CHAPTER 6: IMPLEMENTATION & COMPATIBILITY

Introduction

The implementation and compatibility plan provides guidance on how to carry out the preferred development recommendations identified in **Chapter 5: Alternatives Analysis**. Based on the preferred development plan, the improvement projects needed at the Grand Forks International Airport (GFK) over the planning period can be formulated. This chapter includes the following sections:

- Project Sequence
- Financial
- Environmental Review
- Compatibility

Background

Each project is sequenced to balance demand, schedule, other projects, environmental/agency approval, funding, and financial constraints. The project plan may change over time to react to changing conditions but is flexible so that the airport can react to change and re-prioritize projects based on actual demand.

The implementation plan is divided into the following development time periods:

- Short-Term (2018 to 2023)
- Mid-Term (2023 to 2028)
- Long-Term (2028 to 2038), and
- Ultimate (beyond 2038)

A more detailed facility implementation and financial feasibility plan is identified for the short-term and mid-term as the project needs can be more realistically anticipated based on available funding and actual activity demand. There is more uncertainty in project funding, demand, and local project importance in the long-term. When reaching that point, airport planning documents should be updated.

All planning-level project costs developed are in 2018 dollars. Final project costs are subject to change based on actual construction and project formulation needs.

Many of the projects identified are demand-driven based on the Planning Activity Levels (PALs) from the approved aviation forecasts. Each PAL corresponds to an estimated year. The timing of implementation is estimated from the FAA-approved activity forecasts. Any change from the forecasted airport activity may affect the timing of capacity-driven improvements.

A sound development strategy is vital to creating a realistic implementation plan. These considerations for GFK include:

- Maintain a safe airport. Address key safety/security/standards projects while providing adequate funding for other necessary improvements. Priority projects include upgrading Runway 9L-27R for air carrier traffic to eliminate converging traffic patterns.
- Maintain airport pavements and facilities in a functional condition. Priority projects through the mid-term include major rehabilitation or reconstruction of Runway 17R/35R, as well as rehabilitation of west hangar taxilanes and a portion of the north alpha apron.

- Build capacity at the airport to meet existing and anticipated future demands. Key projects include expanding the terminal building, constructing bypass taxiways, holding bays, a capacity-only runway, as well as improving instrument approach minimums.
- Sequence airport improvement projects considering a realistic funding plan with a mix of federal, state and local funds.

Based on the PALs and other regular pavement and safety needs, some airport development capacity projects may not be able to be sequenced to meet PALs within a realistic funding plan. These projects are initiated within a few years of their PAL demand trigger to account for anticipated available funding.

Implementation Process

The airport must go through an established process to receive the federal funds to complete an airport development project. FAA requires long lead times to complete all project steps and incorporate projects into funding plans. Additional coordination is required to prepare National Environmental Policy Act (NEPA) environmental documentation. Common steps in the project implementation process for a complex project include:

- Professional Services: Select a qualified consultant for the project planning, environmental reviews, survey, engineering design and construction administration for the project. Separate selection process for planning and engineering services.
- Five (5) Years Prior to Construction: Identify the project on the Airport Layout Plan, complete necessary airport planning studies and collect supporting documentation to demonstrate the project is justified for AIP funding, and is compatible with the Airport Layout Plan.
- Four (4) Years Prior to Construction: Update the Capital Improvement Plan (CIP) to identify the project scope, eligibility, justification, and funding. Close coordination with FAA is required.
- Three (3) Years Prior to Construction: Initiate any aeronautical surveys, navigational aid agreements (reimbursable agreements) or special FAA coordination for flight procedures which may be necessary prior to construction. Solidify project funding plan and final justification with FAA.
- Two (2) Years Prior to Construction: Complete required NEPA environmental documentation and analysis for the proposed action. Prepare 25 percent project design, refine cost estimates, and prepare benefit/cost analysis as necessary. Acquire land for project and initiate airspace studies.
- One (1) Year Prior to Construction: Obtain environmental clearance and permits for the proposed action. Prepare detailed project plans and specifications including design report, airspace studies, Safety Management Systems (SMS) and construction safety/phasing plan. Finalize project schedule.
- Year of Construction: Complete final design. Solicit bid proposals from companies engaged in the project construction. Prepare grant application and accept Federal grant. Issue notice to proceed and monitor construction. Maintain FAA grant compliance and payments.
- After Construction: Submit final report and close out the AIP grant.

For complex projects requiring federal discretionary funding such as runway extensions, these steps may take up to five years prior to the issuance of an AIP grant for construction. Less complex projects using entitlements such as pavement rehabilitation will require less lead times, typically no less than three years prior to grant issuance.

Project Sequence

Significant individual projects are described in this section along with information about the project purpose, scope, and triggering events. The recommended project phasing at GFK is based on anticipated needs and available funding. There are significant 10-year needs at GFK that require a significant amount of additional Federal funding that would need to be secured to Upgrade Runway 9L/27R, Reconstruct Runway 17R/35L, and Construct Runway 18/36. These projects are collectively known as the 10-year GFK airfield development plan. This plan was discussed with FAA headquarters and elected representatives in Washington D.C. in late 2017 and early 2019 and received congressional support and FAA support.

The following information provides guidance to the airport sponsor and funding agencies on future implementation steps. **Tables 6-1 through 6-3** describe the significant anticipated projects which are graphically depicted on the Airport Layout Plan **(Appendix N)**.

Short-Term Projects (0-5 Years)

Short-term projects cover the beginning of the planning period for the next five years through 2023, also identified as forecasted Planning Activity Level (PAL) 1. The identified sequencing is based on years because activity and funding can be reasonably anticipated. Projects also require actions to be taken several years ahead of implementation, requiring a solid project and funding plan to be developed for projects within the next five years.

Projects in this phase address the highest priority needs justified for funding within the next five years. First, the airport plans to embark on the **Reconfigure West General Aviation Area** project to provide public infrastructure to create opportunities for new corporate hangar development on the west side of the terminal area. The most critical short-term airfield project is the **Extend, Widen and Strengthen Runway 9L/27R, Taxiway B** project identified to be completed by year 2023. The project is needed to enhance safety, reduce ATC workload complexity and reduce delays. This project also provides the ability for GFK to continue air carrier operations while Runway 17R/35L is down for construction. Federal discretionary funding is proposed to be utilized on this project over a five-year period from 2019 to 2023.

Significant short-term projects are further described in **Table 6-1: Short-Term Implementation Plan**.

Mid-Term Projects (6-10 Years)

Mid-term projects cover the beginning of the planning period for the next six to ten years through 2028 or forecasted PAL 2. The identified sequencing is still based on years. Although the sequencing can be more fluid than the short-term, mid-term projects can still be reasonably anticipated based on project activity and funding. A 10-year plan should be established because projects require actions to be taken several years ahead of implementation. Projects in this phase may change sequence, however the bulk of the identified projects need to be implemented unless an unforeseen event occurs that changes the basis for the plans developed.

GFK mid-term projects address priority pavement rehabilitation and airfield/terminal capacity needs. The priority pavement rehabilitation project is to **Reconstruct Runway 17R/35L** to extend the useful life of the airport's primary runway. The scope of this project should be refined in the next five years.

The next priority project is to **Construct Runway 18/36** to increase total airfield capacity to reduce delays to accommodate the existing and forecasted increase in airport operations. The construction of an **Airport Perimeter Road** will be completed as opportunities present themselves to improve airfield access. These three significant airfield projects are planned to be completed by year 2028.

Additional terminal building and apron capacity is needed to meet existing passenger needs. Because of other needs, the **Expand Terminal Building & Apron** project is sequenced after the airfield improvements. This project would expand the terminal holdroom to the west (3,500 SF) and provide additional apron pavement to improve operational flow during peak periods, irregular and deicing operations. Federal discretionary funding is proposed to be utilized over a five-year period from 2023 to 2028 for the identified projects. A new Passenger Facility Charge (PFC) is proposed to be imposed to provide debt repayment for the terminal building expansion project.

Significant mid-term projects are further described in **Table 6-2: Mid-Term Implementation Plan**.

Long-Term Projects (PAL 3-4)

Long-term projects cover the remainder of the planning period for the next 11 to 20 years through year 2038 or forecasted PAL 3 and 4. Projects are identified based on forecasted project activity and funding. The project sequencing for demand driven projects in this phase may change because of change in aviation activity, new standards, funding, or even new local priorities. Long-term projects are important to consider in airport master planning so that appropriate steps, funding, and resources can be allocated. It also allows the ability for the airport to react to changes in airport activity.

In this phase, significant pavement reconstruction projects are described as their schedules are not typically flexible and funding needs tend to be higher. Demand projects are required to adequately meet demand thresholds triggered between PAL 3 and PAL 4. Because of changing considerations, actual funding needs are likely to vary between the completion of this master plan study and the long-term.

Long-term projects at GFK include a variety of pavement preservation projects including **Reconstruct North Alpha Apron, Air Cargo Apron, Taxiway G, Taxiway C, C2, C3, and Taxiway A, A1, A2, A3, A4 and A5** projects. These pavements are projected to be below the target pavement condition during this period and will need significant pavement work. The Alpha Apron project will remove a significant amount of old pavement no longer needed. Reconstruct taxiways provides an opportunity to remove direct access from the apron to the runway. These projects are a high priority project to preserve existing infrastructure. An **Expand Snow Removal Equipment Building** project is forecast to be needed to accommodate the additional equipment needed to maintain new pavement areas.

A significant demand/capacity project identified in the long-term is to **Construct Runway 17R/35L Bypass Taxiways** to improve operational flow with different aircraft types, particularly if Runway 18/36 is not constructed. Other capacity improvements include **Construct Holding Bays** to improve operational flow and reduce delays during peak operational periods. The **Construct Customs & Border Protection Facility** project will replace the existing facility to provide CBP services to arriving general aviation aircraft. If demand thresholds are triggered, then the **Expand West General Aviation Apron** project is forecast to be completed during the long-term. Other capacity projects include **Expand Economy Parking Lot** and **Expand Rental Car Parking Lot**.

Long-term project priorities tend to change over time. A change in activity from the forecasts, for example, will require modification to the demand/capacity projects implementation schedule. It is important however for the airport to identify potential needs and be prepared to react accordingly. Pavement preservation projects will continue to be a higher priority.

Significant long-term projects are further described in **Table 6-3: Long-Term Implementation Plan**.

Ultimate Projects (Beyond PAL 4)

It is important to identify ultimate phase projects so that decisions can be made in other planning periods that preserve the ability to achieve these longer-term goals. These projects are identified without sequencing or a funding plan. Pavement preservation projects are not identified as their development area does not tend to affect other projects.

Examples of ultimate development projects at GFK include extending Runway 17R/35L to 8,000 feet, upgrading Runway 17R/35L to a Category II ILS approach, and expanding the Bravo apron.

Implementation Summary

Recommended infrastructure projects are identified in a phased development schedule. These projects are then prioritized and sequenced based on a variety of factors previously described including demand triggers, scheduled improvements, and available funding. The actual implementation will vary depending upon demand, financial, environmental and compatibility considerations. Each project identified requires detailed planning, environmental documentation, design, and construction steps prior to its completion.

Table 6-1 through **Table 6-3** summarizes the recommended development projects and sequencing over the planning period.

Table 6-1 - Short-Term Implementation Plan

Year[1]	Project	Purpose	Scope	Trigger	Prerequisites	Estimated Cost	Federal Share	State Share	Local Share
Short-Term (0-5 Years)									
2019	Construct Westside GA Taxiways/Taxilanes & Apron A Rehabilitation (Engr. Report and Design)	Pavements and facilities reaching end of useful life. Reconfigure area to accommodate larger corporate aircraft while small GA aircraft relocated to east GA development	Rehabilitate Apron, Reconstruct Apron, Remove Apron, Construct Access Road and Parking	Demand for corporate area exceeds available space / Existing infrastructure requires improvements to maintain structural integrity.	East GA Infrastructure Completed, Documented CATEX (Approved by FAA 5/3/2019)	$70,000	$63,000	$3,500	$3,500
2019	Construct Westside GA Taxiways/Taxilanes & Apron A Rehabilitation (Construction Engr.)					$80,000	$72,000	$4,000	$4,000
2019	Construct Westside GA Taxiways/Taxilanes & Apron A Rehabilitation (Phase 1 - Construction)					$800,000	$720,000	$40,000	$40,000
2020	Extend Runway 9L-27R (Environmental Assessment) Start EA in 2019	Enhance Runway Infrastructure To Accommodate Air Carrier Aircraft And Eliminate Converging Traffic During East-West Flow	Reconstruct Runway Pavement, Lighting, Signage.	Enhance airfield efficiency as identified as deficiency in the AMP.	Simple Written Record CATEX	$400,000	$360,000	$20,000	$20,000
2021	Reconstruct/Extend [Runway 9L-27R (6700'x100') & Taxiway B (6700'x50'), Design]				Runway 9L-27R Environmental Assessment	$1,293,000	$1,163,700	$64,650	$64,650
2021	Extend Runway 9L-27R [9L-27R/17R-35L Intersection (Bidding & Construction Engr)]					$734,000	$660,600	$36,700	$36,700
2021	Extend Runway 9L-27R [Reconstruct Rwy 9L-27R/17R-35L Intersection (Construction)]					$7,339,380	$6,605,442	$366,969	$366,969
2021	Extend Runway 9L-27R [Acquire Land for Rwy 9L-27R Extension (83.3 acres)]	Acquire Land For Relocated Highway And RPZ Of Extended Runway 9L-27R	Land Acquisition	Enhance airfield efficiency as identified as deficiency in the AMP.	Runway 9L-27R Environmental Assessment	$883,000	$794,700	$44,150	$44,150
2021	Extend Runway 9L-27R (Wetland Mitigation for Rwy 9L-27R Extension)	Mitigate Wetland Disturbance For Extension Of Runway 9L-27R	Wetland Mitigation	Enhance airfield efficiency as identified as deficiency in the AMP.		$764,000	$687,600	$38,200	$38,200
2022	Extend Runway 9L-27R [Relocate County 5 (Design, Bidding & Construction Engr.)]	Locate County Highway 5 around the RPZ of Extended Runway 9L-27R	Construct New Highway Alignment	Enhance airfield efficiency as identified as deficiency in the AMP.	Acquire Land, Wetland Mitigation, Runway 9L-27R Environmental Assessment	$600,000	$540,000	$30,000	$30,000
2022	Extend Runway 9L-27R [Relocate County 5 (Construction)]					$4,000,000	$3,600,000	$200,000	$200,000
2023	Extend Rwy 9L-27R (2500'x100') Construction	Enhance Runway 9L-27R Infrastructure To Accommodate Air Carrier Aircraft And Eliminate Converging Traffic During East-West Flow	Construct Runway And Taxiway Pavement, West Electrical Vault, Install Lighting, Signage	Enhance airfield efficiency as identified as deficiency in the AMP.	Acquire Land, Wetland Mitigation, Relocate Highway 5, Runway 9L-27R Environmental Assessment	$8,615,500	$7,753,950	$430,775	$430,775
2023	Extend Runway 9L-27R [Extend Twy B (2500'x50'), Construction]					$4,548,240	$4,093,416	$227,412	$227,412
2023	Extend Runway 9L-27R [Reconstruct Rwy 9L-27R (650'x100') & Twy B (650'x50'), Construction]					$3,922,716	$3,530,444	$196,136	$196,136
2023	Extend Runway 9L-27R [Construct Rwy 9L Approach Lighting System, Construction]	Lower Instrument Approach Minimums Increase Airport Utility. Install Approach Lighting System for 3/4 Mile Approach	Install Medium Intensity Approach Lighting System with Sequence Flasher (MALSF) - 9L End	Enhance airfield efficiency as identified as deficiency in the AMP.		$800,000	$720,000	$40,000	$40,000
2023	Extend Runway 9L-27R [Construct 2 New Twy B Connectors (300'x50'), Construction]	Enhance Runway 9L-27R Infrastructure To Accommodate Air Carrier Aircraft And Eliminate Converging Traffic During East-West Flow	Construct Taxiway Pavement, Install Lighting, Signage	Enhance airfield efficiency as identified as deficiency in the AMP.		$1,236,260	$1,112,634	$61,813	$61,813
2023	Bidding & Construction Engineering Services for 2023 Projects					$1,913,550	$1,722,195	$95,678	$95,678
	Develop Land Use Compatibility Plan and Adopt Airport Zoning Ordinance	Preserve and Enhance Compatible Land Use Around Airport	Develop Land Use Compatibility Plan	Change in runway configuration	None	$100,000	$90,000	$5,000	$5,000
	Reconfigure Parking Lot A for Ready-Return Parking	Existing Ready/Return lot near capacity. Reconfiguring lots would meet capacity needs	Reconfigure South Portion of Lot A	When demand exceeds capacity of existing ready/return lot	None	$500,000	$0	$0	$500,000
					Short-Term Total	**$38,599,646**	**$34,289,681**	**$1,904,982**	**$2,404,982**

Note: Green highlighted projects included on current CIP
Source: KLJ Analysis

[1] Some Projects have a flexible implementation schedule but should be given serious consideration for completing in the ranges recommended.

Table 6-2 - Mid-Term Implementation Plan

Year[2]	Project	Purpose	Scope	Trigger	Prerequisites	Estimated Cost	Federal Share	State Share	Local Share
Mid-Term (5-10 Years)									
2024	Extend Runway 9L-27R [Reconstruct Rwy 9L-27R (3050'x150'), Construction]	Enhance Runway Infrastructure To Accommodate Air Carrier Aircraft And Eliminate Converging Traffic During East-West Flow	Construct Runway And Taxiway Pavement, Install Lighting, Signage	Enhance airfield efficiency as identified as deficiency in the AMP.	Acquire Land, Wetland Mitigation, Relocate Highway 5, Runway 9L-27R Environmental Assessment	$11,332,000	$10,198,800	$566,600	$566,600
2024	Extend Runway 9L-27R [Reconstruct Twy B(2850'x50'), Construction]					$5,395,000	$4,855,500	$269,750	$269,750
2024	Extend Runway 9L-27R [Reconstruct Taxiway B1 & C Connectors, Construction]					$1,732,500	$1,559,250	$86,625	$86,625
2024	Construction Engineering Services for 2024 Projects					$1,848,000	$1,663,200	$92,400	$92,400
2024	Reconstruct Rwy 17R-35L (Design)	Runway originally constructed in 1963, Last resurfaced 15 years ago. Experienced Pavement Heaving In Multiple Sections. Pavement Maintenance should occur based on a pavement management program to extend their useful life to function for safe airport operations.	Reconstruct Runway Pavement, Install Lighting, Signage.	Existing infrastructure requires improvements to maintain structural integrity.	Runway 9L-27R Extension Complete. Runway 17R-35L Documented CATEX	$1,750,000	$1,575,000	$87,500	$87,500
2025	Reconstruct Rwy 17R-35L [Phase 1 North (3600'x150' minus Rwy 9L-27 R intersection), Construction]					$21,093,750	$18,984,375	$1,054,688	$1,054,688
2025	Reconstruct Rwy 17R-35L (Bidding & Construction Engr)					$2,109,375	$1,898,438	$105,469	$105,469
2026	Reconstruct Rwy 17R-35L [Phase 2 Middle Section (1950'x150'), Construction]					$13,143,750	$11,829,375	$657,188	$657,188
2026	Reconstruct Rwy 17R-35L (Bidding & Construction Engr)					$1,314,375	$1,182,938	$65,719	$65,719
2027	Reconstruct Rwy 17R-35L [Phase 3 South Section (1951'x150'), Construction]					$14,071,875	$12,664,688	$703,594	$703,594
2027	Reconstruct Rwy 17R-35L (Bidding & Construction Engr)					$1,407,188	$1,266,469	$70,359	$70,359
	Expand West General Aviation Apron (Phase 2), Construct Taxiways	Pavements and facilities reaching end of useful life. Reconfigure area to accommodate larger corporate aircraft while small GA aircraft relocated to east GA development	Rehabilitate Taxilane Pavement, Reconstruct Apron, Remove Apron, Construct Access Road and Parking	Demand for corporate area exceeds available space / Existing infrastructure requires improvements to maintain structural integrity.	East GA Infrastructure Completed, Documented CATEX	$3,000,000	$2,700,000	$150,000	$150,000
	Rehabilitate Runway 17L-35R, Taxiway A, Taxiway C3 (Joint/Concrete Panel Replacement)	Pavement Maintenance should occur based on a pavement management program to extend their useful life to function for safe airport operations.	Rehabilitate Runway and Taxiway Pavement	Existing infrastructure requires improvements to maintain structural integrity.	Simple Written Record CATEX	$500,000	$450,000	$25,000	$25,000
	Reconstruct Airport Access Road	Pavement Maintenance should occur based on a pavement management program to extend their useful life to function for safe airport operations.	Reconstruct Access Road Pavement	Existing infrastructure requires improvements to maintain structural integrity.	Simple Written Record CATEX	$1,375,000	$1,237,500	$68,750	$68,750
	Construct Public Access Roads from Airport Drive	Provide access to new development areas	Construct Access Road	As development demands	Simple Written Record CATEX	$500,000	$450,000	$25,000	$25,000
	Expand UND Parking Lot	Expand Auto Parking to meet demand	Expand Parking Lot	Demand for parking exceeds available space	None	$500,000	$0	$0	$500,000
	Expand Terminal Building, Apron - Design	Passenger Holdroom Space is Deficient. West Building Expansion provides Expanded Holdroom, Baggage Makeup, Equipment Storage	Expand Terminal Building West	Passenger seating demand in holdroom exceeds available space	Simple Written Record CATEX	$750,000	$675,000	$37,500	$37,500
	Expand Terminal Building (Stage 1: West)					$2,800,000	$2,520,000	$140,000	$140,000
	Expand Commercial Terminal Apron (Stage 1 & 2)	Apron Expansion needed to accommodate maneuvering of multiple aircraft during deicing operations	Construct Additional Taxiway Access, Expand Apron Pavement, Realign Taxilane to Cargo Apron	Demand for aircraft parking and deicing exceeds separation standards	Documented CATEX	$3,800,000	$3,420,000	$190,000	$190,000
	Construct Runway 18-36, Taxiway (3,300' x 60') - Design	Airport is capacity constrained. Additional parallel runway system would increase overall airfield capacity	Construct Runway And Taxiway Pavement, Install Lighting, Signage	Enhance capacity of currently constrained airfield	Runway 18-36 Environmental Assessment	$750,000	$675,000	$37,500	$37,500
	Acquire Land for Runway 18-36 (42.6 acres)					$500,000	$450,000	$25,000	$25,000
	Construct Runway 18-36, Taxiway (3,300' x 60')					$8,000,000	$7,200,000	$400,000	$400,000
	Acquire ARFF Truck	ARFF Truck Replacement Plan to Maintain Operational Service	Replacement of ARFF Truck	Existing equipment reaches end of service life	Simple Written Record CATEX	$850,000	$765,000	$42,500	$42,500
					Mid-Term Total	**$98,522,813**	**$88,220,531**	**$4,901,141**	**$5,401,141**

Note: Green highlighted projects included on current CIP
Source: KLJ Analysis

[2] Some Projects have a flexible implementation schedule but should be given serious consideration for completing in the ranges recommended.

Table 6-3 - Long-Term Implementation Plan

Year[3]	Project	Purpose	Scope	Trigger	Prerequisites	Estimated Cost	Federal Share	State Share	Local Share
Long-Term (10-20 Years)									
	Construct Holding Bays (Charlie & Bravo Aprons, Runway 35R)	Aircraft Runups in non-movement areas will improve airfield flow and reduce delays	Construct Taxiway Pavement, Install Lighting, Signage	Enhance capacity and reduce delay of currently constrained airfield	Documented CATEX	$4,500,000	$4,050,000	$225,000	$225,000
	Construct Airport Perimeter Road	Access other parts of airfield without entering ATCT controlled movement areas	Construct Access Road	Enhance airfield operational efficiencies / As airfield development occurs	Documented CATEX	$2,500,000	$2,250,000	$125,000	$125,000
	Construct Self-Service Fuel Facility	Reduce Aircraft Taxi-Time or Fuel Truck Drive Time To Serve Aircraft on Other Side of Airfield	Construct concrete pad and fuel system	Demand for aircraft fueling in East GA	East GA Infrastructure Completed, Simple Written Record CATEX	$500,000	$0	$350,000	$150,000
	Construct Customs and Border Protection General Aviation Facility for CBP Facility	Relocate Customs Closer to Terminal and GA Traffic. Expand Employee Lot to Accommodate Customs Facility	Construct Customs Building, Expand Parking Lot	CBP Facility size demands exceed available space	None	$2,000,000	$0	$1,000,000	$1,000,000
	Expand Employee Parking Lot					$300,000	$0	$150,000	$150,000
	Reconstruct North Alpha Apron, Reconstruct Taxiway G, Construct Taxilane	Pavement Maintenance should occur based on a pavement management program to extend their useful life to function for safe airport operations.	Reconstruct Taxiway and Apron Pavement	Existing infrastructure requires improvements to maintain structural integrity / Enhance airfield operational efficiencies	Simple Written Record CATEX	$3,800,000	$3,420,000	$190,000	$190,000
	Expand Snow Removal Equipment Building	Expand Storage Building to accommodate SRE Fleet	Construct Building Extension, Access Road, Parking lot	Primary SRE fleet exceeds capacity of existing facility	Simple Written Record CATEX	$2,000,000	$1,800,000	$100,000	$100,000
	Construct Runway 17R/35L Bypass Taxiways	To improve airfield flow and reduce delays	Construct Taxiway Pavement, Install Lighting, Signage	Enhance capacity and reduce delay of currently constrained airfield	Documented CATEX	$1,500,000	$1,350,000	$75,000	$75,000
	Reconstruct Taxiways G, A1, A2, A3 (Remove Direct Access)	Direct Access from Apron to Runway Should be removed to reduce the risk of runway incursions	Remove Taxiway Pavement, Construct Taxiway Pavement, Install Lighting, Signage	Existing infrastructure requires improvements to maintain structural integrity / Airfield geometry to meet design standards	Simple Written Record CATEX	$3,000,000	$2,700,000	$150,000	$150,000
	Reconstruct Taxiway A5 (Remove Direct Access), Construct Taxiway	Direct Access from Apron to Runway Should be removed to reduce the risk of runway incursions	Remove Taxiway Pavement, Construct Taxiway Pavement, Install Lighting, Signage	Existing infrastructure requires improvements to maintain structural integrity / Airfield geometry to meet design standards	Simple Written Record CATEX	$1,500,000	$1,350,000	$75,000	$75,000
	Reconstruct Taxiway C (TWC-GF-15)	Pavement Maintenance should occur based on a pavement management program to extend their useful life to function for safe airport operations.	Reconstruct Taxiway Pavement, Replace Lighting, Signage	Existing infrastructure requires improvements to maintain structural integrity.	Simple Written Record CATEX	$500,000	$450,000	$25,000	$25,000
	Reconstruct Taxiway C1, C3					$1,250,000	$1,125,000	$62,500	$62,500
	Construct East Hangar Site Taxilane	As demand increases, additional aircraft storage is needed	Construct Taxilane Pavement	Demand for small aircraft storage exceeds available space	Documented CATEX	$300,000	$270,000	$15,000	$15,000
	Expand Economy Parking Lot	As demand increases, additional public parking is needed	Expand Parking Lot	Demand for parking exceeds available space	None	$750,000	$0	$0	$750,000
	Expand Rental Car Parking Lot	As demand increases, additional public parking is needed	Expand Parking Lot	Demand for rental car parking exceeds available space	Reconfiguration of Ready/Return Lot Complete	$400,000	$0	$0	$400,000
	Reconstruct Air Cargo Apron (ACARGO-GF-75)	Pavement Maintenance should occur based on a pavement management program to extend their useful life to function for safe airport operations.	Reconstruct Apron Pavement	Existing infrastructure requires improvements to maintain structural integrity.	Simple Written Record CATEX	$3,500,000	$3,150,000	$175,000	$175,000
	Reconstruct Taxiway A	Pavement Maintenance should occur based on a pavement management program to extend their useful life to function for safe airport operations.	Reconstruct Taxiway Pavement, Replace Lighting, Signage	Existing infrastructure requires improvements to maintain structural integrity.	Simple Written Record CATEX	$15,000,000	$13,500,000	$750,000	$750,000
					Long-Term Total	**$43,300,000**	**$35,415,000**	**$3,467,500**	**$4,417,500**

Source: KLJ Analysis

[3] These projects are ten years beyond the creation of the planning document and in lieu of a specific year, which would be highly speculative, we recommend using the triggering event for implementation.

Financial

The implementation plan considers the airport's ability to fund the projects identified in this planning study. Projects in the short-term and mid-term are discussed in more detail for realistic project sequencing based on identified needs, airport priorities and available funding. Financial feasibility is a major consideration in developing the implementation plan and Capital Improvement Plan (CIP).

Airport funding for projects is derived from many sources. Funding sources can be categorized into three main categories:

- Federal funding
- State funding
- Local or Private funding

A realistic project implementation plan must consider financial resources. This financing strategy identifies the plan to provide sufficient federal, state and local funding for future airport improvements. **Table 6-4** summarizes the proposed funding sources. Projected funding sources are based on existing legislation as of 2019.

Table 6-4 – Proposed Funding

Phase	Cost	FAA Entitlement	FAA Discretionary	State Funding	Local
Short-Term (2018-2023)	$38,599,646	$6,955,520	$27,334,161	$1,904,982	$2,404,982
Mid-Term (2023-2028)	$98,522,813	$6,955,520	$81,265,011	$4,901,141	$5,401,141
TOTAL	**$137,122,459**	**$13,911,040**	**$108,599,172**	**$6,806,123**	**$7,806,123**

Source: KLJ Analysis

Federal Funding

Most funding for airport development comes from the Airport Improvement Program, commonly referred to as AIP, managed by the FAA. FAA can issue grants for airport planning and development in the United States. Revenue for AIP is drawn from the Airport and Airway Trust Fund, commonly referred to as the Trust Fund. A variety of revenue sources in the aviation industry funds the Trust Fund, including a domestic ticket taxes/fees and fuel taxes.

The current AIP is authorized through September 2023. With reauthorization required after that date, funding levels may change. For planning purposes this implementation plan assumes AIP funding is available per current authorization. A project must be eligible and justified for funds to be released for a project

FEDERAL SHARE OF PROJECT FUNDING

Federal AIP funds typically do not cover the entire cost of an airport development project. Although there are some exceptions, the current legislation limits the federal share of allowable AIP costs at 90 percent for most non-hub primary or smaller airports. The remaining 10 percent is considered the local share. In North Dakota, the State currently provides a 5 percent match with all AIP funds leaving the airport sponsor with a 5 percent share of the project cost.

ENTITLEMENT & DISCRETIONARY FUNDING

Federal Airport Improvement Program (AIP) funding provides financing for most of the airport improvements proposed at the Grand Forks International Airport. Federal funding for GFK is broken down to entitlement and discretionary funding. Entitlements are allocated on both enplaned passenger and air cargo activity. Prior to 2017, GFK received both passenger and cargo entitlements, however

with FedEx leaving GFK, the Airport only receives passenger entitlements. Currently, passenger Entitlement funds are available to airports with scheduled passenger service and enplaning more than 10,000 passengers per year and is allocated annually predicated on the number of enplaned passengers. Discretionary funding is monies set aside for additional higher priority projects at the discretion of the FAA. Please refer to **Appendix I Airport Funding** for more details on the federal funding program.

Due to the magnitude of projects needed at GFK, entitlement funds alone cannot cover anticipated costs. Entitlements will be applied to fund AIP-eligible projects, particularly critical maintenance, safety, and capacity enhancements. Federal discretionary funding will be needed to supplement funding the highest priority projects at the airport. Therefore, to cover the significant project cost of the proposed projects at GFK, we anticipate the need to use a combination of Federal Discretionary and Entitlement funds, funding from the North Dakota Aeronautics Commission, and increased local participation. It should be noted that FAA and state prefer to utilize their funding on high priority projects such as the safety enhancements and key infrastructure components such as GFK's proposed runway projects.

GFK's entitlements allocated in 2019 are $1,391,104 and with projected growth may grow to $1,859,702 in 2029. Due to uncertainty in growth entitlements utilized in the implementation plan will be using the 2019 entitlement amount.

Passenger entitlements will only finance about 10 percent of the proposed improvements. Discretionary funding is anticipated to fund about 79 percent of the cost of airport improvement projects through the next 10 years. A summary of total Federal funding needs can be found **Table 6-4.**

State Funding

State funding for airport development is managed by the North Dakota Aeronautics Commission (NDAC). The NDAC normally receives biannual appropriations from the state legislature. In 2019, the state legislature appropriated $25.5 million in airport funding with an additional $20 Million for a one-time Strategic Investment through FY 2021.

Airports may apply for state grants to cover up to 50 percent of the local share for federal AIP-funded projects. Airports may also apply for state grants to cover up to 90 percent of the cost of airport development projects that are not funded through the federal AIP program.

A total need of $1,904,982 in State funding is identified in the short-term and $4,901,141 in the mid-term at GFK. This makes up approximately 5 percent of the total funding needs through the mid-term.

Local Funding

The airport receives revenue from a multitude of sources. This revenue is used to cover airport expenses such as operating expenses, debt reduction, and capital improvements. The Grand Forks Regional Airport Authority receives revenue from items that are broken into aeronautical related revenue, nonaeronautical related revenue, and tax revenue.

Aeronautical Related Revenue

- Aircraft Landing Fees
- Fuel Flowage Fees
- Aeronautical Ground Leases / Terminal Leases

Nonaeronautical Related Revenue

- Auto Parking Fees
- Rental Car Concessions
- Restaurant / Vender Concessions (Food, Beverages, Gifts, etc.)
- Nonaeronautical Ground/Terminal Leases
- Advertising

Tax Revenue

- Grand Forks County / City of Grand Forks (4 Mills)

The Grand Forks Regional Airport Authority maintains financial records detailing the specifics of their total annual budget including revenue and expenses. This Master Plan will focus primarily on the use of these revenues as local funds as it relates to the implementation of capital improvements.

As shown in **Table 6-1**, Short-Term Implementation Plan, local funds are used in a variety of ways. On FAA funded improvements local funds are used to augment the remaining 10% minus any State funding that is provided for the project. Local funds are also used to augment state funded improvements. State participation is determined by the North Dakota Aeronautics Commission and varies depending on availability of funds, type of projects, and priority as it relates to other proposed development. Additionally, some improvements are not eligible for either FAA or State funding. Local funds must be used to fully fund these projects. The implementation plan has projects that fall into each of these categories.

PASSENGER FACILITY CHARGE

The Aviation Safety and Capacity Expansion Act of 1990 authorized the Secretary of Transportation to grant public agencies the authority to impose a Passenger Facility Charge (PFC) to fund eligible airport projects. PFC revenue may be used on a "pay-as-you-go" basis or leveraged to pay debt service on bonds or other debt used to pay for PFC-eligible projects. Although the FAA is required to approve the collection and use of PFCs, the program permits local collection of PFC revenue through the airlines operating at an airport and provides more flexibility to airport sponsors than AIP funds. The current cap on PFCs is $4.50 per revenue passenger.

Grand Forks International Airport currently implements a PFC. The current PFC approval is effective until July 1st, 2021 with a charge of $4.50 per enplaned passenger. Estimated annual revenue from PFCs varies predicated on passenger enplanements. Recent trends provide the Authority PFC revenue between $450,000 and $500,000 annually.

CUSTOMER FACILITY CHARGE

A customer facility charge (CFC) is a fee paid by airport customers for the use of some non-aeronautical service at the airport. These charges are commonly collected from on-airport rental car agencies. The funds are collected by the rental car agency from their customers and then paid to the airport for use in paying the debt service on, for example, a consolidated rental car facility. The airport constructs the facilities on behalf of the agency, allowing them to finance major projects, but keeping the debt off their balance sheets. Airport CFCs are typically charged to each customer for each rental day, ranging from $1.50 per day up to $8 per day. Fees imposed are identified for specific projects.

The Grand Forks International Airport currently collects a CFC on rental car agencies in the amount of $3/transaction day with a maximum fee of $42 per transaction. The airport uses this fee to provide local funding toward capital improvements related to the rental car operations.

BONDS

Bonds are a form of debt financing. They are loans where there is a promise of payback backed by the issuing agency such as an Airport Authority or a City/Municipality.

Grand Forks Regional Airport Authority does have the ability to bond and currently has an active bond. The Airport Authority anticipates paying off their existing bond within the next 5-8 years.

Capital Improvement Plan

The CIP is a key element in the implementation plan. This is a separate document specifically listing the planned airport projects and funding. The airport updates the official airport CIP annually. The CIP identifies the project title, year, estimated costs, and anticipated funding for airport improvements. Larger projects are often divided into smaller elements that reflect how projects are approved, designed, and constructed. Each project is requested through the CIP project programming and grant application process. The CIP is updated and submitted to the FAA annually to program Federal and State grant funding.

The proposed updated GFK CIP identifies over $113,197,459 in airport improvements over the next 10 years. All projects on the most recent 2019 CIP are identified above in **Tables 6-1 and 6-2**.

Environmental Review

Introduction

FAA AC 150/5070-6B, *Airport Master Plans* identifies a planning-level environmental review as one of the elements of effective planning. The purpose behind this element of the airport master planning process is to help the airport sponsor thoroughly evaluate environmental impacts of airport development alternatives, and to provide information for subsequent environmental processing. Key environmental considerations for future development at GFK were identified in **Chapter 5: Alternatives Analysis** based on the existing conditions described in **Chapter 2: Facility & Environmental Inventory**.

This environmental review section is not intended to fulfill the requirement of environmental review required by National Environmental Policy Act (NEPA) or provide a definitive class of action determination for the proposed improvements. The purpose of this environmental review is to provide community, airport sponsor, and regulatory awareness of the importance of minimizing the environmental impacts to this airport improvement area and to provide a general indication of the likely need for further investigation. Appropriate environmental documentation in accordance with FAA Order 5050.4B, *NEPA Instructions for Airport Actions* and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* is required to be completed prior to commencing with project actions.

Environmental Impact Summary

The **Environmental Review Summary** identified in **Table 6-5** summarizes the potential environmental impacts categories. This table is intended to give a general indication of the likely impact categories that need for further environmental analysis for the proposed projects. The Additional environmental investigation is necessary to determine possible impacts associated with the improvement area.

At the appropriate time, the FAA would decide whether, and to what extent, any additional investigation would be performed. Based on findings of this environmental review, it is estimated that further environmental analysis is required for the proposed improvements.

Table 6-5 – Environmental Review Summary

NEPA Impact Category	Further Analysis Required
Air Quality	YES
Biological Resources	YES
Climate	NO
Coastal Resources	NO
Department of Transportation Act Section 4(f)	YES
Farmlands	YES
Hazardous Materials, Pollution Prevention, and Solid Waste	YES
Historical and Cultural Resources	YES
Land Use	YES
Natural Resources and Energy Supply	NO
Noise and Noise-Compatible Land Use	YES
Socioeconomic Impacts and Environmental Justice	YES
Visual Impacts	NO
Surface and Ground Water	YES
Wetlands	YES
Floodplains	NO
Wild and Scenic Rivers	NO

Source: KLJ Analysis, FAA Order 1050.1F, Environmental Impacts: Policies and Procedures

NEPA Environmental Review Process

Every Federal action requires an environmental review per NEPA. Actions shall be thoroughly evaluated and coordinated with resource agencies during the environmental review phase. Impacts should be avoided whenever possible, minimized, or mitigated as a final option. Federal actions fall into one of three types of class of actions:

- **Categorical Exclusion (CATEX):** This environmental documentation is used for actions that do not normally require an Environmental Assessment (EA) or Environmental Impact Statement (EIS), because they do not individually or cumulatively have a significant effect on the human and/or natural environment. Documentation required includes either simple documentation or the completion of a checklist with supporting documentation certifying that the action will not exceed any environmental impact thresholds.

- **Environmental Assessment (EA):** Typical actions that require an EA are those that are not categorically excluded or actions that may result in extraordinary circumstances such as impacts to wetlands, historical properties, or floodplains. EA documentation required here includes a condensed or comprehensive environmental analysis of the proposed action and alternatives, and the anticipated impacts from the proposed action. Agency review and coordination of the proposed action and impacts is required. The decision document proceeded after this analysis if no significant impacts are determined is a Finding of No Significant Impact (FONSI) issued by FAA, which is typically valid for three years.

- **Environmental Impact Statement (EIS):** Actions that require an EIS include those that will have a significant impact to the quality of the human and/or natural environment. An EIS may also be triggered if an EA concludes that the project will have a significant impact. This document provides in-depth impact and cumulative analyses of all proposed alternatives. The document published once a decision has been made on the alternative (typically the alternative that achieves the actions goals but has the least impacts) to move forward with is a Record of Decision (ROD). The EIS is valid for a period of three years.

NEPA Documentation

Based on the preliminary environmental evaluation and the anticipated projects in the implementation plan (See **Tables 6-1, 6-2, and 6-3),** the potential anticipated environmental documentation necessary to proceed with each of the proposed actions has been included in the "Prerequisites" column of **Tables 6-1, 6-2, and 6-3**. The ultimate decision on what documentation may be required for each proposed action will be determined by the FAA. All environmental reviews must be completed prior to initiating project design beyond 25 percent.

Land Use Compatibility

Overview

Airports are community assets providing significant benefits. They facilitate the movement of people, goods, and services, promote tourism and trade, stimulate business development, and support a variety of jobs.

The objective of land use planning is to guide on-airport and off-airport land use development to be compatible with airport operations. The airport directly controls on-airport compatible land uses to primarily serve aeronautical activities. The airport does not directly control off-airport land uses. Surrounding land uses compatible with airports typically include those uses that can co-exist with a nearby airport without either constraining the safe and efficient operation of the airport or exposing people working or living nearby to unacceptable levels of noise or safety hazards. Compatible land use also considers minimizing potential hazards to aircraft and the flying public. The impact of airport planning decisions extending well beyond the airport property line must be considered.

Land use planning around airports is important to airports and communities for several reasons:

- **Safety** - Compatibility is needed to maintain safety of the general and flying public. Risk should be reduced to an acceptable level. The airport must also maintain operational utility within identified safety and risk criteria.
- **Airport Utility** - Land uses around airport should provide the airport so that there are not undue restrictions placed on the airport's existing or planned future arrival and departure procedures. Opportunities for future development identified in the Airport Master Plan and shown on the Federally (FAA) approved Airport Layout Plan should be considered.
- **Human Environment** - Balancing the human environment with airport operations is important to maintain an acceptable level of airport impacts (i.e. noise and visual exposure) with the surrounding community.
- **Economic Development** – Operational restrictions placed on the airport because of land use compatibilities have the potential to have a trickle-down effect on the community. This reduces the community's ability to accommodate the aviation needs of the public and local businesses, thus limiting economic development opportunities.

Incompatible land uses are one of the largest issues facing airports today, often resulting in conflicts between airports and their communities. They also may result in airport operational and grant project funding implications in certain situations. Building consistency between the recommendations in this study with airport land use compatibility standards and area-wide planning is vital for maintaining compatible land use.

During this Master Plan, the objective of this section was to assist the Grand Forks Regional Airport Authority in reviewing the existing Airport Compatibility Plan and provide general recommendations as

it relates to land use standards compatible with the development plan and provide recommendations so that the airport can continue to meet safety and compatibility criteria.

Roles and Responsibilities

AIRPORT SPONSOR

As the airport sponsor, the Grand Forks Regional Airport Authority, applies and receives federal grants. These federal grants require the city to develop and maintain the airport compatible with FAA rules and regulations through FAA Grant Assurances (obligations). There are currently 39 grant assurances which an airport sponsor assumes as a contractual obligation with the Federal Government when the sponsor accepts federal funds for airport development. These grant assurances describe how the sponsor must operate the airport and serve the needs of the flying public. Grant assurances 20 and 21 pertain to compatible land use around airports.

> **20. Hazard Removal and Mitigation.** It will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.
>
> **21. Compatible Land Use.** It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

FAA grant assurances require airports take appropriate action to protect airspace and restrict land uses in the immediate vicinity to those compatible with airport operations. Compatible land use control for the Grand Forks International Airport is the responsibility of the airport sponsor, the Grand Forks Regional Airport Authority.

FEDERAL AVIATION ADMINISTRATION

The FAA can provide guidance and funding to promote compatible land development around airports; however, it has no regulatory authority for controlling land uses. State and local governments are responsible for land use planning, zoning, and regulations. The FAA develops grant assurances to protect federal investments in airports but are the responsibility of the airport sponsor to maintain.

The FAA monitors all obligated airports to ensure they comply with the requirements of the grant assurances through its Compliance Program. If the sponsor fails to take the necessary corrective action, the FAA can legally impose penalties on the sponsor, including the loss of federal funding.

As defined by law, the FAA's authority to enforce most regulations and grant assurances is limited to within the airport boundaries. The FAA's only authority on compatible land use planning is through the grant assurances airport sponsors must adhere to in order to obtain federal funding for airport improvements. In most cases, the most practical and cost-effective method for a sponsor to affect compatible land use outside of the airport's property is through zoning or easements rather than through land acquisition.

STATE OF NORTH DAKOTA

The State of North Dakota has adopted laws to encourage multi-jurisdictional airport zoning. North Dakota Century Code Chapter 2-04 is the enabling legislation that allows political subdivisions to administer and enforce, under the police power, airport zoning regulations for the airport hazard area. Tools identify the abilities of political subdivisions, a mechanism to create a joint airport zoning board,

and a mechanism for airport sponsors to supersede political subdivisions for airport zoning purposes when political subdivisions refuse to participate.

SURROUNDING JURISDICTIONS

Local jurisdictions are responsible for developing and enforcing land use planning, zoning, and regulations. Development proposals are reviewed and approved at this local level through an established process. The local authority enforces multi-jurisdictional airport zoning regulations for proposed development. For the Grand Forks International Airport, surrounding jurisdictions affected by the airport include the City of Grand Forks, Grand Forks County, and Rye Township.

Existing Compatibility Policies

In 2006, the Grand Forks Regional Airport Authority led an effort to examine and enact a land use compatibility plan for the Grand Forks International Airport. The Land Use Compatibility Plan was adopted by the Authority on July 20, 2006. The Land Use Compatibility Plan consisted of four zones around the airport which are described in **Table 6-6 Compatibility Zone Factors**. The specific zones are portrayed in a map shown later as **Figure 6-7** which also includes other existing and future airport layout and activity information.

Please note that according to the North Dakota Century Code referenced above, that the Authority is not a political subdivision and therefore the Land Use Compatibility Plan was not adopted in an enforceable manner. It is therefore a helpful guideline but is not currently a requirement. The recommendations following in this chapter will be based on adjustments to the plan as adopted by the Authority.

Table 6-6 – Compatibility Zone Factors

Zone/Location		Standards			*Additional Criteria*	
		Min. Parcel Size [4]	Other Uses Max People/Acre [5]		Unacceptable Uses [6]	Other Development Conditions
			Avg [7]	Single Acre [8]		
A	Within Building Restriction Line and Runway Protection Zone.[9]	No New Dwellings Allowed	0	0	» All structures except ones with location set by aeronautical function » Assemblages of people » Objects exceeding FAR Part 77 height limits » Storage of hazardous materials » Hazards to flight.[10]	» Avigation easement dedication.[11]
B	High Noise & Inner Approach/ Departure Zone	No Dwellings Allowed except on Existing Legal Lot	40	100	» Children's schools, day care centers, libraries » Hospitals, nursing homes; places of worship » Bldgs with >2 aboveground habitable floors » Aboveground bulk storage of hazardous materials.[12] » Highly Noise-sensitive outdoor nonresidential uses.[13] » Hazards to flight	» Locate structures maximum distance from extended runway centerline » Critical community infrastructure facilities generally unacceptable.[14,15] » Potential NLR requirement of 20 dB in residences (including mobile homes) and office buildings.[16] » Airspace review required for objects >35 feet tall.[17] » Avigation easement dedication
C	Flight Corridor Zone	≥ 40	100	250	» Children's schools, day care centers, libraries » Hospitals, nursing homes » Bldgs with >3 aboveground habitable floors » Highly noise-sensitive outdoor nonresidential uses » Hazards to flight	» Aboveground bulk storage of hazardous materials generally unacceptable » Airspace review required for objects >70 feet tall » Deed notice required
D	Airspace Protection Buffer Zone	No Restriction.[18]			» Highly noise-sensitive outdoor nonresidential uses » Hazards to flight	» Children's schools, hospitals, nursing homes generally unacceptable » Major spectator-oriented sports stadiums, concert halls amphitheaters, generally unacceptable » Airspace review required for objects >100 feet tall » Deed notice required

Source: Land Use Compatibility Plan (July 2006)

[4] Single-family dwellings on legal lots of record are permissible. Clustering of units is encouraged. Densities are to be calculated in terms of site size. Noise level reduction and avigation easement requirements for the compatibility zone in which the dwellings are to be located are to be applied.
[5] Usage intensity calculations shall include all people (e.g., employees, customers/visitors, etc.) who may be on the property at a single point in time, whether indoors or outside.
[6] The uses listed here are ones that are explicitly unacceptable regardless of whether they meet the intensity criteria. In addition to these explicitly unacceptable uses, other uses will not be permitted in the respective compatibility zones because they do not meet the usage intensity criteria.
[7] The total number of people permitted on a project site at any time, except rare special events, must not exceed the indicated usage intensity times the gross acreage of the site. Rare special events are ones (such as an air show at the airport) for which a facility is not designed and normally not used and for which extra safety precautions can be taken as appropriate.
[8] Clustering of nonresidential development is permitted. However, no single acre of a project site shall exceed the indicated number of people per acre.
[9] Runway protection zone (RPZ) and building restriction line (BRL) limits that delineate Zone A are derived from locations indicated on the airport layout plan. Zone A is typically on airport property or otherwise under airport control.
[10] Hazards to flight include physical (e.g., tall objects), visual, and electronic forms of interference with the safety of aircraft operations. Land use development that may cause the attraction of birds to increase is also unacceptable.
[11] As part of certain real estate transactions involving residential property within any compatibility zone (that is, anywhere within an airport influence area), information regarding airport proximity and the existence of aircraft overflights should be disclosed. Easement dedication and deed notice requirements indicated for specific compatibility zones would apply only to new development and to reuse if discretionary approval is required.
[12] Storage of aviation fuel and other aviation-related flammable materials on the airport is exempted from this criterion. Storage of up to 6,000 gallons of nonaviation flammable or other hazardous materials is also exempted.
[13] Examples of highly noise-sensitive outdoor nonresidential uses that are unacceptable include amphitheaters and drive-in theaters. Caution should be exercised with respect to uses such as poultry farms and nature preserves.
[14] Critical community facilities include power plants, electrical substations, and public communications facilities.
[15] Generally unacceptable uses are those that are incompatible with airport operations. These uses should not be permitted unless no feasible alternative is available.
[16] To attain an interior noise level of no more than 45 dB DNL, the structure would need to provide up to the indicated Noise Level Reduction (NLR) given the maximum noise exposure for the specific compatibility zone.
[17] Objects up to 35 feet in height are permitted. However, the Federal Aviation Administration may require marking and lighting of certain objects. This height criterion is for general guidance. Shorter objects normally will not be airspace obstructions unless situated at a ground elevation well above that of the airport. Taller objects may be acceptable if determined not be obstructions.
[18] Although no explicit upper limit on usage intensity is defined for Zone D, land uses of the types listed—uses that attract very high concentrations of people in confined areas—are generally unacceptable in locations below or near the principal arrival and departure flight tracks.

Recommendations

The forecast operations, type of activity, and recommended development plan will dictate the needs for changes to the land use compatibility plan. In comparison to the forecast conditions considered in 2006, there are several changes that have occurred in this Master Plan. These changes are visible in **Figure 6-7 Land Use Compatibility and Existing/Future Airfield Layout and Activity**. The notable items are as follows:

Forecast Activity – the forecast in this Master Plan is for 334,000 operations by 2024 in comparison to 315,000 operations forecast for 2025 in the 2006 Land Use Plan. The difference of 6 percent does not change the Land Use needs from an operational standpoint.

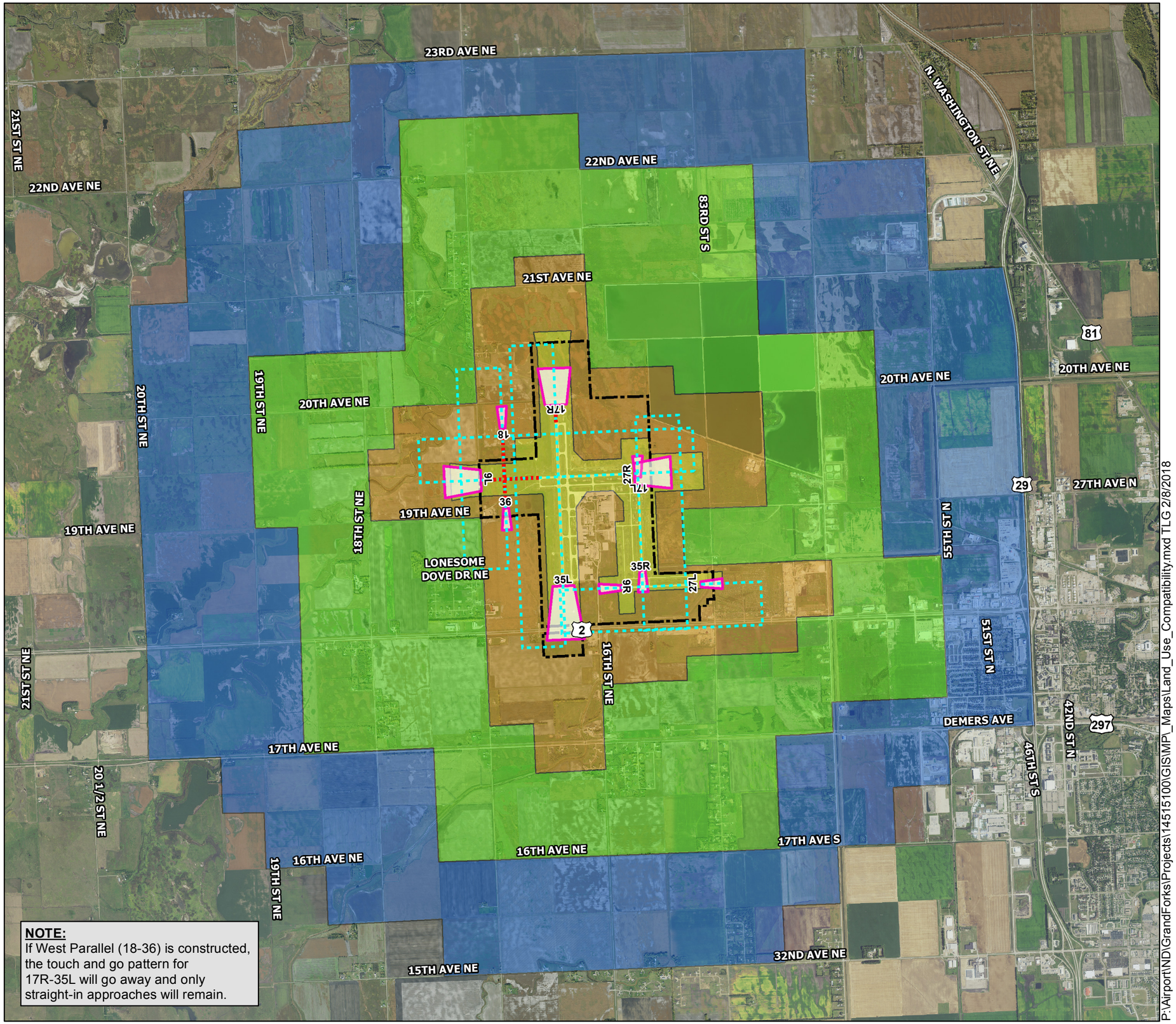
Airfield Configuration – There are three major airfield elements that could occur during the planning period which will change the impact of the airport on the surrounding land area. These items and their impact are:

- Extend Runway 17R – the extension of 649 feet to the north end of Runway 17R-35L will extend the flight activity and safety surfaces further north.
- Extend Runway 9L – the extension of 2,494 feet to the west end of Runway 9L-27R will extend the flight activity and safety surfaces much further west than currently exists.
- New Runway 18-36 – the addition of a 3,300' x 60' runway west of the existing airfield will shift flight activity and safety surfaces much further west. At the same time the touch-and-go flight activity currently on Runway 17R-35L will be shifted to this new Runway 18-36.

Pattern Flight Activity – The most significant changes would be as a result of the Runway 9L extension and the new Runway 18-36. As noted above these airfield changes would impact the location of pattern flight activity which is depicted in **Figure 6-7**. The new Runway 18-36 would extend pattern flight activity over areas which are currently identified as Zone C while all other pattern flight activity is occurring over Zone B areas.

FAA Standards – since the Land Use Compatibility Plan was adopted in 2006 by the Airport Authority, the FAA has enacted stricter standards for certain safety surfaces, the most notable being the Runway Protection Zone. The RPZ will clearly need to be included in Zone A and ownership in fee simple title is recommended rather than just an avigation easement. The notable areas are south of Runway 35L, west of Runway 9L and the new Runway 18-36.

Based on the items noted above, it is recommended that the Airport Authority work with the various zoning jurisdictions to amend and enact a land use compatibility plan to protect the airport for the future.



NOTE:
If West Parallel (18-36) is constructed, the touch and go pattern for 17R-35L will go away and only straight-in approaches will remain.

Legend

- Existing Airport Property
- New/Extended Runway
- Touch-and-Go Flight Tracks
- Runway Protection Zone

2006 Land Use Compatibility Zones

- Zone A
- Zone B
- Zone C
- Zone D

N

0 1 2 Miles

*Intended for Planning Purposes Only

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KLJ

Grand Forks International Airport
Land Use Compatibility Map
Figure 6-7