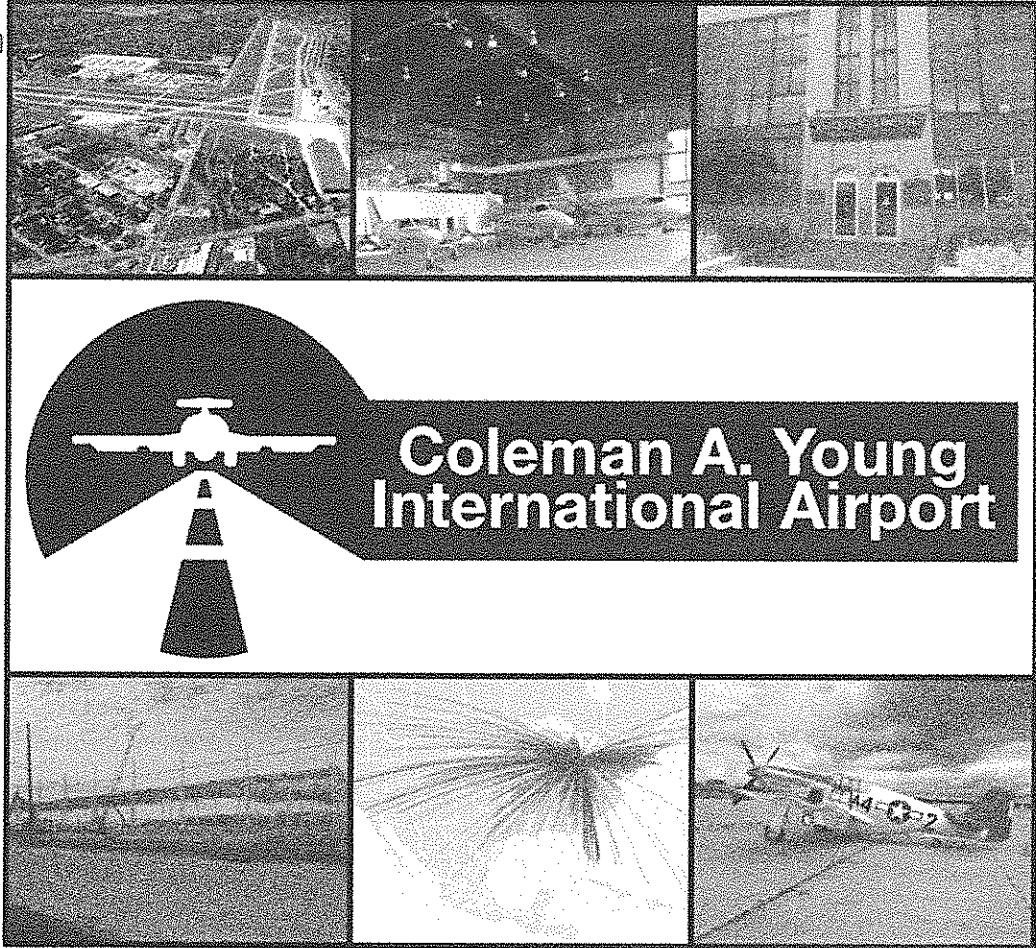


# Phase I Report - DRAFT

Futu



December 13, 2017



**GRA, Incorporated**

In association with:

**QED**

Airport & Aviation Consultants

JUERGENSEN+ASSOCIATES, LLC

baltimore design

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## Executive Summary

When it opened in 1930, Detroit City Airport's new Executive Terminal was the largest of its kind and was the busiest in the nation. Residential, commercial, and industrial neighborhoods grew up around the Airport's prominent location at Conner and Gratiot as Detroit's economic and industrial power grew for decades to follow. More than 70 years later, the Airport was renamed for the City's longest serving Mayor whose public service included piloting a "Red Tail" as a member of the path-breaking and honored Tuskegee Airman in World War II. Although most passenger airline service had moved to Detroit Metropolitan Wayne County Airport after World War II, City Airport still had limited passenger airline service until 2000. In recent years the Coleman A. Young International Airport (DET) has been a drain on City resources while also reflecting the disinvestment of a City recovering from bankruptcy as the Airport was unable to attract revenue-producing corporate jets because of dilapidated facilities.

But, Detroit is booming and experiencing an unprecedented resurgence and the confidence in the City's future is demonstrated in a booming downtown. Recently, public and civic leadership pursuit of Amazon's HQ2 is evidence that the world is not only taking notice of Detroit's revitalization, but is drawn in and investing in the City.

A key challenge to Detroit's return to economic vitality is assembling its historic patchwork of land for modern commercial and industrial uses. In this light, the Airport's 264 contiguous acres seem particularly attractive. At first glance, repurposing the land into 30-40 acre parcels for top tier auto suppliers seems as if it could not only eliminate the Airport deficit's impact on the City Budget, but also attract investment that would produce revenue for the City and jobs for its residents.

However, throughout the region, more than 80% of industrial users are on sites of less than 7 acres, of which there are many vacant sites in Detroit. The City's property taxes are 30-50% higher than urbanized communities in the metro's three adjacent counties. No new large assembly plants are on the horizon, the auto supply chain is shrinking, vehicle demand is plateauing, and significant disruptions in the industry are expected as autonomous and electric vehicles come to market in the next decade.

Airports are unique assets, which are difficult to replace, and DET can play an important role in the City's ongoing revitalization due to its strategic location less than five miles from downtown. Many business leaders, real estate professionals, and aviation industry stakeholders agree that the Airport could be leveraged to attract investment in the aviation facilities and surrounding area.

Nearly 5,000 times a year, jet aircraft pilots fly to DET, retrieve their passengers, and make nonstop flights to the entire continental US, Caribbean, much of Canada, and even Europe. This type of user represents the highest revenue potential for the Airport; investments in hangars and other facilities could attract more of these users to the Airport. DET's fees for various aviation-related services are competitive with other airports in the region. Many of the needed improvements could be underwritten by the Federal Aviation Administration and the Michigan Department of Transportation Office of Aeronautics, but the City's posture on the future of the Airport needs to change to unlock the share (up to 95% of project cost) these government agencies might provide.

Confidence in the commitment to retain the Airport will release pent-up demand allowing the Airport to accrue income from additional fuel sales, long-term lease revenue from hangars, and from other niche services not offered by DET's primary competitors at Pontiac and Willow Run. Private funds could be used to improve Airport facilities and build larger, modern hangars for corporate jets. The City could also leverage historic tax credits and lure philanthropic investments in the two aviation museums at the Airport.

With the resurgence of Detroit's downtown and the investments made there, an airport within a few miles of downtown is a unique asset that could not be easily replicated. The research to date suggests that there is an opportunity to maintain the Airport for aviation use, which in turn could attract local, state, and federal public investment plus private investment. The City's investment should consider that strategic investments will be necessary over time, with an initial focus on building stabilization and repair.

The analysis conducted in Phase I will be furthered expanded to determine the economic impact of the Airport and other potential uses in Phases II and III of this project.



## Coleman A. Young International Airport Overview

In 1927, the Detroit City Airport opened just five miles northeast of downtown Detroit. As the only airport with passenger airline service in the region, it served as the Detroit region's gateway to the rest of the United States and the world through the end of World War II. After that, most passenger airline service at Detroit City Airport moved to Willow Run Airport in Ypsilanti (located about 24 miles southwest of downtown Detroit), which had been built to support a bomber factory for the war effort. Willow Run Airport served as the Detroit region's main passenger airline airport until 1957 when airline service began to shift to Detroit Metropolitan Wayne County Airport in Romulus (located about 17 miles southwest of downtown Detroit). Detroit Metropolitan Wayne County Airport constructed terminals, runways, and navigation equipment specifically designed for jet aircraft, which had recently become commonplace in the industry. By 1967, Detroit Metropolitan Wayne County Airport was the dominant airport for passenger airline service in the Detroit region, as it remains today.

Since 1975, at least 11 airlines have started passenger service at Detroit City Airport with hopes to draw passengers due to the Airport's proximity to downtown Detroit.<sup>1</sup> However, none of the airlines served the Airport for any significant length of time due to weak passenger demand, short runways at the Airport, and airline financial difficulties. Southwest Airlines served the Airport from 1988 to 1993 but left after plans the City failed to extend the primary runway and make other improvements.<sup>2</sup> Pro Air, the most recent passenger airline to serve the Airport, ceased operations in 2000.

The Airport was renamed to Coleman A. Young Municipal Airport in 2003 in honor of the former Mayor and is the Airport's official name. It is marketed as the Coleman A. Young International Airport, but is still most commonly referred to as City Airport. The names are used interchangeably by those familiar with the Airport. The location identifier assigned to the Airport by the Federal Aviation Administration (FAA) is DET. The Airport has operated as a general aviation (GA) facility since the last scheduled passenger airline service ended.

General aviation is the term used to refer to all civilian aviation except for scheduled passenger or cargo airlines. General aviation includes a wide variety of aviation activity, including air taxi, corporate flight departments, fractional aircraft ownership programs, sightseeing flights, air medical services, agricultural flying, civilian government aircraft operations, flight training, flying clubs, and personal flying. General aviation aircraft can range from non-powered aircraft such as gliders to large jet aircraft with multiple engines. Scheduled passenger or cargo service is the offering of transportation services for hire on routes pursuant to published flight schedules. Airlines such as Delta Air Lines are in the primary business of providing scheduled passenger service and airlines such as FedEx are in the primary business of providing scheduled cargo service.

The Airport is generally located at the intersection of Gratiot and Conner Avenues on Detroit's eastside less than five miles from Detroit's Central Business District. It occupies a large, 264-acre, L-shaped parcel bounded by Conner Avenue to the east, McNichols Road to the north, French, Lynch and Erwin Roads to the west and a rail line adjacent Grinnell Avenue and Gethsemane Cemetery to the south. The Airport includes a 200,000 SF, three-story Main Terminal Building on Conner Avenue along with a number of single and two-story accessory buildings and an air traffic control tower that is staffed 24 hours a day, seven days a week. A 191,000 SF Historic Executive Terminal prominently occupies land near the corner of Gratiot and Conner Avenues and a Detroit Police Department hangar built at approximately the same time, is nearby to the west of Gethsemane Cemetery. There are 131 T-Hangars, some of which are located north of the Main Terminal Building with others are located on the southwest quadrant of the grounds. A fuel farm, located at the terminus of French Road, near Grinnell Avenue serves the Airport. There are other vacant buildings scattered about the site.

An aerial view of the Airport is shown in Figure 1. This location presents a clear advantage to users destined to and from downtown Detroit, when compared to other airports in the region.

<sup>1</sup> Darci McConnell, Cameron McWhirter, and Joel J. Smith, "Mayor: Fix or shut Detroit City Airport," *The Detroit (MI) News*, March 20, 2002.

<sup>2</sup> Brian Lusk, "Flashback Fridays – Once Upon a Time in Detroit," *Southwest Stories*, July 9, 2010.

Figure 1: Detroit City Airport

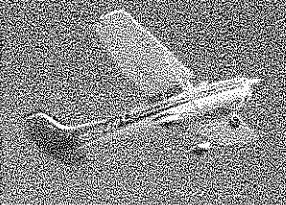

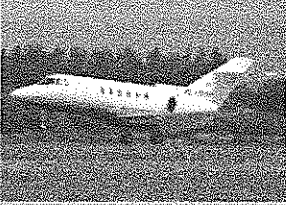



The Airport is served with two runways. Runways are identified using their compass bearing (rounded to the nearest 10 degrees) such that a runway that is 152 degrees from magnetic north would be identified as runway 15. Since most runways are able to be used in both directions, the opposite compass bearing would be 180 degrees plus the first compass bearing. At DET:

- Runway 15-33 is the primary runway with a length of 5,090 feet. Instrument approaches may be conducted during periods of low ceiling and visibility to each end of the primary runway.
- Runway 7-25 is the secondary runway at 3,714 feet long and is restricted to use during visual flight rule conditions.

The runways are served with a taxiway network to facilitate aircraft ground movement. All aircraft activity at the Airport is under the control of an FAA contract air traffic control tower that is staffed 24 hours a day, seven days a week. Terminal area facilities at the Airport provide hangar storage for based and, when available, transient aircraft. There are large apron areas for aircraft such as small piston engine aircraft, small turboprop aircraft, and business jets. Table 1 shows characteristics of common aircraft types at DET. The apron areas are used nearly to their capacity for transient aircraft parking during periods of peak demand typically resulting from major sporting events and concerts at Detroit venues.

**Table 1: Characteristics of Common Aircraft Types at DET**

Aircraft Type	Photo of Representative Aircraft	Typical Seating Capacity	Typical Users
Small Piston		2 - 4	<ul style="list-style-type: none"> <li>- Flight training</li> <li>- Recreational flight</li> </ul>
Small Turboprop		7 - 15	<ul style="list-style-type: none"> <li>- Air taxi</li> <li>- Air ambulance</li> <li>- Corporate flight department</li> <li>- Shared ownership program</li> </ul>
Business Jet		9 - 19	<ul style="list-style-type: none"> <li>- Air taxi</li> <li>- Air ambulance</li> <li>- Corporate flight department</li> <li>- Shared ownership program</li> </ul>
Helicopter		2 - 6	<ul style="list-style-type: none"> <li>- Police</li> <li>- Air ambulance</li> <li>- Air taxi</li> </ul>

Airports similar to Detroit City Airport often contract with one or more Fixed Base Operators (FBO). An FBO is a commercial business that provides aeronautical services (such as fueling, aircraft storage, aircraft parking, aircraft rental, and aircraft maintenance) at an airport with the permission of the airport sponsor.<sup>3</sup> As the sponsor of Detroit City Airport, the City of Detroit is responsible for the operation and maintenance of the Airport.

The City has assigned certain duties under contract to AvFlight, the sole FBO at the Airport. AvFlight leases two hangar bays in the Historic Executive Terminal and office/operations space in the main terminal building. Private individuals offer maintenance services to based and transient aircraft.

### Project Overview

The City of Detroit commissioned GRA, Incorporated, QED Airport & Aviation Consultants, Juergensen+Associates, LLC, and BaltimoreDesign (the "GRA Team") with a three-phase project to evaluate the future use of the Airport. The City's objectives for the project are to eliminate the impact of the existing Airport deficit on the City budget and to maximize the impact of the Airport site on the City's overall economy.

This report presents the results of the first phase of the project, which includes a general overview of the metropolitan Detroit area, financial and operations analyses of the Airport, summaries of proposed Airport

<sup>3</sup> FAA, Advisory Circular 160/5190-7, *Minimum Standards for Commercial Aeronautical Activities*, August 2006.



improvement plans, summaries of interviews with key stakeholders regarding the Airport's future, and preliminary analyses of possible aviation and non-aviation future uses of the Airport.

The research and analysis were performed in line with industry best practices and with consideration of FAA and other relevant government agency regulations. Data were gathered from sources including the City of Detroit, FAA, and other authoritative sources. The most recently available data as of fall 2017 were used. The GRA Team visited five airports in the Detroit region (in addition to DET) to obtain first-hand information and observations of the airports.

The first phase of the project is the only portion currently authorized and funded by the City. Figure 2 shows a current overview of the project schedule. Population data for the area around the Airport, traffic data, and proposed roadway improvements have been requested from the City.

**Figure 2: Project Schedule**

Task Descriptions	2017					2018				
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
<b>Phase I - Create Coleman A. Young Municipal Airport (DET) Operational and Financial Baseline</b>										
Kickoff Meeting with Study Committee										
Task 1. General Overview of Detroit Metro Aviation Market										
Task 2. Provide an Overview of DET Financial Performance										
Task 3. Identify and Summarize Assets and Liabilities and Cost of Aviation Related Improvements										
Task 4. Interview City Officials, Civic Leaders and Stakeholders										
Task 5. Preparing for Aviation and Non-Aviation Use Analyses										
Draft Report										
Review Period for Study Committee										
Review Meeting with Study Committee										
<b>Phase II - Identify Potential Aviation and Non-Aviation Uses and Calculate Potential Economic Impact</b>										
Task 1. Evaluate Maximum Economic Impact of DET as a General Aviation Airport										
Task 2. Evaluate Maximum Economic Impact of DET as a Commercial Service Airport										
Task 3. Evaluate Maximum Economic Impact of Repurposing DET for Non-Airport Use										
Draft Report										
Review Period for Study Committee										
Review Meeting with Study Committee										
<b>Phase III - Summarize Future Use Options and Identify Next Steps</b>										
Task 1. Synthesize Potential DET Uses and Recommend Strategic Actions										
Draft Final Report										
Review Period for Study Committee										
Review Meeting with Study Committee										
Final Report										
Presentation to City Council										

Modification to the current contract to award Phases II and Phase III will be necessary to finalize the project schedule and complete the work.

**Methodology**

Local stakeholder perspective is a key ingredient to charting a sound course for the Airport and its potential repurposing. To accomplish this task, the GRA Team conducted one-on-one interviews and focus groups with over 80 people, collectively. The interviews and focus groups included city officials, industry representatives, economic development organizations, area businesses, and existing and potential DET users (pilots, aviation service providers, customers, and others). Meetings were conducted both in person and by telephone.

Industry experts including representatives from aviation, automotive suppliers, authors, academics, and commercial and industrial real estate development organizations throughout metro Detroit were also queried individually and in groups. This includes members of the Coleman A. Young International Airport Education Association (CAYIAEA), Aircraft Owners and Pilots Association (AOPA), National Business Aviation Association (NBAA), the aviation group in Michigan's Department of Aviation, The Tuskegee Airmen, the new Civil Air Patrol chapter at DET, local businesses, universities, and community groups. The team also met with FAA, business leaders, potential investors, aircraft operators, and others to gain inputs on the future of the Airport. In addition, Building Owners and Managers Association (BOMA) of Metro Detroit and Urban Land Institute assisted in identifying qualified and interested real estate professionals from their ranks. Real estate professionals had no less than 20 years of experience in the industry and many had tenure in excess of 40 years.

Those in attendance at various focus groups and meetings were oriented to the site, DET's current operations, the challenge and limitations, and the objectives of the Mayor's Office. The focus group and meeting participants were asked to respond to the proposed repurposing of the site.

Using the experience of Team members familiar with Detroit, the Team also examined current events and the economic and political context of the effort. Most notably, the City's recent submittal of a bid to recruit Amazon's HQ 2 could be relevant for DET. Leading the charge was Dan Gilbert, Chairman of QuickenLoans and active member in the redevelopment of downtown Detroit. He was quoted in *Crain's Detroit Business* suggesting that City Airport is "an asset that could be a selling point" and that "the airport could be 'rejuvenated a little bit' to meet the air-traveling needs of Amazon executives as well as options for Amazon to consider investing package-delivering drones and the airport is just an example of how we're trying to be as creative as possible to present options to Amazon."

## Summary of Aviation Activity in the Detroit Metro Region

The 2017 Michigan Aviation System Plan (MASP) focuses on the 114 public-use airports that are critical to Michigan's airport network. The System Plan includes forecasts of aviation activity at the state, Michigan Economic Prosperity Region, and individual airport levels. The Michigan Economic Prosperity Regions are designated by the State of Michigan and DET is one of the ten airports in the Detroit Metro region. The remaining nine airports are:

- Detroit Metropolitan Wayne County Airport (DTW)
- Oakland County International Airport (PTK)
- Willow Run Airport (YIP)
- Grosse Ile Municipal Airport (ONZ)
- Oakland/Troy Airport (VLL)
- Canton-Plymouth-Mettetal Airport (1D2)
- Ray Community Airport (57D)
- Oakland Southwest Airport (Y47)
- Romeo State Airport (D98)

Of the ten airports in the MASP Detroit Metro region, three (DET, PTK, and YIP) can be considered to be major general aviation (GA) airports based on activity levels and the size of aircraft served.

Six of the airports (ONZ, VLL, 1D2, 57D, Y47, and D98) are smaller GA airports. DTW is a major air carrier airport with passenger and cargo airline service. Table 2 provides a summary of key characteristics and recent operations at the six closest GA airports to Detroit.

Detroit City Airport is the second busiest facility in terms of aircraft operations, owing in large part to the volume of itinerant aircraft movements. These flights are conducted by based and transient aircraft that use DET as a point of origin or destination. Local aircraft operations are those conducted at the Airport as training flights. Detroit City Airport accounts for the lowest number of based aircraft (approximately six percent of the total) at the airports. Of note is the low number of based jet aircraft at DET given that it is located closer to downtown Detroit than any of the major GA airports in the region.

None of the six airports offer scheduled passenger service. DTW serves all scheduled passenger flights in the Detroit metro region. DTW is a hub for Delta Airlines and is served by 13 airlines, including five international carriers.

Outside of the Detroit Metro region, Capital Region International Airport (LAN) serving Lansing, Ann Arbor Municipal Airport (ARB) serving Ann Arbor, and Bishop International Airport (FNT) serving Flint are other airports with scheduled service in Michigan that may provide useful lessons for DET. Airline activity at these airports will be evaluated in the Phase II report.

Total operations include both visual flight rules (VFR) and instrument flight rules (IFR) operations. VFR flight is based on the principle of "see and avoid" which means that weather conditions must be clear enough to allow the pilot to see other aircraft, obstructions, and the ground. Pilots must use IFR when the

conditions for VFR are not met. The FAA Traffic Flow Management System Counts provide a count of IFR flights that are captured by the FAA's air traffic control enroute computers.

**Table 2: Aviation Activity at the Principal GA Airports in the Detroit Metro Region**

	DET Detroit City	YIP Willow Run	PTK Oakland County	ONZ Grosse Isle	VLL Troy	1D2 Plymouth
<b>Air Traffic Control Tower</b>	Yes	Yes	Yes	No	No	No
<b>Runway(s) Length in Feet</b>	5,090 3,714	7,543 7,292 5,996	6,521 5,676 2,582	4,846 4,424	3,549	2,303
<b>Based Aircraft</b>						
Single Engine	49	111	295	52	92	76
Multi-Engine (propeller)	6	34	107	8	5	3
Jet Engine	5	65	159	0	0	0
Other	1	7	12	2	6	5
<b>Total</b>	<b>61</b>	<b>217</b>	<b>573</b>	<b>62</b>	<b>103</b>	<b>84</b>
<b>Total Operations</b>						
Air Carrier	0	2,966	910	0	0	0
Air Taxi	0	8,796	8,762	0	0	0
Military	0	255	178	0	0	0
General Aviation Local	26,294	26,827	50,289	10,000	15,000	22,000
General Aviation Itinerant	39,440	23,900	65,931	6,000	15,000	10,000
<b>Total</b>	<b>65,734</b>	<b>62,744</b>	<b>126,070</b>	<b>16,000</b>	<b>30,000</b>	<b>32,000</b>
<b>Instrument Flight Rules (IFR) Operations</b>						
Jet Engine	4,454	12,752	23,901	36	38	0
Turbine Engine	1,472	2,760	5,276	80	364	0
Piston Engine	1,604	2,868	7,200	476	1,465	607
Other	68	94	207	2	17	4
<b>Total</b>	<b>7,598</b>	<b>18,474</b>	<b>36,584</b>	<b>594</b>	<b>1,884</b>	<b>611</b>

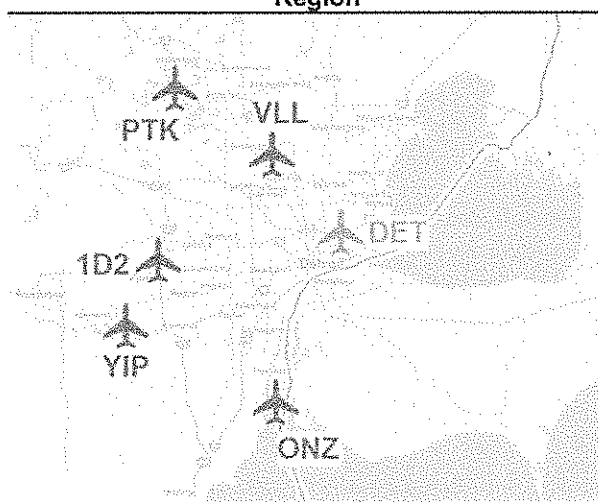
Sources: Air traffic control tower, runway length, based aircraft, and total operations – most recent FAA Form 5010; Instrument flight rules (IFR) operations – 2016 FAA Traffic Flow Management System Counts (TFMSC)

**Comparison of Competing Airports**

Detroit City Airport may be considered to compete with five other airports in the Detroit metro region for general aviation activity. Of these airports, DET is the closest airport to downtown Detroit. Figure 3 illustrates the locations of these general aviation airports.

The GRA Team conducted site visits to the principal GA airports in the Detroit metro region to assess the relative competitive position of Detroit City Airport in terms of serving the general aviation market. This market encompasses a range of aircraft types, from light, piston-powered aircraft typically used for personal flying to large business jets serving corporations and business travelers. The following airports were evaluated:

**Figure 3: Principal GA Airports in the Detroit Metro Region**



- Canton-Plymouth-Mettetal Airport, Plymouth (1D2)
- Grosse Ile Municipal Airport, Grosse Ile (ONZ)
- Oakland County International Airport, Pontiac (PTK)
- Oakland/Troy Airport, Troy (VLL)
- Willow Run Airport, Ypsilanti (YIP)

Of these airports, Willow Run and Pontiac were considered as true competitors with DET for GA activity in the region. The remaining three airports have significantly shorter runway lengths, ranging between 2,303 and 4,846 feet long, which are not fully supportive of corporate jet aircraft flight missions, and there is limited opportunity for lengthening the runways. Occasional light business jet activity does occur at ONZ and VLL. Collectively, these three airports (Grosse Ile, Oakland/Troy, and Canton/Plymouth) serve as a base for 249 aircraft of which nearly all are single-engine piston-powered and none are jet engine aircraft. Tables 2 through 4 present comparative summaries of the runways, facilities, services, fees, and charges at DET, PTK, and YIP.

**Runways**

The primary runway length at DET is significantly shorter than those at PTK and YIP, although as described in a later section of this report, aircraft operational capability is not hampered. The runway pavement condition at DET does not meet the goal for its FAA Aircraft Approach Category (AAC) C aircraft, based on data presented in the 2017 MASP.

The aircraft approach category is a means to classify aircraft based on its wingspan and approach speed, which characteristics may be translated into airport facility requirements. Approach category C aircraft include most twin-engine jet aircraft used in airline service such as the Boeing 737 series and a range of business jets as noted in Figure 1. The pavement condition index of the primary runway at Detroit City Airport was determined to rate a score of 50 versus a minimum value of 60, owing principally to cracks and other deterioration of the pavement surface that can eventually lead to structural failure of the pavement if not corrected.

Willow Run Airport occupies an area of 2,600 acres and provides potential for additional aeronautical and non-aeronautical use development. The secondary runway can be extended to the east, whereas the primary runway is at its maximum length barring road relocation at either end. On the contrary, runway extensions at PTK are not considered possible without the relocation of roads and residences.

Table 3 summarizes the runway features at DET, YIP, and PTK.

**Table 3: Runway Features Summary for DET and Competitor Airports**

Runway Features	DET	YIP	PTK
	Detroit City Airport	Willow Run Airport	Oakland County International Airport
<b>Primary Runway</b>	<b>15/33</b>	<b>05R/23L</b>	<b>09R/27L</b>
Length and Width	5,090' x 100'	7,543' x 150'	6,521' x 100'
Pavement Strength	75,000 single wheel 135,000 dual wheel	100,000 single wheel 200,000 dual wheel	120,000 single wheel 219,000 dual wheel
Displaced Landing Threshold	N/A	N/A	N/A
Surface	Paved	Paved	Paved
Lighting	High intensity runway lights	High intensity runway lights	High intensity runway lights
<b>Secondary Runway</b>	<b>07/25</b>	<b>09/27</b>	<b>09L/27R</b>
Length and Width	3,714' x 100'	7,292' x 160'	5,676' x 100'
Pavement Strength	12,500 single wheel	55,000 single wheel 70,000 dual wheel	57,500 single wheel 81,000 dual wheel
Displaced Landing Threshold	Runway 7 – 715'	Runway 9 – 576'	N/A
Surface	Paved	Paved	Paved
Lighting	Medium intensity runway lights	Medium intensity runway lights	Medium intensity runway lights
<b>Secondary Runway</b>	-	<b>5L/23R</b>	<b>18/36</b>
Length and Width	-	5,996' x 160'	2,582' x 75'
Pavement Strength	-	35,000 single wheel 45,000 dual wheel	N/A
Displaced Landing Threshold	-	N/A	Runway 18 – 650'
Surface	-	Paved	Paved
Lighting	-	Medium intensity runway lights	None

**Facilities and Services**

Services offered to based and transient aircraft at the three airports are comparable, with the notable exception of the condition of the airfield and terminal area facilities. The terminal area facilities at DET have exceeded, or are at or near their remaining useful lives. Publicly-owned facilities at YIP are in observably better condition than those at DET and PTK facilities are in excellent condition. Table 4 summarizes the facilities and services available at DET, YIP, and PTK.

**Table 4: Facilities and Services at DET and Competitor Airports**

Features	DET Detroit City Airport	YIP Willow Run Airport	PTK Oakland County International Airport
<b>Ownership</b>			
Public Agency	City of Detroit	Wayne County Airport Authority	Oakland County Airport Authority
<b>Instrument Approach</b>			
Type	Precision	Precision with Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights	Precision with Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
<b>Lowest Approach Minimums</b>			
Ceiling	250 feet	250 feet	200 feet
Visibility	1 mile	0.75 mile	0.50 mile
<b>Air Traffic Control Tower</b>			
Presence	✓	✓	✓
Hours of Operation	24 hours	24 hours	24 hours
<b>Services</b>			
Number of FBOs / Service Providers	1	2	14
Air Cargo and Passenger Charter	✗	✓	✓
Aircraft Interiors	✗	✗	✓
Avionics	✗	✓	✓
Car Rental	✓	✓	✓
Catering	✓	✓	✓
Customs	✓	✗	✗
Deicing	✓	✓	✓
Flight Training	✗	✓	✓
Free Trade Zone	✗	✓	✗
Ground Power	✓	✓	✓
Ground Run-Up Enclosure	✗	✗	✓
Jet Engine Run Up Cell	✗	✓	✗
Major Maintenance	✓	✓	✓
Minor Maintenance	✓	✓	✓
<b>Hangar Spaces</b>			
T-Hangar	131	60	476
Single / Community	2	1 + 15 private	40 private
Spaces Available	86 (T-Hangar)	3	55 (T-Hangar)
Waiting List	4	None	None

Legend: ✓ - service present at airport; ✗ - service not present at airport

Both the Willow Run and Oakland County International airports own aircraft storage facilities. At YIP, the Wayne County Airport Authority owns two conventional aircraft hangars, one of which has eight bays (each approximately 20,000 square feet) and an additional hangar (approximately 123,000 square feet). The remaining hangar facilities, including the T-hangars, are owned by the private sector, with ground rent paid to the Wayne County Airport Authority. The reverse applies to PTK where all the T-hangars are owned by the Oakland County Airport Authority and all the conventional hangars were constructed by private interests under long-term ground leases. At DET, all the terminal area facilities are owned by the City of Detroit and leased to tenants.

It is noteworthy that a significant number of T-hangars owned by the Oakland County Airport Authority at PTK are unoccupied. This is due to unfortunate timing of their construction just prior to the early 2000's economic recession and the nationwide, long-term downward trend in the number of small general aviation aircraft that typically utilize T-hangars.. The occupancy rate at PTK has been increasing slightly and it will take several years to fill the available T-hangar spaces. There remain opportunities for terminal

area facilities for aeronautical uses at PTK and two new sites are currently under development for larger aircraft.

Figure 18 contains photographs of aircraft storage facilities at DET, PTK, and YIP that illustrate the differences in existing physical condition. The aircraft storage facilities at DET compare unfavorably with those at the other two airports and would require replacement or rehabilitation to attract more tenants and achieve higher occupancy and rental rates.

Rates and charges at DET, PTK, and YIP are influenced by supply and demand as well as the physical condition of the facilities. DET has been hampered in modifying its rates and charges due to the uncertainty of its long-term viability as viewed by existing and potential tenants.

Based on existing charges, service providers at DET have generally comparable tiedown and handling fees, although the imposition of a security fee at DET is unique. DET is well below market rates with regard to hangar rents for both T-hangars and conventional hangar space. Fuel providers at PTK and YIP offer lower pricing for full-service avgas and Jet-A, which can influence decisions with respect to purchasing fuel at DET or tankering fuel. Although DET has 131 T-hangars, many are considered to not meet user needs in terms of their physical condition. Only 45 T-hangar units are occupied at DET. PTK is experiencing an overbuilt situation that has contributed to a surplus of available T-hangar units that are in excellent physical condition.

If the T-hangars at DET were in comparable physical condition to those at PTK or YIP, DET may be able to attract new tenants and DET does not have a waiting list for T-hangar space. The four spaces available for rent at DET are in the Historic Executive Terminal and its physical condition and door heights are two primary factors adversely affecting their use by new tenants.

Services at DET are less comprehensive than those available at PTK and YIP, but there are niche market opportunities at DET including aircraft exterior painting services which is not available at PTK or YIP.

### Fees and Charges

Fees at DET are generally lower than at YIP and PTK. The maximum tiedown fee at DET for transient aircraft is \$35 per day, while the equivalent fees are \$225 at YIP and \$400 at PTK. Landing fees at DET range from \$25 to \$115, while landing fees at YIP can exceed \$300. Fuel prices at DET are generally slightly higher than at YIP and PTK. Table 5 summarizes the fees and charges at DET and competitor airports.

**Table 5: Fees and Charges at DET and Competitor Airports**

Features	DET	YIP	PTK
	Detroit City Airport	Willow Run Airport	Oakland County International Airport
<b>Tiedown Fees</b>			
Based (monthly)	N/A	N/A	\$30
Transient (daily)	\$10 - \$35	\$130 - \$225	\$150 - \$400
<b>Transient Aircraft Fees</b>			
Handling	\$100 - \$600	\$10 - \$700	Variable
Security	\$20 - \$50	None	None
<b>Landing Fee</b>			
Rate 1	\$25 - \$115	Greater than 6,000lbs gross landing weight: \$28 - \$338	Fixed wing, greater than 12,500lbs gross takeoff weight: \$15 - \$105
Rate 2	None	Greater than 150,000lbs gross landing weight: \$2.25 per 1,000lbs	Rotorcraft: \$7
<b>Hangar Fees</b>			
T-hangar		\$325 per month	\$214 - \$380 per month
Single / community	\$2.25 per SF per month	\$7 per SF per year	N/A
<b>Ground / Land Rent</b>			
Annual, per square foot		\$0.10	\$0.27

### Lighting and Visual Aids

The MASP provides report cards for each airport that evaluate whether the airport meets the development goals for its airport classification. DET, PTK, and YIP are all classified as C-II airports, which

are airports that serve medium/large business and regional jets. There are seven development goals for lighting and visual aids for the C-II airport classification and all three airports meet most of the goals. However, DET does not meet the Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) and segmented circle goals. PTK and YIP also do not meet the segmented circle goal, and YIP does not meet the Runway End Identifier Lights (REIL) goal.

MASP goals should not be interpreted as facility design standards or requirements as defined by the Federal Aviation Administration inasmuch as the need to achieve these goals may not be cost-justified. According to the MASP, "Facility development goals reflect an airport's role in Michigan's aviation system. They are not requirements or justification; rather they serve as a guide to airports, along with local, state, and federal agencies, in identifying deficiencies in the state's aviation system."

## Aviation Activity Demand

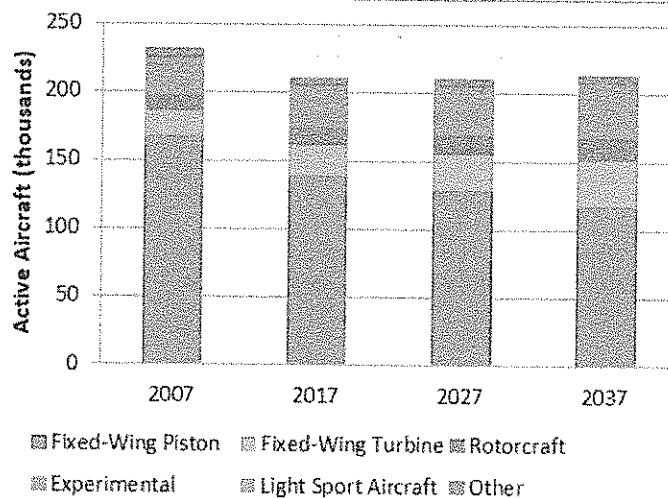
### National Trends

Each year, the FAA prepares a forecast of demand for aviation, which is driven by forecasts of economic activity. The latest FAA Aerospace Forecast was prepared for the 2017 through 2037 period. On a national scale, the FAA does not expect significant change in overall levels of GA activity during the medium and long term. According to the FAA, "the long term outlook for general aviation is stable to optimistic, as growth at the high end offsets continuing retirements at the traditional low end of the segment."

The FAA notes that the national GA fleet decreased from 2007 to 2013 due to the 2010 FAA Rule for Re-Registration and Renewal of Aircraft Registration, but this rule impacted aircraft registration records that were canceled, expired, or revoked and does not reflect a decrease in overall active fleet size so much as a removal of inactive aircraft from the FAA Aircraft Registry. The GA fleet has increased since 2013, although aircraft deliveries have been decreasing over time. This decrease has been particularly pronounced in single- and especially multi-engine piston aircraft in recent years. Turbine and rotorcraft deliveries have seen a slight decrease, and business jet deliveries have increased slightly.

Overall, the FAA forecasts an average annual growth rate of 0.1% in the active GA fleet over the forecast period. While single-engine piston aircraft are expected to remain the largest part of the GA fleet, the FAA forecasts that this segment of the market will continue shrinking as smaller segments such as fixed wing turbine aircraft, rotorcraft, and light-sport aircraft (LSA) grow. LSA in particular is expected to grow at an annual rate of 4.1%, although it is expected to remain the smallest segment of the GA fleet for the duration of the forecast period. Figure 4 shows the national active GA aircraft forecast from the FAA Aerospace Forecast 2017-37.

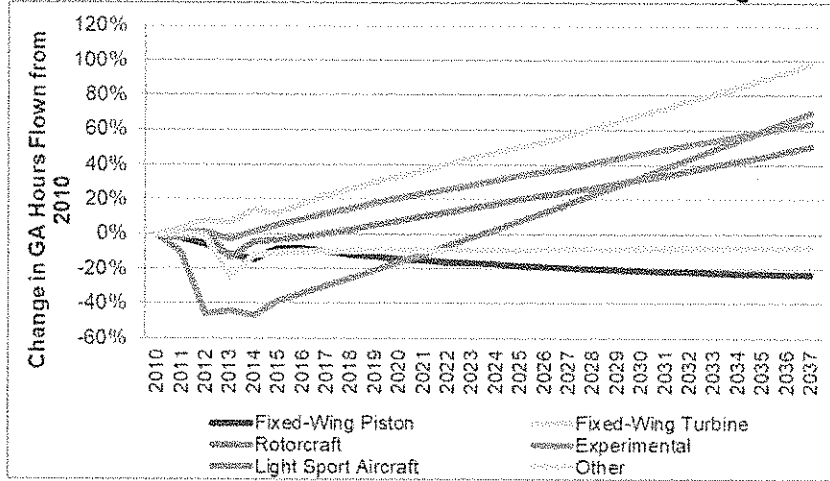
**Figure 4: National Active General Aviation Aircraft Forecast**





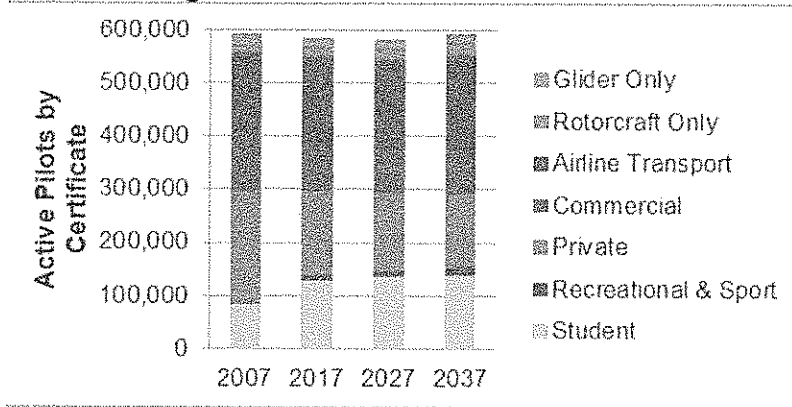
The FAA anticipates 0.9% annual growth in GA hours flown, which is significantly above its expected growth rate for GA fleet size. As with the fixed wing piston fleet, hours flown by fixed wing piston aircraft are expected to decrease at an annual rate of 0.8% over the forecast period. However, hours flown by turboprop, turbojet, and light sport aircraft are forecast to grow at rates of 1.6%, 3.0%, and 4.6% per year, respectively. Figure 5 shows the actual and forecast change from 2010 in national GA hours flown from the FAA Aerospace Forecast 2017-37.

**Figure 5: National General Aviation Hours Flown Forecast: Change since 2010**



The FAA expects that the number of private and commercial pilots will continue their current decrease, while airline transport and student pilots are likely to increase over the forecast period. It estimates a 0.1% annual decrease in the number of active GA pilots, a balance of the expected increase in student and sport pilots with the 0.6% and 0.7% expected annual decrease in certified commercial and private pilots. Figure 6 shows the national active pilots forecast by certificate type from the FAA Aerospace Forecast 2017-37.

**Figure 6: National Active Pilots Forecast**

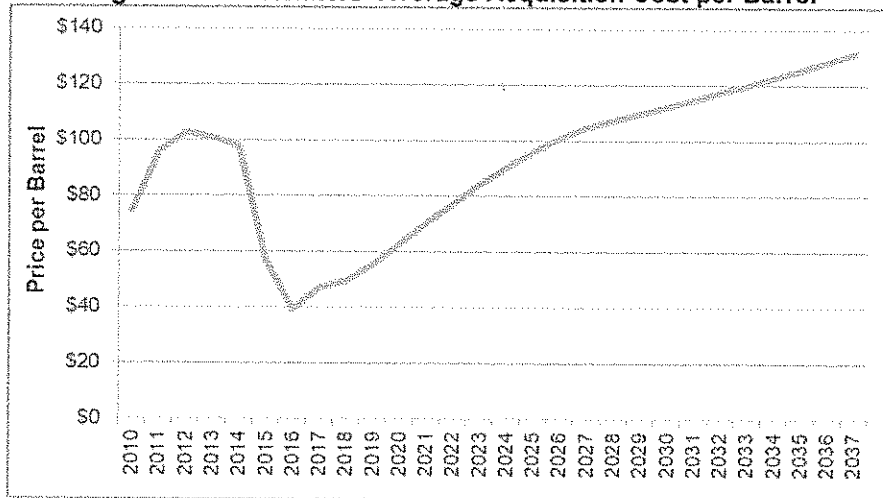


Like most other industries, the global economy impacts aviation in that economic downturns are correlated with a decrease in both leisure and business travel. The 2017 MASP outlines a few global and national trends that impact aviation activity and GA specifically in that nearly every segment of GA operations in the airports studied decreased between 2007 and 2008, consistent with the global economic downturn.

Fuel prices have a substantial impact on general aviation. Jet fuel tends to be more expensive for GA operators than it is for larger airlines, which are more able to buy fuel in bulk. Jet fuel prices have increased substantially over the past twenty years and are expected to continue increasing over the forecast period. Like the overall economy, fuel prices are subject to significant year-to-year fluctuations that impact both levels of GA activity and GA aircraft sales. Figure 7 shows the historical and forecast average acquisition costs per barrel of oil for U.S. refiners from the FAA Aerospace Forecast 2017-37.

The cost decreased substantially from 2012 to 2016, but is expected to increase at an average annual growth rate of 5.9% from 2016 through 2037.

**Figure 7: U.S. Refiners' Average Acquisition Cost per Barrel**



**Regional Trends**

The gross domestic product (GDP) growth rate in the Detroit-Warren-Dearborn, MI metropolitan statistical area (MSA) began to diverge from the national GDP growth rate in 2004 and began to substantially decline in 2006, which preceded the national recession that began in late 2007. At the lowest point of the recession in 2009, the Detroit MSA's GDP was nearly 15% lower than it was in 2001. Since then, annual GDP growth in the Detroit MSA has been similar or exceeded the national GDP growth rate. In 2015, GDP in the Detroit MSA exceeded the 2001 level for the first time since 2007. Figure 8 shows the change in real (inflation-adjusted) GDP from 2001 to 2016 for the United States and the Detroit MSA.

**Figure 8: National and Detroit MSA Change in Real GDP from 2001**

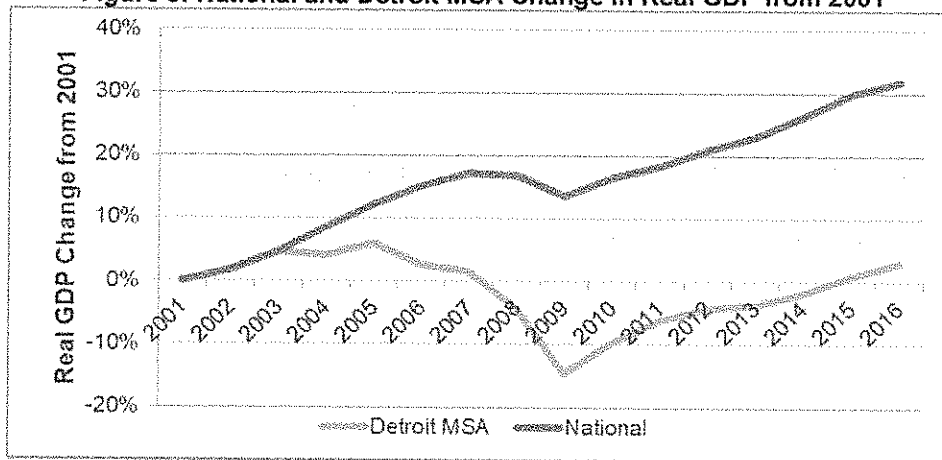
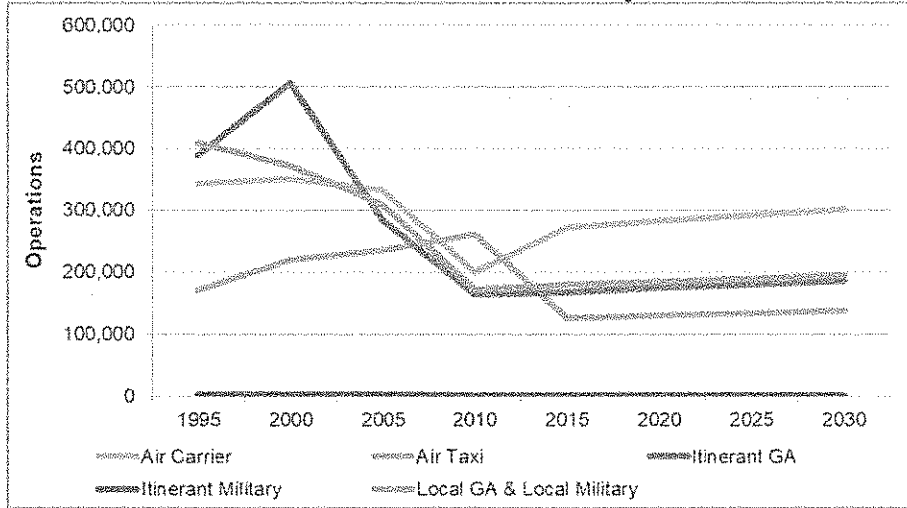


Figure 9 shows the historical aviation activity for the ten airports in the Detroit Metro region from 1995 through 2015 and the forecast aviation activity from 2020 through 2030 per the MASP. Total aviation activity in 2030 is forecast to be approximately 820,000 operations, which is 38 percent lower than the 1,300,000 operations in 1995.

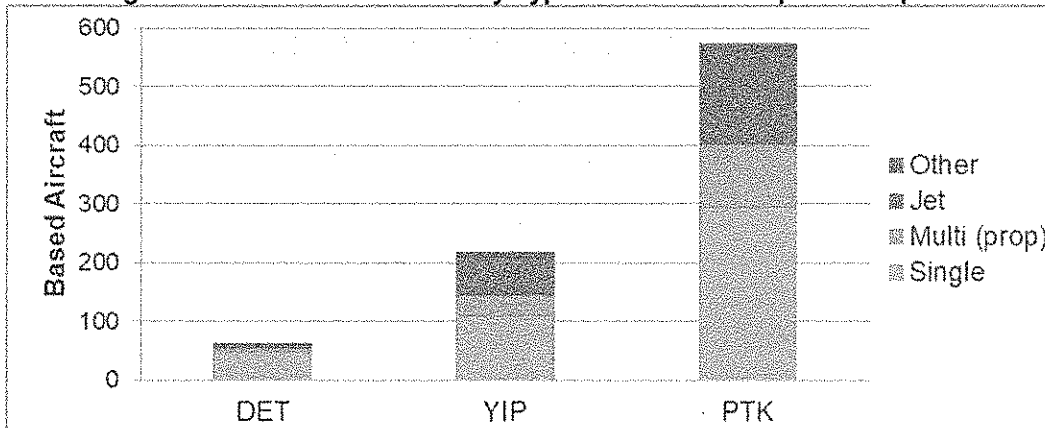
**Figure 9: MASP Historical and Forecast Aviation Activity in the Detroit Metro Region**



**Local Trends**

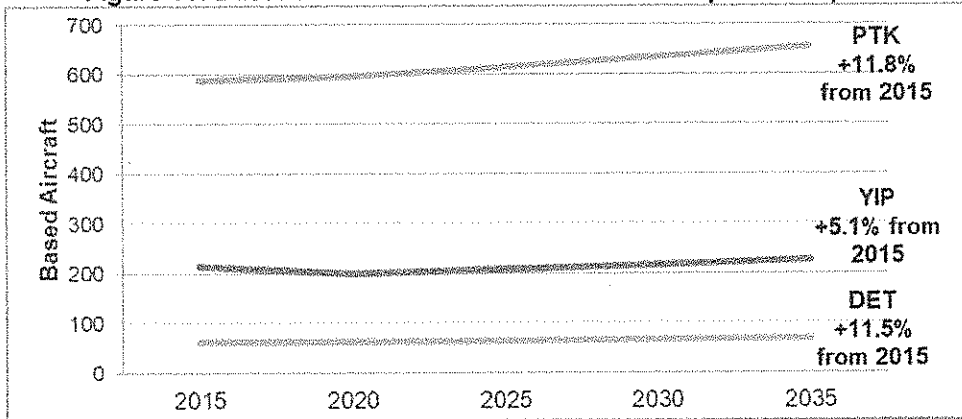
DET's prominent competitors are PTK and YIP due to their physical proximity and facilities. A majority (53%) of aircraft based at DET, YIP, and PTK are single-engine piston aircraft. In 2016, there were 61 based aircraft at DET, 217 based aircraft at YIP, and 573 based aircraft at PTK. Figure 10 shows the number of based aircraft by type at DET and the competitor airports in 2016. Of the 229 jet aircraft based at the three airports, only 2% are based at DET. The majority (69%) of jet aircraft based at GA airports in the Detroit metro region are based at PTK and the remaining 28% are based at YIP.

**Figure 10: 2016 Based Aircraft by Type at DET and Competitor Airports**



The 2017 MASP forecasts an overall 10% increase in the number of based aircraft at DET, YIP, and PTK, but this increase is not evenly distributed among the airports. As shown in Figure 11, the number of based aircraft at DET and PTK will be about 12% higher in 2035 than in 2015, while the increase at YIP will be approximately 5%.

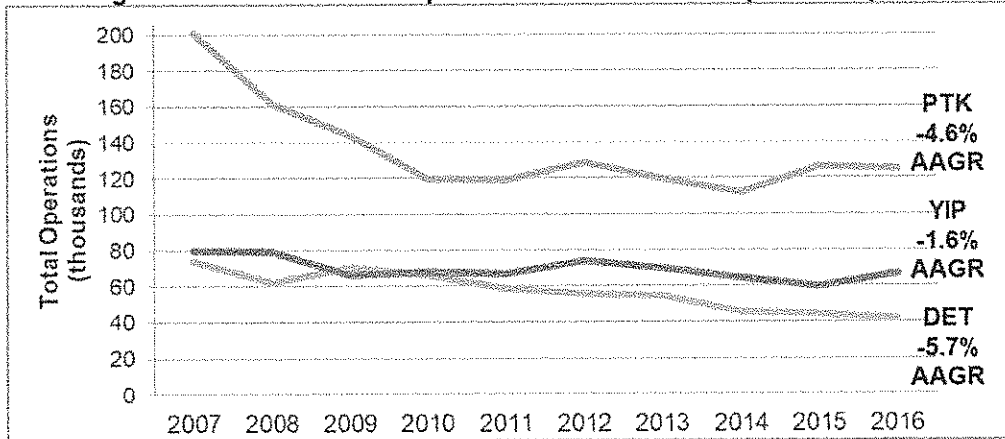
**Figure 11: Based Aircraft Forecast at DET and Competitor Airports**



PTK has about two to three times as many annual operations as YIP or DET, but all have air traffic control (ATC) towers and serve a mix of local and itinerant traffic for aircraft operating under both visual (VFR) and instrument (IFR) flight rules. Figure 12 shows historical annual operations and average annual growth rates (AAGR) at DET and competitor airports from 2007 to 2016.

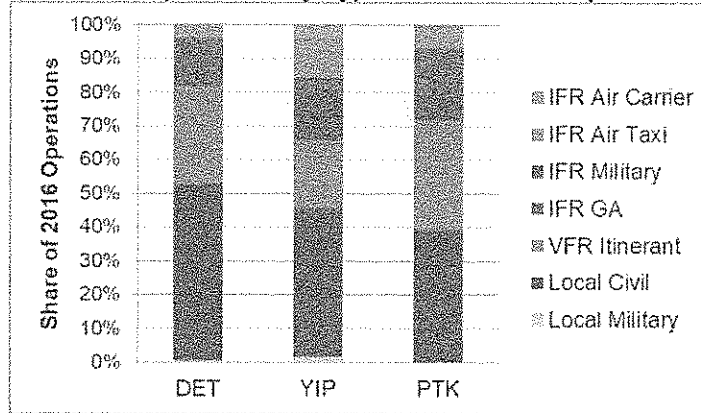
Between 2007 and 2010, DET had around the same number of annual operations as YIP, with 55,000 to 80,000 takeoffs and landings (operations) per year. However, while operations at YIP have remained relatively stagnant since then, aircraft operations at DET have steadily declined since 2009. PTK operations declined substantially from 2007 to 2010 and have remained relatively steady since 2010. While the national economic recession of 2007-2009 appears to have had a substantial impact on operations at PTK, it does not appear to have substantially impacted operations at DET or YIP.

**Figure 12: Recent Annual Operations at DET and Competitor Airports**



The 2016 mix of operations at DET (about 56% local GA, 40% itinerant GA, and 4% air taxi) represents an increase in the share of local operations at the Airport. In 2007, the mix was about 42% local GA, 53% itinerant GA, and 5% air taxi. Figure 13 shows 2016 operations by type at DET and competitor airports. The mix of operations at DET is fairly similar to that at PTK and YIP.

**Figure 13: 2016 Operations by Type at DET and Competitor Airports**



Absent any major capital improvements at DET in terms of aircraft storage and other physical facilities, it is anticipated that future general aviation activity will mirror the trends reflected in the 2017 MASP. The number of based aircraft at DET is projected to increase by nearly 12% through 2035, comparable to the growth rate anticipated at PTK and more than twice the growth rate predicted for YIP. This increase in based aircraft will translate to higher numbers of aircraft operations at DET.

The majority of new aircraft operations will be generated by corporate aircraft that continue to reflect the current practice of transitioning aircraft from PTK to pick up and drop off passengers originating their ground travel from downtown Detroit, coupled with transient aircraft operations from other airports generally within a 500-nautical mile range of DET.

Should the City opt to upgrade the terminal area facilities at DET and other aspects important to users of the Airport such as security measures and aesthetics, it is likely that higher levels of aviation activity in terms of based aircraft and operations can be realized. These levels will be more pronounced in the short-term, perhaps by as much as 20% following the implementation of the capital improvements and then follow national trends that reflect the overall health and strength of the general aviation market.

The 2017 MASP forecasts operations at DET to increase at an AAGR of 0.53% per year over the forecast period. The AAGR for operations at PTK is also forecasted to be 0.53%, while the AAGR at YIP is forecasted to be 0.88% as shown in Figure 14. For comparison, the 2017 MASP estimates that growth in aviation activity within the state of Michigan will average about 0.74% per year, over the 20-year forecast period.

**Figure 14: Forecast Operations at DET and Competitor Airports**

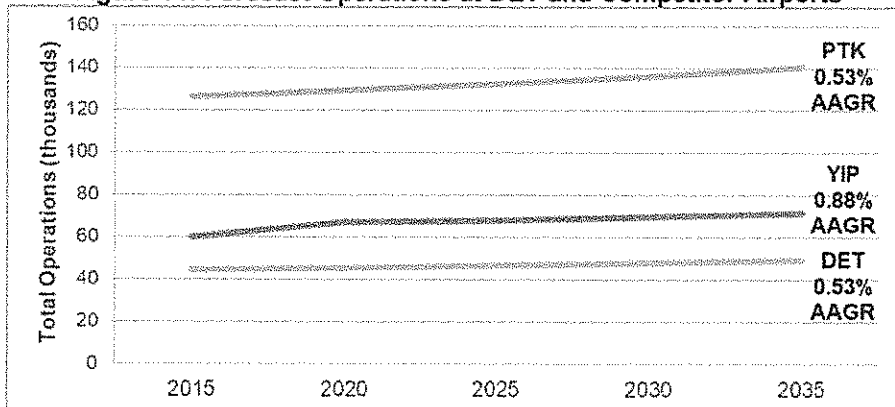


Figure 15 shows the change in the historical and forecast air taxi, commuter, and itinerant GA operations at DET and competitor airports from FAA's Terminal Area Forecast (TAF) relative to 1995. Itinerant

operations by air taxi, commuter, and GA operators fell substantially from 1995 through 2016. Future operations are forecast to be fairly steady or slightly increasing. At DET specifically, the number of itinerant air taxi, commuter, and GA operations decreased from about 59,000 in 1995 to about 20,000 in 2016, a decrease of 66%.

**Figure 15: Historical and Forecast Air Taxi, Commuter, and Itinerant GA Operations at DET and Competitor Airports**

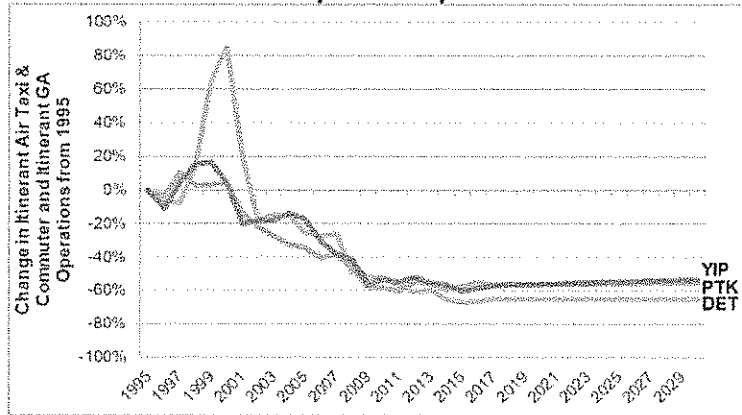
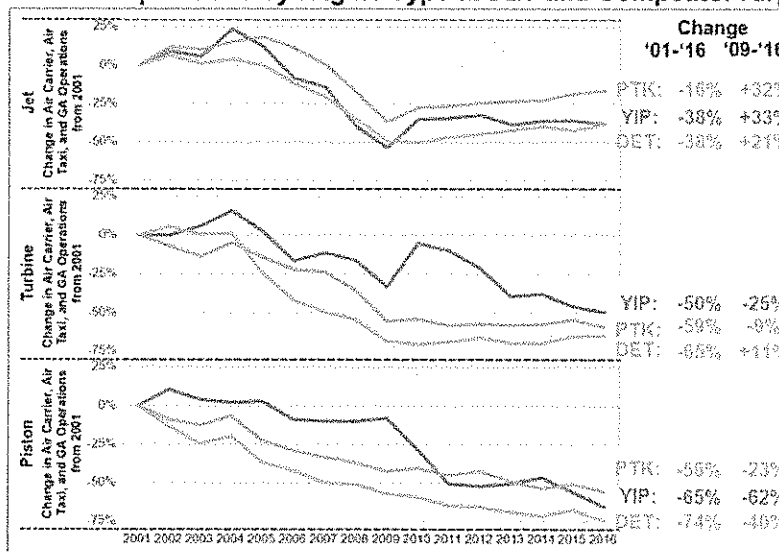


Figure 16 shows a subset of the change in recent operations at DET, PTK, and YIP from 2001 to 2016. The data source is FAA's Traffic Flow Management System Counts (TFMSC) which includes most IFR flights. Most flights by high-performance aircraft (jet and turbine engine aircraft) are IFR flights due to the speed at which they fly and the need for air traffic control services. Some piston engine aircraft (often those operated by air taxi or other commercial operators) also fly IFR and are thus included in TFMSC.

The TFMSC data show that there has been a substantial decrease in these high-performance operations at DET, PTK, and YIP since 2001. However, there has been a recovery in the number of operations by jet engine aircraft at all three airports and by turbine engine aircraft at DET since the end of the recession in 2009. The number of TFMSC operations by piston engine aircraft has continued to decline at all three airports since 2009. This means that the focus for attracting new aircraft operators and revenue at DET must be on jet and turbine engine aircraft operators as this segment of the industry continues to grow in the future.

**Figure 16: Recent TFMSC Operations by Engine Type at DET and Competitor Airports**



As shown in Table 6, fuel prices tend to be higher at DET than at YIP or PTK. Self-serve avgas (which is used by piston engine aircraft) was similar at DET and YIP in August 2017, while full service avgas was substantially more expensive at DET than at YIP or PTK. Jet A fuel (which is used by turbine engine aircraft) was also substantially more expensive at DET than at YIP or PTK.

**Table 6: Fuel Prices at DET and Competitor Airports, August 2017**

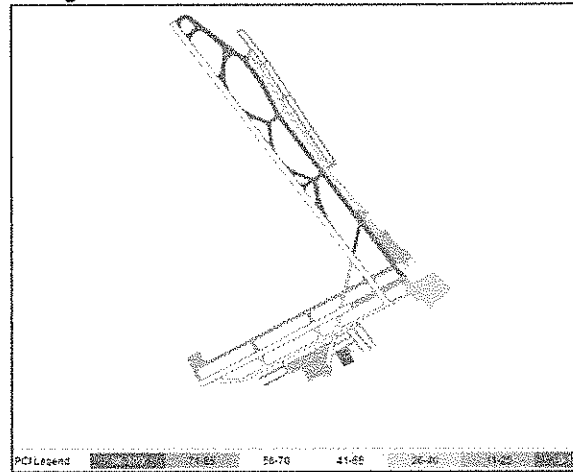
Airport	Avgas		Jet A
	Self-Serve	Full-Service	
DET - Detroit City	\$4.56	\$6.47	\$6.21
YIP - Willow Run	\$4.99	\$5.10 to \$5.50	\$4.25 to \$4.57
PTK - Oakland County	N/A	\$4.50 to \$4.87	\$3.15 to \$3.86

## DET Airport Facilities Condition Assessment

A review of the current primary airfield and terminal area facilities by the GRA Team yields the following observations:

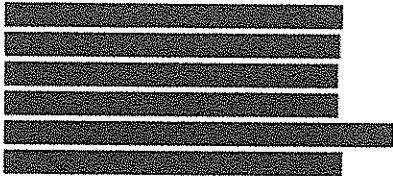
- Runway 15-33 and the western portion of Runway 7-24, the south parallel Taxiway J serving Runway 7-25, Taxiway F serving the eastern T-hangar area, and apron areas serving the passenger terminal, and executive and police department hangars are deteriorating and in need of major rehabilitation or reconstruction. Figure 17 shows the DET Pavement Condition Index (PCI) from the 2015 Statewide Pavement Management System Update prepared by the Michigan Office of Aeronautics. Higher scores (in green) indicate pavement in good condition and lower scores (in red) indicate pavement in poor condition.
- The Main Terminal Building is being used as offices for the City Airport Department, AvFlight (the fixed base operator), and U.S. Customs and Border Control. A facilities assessment conducted in 2016 by the Detroit Building Authority highlighted functional and integrity issues that should be addressed to maintain the serviceability of the building in the short- and long-term.
- The Historic Executive Terminal (approximately 191,000 square feet) is used for aircraft storage and appears to be structurally sound. Some bays have been upgraded for aircraft storage. The hangar doors slide into position and are motor-powered but the door heights (19 feet high in two bays and 22 feet high in 12 bays) are too low to accommodate some of the larger, more advanced corporate jet aircraft.
- Currently, the Airport has no facilities to house large corporate aircraft. The Airport receives requests repeatedly during inclement weather to overnight aircraft inside a hangar, but the Airport has no facilities for aircraft with tail heights that exceed 22 feet. Consequently, these users drop their passengers and depart to other airports, reducing potential operating revenue for the Airport.

**Figure 17: DET Pavement Condition Index**



5. The 131 T-hangars in the north and southwest quadrants of the Airport have exceeded their useful lives, are mostly unusable, prohibiting the attraction of new tenants. Reconstructing these T-hangars is not cost-effective. New facilities would attract small corporate and light aircraft operators, which will improve Airport finances. Figure 18 compares hangars at DET and PTK, noting poor physical condition of the T-hangars at DET.

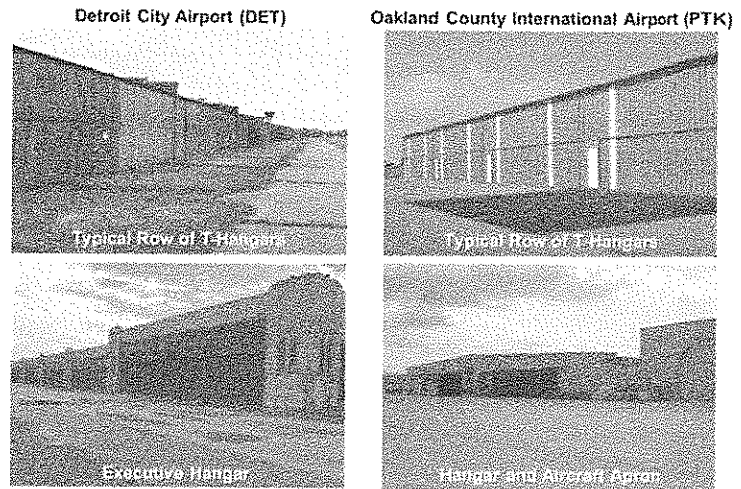
6. The Detroit Police Department



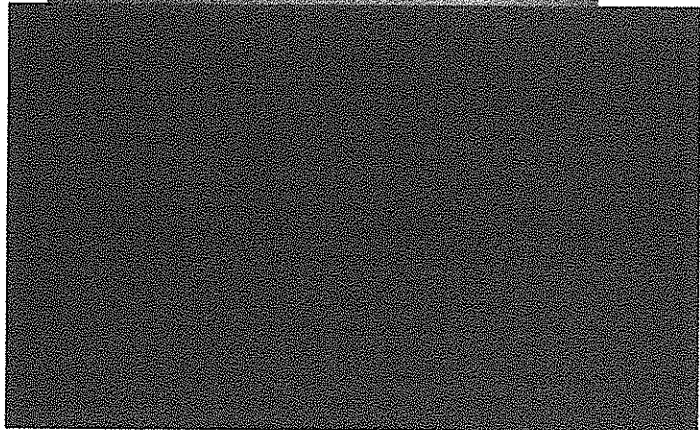
7. There are other small structures on the Airport property that are abandoned and in poor condition. The current snow removal equipment (SRE) storage is in two bays of the Historic Executive Terminal, but should be stored in their own facility. The aircraft rescue and firefighting (ARFF) building is in serious need of repair due to a waterline break several years ago. Consolidating these two functions into a single facility will result in more efficient Airport operation and will open two hangar bays to house new tenants.

8. The length of Runway 15-33 (5,090 feet) affords adequate operational performance by corporate jets as illustrated in Figure 20. These aircraft operate to nonstop destinations in the western United States, Central America, the Caribbean, and Europe. The length of Runway 7-25 (3,714 feet) is adequate to serve the light aircraft operating from this facility. The overall activity level of the Airport does not exceed its annual and hourly capacities.

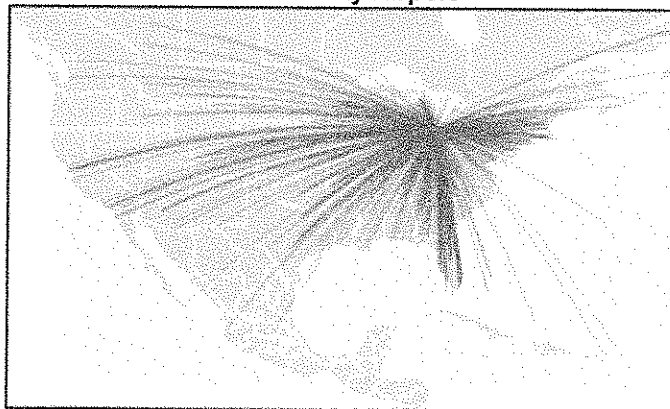
**Figure 18: Comparison of DET and PTK Facilities**



**Figure 19: Detroit Police Department Hangar at DET**



**Figure 20: FY2016 TFMS Nonstop Flights from Detroit City Airport**





## Runway Design

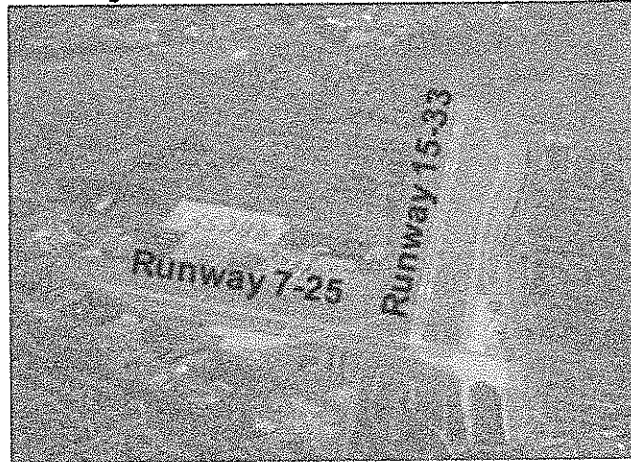
While both runways are serviceable, the Detroit City Airport does not meet several facility design standards applicable to runway design standards for each. The design standards differ based on the critical design aircraft operating on or anticipated to operate on each runway. Runway 15-33, the primary runway with a length of 5,090 feet, is categorized as a C-II-5000.

- C applies to aircraft with approach speeds of at least 121 but not less than 140 knots;
- II references wing spans of at least 49 feet but not more than 79 feet and tail heights of at least 20 feet but not more than 30 feet
- 5,000 include runway ends with instrument approach visibility minimums of not lower than one statute mile.

Runway 7-25 is 3,714 feet in length and the Runway 7 threshold is displaced 715 feet and is classified as a B-I (SAE)-VIS runway.

- B applies to approach speeds of at least 91 knots but less than 121 knots;
- SAE is the abbreviation for Small Aircraft Exclusively, that is, those with maximum takeoff weights of 12,500 pounds or less; and
- VIS indicates that the runway is used only for visual approaches. Figure 21 shows an aerial view of DET's two runways.

Figure 21: Aerial View of DET Runways



Runway 7-25 does not meet runway safety area length dimension on the Runway 7 end. Additionally, the FAA has expressed concern about the intersection of Runway 7-25 and Runway 15-33 at the southeastern end (Runways 25 and 33.) The intended action is to decouple the runway ends and thereby afford less interaction of aircraft maneuvering concurrently to either runway end.

Runway 15-33 is observed to have several design features that are not in compliance with FAA standards. These include the length of the runway safety area at each of the runway, the location of McNichols Road in the runway safety area and its proximity to the Localizer Navigational Aid at the Runway 15 end, and the lack of a 90-degree access taxiway to the Runway 15 end. The primary surface (which is a federal aviation regulation as opposed to a facility design standard) of Runway 15-33, is also deficient on the west side and involves what is commonly referred to as the French Road Mini-Take Area.

The distinction between compliance with a federal regulation and a facility design standard is that regulations assert an intended situation or outcome that is achieved through the imposition of facility design standards. The FAA has not identified the primary surface as a design standard, but rather incorporates this imaginary surface through the determination of applicable design standards. The FAA also allows for modifications to design standards when these do not compromise flight safety and cannot otherwise be reasonably achieved.

The Runway Safety Area Evaluation and Recommendation for Runway 15-33 and Runway 7-25 study prepared by QOE (the engineering firm under contract with the Airport) in June 2016 recommended that the runway safety area on Runway 7 end be achieved by shortening the runway at that end by 223 feet resulting in a total runway length of 3,491 feet. The resulting length was assessed as adequate to continue serving the types of aircraft operating on the runway.

Decoupling the runway at the eastern end (Runway 25) from Runway 33 will require shortening one or the other runway end. A determination on the better means has not been made, but would favor a reduction at the Runway 25 end in order to avoid any adverse aircraft operational capabilities on the primary Runway 15-33. The GRA Team estimates that the Runway 25 end would need to be relocated to

the southwest by some 730 feet in order to meet the runway safety area associated with Runway 15-33 and achieve an effective decoupling of the runway ends. This would reduce the length of Runway 7-25 to 2,761 feet, a length that would likely discourage its use by all but single-engine, piston aircraft. The runway width can then be reduced from 100 feet to 60 feet to meet facility design standards applicable to this runway use, which will necessitate a repositioning or replacement of the runway edge lights and the precision approach path indicator serving the Runway 25 end. As mentioned above, the decoupling of the Runway 25 and Runway 33 ends has not been fully evaluated by the City, Michigan Office of Aeronautics, or the FAA and no determinations have been made.

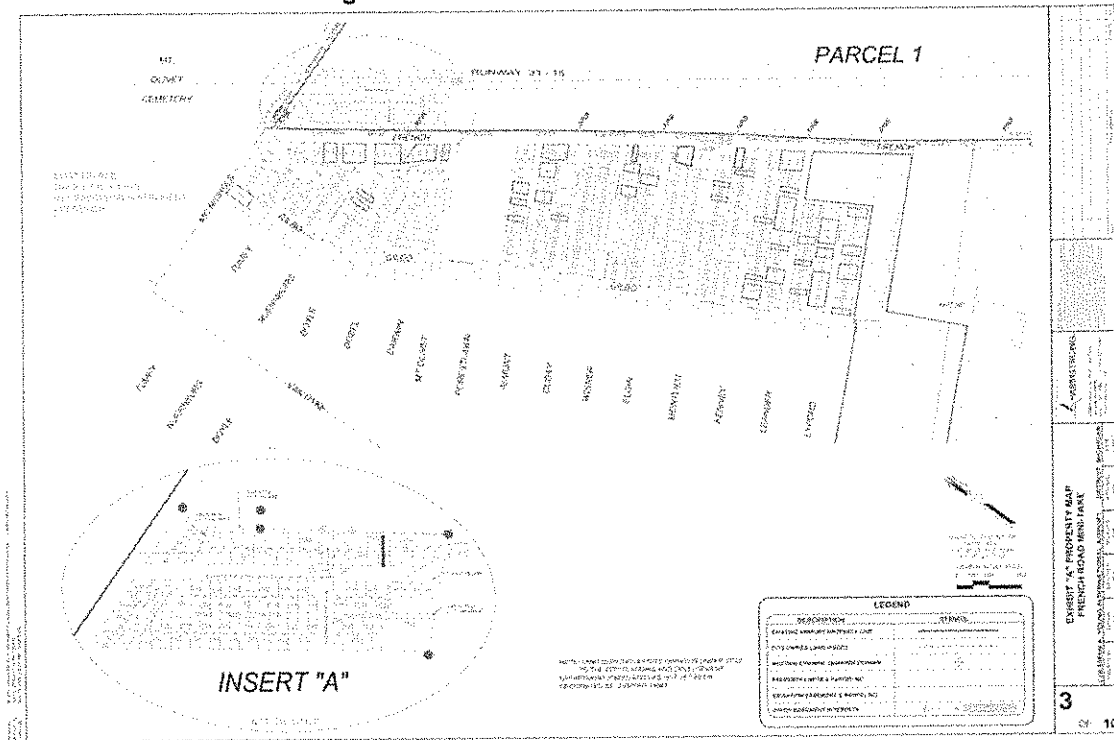
The same study presented a detailed assessment of the runway safety area for Runway 15-33 and concluded that the best means to achieve compliance with this FAA facility design standard was to install an engineered material arresting system (EMAS) at both ends of the runway. EMAS is a crushable material that serves to brake the speed of landing aircraft once on the runway and bring it to a stop in less time and distance than a paved surface. This recommendation maintains the 5,090 foot length of Runway 15-33 and avoids impacts on the cemeteries that lie immediately beyond each runway end. Implementation of EMAS at the Runway 15 end may also resolve the McNichols Road runway safety area and proximity to the localizer facility issue at this runway end.

Resolution of the status of McNichols Road and the 90-degree access taxiway access to the Runway 15 end is currently under consideration by the City, Michigan Office of Aeronautics and FAA with the intent to result in no reduction in the usable length of Runway 15-33.

#### **Land Acquisition**

The French Road Mini-Take Area land acquisition program has been an on-going initiative since 1994. The area is principally located west of Runway 15-33 at its northwestern end and is highlighted in drawings provided by QOE shown as Figure 22. The basis for acquiring the land was to achieve compliance with the Federal Aviation Regulations (FAR) Part 77 primary surface (total width of 1,000 feet centered on the runway.) Prudent planning also provides for the potential development of that land area just to the west and beyond the primary surface. Industry standards are to establish a "building restriction line" that would allow for structures as high as 35 feet above the runway elevation.

Figure 22: French Road Mini-Take Area



Federal Aviation Regulations (FAR) Part 77 establishes the standards used to determine obstructions to air navigation, and navigational and communication facilities. A transitional surface is defined as one that rises from the FAR Part 77 primary surface surrounding the runway at the rate of one foot vertically for each seven feet horizontally and results in a setback distance of 245 feet. Industry practice has been to define a 750-foot lateral separation from the runway centerline (500 feet + 245 feet = 745 feet ~750 feet.) This lateral distance places the building restriction line west of French Road and nearly midway to Gilbo Avenue. Rather than acquiring split parcels, that is, those located between French Road and Gilbo Avenue, the City has opted to acquire that land between the western boundary of the Airport to Gilbo Avenue. The City has acquired many of these parcels.

The above are the primary facility design standards that are to be addressed at DET. Other standards may not be met; however, at present the Michigan Office of Aeronautics and the FAA have not assessed these as imminent needs. The challenge at DET is that the City has not been willing to undertake remediation action with federal and/or state grants. Rather, the City is contemplating funding the imminent design standards deficiencies with its own resources and seeking federal and/or state reimbursement at a later date. Although this may appear to be a rational approach for the City given that it is also considering the closure of the Airport, the federal policies associated with reimbursement do not allow for such action unless the improvements are depicted on an FAA approved airport layout plan, which is currently not in effect.

**Airport Layout Plan**

The City, Michigan Office of Aeronautics, and FAA recently met concerning an updated airport layout plan (termed a Phase II update), which is to be accompanied by a comprehensive analysis of alternative means to address the noncompliance with design standards issues. The FAA and State require this planning initiative inasmuch as the cost to implement the runway safety area improvement alone is anticipated to be in the tens of millions of dollars. The agencies are also concerned that the City may move to close the Airport and thus an allocation of large sums from these State and Federal agencies requires commitments from the City as to the continued operation of the Airport. The entire matter may

not be resolved until the conclusion of the study conducted by the GRA Team, but may also not be dependent on the GRA Team's work.

Ultimately, at some point in the near future, the City will need to decide how best to address these facility design standards. Maintaining the Airport will necessitate action and funding to accomplish this – the majority of which can be provided by MDOT and FAA.

## Financial Analysis

The majority of publicly-owned GA airports nationwide fail to break even on an operating basis and are not "profitable" i.e. cover all operating and investment costs. Investments are often paid for by grants from federal, state, or other government agencies and GA airports attempt to cover the local share of federal and state grant-eligible projects with the net income from operations. Net income is the funds remaining after operating costs are absorbed by operating revenue. The majority of publicly-owned airports nationwide that primarily serve GA aircraft operate at a net loss and require subsidy from their owner's general fund. That fund may rely on general obligation bonds issued by the public agency.

The few GA airports that are profitable often have a large quantity of based aircraft (including turbine engine aircraft) or have unique land assets that produce an alternative source of revenue, such as agriculture, mineral extraction, or supporting a specific industrial use. "Reliever" airports that support a mix of commercial and GA flights typically receive funds from a larger airport serving scheduled passenger airlines and may break even and generate funds for investment. Regardless of whether an airport is profitable, GA airports commonly use FAA and other grant funds to make capital investments or are able to let commercial enterprises make selected investments to help meet investment needs, including hangars and other facilities.

The FAA wants airports to be as self-sustaining as possible and allow excess land to be used for non-aviation purposes as long as revenues support the aviation activities. FAA and DOT policies require all airport revenues to be used for aviation purposes. The principal sources of GA airport revenues include:

- Fuel flowage fees
- Fuel sales (if airport retains right to provide fuel)
- Hangar rents/leases
- Landing/ramp fees
- Land and building leases
- Concessions revenue (such as food and beverage providers or rental car agencies)
- Parking

Airports are very volume sensitive and many assets are underutilized relative to their physical capacity, leading to economies of scale such that increasing the number of flights is likely to have a low unit cost and high revenue benefit. Changing the mix of aircraft served to more jet and turbine engine aircraft rather than piston engine aircraft can improve revenues. Investments needed to attract high performance aircraft (like runway improvements) are eligible for FAA and state grants while other improvements can be privately financed. Once an airport can accommodate larger aircraft, adding more flights and based aircraft has large revenue benefits:

- Turbine aircraft fly longer distances and use more fuel
- Turbine aircraft tend to be larger and more expensive; owners are more willing to pay for modern hangar space

## DET Finances

The City has not been able to achieve a positive net operating income for the past several years. A snapshot of recent Airport operating revenue and expense data is presented in Table 7. Detailed data on operating expenses were not available for FY 2015.

In FY 2017, approximately:

- 41% of operating revenue was from landing fees,
- 19% was from T-hangar rentals,
- 19% was from the rental of miscellaneous property, and
- 13% was from the rental of hangar bays.

The largest contributors to operating expenses were

- utility charges (57%),
- salaries, wages, and benefits (16%), and
- materials, supplies, and other expenses (10%).

In FY 2016, operating expenses were impacted by atypical events including a \$1.5 million pension expense item due to the City's bankruptcy and \$80,000 workers compensation item which contributed to a negative expense for salaries, wages, and benefits. Materials, supplies, and other were significantly higher in FY 2016 due to \$1.9 million of expenses related to Airport litigation.

Utility charges doubled from \$678,688 (27% of total operating expenses) in FY 2016 to \$1,385,345 (57% of total operating expenses) in FY 2017. Water charges were the single largest component of utility charges in FY 2017 after increasing nearly 10 fold to \$498,008 from \$55,207 in FY 2016. Sewage charges decreased from \$483,168 to \$439,524. Gas charges nearly doubled from \$185,739 to \$305,605. Electricity charges were recorded as a negative expense in FY 2016 and were \$142,207 in FY 2017. An audit of utility expenses at DET should be conducted, as they appear to be extremely high for a general aviation airport of DET's size (\$1.4 million of \$2.4 million in total expenses) and exhibit extreme year over year changes.

**Table 7: DET Recent Net Operating Income**

Values in Dollars (\$)	FY 2015	FY 2016	FY 2017
<b>Operating Revenue</b>			
Sales and Charges for Services	5,885	12,162	32,011
Rentals, Fees and Surcharges	586,064	438,128	668,609
Miscellaneous	36,272	27,172	411
<b>Total</b>	<b>628,221</b>	<b>477,462</b>	<b>701,031</b>
<b>Operating Expenses</b>			
Salaries, Wages and Benefits	99,085	(1,175,677)	393,691
Operating			
Water		55,207	498,008
Sewage		483,168	439,524
Gas		185,739	305,605
Electricity		(45,426)	142,207
Other Operating		287,985	216,109
<b>Total Operating</b>	<b>1,076,050</b>	<b>966,673</b>	<b>1,601,454</b>
Maintenance	52,361	38,586	53,212
Materials, Supplies and Other	41,680	2,446,569	235,797
Depreciation and Amortization	95,796	216,370	145,925
<b>Total</b>	<b>1,364,972</b>	<b>2,492,522</b>	<b>2,430,079</b>
<b>Net Operating Income (Loss)</b>			
<b>Total</b>	<b>(736,751)</b>	<b>(2,015,060)</b>	<b>(1,729,048)</b>

Table 8 shows recent non-operating and net financial performance data for the Airport. Non-operating income includes federal and state grants, of which the Airport received \$4.1 million in FY 2015, \$220,000 in FY 2016, and \$14,000 in FY 2017. Major recent non-operating expenses include \$550,000 in special items in FY 2015 and \$2.0 million in losses on disposal of capital assets in FY 2016. Transfers in reflect transfers from the City's general fund to the Airport and ranged from \$0.7 million to \$1.0 million per year.

The net impact of the operating and non-operating income and expenses and the transfers from the general fund to the Airport is shown in the last row of Table 8. The Airport experienced a \$3.7 million

increase in net position in FY 2015, largely as a result of federal and state grants. In FY 2016, the Airport experienced a \$3.1 million decrease in net position, largely resulting from \$1.9 million of litigation expenses and a \$2.0 million loss on the disposal of capital assets which were partially offset by \$1.5 million in negative pension expenses that was accrued to the Airport due to the City's bankruptcy. The Airport experienced a \$0.7 million decrease in net position in FY 2017, which did not experience any major atypical expense or revenue items. The operating loss in FY 2017 resulted from low revenue relative to high expenses which were primarily driven by significant increase in utility costs.

**Table 8: DET Recent Non-Operating and Net Financial Performance**

Values in Dollars (\$)	FY 2015	FY 2016	FY 2017
<b>Non-Operating Income (Expense)</b>			
Interest Expense	(7,081)	(20,287)	-
Federal and State Grants	4,090,467	220,008	14,070
Special Item	(552,308)	-	-
Loss on Disposal of Capital Assets	-	(2,042,496)	-
Total	3,531,078	(1,842,775)	14,070
<b>Net Financial Performance</b>			
Net Gain (Loss) Before Contributions and Transfers	2,794,327	(3,857,835)	(1,714,978)
Transfers In	866,910	721,762	1,048,986
Increase (Decrease) in Net Position	3,661,237	(3,136,073)	(665,992)

**DET Grant History**

DET has received federal and state grants to acquire land and make improvements throughout its history. The obligation to repay the federal and/or state government if the Airport is converted to non-aviation use depends on the purpose of the grant. The City is obligated to repay Federal grants were used to acquire land. Repayment must be made at current market value and could apply to the entire Airport land area as opposed to those portions acquired with federal funds. Using the recent Flex-N-Gate land sale as a rough estimate for current market value would put the approximate value of the Airport at nearly \$12 million (\$44,737 per acre multiplied by 264 acres). The airports in Rialto, CA and St. Clair, MO were recently closed and in both cases, land value for the entire airport grounds became an issue of contention and negotiation with FAA and should be included in the City's closing analysis.

The City would also be obligated to repay the federal government for grants that were used to make capital improvements to the Airport that were grant-funded. Repayment is based upon the unamortized value of the improvements with a common understanding that most capital projects have a useful life of 20 years from the date of the grant.

The State of Michigan retains the right of first refusal to buy the land if the Airport is sold for non-aviation use and, because it is an asset of the City, the State would have to acquire the airport at fair market value. In St. Clair, MO, the City had to release revenue in the Airport account as of the closure date, and following the payment of any outstanding expenses, the remaining balance would become an asset of the State and might be used to continue to continue airport operations.

The Airport has received a total of \$33.2 million in grants over nearly 20 years. Table 9 shows the amount of federal and state grants received by the Airport before fiscal year 2000 and in five-year periods thereafter by type of grant. Of this total, \$16.2 million was used for land acquisition, \$11.3 million was used for improvements, and \$5.7 million was used for both. Closure of the airport would create a large obligation of the City for grant repayment. These costs will be quantified in Phase III.

**Table 9: DET Grant History**

FY Period	Land	Mixed Land and Improvements	Improvements	Total
Pre-2000	\$5,685,231	N/A	N/A	\$5,685,231
2000-2004	\$4,750,796	\$5,670,900	\$6,462,798	\$16,884,494
2005-2009	\$2,576,563	\$27,132	\$826,682	\$3,430,377
2010-2014	\$3,214,000	\$0	\$3,573,583	\$6,787,583
2015-2016	\$0	\$0	\$450,000	\$450,000
<b>Total</b>	<b>\$16,226,590</b>	<b>\$5,698,032</b>	<b>\$11,313,063</b>	<b>\$33,237,685</b>

The Airport closure process will be lengthy as evidenced recently by the City of St. Clair, Missouri.<sup>4</sup> The closure process consumed about seven years, as the FAA was reluctant to make a decision allowing closure despite the City's efforts that followed FAA guidelines. Eventually, the City obtained the support of its Congressional delegation to pass federal legislation authorizing the closure of the Airport. The City was then obligated to prepare an environmental assessment that addressed the repurposing of the land and conclude other administrative matters that consumed two of the seven years leading to closure. The Airport was released from all federal obligations on November 13, 2017.

The City of Santa Monica has been seeking the closure of its airport for a number of years in response to residents' complaints.<sup>5</sup> An agreement was finally reached with FAA to allow closure of the airport in 2028. This matter is still facing litigation from those who want to keep the airport open. For 55 years (since 1962), Santa Monica has spent a substantial amount of money on attorneys, accountants, and consultants trying to make the case for closing the airport.

### Financial Comparison of DET with Competitor Airports

To better understand DET's financial performance and potential areas for improvement, it is helpful to compare the Airport to its competitors PTK and YIP. Table 10 shows selected FY 2017 operating revenue and expense data for all three airports. DET lags behind its competitors in nearly all operating revenue categories but does not lag PTK and YIP in operating expenses by nearly as much. This is largely a result of the high contractual services expenses at DET, a category which includes utilities (water, sewage, gas, and electric).

PTK and YIP both generate substantial (\$0.7 million to \$0.9 million) revenue from fuel sales, while DET generates very little revenue from fuel sales. There are several causes for DET's relatively low fuel sales: 1) there are many more high-performance (turbine engine) based aircraft and operations at PTK and YIP; and 2) DET has the highest fuel prices of the three airports. While DET has relatively high, yet competitive, landing fees, this category may be the best way to increase revenue due to the large quantity of operations by transient aircraft.

**Table 10: Comparison of Selected FY 2017 DET Financial Data with Competitor Airports**

Values in Dollars (\$)	DET	PTK	YIP
<b>Operating Revenue</b>			
Fuel Sales	25,872	870,200	650,000
Land Lease	130,000	1,194,000	-
Landing Fees (including concessions)	286,231	74,000	723,000
T-Hangar Rental	133,716	1,710,000	-
Historic Executive Terminal Rental	88,626	-	-
Airline & Non-Airline Rent	-	-	1,163,000
Sub-Total Selected Items	664,445	3,848,200	2,536,000
<b>Operating Expense</b>			
Salaries, Wages, and Benefits	393,691	2,044,034	1,459,000
Contractual Services	1,601,454	1,535,500	933,000
Sub-Total Selected Items	1,995,145	3,579,534	2,392,000

### PTK Finances

A more detailed review of the financial data from PTK in Table 11 illustrates how positive net operating income can be achieved by airports of similar character and use to DET. Financial data for YIP was assessed and determined to be less relevant to DET due to the large, open land areas, much longer runway lengths and emphasis on air cargo operations.

<sup>4</sup> Elizabeth Barmeier, "St. Clair Regional Airport Officially Closed," *The Missourian*, November 15, 2017, [http://www.emissourian.com/local\\_news/saint\\_clair/st-clair-regional-airport-officially-closed/article\\_e8775f33-d0f3-5adc-b996-823210a30b91.html](http://www.emissourian.com/local_news/saint_clair/st-clair-regional-airport-officially-closed/article_e8775f33-d0f3-5adc-b996-823210a30b91.html), accessed 11-15-2017.

<sup>5</sup> Dan Weikel and Dakota Smith, "Santa Monica Airport will Close in 2028 and be Replaced by a Park, Officials Say," *Los Angeles Times*, January 28, 2017, <http://www.latimes.com/local/lanow/la-me-santa-monica-airport-20170128-story.html>, accessed 12-4-2017.

**Table 11: PTK Historical Net Operating Income**

Values in Dollars (\$)	FY 2014 Actual	FY 2015 Estimated	FY 2016 Budget
<b>Operating Revenue</b>			
Aviation Gas (fuel flowage fee)	844,335	867,660	870,200
Car Rental Concessions	47,750	61,250	41,000
Costs	1,392	1,400	1,800
Gasoline Oil Grease Charges	184	100	100
Land Lease	1,196,882	1,225,000	1,194,000
Landing Fee Concessions	56,802	61,304	57,000
Landing Fees	23,490	23,600	17,000
Late Penalty	7,721	7,394	7,100
Miscellaneous	3,138	41,500	5,000
Parking Fees	1,670	3,550	1,900
Reimb US Customs Service	353,956	357,800	400,000
Rental Facilities	60	100	0
T Hangar Rental	1,719,593	1,612,163	1,710,000
Terminal Space	0	0	0
Tie Down	11,215	10,000	11,300
<b>Total</b>	<b>4,268,188</b>	<b>4,272,821</b>	<b>4,316,400</b>
<b>Operating Expenses</b>			
Salaries and Benefits	1,813,441	1,923,198	1,984,217
Contractual Services	1,558,805	1,819,920	1,535,500
Supplies	134,312	105,573	107,500
Internal Services	217,711	236,283	265,660
<b>Total</b>	<b>3,724,270</b>	<b>4,084,974</b>	<b>3,892,877</b>
<b>Net Operating Income (Loss)</b>			
<b>Total</b>	<b>543,918</b>	<b>187,847</b>	<b>423,523</b>

The greatest contributor to operating revenue is the leases on the T-hangars owned by the Airport, despite the large number of vacancies followed by ground leases paid by the various Airport tenants. The current ground lease at the Airport is \$0.27/SF/year with an increase of a penny per square foot effective in 2019. Most ground leases are for 20 years and require a minimum hangar size of 10,000 square feet. Fuel flowage fees are the third largest source of operating income and reflect the \$0.08/gallon avgas and \$0.09/gallon charge. The fuel flowage fee is imposed on the number of gallons delivered and in 2016 about 10 million gallons of fuel was delivered to Airport tenants, of which only about 2.8% (280,000 gallons) was avgas. These volumes highlight the relatively high use of the Airport by corporate and charter jet aircraft.

Whether publicly- or privately-owned, the largest operating expenses at most airports are those related to staffing. At PTK, salaries, wages, and benefits account for just over one-half of total operating expenses.

Net operating income at PTK is positive and has been for several years – averaging 9% of operating revenue over the last 3 years. This is a result of the large number of corporate jets based at the airport, which translates into high volume fuel sales and other operating charges earned by the fixed base operators and service providers at PTK, a portion of which flows to the Oakland County Airport Authority through its lease arrangements.



## Proposed Airport Improvement Plans

At one point in time, DET was the leading aviation facility in the Detroit metro region. Regional and national social, economic, and industry-related events led to its decline and its use as a GA airport. Suburban growth and new and expanded airports to the west and northwest of the City limits attracted businesses and customers. Yet, current flight activity indicates that a significant number of corporate flights originating from these suburban airports fly to and from DET to pick up and drop off passengers originating in and near downtown Detroit. This highlights the demand that could be served by DET, if certain improvements to the Airport are made by the City.

The GRA Team has identified six distinct proposed Airport improvement plans ranging from \$23M to \$60M:

- Other Assessments – A number of proposed Airport improvement plans have been prepared by other parties, including:
  - Airport Capital Schedule – Capital schedule developed by the City that is included in the City Budget
  - Facilities Assessment – An examination of the main terminal building, executive hangar structures, support features (e.g. utilities and security), and building code compliance deficiencies that was completed by the Detroit Building Authority on behalf of the Airport in June 2016
  - City-State Partnership – Projects identified by the Airport for a potential city-state partnership to redevelop the Airport
- GRA Team Assessment - The GRA Team summarized cost estimates made by other parties for three scenarios:
  - Bringing the Airport up to current standards
  - Optimizing as a GA airport
  - Attracting air carrier service

Table 12 summarizes the costs of the major components of each of the six plans. There is overlap between the plans for some components, but the scope of each of the six plans differs. In Phase II, the GRA Team will prepare detailed cost estimates for various scenarios to meet the needs of the Airport as identified in this Phase I report.

**Table 12: Summary of Airport Improvement Plans**

Improvement	Other Assessments			GRA Team Assessment		
	Airport Capital Schedule	Facilities Assessment	City-State Partnership	Bring Airport up to Current Standards	Optimize as GA Airport	Attract Air Carrier Service
Main Terminal Building	\$3,562,500	\$1,507,550	\$2,800,000	-	\$3,600,000	\$1,000,000
Executive Hangar Building	\$32,426,500	\$25,935,175	\$29,000,000	-	\$25,000,000 to \$32,000,000	-
Corporate Hangars	-	-	\$10,500,000	-	\$4,000,000	-
T-Hangars	-	-	\$6,250,000	-	\$8,000,000	-
FBO	-	-	-	-	-	-
ARFF/SRE Building	-	-	\$2,800,000	-	\$2,800,000	-
Security	-	-	-	\$1,000,000	-	-
Runways	-	-	-	\$17,200,000	-	-
Apron	-	-	-	\$5,000,000	-	\$3,000,000
Reopen McNichols Road	-	-	\$6,500,000	-	-	-
New Terminal Building with Baggage Handling	-	-	-	-	-	\$26,200,000
Passenger Loading Bridges	-	-	-	-	-	\$3,500,000
Parking Structure	-	-	-	-	-	\$10,000,000
Pedestrian Overpass	-	-	-	-	-	\$3,000,000
Traffic Flow Improvement	-	-	-	-	-	\$4,000,000
Existing Parking Lot Improvements	-	-	-	-	-	\$3,000,000
Miscellaneous	-	-	-	-	-	\$6,300,000
Total	\$32,426,500	\$27,442,725	\$57,850,000	\$23,200,000	\$37,000,000 to \$50,400,000	\$60,000,000
Sources	City of Detroit	Detroit Building Authority	DET	DET	Various studies for DET	QOE Consulting

**Other Assessments**

Three airport investment scenarios developed by other parties were identified: an Airport capital schedule, a facilities assessment, and a city-state partnership. Some projects within the first three scenarios are eligible for grants, but eligibility does not necessarily mean that a project will be funded. Both FAA and MDOT have limited grant budgets; projects generally compete for funds and there are priority areas that are used to decide which projects are funded. In general, private funding sources require long-term agreements that cover the life of an investment or buy-back provisions if the lease is terminated.

**Airport Capital Schedule**

The capital schedule for DET for the fourth quarter of FY 2016 and the full FY 2017 as prepared by the City identifies terminal area facility improvement projects totaling \$32,426,500. FY 2016 4th quarter projects totaled \$2,618,250 with \$490,250 allocated to life-safety issues and basic renovation needs in the Main Terminal Building. Fire suppression systems for the Historic Executive Terminal account for \$1,910,000 and the balance is assigned for certain code compliance matters. These projects are currently on hold pending decisions regarding the future of DET as an aviation facility.

The capital schedule for FY 2017 totals \$29,658,250 and the majority of the cost is allocated to improvements to the Historic Executive Terminal.

Given the existing physical condition of these primary Airport terminal and hangar facilities, the capital schedule appears appropriate should the City opt to continue operating the Airport. These projects are ineligible for federal and state grants and the City will be required to fund them. Private investment and the Michigan Economic Development Corporation (MEDC) may also be possible funding sources.

**Facilities Assessment**

The Facilities Assessment conducted by the Detroit Building Authority (DBA) for DET completed in June 2016 focused on the Main Terminal Building, Historic Executive Terminal, support features (e.g. utilities and security), and building code compliance deficiencies. Pavements were not assessed. The assessment considered two operating approaches for the City: (1) short-term use of the facilities and those capital projects necessary to support that time frame, and (2) long-term use that provided for a three-phase capital improvement program.

Costs estimated to establish these capital projects are summarized in Table 13 and include an allowance of 10 percent for engineering/architecture fees. It is noted that the assessment did not provide cost estimates for certain other projects that require additional study suggesting the values shown in Table 13 represent the lowest possible costs.

**Table 13: Estimated Cost of Improvements: Facilities Assessment**

Facility Useful Life Factor	Main Terminal Building	Historic Executive Terminal	Total
<b>Short-Term Use – Immediate</b>			
Total	\$259,875	\$2,296,800	\$2,642,475
<b>Long-Term Use</b>			
Immediate (1 – 2 years)	\$1,194,875	\$4,058,175	\$5,253,050
Short-term (3 – 5 years)	\$17,600	\$18,240,200	\$18,257,800
Intermediate (6 – 10 years)	\$17,600	\$1,322,400	\$1,340,000
Long (11 – 20 years)	\$17,600	\$17,600	\$35,200
Total	\$1,247,675	\$23,638,375	\$24,886,050

Source: Detroit Building Authority report for DET, June 2016

The assessment also illustrates that the majority of the capital projects involve the Historic Executive Terminal.

**City-State Partnership**

The Airport identified a number of projects that could be funded by a 90/10 MDOT Aeronautics grants or MEDC grants.

Renovation of the Historic Executive Terminal and hangar bays would cost an estimated \$29 million and would enable the Airport to house more aircraft and increase revenue. Similarly, new corporate hangars at a cost of \$10.5 million would allow the Airport to meet current and future demand to house large aircraft. Finally, new T-hangars costing \$6.25 million would allow the Airport to attract small corporate and hobbyist light aircraft operators, which will also improving the Airport’s finances.

Renovation of the Main Terminal Building into office space, with common-use areas for collaborations and private offices for aviation companies is estimated to cost \$3.6 million allowing the Airport to attract small aviation and drone businesses.

Consolidation of Aircraft Rescue and Fire Fighting (ARFF) and Snow Removal Equipment (SRE) into another building on the grounds would result in more efficient Airport operations and would allow two hangar bays in the Historic Executive Terminal to be occupied by tenants and would increase revenue. The estimated new construction cost is \$2.8 million.

A proposed project to reopen McNichols Rd would allow the surrounding neighborhood to be reconnected. This project would also support the logistics centers being built in the I-94 industrial district making neighborhoods and facilities more efficient. The estimated cost of the project is \$6.5 million.

**GRA Team Assessment**

The GRA Team assessed three airport investment scenarios: bringing the Airport up to current standards, optimizing as a GA airport, and attracting air carrier service. The GRA Team did not create the plans or estimate the costs of the improvements proposed within each plan; the plans were prepared by other parties.

Some projects within the scenarios are identified as eligible for grants, but grant eligibility does not necessarily mean that a project will be funded when a grant is applied for. Both FAA and MDOT have limited grant budgets; projects generally compete for funds and there are priority areas that are used to decide which projects are funded. In general, private funding sources require long-term agreements that cover the life of an investment or buy-back provisions if the lease is terminated.

**Scenario 1: Bring Airport Up to Current Standards**

Scenario 1 involves various runway, taxiway, apron, and security improvements that are needed to meet airport design standards and accommodate large business jets currently using the Airport. The estimated cost of these improvements is \$23 million as outlined in Table 14. Many of these projects would be eligible for FAA or MDOT grants, but a commitment to continue operating DET as an airport would be required to receive these grants.

**Table 14: Scenario 1 Estimated Cost of Improvements**

Action Item	Year in Place	Establishment Cost	Grant Eligible*
<b>Runway 15-33</b>			
Rehabilitate pavement	2018	\$3,700,000	Yes
Install EMAS at each runway end	2018	\$11,750,000	Yes
<b>Runway 7-25</b>			
Relocate Runway 7 threshold for RSA	2019	\$100,000	Yes
Decouple Runways 25 and 33	2019	\$150,000	Yes
Rehabilitate pavement; reduce width to 60'	2019	\$1,500,000	Yes
<b>Apron Pavement</b>			
Rehabilitate apron pavements serving terminal building and Historic Executive Terminal	2020	\$5,000,000	Yes
<b>Security</b>			
Install airport-wide security camera system	2020	\$1,000,000	Yes
<b>Total</b>		<b>\$23,200,000</b>	

\* Both FAA and MDOT grants may be available to fund a majority of costs for these improvements. However, obtaining these funds would require the City to commit to maintaining the facility as an airport. Funds for any one airport are generally limited so some of the timing in this chart may be optimistic. GRA estimates of cost based on Airport input.

**Scenario 2: Optimize as GA Airport**

Rehabilitating or replacing existing T-hangars, renovating the Historic Executive Terminal, constructing at least one new FBO hangar to optimize DET as a GA airport would cost between \$32 million to \$48 million as outlined in Table 15 and demonstrated schematically in Figure 23.

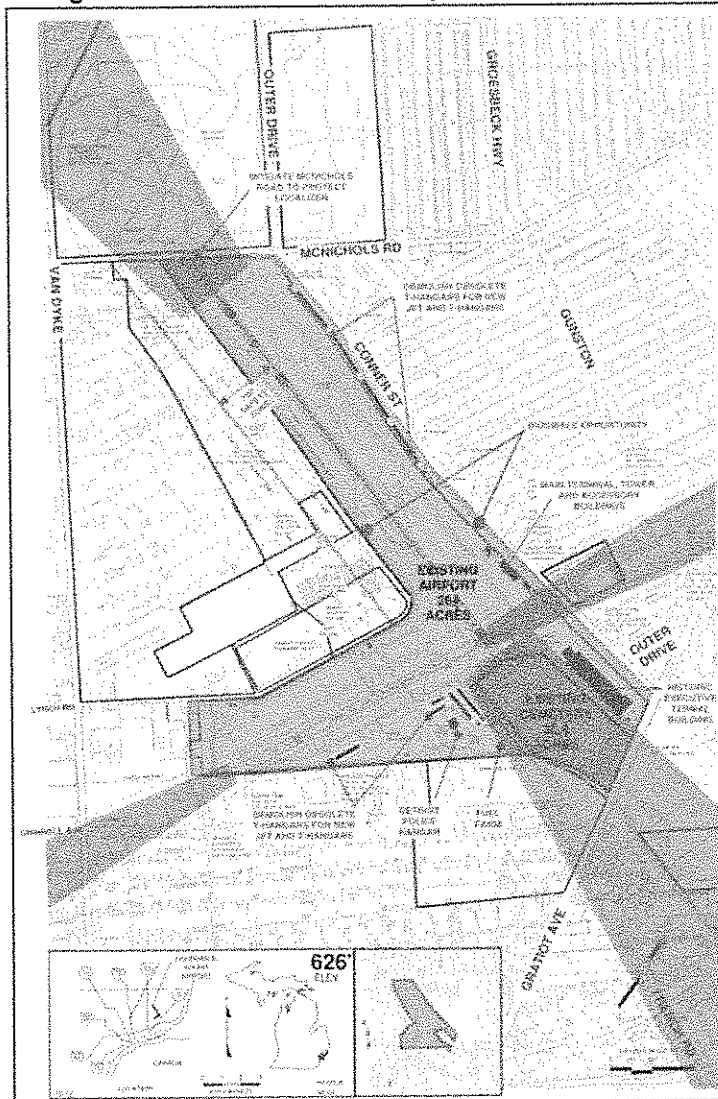
While one corporate hangar is needed for larger business jets, it could also house potential aircraft maintenance and painting facilities and more hangars can be developed on a self-sustaining basis and other projects can be initiated as market demand requires. The renovation of the Historic Executive Terminal and commitment to long-term leases will attract investments by an FBO, the two museums, and others. Historic Tax Credits might also be available through a public-private partnership and all these projects should be completed in phases. The aircraft rescue and firefighting (ARFF) building should be renovated so that it can also house snow removal equipment.

**Table 15: Scenario 2 Estimated Cost of Improvements**

Action Item	Year in Place	Establishment Cost	Funding
<b>Build New Corporate Hangar</b>			
Needed for larger business aircraft	2020	\$4,000,000	MDOT, MEDC
Could house aircraft maintenance and painting facility			FBO Investment*
<b>T-Hangars Phase 1</b>			
Replace existing T-hangars including taxiways	2019	\$4,000,000	AIP for taxiway only – private investor*
<b>Renovate Historic Executive Terminal</b>			
To locate FBO and provide corporate hangars	2020	\$25,000,000 to \$32,000,000	Historic Tax Credit Private Investor MEDC
Tuskegee and Fighter Jet Museum			Donors*
<b>T-Hangars Phase 2</b>			
Replace existing T-hangars including taxiways	Based on need	\$4,000,000	AIP for taxiway only – private investor*
<b>Renovate Main Terminal</b>			
Validate needs – excluded from low estimate	2021	\$3,600,000	MDOT, MEDC, or private investor
<b>Renovate ARFF Building</b>			
Renovate ARFF building to handle ARFF needs and snow removal equipment – excluded from low estimate	2020	\$2,800,000	MEDC or City
<b>Total</b>		\$37,000,000 to \$50,400,000	

\*Potential for MEDC grants, private investment, or public-private partnership. Funding sources have limited budgets and may only fund certain types of projects. Private investors will see some predictable rate of return and protection from early termination. Cost estimates from various studies for DET.

**Figure 23: Scenario 1 and 2 Proposed Improvements**



**Scenario 3: Attract Air Carrier Service**

Scenario 3 involves making a number of improvements with the goal of attracting air carrier service to DET. A terminal building with baggage handling and passenger loading bridges would need to be constructed to support airline operations. Additional parking (potentially in a deck), improved services, enhanced security and access would all need to be addressed. A rough order of magnitude (ROM) estimate for the improvements needed to attract air carrier service is \$60 million as prepared for the City by QOE Consulting in March 2017. ROM costs by project type are shown in Table 16. The GRA Team will create an independent cost estimate of the improvements needed to attract air carrier service in Phase II.

**Table 16: Scenario 3 Rough Order of Magnitude PLOOM Costs**

Development Item	Description	ROM Cost
Terminal building with baggage handling	2-level, 60,000 sf	\$26.2M
Five passenger loading bridges	Estimated unit cost of \$700,000	\$3.5M
Parking structure	3-level, 380ft x 125ft, 400 spaces	\$10.0M
Pedestrian overpass	300ft x 10ft, enclosed	\$3.0M
Demolition of old terminal		\$1.0M
Traffic flow improvement	RW Armstrong 2000 study	\$4.0M
Existing parking lot improvements	Rehabilitation of auto lots B, C, and D	\$3.0M
Terminal apron improvements		\$3.0M
Miscellaneous		\$6.3M
<b>Total</b>		<b>\$60.0M</b>

Source: QOE Consulting report prepared for the City of Detroit, March 2017

**Grant Eligible Projects**

Pavement projects for runways and taxiways are essential and are Airport Improvement Program (AIP)-eligible for FAA (90%) and MDOT (5%) funding. While MDOT is more flexible in the kinds of projects it funds, its budget is fairly modest and grants are competitive. It may offer grant funding for non-AIP eligible projects on a negotiated percentage of the cost and also has a revolving loan program.

T-hangars are not essential for a safe airport, but they are eligible under AIP, when the airfield meets all applicable facility design standards. DET does not currently meet those standards. However, the public-use taxilanes that run parallel to the T-hangars are AIP-eligible, but not the stubs that lead to the individual T-hangar units.

Apron pavement is essential and AIP-eligible as long as the apron will be used on a regular basis and is available to all airport users.

A security camera system that is part of a complete security program that includes fencing, gates, and related controls is AIP-eligible. Fencing is considered important by FAA, so the camera security system could be labeled as essential if it is the only practical solution for certain areas of the Airport.

As a private, revenue generating facility, the FBO hangar is not AIP-eligible. But, the public-use apron is and if the City builds the FBO hangar and leases it to a private entity, then it is still not grant-eligible because it would be considered an exclusive use of that investment. If the City is the FBO, the hangar could be considered as nonexclusive use provided that it allows for tenants to operate from the facility. For example, airport owners have installed self-fueling systems with AIP grant funds. But, an FBO hangar would be a low priority project for the FAA/MDOT funds, and they would push for private sector funding even though it is viewed as an essential to service the aircraft using the Airport.

## Airport Redevelopment Opportunities and Challenges

### Detroit's Urban Industrial Fabric

As the center of horseless carriage manufacturing a century ago, Detroit came late to the American Industrial Revolution in the early Twentieth Century while most industrialized cities experienced significant growth and expansion between 1850s and 1890s. Across over 140 square miles, Detroit's growth and development occurred as a relatively dense urban fabric with mixed residential, commercial, and industrial uses immediately adjacent and in many instances nearly on top of each other into the 1920s. Neighborhoods in the city became "small factory towns" allowing workers to walk to work at a plant close by with commercial services and institutions like schools and churches all within a few blocks.

The Arsenal of Democracy continued to experience growth after World War II as the footprint of homes, commercial development, and industry grew to accommodate car and truck traffic. In the intervening 70 years, Detroit experienced numerous events that negatively impacted the quality of life including suburbanization, Dutch Elm Disease, racial unrest, the Oil Embargo's impact on American auto manufacturers and growth of foreign auto makers, the near failure of the American auto industry and consolidation within the automotive supply chain, the Great Recession, and the largest municipal bankruptcy in American history. The cumulative impact of these events was multiple waves of disinvestment.

Left behind is a patchwork of small parcels encumbered by tax foreclosure, title uncertainty, limits on eminent domain, and potential speculation. Changes in commercial and industrial development building and site typologies along with single-use zones to protect the health and safety of residents, businesses, and visitors requires the assembly of these puzzle pieces and it is commonly understood that land assembly to support the repurposing for large scale redevelopment throughout the city is Detroit's single largest challenge.

This challenge makes the 264 acres of consolidated City-owned property at the Airport attractive for redevelopment.

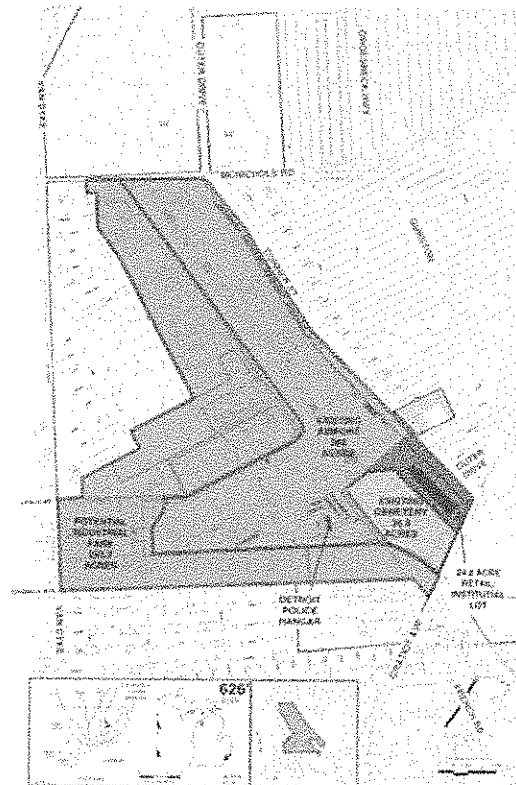
Figure 24 denotes the Airport in its neighborhood context surrounded by potential industrial development, some of which is already used industrially, including land along Grinnell Avenue between Gratiot Avenue and Van Dyke.

DTE Energy's Lynch Road Complex occupies just under 10 acres with land for vehicles that support the gas main located there while also functioning as a service center for the eastern region of their enterprise. The buildings in this complex total 24,000 square feet with approximately 100 employees per shift. Improvements are planned to expand services and efficiency within the company's footprint.

Adjacent to DTE, Fiat Chrysler Automotive currently occupies over 40 acres of City-owned land on Lynch Road.

The Mayor's Office current strategy to redevelop the Airport is based upon large auto suppliers requiring approximately 40 acre parcels, allowing for up to six users with another 25 acres for commercial and retail redevelopment of the Historic Executive Terminal at the corner of Conner Avenue and Gratiot Avenue. Taken together, the Airport and surrounding land could total in excess of 530 acres for industrial users.

Figure 24: City Airport's 264 Acres

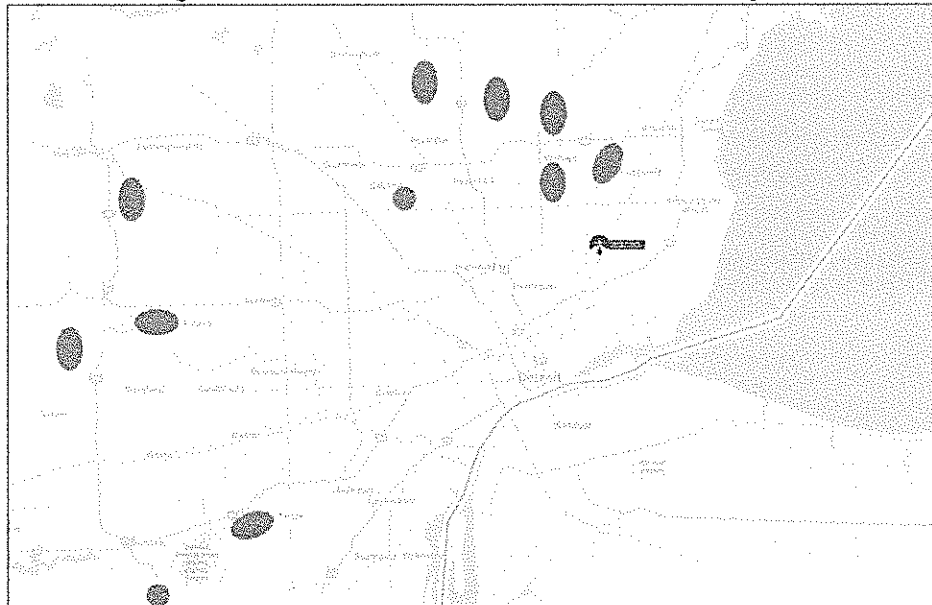




**Industrial Sites in the Metro Detroit Region**

From Canton to Romulus to Troy to Roseville, Detroit's industrial legacy is obvious in the fabric of every community throughout the metropolitan area as noted in Figure 25. Detroit is competing with each of those communities, developers, and land owners. Research suggests there is plenty of available land and space with vacancy rates under 10% vacancy and reasonably strong demand.

**Figure 25: Industrial Sites in the Metro Detroit Region**



As the City of Detroit offers incentives similar to those provided by other communities, the City will have to reconcile the cost of doing business in Detroit versus those locations. The cost of vacant land and space must be considered, while also responding to competitive property tax rates and the higher quality of services (including food and retail) that surround those industrial users and are available to their employees. Table 17 compares property tax rates for Detroit to the rest of Wayne County, all of Oakland and Macomb Counties, and select urbanized communities (these are likely to be competitive locations for industrial users).

**Table 17: Property Tax Rates in the Detroit Metro Region**

Area	Average Property Tax Rate In Mills
City of Detroit	88.10
Metropolitan Detroit	59.15
Select, Urbanized Wayne County	57.05
Select, Urbanized Oakland County	61.32
Select, Urbanized Macomb County	68.79

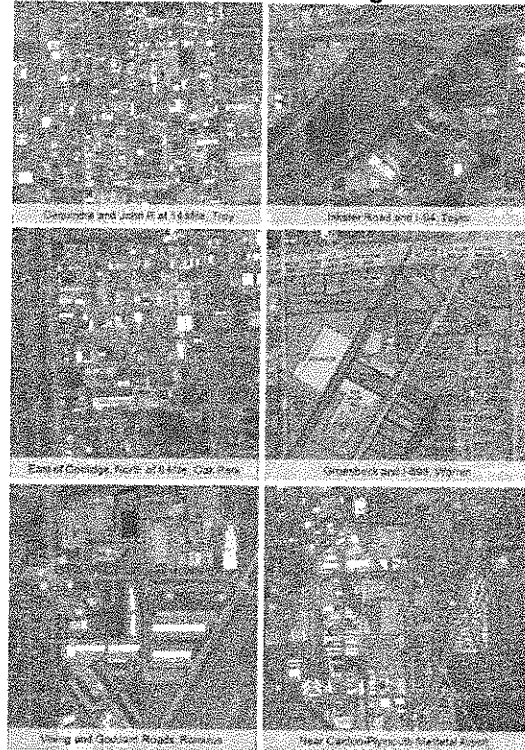
Owners and brokers throughout the metropolitan area were surveyed and the average costs for industrial land and space are noted in Table 18.

**Table 18: Industrial Space and Land Costs**

Property Type	Low Range	High Range
Range / Average Cost of Lease Space	\$5.50 - \$7.00 per square foot NNN Large, bankable tenants, 40,000+ square feet, 3-5-year lease	\$6.00 - \$7.25 per square foot NNN 2,000 - 14,000 SF, avg, 6,300 SF
Range / Average Cost of Vacant Land	\$60,000 - \$100,000 per acre Shovel ready, clean, 50+ acres	\$100,000 - \$135,000 per acre Shovel ready, clean, 2 - 10 acres
<small>NNN is Triple Net or net, net, net. NNN is a pro-rata pass-through of expenses including property taxes, property insurance, and common area maintenance in addition to the lease rate.</small>		

Additionally, industrial land and space throughout the metropolitan area generally consist of smaller parcels. Very few locations contain more than one or two 30 to 40 acre parcels, with the overwhelming majority (80-85%) being no more than seven acres. Large buildings on large parcels are generally subdivided and occupied by smaller users. Research revealed that smaller spaces are in higher demand and are leased more quickly. Figure 26 shows an array of industrial properties, demonstrating the mix of users, mostly on small parcels. One sample notes the parcel sizes and a similar analysis was conducted on sites throughout the region.

**Figure 26: Array of Industrial Property in the Detroit Metro Region**



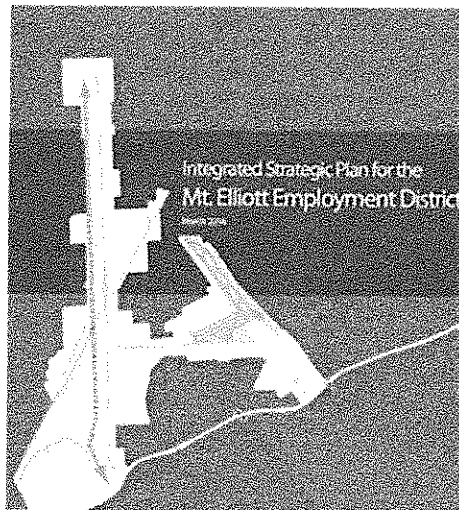
**Development Opportunities at DET**

**Mt. Elliot Employment District**

The City of Detroit commissioned the Mt. Elliott Employment District Study (Study), shown in Figure 27, to identify challenges and opportunities in the Mt. Elliott to Van Dyke, I-94 to 8 Mile Road industrial corridor on Detroit's eastside. The Study was completed by AECOM in March 2016, captured industrial land and opportunities around City Airport and lays out a bold vision for this area of the City suggesting the opportunity to:

*Create an attractive, sustainable, integrated District of modern industrial facilities, entrepreneurial businesses, and supporting infrastructure that reinforces the region as a global manufacturing hub, expands access to economic opportunity for Detroiters, and enhances quality of life in the surrounding community.*

**Figure 27: Mt. Elliott Employment District Study**

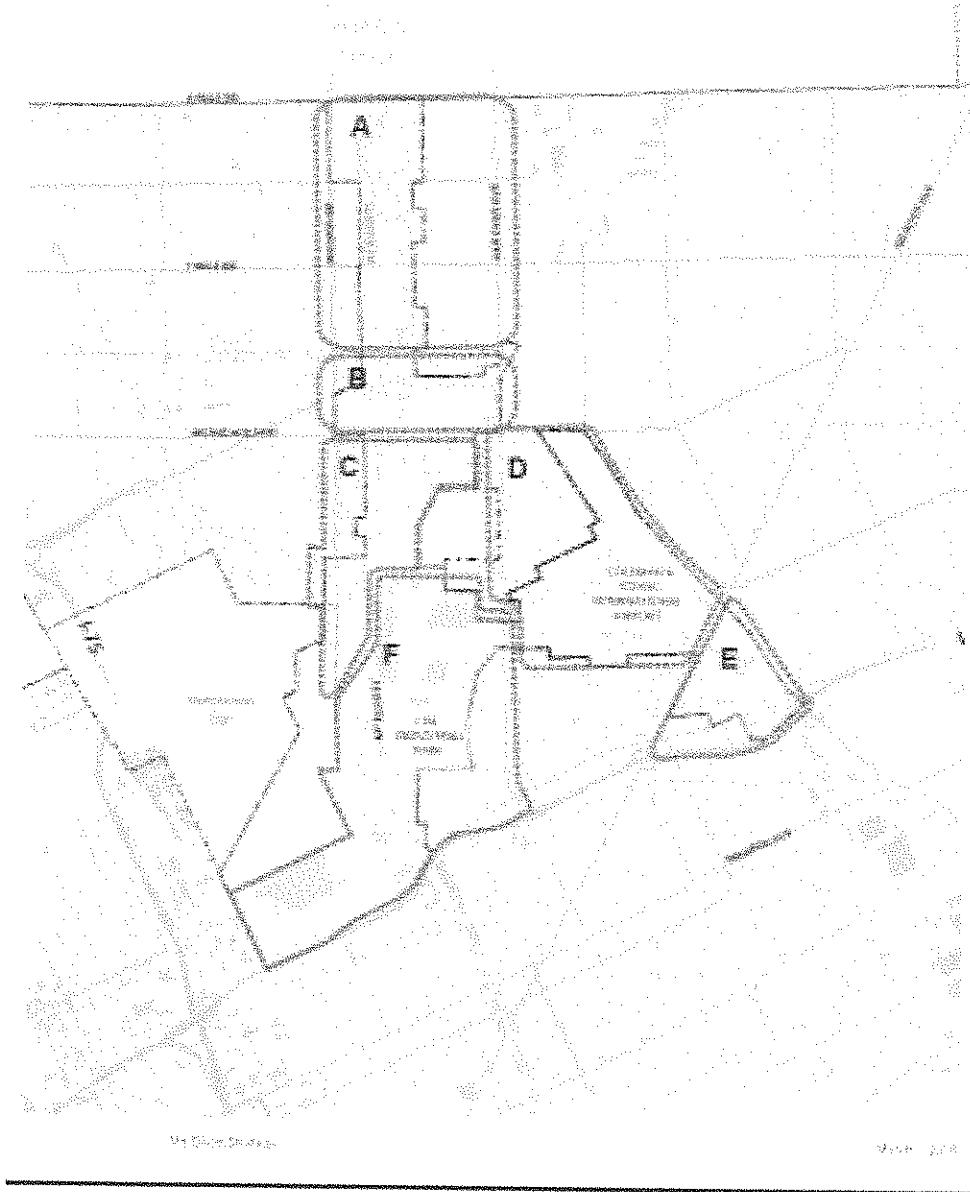


A map of the Sub-Districts outlined in the Study is provided in Figure 28.

# Figure 28: Mt. Elliott Employment District Sub-District Map

Prepared by Juergensen Associates, LLC for the City of Cleveland

Figure 28. Mt. Elliott District Study Area



The Study supports demand for industrial space and identifies a variety of growth sectors the City might pursue and users that could fit with or support firms throughout the metropolitan area as noted Table 19.

**Table 19: Growing Industries Recommended for Mt. Elliott Employment District**

Industry	Examples
Construction	- Conveyance systems - Smart home devices - Micro-grids - Renewable energy - Energy storage
Technology	- Cloud computing - Wearable technologies - Biomedical devices
Automotive	- Autonomous vehicles - Lightweight vehicles - Electric vehicles
Transportation	- Commercial aviation - Rail transit
Community Revitalization	- Vertical farming - Urban farming / local food - Urban, walkable housing

The Study reaffirms the challenges associated with land assembly, but speaks to a smaller footprint for Tier 1 and Tier 2 suppliers and other advanced manufacturers, beginning at 10 acres. Smaller users are likely to be more dynamic, risk-taking entrepreneurs that might be drawn to Detroit, thereby reducing the demands for large parcel assembly.

Finally, industrial uses buttress the Airport site on its south and western edges along Grinnell, Erwin, and Lynch, creating additional opportunities to attract more employers.

**Automotive Industry and Supplier Trends**

“Cash is king!” Industry professionals interviewed made that exact comment, noting that investment in expansion of any kind requires a sound balance sheet that is heavy with cash. This message was consistent amongst the industry professionals, experts, and academics, especially in the context of the Great Recession nearly 10 years ago and the bailout of the American automotive industry.

Suppliers that survived the consolidation that was beginning before the Great Recession are now part of a deeply reduced number of companies, especially in the top two tiers of the of Original Equipment Manufacturer (OEM) supply chain. Balance sheet cash will continue to be critical to survive industry cycles as production appears to be currently reaching a plateau, which equates to limited expansion opportunities in the near term.

For over a decade auto-makers have and will continue to pursue global platforms – meaning producing the same product (what suppliers call “Program”) in multiple markets – that is, the same vehicle in the U.S., Europe, and Asia.

Top tier suppliers follow assembly plants, which continue to pursue locations that offer cheaper labor. Despite the facts that Michigan is now a right-to-work state and the United Auto Workers (UAW) demonstrated flexibility during the Great Recession, no new assembly plants have been announced and even with major disruptions in the industry that include autonomous and electric vehicles in the coming decade, OEMs are likely to produce driverless and electric cars side-by-side on the same assembly line. This means the prospect for more plants and supplier expansion may be limited.

It is important to note resiliency and opportunities to grow in the supply chain exist due to: the sheer size of a sector; a supplier’s confidence in their sector; and a supplier’s confidence with their OEM. Most suppliers have to be able to amortize their investment over the OEM program contract life, which is typically no more than five years. However, the Big 3 automakers are currently master leasing assembly

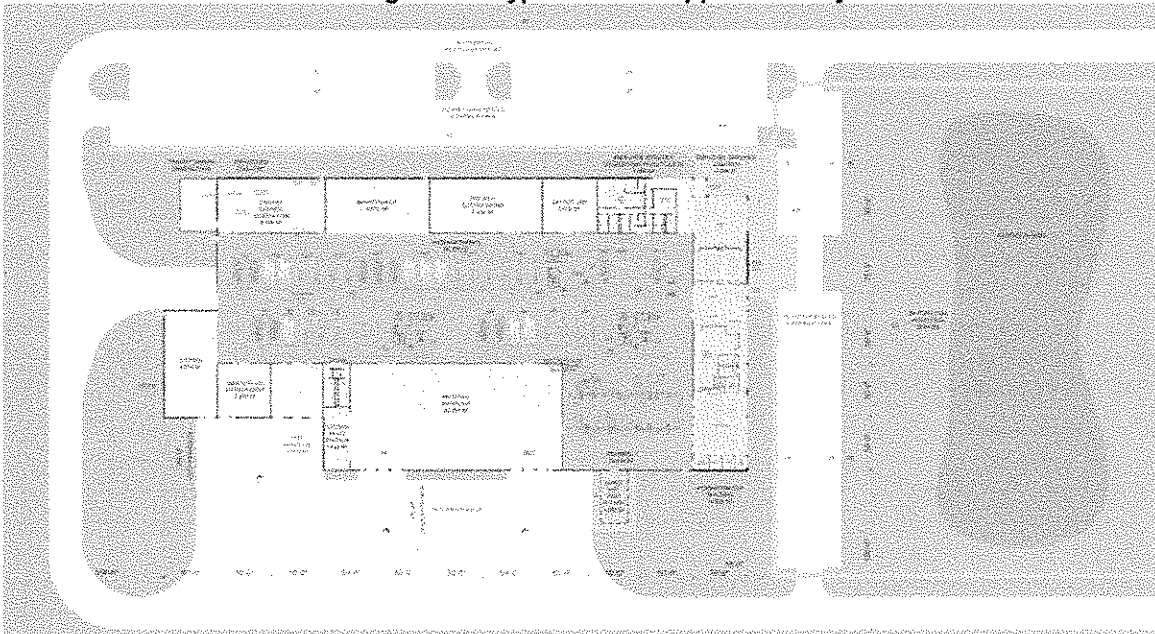
plant-adjacent industrial space and providing operating agreements with top tier suppliers, reducing risk for suppliers and providing flexibility for the OEMs.

With unemployment at 4.7%, Michigan is considered at full employment. However, the Detroit unemployment rate is nearly twice the state average at 8.4% and more employment opportunities in the City and for Detroiters will allow more residents to participate in the City's current resurgence. Industrial employers might typically provide job types consisting of:

- management (1%) earning in excess of \$120,000;
- professional, administrative and engineering (2%) earning \$60,000-\$80,000; and
- industrial workers (97%) earning \$40,000-\$50,000.

Figure 29 shows a typical new facility for an auto supplier on a 15-acre site in suburban Detroit. Its land use employee profile is consistent with what the experts suggested and as outlined above. Note also, that nearly 20% of the site is dedicated to storm water retention.

**Figure 29: Typical Auto Supplier Facility**



**Detroit is a Player**

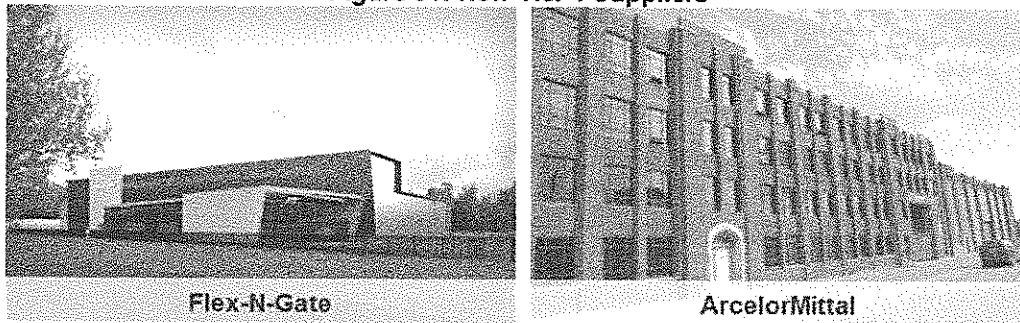
Detroit should be and is a contender in the industrial marketplace as demonstrated by the attraction of two Tier 1 suppliers to the Mt. Elliott Employment District. ArcelorMittal's and Flex-N-Gate's arrival to Detroit and the eastside (less than two miles from DET as shown in Figure 30) strengthen the confidence of all stakeholders – suppliers, residents, developers, and local and state public-sector agencies.

**Figure 30: Location of New Tier 1 Suppliers near DET**



More interesting, however, is that one project is a lease and the other a land sale. One is new construction and the other is a rehabilitation of a 19th century facility as shown in Figure 31. One has been able to execute a contract with their customer that extends the Program life allowing them to amortize the investment over a long period of time and the other is a sector powerhouse.

**Figure 31: New Tier 1 Suppliers**



Flex-N-Gate is 40th on *Crain's Automotive News* list of Tier 1 Top 100 Global Suppliers. ArcelorMittal is the largest steel company in the world. Both required significant subsidies from the City that allowed them to justify their investment.

**Infrastructure  
Transportation**

The Mt. Elliott Study notes a decades long concern over the lack of designated truck routes suggesting that "truck traffic can drive on any street unless signed otherwise." Any redevelopment plan should reinforce current truck traffic patterns and discourage new truck travel through neighborhoods. The Study notes supporting industrial expansion in Parcel E (see Figure 28) near PVS Chemicals, but fails to recognize the French Road interchange. French Road is in need of significant improvements in the surface road between Gratiot and I-94 as well as at the interchange. These improvements would likely strengthen the proposed repurposing and other adjacent industrial investments. The site also benefits from rail service at its very southern edge, paralleling Grinnell and crossing Gratiot just south and Erwin just west of the site.

**Gas, Electric, Communications, and Lighting**

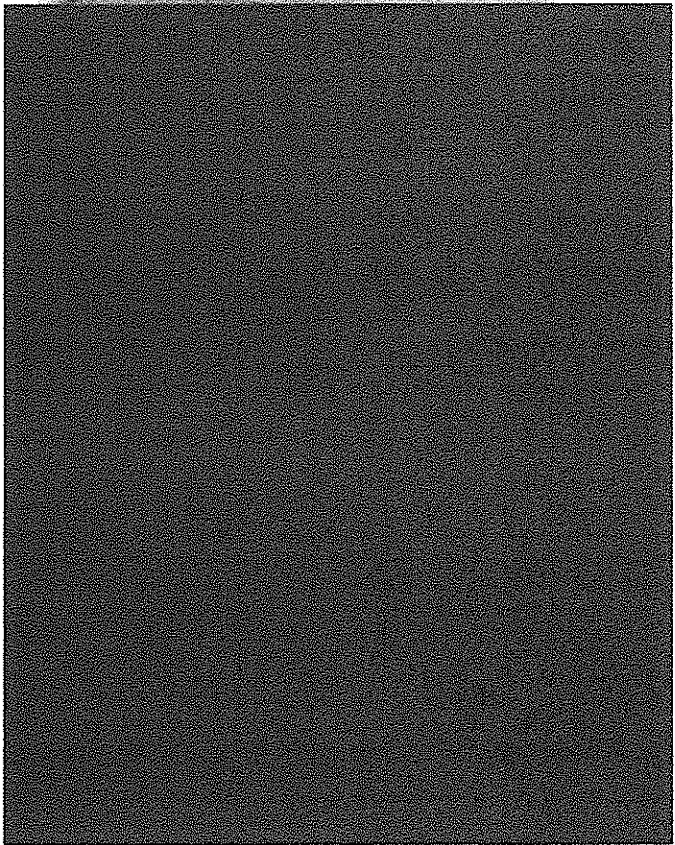
DTE is the primary electric and gas utility in metro Detroit and according to the Study, "they believe the existing infrastructure will be satisfactory to most of the intended uses." The utility and communications companies should be engaged early to determine the demand on the systems in the immediate area based upon the proposed business types and quantity of users. While vacancy in the area might allow for adequate capacity in the utility and communications transmission and distribution system, the providers should examine the useful life of the systems to insure they can support the proposed uses. DTE can likely finance necessary upgrades to support users out of the future service income of those users. Renewable energy sources and a micro-grid might be considered as part of a larger utility district.

AT&T and Comcast are the current communications providers. Capacity should be examined even though both companies have been upgrading infrastructure from copper/coaxial to fiber optic. The Public Lighting Authority of Detroit (PLA) has upgraded most of the lights in the area as well.

**Water and Sewer Service**

[REDACTED]

Figure 32: [REDACTED]



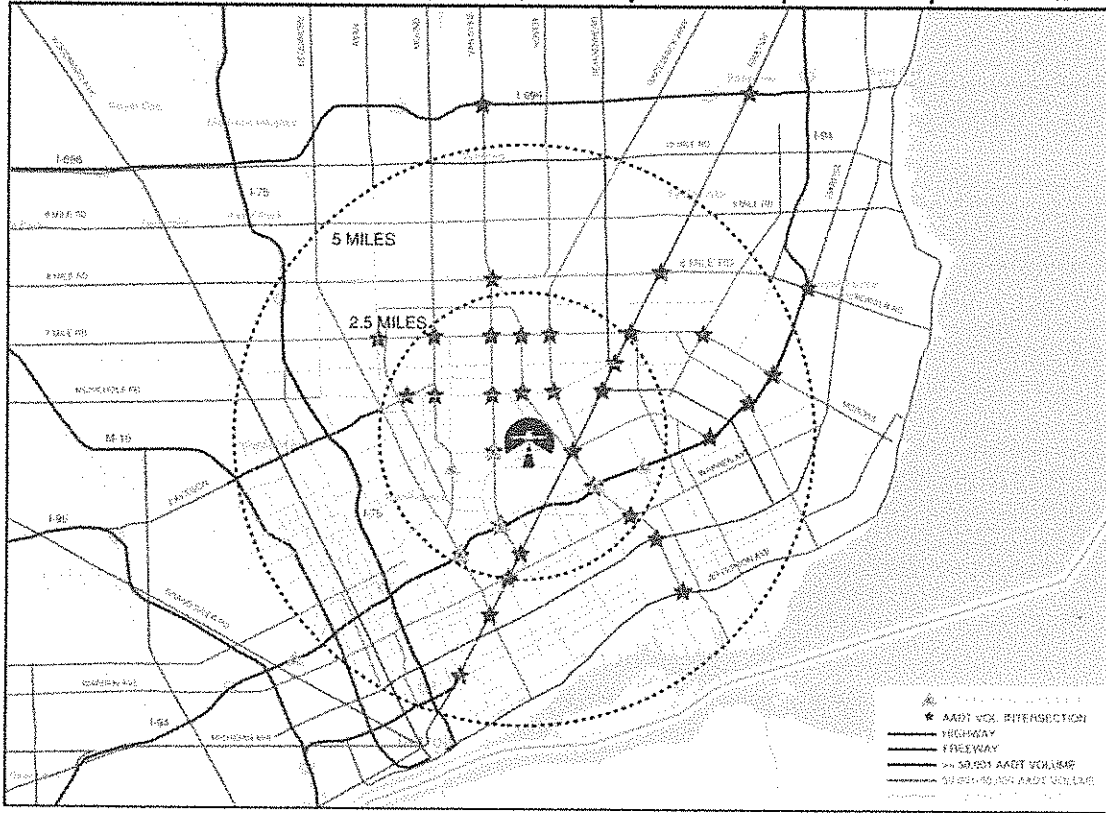
Sustainable strategies that include parcel specific on-site retention, green roofs, and bio-swales should be included and opportunities to manage storm water from a large radius of users should also be considered,

especially given the location within the [REDACTED].

**Investments, Workforce, and Consumers**

The Mt. Elliott Employment District Study reviews a variety of issues that would impact the entire District as well as Parcel D, the Airport Sub-district. This includes a potential employment base drawn from the City's eastside as well as the near eastside suburbs. Census data within a 2.5 mile and 5-mile radius around City Airport on employment/unemployment, educational, and income levels will inform not only the employment base but also a base of consumers that might support retail development as shown in Figure 33. In addition, the evaluation of the volume of Average Annual Daily Traffic (AADT) at various intersections on I-94, Gratiot Avenue, Van Dyke Avenue, McNichols Road, and Seven Mile will inform traffic patterns and explain how consumers move through the area.

**Figure 33: Census Information, Traffic, and Proposed Transportation Improvements**



Finally, proposed improvements to I-94 from I-96 to Conner Avenue are planned, including interchange improvements on I-94 at Van Dyke and Mt. Elliott. Street improvements are also planned for Mt. Elliott and Van Dyke between I-94 and Georgia – the location of both Flex-N-Gate and ArcelorMittal.

These data (including the dates for implementation of proposed improvements) have been requested from the City of Detroit Planning & Development Department and will be analyzed in later phases of this engagement.

**Zoning**

The City of Detroit Zoning Ordinance is Chapter 61 of the 1984 Detroit City Code. The most recent revisions were adopted on March 1, 2016 and the overwhelming majority of the Airport is classified as M2: RESTRICTED INDUSTRIAL DISTRICT defined in Section 61-10-31 as:

*This district is designed for a wide range of industrial and related uses which can function with a minimum of undesirable effects. Industrial establishments of this type provide a*



buffer between residential districts and intensive industrial districts. New residential construction is excluded from this district with the exception of loft conversions of existing buildings and of residential uses combined in structures with permitted commercial uses.

Oddly, a majority of the southern end of the site adjacent to the eastern edge of the Gethsemane Cemetery and occupied by the Historic Executive Terminal (the first major structure on the site) is classified as R2 TWO-FAMILY RESIDENTIAL DISTRICT defined in Section 61-8-31 as designed:

*"to protect and enhance those areas developed or likely to develop with single- or two-family dwellings. The district regulations are designed to promote a suitable environment for homes and for activities connected with family life. The only principal uses permitted by right are single- and two-family dwellings. Additional uses are conditional."*

The By-Right uses for the restricted industrial district are shown in Table 20.

**Table 20: M2 By-Right Uses per Sections 61-10-35 through 61-10-37**

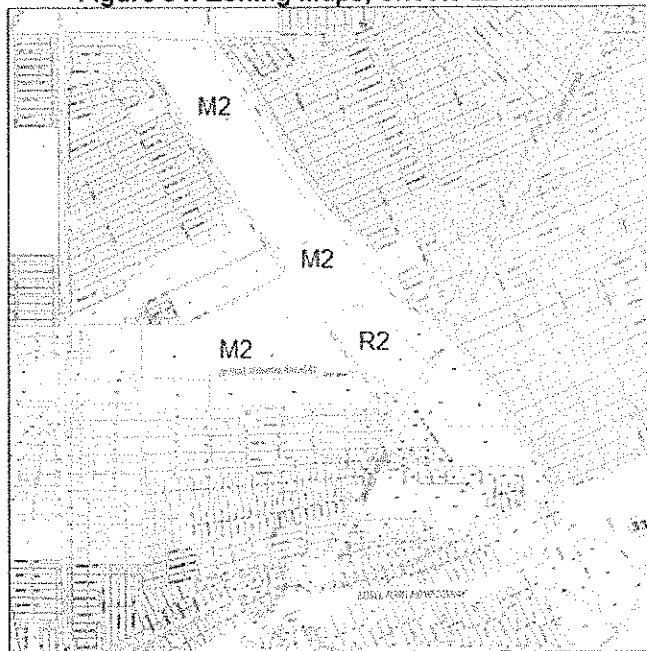
Type of Use	Example of Use
Public civic and institutional (35)	public auditoriums, government service agency, museum, substance abuse facility
Retail, service and commercial (36)	arcade, bank, brewpub, business college or commercial trade school, go-cart track, pool or billiard hall, recreation – indoor commercial and health club, tattoo and/or piercing parlor
Manufacturing and industrial (37)	confection manufacture, contractor yard – landscape or construction, general – low-impact manufacturing or processing facility, lumber yard, tool/die/gauge manufacturing – small items, wearing apparel manufacturing.

Figure 34 shows the zoning maps for the Airport property. Consistent with many up-zone classifications, the M2 Zoning District includes a full complement of By-Right public, civic, institutional, retail, service, commercial, manufacturing, and industrial uses.

The City's Planning & Development Department recommended any redevelopment discourage some Zoning Ordinance By-Right Uses that currently saturate the area, including power or heating plant with fuel storage on site, tank storage of bulk oil or gasoline be discouraged while motor vehicle sales and service. Instead, these uses should not be allowed. At the same time, By-Right uses including:

- electric transformer station
- gas regulator station, water works
- reservoir, pumping station, or filtration plant
- customer service center
- employee recruitment center
- park lots/structures
- bailing of waste paper or rags
- cold storage plant
- containerized freight yard
- trucking terminals
- wholesaling
- warehousing
- storage buildings, or
- public storage houses

**Figure 34: Zoning Maps, Sheets 22 and 25**



These By-Right projects should have a formal Design Review. A similar Design Review should occur for Conditional Uses that include: chemical materials blending or compounding but not involving chemicals manufacturing; firearms dealership/target practice; construction equipment; and agriculture implements. Other heavy equipment repair or service, motor vehicle sales and service as well as tires and towing, should be denied.

The Airport, Conner Avenue, and the adjacent cemeteries have served as clear demarcation between the residential neighborhoods to the east and industrial uses west of Van Dyke and into the Mt. Elliott industrial corridor. Therefore, industrial uses are a logical repurposing strategy and likely the only alternative use to the Airport.

Ultimately, the M2 zoning classification will allow the City to easily accommodate industrial uses at the site without the cost and risk associated with rezoning. The City might consider an overlay district or Planned Development (PD) to promote proposed uses and limit others. The City can also control uses through conditions in Development Agreements land sales.

### Historic Designation

In late 2015, the Detroit City Council charged the Historic Designation Advisory Board (HDAB) to study City Airport resulting in a Final Report issued by HDAB in to City Council in October of 2016 recommending for the creation of an Historic District for the entire site. No action has been taken.

There is little doubt the airport has a strong, rich, and storied history and the Executive Terminal (shown in Figure 35) is an iconic architectural feature. While National and State registration provide access to historic tax credits and would benefit the adaptive reuse of the Executive Terminal, local Historic Designation would encumber the balance of the site and therefore, should be considered with prudence and balance in promotion of proposed re-use goals.

### State and Local Incentives

Table 21 presents a comprehensive list of incentives collected by the Detroit Regional Chamber and available to support economic development in the region. Some of these incentives were recently used by automotive suppliers building facilities in the Mt. Elliott Employment District. A complete analysis of how these incentives might apply and support a potential repurposing of the site will be completed in Phase II.

Figure 35: Historic Executive Terminal



**Table 21: State and Local Incentives**

Incentive Type	Description
Border County Program	Eligible businesses may apply for tax incentives under P.A. 198 Industrial Property Tax Abatement or P.A. 328 Personal Property Tax Relief in Distressed Communities.
Commercial Rehabilitation Act (P.A. 210)	Encourages the rehabilitation of commercial properties that are at minimum 15 years old by providing tax abatements for up to 10 years.
Commercial Redevelopment Abatement (P.A. 255)	Encourages the replacement, restoration or new construction of commercial properties
New Facility Property Tax Abatement (P.A. 198)	Tax abatement of about 50% of property taxes from value of new improvements and personal property, land not included of up to 12 years.
Renaissance Zones	Renaissance Zones are virtually tax free geographical areas for any business or resident presently in, or moving into, the zone. In addition, the Detroit region is home to several Tool & Dye Renaissance Zones
Industrial Property Tax Abatement (P.A. 198)	Industrial property tax abatements provide incentives for Michigan manufacturers to build new plants, expand existing plants, renovate aging plants or add new machinery and equipment. Also, eligible for the abatement are high-technology operations defined as advanced computing, advanced materials, biotechnology, electronic device technology, engineering or laboratory testing, medical device technology, product research and development and advanced vehicles technology.
Personal Property Tax Relief in Distressed Communities (P.A. 328)	This abatement allows distressed communities, county seats and certain border county communities to abate personal property taxes by the full millage rate on new investments made by eligible businesses.
Obsolete Property Tax Act (OPRA)	Property tax exemption for value of improvements made to obsolete commercial real property for up to 12 years. Excludes land and personal property.
SmartZones	SmartZones provide distinct geographical locations where technology-based firms, entrepreneurs and researchers locate in close proximity top all of the community assets that assist in their endeavors. Companies located in the SmartZones benefit from resource collaborations, Small Business Innovation Research assistance, Small Business Technology Transfer assistance and venture capital preparation and introductions.
Michigan Emerging Technologies	Designed to assist Michigan technology based companies with funding needs who are engaged in federal innovation research and development.
Michigan Works!	To retain the current workforce, the Michigan Works! program offers several workforce assistance programs, including Employee Enhancement Training, through the Incumbent Worker Program. This program allows companies to spend up to \$3,500 to train each employee, depending on the training program.

**Alternative Redevelopment Schemes**

Scheme One (shown in Figure 36) follows the Mayor’s Office primary directive and demonstrates an approach to maximize the site using large (30-40+ acres) parcels for large users, leaves the Detroit Police Hangar, and allows approximately 25 acres for the adaptive reuse and redevelopment of the Historic Executive Terminal at Gratiot and Conner. It also proposes the reconnection of French Road and examines the French Road Mini-Take for more than 80 additional acres for potential industrial users and adds property shown in gray that surrounds the Airport site along Lynch, Erwin, and Grinnell from Gratiot to Van Dyke into a 530-acre “industrial park.”

Figure 36: Redevelopment Scheme One



Scheme One is summarized in Table 22.

Table 22: Scheme One Summary

Description	Number of Units	Size
Industrial Parcel	6	34 to 45 acres
Retail/Institutional Parcel	1	24.8 acres
Detroit Police Hangar	1	10.6 acres

Industrial uses are also the focus of Scheme Two (shown in Figure 37) which provides for two large (30-40 acre) parcels, but considers a wider and more likely array of smaller parcel sizes.

Figure 37: Redevelopment Scheme Two

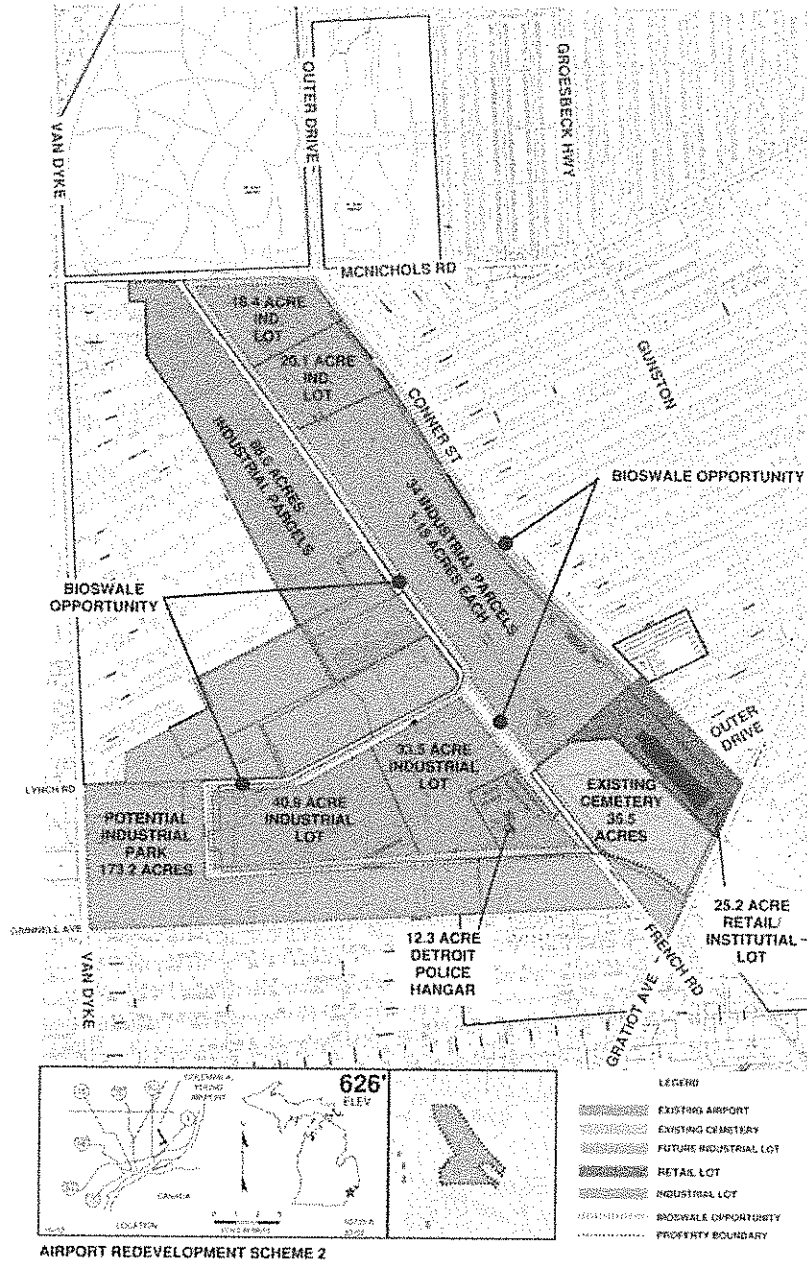


Table 23 provides a summary of Scheme Two.

Table 23: Scheme Two Summary

Description	Number of Units	Size
Industrial Parcel	1	40 acre
Industrial Parcel	1	30 acre
Industrial Parcel	2	20 acre
Industrial Parcel	34	1 to 15 acres
Retail/Institutional Parcel	1	24.8 acres
Detroit Police Hangar	1	10.6 acres

### Historic Executive Terminal Adaptive Reuse

As primary arteries on the eastside, the Gratiot-Conner intersection would typically be considered a "100% Corner" by any savvy real estate professional and as result, provides a potential commercial development opportunity. Traffic counts suggest significant vehicle traffic crossing the intersection on a daily basis. Casual observation would note heavy outbound/northeast traffic in the evening on Gratiot and the proposed improvements to I-94 will cause a spike in use in 2019 and 2020. While there is a high volume of suburb-bound traffic, consumers would have to make a left onto Conner and then another left into the site – diminishing its 100% corner value.

While Gratiot is also one of Detroit's five "spokes" and might support transit to Central Business District, that prospect is far off.

Given the dearth of marginal and vacant commercial property along Gratiot, an industrial re-use of the terminal would like be limited. However, redevelopment for a unique or destination retail or commercial user that could take advantage of the high bays and austere structure (as shown in Figure 38) is also possible and the insertion of additional floors could more than double leasable square footage. Additional square footage would require additional parking and might encroach on or would have to share parking space with adjacent industrial uses.

A permanent and enhanced home for the Redtails' Tuskegee National Historic Museum (shown in Figure 39) could be considered both an aviation and non-aviation/institutional use. A museum use should also consider the foreign jet fighters stored in the Historic Executive Terminal. Both museums have flyable aircraft and the loss of runways in industrial repurposing would cause both museums to store flying assets elsewhere and limit its value.

Figure 38: Historic Executive Terminal Interior

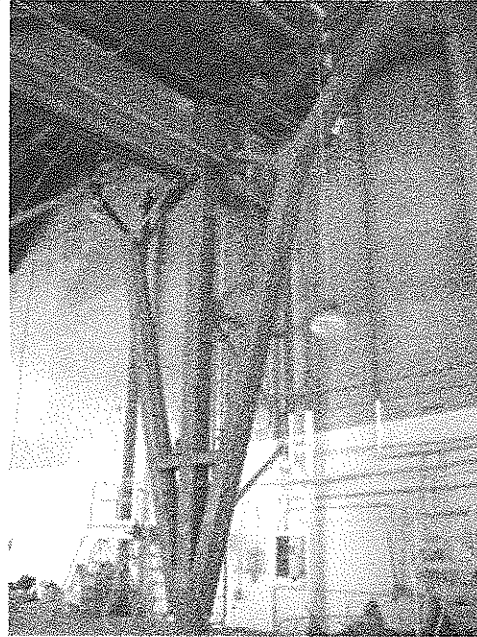
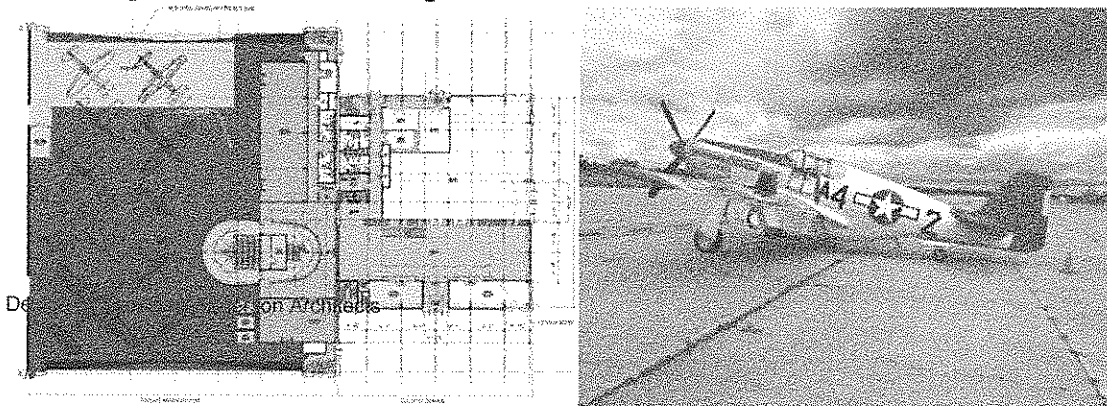


Figure 39: Potential Tuskegee National Historic Museum and Redtail Aircraft


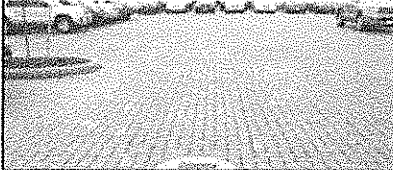
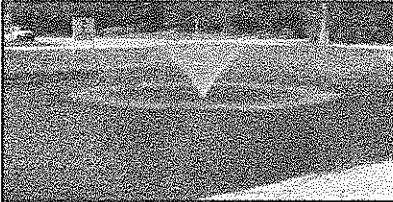



### Storm Water Management

DET's current utility costs reflect a charge related to storm water runoff that enters the sewage system. (Detroit's "Rain Tax") is a barrier for investment and could dramatically impact industrial users given their large roof tops and large paved areas for parking and truck bays and related access. DET is well

positioned to ensure the potential repurposing of the site includes every form of storm water management available to reduce the cost to the user. Figure 40 gives a brief overview of a number of storm water management techniques.

**Figure 40: Storm Water Management Techniques**

	<p>A green roof is partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane to allow for the absorption of rain water, eliminating it from a storm water system.</p>
	<p>Permeable paving is a range of sustainable materials and techniques for permeable pavements with a base and subbase that allow the movement of storm water through the surface. In addition to reducing runoff, this effectively traps suspended solids and filters pollutants from the water.</p>
	<p>A retention pond is designed to hold a specific amount of water indefinitely. A retention basin is used to manage storm water runoff.</p>
	<p>Bio-swales are landscape elements designed to concentrate or remove silt and pollution from surface runoff water and can be used to aid in storm water management.</p>

The site's location in the Conner Creek basin might allow portions of the site to also receive storm water from adjacent land owners. If adjacent owners choose to support the creation of surface assets that would hold storm water, the Airport might collect a fee for that service from adjacent land owners to support the capital investment.

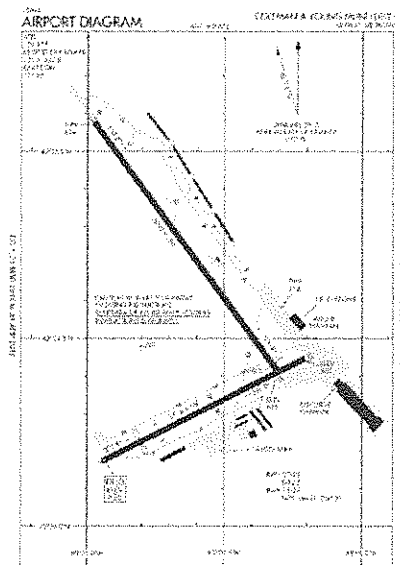
**Challenges to Redevelopment**

**Costs to Prepare the Land**

As shown in Figure 41, the Airport is currently occupied with a variety of structures including the Main Terminal & Administration Building and adjacent accessory buildings – including the tower, obsolete T-Hangars as well as several small accessory buildings scattered about the site totaling just under 200,000 square feet. The site also has a fuel farm.

The majority of the buildings are post-and-beam structural steel with exterior curtain walls. The T-Hangars are similar to "pole barn" construction and the Historic Executive Terminal and Police Hangar are large buildings with massive structural systems and exterior brick and stone.

**Figure 41: Paving and Buildings at DET**



Over 3.7 million square feet of paving for runways, taxiways, aprons, service roads, and parking cover portions of the site and they range in minimum asphalt paving thickness and paving sections on crushed base that include concrete up to 36" in thickness. Considering the different pavement thicknesses the site has over 4.1 million cubic feet of paving to be removed. As noted in Table 24, the estimated cost to demolish all the buildings (except for the Detroit Police Hangar and Historic Executive Terminal) and to remove the fuel farm and paving is just over \$4.5 million, with a reasonable (30%) contingency for unexpected conditions.

**Table 24: Costs to Prepare the Land**

Total Building Area	213,000 square feet
Total Paved Area	4,127,502 cubic feet
Remove and Abate Fuel Farm (estimate)	
Contingency	30%
Total	Over \$4.5 million
Costing basis for removal	\$18,750 per acre

### Real Estate Industry Reaction

After consideration of the costs to prepare the land and expected FAA and aviation industry pushback to closing the Airport, real estate professionals had numerous concerns. Interview and focus group responses ranged from minimum concern to outright anger over the Mayor's Office pursuit of this idea. Only one of the 35 participants suggested they would be slightly interested in developing the site, but it would have to be available now and clean, and given their experience in previous attempts to develop in Detroit they would be unlikely to pursue it in the near term because other places in the metro area would be much easier to develop and are more profitable.

Many of those interviewed believe the Airport plays an important role in supporting the City's current revitalization – both now and in the future. Additionally, as a unique asset, they all expressed concerns about giving it up, knowing the City would never be able to get it back. Nearly all had used the airport for scheduled airline service when it existed, and with colleagues that had used chartered or corporate flight department aircraft.

Both real estate professionals and others interviewed generally agreed it should be allowed to grow as a general aviation airport and believe that commercial service should be explored to the fullest extent possible. They all suggested the Airport should be improved which would stabilize the surrounding industrial and commercial real estate value and many suggested aviation expansion might lure additional logistics and technology (drone, autonomous vehicle, etc.) businesses. They believe that the land holds limited special value without the adjacent aviation use.

Many believe public-private partnerships might be used to develop the airport and surrounding real estate and used Midtown and Eastern Market as examples where bold leadership, forward looking strategies, and sound management have unlocked investment. They further noted that the City should take a "systems" and not "transactional" approach to revitalization of this area.

Finally, the two Tier 100 suppliers that are coming to the Mt. Elliott Employment District are likely the only two auto suppliers that Detroit may secure. Dependency on large auto suppliers was viewed as "a 1990s strategy" by the focus group participants.



## Phase I Observations

It will be important to address the current financial liability accruing against the City's budget associated due to the Airport's deficit and a City recently leaving bankruptcy needs to closely monitor elements of the budget that are not at a minimum revenue neutral. However, the Airport's \$1.7 million deficit (Table 6) is less than 1% of the City's \$1.9 billion overall annual budget,<sup>6</sup> and while many small airports do not make money or break even, most communities understand a small deficit is off-set by the economic impact the airport generates.

## Phase I Findings

The Phase I research focused on assessing the current use as an airport and what would be required to create a competitive general aviation airport that could reduce the costs to the City budget and generate a positive economic impact. Additional examination that focuses on the efficient use of facilities, identifying limited investments that would stabilize buildings for the short-term and the audit of unusually high utility costs might result in revenue neutral budget.

The City's current operating posture and the Airport's uncertain future undermine its ability to be revenue neutral. The City's unwillingness to enter into long-term agreements with a fixed base operator or leases for the construction of hangars and other improvements has limited investment at the airport. Alternatively, Oakland County International Airport has created an open, welcoming and flexible operating climate, resulting in significant private investment in hangars and related facilities.

At the same time, industry shifts and niche market opportunities could provide DET a competitive advantage. Many of the fees collected by DET have some elasticity and could be increased. PTK is overbuilt with T-hangars constructed before the economic downturn nearly a decade ago while fewer piston aircraft are expected to be delivered in the coming years as the industry moves to more jets. Additionally, the industry is expected to have a constant number of jets flying more hours per year. More jet hangars at DET would not only respond to demand for itinerant users, but would directly add to the Airport's revenue and when combined with increases in fees following strategic improvements could improve its financial position by as much as 20%.

While pilots are retiring the industry is expected to continue to need aviation professionals for both private and commercial enterprises. Restoring DET's educational activities and enhancing those services provided by the museums could also create an economic boon for the City.

The rationale for closing the Airport is based upon the challenge associated with land assembly and efforts to create large parcels of developable land, specifically for automotive suppliers and other advanced manufacturing/industrial uses. However, the research suggests that there are seldom more than one to two large users in any one industrial zone throughout the Detroit metropolitan area and the majority (80+%) of industrial users are on parcels of less than seven acres, many of which user one to two acre parcels. Although the City's land assembly challenges will not go away, land assembly of smaller parcels adjacent to the Airport could support long-term aeronautical-related users.

Uncertainty in any business creates risk and detours investment. The FBO operates on a year-to-year lease and as such, is not willing to make long-term investments in improving airport facilities because it is not assured of the opportunity to recover these costs. Similarly, the State and FAA are unwilling to provide grants for investments in the Airport infrastructure because of the stated goal of ending Airport operations and it is likely that a significant share of the necessary safety requirements could be funded by grants from these agencies. As an example, if Detroit gets a \$5 million FAA grant with a five percent match (\$250,000), the remaining \$4.5 million of the grant represents an economic benefit to Detroit because of the spending it generates in the local economy. This uncertainty also undermines the museums' ability to make long-term plans and to raise funds to improve/expand their facilities. The City has also been unwilling to make improvements and the buildings and grounds show signs of neglect.

<sup>6</sup> City of Detroit 2017-2018 Budget in Brief, page 5.

At the same time, this means there is no urgency to operate the facilities in the most efficient manner. Hangar bays in the Historic Executive Terminal are being used for a variety of storage for airport equipment and materials associated with the museums. Many items currently stored in the Historic Executive Terminal could be moved to renovated T-Hangars allowing the Terminal to generate additional revenue.

With the resurgence of Detroit's downtown and the investments made there, an airport within a few miles of downtown is a unique asset that could not be easily replicated. The research to date suggests that there is an opportunity to maintain the Airport for aviation use, which in turn could attract local, state, and federal public investment plus private investment. The City's investment should consider the Detroit Building Authority's assessment of strategic investments that will be necessary over time, with an initial focus on building stabilization and repair.

The Historic Executive Terminal might also attract significant investment for restoration through Historic Designation and a public-private partnership and the use of Historic Tax Credits. While the City does not have a Federal tax liability, the City could allow the sale of the historic building while maintaining the underlying land. The depreciable asset (the building) would be rehabbed and restored using the Secretary of Interior's Standards for Rehabilitation, which outlines how historic buildings must be treated in order to qualify for the tax credits. It is likely that a major retrofit of the hangar doors would not be allowed, limiting the building's use to medium sized business jets as larger planes move to new hangars constructed elsewhere on the grounds. The private ownership interests would enter into long term-leases with aircraft operators and the museums.

As attempts are made to maximize the use of and revenue associated with each of the buildings, a portion of the space could be dedicated to the proposed museums in a reasonable footprint that allows them to live out their mission, while also providing a reasonable rental income to the Airport, a cultural attraction and educational magnet. Both museums indicated they had funding available for investment at the Airport. Long-term tenancy will also give these institutions the certainty to do strategic planning, fund raise, hire staff and also make future investments in the building. If the museums make a significant contribution the buildings' restoration through a capital campaign or gift, the ownership structure could include the museums. Land control and thoughtful plans have allowed cultural institutions to come together under the University Cultural Center Association, through which they cooperatively laid the foundation for what has been the centerpiece of Detroit's recent revitalization – the investment in and around Midtown.

## Glossary

**Air Traffic Control (ATC)** – ATC is the provision of air navigation services to aircraft pilots on the ground and in the air to ensure safe and efficient aircraft operations.

**Aircraft Approach Category (AAC)** – AAC means a grouping of aircraft based on reference landing speed (if specified) or stalling speed (if not specified) at the maximum certificated landing weight.

**Aircraft Owners and Pilots Association (AOPA)** – AOPA is an association of aircraft owners and pilots with the mission to advocate on behalf of its members; educate pilots, nonpilots, and policy makers; support activities that ensure the long-term health of General Aviation; fight to keep General Aviation accessible to all; and secure sufficient resources to ensure its success.

**Aircraft Rescue and Firefighting (ARFF)** – ARFF is the response, hazard mitigation, evacuation, and possible rescue of people involved in an aircraft emergency on the ground.

**Airport Improvement Program (AIP)** – The AIP is an FAA-administered program that provides grants to public agencies (and, in some cases, to private owners and entities) for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS).

**Ann Arbor Municipal Airport (ARB)** – The Ann Arbor Airport is a municipally owned airport operating 24 hours a day, seven days a week. The airport maintains a 3,500-foot concrete runway and a 2,750-foot seasonal turf runway to serve public and business flights, medical flights, flight instruction and charter services. The Ann Arbor Control Tower, operated by the FAA, provides air traffic control services daily from 8 am to 8 pm. The Airport is home to more than 180 aircraft and handles approximately 60,000 operations (take-off/landings) per year. These aircraft are housed in 150 T-hangars, six box hangars and a few other hangars owned and leased out by the Airport. Tie down spaces on the airport ramp are also available on a short term (daily/overnight) or long term (monthly/annual) basis.

**Average Annual Growth Rate (AAGR)** – The AAGR is the average change over a specified interval of time. It is calculated by taking the arithmetic mean of the growth rate over the specified time periods.

**Bishop International Airport (FNT)** – FNT is located in Flint, Michigan and is served by five scheduled passenger airlines.

**Building Owners and Managers Association (BOMA)** – Founded in 1908, BOMA of Metro Detroit is a professional, nonprofit trade association whose 400+ members either own or manage commercial real estate, or provide goods and services to the industry. BOMA Michigan members represent organizations managing more than 250 million square feet of commercial office space and support over 24,000 jobs. Michigan members' annual expenditures contribute \$3 billion to the state's economy.

**Canton-Plymouth-Mettetal Airport (1D2)** – 1D2 is owned and operated by MDOT and is located in Canton, Michigan. The airport has a 2,300-foot paved runway and offers T-hangars and box hangars for aircraft storage.

**Capital Region International Airport (LAN)** – LAN is located in Lansing, Michigan and is owned and operated by the Capital Region Airport Authority. The airport is served by three scheduled passenger airlines.

**Civil Air Patrol (CAP)** – The CAP is the official auxiliary of the United States Air Force and a 501 (c)3 nonprofit organization. CAP supports America's communities with emergency/disaster response, aviation and ground team services; youth development; and promotion of air and space power.

**Coleman A. Young Municipal Airport (DET)** – The Coleman A. Young Municipal Airport is the Airport's official name. It is marketed as the Coleman A. Young International Airport, but is still most commonly referred to as City Airport. The names are used interchangeably by those familiar with the Airport. The location identifier assigned to the Airport by the Federal Aviation Administration (FAA) is DET.

**Detroit Building Authority (DBA)** – The Detroit Building Authority manages the blight demolition program for the City of Detroit.



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INTERNATIONAL AIRPORT AUTHORITY

Detroit Metropolitan Wayne County Airport (DTW) – DTW is commonly known as Detroit Metro Airport and is Michigan's largest and busiest airport. The airport is served by numerous scheduled passenger and cargo airlines. The airport is operated by the Wayne County Airport Authority.

Engineered Material Arresting System (EMAS) – An EMAS uses materials of closely controlled strength and density placed at the end of a runway to stop or greatly slow an aircraft that overruns the runway. The best material found to date is a lightweight, crushable concrete. When an aircraft rolls into an EMAS arrestor bed, the tires of the aircraft sink into the lightweight concrete and the aircraft is decelerated by having to roll through the material.

FAA Aerospace Forecast – The FAA Aerospace Forecast is developed to support budget and planning needs of the FAA. The forecasts are developed using statistical models to explain and incorporate emerging trends of the different segments of the aviation industry. This year's document contains updated forecasts for US airline traffic and capacity, FAA workload, General Aviation activity and pilots, as well as Unmanned Aircraft System (UAS) fleet and remote pilots.

Federal Aviation Administration (FAA) – The FAA regulates and oversees all aspects of civil aviation in the United States.

Federal Aviation Regulation (FAR) – FARs are regulations controlling all aspects of civil aviation in the United States. They are promulgated by the FAA and codified in Title 14 of the Code of Federal Regulations.

Fiscal Year (FY) – A fiscal year is the period used by a company or government for accounting purposes.

Fixed Base Operator (FBO) – An FBO is a commercial business that provides aeronautical services (such as fueling, aircraft storage, aircraft parking, aircraft rental, and aircraft maintenance) at an airport with the permission of the airport sponsor.

Form 5010 – The FAA's Office of Aeronautical Information maintains a database of descriptive information of U.S. airports. The information is collected via FAA Airport Master Record (Form 5010).

General Aviation (GA) – All civilian aviation except for scheduled passenger or cargo airlines. General aviation includes a wide variety of aviation activity, including air taxi, corporate flight departments, fractional aircraft ownership programs, sightseeing flights, air medical services, agricultural flying, civilian government aircraft operations, flight training, flying clubs, and personal flying. General aviation aircraft can range from non-powered aircraft such as gliders to large jet aircraft with multiple engines.

Gross Domestic Product (GDP) – Gross domestic product is the value of the goods and services produced by the nation's economy less the value of the goods and services used up in production. GDP is also equal to the sum of personal consumption expenditures, gross private domestic investment, net exports of goods and services, and government consumption expenditures and gross investment.

Gross Landing Weight (GLW) – The gross landing weight is the maximum weight that an aircraft is permitted to be at due to design or operational limitations during landing.

Gross Takeoff Weight (GTW) – The gross takeoff weight is the maximum weight that an aircraft is permitted to be at due to design or operational limitations at takeoff.

Grosse Ile Municipal Airport (ONZ) – ONZ is a publicly-owned airport located in Grosse Ile, Michigan. It has one paved 4,800-foot runway and one paved 4,400-foot runway.

High Intensity Runway Lights (HIRL) – HIRL are one type of a runway edge light system, which is used to outline the edges of a runway during times of darkness or poor visibility.

Instrument Flight Rules (IFR) – Flight rules adopted by the FAA governing aircraft flight using visual references. VFR operations specify the amount of ceiling and the visibility the pilot must have in order to operate according to these rules. When the weather conditions are such that the pilot cannot operate according to VFR, he or she must use instrument flight rules (IFR).

Light Sport Aircraft (LSA) – A LSA is an aircraft (other than a helicopter or powered-lift) that, since its original certification, meets a number of conditions, principally the restriction of maximum takeoff weight to 1,320 pounds for aircraft not intended for operation on water.

Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) – The MALSR is a navigation aid installed in airport runway approach zones along the extended centerline of the runway. The MALSR, consisting of a combination of threshold lamps, steady burning light bars and flashers, provides visual information to pilots on runway alignment, height perception, roll guidance, and horizontal references for Category I Precision Approaches.

Medium Intensity Runway Lights (MIRL) – MIRL are one type of a runway edge light system, which is used to outline the edges of a runway during times of darkness or poor visibility.

Metropolitan Statistical Area (MSA) - The metropolitan statistical areas used by BEA for its entire series of GDP statistics are the July 2015 county-based definitions developed by the Office of Management and Budget (OMB) for federal statistical purposes. OMB's general concept of a metropolitan area is that of a geographic area consisting of a large population nucleus together with adjacent communities having a high degree of economic and social integration with the nucleus.

Michigan Aviation System Plan (MASP) – The MASP was commissioned by the Michigan Department of Transportation to provide an update to a similar study produced in 2008. The MASP focuses on the 114 public-use airports in Michigan that have been acknowledged as critical to state aviation system. Facility development goals, system accessibility, activity forecasts, and economic impacts are discussed for each of the airports included in the MASP.

Michigan Department of Transportation (MDOT) –MDOT is responsible for Michigan's 9,669-mile state highway system, comprised of all M, I, and US routes. MDOT also administers other state and federal transportation programs for aviation, intercity passenger services, rail freight, local public transit services, the Transportation Economic Development Fund (TEDF), and others.

Michigan Economic Development Corporation (MEDC) – The Michigan Economic Development Corporation is the state's marketing arm and lead advocate for business development, job awareness and community and talent development with the focus on growing Michigan's economy.

National Business Aviation Association (NBAA) – The National Business Aviation Association is the leading organization for companies that rely on general aviation aircraft to help make their businesses more efficient, productive and successful. The association represents more than 11,000 companies and provides more than 100 products and services to the business aviation community, including the NBAA Business Aviation Convention & Exhibition, the world's largest civil aviation trade show.

Oakland County International Airport (PTK) – PTK is the 118<sup>th</sup> busiest airport in the United States and serves more than 500,000 passengers and pilots per year. More than 550 private and corporate aircraft are based at PTK.

Oakland Southwest Airport (Y47) – Y47 is a publicly-owned airport located in New Hudson, Michigan. The airport has a 3,100-foot paved runway.

Oakland/Troy Airport (VLL) – VLL is located in Troy, Michigan and is the executive airport serving Oakland County. Business travelers and tourists using private, corporate and charter aircraft benefit from the airport's convenient proximity to business, recreation and entertainment facilities. Charter passenger, air freight, as well as aircraft maintenance and fuel, are available on the field.

Original Equipment Manufacturer (OEM) – An original equipment manufacturer is a company that produces parts and equipment that may be marketed by another manufacturer.

Pavement Condition Index (PCI) – The PCI is a numerical indicator that reflects the structural integrity and surface operational condition of a pavement. It is based on an objective measurement of the type, severity, and quantity of distress.

Ray Community Airport (57D) – 57D is privately-owned, public use airport located in Ray, Michigan. The airport has one 2,500-foot paved runway and a 2,200-foot paved/turf runway.

Romeo State Airport (D98) – D98 is owned and operated by MDOT and is located in Romeo, Michigan. The airport has a 4,000-foot paved runway.

Rough Order of Magnitude (ROM) – A ROM estimate is an estimate of costs provided in the early stages of a project when the project's scope and requirements have not been fully defined.

Runway End Identifier Lights (REIL) – The REIL system provides rapid and positive identification of the end of the runway. The system consists of two synchronized, unidirectional flashing lights. The lights are positioned on each corner of the runway landing threshold, facing the approach area and aimed at an angle of 10 to 15 degrees.

Runway Safety Area (RSA) – The FAA requires that commercial airports, regulated under Part 139 safety rules and federally obligated, have a standard RSA where possible. At most commercial airports the RSA is 500 feet wide and extends 1,000 feet beyond each end of the runway. The FAA has this requirement in the event that an aircraft overruns, undershoots, or veers off the side of the runway.

Segmented Circle – A segmented circle is a navigation aid that aids a pilot in locating an airport and provides a centralized location for such indicators and signal devices as may be required on a particular airport.

Snow Removal Equipment (SRE) – Airports use SRE during winter storms to remove snow and ice from runways and taxiways.

Terminal Area Forecast (TAF) – The TAF is the official FAA forecast of aviation activity for U.S. airports. It contains active airports in the National Plan of Integrated Airport Systems (NPIAS) including FAA-towered airports, Federal contract-towered airports, nonfederal towered airports, and non-towered airports. Forecasts are prepared for major users of the National Airspace System including air carrier, air taxi/commuter, general aviation, and military. The forecasts are prepared to meet the budget and planning needs of the FAA and provide information for use by state and local authorities, the aviation industry, and the public.

T-Hangar – T-hangars are structures designed to store light general aviation aircraft and are primarily used at general aviation airports.

Traffic Flow Management System (TFMS) – TFMS is a data exchange system for supporting the management and monitoring of national air traffic flow. TFMS processes all available data sources such as flight plan messages, flight plan amendment messages, and departure and arrival messages. The FAA's airspace lab assembles TFMS flight messages into one record per flight. TFMS is restricted to the subset of flights that fly under IFR and are captured by the FAA's enroute computers. Most VFR and some non-enroute IFR traffic is excluded.

Traffic Flow Management System Counts (TFMSC) – TFMSC provides information on traffic counts by airport or by city pair for various data groupings such as aircraft type or by hour of the day (city pair) from TFMS.

Urban Land Institute (ULI) – The Urban Land Institute is a 501(c) (3) nonprofit research and education organization supported by its members around the globe, representing the entire spectrum of land use and real estate development disciplines working in private enterprise and public service. ULI facilitates an open exchange of ideas, information, and experience among industry leaders and policy makers dedicated to best practices in land use policy and practice.

Visual Flight Rules (VFR) – VFR flight is based on the principle of "see and avoid" which means that weather conditions must be clear enough to allow the pilot to see other aircraft, obstructions, and the ground.

Willow Run Airport (YIP) – YIP serves cargo, corporate, and general aviation clients and is the third busiest airport in Michigan. The airport is operated by the Wayne County Airport Authority.