aircraft operating more frequently at the airport in the future. This alternative considers a pavement strength increase to 100,000 pounds DWL on Runway 11-29 and 30,000 pounds DWL on Runway 2-20.

²³ Refer to Exhibit 26.



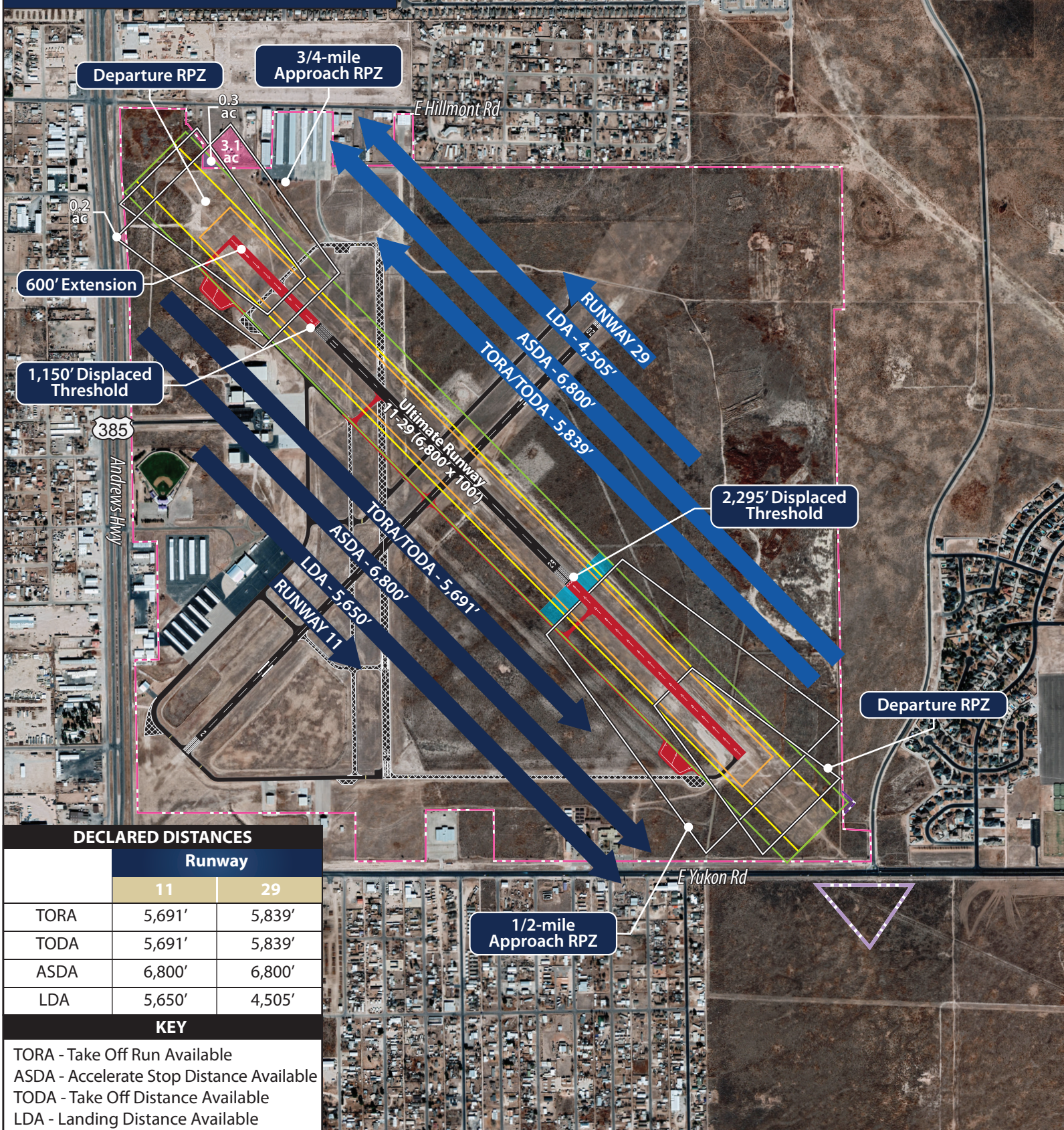
- **Mitigate non-standard conditions in the ultimate ROFAs** — As detailed in the Facility Requirements section, when Runway 11-29 transitions to ultimate RDC C-III-2400, the RSA and ROFA dimensions will increase. A small portion of the ultimate ROFA at the Runway 29 end (approximately 0.05 acres) extends beyond airport property and is proposed to be acquired in fee. The expanded ROFA will also encompass the airport’s perimeter fencing, which is a non-standard condition. As such, this alternative plans for the fencing to be relocated in this area. Additionally, the wind cones adjacent to Runway 2-20 are located within that runway’s ROFA. This alternative proposes relocating the wind cones outside of the Runway 2-20 ROFA.
- **Improve instrument approach capability** — Currently, Runway 11-29 offers the airport’s lowest visibility minimums, with ¾-mile GPS LPV approaches to both ends of the runway. Runway 20 also provides an LNAV approach with 1-mile visibility minimums. Airport Alternative 1 proposes lower visibility minimums to Runway 29 through the implementation of a non-precision LPV approach with minimums not lower than ½-mile. To achieve this, the existing medium intensity approach light system (MALS) equipment on Runway 29 would need to be upgraded to a MALSR, which is a MALS with runway alignment indicator lights. The alternative also includes implementation of a GPS approach with 1-mile visibility minimums to Runway 2. The existing instrument approach procedures to Runways 11 and 20 are planned to remain at ¾-mile and 1-mile, respectively.
- **Upgrade visual approach aids** — Runway 11-29 is currently equipped with a PAPI-4 on both ends, while Runway 2-20 has a VASI system at each end of the runway. This alternative plans for the PAPI-4s on Runway 11-29 to remain and for the VASIs on Runway 2-20 to be upgraded to a PAPI-2 system. Neither Runway 11-29 or 2-20 are equipped with REILS; however, as Runway 11 is equipped with a MALS and Runway 29 is planned to be equipped with a MALSR, REILS are not necessary for this runway. Runway 2-20 does not have an approach light system, so this alternative plans for the installation of REILS on both ends of this runway.
- **Reconfigure taxiways** — As detailed in the Facility Requirements, there are several instances of non-standard geometry on the existing taxiway system, including direct access, acute-angle intersections, and high energy crossings. The proposed closure of Runway 16-34 and its associated taxiways, as depicted on **Exhibit 31**, will alleviate some of these issues. The remaining non-standard conditions are proposed to be mitigated through the construction of new taxiway pavement and the inclusion of a no-taxi island at the entrance to Taxiway E.

Airport Alternative 1 proposes construction of a full-length parallel Taxiway G serving Runway 11-29, with new right-angle connectors to serve as runway exits. The existing portions of Taxiway G that connect to each end of Runway 16-34 are planned to be closed. The portion of Taxiway F that extends beyond the Runway 34 threshold and connects to Runway 29 is also planned to be closed.

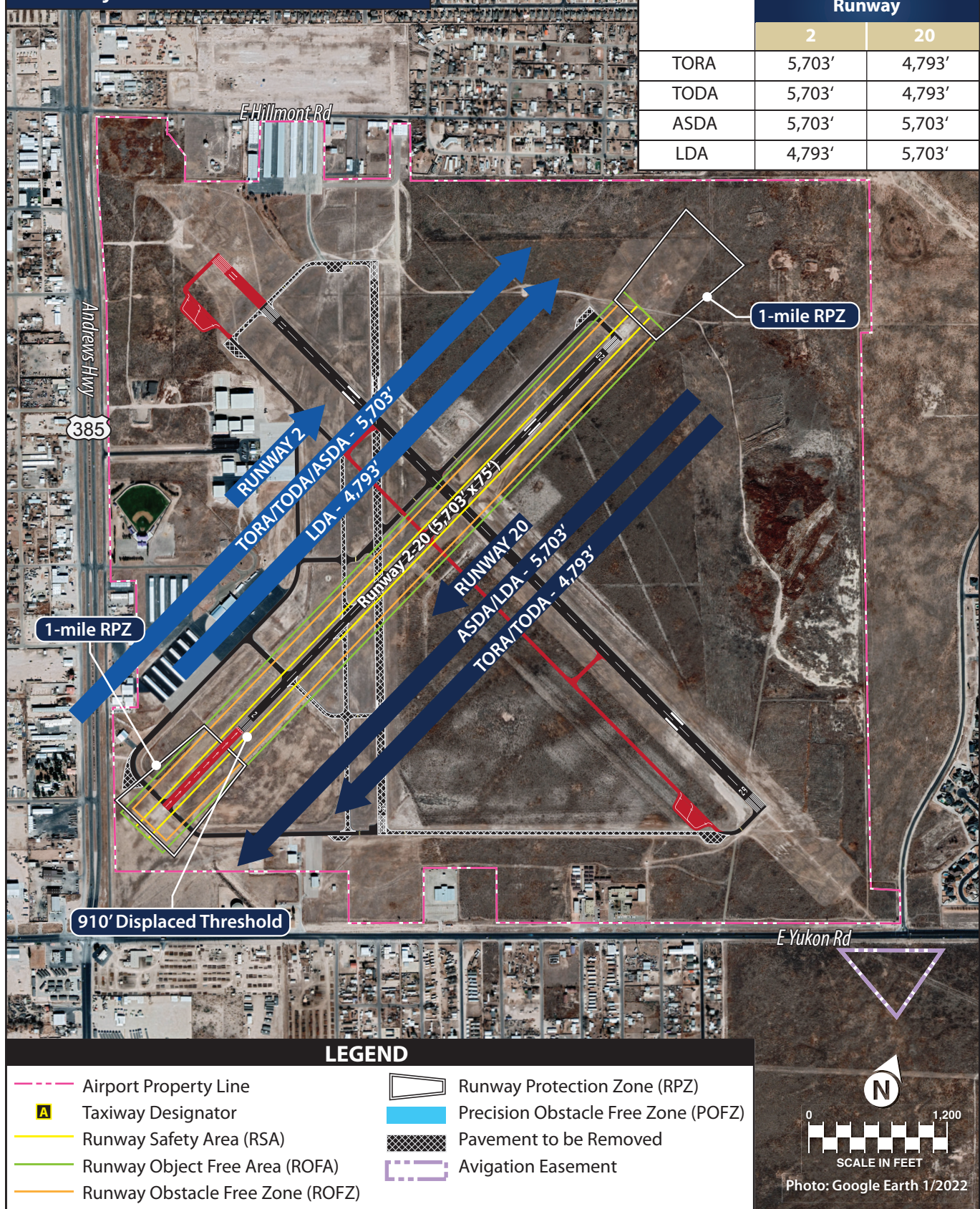
The airport currently has holding bays at each end of Runways 11-29 and 2-20. These are a traditional design featuring wide, unmarked pavement. The FAA’s preferred design for hold bays includes clearly marked entrance/exits with independent parking areas that are either separated by islands or are clearly marked with centerlines to allow aircraft to safely bypass each other. Airport Alternative 1 includes the construction of standard hold bays at each end of Runway 11-29 and the removal of non-standard hold bay pavement on the airport.



Runway 11-29 Declared Distances



Runway 2-20 Declared Distances





- **Installation/upgrade of airfield lighting and marking** — Both Runways 11-29 and 2-20 are equipped with MIRL. This alternative plans for this level of runway lighting to be maintained, with additional MIRL on the extended portion of Runway 11-29. There is currently no taxiway lighting at ODO; as such, Airport Alternative 1 plans for the addition of MITL on all taxiways. In accordance with the proposed ½-mile LPV approach to Runway 29, precision markings are proposed on Runway 29. While the approach is considered a non-precision approach (i.e., not an ILS approach), precision markings are required for any runway with visibility minimums below ¾-mile. The additional markings for Runway 29 include touchdown zone and edge markings. The existing non-precision markings on Runway 2-20 are planned to remain.
- **Reserve portions of airport land use for future aeronautical/non-aeronautical development** — The right side of **Exhibit 31** illustrates proposed land uses within the existing airport property. A variety of aviation uses are planned along the flight lines of Runway 11-29 and Runway 2-20, with specific development types concentrated on the west and south sides of the airport where current infrastructure is located. These include parcels earmarked for large scale SASO/MRO development, executive hangar development, T-hangar development, and small aircraft facilities (shade hangars, uncovered parking aprons). This alternative also plans for future reserve areas, primarily on the undeveloped north and east portions of airport property. Areas along the flight lines are reserved for future aeronautical development, while a portion of property adjacent to Dawn Avenue is proposed for non-aeronautical development. As mentioned, specific hangar and apron layouts will be depicted in the next section, Recommended Development Concept.

As previously discussed, the RPZs associated with Runways 11, 29, and 2 extend beyond airport property and encompass incompatible land uses in both the existing and ultimate conditions. Unless there is a significant change to the runway environment, the FAA may allow certain land uses to remain, but as a general rule, any uses that attract people to remain for periods of time should be mitigated. As Runway 11-29 is planned for a significant change (i.e., extension, change in RDC, lower approach minimums), the airport sponsor is expected to take actions to mitigate incompatible uses within the RPZs.

The reverse side of **Exhibit 31** depicts a secondary option (Airport Alternative 1B) to mitigate RPZ incompatibilities for both runways. This option considers the displacement of the runway thresholds for Runways 11, 29, and 2 to remove incompatible land uses within these runways' RPZs. This would be achieved by the application of declared distances. The Runway 11 RPZ can be shifted off potentially incompatible land uses (Andrews Highway, Hillmont Rd., and commercial/industrial land uses) by displacing the Runway 11 threshold by 1,150 feet. Similarly, the Runway 29 and Runway 2 thresholds could be displaced by 2,295 feet and 910 feet, respectively, to bring those RPZs onto airport property and mitigate any potential incompatibilities. While the impact to the airfield in terms of earthwork and construction would be minimal as compared to other alternatives to be presented, the usable length of the runway would be lessened for some operations due to the implementation of declared distances.

Declared distances are used to define the effective runway length for landing and takeoff when a standard safety area cannot be achieved. The declared distances are defined by the FAA as:

- **Takeoff run available (TORA)** — The runway length declared available and suitable for the ground run of an aircraft taking off (factors in the positioning of the departure RPZ)



- **Takeoff distance available (TODA)** — The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA; the full length of the TODA may need to be reduced because of obstacles in the departure area
- **Accelerate-stop distance available (ASDA)** — The runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff (factors in the length of RSA/ROFA beyond the runway end)
- **Landing distance available (LDA)** — The runway length declared available and suitable for landing an aircraft (factors in the length of RSA/ROFA beyond the runway end and the positioning of the approach RPZ)

Table 35 and the reverse side of **Exhibit 31** details the runway length available during takeoff and landing operations with these declared distances in place. Note that TODA may be reduced further following FAA airspace analysis.

TABLE 35 | Declared Distances for Alternative 1B

	Runway 11	Runway 29	Runway 2	Runway 20
Takeoff Run Available (TORA) ¹	5,691'	5,839'	5,703'	4,793'
Takeoff Distance Available (TODA) ²	5,691'	5,839'	5,703'	4,793'
Accelerate Stop Distance Available (ASDA) ³	6,800'	6,800'	5,703'	5,703'
Landing Distance Available (LDA) ³	5,650'	4,505'	4,793'	5,703'

¹ Departure RPZ begins 200 feet from the end of the TORA.

² TORA cannot be longer than TODA. Departure surface is set on TODA. TODA can be shortened to mitigate departure surface penetrations; if so, TORA is shortened, too.

³ Available runway length plus RSA. Approach RPZ begins 200 feet from the landing threshold.

Source: FAA AC 150/5300-13B, Airport Design; Coffman Associates analysis

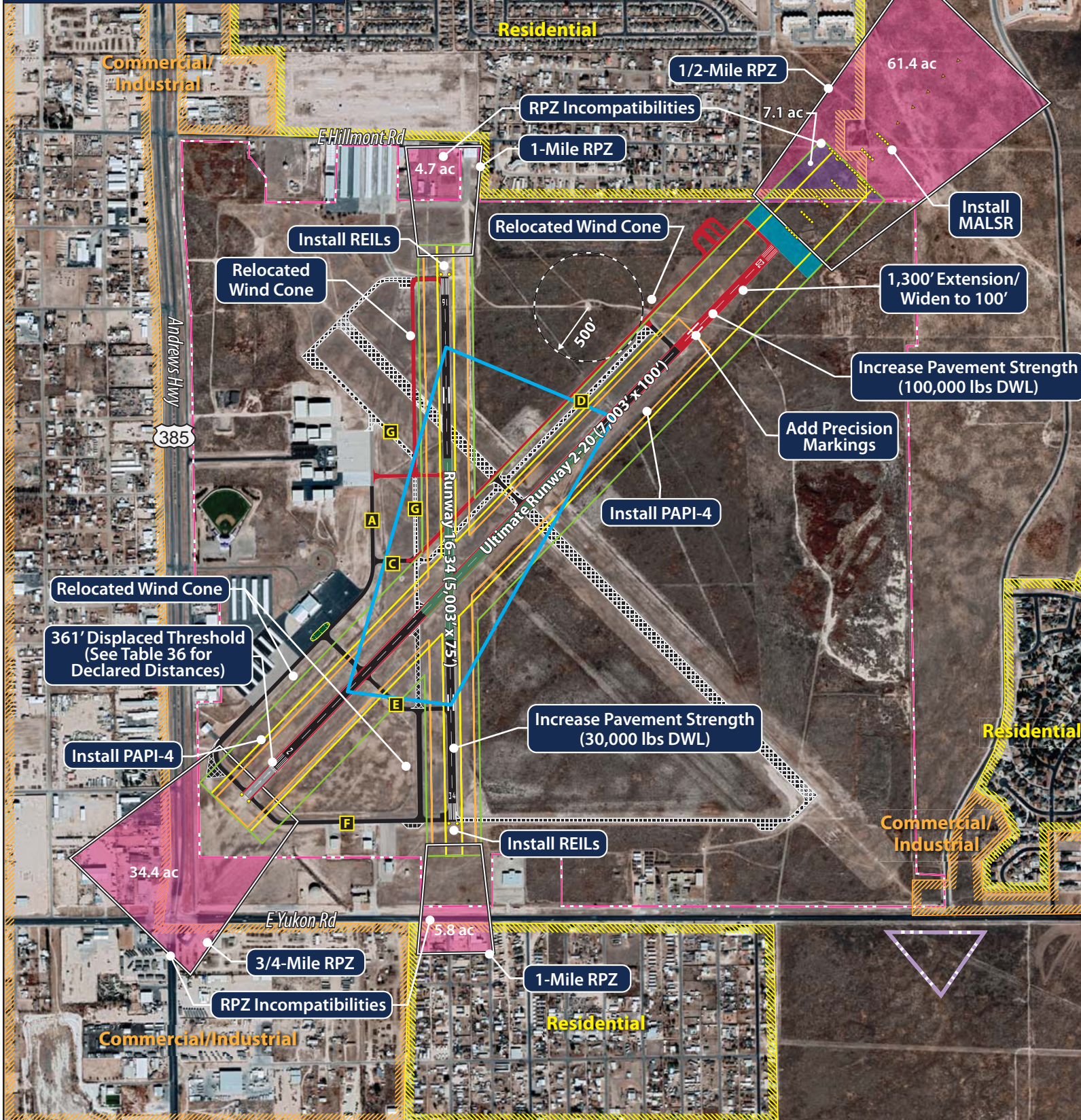
With declared distances in effect, RPZs for both Runways 11-29 and Runway 2-20 would be fully contained on airport property and would not encompass any incompatible land uses. However, there would be negative impacts to takeoff and landing operations for both runways. For aircraft taking off on Runway 11, pilots would have 5,691 feet of available runway, and 5,650 feet for pilots landing on Runway 11. Takeoff length would be reduced for pilots departing via Runway 29, with 5,839 feet of available runway length. For aircraft operating on Runway 2-20, pilots taking off from Runway 2 would have the full runway length available but landing operations would be reduced to 4,793 feet. Pilots departing from Runway 20 would have 4,793 feet of available runway, while the full runway length of 5,703 feet would be available for landing operations on Runway 20. Alternative 1B fully meets FAA design standards pertaining to RPZ incompatibilities, but the drawback to this is a reduction in usable runway length, making it more restrictive to intended users, such as business jets.

Another option to bring RPZs into compliance without having to implement declared distances is to purchase property within the RPZ and remove incompatible land uses (i.e., public roads and structures). If it is not practicable to take these steps, the airport sponsor is expected to complete and submit an Alternatives Evaluation to the FAA ADO to demonstrate that mitigative measures have been analyzed.

AIRPORT ALTERNATIVE 2

Airport Alternative 2, depicted on **Exhibit 32**, illustrates a second option for a dual runway system. Under this alternative, Runways 2-20 and 16-34 are proposed to be maintained and Runway 11-29 is proposed to be decommissioned. Primary actions associated with this alternative include:

Runway 2-20 RDC: C-III-2400
Runway 16-34 RDC: B-II-5000



AIRPORT LAND USE LEGEND

- T-Hangar Development Reserve
- Executive Hangar Development Reserve
- Aeronautical Development Reserve
- Non-Aeronautical Development Reserve/Release
- Large Scale SASO/MRO Development Reserve



LEGEND

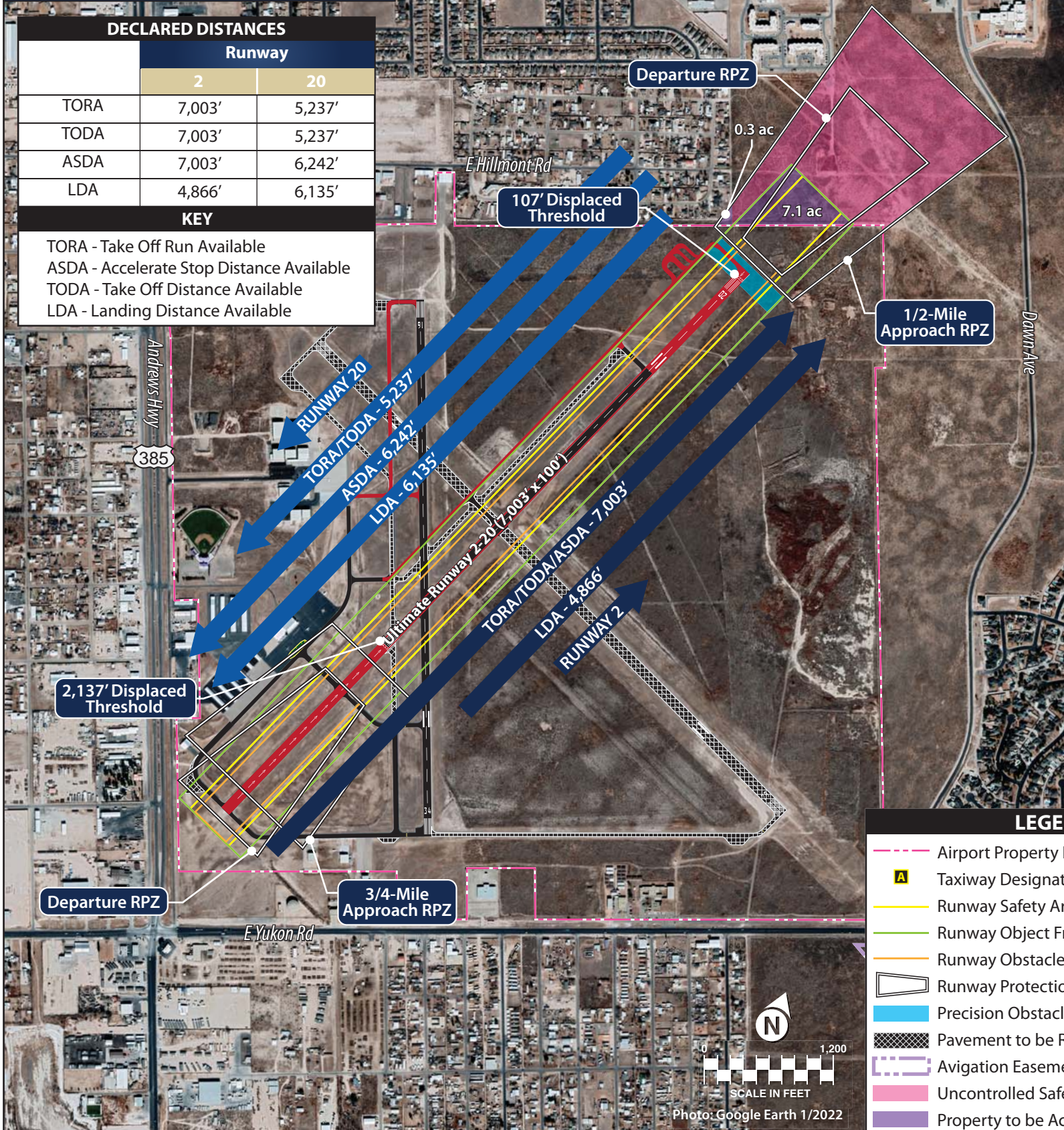
- Airport Property Line
- Taxiway Designator
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Visibility Zone (RVZ)
- 35' Building Restriction Line (BRL)
- ASOS Critical Area
- Runway Protection Zone (RPZ)
- Uncontrolled Safety Areas
- High Energy Area
- Precision Obstacle Free Zone (POFZ)
- Pavement to be Removed

Note: Acreages are approximations and are intended for planning purposes only.

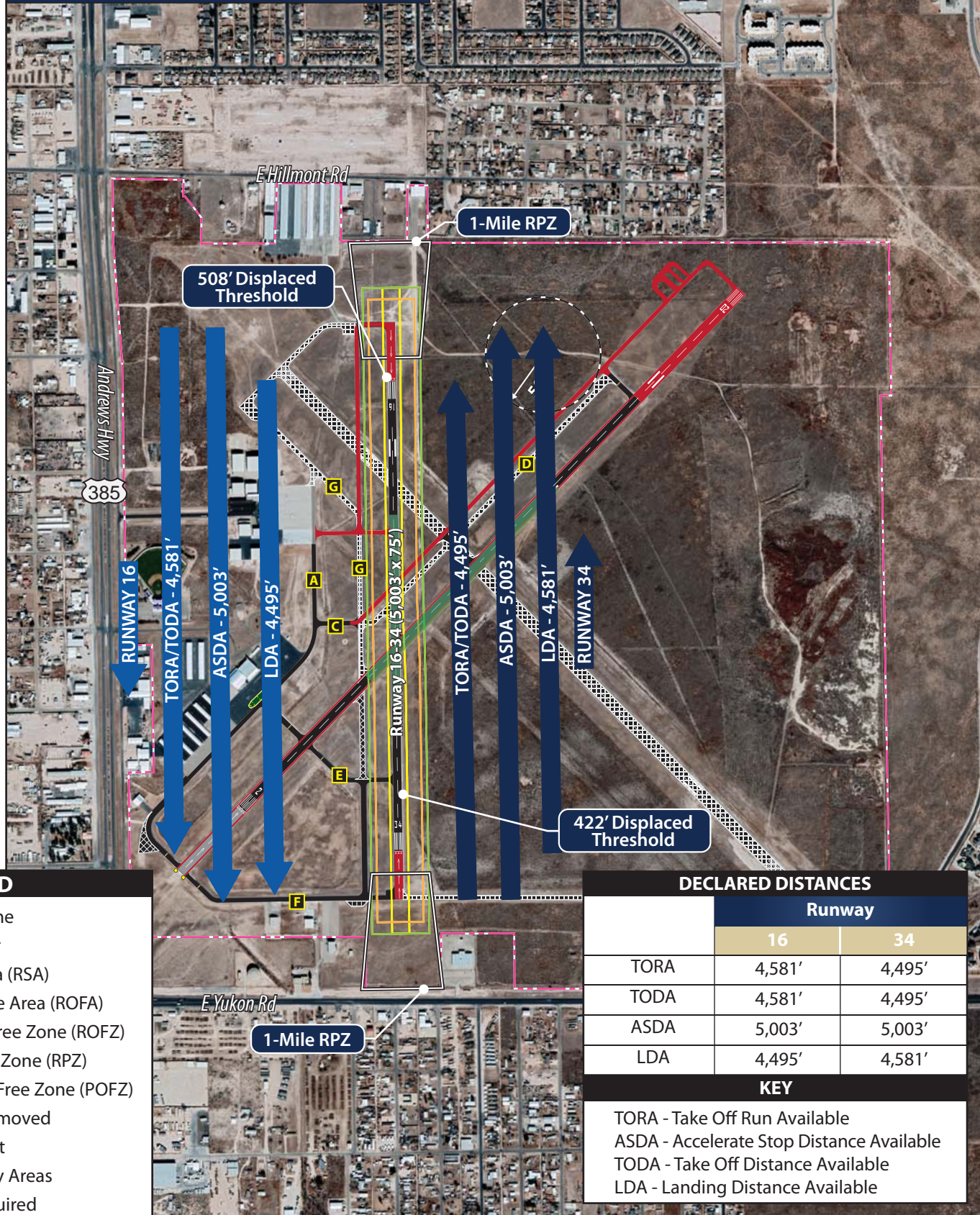
Runway 2-20 Declared Distances

DECLARED DISTANCES		
	Runway	
	2	20
TORA	7,003'	5,237'
TODA	7,003'	5,237'
ASDA	7,003'	6,242'
LDA	4,866'	6,135'

KEY
 TORA - Take Off Run Available
 ASDA - Accelerate Stop Distance Available
 TODA - Take Off Distance Available
 LDA - Landing Distance Available



Runway 16-34 Declared Distances



LEGEND

- Airport Property Line
- A Taxiway Designator
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Precision Obstacle Free Zone (POFZ)
- Pavement to be Removed
- Aviation Easement
- Uncontrolled Safety Areas
- Property to be Acquired

DECLARED DISTANCES		
	Runway	
	16	34
TORA	4,581'	4,495'
TODA	4,581'	4,495'
ASDA	5,003'	5,003'
LDA	4,495'	4,581'

KEY
 TORA - Take Off Run Available
 ASDA - Accelerate Stop Distance Available
 TODA - Take Off Distance Available
 LDA - Landing Distance Available



- **Decommission Runway 11-29** — In all weather conditions, the combined wind coverage for Runway 2-20 and Runway 16-34 is 95.25 percent for 10.5-knot crosswind components and greater than 97.85 percent for 13-knot and greater components²⁴, thus meeting the FAA’s minimum of 95 percent coverage. As with Airport Alternative 1, a third runway would be considered an ‘additional’ runway by the FAA and would not be eligible for federal funding assistance. Under this alternative, both Runway 2-20 and Runway 16-34 would be eligible for federal funding assistance.

As Runway 11-29 is currently the longest and widest runway with the best instrument approach capability, as well as approach lighting systems on both ends, significant modifications would be necessary to bring another of ODO’s runways up to the same level of service currently provided by Runway 11-29. Runway 2-20 offers the best potential for this as it is less constrained than Runway 16-34. Therefore, Airport Alternative 2 will consider Runway 2-20 as the primary runway meeting RDC C-III-2400 standards, with Runway 16-34 serving as the crosswind and meeting B-II-5000 design standards.

- **Extend Runway 2-20 1,300 feet to the north and increase width** — Airport Alternative 2 proposes a 1,300-foot extension to Runway 20, bringing the total runway length to 7,003 feet. In order to meet ultimate RDC C-III-2400 design standards for runway width, the alternative also includes a plan to widen the runway to 100 feet. At these dimensions, Runway 2-20 will be capable of safely accommodating all piston aircraft and many of the turboprop and business jet aircraft that currently, and are anticipated to, use the airport.
- **Increase pavement strength on Runways 2-20 and Runway 16-34** — Like the previous alternative, Airport Alternative 2 plans for pavement strength increases for both the primary and crosswind runways. As such, this alternative considers a pavement strength increase to 100,000 pounds DWL on Runway 2-20 and 30,000 pounds DWL on Runway 16-34.
- **Mitigate non-standard conditions in the ultimate RSA/ROFA** — With Runway 2-20 being proposed as the primary runway and meeting ultimate RDC C-III-2400, the RSA and ROFA dimensions will increase. At the Runway 20 end, the RSA and ROFA extend beyond the airport’s existing property line, with approximately 7.1 acres uncontrolled. This alternative proposes fee simple acquisition of this property, which is undeveloped, as the FAA requires the airport sponsor to maintain ownership and control over the RSA and ROFA.

At the Runway 2 end, a similar issue exists, with the RSA and ROFA extending beyond airport boundaries and encompassing adjacent roadways (Andrews Highway and Yukon Road) and businesses. An alternate option to owning this property outright and relocating roads and structures is to displace the threshold and implement declared distances in order to provide the full RSA and ROFA. Airport Alternative 2A on the front side of **Exhibit 32** proposes to displace the Runway 2 threshold by 361 feet and implement the declared distances outlined in **Table 36** to bring these safety areas onto airport property:

²⁴ Refer to Exhibit 26.



TABLE 36 | Declared Distances for Alternative 2A

	Runway 2	Runway 20
TORA	7,003'	7,003'
TODA	7,003'	7,003'
ASDA	7,003'	6,242'
LDA	6,642'	6,242'

Source: FAA AC 150/5300-13B, Airport Design; Coffman Associates analysis

With a 361-foot displaced threshold on Runway 2, pilots taking off from Runway 2 would have the full 7,003 feet of runway pavement available, while landing operations on Runway 2 would be reduced to 6,642 feet. Pilots taking off from Runway 20 would also have the full runway length available, except during a rejected takeoff, where the ASDA is shortened to 6,242 feet. Landing operations on Runway 2 are also reduced to 6,242 feet of available pavement. **Exhibit 33** illustrates these declared distances in graphic form.

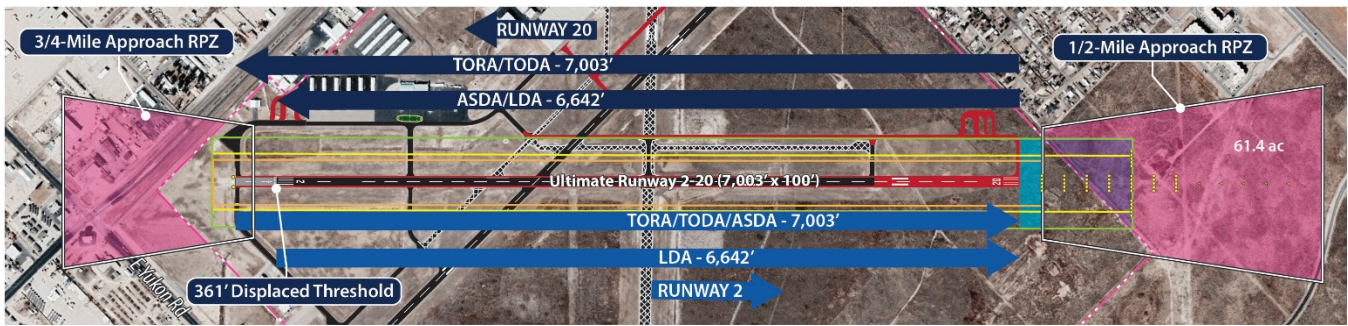


Exhibit 33 – Runway 2-20 Declared Distances (Alternative 2A)

It should be noted that this displacement does not allow for the Runway 2 RPZ to be contained on airport property. If this property cannot be purchased fee simple and incompatible land uses removed, additional displacement may be necessary (to be discussed as Alternative 2B at the end of this section).

Airport Alternative 2 also proposes the relocation of additional obstructions, including the wind cones at the ends of Runways 2-20 and 16-34, as well as the perimeter fencing at the extended Runway 20 end.

- Improve instrument approach capability** — Currently, this runway pair offers just one instrument approach, with Runway 20 providing an LNAV approach with 1-mile visibility minimums. Runways 2 and 16-34 are visual runways. Airport Alternative 2 proposes lower visibility minimums to Runway 20 through the implementation of an LPV GPS approach which could provide minimums down to ½-mile. As with the previous alternative, installation of a MALSR on Runway 20 is planned in order to achieve this approach, along with precision markings. Runway 2 is planned for a GPS approach with visibility minimums down to ¾-mile. GPS approaches with 1-mile visibility minimums are proposed for both ends of Runway 16-34. No additional ground-based equipment is needed for the proposed instrument approaches to Runway 16-34.



- **Upgrade visual approach aids** — Runway 2-20 is currently equipped with a VASI system on each end, while Runway 16-34 is equipped with PAPI-2. This alternative proposes PAPI-4s to replace the VASIs on Runway 2-20 and the existing PAPI-2 system on Runway 16-34 to remain. Neither runway is equipped with REILs. As such, REILs are proposed for runways not being planned for a more sophisticated approach lighting system (i.e., the MALSR planned for Runway 20), as indicated on **Exhibit 32**.
- **Reconfigure taxiways** — Like the previous alternative, Airport Alternative 2 plans for modification to the taxiway system to correct instances of non-standard taxiway geometry. The proposed closure of Runway 11-29 under this alternative alleviates some of these issues; however, additional changes are proposed to provide for more efficient aircraft movements while meeting FAA design standards.

With Runway 2-20 functioning as ODO’s primary runway, the existing 300-foot runway-taxiway separation between 2-20 and Taxiway D does not meet ultimate RDC C-III-2400 design standards. The standard for this RDC is 400 feet, so this alternative proposes construction of new taxiway pavement to serve much of Runway 2-20, with a standard hold bay planned at the Runway 20 end. The segmented circle and lighted wind cone located near the juncture of Runways 2-20 and 11-29 is proposed to be relocated to the west to accommodate the relocated parallel taxiway. A new partial-parallel taxiway is also planned for Runway 16-34, with a new connector planned to provide access to the terminal apron. Two no-taxi islands are planned at the entrance to this proposed connector and at the entrance to Taxiway E to eliminate the direct access presented by these alignments.

- **Installation/upgrade of airfield lighting and marking** — Both Runways 2-20 and 16-34 are equipped with MIRL. This alternative plans for this level of runway lighting to be maintained, with additional MIRL on the extended portion of Runway 2-20. There is currently no taxiway lighting at ODO, so this alternative plans for the addition of MITL on all taxiways. In accordance with the proposed ½-mile LPV approach to Runway 29, precision markings are proposed on Runway 20. These markings include the addition of touchdown zone and edge markings. The existing non-precision markings on Runway 16-34 are planned to remain.
- **Reserve portions of airport land use for future aeronautical/non-aeronautical development** — Similar to Airport Alternative 1, the right side of **Exhibit 32** illustrates proposed land uses within the existing airport property. On the east side of the airport, approximately 235.2 acres of property along the Runway 2-20 and 16-34 flight line is proposed for aeronautical development reserve, along with more than 130 acres earmarked for non-aeronautical reserve. On the west side of the airport, a variety of aviation uses are planned, again with specific development types concentrated near current infrastructure.

Airport Alternative 2B on the reverse side of **Exhibit 32** shows a secondary option for mitigating potential RPZ incompatibilities associated with Runways 2-20 and 16-34. As Runway 2-20 is proposed to undergo a significant change under this alternative (i.e., extension, width increase, RDC transition to C-III-2400, and lower visibility minimums that increase the size of the RPZs), the airport sponsor is required to



demonstrate an effort to control land within the RPZ and mitigate incompatible uses. This option illustrates a greater displacement of Runway 2 (2,137 feet) to bring the RPZ onto airport property, along with a 107-foot displaced threshold on Runway 20 to shift the RPZ off of Dawn Avenue. As shown on the exhibit, a portion of the Runway 20 RPZ remains off airport property and should be controlled through fee simple acquisition or avigation easement. The 0.3-acre portion of the Runway 20 RPZ that encompasses a residential land use is proposed to be acquired in fee. **Table 37** details the declared distances that would be implemented to maintain standard RPZs on Runways 2-20 and 16-34.

TABLE 37 | Declared Distances for Alternative 2B

	Runway 2	Runway 20	Runway 16	Runway 34
TORA	7,003'	5,237'	4,581'	4,495'
TODA	7,003'	5,237'	4,581'	4,495'
ASDA	7,003'	6,242'	5,003'	5,003'
LDA	4,866'	6,135'	4,495'	4,581'

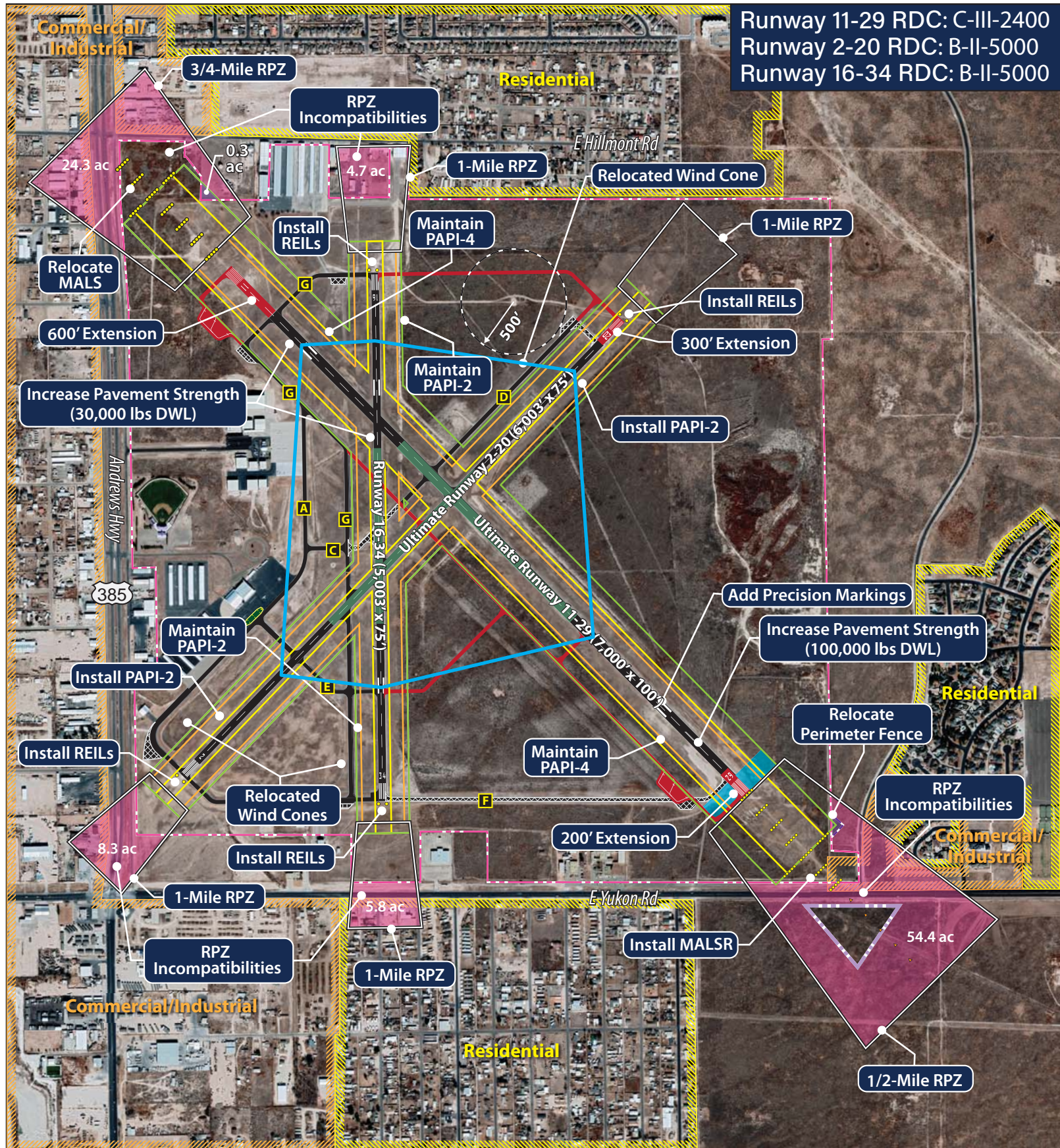
Source: FAA AC 150/5300-13B, Airport Design; Coffman Associates analysis

AIRPORT ALTERNATIVE 3

Airport Alternative 3, presented on **Exhibit 34**, illustrates a scenario in which all three runways are maintained. Under this alternative, Runway 11-29 is planned to meet ultimate RDC C-III-2400 standards and is considered the primary runway. Runway 2-20 would serve as the crosswind runway, meeting B-II-5000 design standards. Both runways would be eligible for federal funding assistance. Runway 16-34 is also proposed to meet B-II-5000 standards but would function as an ‘additional’ runway and would therefore be the responsibility of Ector County to maintain. Primary actions associated with this alternative include:

- **Extend Runway 11-29 600 feet to the northwest and 200 feet to the southeast** — Airport Alternative 3 proposes extensions to both ends of Runway 11-29 – a 600-foot extension to Runway 11 and a 200-foot extension to Runway 29, bringing the total runway length to 7,000 feet. Like Airport Alternative 1, the 600-foot extension to Runway 11 maintains the majority of the RSA and ROFA on existing airport property (except for a 0.3-acre portion), eliminating the need to modify the surrounding road network or implement declared distances to maintain control over these safety areas. However, the 200-foot extension to the Runway 29 end would require either a realignment of Yukon Road outside of these safety areas or the implementation of declared distances meet RSA/ROFA design standards (to be discussed). Other actions connected to the Runway 11-29 extension include new taxiway pavement and relocation of the approach lights and PAPI-4s serving both runway ends.
- **Extend Runway 2-20 300 feet to the north** — A 300-foot extension is also proposed to Runway 20, bringing the total runway length to 6,003 feet. As the crosswind runway, Runway 2-20 should be capable of safely accommodating most of aircraft that currently, and are anticipated to, use the airport, including more demanding turboprop and jet aircraft. As has been stated, runway extension projects must be justified before the FAA/TxDOT will participate in funding assistance. While justification to extend this runway may not currently exist, it is important to plan for this potential to ensure that appropriate land use measures are put into place to allow for the extension in the future if specific demand can be identified.

Runway 11-29 RDC: C-III-2400
 Runway 2-20 RDC: B-II-5000
 Runway 16-34 RDC: B-II-5000



AIRPORT LAND USE LEGEND

- Small Aircraft Facilities Reserve
- Non-Aeronautical Development Reserve/Release
- Executive Hangar Development Reserve
- Large Scale SASO/MRO Development Reserve
- Aeronautical Development Reserve



LEGEND

- Airport Property Line
- A Taxiway Designator
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Visibility Zone (RVZ)
- 35' Building Restriction Line (BRL)
- ASOS Critical Area
- Runway Protection Zone (RPZ)
- Uncontrolled Safety Areas
- High Energy Area
- Precision Obstacle Free Zone (POFZ)
- Pavement to be Removed
- Avigation Easement

Note: Acreages are approximations and are intended for planning purposes only.

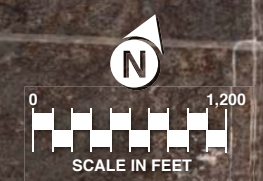
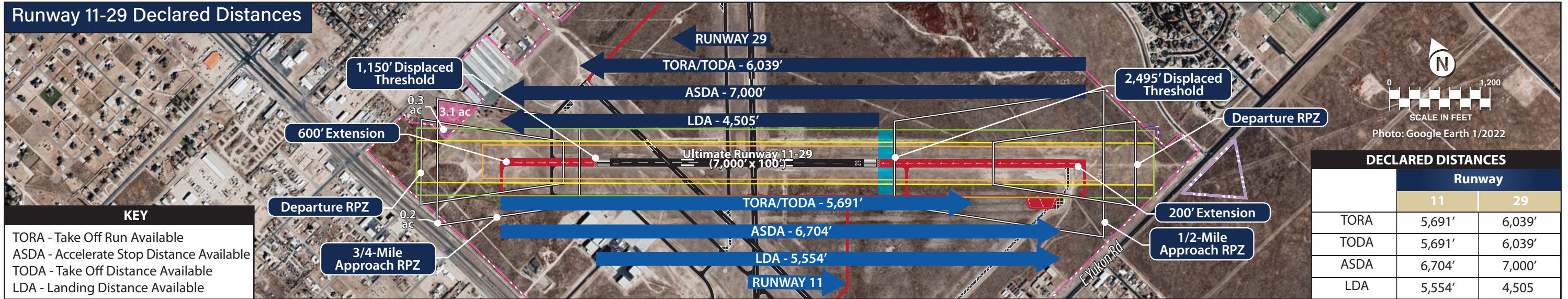
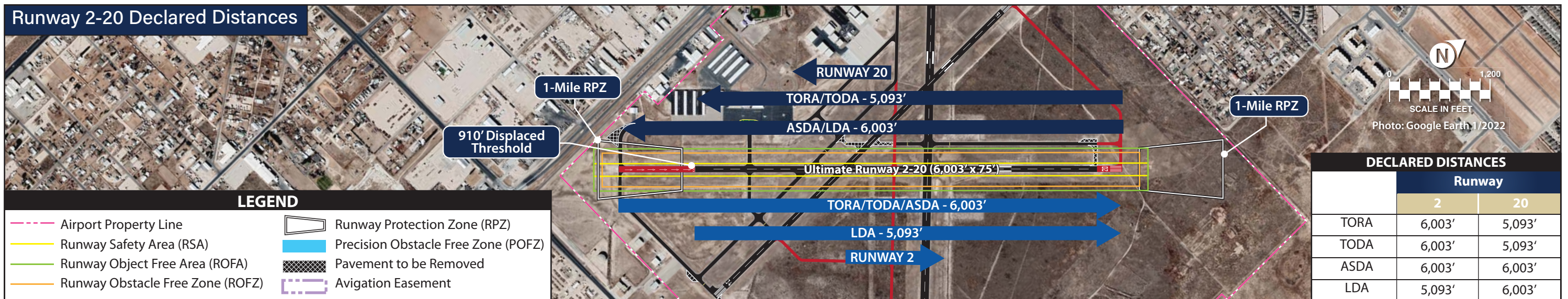


Photo: Google Earth 1/2022

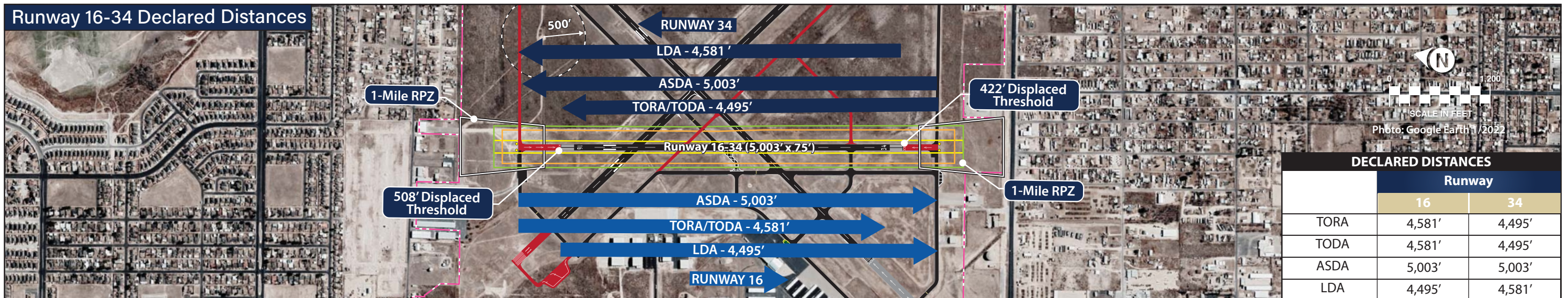
Runway 11-29 Declared Distances



Runway 2-20 Declared Distances



Runway 16-34 Declared Distances





- **Increase pavement strength on all runways** — Like the previous alternatives, Airport Alternative 3 considers a pavement strength increase to 100,000 pounds DWL on the primary runway (11-29) and 30,000 pounds DWL on the crosswind runway (2-20). Runway 16-34 is also proposed to be strengthened to 30,000 pounds DWL.
- **Mitigate non-standard conditions in the ultimate RSA/ROFA** — Under this alternative, several obstructions to the RSA and/or the ROFA are present. With the 200-foot extension to Runway 29, 704 feet of RSA/ROFA past the runway end is available, which is 296 feet short of meeting the standard 1,000 feet. Airport Alternative 3 proposes implementation of declared distances to provide standard RSA/ROFA without impacting Yukon Road or needing to relocate any perimeter fencing that would otherwise obstruct the ultimate RSA/ROFA. A displaced threshold on Runway 29 is not necessary as the RSA/ROFA standards allow for 600 feet prior to threshold, which is possible even with the 200-foot extension. **Table 38** details the declared distances would be in effect:

TABLE 38 | Declared Distances for Alternative 3A

	Runway 11	Runway 29
TORA	7,000'	7,000'
TODA	7,000'	7,000'
ASDA	6,704'	7,000'
LDA	6,704'	7,000'

Source: FAA AC 150/5300-13B, Airport Design; Coffman Associates analysis

With these declared distances, pilots taking off from Runway 11 would have the full 7,000 feet of runway pavement available except during a rejected takeoff where the ASDA is 6,704 feet, while landing operations would be reduced to 6,704 feet. All operations on Runway 29 would have the full runway length available. **Exhibit 35** illustrates these declared distances in graphic form.

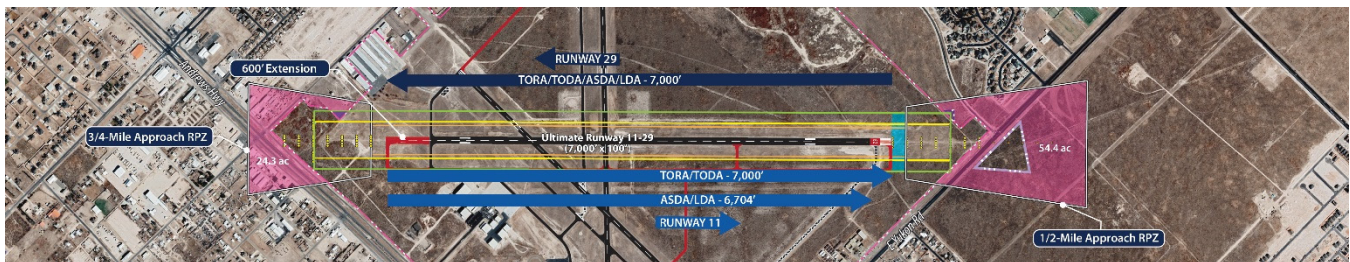


Exhibit 35 – Runway 11-29 Declared Distances (Alternative 3A)

As with previous exhibits, the reverse side of the exhibit shows greater displacement of runway thresholds where the associated RPZ extends beyond airport boundaries and encompasses incompatible land uses, which will be discussed.

Additional obstructions to these ultimate safety areas include the wind cones near the ends of Runways 2-20 and 16-34. These are planned to be relocated outside of these runways' ROFAs.



- **Improve instrument approach capability** — Airport Alternative 3 plans for improved instrument approach capability to Runways 29, Runway 2, and Runway 16-34. Like the first alternative, Runway 29 is proposed to be equipped with a MALSR to support a ½-mile GPS LPV approach. Runways 2 and 16-34, none of which currently provide an instrument approach, are planned for GPS approaches with visibility minimums down to 1-mile. The existing ¾-mile LPV GPS approach to Runway 11 and the 1-mile LNAV GPS approach to Runway 20 would remain.
- **Upgrade visual approach aids** — As previous alternatives, an upgrade to existing visual approach aids and the installation of new visual approach aids is planned under this option. The alternative proposes to maintain the existing PAPI-4s on Runway 11-29 and the existing PAPI-2s on Runway 16-34. The VASI system on each end of Runway 2-20 is proposed to be replaced with PAPI-2s. REILs are proposed at the ends of Runways 2-20 and 16-34, with the existing MALSR on Runway 11 and the planned MALSR on Runway 29 negating the need for REILs on these runway ends.
- **Reconfigure taxiways** — A full-length parallel taxiway is proposed for Runway 11-29, with standard holding bays planned at each end. Taxiway F, which currently connects to Runway 29, is proposed to be closed west of Runway 34, with new taxiway pavement extending from existing Taxiway E to connect with the planned parallel to Runway 11-29. A portion of Taxiway D where it crosses Runway 16-34 is also proposed to be closed, as the new Taxiway G pavement in this area would not allow for adequate space to hold between the holding line markings. As the partial closure of Taxiway D eliminates the quickest taxi route to Runway 20, new taxiway pavement extending west from the Runway 16 threshold is planned to provide access to Runway 20. Direct access from the apron is planned to be mitigated by the construction of a no-taxi island at the entrance to Taxiway E.
- **Installation/upgrade of airfield lighting and marking** — As with previous alternatives, the existing MIRL on each runway is planned to be maintained under this alternative, with new MIRL added to extended runway pavement. The existing taxiway reflectors are proposed to be replaced with MITL on all taxiway pavement. To support the proposed ½-mile LPV approach to Runway 29, precision markings are proposed on Runway 29. These markings include the addition of touchdown zone and edge markings. The existing non-precision markings on Runways 2-20 16-34 are planned to remain.
- **Reserve portions of airport land use for future aeronautical/non-aeronautical development** — The right side of **Exhibit 34** illustrates proposed land uses within the existing airport property, again depicting specific aeronautical uses near existing landside facilities and reserve property on the undeveloped west and south sides.

The reverse side of **Exhibit 34** shows a secondary option (Airport Alternative 3B) for mitigating RPZ incompatibilities associated with Runways 11, 29, 2, 16, and 34. A displacement of the Runway 20 threshold is also not necessary as the RPZ remains on airport property, even with the 300-foot extension to this runway end. To maintain the three-runway system as proposed in Alternative 3A and achieve standard RPZs without the need to acquire property or reroute roads, the following threshold displacements would be necessary:

- Runway 11 – Displace threshold 1,150 feet to bring ¾-mile approach RPZ onto airport property
- Runway 29 – Displace threshold 2,495 feet to bring ½-mile approach RPZ onto airport property



- Runway 2 – Displace threshold 910 feet to bring 1-mile approach RPZ onto airport property
- Runway 20 – No displacement necessary
- Runway 16 – Displace threshold 508 feet to bring 1-mile approach RPZ onto airport property
- Runway 34 – Displace threshold 422 feet to bring 1-mile approach RPZ onto airport property

Table 39 includes the declared distances that would be in effect for Runways 11-29, 2-20, and 16-34 if the RPZs are brought fully onto airport property.

TABLE 39 | Declared Distances for Alternative 3B

	Runway 11	Runway 29	Runway 2	Runway 20	Runway 16	Runway 34
TORA	5,691'	6,039'	6,003'	5,093'	4,581'	4,495'
TODA	5,691'	6,039'	6,003'	5,093'	4,581'	4,495'
ASDA	6,704'	7,000'	6,003'	6,003'	5,003'	5,003'
LDA	5,554'	4,505'	5,093'	6,003'	4,495'	4,581'

Source: FAA AC 150/5300-13B, Airport Design; Coffman Associates analysis

SUMMARY

The airport development alternatives have focused on several elements that include potential runway extension, mitigating safety area deficiencies, improving existing and future taxiway development on the airfield, and enhancing instrument approach capabilities to the runway system. On the landside, reserve areas have been highlighted for specific types of aeronautical development as well as aeronautical and non-aeronautical reserve areas. These alternatives will be considered by the planning advisory committee, Ector County, TxDOT, and the FAA. Following discussion and review with these entities, a preferred recommended development concept the includes specific landside layouts (hangars, apron areas, etc.) will be drafted and presented in the next section of this report.