

GERALD R. FORD INTERNATIONAL AIRPORT



2004 MASTER PLAN UPDATE

Executive Summary

December 2004

HNTB



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Prepared for:
Kent County Department of Aeronautics

INTRODUCTION

Gerald R. Ford International Airport (GRR) serves the air transportation needs of West Michigan. From its opening in 1963 until today, passenger activity has steadily increased to two million passengers and is forecast to double to four million passengers by 2023.

The Airport is an important factor influencing regional economic growth and development by catalyzing business enterprise, job growth, and investment. More than 2,000 people are employed at the Airport. The Airport annually generates hundreds of millions of dollars in economic activity within the West Michigan 13-county service area.

The Kent County Department of Aeronautics (KCDA), in cooperation with the Federal Aviation Administration (FAA), and the Michigan Department of Transportation (MDOT), updated the Airport's Master Plan to ensure the Airport continues to meet the traveling needs of the West Michigan region. The updated Master Plan will also enable KCDA to be eligible for Federal funding for development projects once the document is accepted by the FAA.

The Master Plan Update process consisted of nine steps:

- Establishing goals and objectives
- Conducting an inventory of existing facilities, surveying passengers, and observing key functional elements of the terminal
- Identifying key Airport issues
- Forecasting aviation activity
- Determining the facility requirements needed to meet future demand
- Developing alternate concepts and plans
- Identifying potential environmental considerations
- Preparing financial analysis for proposed development
- Inviting public participation

This executive summary provides an overview of the Master Plan Update process and presents the recommended 20-year development plan for the Airport.

GOALS AND OBJECTIVES

To guide the Master Plan Update process, the KCDA developed an initial list of goals and objectives that reflects the Airport's mission statement, which is shown below.

It is the mission of the Kent County Department of Aeronautics to provide safe, efficient, environmentally sensitive and economically self-sustaining air transportation facilities responsive to regional needs.

The draft list of goals and objectives was then reviewed by a Steering Committee and Advisory Committee, which were formed to provide stakeholder input to the Master Plan Update process, and revised to reflect their comments. Eight goals were established for the Master Plan Update:

- 1. Provide an airport that is safe and reliable
- 2. Provide an airport that meets security requirements
- 3. Develop the Airport's physical facilities to meet the region's future aviation needs for passengers, cargo, and general aviation
- 4. Ensure that the Airport is self-sustaining
- 5. Develop the Airport in a manner that is flexible, adaptable to changing conditions, and utilizes the highest and best land use
- 6. Develop the Airport in a manner that will minimize and reduce adverse environmental effects
- 7. Support local and regional economic goals and plans without constraining long-term Airport development
- 8. Build and maintain community confidence and support

A set of specific objectives was also identified for each goal to identify how the goal would be achieved.

INVENTORY

An Airport inventory was undertaken to determine the type, number, and condition of existing facilities and to document changes that had occurred since the previous master plan. Figure 1 is an aerial photo showing the existing Airport layout. The Airport airfield has three runways, associated taxiways, aircraft aprons, a passenger terminal area, Air Cargo and Trade Center, several general aviation (GA) areas, a fire-rescue facility, an airfield maintenance facility, and a Foreign Trade Zone (FTZ). Figure 2 is a timeline highlighting significant milestones, facility improvements, and studies.

During the inventory process, each major functional element of the Airport was visited, plan documents were obtained, pertinent socioeconomic data was gathered, and interviews were conducted with KCDA staff and Airport tenants. Previous studies were also reviewed.

SURVEYS AND TERMINAL OBSERVATIONS

To collect information on the travel characteristics of Airport passengers and gauge their opinion of how well the Airport functions, a one-week departing passenger survey of nearly 2,000 travelers was conducted. The survey found that more than half (55.6 percent) of departing passengers began their ground trip to the Airport from within Kent County. About 22.9 percent of passengers came from Allegan, Muskegon, or Ottawa Counties. The percentage of passengers traveling on business versus pleasure was fairly evenly split (47 percent and 53 percent, respectively). More than two-thirds (67.6 percent) of the passengers were residents of the area; less than one-third (32.4 percent) were visitors.

Nearly four out of 10 passengers provided a written comment on their questionnaire. Most noted how nice they think the Airport is, how easy it was to navigate, and the friendly staff. Other key comments included statements about desiring improved air service (e.g., cheaper flights and direct/nonstop flights to more destinations), improved concessions and amenities, and improved parking options (e.g., more parking or a garage).

A series of terminal observations was undertaken to become familiar with how the various elements of the terminal function and to develop planning factors to help calculate future facility requirements. The key findings of these observations showed that while the Airport is functioning well overall, the introduction of the six large Explosive Detection System (EDS) machines has resulted

in the loss of circulation and queuing space, causing congestion and circulation impairment in the East and West Ticket Halls.

AVIATION ACTIVITY FORECASTS

Forecasts of passengers, cargo, and aircraft operations (takeoffs and landings) were prepared to project the level of activity the Airport would experience in the 20-year planning horizon. The forecasts were based on regional socioeconomic projections and local, regional, and national aviation industry trends.

Aviation activity projections are based primarily on the strength and growth of the local economy. Through the year 2023, the region's population is forecast to grow at a faster rate than for the State and the nation overall, indicating continued growth of aviation activity.

To ensure that Airport facilities are developed in a flexible manner and can accommodate unforeseen changes in the industry, both a base case and alternative forecasts were prepared. The FAA-approved base case forecast assumes what industry experts believe to be the most likely long-term scenario for the Airport. It shows a doubling of passenger activity from nearly two million passengers in 2003 to nearly four million passengers by 2023. (See **Figure 3.**) Air cargo activity is forecast to more than double from 75 million pounds to 164 million pounds during the same period. Aircraft operations are expected to grow more slowly than either passengers or cargo. Between 2002 and 2023, total aircraft operations are forecast to increase from 126,000 operations to 203,000 operations, an increase of 62 percent.

To account for the uncertainty associated with the dynamic aviation industry (especially in the long term), alternative forecasts (represented by dashed lines in Figure 3) were prepared based on assumptions that differed from those assumed for the base case. The first assumed the initiation of service by an additional low-fare airline, which would increase the number of passengers using the Airport. The second scenario assumed the development of a regional airline cargo hub, which would increase the amount of cargo shipped through the Airport. Both of these alternative scenarios would also result in an increased number of aircraft operations at GRR. Planners used these alternative scenarios to test various development concepts to ensure the preferred concept provides the greatest flexibility.

Figure 1





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Figure 2





1920s





1930s









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	1910)s

HISTORIC MILESTONES
J.C. "Cliff" Turpin gives first successful

- 1913 Grand Rapids Street Railway Co. brings ony Jannus to town to give rides at
- 1917 Michigan Aircraft Company founded by
- 1917 Grand Rapids Airplane Company founded to build Handley-Page bombers
- 1919 Grand Rapids Aero Club founded to lobby for establishment of a safe
- 1919 Groundbreaking for Kent County's first
- 1919 Local Association of Commerce forms
- 1919 Comstock Park Fairgrounds becomes landing site for the first air express delivery of merchandise to Grand Rapids. Art Rosenthal founds the seswift Airplane Company whose initial success and its need for a facility were vital motivators towards founding



ANNUAL PASSENGER ENPLANEMENTS (1920)

HISTORIC MILESTONES

- 1923 Army pilots from Fort Selfridge give military aircraft exhibition
- 1925 Grand Rapids Aviation Society established.
- 1927 Charles Lindbergh lands the "Spirit of St. Louis" at Kent County Airport in front of 100,000
- 1928 Airport installs first beacon light allowing night
- 1929 Michigan Central Railroad Intermodal Train to Plane Connection.
- The Kent County Board of Supervisors allots \$25,000 budget for airport use, taking responsibility for the airport from the flying club

AIR SERVICE

- 1926 United States first regularly scheduled airline service begins between Grand Rapids and Detroit with three flights a week.
- 1927 Service added to Chicago and Cleveland. Roseswift Airplane Company merges into the future United Airlines.
- 1928 Michigan Air Transport, Inc. founded to start
- 1928 Long-sought contract for twice-daily U.S. airmail service, linking Muskegon to Chicago via Grand Rapids, Kalamazoo, and South Bend.

AIRPORT PLANNING

1929 Kent County Board of Supervisors appoints special committee to look into airport plans

AIRPORT DEVELOPMENT

- 1926 Aero Club raises \$28,000 for the development of
- 1928 Beacon tower light system turned on.
- 1928 Second hangar built in northeast part of airport; runways upgraded.
- 1928 Division Avenue storm sewer project improves (1930 field drainage.
- 1928 Kent County Board of Supervisors allocates \$5,000 for airport maintenance and improvement. \$15,000 new hangar erected.
- 1929 The NE/SW runway receives coat of asphalt paving 1,400 feet long and 30 feet wide

HISTORIC MILESTONES

- 1930 Tom Walsh appointed Airport Manager.
- 1934 Tom Walsh holds ceremony rededicating airport and renaming it the Daniel Waters Cassard Airport. (Kent County remained the far more commonly used name.)

AIR SERVICE

- 1933 First mailbag flown across lake from Milwaukee under contract with Kohler Aviation.
- 1934 Federal government cancels all civilian airmail contracts and switches to military fliers, effectively devastating business at the airport and rendering the airport's biggest airline, Kohler,
- 1934 PAL acquires Kohler Aviation; government airmail contracts return to private sector and PAL secures the Detroit-Milwaukee airmail contract.

AIRPORT DEVELOPMENT

- The NE/SW runway's asphalt paving lengthened airport marking improvements made.
- 1930 Airport Villa restaurant opens.
- 1931 New asphalt southeast-northwest runway crosses existing runway.
- 1932 The Ole Flottorp's propeller factory erects cement block building at airport.
- 1932 East-west apron and taxi strip in front of main group of buildings are paved.
- 1932 Safety upgrades: short-wave radio, weather equipment, fire apparatus.
- 1933 Ice skating and baseball facilities built near the administration building.
- 1933 Civil Works Administration project in Kent County creates funds for airport improvements.
- County Board purchases additional 36 acres to 1937 expand airport to accommodate larger aircraft.
- WPA grants lead to additional improvements; 1938 New weather station begins operation at
- New administration (terminal) building
 - 44 acres bought to expand Airport.
- WPA finances runway construction, fencing, 1939 sodding, lighting, runway widening to 100 feet;

HISTORIC MILESTONES

- 1946 Gala marks 20th anniversary of Bill Stout's first
- 1947 New \$60,000 control tower opens atop administration building.

AIR SERVICE

- 1941 Introduction of DC-3s and expanded air service results in 73% increase in passenger service.
- 1946 All-cargo air freight service begins.
- 1946 All-cargo air freight service added to PCA's
- 1946 Air service added to Cincinnati and Louisville.

AIRPORT PLANNING

- 1945 State allocates \$6,000 for preliminary master plan
- 1946 New master plan unveils an ambitious attempt to cope with postwar growth.
- 1948 Tom Walsh offers County Board revised plan that calls for purchase of 126 acres.
- 1948 Chester J. Clark & Associates endorses Walsh's revised master plan for \$2.5 million runway project to be funded by federal, State, and County
- 1949 County-wide vote gives funding to Walsh

AIRPORT DEVELOPMENT

- 1940 CAA grants airport formal traffic-controlled airport
- 1941 Airport receives U.S. Postal Service office.
- 1942 First pilot cadet training program in Michigan leads to further building development at airport by the
- 1942 Expansion project finished.

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- 1943 Lear, Inc. (aircraft instrument company) leases space at Airport.
- 1943 War production taking place at airport.
- 1945 Kent County Airport demilitarized; war projects shut down.
- 1946 Northern Air Service leases land to erect more hangars.
- 1946 PCA purchases snow removal equipment for airport.

HISTORIC MILESTONES

- 1951 Land purchasing complete; Walsh and engineers hold "bulldozing" ceremony.
- 1952 Four-engine 50-passenger DC-4 liner lands before a large crowd at airport.
- 1956 Board of Supervisors creates Kent County Aeronautics Board.
- 1957 Tom Walsh resigns for health reasons as Airport
- John F. Meachum becomes Kent County's first Director of Aeronautics.

AIR SERVICE

- 1953 North Central becomes third scheduled airline at
- 1956 193,000 passengers use Airport in FY '56.

AIRPORT PLANNING

- Airport hires aviation consultant to explore options for expanding and improving existing airport or starting over on a new site.
- 1957 Study states existing facility would produce a substandard airport.
- 1957 County Board votes to proceed with study of
- 1958 Board of Supervisors retains aviation consultant to develop a master plan for a new airport in western Cascade Township.
- 1958 Kent County officials give final approval to Cascade site selection.
- New location study recommends County purchase 2,000 acres in eastern Cascade Township for \$7
- Master plan complete; recommends acquiring adequate land at outset and updating master plan through future phases.

AIRPORT DEVELOPMENT

- Newly expanded 5,700 foot runway opens; New 5,700-foot-long, 150-foot-wide landing strip
- Field development phase of master plan substantially completed. 1952
- New firefighting unit organized at Airport; Lear announces plan for \$3 million manufacturing
- 1954 Lear, Inc. announces plans to build plant at new

Gerald R. Ford International Airport

HISTORY IN THE MAKING







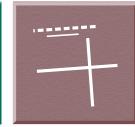














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HISTORIC MILESTONES

- 1961 Groundbreaking ceremonies held at new 1.847-acre site.
- 1962 First plane lands at new Cascade Township site; groundbreaking ceremony for \$1 million ten-story control tower.
- 1963 Robert M. Ross becomes Director of Aeronautics.
- 1964 New Kent County Airport formally dedicated before a crowd of 35,000.

AIR SERVICE

1963 All Kent County air service from old facility transferred to new facility in Cascade Township.

AIRPORT PLANNING

- 1963 Plans identified to extend east-west runway from 5,800 to 6,600 feet to accommodate larger planes.
- County approves construction of new hangars for private planes.
- 1968 \$5.5 million field improvement program approved by Kent County Supervisors.
- Airport Layout Plan produced.

AIRPORT DEVELOPMENT

- 1962 Clearing, grading, and drainage at new field complete.
- 1962 Contracts let for paving, drainage structures, underground water, electrical systems, and sewage treatment plant.
- 1963 Contracts let for water system, runway lighting, floodlights, service roads, and maintenance building.
- 1965 New computerized visibility monitoring system



HISTORIC MILESTONES

- 1974 Open house for completion of Phase II and airport's 11th anniversary.
- 1974 Gerald R. Ford and wife Betty return to Grand Rapids.
- 1977 Kent County Airport becomes Kent County
 International Airport with the opening of a U.S.
 Customs Office in the terminal and becomes
 Michigan's seventh port of entry.

AIRPORT PLANNING

- 1974 Master Grading, Drainage, and Utilities Report for the Kent County Airport.
- 1974 Airport Layout Plan updated.
- 1977 Aeronautics Board releases proposals for extension of main runway to 10,000 feet to accommodate Boeing 747 jumbo jets.
- 1978 FAA authorizes runway expansion funding.
- 1979 Environmental Impact Study states removed swamp should be re-created nearby.
- 1979 Air Service Needs Study advocates more regional connections.

AIRPORT DEVELOPMENT

- 1970 New air freight terminal constructed.
- 1970 Offices and hangars for Centurion Flight Center built.
- 1972 \$1.5 million radar surveillance system activated.
- 1972 New 3,600-foot east-west runway built north of terminal.
- 1972 Terminal expanded.
- 1974 Finishing work includes: new taxiways, aircraft parking areas, lighting, security fences, and expanded parking lot.
- 1977 Loading bridges added to concourses.
- 1977 Replica of La Grand Vitesse stabile placed in passenger lounge.
- 1978 Airport entrance improvements complete.
- 1979 The main runway (8R-26L) extended to the east to a total length of 10,000 feet.

HISTORIC MILESTONES

- 1982 First Boeing 747 lands on the newly-expanded 10,000 ft. runway.
- 1989 Airport holds 25th anniversary air show.

AIR SERVICE

- 1981 US Air begins service to Pittsburgh.
- 1982 Northwest Orient Airlines launches service to East Coast through Detroit and Washington, DC.
- 1984 Kent County International Airport surpasses the one million passenger mark.
- 1984 American Airlines begins serving Grand Rapids.
- 1986 ComAir begins serving Grand Rapids.

AIRPORT PLANNING

- 1981 Projected Future Development study completed.
- 1983 New Master Plan Update calls for expansion of passenger terminal, parking lots, GA facilities, and cargo buildings, as well as new taxiways, aprons, and runways over next 20 years (\$60 million).
- 1985 Michigan Statewide Heliport Study Summary Report completed.

AIRPORT DEVELOPMENT

1980 Freight terminal enlarged; motel enlarged; new hangars erected; new carpeting and restroom fixtures installed.

1984 Contracts let for \$25 million in taxiway

improvements, sewer connection, parking lot

expansion, and new passenger hold rooms.

ernational Airport surpasses the 1992 GRR Airport Layout Plan completed.

1992 GRR Master Plan Update completed.

R. Ford International Airport.

1992 GRR Above Ground/Below Ground Fuel Farm Report prepared.

HISTORIC MILESTONES

1991 James A. Koslosky becomes Aeronautics Director.

AIRPORT PLANNING

1991 GRR Heliport Master Plan Study completed.

1992 GRR FAR Part 150 Noise Compatibility Study

Kent County International Airport renamed Gerald

- 1992 GRR Comprehensive Wetland Mitigation Strategy prepared.
- 1992 GRR Environmental Assessment (Final Draft).
- 1994 Air Freight Site Study completed.
- 1997 GRR Pavement Maintenance Management Program 1996 Annual Update Report.
- 1998 GRR Pavement Maintenance Management Program 1997 Annual Update Report released.
- 1998 Airport Condition Report released.
- 999 Airport completes NCP Strategic Implementation Program Plan.
- GRR Landside Transportation Master Plan Study completed.
- 1999 GRR Air Service Analysis report prepared.

AIRPORT DEVELOPMENT

- 1994 Construction completed on extension of East-West Runway 8L-26R.
- 1996 Airport parking and circulation roads upgraded.
- 1996 Airport constructs wetland mitigation site in Lowell Township.
- 1997 New 8,500-foot north-south air carrier runway constructed.
- The Airport's new Air Cargo and Trade Center opens on east side of Airport.

HISTORIC MILESTONES

- 2003 100th anniversary of Wright Brothers' first powered flight.
- 2003 Gerald R. Ford International Airport celebrates 40th anniversary at its current location in Cascade Township.

AIRPORT PLANNING

- 2000 I-96 Airport Area Access Study Draft EIS completed.
- 2000 GRR Noise Exposure Map Update completed.
- 2001 2000-2001 Annual Deicing
 Management Program Report
- 2002 GRR Pavement Maintenance Management Program 2001 Annual Update Report.
- 2002 2001-2002 Annual Deicing
 Management Program Report
 - I-96 Airport Area Access Study Abbreviated Final EIS released.
- 2002 2002-2003 Annual Deicing Management Program Monitoring Plan prepared.

AIRPORT DEVELOPMENT

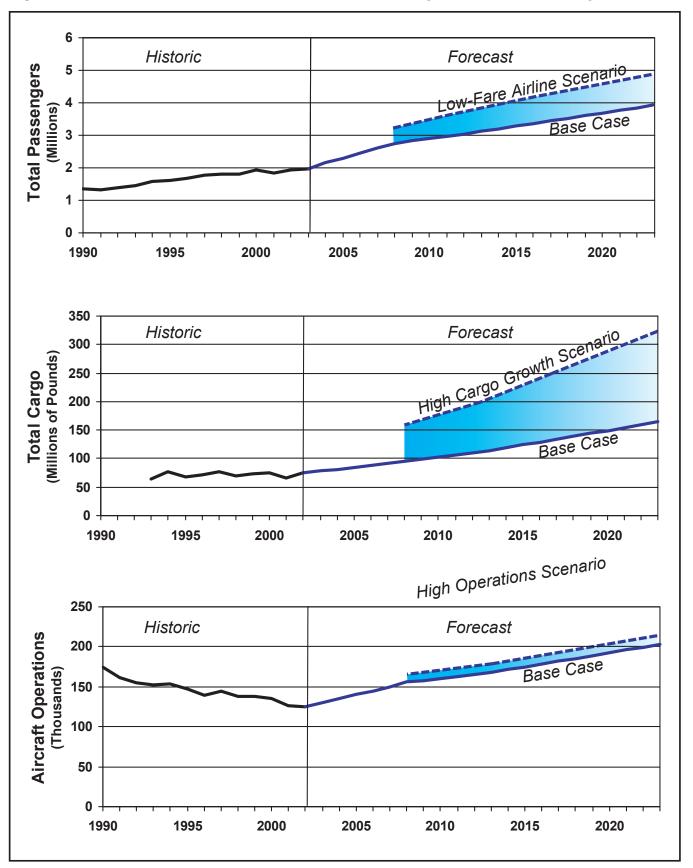
- 2000 Gerald R. Ford International Airport completes \$50 million major renovation of passenger terminal building.
- 2000 \$32 million reconstruction of Airport's primary east-west runway complete.
- Airport becomes first in U.S. to screen 100% of checked baggage using explosive detection equipment.
- 2002 Airport serves over 1.9 million passengers.
- 2003 Airport completes Noise Compatibility
 Program and Residential Sound
 Insulation Program.
- 2004 KISD and Museum building constructed.
- 2004 Airport improves entrance drive landscape (Gateway to West Michigan).
- 2004 For the first time, airport serves more than two million passengers in a single calendar year.



ES-5

Figure 3

Summary of Aviation Activity Forecasts



DEMAND/CAPACITY AND FACILITY REQUIREMENTS

The next step in the Master Plan Update process was to translate the forecasts into facility requirements for the five, 10, and 20-year planning horizons. By comparing future facility needs to the Airport's inventory of existing facilities, planners determined the level of development required to meet future demand. Future facility needs were determined by incorporating FAA planning/design standards, observations made of various functional elements of the Airport, consultation with airlines and other users, and industry standards.

Airfield Requirements

The existing three-runway airfield will be able to accommodate the forecast growth in aircraft operations over the next 20 to 30 years; therefore, no new runways will be required. The Master Plan Update recommends, however, that land already identified for the future third runway on the north side of the Airport be preserved.

Passenger Terminal Requirements

Although the recently-completed terminal renovation included room for near-term expansion, the increased security requirements stemming from the September 11, 2001 terrorist attacks have already resulted in constraints at some locations, particularly in the ticket lobby. Overall, the terminal building and concourses would need to be expanded by 22 percent (from about 270,000 square feet to 330,000 square feet) to meet 2023 requirements, and the number of gates would need to increase from 10 to 16. Under the low-fare scenario, the size of the terminal would need to increase to 415,000 square feet and 17 gates would be needed by 2023.

Terminal Curb, Parking, and Roadways

The terminal curb is used to drop off and pick up passengers. The existing curb length, measured from one end of the terminal to the other, is approximately 625 feet long; a second (outer) curb provides about the same length. These two curbs will provide sufficient length to meet 20-year requirements, and no lengthening is required.

The Airport provides more than 5,800 public parking spaces, and serves customer needs by allocating these spaces among short-term, long-term, and valet lots, and the recently expanded Express Shuttle Lot. As passenger

activity continues to grow, an additional 3,200 spaces will be needed by 2023. Under the low-fare airline scenario, a total of 4,400 additional spaces will be needed by 2023.

Future on-airport roadway traffic was analyzed and compared to the existing on-airport roadway system. Based on the analysis, the existing on-airport roadway system is adequate to accommodate 2023 traffic.

Air Cargo

Air cargo is currently processed at a west facility (which includes an Air Mail Facility) and the Air Cargo and Trade Center occupied by FedEx and Menlo Worldwide (formerly Emery). Combined, the two facilities provide 184,000 square feet of cargo building space. By 2023, approximately 21,000 square feet of additional cargo building will be required under the base case scenario. Should GRR become the location of a regional air-cargo facility (as assumed in the high cargo forecast scenario), a total 402,000 square feet of cargo building would be required by 2023, more than double existing capacity.

General Aviation

General Aviation (GA) includes all aviation activity not directly related to passenger airlines, cargo airlines, or the military. Although GA activity has decreased recently (in terms of total operations), the forecasts show a return to growth, especially for corporate/business jet users (versus recreational flying). This increase in corporate/business jet activity will result in the need for increased corporate hangar storage and more Fixed Base Operator (FBO) services (fueling, catering, and maintenance). Lastly, many GA facilities at GRR have reached the end of their useful life, which will require redevelopment of these facilities.

Support Facilities

Support facilities include aircraft rescue fire fighting facilities, fuel storage, and airfield maintenance. Each of these facilities is adequate to meet long-term requirements; however, the Master Plan Update recommends providing expansion areas for planning purposes.

RECOMMENDED AIRPORT DEVELOPMENT PLAN

Recognizing that the Airport will need to continue to meet the region's air transportation needs beyond the 20-year planning horizon, the Master Plan Update considered general facility requirements not only for 2023 but through 2033 (i.e., an additional 10 years). Once the general amount of land area required for each major functional element of the Airport was estimated, an on-airport land use map was developed to guide general development and to ensure that the recommended concepts provided sufficient area to meet not only 2023 requirements but 2033 requirements as well. (See **Figure** 4.) This exercise indicated that, over the long term, the core area of the Airport will likely become site-constrained, requiring some development to shift to the east side of the Airport. Finally, specific development projects needed to accommodate the 20-year planning horizon were identified as part of the recommended Airport development plan, as shown in Figure 5.

Recommended Airfield Development Plan

Because GRR's current three-runway airfield has sufficient capacity to accommodate aircraft operations through the 20-year planning horizon, no significant airfield improvements are required. The airfield development concept does, however, recommend preserving land on the north side of the airfield for a future air carrier runway should additional capacity be required beyond the planning period. The plan also shows the construction of taxiways to serve potential development at the Airport's Foriegn Trade Zone (FTZ), located in the southeast corner of the airfield.

Recommended Terminal Development Concept

The recommended terminal development concept addresses three key issues: 1) relocating checked bag screening functions from the ticket lobby, 2) increasing the capacity of baggage handling systems, and 3) accommodating the forecast growth in passenger and aircraft activity.

The Master Plan Update shows construction of new facilities to accommodate checked bag screening functions on the east and west sides of the terminal building. In addition, new, larger outbound bag make-up areas would be constructed. Baggage takeaway belts would transfer bags from the ticket counters to the checked bag facility where Transportation Security Administration (TSA) agents would inspect the bags. An additional set of

baggage belts would deliver the luggage to the new outbound bag makeup area. This area would be sized to accommodate carousels to store bags until airline personnel sort them and place them on baggage carts to transport them to the appropriate flight.

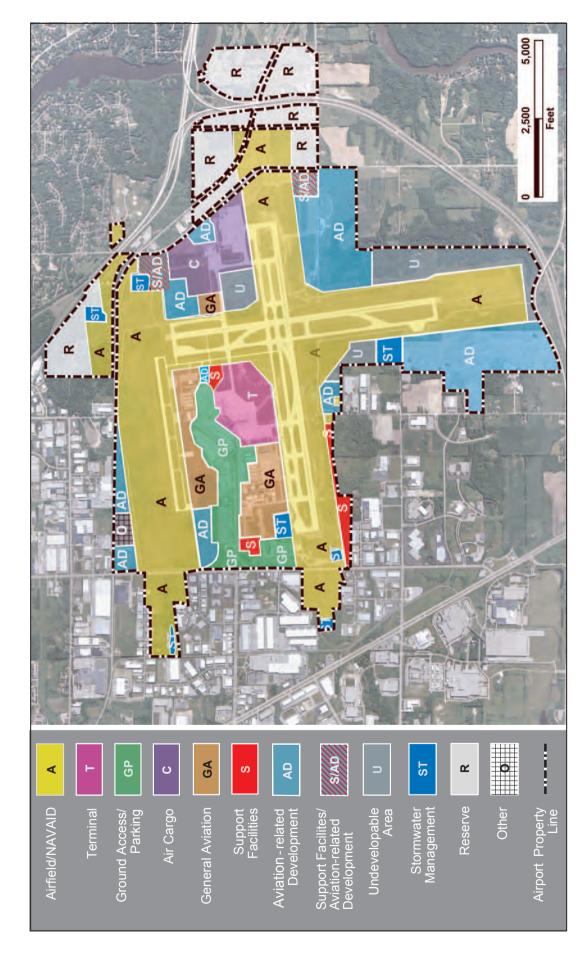
Due to the projected increase in peak hour flights, the recommended terminal development plan also shows a one-gate addition to Concourse B and a four-gate addition to Concourse A. The gate expansion at Concourse A would also require an expansion of the Concourse A security screening checkpoint. To accommodate the additional gates and a forecast increase in the number of overnighting aircraft, the terminal apron would be expanded.

Additional baggage claim device capacity would be provided by first lengthening the three existing carousels; toward the end of the forecast horizon, two additional bag claim devices would be provided.

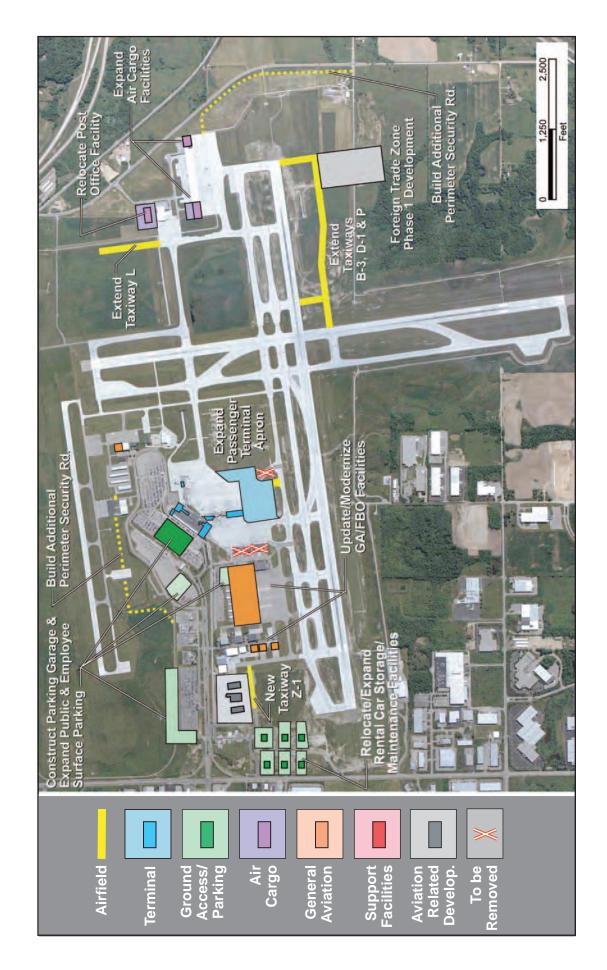
Additional airline ticketing capacity and airline offices would be provided by first relocating rental car functions to a new parking garage; toward the end of the forecast horizon, the ticket halls would be expanded on both the east and west sides of the terminal building.

Recommended On-Airport Land Use Plan

Figure 4



Recommended Airport Development Plan



Recommended Off-Airport/On-Airport Ground Access and Parking Development Concept

Off-Airport Roadway Improvements - The arterial roadway system in the vicinity of the Airport (comprising Patterson Avenue and John J. Oostema Boulevard) has adequate capacity in its current configuration to serve traffic traveling to and from the Airport through the 20-year Master Plan timeframe. Although the intersection of Patterson Avenue and 28th Street (the current primary approach to the Airport) will remain highly congested despite planned improvements, the construction of a new interchange connecting I-96 to 36th Street north of the Airport will become the preferred route to/from the Airport for passengers coming from the north. This new route will allow Airport users to bypass the congested 28th Street/Patterson Avenue intersection.

Direct Connection between I-96 and Airport - Although the existing and programmed roadway improvements will provide sufficient capacity, a "direct connection" from the new I-96/36th Street interchange directly into the Airport (and tunneling under the northern half of the airfield) was examined to identify possible benefits and determine its impact on Airport facilities. Even though a direct connection would save a few minutes in travel time, the Master Plan does not recommend a direct connection for multiple reasons, several of which include cost (at least \$80 million), impacts to existing and future Airport facilities, and security (due to tunneling under the airfield).

On-Airport Roadways - On-Airport roadway capacity, provided by the four-lane divided arterial configuration of John J. Oostema Boulevard and the two lanes flowing counter-clockwise on Terminal Drive, provides adequate capacity to serve GRR throughout the 20-year planning horizon; therefore, no capacity-related on-airport roadway projects have been identified in the Master Plan Update.

Terminal Curbs - The terminal is currently served by two roadways: a four-lane inner roadway, next to the terminal, and a two-lane outer roadway. The full 625-foot length of the curb lane on the inner roadway is dedicated to serving private autos, taxis with a contract for providing service to the Airport, parking shuttle buses, and valet parking. Presently, only a portion of the 600-foot outer curb is used (by tour buses, hotel shuttle buses, and other public transportation). Although no additional curb length is required, the Master Plan Update recommends a shifting of some public vehicles (e.g., taxis and parking shuttles) to the outer curb to meet future demand.

Automobile Parking - Because there is limited land available for expanding close-in public parking, the Master Plan Update recommends constructing a multi-level parking garage near the terminal building. A variety of parking uses would be provided in the garage, including all hourly parking, some close-in daily parking for those wishing to pay a premium to park under cover and walk a shorter distance, and rental car ready/return spaces. Additional long-term parking would be provided by removing an existing office building and converting the site to public parking, gaining an estimated 300 spaces. In addition, the Express Shuttle Parking Lot has been expanded to accommodate an additional 750 vehicles.

Rental Car Facilities - The four on-airport rental car companies each have customer counters in the east wing of the terminal and are allotted, in accordance with market share, a proportional number of ready return spaces in a 200-space lot opposite the east wing of the terminal. The four companies have their individual storage/maintenance facilities in a series of parcels, totaling 6.2 acres, east of the Express Shuttle Parking Lot. The Master Plan Update recommends that the rental car company ready/return spaces be incorporated into the ground level of the parking It is also recommended that the rental car customer counters and associated offices be relocated from the east wing of the terminal into the garage. The Master Plan Update also recommends relocating the rental car storage and maintenance facilities to a larger 18-acre site located southeast of the Patterson Avenue/Van Laar Drive intersection.

Multi-modal Connection - The Grand Rapids community is in the early stages of planning an enhanced transit system. Several possible corridor alignments include routes along Patterson Avenue in the vicinity of the Airport and the possibility of a major node near the intersection of Patterson and 44th Street. The Master Plan Update therefore identifies the intersection of Patterson Avenue and Oostema Boulevard (directly west of the Airport) as a multi-modal node. The Master Plan Update also recommends maintaining the Oostema Boulevard right-of-way as a corridor to connect this node with the Airport terminal. Based on expected long-term Airport growth, it is anticipated that the connection between the transit node and the terminal will initially be provided by a high-frequency shuttle bus connection.

Recommended Air Cargo Development Concept

The Master Plan Update confirmed the current plan of locating all cargo activity on the east side of the Airport. The air cargo development concept recommends continuing this eastward shift of facilities. Based on future facility requirement calculations (including consideration for an additional cargo hub), the existing land area allocated to cargo development is more than adequate to meet 20-year demand. This would provide opportunity for other aviation-related development in this area.

Although the final layout of the future east side air cargo facilities will have to consider the operating preferences and requirements of specific carriers, the Master Plan Update recommends meeting additional cargo building requirements by first expanding the FedEx building. Air mail functions would be relocated from their facility on the west side of the Airport to a new, larger facility north of the Menlo Worldwide (Emery) cargo site. Additional cargo development would be accommodated by extending Taxiway L northward, with construction of cargo buildings and ramp on either side, and by constructing buildings and ramp on the east side of Taxiway K.

Recommended General Aviation Development Concept

GA facilities are currently located on the west side and north side of the Airport. The west side contains a large FBO facility, aircraft apron, corporate hangars, and T-hangars. The north GA facilities include two FBOs, T-hangars, and parking aprons. Many of the facilities on the west side have reached the end of their useful life; therefore, the Master Plan recommends redeveloping/modernizing and expanding these facilities to accommodate both forecast growth and a greater share of large, sophisticated GA aircraft that are anticipated in the future.

The Master Plan Update recommends that the north GA area be developed with facilities serving GA utility-type aircraft (e.g., recreational and light business aircraft), recognizing weight restrictions on Taxiway J and Runway 8L-26R.

The Master Plan Update identifies an east expansion area, east of Runway 17-35 and north of the east cargo area, as a location for additional GA facilities should either an existing FBO or a new FBO desire to provide additional full-service capabilities at GRR, with unrestricted weight access to Runways 8R-26L and 17-35.

Recommended Support Development Concept

Support facilities include airfield maintenance, fuel storage, and aircraft rescue firefighting (ARFF).

Based on the Master Plan Update research, the existing airfield maintenance facility has capacity for future activity and can be expanded within the 10-acre site. Recognizing that little airfield expansion is required to meet future aviation activity levels, it is not anticipated that airfield maintenance facilities will require expansion over the planning period. Nevertheless, it may be desirable to consolidate all airfield maintenance facilities at one location; it is therefore assumed that maintenance activities and materials located at the storage barns and storage shop on the east side of the airfield will eventually be moved to the west airfield maintenance facility. To accommodate this possible relocation and to provide for unforeseen capacity needs, the Master Plan update recommends that an additional 10 acres of land be preserved at the west location.

The existing fuel storage facility on the west side of the Airport can accommodate anticipated fuel storage requirements through the 20-year planning period. Should significant additional development occur on the east side of the Airport (e.g., a regional cargo hub or expanded FBO facilities), a new fuel farm on the east side may be desirable. The Master Plan Update therefore recommends preserving land for an additional fuel farm on the east side of the Airport.

The existing single ARFF facility, located directly east of Concourse B, is adequate to meet future rescue and firefighting requirements both in terms of providing firefighting and rescue capabilities and meeting required response times.

ENVIRONMENTAL CONSIDERATIONS

The Master Plan Update process included an initial environmental overview of the potential impacts that will need to be considered prior to construction of the Airport improvements identified by the recommended plan. The FAA's Airport Environmental Handbook identifies 20 impact categories that should be considered:

- Noise
- Compatible Land Use
- Social Impacts
- Induced Socioeconomic Impacts
- Air Quality
- Water Quality
- Department of Transportation Act, Section 4(f)
- Historic, Architectural, Archaeological, and Cultural Resources
- Biotic Communities
- Endangered and Threatened Species of Flora and Fauna
- Wetlands
- Floodplains
- Coastal Zone Management Program
- Coastal Barriers
- Wild and Scenic Rivers
- Farmland
- Energy Supply and Natural Resources
- Light Emissions
- Solid Waste Impacts
- Construction Impacts

Of these 20 environmental impact categories, none was determined to be significantly affected by the proposed Airport development plan based on the initial review undertaken, and only four categories (air quality, water quality, wetlands, and solid waste) were identified as possibly being impacted and therefore needing further analysis. The additional analysis will be undertaken in cooperation with appropriate federal, State, and local agencies to ensure minimal impacts on the environment.

FINANCIAL ANALYSIS

A financial plan was prepared, outlining the general cost of each project, its timing, and potential revenue sources. Over the 20-year planning horizon of the Master Plan Update, approximately \$253 million of development projects is anticipated, as shown in **Table 1**. The scheduling of projects in the Capital Improvement Program (CIP) was based solely on when they would be required to meet forecast demand. In addition, a significant amount of resources will be required to finance security-related projects associated with the TSA's checked bag screening functions.

At this time, there are five primary sources of funding for capital projects:

- Passenger Facility Charges (PFCs)
- The federal Airport Improvement Program (AIP)
- Michigan Department of Transportation grants
- Third-party sources (including bonding)
- Airport revenues

Recognizing that most of the capital expenditures associated with Master Plan projects will be required within the next five years, a financial analysis was undertaken to determine if the Airport would have sufficient funding to cover these up-front expenditures. The financial analysis suggests that, although the Airport could fund most demand-driven projects, it would be difficult to pay for TSA-related projects without substantial increases in airline rates and charges. KCDA may have to defer some security-related development until TSA makes funding available.

Table 1 - 20-Year Capital Improvement Program

(Costs Include Engineering/Design, Management/Administration, and Contingencies) (Millions of 2004 Dollars) (1)

Project	Phase I (2004-2008)	Phase II (2009-2013)	Phase III (2014-2023)	(Total)
Airfield	\$12.5	\$1.3	\$13.1	\$26.9
Terminal	\$46.8	\$2.6	\$10.1	\$59.4
Ground Access/Parking	\$72.2	\$3.4	\$6.5	\$82.1
General Aviation	\$5.0	\$3.9	\$11.2	\$20.1
Air Cargo	\$5.4	\$2.5	\$23.5	\$31.4
Airfield Maintenance/Support Facilities	\$7.1	\$5.2	\$11.9	\$24.1
Miscellaneous	\$2.9	\$0.7	\$5.3	\$8.8
Total	\$151.9	\$19.5	\$81.5	\$252.8

Source: HNTB analysis

Note: (1) Totals may not add due to rounding.

PUBLIC PARTICIPATION

A comprehensive public participation process was established to ensure public input in preparing a recommended development plan for the Airport.

A Master Plan Update Steering Committee was established to provide guidance, technical review, and policy direction, and to maintain coordination with the MDOT, the Kent County Aeronautics Board, and the FAA. The Committee met several times throughout the process.

A Master Plan Update Advisory Committee was established to provide data input, review and comment on analysis, and keep the community-at-large informed of the study. The Advisory Committee was composed of representatives from the Kent County Aeronautics Board, KCDA, FAA, MDOT, local planning officials, community representatives, and airport users. The Committee met at key points in the planning process.

A User Subcommittee was established to review and comment on items specifically related to tenant/user issues. It was composed of representatives of Airport users, including airlines, FBOs, rental car operators, corporate operators, federal agencies, and concessionaires. The Subcommittee met at key points in the planning process. In addition, Subcommittee members were interviewed during the inventory phase of the project.

Throughout the process, elected officials were kept apprised of, and afforded opportunity to participate in, the master planning process. U.S. representatives, State representatives, and local officials were invited to all Advisory Committee meetings and public information workshops (described below) and received copies of all documentation and presentations.

Media representatives were also invited to all Advisory Committee meetings and public workshops and received copies of all documentation and presentations.

Three public information workshops were held during the Master Plan Update Process to keep the public apprised of the study, to answer questions, and to receive public input. Notices for these workshops were placed in The Grand Rapids Press and on the Airport's website.

Finally, a Master Plan Update website was developed on the Airport's website to inform interested parties of the status of the Master Plan Update and to encourage public participation. The site encouraged visitors to submit comments or questions concerning the Master Plan through the website and through the mail. The preparation of this document was financed in part through an Airport Improvement Program (AIP) grant from the Federal Aviation Administration (FAA) (Grant #3-26-0039-3404) as provided under the Federal Aviation Reauthorization Act of 1996. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws. (FAA Order 5100.38 from the AIP Handbook.)



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