

Chapter 5 – Airport Development Alternatives

The evaluation of future development options represents a critical step in the airport master planning process. The primary goal is to define a path for future development that provides an efficient use of resources and is capable of accommodating the forecast demand and facility needs defined in the master plan.



Introduction

As noted in the facility requirements evaluation, current and long-term planning for Ashland Municipal Airport is based on maintaining and improving the airport’s ability to serve a range of general aviation and business aviation type aircraft. The airport facilities accommodate a wide variety of aircraft types including conventional fixed-wing and rotary-wing aircraft. This unique mix of aircraft activity requires facility improvements capable of accommodating demand while maintaining air safety for all users.

The alternatives depicted in this chapter address current and future facility demands and FAA airport design requirements discussed in Chapter 4 – Facility Requirements. All proposed facility improvements depicted within each alternative are evaluated against five broad categories that include operational performance, fiscal factors, environmental factors, planning tenets, and FAA design standards.

The FAA recommends that airport master plans be developed in an “unconstrained” manner when initially defining future demand and related facility improvements, rather than establishing pre-defined limits that drive the planning process. The evaluation of development alternatives for Ashland Municipal Airport will be unconstrained, consistent with FAA guidance, forecast demand, and the defined facility requirements.

Evaluation Process

Developing effective alternatives for evaluation represents the first step in a multi-step process that leads to the selection of a preferred alternative. It is important to note that the current FAA-approved airport layout plan (ALP) identifies future improvements recommended in the last master planning process.

The alternatives are created to respond to defined facility needs, with the goal identifying general preferences for both individual items and the overall concepts being presented. The process will allow the widest range of ideas to be considered and the most effective facility development concept to be defined.

The evaluation process utilized in this study is based on guidance provided in AC 150/5070-6B Airport Master Planning. Evaluation criteria categories selected to support the evaluation of development alternatives include:

Operational Performance (Capacity, Capability, and Efficiency) – Includes criteria that evaluate how well the airport functions as a system and is able to satisfy future activity levels, meet functional objectives such as accommodating the design aircraft, and provide for the most efficient taxiway system or aircraft parking layout.

Fiscal Factors (Cost Estimates, Fiscal Constraints, etc.) - Includes cursory fiscal analysis through the preparation of rough order magnitude cost estimates and identifies any fiscal constraints to implementation that may exist.

Environmental Factors (NEPA Categories) – Includes a cursory analysis/identification of potential environmental effects as defined in FAA order 1050.1 Environmental Impacts Policies and Procedures and FAA Order 5050.4 FAA Airports Guidance for complying with NEPA.

Planning Tenets (Land Use, Growth, Local Vision, Political Feasibility, etc) – Includes an analysis of best planning practices such as highest and best use of land, land-use compatibility, political feasibility, and more.

FAA Design Standards (FAA Advisory Circulars and Requirements) – Includes an analysis of existing FAA design standards and various requirements or areas of focus currently identified by staff at the Seattle ADO.

By analyzing the development alternatives against the evaluation criteria presented above, and subsequently discussed with local stakeholders and interested Airport users, an iterative process of identifying and selecting elements of a preferred alternative will emerge that can best accommodate all required facility improvements. Based on the preferences of the airport sponsor, the Consultant will

consolidate these elements into a draft preferred alternative that can be refined further as the City proceeds through the process of finalizing the remaining elements of the airport master plan. Throughout this process, public input and coordination with the Planning Advisory Committee (PAC), FAA, and ODA will also help to shape the preferred alternative.

Once the preferred alternative is selected by the City of Ashland, a detailed capital improvement program will be created that identifies and prioritizes specific projects to be implemented. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the airport.

Development Alternatives

The development alternatives are intended to facilitate a discussion about the most effective way to meet the facility needs of the airport. The facility need identified in the previous chapter and depicted accordingly within each development alternative include a variety of airside (runway-taxiway) and landside needs (aircraft parking, hangars, fueling, terminal, FBO facilities, fencing, etc.). Items such as lighting improvements, minor roadway extensions and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative and the ALP. The development alternatives have been organized accordingly:

- No-Action Alternative
- Alternative 1
- Alternative 2
- Alternative 3
- Alternative 3A
- *Preferred Alternative*

The development alternatives are described below with graphic depictions (Figures 5-1 through 5-4) provided to illustrate the key elements of each proposed alternative.

It is important to note that the eventual preferred alternative selected by the City may come from one of the alternatives, a combination or hybrid of the alternatives, or a new concept that evolves through the evaluation and discussion of the alternatives. As noted earlier, the City of Ashland also has the option of limiting future facility improvements based on financial considerations or development limitations.

No-Action Alternative

In addition to proactive options that are designed to respond to defined future facility needs, a “no-action” option also exists, in which the City of Ashland may choose to maintain existing facilities and capabilities

without investing in facility upgrades or expansion to address future demand. The existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a “maintenance-only” mode.

The primary result of this alternative would be the inability of the airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development effectively limits the airport sponsor’s ability to increase airport revenues and operate the airport on a financially sustainable basis over the long term.

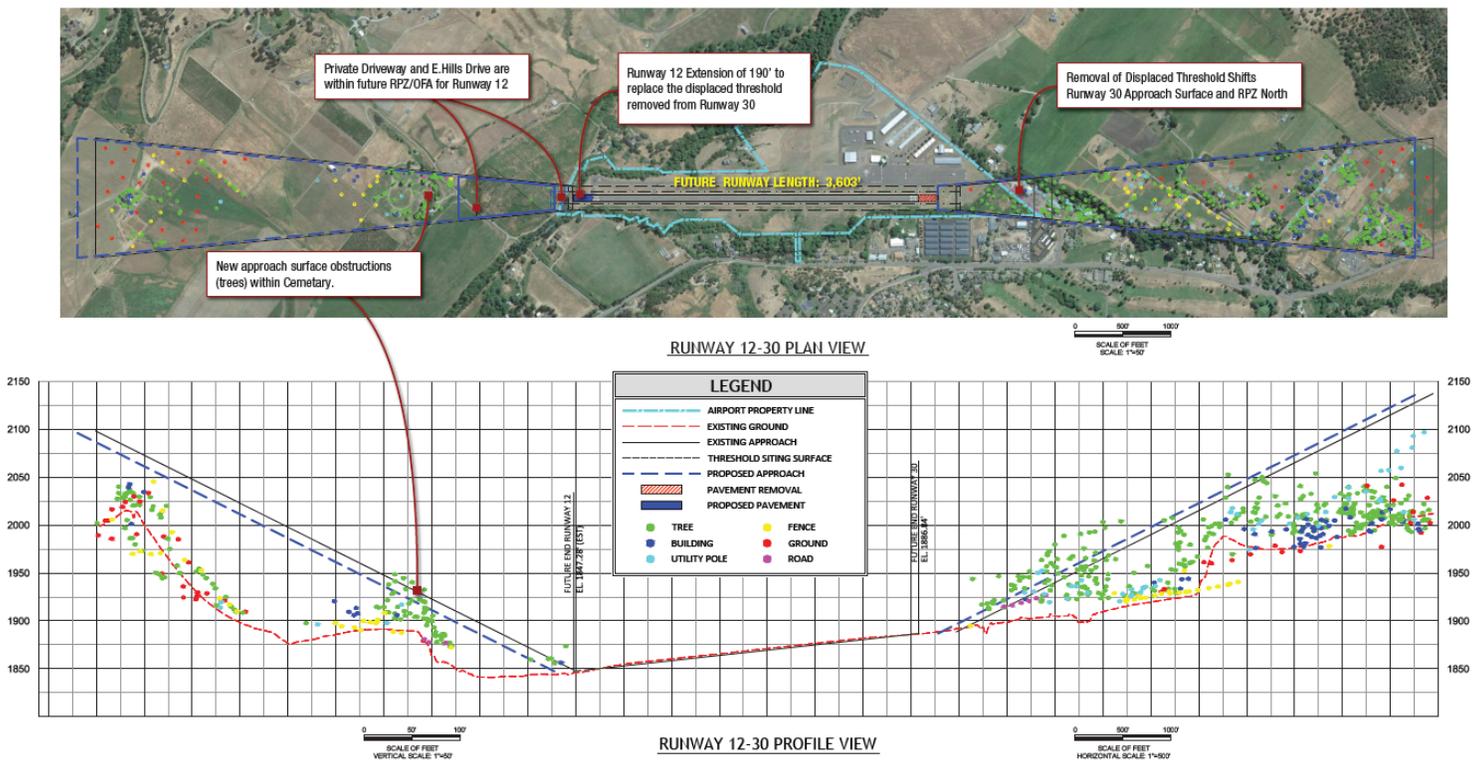
The no-action alternative establishes a baseline from which the action alternatives can be developed and compared. The purpose and need for the action alternatives are defined by the findings of the forecasts and facilities requirements analyses. The factors associated with both current and future aircraft activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (hangar construction, business relocation to the airport, etc.) at an airport. Public investment in facilities is driven by safety, capacity, and the ability to operate an airport on a financially sustainable basis.

Based on the factors noted above, the no-action alternative is inconsistent with the management and development policies established by the City of Ashland and its long-established commitment to provide a safe and efficient air transportation facility to serve the surrounding areas that is socially, environmentally, and economically sustainable.

Alternative 1

Alternative 1 (Figure 5-1) addresses FAA design standard issues and Airport facility requirements by removing the displaced threshold pavement on Runway 30 end and constructing a 190' extension on the Runway 12 end to maintain the runway length at 3,603'; redesigning the apron/aircraft parking layout; developing additional hangar and apron space to satisfy aircraft storage needs for the 20-year planning period; and by addressing other secondary facilities including fencing and fuel tanks within the context of the primary Airport facility improvements.

Before any landside alternatives were introduced or discussed, the conceptual runway shift was analyzed and discussed with the PAC at a meeting in August 2018. The first step to analyzing the feasibility of the potential runway shift and removal of the displaced threshold was to identify any approach surface obstructions that may result. Utilizing the 2018 AGIS data provided by the City of Ashland, the obstacles identified in the survey were depicted against existing and future approach surfaces. The most notable issues created from the runway shift to the north is the introduction of new tree obstructions located in the cemetery to the north of the Airport. The new obstructions introduced were not considered to be severe enough to prevent additional consideration of the runway shift as a potential alternative to address facility requirements. The following figure presented to the PAC in the August meeting depicts existing and future 20:1 Visual Approach surfaces and surveyed obstructions.



After the runway shift to address the displaced threshold was tested for preliminary feasibility, the remaining elements of the alternative were developed and evaluated within the context of the Airport as a system. As previously mentioned, the evaluation criteria selected to assess each alternative include operational performance, fiscal factors, environmental factors, planning tenets, and FAA design standards.

OPERATIONAL PERFORMANCE

Operationally, Alternative 1 adequately addresses and/or maintains many of the facilities and needs identified within the facility requirements chapter. Most notably, this alternative maintains the locally preferred existing runway length of 3,603' but does not satisfy the FAA recommended runway length of 3,700'. Alternative 1 provides adequate space for future development of hangars and aircraft storage during the planning period in addition to providing for non-aviation type development where appropriate. The hangar layout depicted in Alternative 1 may be modified to depict larger 100'x75' hangars (similar to Alternative 2) in which case the number of tiedown spots would be reduced. The apron/aircraft parking tie-down redesign and proposed hangar layout of 50'x50' hangars fronting the apron results in approximately 37 tie-down spots on existing apron pavement and 56 tie-down spots with planned apron expansion exceeding facility requirements over the planning period. If the larger 100' x 75' hangars were constructed at the apron frontage and ADG Group I TLOFA was applied, the total number of tiedown spots would be reduced to 51. This alternative also includes the relocation of the existing fuel tanks (existing pump location remains) from the apron to an area behind the FBO identified by Skinner Aviation as the preferred location. Relocating the fuel tanks and constructing the requisite piping to this location behind the existing FBO may present future access issues due to fuel tank set back requirements.

FISCAL FACTORS

Alternative 1 is the second most expensive alternative with an estimated rough order magnitude cost of \$9.3 million. The bulk of the costs in this alternative stem from the creek diversion and culvert and requisite environmental process that is expected to be very costly due to the fact that Emigrant and Neil Creek are known habitat for salmon species. Another considerable cost associated with this alternative is the land acquisition of farm land/orchard currently in production.

ENVIRONMENTAL FACTORS

Environmentally, Alternative 1 presents several challenges due to the proposed runway shift and requisite construction of culverts and creek diversions in Emigrant Creek and Neil Creek, which are understood to be sensitive salmon habitat and home to other potential threatened and endangered species. The relocation/diversion of the small portion of Neil Creek and culvert for Emigrant Creek will likely require an Environmental Impact Statement (EIS) and significant environmental coordination before any major design/construction can begin. The fencing option depicted in this alternative is sensitive to local riparian

setback regulations and only proposes constructing future fencing where it does not interfere with local environmental features. A wildlife hazard assessment will likely be required before any fencing options described can be constructed. Additionally, relocation of the fuel tanks will require additional environmental permitting and analysis per State and federal requirements.

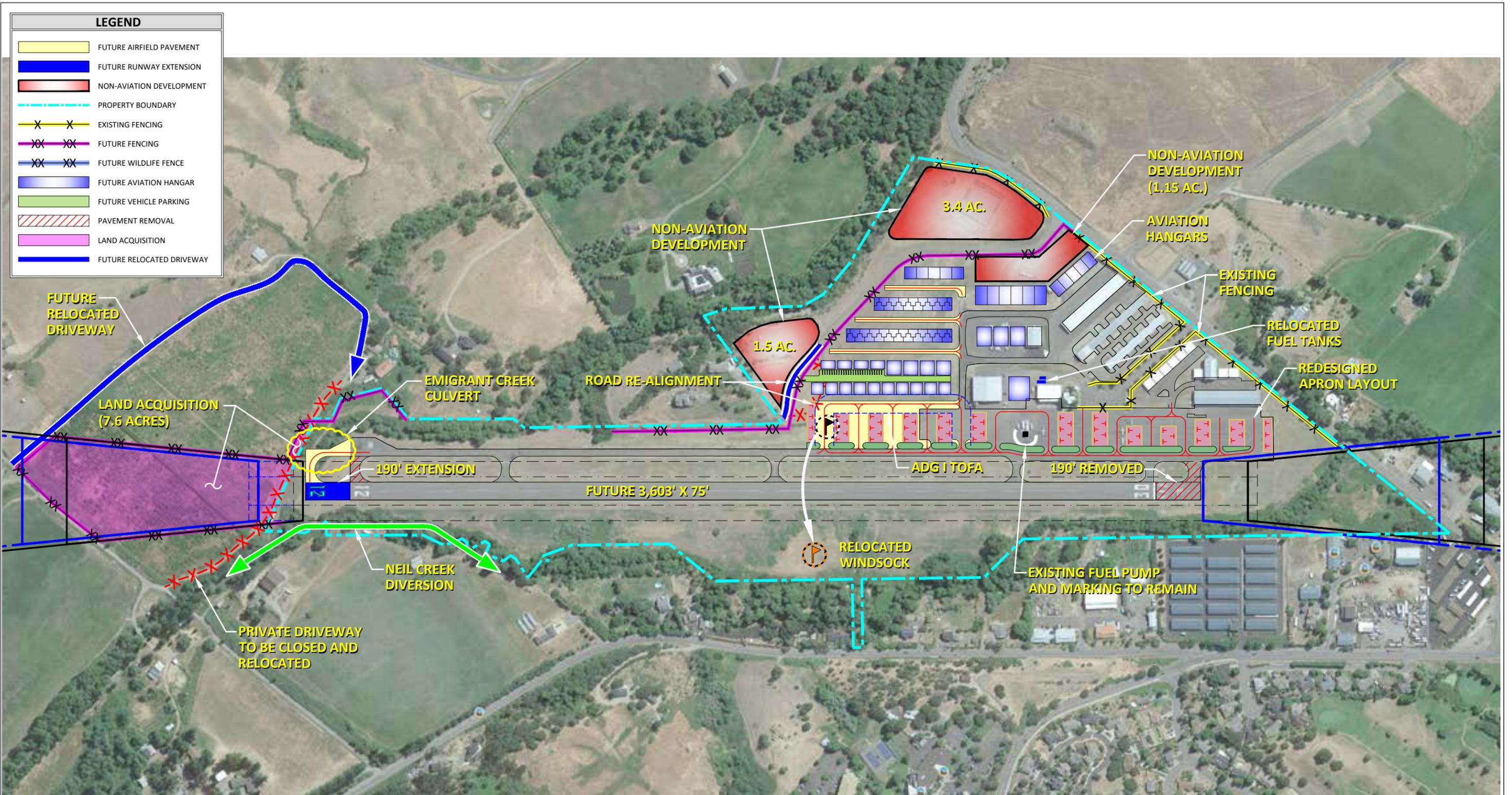
PLANNING TENETS

The planning principles evaluated and highlighted in Alternative 1 presents several opportunities and challenges for the community. The partial perimeter fencing depicted in coordination with the natural barriers of the adjacent creeks and vegetation is expected to provide adequate security for the airfield and also to be in compliance with local riparian setback ordinance prohibiting fencing within certain proximity to adjacent creeks. The 6.05 acres of non-aviation development depicted on the alternative provides for the highest and best use of land that is considered to be inaccessible to airside facilities. The relocated runway and Runway 12 RPZ requires 7.6 acres minimum of private farmland currently in production. While an agricultural leaseback is an option, the acquisition will still likely require a DLCD Goal Exception and is inconsistent with local planning goals expressed early in the planning process not to extend/relocate the runway to the North. The depicted runway relocation also requires the closure and relocation of a private driveway that would protrude through the future RPZ, OFA, and RSA. Additionally, relocating the runway to the north introduces new approach surface obstructions such as trees in the cemetery. Overall, the elements depicted in Alternative 1 satisfy growth/facility requirements for the planning period, but the political feasibility is questionable.

FAA DESIGN STANDARDS

Alternative 1 addresses several design standard issues identified and discussed in the facility requirements analysis. Relocating the Runway 30 RPZ minimizes incompatible land uses within Runway 30 RPZ but introduces new incompatible land uses within Runway 12 RPZ (Road/Driveway). The alternative removes the Runway 30 displaced threshold and also depicts the removal of all non-standard direct entry connections and wide expanses of pavement on the apron directly between the runway/taxiway and apron area. The diversion of Neil Creek and culvert for Emigrant Creek addresses Runway OFA issues but comes with significant cost and environmental impacts. Additionally, Alternative 1 addresses the existing issues with aircraft parking/tiedowns and taxilane OFAs which have been redesigned to meet applicable standards

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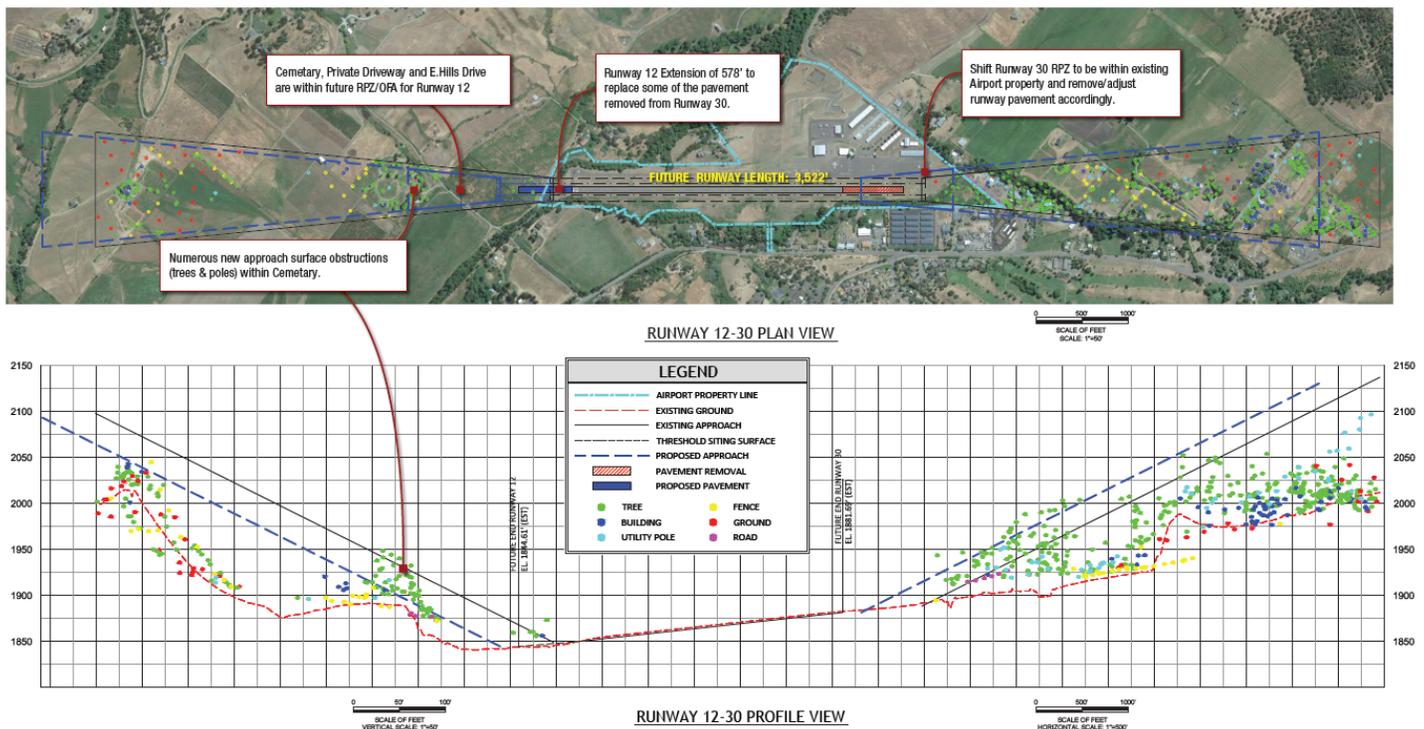


AIRPORT DEVELOPMENT ALTERNATIVES - ALTERNATIVE 1
FIGURE 5-1

Alternative 2

Alternative 2 (Figure 5-2) addresses FAA design standard issues and Airport facility requirements by shifting and shortening the runway to address Runway 30 RPZ issues; minimizing future Runway 12 obstructions resulting in 3,522' final runway length; redesigning the apron/aircraft parking layout; developing additional hangar and apron space to satisfy aircraft storage needs for the 20-year planning period; and by addressing other secondary facilities including fencing, fuel tanks, and FBO siting and visibility within the context of the primary Airport facility improvements.

The conceptual runway shift depicted in Alternative 2 was analyzed and discussed with the PAC at a meeting in August 2018. The intent of analyzing the feasibility of the potential runway shift and removal of the displaced threshold was to identify any approach surface obstructions that may result. 2018 AGIS data obstacles were depicted against existing and future approach surfaces. The most notable issues created from the runway shift to the north is the introduction of new tree obstructions located in the cemetery to the north of the Airport. The placement of the proposed Runway 12 end was selected based on preventing any man-made obstructions that may protrude through the proposed future 20:1 Visual Approach Surface. While new tree obstructions were introduced, they were not considered to be severe enough to prevent additional consideration of the runway shift as a potential alternative to address facility requirements. The following figure presented to the PAC in the August meeting depicts existing and future 20:1 Visual Approach surfaces and surveyed obstructions.



After the runway shift to address the displaced threshold and other non-standard runway conditions was tested for preliminary feasibility, the remaining elements of the alternative were developed and evaluated within the context of the Airport as a system. As previously mentioned, the evaluation criteria selected to assess each alternative include operational performance, fiscal factors, environmental factors, planning tenets, and FAA design standards.

OPERATIONAL PERFORMANCE

The operational performance evaluation of Alternative 2 suggests that many of the airfield facility requirements are satisfied by Alternative 2, but several issues still remain. The reduction in runway length by 81' to 3,522' does not satisfy the FAA recommended length of 3,700'. The redesign of the apron/tiedowns results in 35 spots on the existing apron and 39 with future apron expansion, which provides the fewest number of tiedown spots throughout the planning period, but still satisfies facility requirements. The number of available tie down spots on the future apron expansion has been reduced significantly on this alternative due to an assumption that the FAA may require ADG Group II TLOFAs adjacent to future hangars directly fronting the ramp that are able to accommodate Group II aircraft. No FAA standard or requirement for a Group II TLOFA is known to exist and the aviation activity forecasts and facility requirements analysis clearly identified ADG Group I as the design aircraft. Hangars and aircraft storage expansion depicted in Alternative 2 exceeds facility requirements expected during the planning period. The relocation of fuel tanks/pumps to the northern end of the future ramp in coordination with a future second FBO option addresses siting and ramp flow/visibility concerns of the existing tanks but presents timing and coordination issues with the relocation. The second FBO option was introduced to increase competition on the Airport concurrent with an optimal siting solution for relocated fuel tanks.

FISCAL FACTORS

Alternative 2 is the most expensive alternative with an estimated rough order magnitude cost of approximately \$11.3 million. The bulk of the costs in this alternative stem from the runway extension, creek diversion, creek culvert, and requisite environmental process that is expected to be very costly due to the fact that Emigrant and Neil Creek are known habitat for salmon species. Another considerable cost associated with this alternative is the considerable land acquisition of farm land/orchard currently in production.

ENVIRONMENTAL FACTORS

Environmental factors evaluated within Alternative 2 identified several challenges that will require additional consideration. Numerous negative environmental impacts from the fencing option that generally follows Airport perimeter were identified as the option conflicts with local riparian setback ordinance. Furthermore, a Wildlife Hazard Assessment would likely be required for the proposed fencing

option. Similar to Alternative 1, the proposed runway shift and requisite construction of culverts and creek diversions in Emigrant Creek and Neil Creek, which are understood to be sensitive salmon habitat and home to other potential threatened and endangered species, presents numerous environmental challenges. The relocation/diversion of the small portion of Neil Creek and culvert for Emigrant Creek will likely require an Environmental Impact Statement (EIS) and significant environmental coordination before any major design/construction can begin. Additionally, relocation of the fuel tanks will require additional environmental permitting and analysis per State and federal requirements.

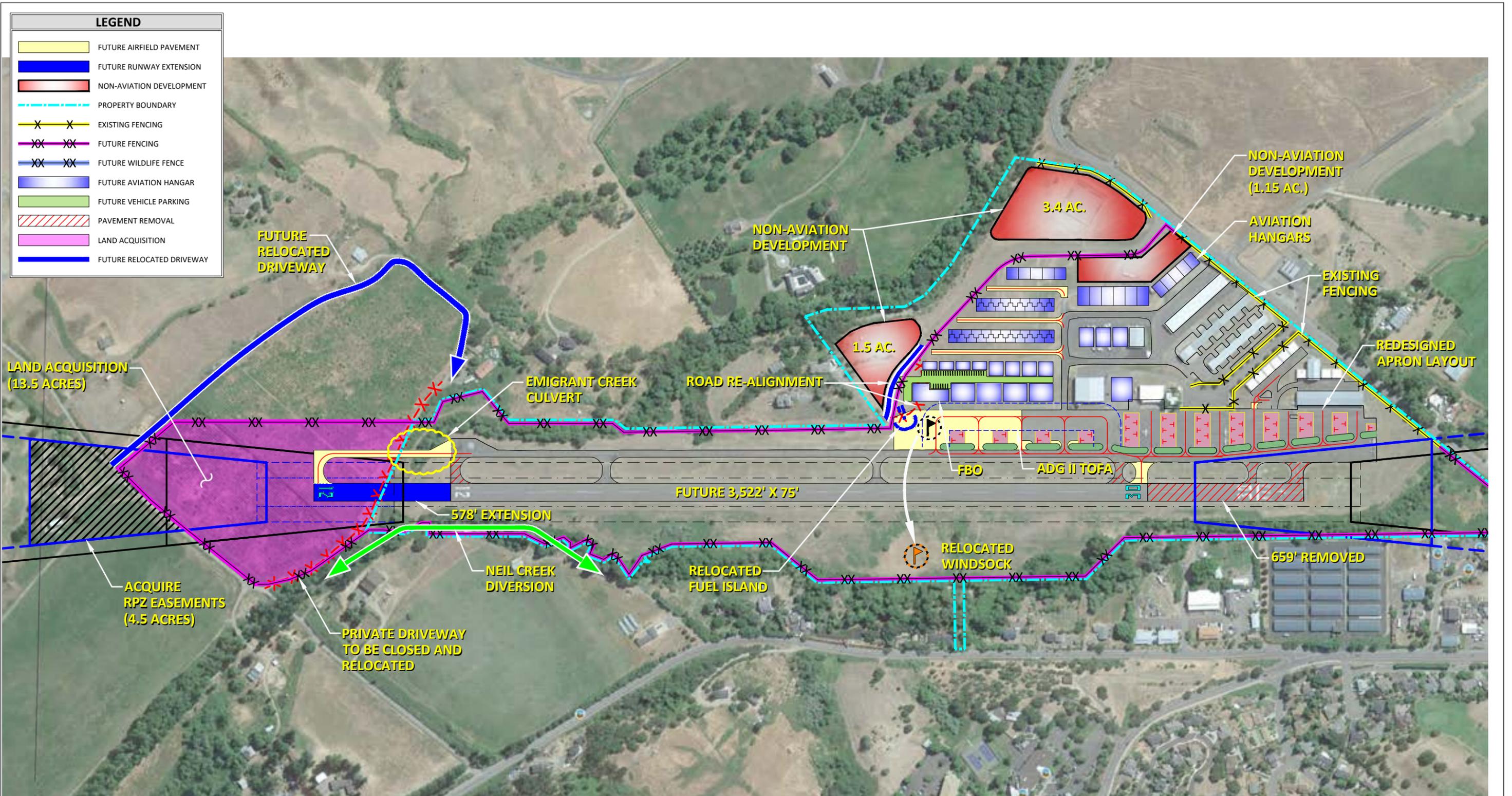
PLANNING TENETS

The planning principles evaluated in Alternative 2 presents several opportunities and challenges associated with this alternative. Most notably, the full-length perimeter fencing proposed is inconsistent with local riparian setbacks and presents numerous challenges. The 6.05 acres of non-aviation development depicted on the alternative provides for the highest and best use of land that is considered to be inaccessible to airside facilities. While the mitigation of incompatible land-uses within the Runway 30 RPZ, the relocated runway and Runway 12 RPZ requires land acquisition of 13.5 acres of private farmland currently in production. An agricultural leaseback is not an option in Alternative 2 due to the scale of the runway extension. The acquisition will require a DLCDC Goal Exception and is inconsistent with local planning goals expressed early in the planning process not to extend/relocate the runway to the North. Similar to Alternative 1, the depicted runway relocation also requires the closure and relocation of a private driveway. Additionally, relocating the runway to the north introduces new approach surface obstructions such as trees in the cemetery as well as new Runway 12 RPZ incompatibilities such as roads and the cemetery. Overall, the elements depicted in Alternative 2 satisfy growth/facility requirements for the planning period, but the political feasibility is very questionable.

FAA DESIGN STANDARDS

Alternative 2 addresses several design standard issues identified and discussed in the facility requirements analysis. Relocating Runway 30 end completely mitigates incompatible land uses within Runway 30 RPZ but introduces new incompatible land uses within Runway 12 RPZ (Road/Driveway). The alternative removes the Runway 30 displaced threshold and also depicts the removal of all non-standard direct entry connections and wide expanses of pavement on the apron directly between the runway/taxiway and apron area. The diversion of Neil Creek and culvert for Emigrant Creek addresses Runway OFA issues but comes with significant cost and environmental impacts. Additionally, Alternative 2 addresses the existing issues with aircraft parking/tiedowns and taxiway OFAs which have been redesigned to meet applicable standards.

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AIRPORT DEVELOPMENT ALTERNATIVES - ALTERNATIVE 2
FIGURE 5-2

Alternative 3

Alternative 3 (Figure 5-3) addresses FAA design standard issues and Airport facility requirements by removing the Runway 30 displaced threshold and relocating the runway end 40' to a location that minimizes obstructions to the Runway 30 20:1 Visual Approach Surface. The alternative also includes addressing several future Runway 30 obstructions with obstruction lighting; including a 137' extension on the Runway 12 end to satisfy FAA recommended length; redesigning the apron/aircraft parking layout; developing additional hangar and apron space to satisfy aircraft storage needs for the 20-year planning period; and by addressing other secondary facilities including fencing and fuel tanks within the larger context of the primary Airport facility improvements.

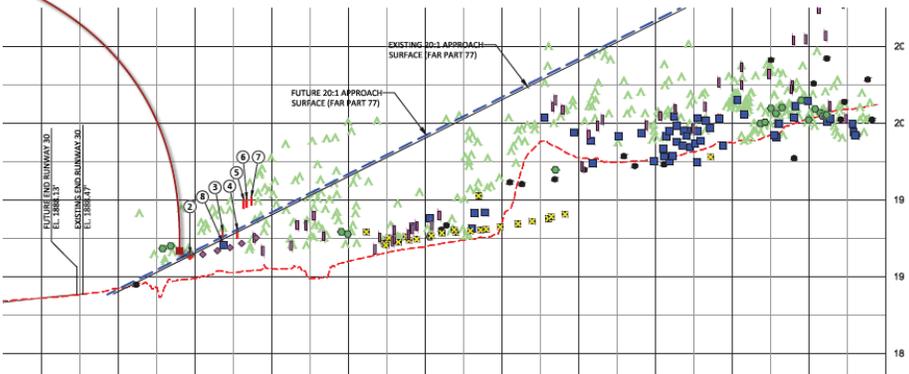
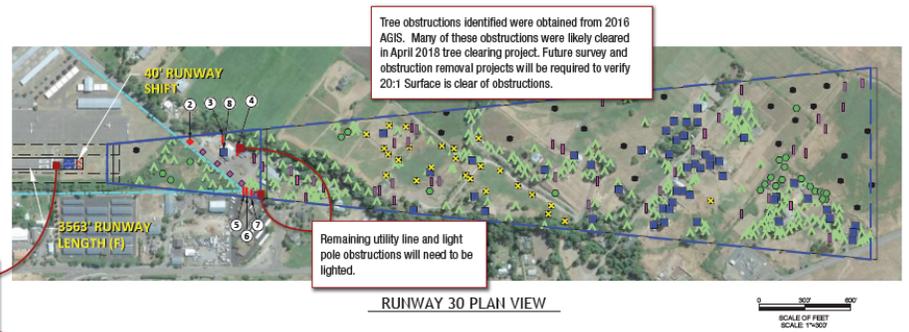
After the initial presentation of preliminary runway alternatives to the FAA prior to the PAC meeting in August 2018, the FAA expressed interest in evaluating another runway alternative that maximized the use of existing runway pavements through the use of obstruction lighting for man-made obstacles on the Runway 30 end in coordination with future tree clearing projects. The 2018 AGIS data obstacles identified in the survey were depicted against existing and future approach surfaces that were best able to minimize the obstructions and maximize the existing runway pavement. The resultant 40' Runway 30 shift to the north removes Dead Indian Memorial Road (includes 15' vehicle) as an obstruction and with the installation of obstruction lighting on the remaining man-made obstacles, Alternative 3 was developed for additional consideration by the PAC.

OBSTRUCTION CHART										
NO.	ITEM	PART 77 SURFACE	MSL TOP ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	EXISTING/ FUTURE	EXISTING/ FUTURE	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
2	ROAD (15' VEHICLE)	APPROACH	1915.10'	142.99' L	699.54'	739.54'	1.5'	0'	NO	SHIFT RWY 30 END
3	UTILITY POLE	APPROACH	1926.53'	156.79' L	813.54'	853.54'	5.3'	3.3'	NO	OBSTRUCTION LIGHTS
4	UTILITY POLE	APPROACH	1930.48'	81.92' L	1006.34'	1046.34'	1.5'	0'	NO	SHIFT RWY 30 END
5	UTILITY POLE	APPROACH	1940.97'	177.62' R	1049.80'	1089.80'	18.9'	17.3'	NO	OBSTRUCTION LIGHTS
6	UTILITY POLE	APPROACH	1950.77'	186.80' R	1059.40'	1109.40'	18.9'	17.3'	NO	OBSTRUCTION LIGHTS
7	UTILITY POLE	APPROACH	1962.15'	201.17' R	1099.39'	1139.39'	18.6'	19'	NO	OBSTRUCTION LIGHTS
8	BUILDING	APPROACH	1922.77'	74.80' L	1109.59'	1149.59'	0'	0'	NO	FOR REF. ONLY

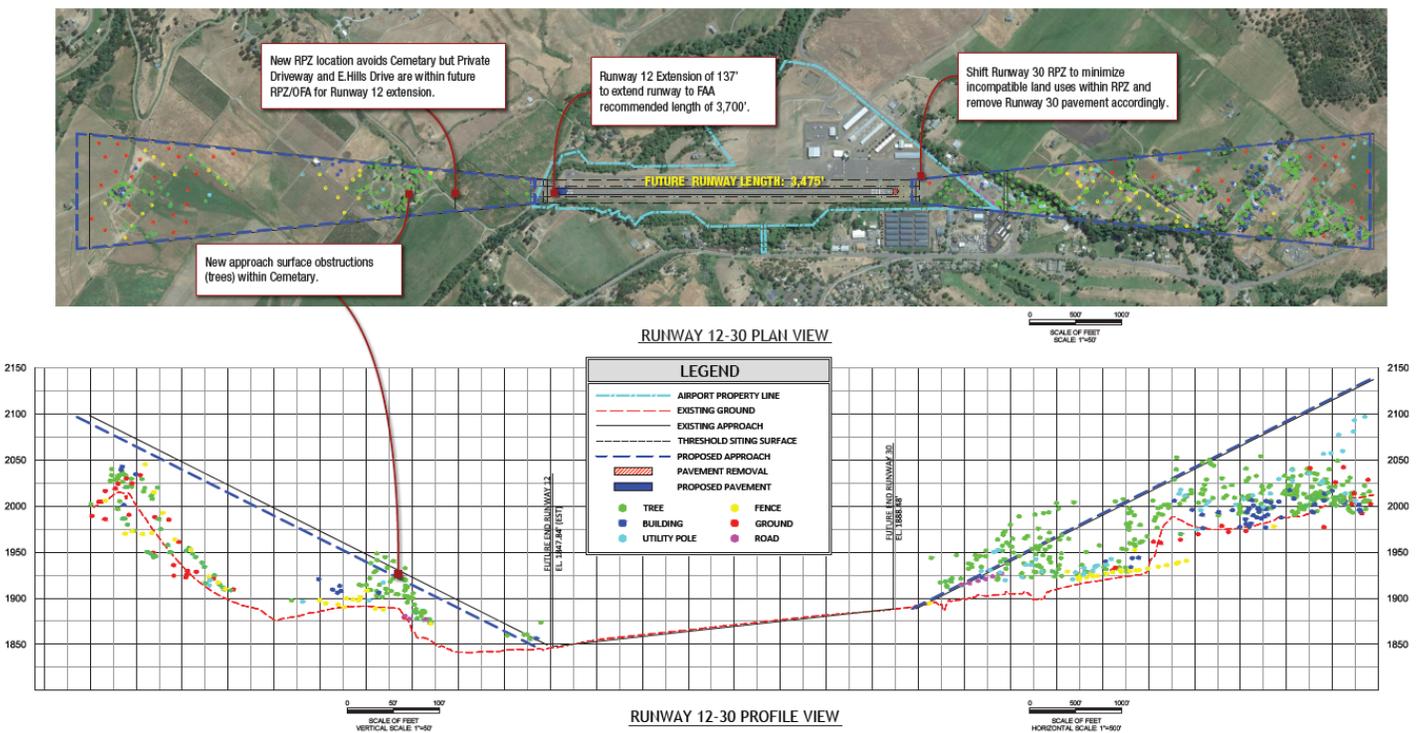
LEGEND	
	AIRPORT PROPERTY LINE
	EXISTING GROUND
	EXISTING APPROACH
	FUTURE APPROACH
	TREE/BUSH
	FENCE
	BUILDING
	GROUND
	UTILITY POLE
	ROAD

● ITEMS THAT CONFLICT WITH PART 77 SURFACES ARE DEPICTED IN RED.

Remove displaced threshold and shift Runway 30 end 40' to mitigate road obstructions and minimize impact of remaining obstructions.



In addition to the focused analysis of Runway 30 end siting and relevant obstructions, the extension of Runway 12 by 137', based on PAC recommendations at the August 2018 meeting, was also considered to satisfy FAA runway length recommendations of 3,700'. The intent was to meet length requirements and minimize the introduction of new tree obstructions located in the cemetery to the north of the Airport. While new tree obstructions were introduced on the Runway 12 end, they were not considered to be severe enough to prevent additional consideration of the runway shift as a potential alternative to address airside facility requirements. The following figure depicts existing and future 20:1 Visual Approach surfaces and surveyed obstructions for Alternative 3.



After the runway shift to address the displaced threshold and other non-standard runway conditions was tested for preliminary feasibility, the remaining elements of the alternative were developed and evaluated within the context of the Airport as a system. As previously mentioned, the evaluation criteria selected to assess each alternative include operational performance, fiscal factors, environmental factors, planning tenets, and FAA design standards.

OPERATIONAL PERFORMANCE

The operational performance evaluation of Alternative 3 verifies that many of the airfield facility requirements are satisfied by Alternative 3. The final runway length of 3,700' satisfies the FAA recommended length requirements. Hangars and aircraft storage expansion depicted in Alternative 3 exceeds facility requirements and demand expected during the planning period, but no longer provides the

option for larger corporate style hangars fronting the apron area. In this alternative, the larger hangars have been traded for additional apron space and tiedowns. The redesign of the apron/tiedowns results in 42 tiedown spots on the existing apron and 81 with future apron expansion, which exceeds the parking requirements calculated in the facility requirements, but is consistent with local knowledge that suggests the existing 72 tiedown spots are all necessary. The relocation of fuel tanks/pumps to the existing apron edge provides additional aircraft parking/apron space and removes any visibility issues that exist but does reduce the space available for vehicle parking.

FISCAL FACTORS

Alternative 3 is the third most expensive alternative with an estimated rough order magnitude cost of approximately \$7.9 million. The bulk of the costs in this alternative originate from the proposed runway extension, creek diversion, creek culvert, and requisite environmental process that is expected to be very costly due to the fact that Emigrant and Neil Creek are known critical habitat for salmon species.

ENVIRONMENTAL FACTORS

Environmentally, Alternative 3 – similar to the previous alternatives - presents several challenges due to the proposed runway shift and requisite construction of culverts and creek diversions in Emigrant Creek and Neil Creek, which are understood to be sensitive salmon habitat and home to other potential threatened and endangered species. The relocation/diversion of the small portion of Neil Creek and culvert for Emigrant Creek will likely require an Environmental Impact Statement (EIS) and significant environmental coordination before any major design/construction can begin. The fencing option depicted in this alternative is sensitive to local riparian setback regulations and only proposes constructing future fencing where it does not interfere with local environmental features. A wildlife hazard assessment will likely be required before any fencing options described can be constructed. Additionally, relocation of the fuel tanks will require additional environmental permitting and analysis per State and federal requirements.

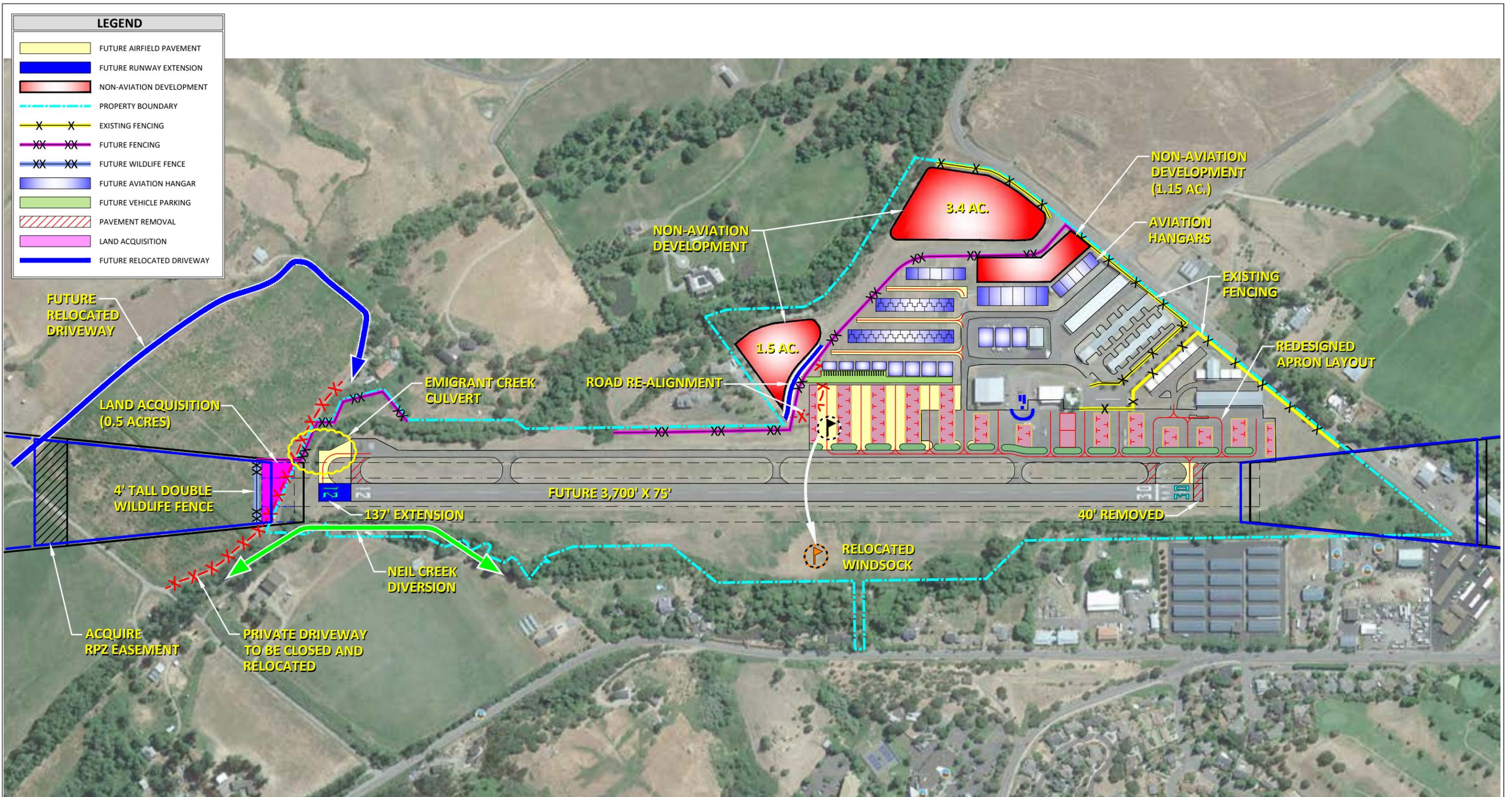
PLANNING TENETS

The planning principles evaluated and highlighted in Alternative 3 presents several opportunities and challenges for the community. The partial perimeter fencing depicted in coordination with the natural barriers of the adjacent creeks and vegetation is expected to provide adequate security for the airfield and also to be in compliance with local riparian setback ordinance prohibiting fencing within certain proximity to adjacent creeks. The 6.05 acres of non-aviation development depicted on the alternative provides for the highest and best use of land that is considered to be inaccessible to airside facilities. The relocated runway Runway 12 end requires .5 acres minimum of private farmland currently in production for the OFA and RSA. While an agricultural leaseback is an option within the RPZ, the acquisition will

still likely require a DLCD Goal Exception and is inconsistent with local planning goals expressed early in the planning process not to extend/relocate the runway to the North. The depicted runway relocation also requires the closure and relocation of a private driveway that would protrude through the future RPZ, OFA, and RSA. Additionally, relocating the runway to the north introduces new approach surface obstructions such as trees in the cemetery. Overall, the elements depicted in Alternative 3 satisfy growth/facility requirements for the planning period, but the political feasibility is questionable.

FAA DESIGN STANDARDS

Alternative 3 addresses several design standard issues identified and discussed in the facility requirements analysis. Relocating the Runway 30 RPZ minimizes incompatible land uses within Runway 30 RPZ but introduces new incompatible land uses within Runway 12 RPZ (Road/Driveway). The alternative removes the Runway 30 displaced threshold and also depicts the removal of all non-standard direct entry connections and wide expanses of pavement on the apron directly between the runway/taxiway and apron area. The diversion of Neil Creek and culvert for Emigrant Creek addresses Runway OFA issues but comes with significant cost and environmental impacts. Additionally, Alternative 3 addresses the existing issues with aircraft parking/tiedowns and taxiway OFAs which have been redesigned to meet applicable standards.

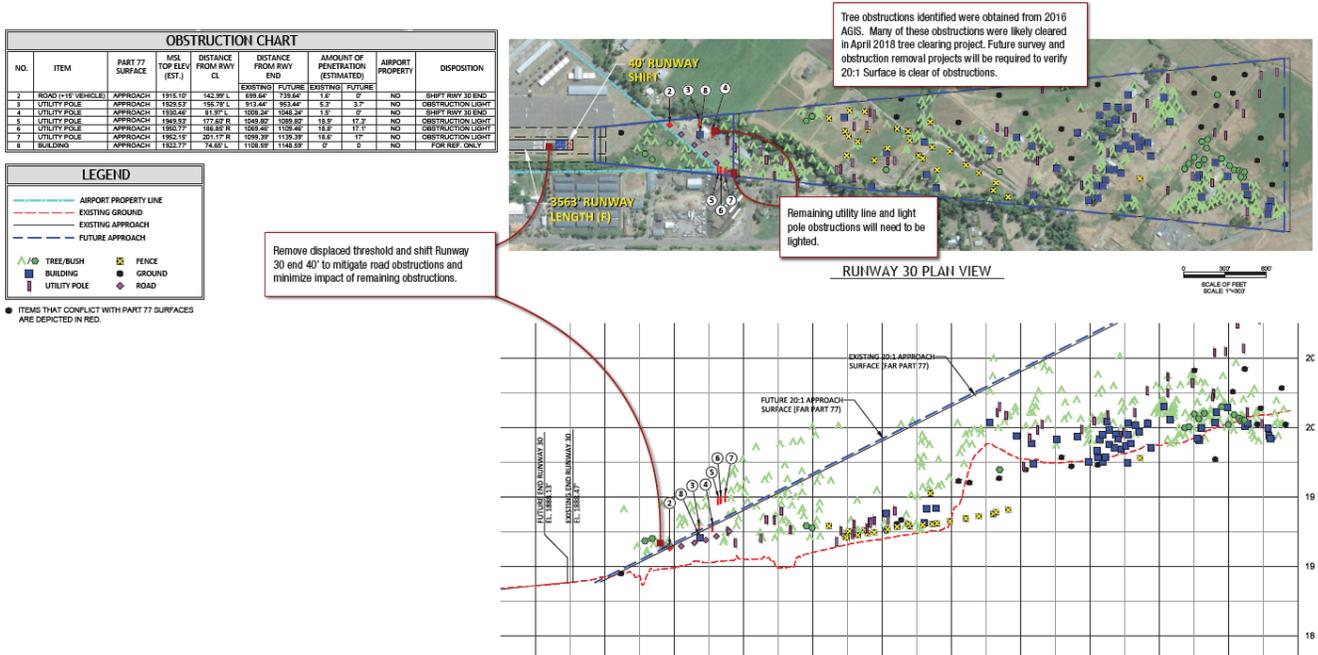


AIRPORT DEVELOPMENT ALTERNATIVES - ALTERNATIVE 3
FIGURE 5-3

Alternative 3A

Alternative 3A (Figure 5-4) addresses FAA design standard issues and Airport facility requirements by removing the Runway 30 displaced threshold and relocating the runway end 40' to a location that minimizes obstructions to the Runway 30 20:1 Visual Approach Surface. However, this alternative does not include the extension on the Runway 12 end depicted in Alternative 3 which is consistent with local planning goals not to extend the runway to the north. Alternative 3A depicts redesigning the apron/aircraft parking layout; developing additional hangar and apron space to satisfy aircraft storage needs for the 20-year planning period; and addressing other secondary facilities requirements including fencing and fuel tanks within the larger context of the primary Airport facility improvements.

The runway solutions depicted in Alternative 3A are similar to the improvements proposed in Alternative 3. The primary difference is the exclusion of any additional runway length on the Runway 12 end. Therefore, no profile obstruction analysis is depicted or discussed for the Runway 12 end within Alternative 3A. For a discussion of the Runway 30 20:1 Approach Surface and obstruction analysis depicted below, see the Alternative 3 discussion on Page 13.



After the runway shift to address the displaced threshold and other non-standard runway conditions was tested for preliminary feasibility, the remaining elements of the alternative were developed and evaluated within the context of the Airport as a system. As previously mentioned, the evaluation criteria selected to assess each alternative include operational performance, fiscal factors, environmental factors, planning tenets, and FAA design standards.

OPERATIONAL PERFORMANCE

The operational performance evaluation of Alternative 3A identifies that many of the airfield facility requirements are addressed, but several issues still remain. The reduction in runway length by 40' to 3,563' does not satisfy the FAA recommended length of 3,700'. Hangars and aircraft storage expansion depicted in Alternative 2 exceeds facility requirements expected during the planning period. The redesign of the apron/tiedowns results in 37 spots on the existing apron and 55 with future apron expansion. This alternative does not implement a TLOFA fronting the future corporate hangars on the ramp and maintains the existing dead-end taxiway/tiedown layout consistent throughout the ramp. The space between hangars and tiedown areas is 50' and is expected to be the minimum space necessary to provide adequate space for repositioning aircraft. The fuel tanks/pumps remain in the existing location on the ramp.

FISCAL FACTORS

Alternative 3A is the least expensive alternative with an estimated rough order magnitude cost of approximately \$3 million. The bulk of the costs in this alternative originate from the depicted fencing upgrades, apron redesign, and apron expansion.

ENVIRONMENTAL FACTORS

Environmental factors evaluated within Alternative 3A presents solutions with the lowest impact on the environment, however, several projects will still require additional environmental analysis per FAA requirements. Most notably, environmental impacts from the proposed fencing alignment, that is generally outside of local riparian setbacks (but within Runway OFA in some instances), will require additional environmental analysis including a Wildlife Hazard Assessment. Modifications to fence type and height may be required to identify preferred fence line for PART 77, OFA, and other obstructions.

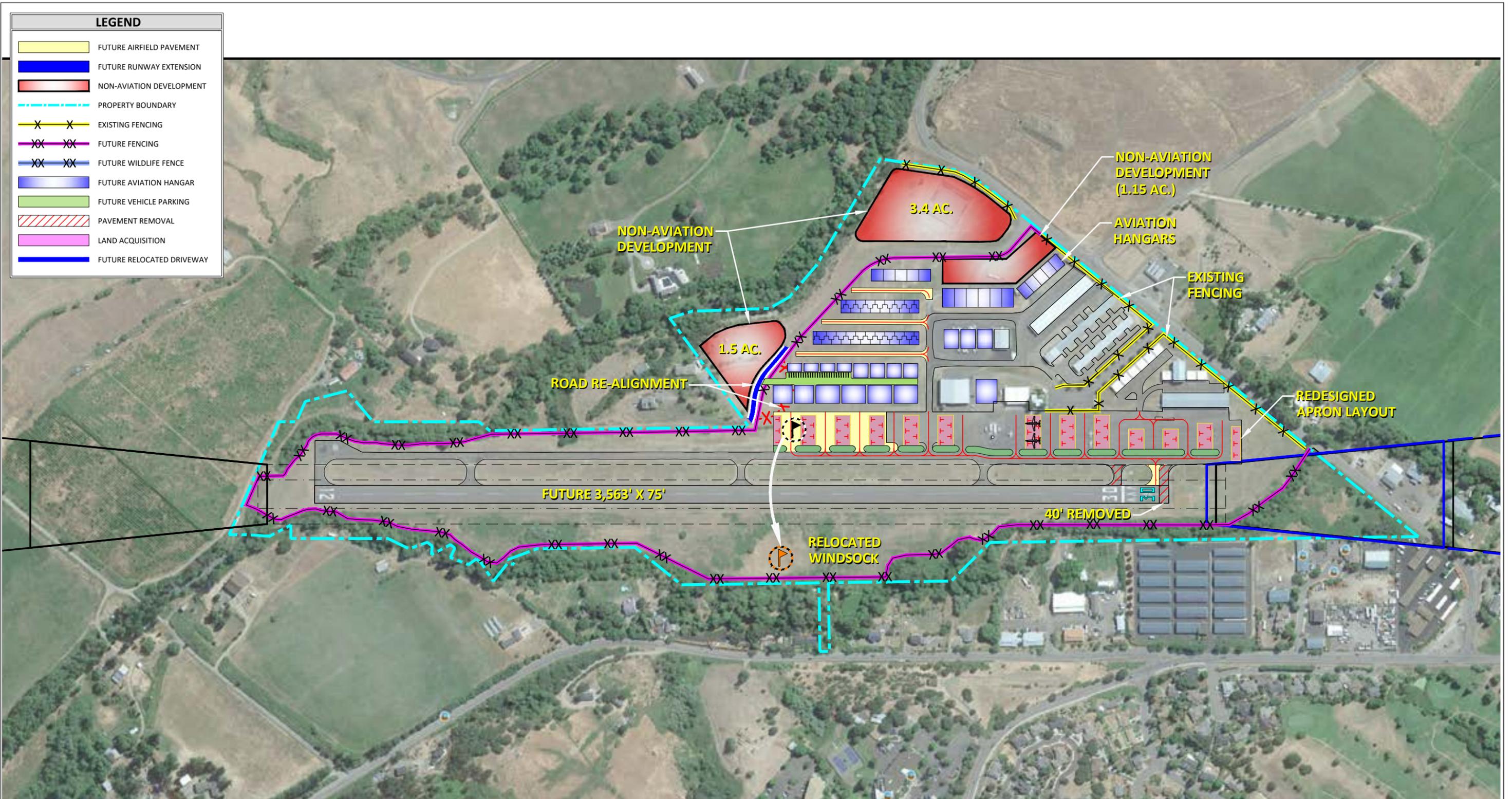
PLANNING TENETS

The planning principles evaluated in Alternative 3A depicts several challenges and opportunities associated with this alternative. Most notably, the fencing proposed is inconsistent with local riparian setbacks in some locations. The 6.05 acres of non-aviation development depicted on the alternative provides for the highest and best use of land that is considered to be inaccessible to airside facilities. Runway 12 is planned to remain in its existing location which is consistent with local planning goals not to extend the runway north. Overall, the elements depicted in Alternative 3A satisfy growth/facility requirements for the planning period and is the most politically feasible alternative.

FAA DESIGN STANDARDS

Alternative 3A addresses several design standard issues identified and discussed in the facility requirements analysis. Relocating the Runway 30 end RPZ minimizes incompatible land uses within Runway 30 RPZ and addresses several approach surface obstructions. The alternative removes the Runway 30 displaced threshold and also depicts the removal of all non-standard direct entry connections and wide expanses of pavement on the apron directly between the runway/taxiway and apron area. The primary difference noted on Alternative 3A is that the diversion of Neil Creek and culvert for Emigrant Creek to address minor Runway OFA issues is not addressed. It is expected that a Modification to Standards will need to be pursued if this alternative is selected. Additionally, Alternative 3A addresses the existing issues with aircraft parking/tiedowns and taxilane OFAs which have been redesigned to meet applicable standards. Future fence line option depicted may require unique solutions to avoid creating new obstructions to PART 77 surfaces and the runway OFA.

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AIRPORT DEVELOPMENT ALTERNATIVES - ALTERNATIVE 3A
FIGURE 5-4

Preferred Alternative (Figure 5-5)

At the November 13, 2018 PAC Meeting, the PAC discussed each of the alternatives and the individual elements of each alternative in detail. The PAC discussed the challenges and opportunities associated with each alternative and ultimately identified a preferred alternative that depicts elements from each of the alternatives but most closely resembles Alternative 3.

The PAC selected the airside options depicted in Alternative 3 that include removing the Runway 30 displaced threshold and relocating the runway end 40' to a location that minimizes obstructions to the Runway 30 20:1 Visual Approach Surface. This option also requires obstruction lighting on several close-in obstructions. The PAC also elected to include a 137' extension on the Runway 12 end to satisfy FAA recommended length, which will require the relocation of an off-airport private drive, a minimum of .5 acres of land acquisition for RSA and OFA, Neil Creek diversion, Emigrant Creek culvert, and/or similar solutions to be identified during an extensive environmental assessment and design process that will finalize a preferred solution. The PAC also identified the minimalist fencing alignment option depicted in Alternative 3 as the preferred alternative for future fencing at the Airport.

The PAC selected a modified version of the landside development layout depicted in Alternative 3. The PAC directed the planning team to depict a modified version of Alternative 3 with a focus on airport facilities designed to accommodate Airplane Design Group (ADG) or "Group I" standards. The PAC preferred alternative landside options include Group I airfield facilities consistent with aviation activity forecasts and facility requirements combined with larger corporate style hangars intended to accommodate multiple Group I aircraft and related businesses. This decision was directed to be in coordination with what they believe to be adequate tie-down parking (approximately 70 spaces) at the expense of reducing the number of T-hangars within existing City owned developable ground.

There was additional discussion amongst the PAC on the preferred location of fuel tanks and fuel pump facilities. The existing site and those presented in the alternatives were considered to be less than ideal due to the loss of aircraft parking/tie downs and/or future hangar space in addition to the existing locations obstructing views of the runway from existing FBO. It was mentioned in the PAC meeting that there had been an aircraft that veered off of the runway and the existing fuel tanks obstructed visibility to the FBO so staff in the FBO was not aware of the incident until bystanders called the office. Therefore, the PAC elected to relocate fuel tanks to a developable site directly south of the existing auto parking lot.

Similar to the previous alternatives, the preferred alternative was evaluated against the following criteria: operational performance, fiscal factors, environmental factors, planning tenets, and FAA design standards.

OPERATIONAL PERFORMANCE

The final runway length of 3,700' satisfies the FAA recommended length requirements. Hangars and aircraft storage expansion depicted exceeds facility requirements and demand expected during the planning period. The preferred alternative also depicted the PAC preferred option for larger corporate style hangars fronting the apron area. In the preferred alternative, the number of T-hangars have been reduced for a combination of larger corporate style hangars and additional apron space and tiedowns. The redesign of the apron/tiedowns results in 2 aircraft staging areas in front of the existing FBO and 43 tiedown spots on the existing apron space and 73 with future apron expansion, which slightly exceeds the parking requirements calculated in the facility requirements, but is consistent with local knowledge that suggests the existing 72 tiedown spots are necessary for peak days. The site selected for fuel tank relocation provides additional future tie-down space and will not interfere with future hangar development. Another item added to the preferred alternative was designated auto parking outside of existing aircraft operations areas.

FISCAL FACTORS

The preferred alternative results in an estimated rough order magnitude cost of approximately \$8-10 million or more depending on timing and project phasing, inflation, and other variables to be considered as required. However, it is clear the majority of the costs required to implement the preferred alternative originate from the proposed runway extension/relocation, creek diversion, creek culvert, and requisite environmental process that is expected to be very costly due to the fact that Emigrant and Neil Creek are known critical habitat for salmon species. This project is expected to be an AIP eligible project and funded up to 90% by federal funds.

ENVIRONMENTAL FACTORS

The preferred alternative presents several challenges due to the proposed runway shift and requisite construction of culverts and creek diversions in Emigrant Creek and Neil Creek, which are understood to be sensitive salmon habitat and home to other potential threatened and endangered species. The relocation/diversion of the small portion of Neil Creek and culvert for Emigrant Creek will likely require an Environmental Impact Statement (EIS) and significant environmental coordination before any major design/construction can begin. The fencing option depicted in this alternative is sensitive to local riparian setback regulations and only proposes constructing future fencing where it does not interfere with local environmental features. A wildlife hazard assessment will likely be required before any fencing options described can be constructed.

PLANNING TENETS

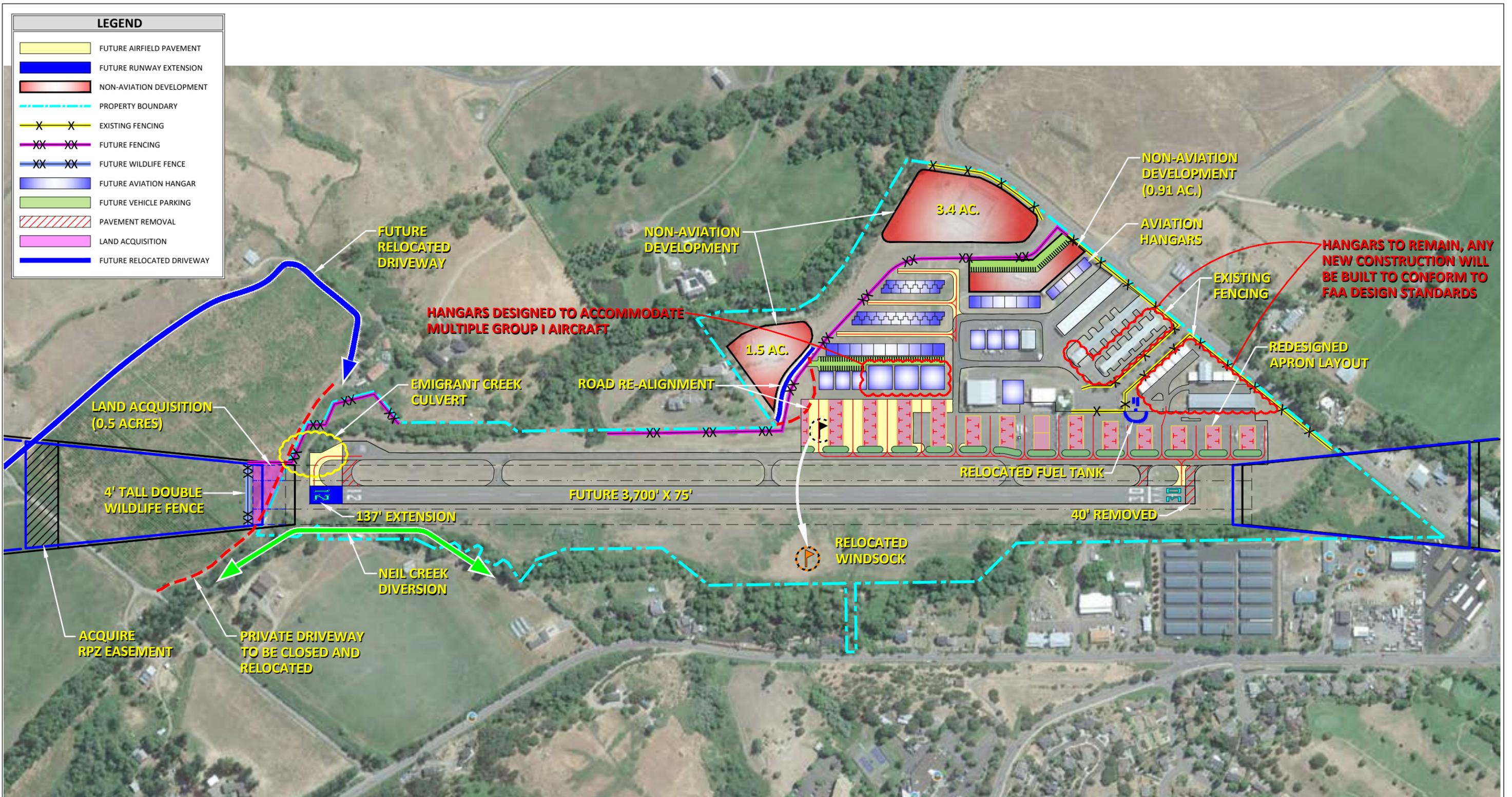
The planning principles evaluated and highlighted in the preferred alternative presents several opportunities and challenges for the community. The partial perimeter fencing depicted in coordination with the natural barriers of the adjacent creeks and vegetation is expected to provide adequate security for the airfield and also to be in compliance with local riparian setback ordinance prohibiting fencing within certain proximity to adjacent creeks. The 5.81 acres of non-aviation development depicted on the alternative provides for the highest and best use of land that is considered to be inaccessible to airside facilities. The inclusion of designated auto parking (upwards of 100 spots identified) will satisfy local parking requirements for new hangar construction. The relocated runway Runway 12 end requires .5 acres minimum of private farmland currently in production for the OFA and RSA. While an agricultural leaseback is an option within the RPZ, the acquisition will still likely require a DLCDC Goal Exception and is generally inconsistent with local planning goals expressed early in the planning process not to extend/relocate the runway to the North. The depicted runway relocation also requires the closure and relocation of a private driveway that would protrude through the future RPZ, OFA, and RSA. Additionally, relocating the runway to the north introduces new approach surface obstructions such as trees in the cemetery. Overall, the elements depicted in preferred alternative satisfy growth/facility requirements for the planning period, but the political feasibility may be questionable.

FAA DESIGN STANDARDS

The preferred alternative addresses several design standard issues identified and discussed in the facility requirements analysis. Relocating the Runway 30 RPZ minimizes incompatible land uses within Runway 30 RPZ but introduces new incompatible land uses within Runway 12 RPZ (Road/Driveway). The alternative removes the Runway 30 displaced threshold and also depicts the removal of all non-standard direct entry connections and wide expanses of pavement on the apron directly between the runway/taxiway and apron area. The diversion of Neil Creek and culvert for Emigrant Creek addresses Runway OFA issues but comes with significant cost and environmental impacts. Additionally, the preferred alternative addresses any existing issues with aircraft parking/tiedowns and taxiway OFAs which have been redesigned to meet applicable ADG-I design standards.

The hangar/TOFA issues identified in the facility requirements are identified with a notation indicating that the existing hangars will remain until the end of their useful life, at which time any new construction will be developed to meet taxiway OFA obstruction clearance standards.

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AIRPORT DEVELOPMENT ALTERNATIVES - PREFERRED ALTERNATIVE
FIGURE 5-5

Summary

Of the four alternatives presented and discussed over the course of numerous meetings with stakeholders, PAC members, the FAA, and the planning team, the PAC identified a preferred alternative that included elements from each of the alternatives as well as several specific requests that were identified by the PAC. Similar to the development alternative, the facility improvements depicted on the preferred alternative were evaluated against the five evaluation criteria categories that include operational performance, fiscal factors, environmental factors, planning tenets, and FAA design standards. The preferred alternative was submitted to the FAA in late 2018 for final approval to begin the process of developing capital improvement planning, ALP drawing set, and the remaining implementation elements as required in the master planning process.