CHAPTER 8
IMPLEMENTATION PLAN

8.1 INTRODUCTION

This chapter of the Airport Master Plan incorporates the most feasible alternatives into a phased 20-year Airport Development Plan for the Duluth International Airport. The plan describes one approach to funding and implementing the sponsor's most feasible development alternative. This year-by-year plan provides guidance for continued maintenance, upgrade, and expansion of facilities, as consistent with the Airport facility requirements, pavement conditions and long-term strategic vision of the Airport Authority. The Airport Layout Plan (ALP) drawings depict these improvements, in accordance with Federal Aviation Administration (FAA and Minnesota Department of Transportation (Mn/DOT-Aeronautics) policy and planning standards.

The Airport Development Plan does not represent an obligation of local funds, nor does it commit federal or state funding until demonstrating proper project justification and environmental clearance. In addition, other state and local coordination may also be necessary, depending upon the project. Cooperation with the FAA/MnDOT-Aeronautics is important to facilitate project formulation and coordinate implementation in a timely manner. It is also important that the development plan receive favorable community support and agreement amongst airport tenants.

8.1.1 Implementation Approach

The Implementation Plan consists of a general project phasing plan and an Airport Capital Improvement Plan (CIP). As a key element of the facilities implementation plan, a revised Airport Capital Improvement Program was recently submitted to the FAA and to Mn/DOT. The CIP incorporates facility improvements identified in the facility requirements analysis and alternatives developed in previous chapters of this master plan with the existing Airport CIP. The recommended phasing plan incorporates the facility improvements and major maintenance during the 20-year planning horizon.

The implementation plan provides guidance on implementation of the findings and recommendations of the Master Plan Update. The plan documents the schedule of projects, opinion of probable costs, and financial obligation throughout the 20-year study. These costs generally are broken-down by the short-term (0-5 year), intermediate (6-10 year) and long-term (11-20 year) development needs. The implementation plan considers the demand-driven need for facilities according to Facility Requirements as well as the safety and design standards improvements and provides the Airport and FAA with the information needed to integrate the Master Plan's recommendations with their daily airport activities.

The chapter is arranged to address the following topics:

- Listing and description of the CIP projects;
- Presentation of the Airport CIP (term); and,
- Summary of the 20 year Airport Development Program.

8.1.2 Project Identification

Projects identified in the Airport Development Plan are a response to a facility or user needs, as a reasonable expectation of when demand warrants and funding becomes available. The identification of projects is largely determined through recommendations resulting from Master Plan findings, in which the assignments of project priorities, phasing and estimated costs were consulted with the Sponsor, FAA and

MnDOT-Aeronautics. The following sources of project improvements have been reviewed for incorporation into the 20-year Airport Development Plan:

- Airport Capital Improvement Program (ACIP) FY 2014 to FY 2021 (Dated August 28, 2013)
- Airport Operating and Maintenance Improvement Needs

The following describes the two airport development phasing and funding schedules, in which each includes a year-by-year schedule of annual projects, project description, probable costs estimates, and anticipated funding break-down:

Master Plan Airport Development Plan: The Airport Development Plan is a 20-year improvement schedule, including both eligible and non-eligible projects allowable under the federal (FAA) and state (MnDOT) funding programs. This plan focuses largely on the capital projects necessary to implement the full project recommendations of the Airport Master Plan, as opposed to routine operating and preventative maintenance projects.

FAA Airport Capital Improvement Program (ACIP): The Airport Capital Improvement Program (ACIP) is an eight to 10-year improvement schedule, including only eligible projects allowable under the federal and state grant programs. The ACIP is submitted by the Airport each year to FAA for federal and state programming consideration. The ACIP is less inclusive of a project program than the Master Plan Airport Development Plan. In addition, the ACIP separately accounts for the project pre-planning, design and construction, as a reasonable implementation sequence necessary to fund and build multi-year projects. It should be noted that all of the Airport's FAA ACIP projects have been included in the Airport Development Plan for the Master Plan. The ACIP projects are incorporated in the Master Plan as submitted to FAA on August 28, 2013.

8.1.3 Project Phasing Periods

Projects are phased to facilitate systematic development over the course of the next 20 years. The Airport Development Plan is broken-down into planning phases, as follows:

Phase 1 (1-5 Years) – Near Term Planning Period
Phase 2 (6-8 Years) – Intermediate Planning Period in conformance with the ACIP
Phase 3 (9-20 Years) – Long Term Planning Period

Overall, the phasing and priority of the projects have been determined as a matter of: 1) airport safety and standard requirements, 2) facility conditions and deficiencies, 3) upgrades and expansion to meet user demand levels, and 4) consistent with funding resources and programming schedules.

Phase 1 and 2 identify individual projects on a year-by-year basis, while most projects in Phase 3 are grouped in a range of probable years. In addition, the Phase 1 and 2 projects often identify a separate 'design' and 'construction' phase for major projects, since the design component must lead construction to account for bidding and contract award time. While the Phase 1 and 2 projects are well defined and include major equipment purchase and building repairs, Phase 3 projects are less certain in terms of a focused project scope, and are more subject to re-sequencing in response to changing Airport needs. Similarly, the Phase 3 costs are typically unspecified due to uncompensated inflation adjustments or projects having yet to be defined.

The Implementation Plan can be dramatically impacted by unpredictable events such as inflation, changing demand profiles, local or national economic health, or legislative changes. Financial projections should be viewed accordingly. Other factors that may impact this implementation also include:

- Changing of priorities in funding for the initially identified capital improvements. Market conditions may cause changes in needed facilities, require new facilities, or redefine priorities.
- Safety and security improvements, whether they are reflected in the Airport CIP or not, may require immediate funding.
- Cost estimates to provide certain improvements can fluctuate dramatically when considering factors such as technological advancements and economies of scale related to undertaking several improvements at once.
- While addressing all of the capital needs of the Airport, the vast majority of the plan addresses the need to rehabilitate airfield pavement and solve runway safety and Federal Aviation Administration (FAA) design standard issues while keeping the Airport open.

It is recommended that the Implementation Plan, including the Airport CIP, be utilized as a working tool and a work in progress. The plan should be updated annually and include reassessment of project chronology within the three term phases, short, intermediate and long. Capital improvements, their associated costs, and financial projections should be re-examined periodically throughout the planning period even though the figures contained herein present a reasonable forecast of needed initiatives to implement the Master Plan Update recommendations.

8.1.4 Critical Airfield Capital Improvement Projects

A primary focus of the Airport Development Plan is centered on airfield rehabilitation projects, in which the size and cost of the pavement projects at Duluth often requires a phased multi-year improvement. As identified in Chapter 9-Implementaiton, approximately 78.5 percent of the eight year ACIP project costs (2014-2021) are dedicated to 'pavement' improvements. The airfield pavement conditions identified by the 2010 Pavement Condition Index (PCI) study are integrated into the overall Airport Development Plan. More particularly, it is the strategy of the Airport Development Plan to incorporate pavement rehabilitation as a sequence of inter-related projects accruing to the ultimate Airport development, as opposed to a set of individual pavement projects.

The keys to considering the Airport Development program are:

Environmental Clearance: Each major project should be re-evaluated at least every two years prior to implementation to ensure it receives the appropriate environmental processing, based on current environmental policies and procedures. Projects requiring environmental processing are typically identified as needing a categorical exclusion or an environmental assessment. The FAA and MnDOT will determine the type and level of environmental analysis required, and whether projects can be combined. Environmental approval for minor projects is normally conducted as part of the preliminary design phase, and typically takes several months to get environmental approval. Major projects normally require a separate environmental study, which can take up to 18 months. Projects in Phase 1 and 2 are anticipated to require minor environmental analysis and documentation to satisfy federal NEPA requirements. However, most of the major projects in Phase 3 involve areas of more significant land disturbance and redevelopment such as the Runway 3-21 extension. These projects would likely require detail environmental analysis, including Environmental Assessments, which typically have a shelf life approval period of 3 to 5 years.

Airport Operations: It is essential that major Airport improvement projects be scheduled and sequenced in a manner which does not unnecessarily limit Airport operations. As an Airport with multiple runways, it is critical that major runway and taxiway construction projects be sequenced, phased and scheduled in coordination with airspace/instrument procedure requirements, navigational systems, ground maneuverability, and points of terminal/hangar access. These considerations must

be factored for daytime, nighttime and inclement weather periods. Therefore, individual projects should not be considered as single improvements, but rather as a series of incremental projects that accrue towards the ultimate vision of Airport development.

Annual Revision of Cost Estimates: It is important to revise cost estimates on an annual basis since the cost of certain improvements can fluctuate dramatically when considering factors such as technological advancements, materials cost, and taking advantage of economies of scale related to undertaking several improvements at once.

8.1.5 Future Development Considerations

It is recommended that the Airport Development Plan and FAA Airport Capital Improvement Program (ACIP) be used as a working tool.

The one to eight year projects should be re-assessed and updated annually, including necessary adjustments in project sequencing, multi-year phasing considerations, engineering-level cost opinions, funding participation and proper lead-time for project formulation and planning requirements.

The following list is a brief description of the Airport Development Plan projects in the ACIP for the one to eight year timeframe listed in the same order as they may be found in Table 9-4 Airport Master Plan Development Program: Stage 1 and 2 (2014-2020). With few exceptions which are noted, the projects listed in this program are all triggered by life cycle circumstances. Their specific timing is based upon the Airport's best determination of priority. The lack of available funding dictates the spreading of these projects over a longer period of time than desired. It is possible that some of these projects may need to be moved up if equipment/pavement fails sooner than anticipated or delayed due to other projects becoming a greater priority or as a result of some unforeseen project that is not included in the list.

- Equipment replacement (2014 and 2019) and equipment purchase (snow removal equipment 2015)
- Air Traffic Control Tower Repairs: HVAC in 2014; roof and building management system in 2015; and, tuck pointing, exterior painting and siding in 2018.
- Completion of an airfield electrical manhole drainage project at the east end of the airport (2015)
- Upgrading airfield signage (2016).
- Runway approach obstruction removal off the Runway 9 end (2016).
- Taxiway "A" rehabilitation, Phase I in 2016 and Phase II in 2017. Rehabilitate Taxiway using "cold-in-place" asphalt recycling and a 4" overlay.
- General pavement maintenance, allowance of $50,000 for 2016, 2018, 2019, and 2020
- Environmental Analysis. Preparation of an environmental assessment of Runway 27 end compliance projects, Runway 3-21 extension, Taxiway "C" relocation, Taxiway "B" east extension to Taxiway "C", and Taxiway "F" configuration (2017). The triggering event for this project is the Airport's decision to begin advance planning for Runway 3-21 reconstruction and extension.
- Relocation of the Parallel Taxiway "C" System. Reconstruction of the north 3,400' x 50' portion of Taxiway "C" at 400' separation runway to taxiway.
- Taxiway "B" design (2018);
- Acquisition of Property (2018). Purchase of 0.5 acres for the future Runway Protection Zone to enable the extension of Runway 21 to an ultimate 8,000'. The property acquisition is necessary to comply with Mn/DOT Zone A standards that are greater than FAA requirements for an RPZ..Hangar repairs; Hangar 104 roof and hangar door repairs (2019) and Municipal Hangar #2 roof and hangar door repairs (2020).
- Access road paving and repair (2019).
- Runway 21 projects: extension of Runway 21 consisting of construction of a 1,282' x 150' extension to 7,000' and reconstruction of Runway 3-21 at 5,719' x 150' to include rehabilitation of runway

pavement, construction of 20' runway shoulders, and taxiway connections. This project would be constructed in two phases, Phase 1 in 2020 and Phase 2 in 2021.
- Midfield ramp apron repair (2021).
- Construction of an Arrivals and Departures building (2021).

The new airport parking garage project will be constructed during the 2014-2021 period but it is not federally eligible or included in the ACIP.

Like the 2014-2021 list, the long-term nine to 20 year projects should be periodically re-examined for proper project chronology and updating of the cost estimates assigned as the project as development becomes more defined. It is anticipated that the Airport will continue to monitor and evaluate which long-term nine to 20 year projects are best to accommodate tenant demands, accommodate growth, and meet federal and state requirements. The primary projects identified for the Long-Term Planning period are listed below:
- Rehabilitation of Runway 9-27, East End. Rehabilitate 2,800' x 150' runway section on Runway 27 end to include rehabilitation of shoulders and taxiway tie-ins, and rehabilitation of the former Taxiway "E" inline taxiway as a displaced threshold. Phase I-A would reconstruct the intersection of Runway 9-27 and Runway 3-21. Phase I-B would reconfigure the Runway 27 end by removing existing Taxiway E-1, constructing a new Taxiway E-1, constructing new Taxiway E-2, removing Taxiway A-5, and reconstructing Taxiway E as a displaced threshold.
- Reconstruction of Runway 9-27, West end. Reconstruct 2000' x 150' section on the Runway 9 end.
- Reconstruction of center portion of Runway 9-27. Reconstruct the center 6,200' x 150' section of Runway 9-27.
- Relocation/Realignment of Parallel Taxiway "C" System South End. Realign Taxiway "C" on the South End of the airport to conform to 400' runway-to-taxiway separation standards.
- Reconstruction of Taxiway D System, South End, 1,500 LF
- Extension of Taxiway "B" east to Taxiway "C". Construct 1,800 x 75' extension of Taxiway "B" to connect with realignment Taxiway "C"
- tower
- Reconstruction of Taxiway "A" to resolve air traffic control tower line-of-sight visibility constraints, removal of an irregular "S" curve, and enable general aviation ramp expansion.
- Extension of Taxiway "B" west to Taxiway A-3 intersection
- Construction of future cargo ramp expansion
- Construction of expanded General Aviation Apron. Construct new general aviation pavement west of Cirrus and south of Taxiway A.
- Construction of a new airport traffic control tower
- Development of a new helicopter hangar facility
- Construction of new terminal taxiway/apron fillet enlargement along Taxiway 'D'
- Site development for potential Unmanned Vehicles or a general aviation expansion area
- Construction of an expanded paved snow dump area
- Construction of a midfield apron expansion along Runway 9-27
- Development of a GPS-based satellite precision instrument approach for Runway 21;
- Construction of Taxiway "F". Realign existing Taxiway "F" by constructing new future partial parallel Taxiway "F" to provide Minnesota Air National Guard Ramp access to the Runway 21 end
- Extension of Runway 9-27 by 1,438' x 150' feet to an ultimate 11,600' feet
- Extension of Runway 21. Construct 1,000' by 150' extension to Runway 21 to a full length of 8,000'

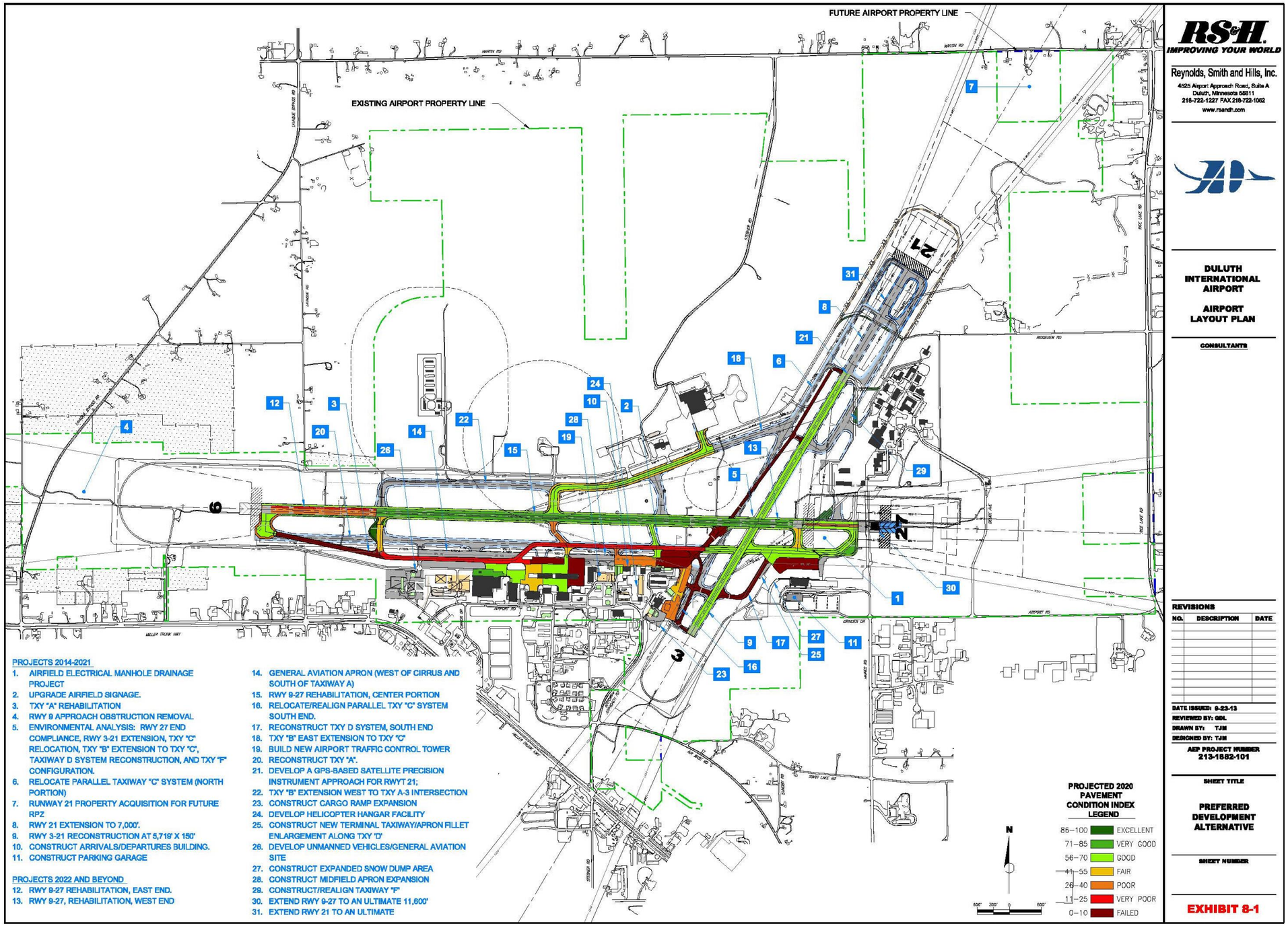
8.2 PHASING PLAN

Projects identified as part of the Master Plan are described below. The projects are aggregated to facilitate systematic development over the course of the next 20 years by short, intermediate, and long term. The

short-term capital improvements include those development items that will begin within the next five years and are intensively focused on solving the critical airfield issues at the Airport. The project numbers in the short term phasing plan provide the year (i.e., 2014) and sequence of project of the projects. The intermediate-term capital improvements generally fall outside the initial five year window and are responsive to expected future / ultimate requirements. Projects identified for the intermediate-term are the six to eight year projects identified in the ACIP.

The long-term capital improvements generally fall outside the initial ten year window and are responsive to expected ultimate requirements. These long-term projects can be re-sequenced in response to changing needs.

The overall phasing plan for the major projects in the development plan is depicted in Exhibit 8-1. This figure identifies the location of each major facility development project listed in the ACIP (2014-2021) exclusive of equipment and general maintenance as well as the identification for projects within the Airport Development Plan for subsequent years. It also replicates the estimate 2020 pavement conditions index shown for the purpose of identifying the critical nature of timing for pavement rehabilitation projects. Exhibit 8-1 follows at the end of the chapter. The timing of intermediate (six to eight years) and long-term projects (beyond eight years) is less well defined and requires future attention by the Airport to adjust sequencing and timing as future conditions dictate.



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DULUTH INTERNATIONAL AIRPORT

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 6-23-13
REVIEWED BY: GDL
DRAWN BY: TJM
DESIGNED BY: TJM
AEP PROJECT NUMBER 213-1882-101

SHEET TITLE

PREFERRED DEVELOPMENT ALTERNATIVE

SHEET NUMBER

EXHIBIT 8-1

8.3 FUTURE MASTER PLAN CONSIDERATIONS

Over the course of the development of the DLH master plan, a new FAA policy was issued having to do with runway protection zones. This policy known as "Interim Guidance on Land Uses Within a Runway Protection Zone" prescribes that an RPZ should be absolutely clear of development. Based upon the guidance within that policy, any change in an RPZ will also require any incompatible land use, as defined by the policy, to be removed from the RPZ. Any plan that includes an incompatible land use within an RPZ must be approved by FAA Headquarters.

Consequently, it is recommended that the next ALP Update or Master Plan Update include an RPZ land use compatibility analysis within it.