Leigh | Fisher

DRAFT TECHNICAL MEMORANDUM NO. 4

ASSESSMENT OF EXISTING CONDITIONS

Airport Master Plan Update

Detroit Metropolitan Wayne County Airport

Prepared for

Wayne County Airport Authority

Detroit, Michigan

March 2016

DETROIT METRO • WILLOW RUN

WAYNE COUNTY AIRPORT AUTHORITY

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CONTENTS *(continued)*

TABLES

TABLES *(continued)*

FIGURES

1.0 INTRODUCTION AND AIRPORT OVERVIEW

In accordance with Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, the information contained in this Technical Memorandum represents the first element of an update to the 2009 Master Plan for Detroit Metropolitan Wayne County Airport (the Airport). The purpose of the Master Plan Update is to provide guidance for the continued improvement of the Airport for the 20-year planning horizon and beyond.

This Technical Memorandum provides background data on the Airport and a comprehensive inventory of existing Airport facilities and conditions. The information will provide the basis for determining future facility requirements and the formulation of Airport development alternatives. The Technical Memorandum is organized as follows:

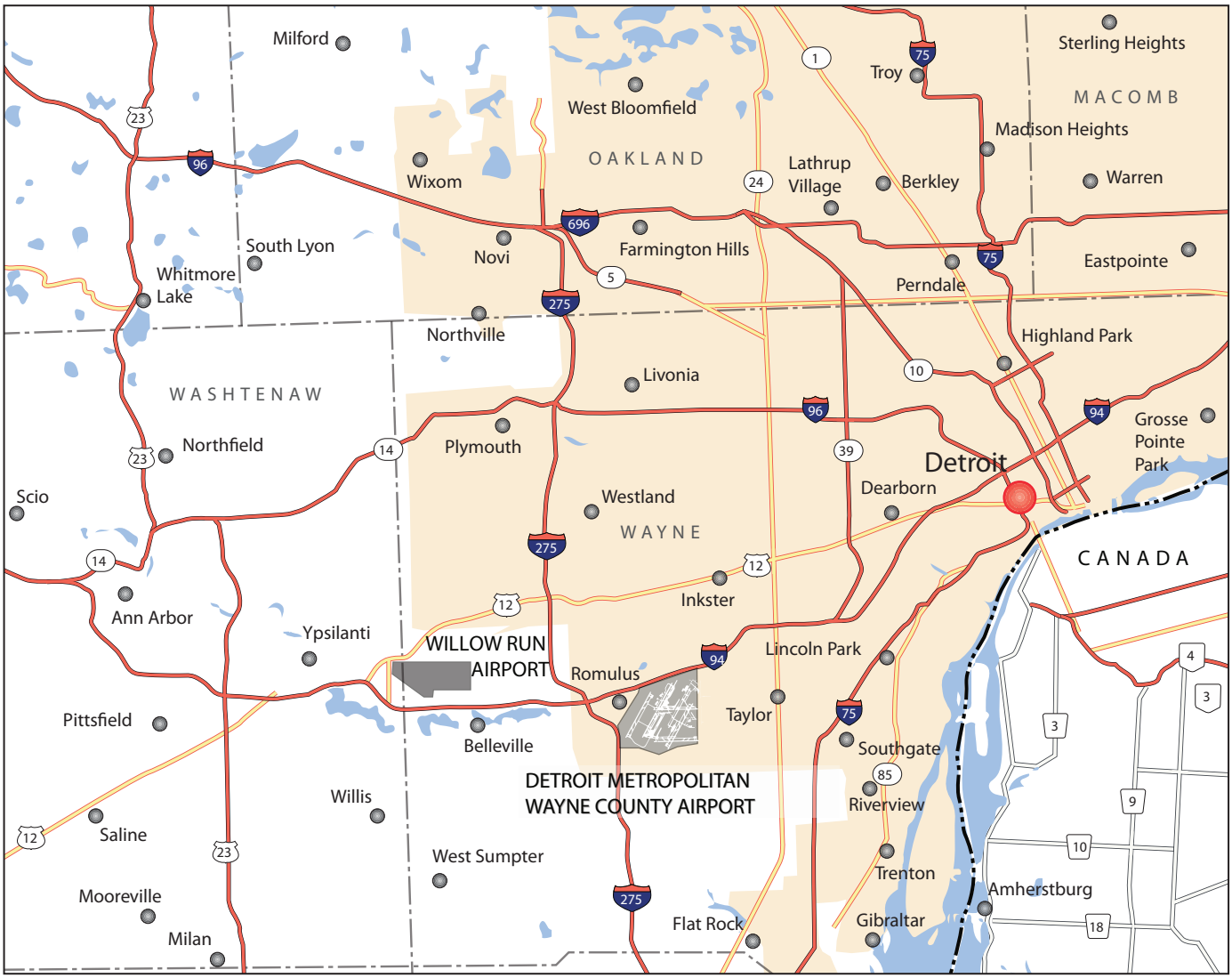
1.0 – Introduction and Airport Overview
2.0 – Airfield and Airspace
3.0 – Passenger Terminal Complex
4.0 – Ground Transportation and Parking
5.0 – Air Cargo
6.0 – General Aviation and Military
7.0 – Airline and Airport Support
8.0 – Environmental Conditions
Appendix A – Runway Protection Zone Inventory
Appendix B – 2011 Traffic Count
Appendix C – Curbside and Ground Transportation Center Level of Service Analysis
Appendix D – Utilities Capability Assessment

1.1 Airport Setting

The Airport is owned and operated by Wayne County Airport Authority (the Authority). As shown on Figure 1-1, the Airport is located in the city of Romulus, about 21 miles west of downtown Detroit and 25 miles east of Ann Arbor. As of 2013, Detroit had an estimated population of 688,700, making it the largest city in the state of Michigan; the fourth largest in the Midwest region; and the 18th largest in the United States.

The Airport is classified in the FAA's National Plan of Integrated Airport Systems (NPIAS) as a Commercial Service Primary Airport, serving origin-destination passengers (i.e., passengers beginning or ending their air journeys in Detroit) and connecting passengers transferring from one flight to another. The Airport is an important passenger connecting hub in the route system of Delta Air Lines and its regional/commuter affiliates. According to 2014 data published by Airports Council International-North America, the Airport is the nation's 17th busiest airport in terms of passenger traffic; 16th busiest in terms of total aircraft operations; and 25th busiest in terms of air cargo tonnage.

In addition to Delta, the Airport also accommodates numerous other air carriers, including: Air France, Alaska Airlines, American Airlines and its affiliates, Frontier Airlines, Icelandair, JetBlue Airways, Lufthansa, Royal Jordanian, Southwest Airlines, Spirit Airlines, United Airlines and its affiliates, and Virgin Atlantic.



LEGEND

- Urban areas
- International boundary
- County boundary

N

2.5 0 2.5 5

Graphic Scale in Miles

Figure 1-1
VICINITY MAP

Assessment of Existing Conditions
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1.2 Airport Site

The Airport occupies an approximate 6,200-acre site that is bounded by Goddard Road to the north; Middle Belt Road to the east; Eureka Road to the south; and Wayne and Vining roads to the west. Primary access is provided from the north via W G Rogell Drive and from the south via John D Dingell Drive.

Figure 1-2 presents the overall Airport site, which consists of the following primary components:

- **Airfield** – The airfield occupies about 55% of the total Airport land area, and includes six runways (four north-south parallel runways and two east-west cross-wind runways), and associated taxiways, aprons, hold pads, and other safety-related protection zones.

- **Passenger Terminal Complex** – The passenger terminal complex includes two terminals with four concourses accommodating 147 aircraft gates; passenger processing facilities that accommodate ticketing, baggage claim, and security screening functions; ground transportation facilities including access roadways, parking garages, and surface parking lots; air cargo terminals (belly freight); and an on-Airport hotel.

- **Air Cargo** – The air cargo area includes facilities for United Parcel Service, Delta Air Lines, FedEx, the United States Postal Service, and a consolidated facility operated by other airlines.

- **General Aviation** – One fixed base operator (FBO)—Signature Flight Support—is located on the north side of the Airport and provide a range of services for general aviation users, including fueling and maintenance.

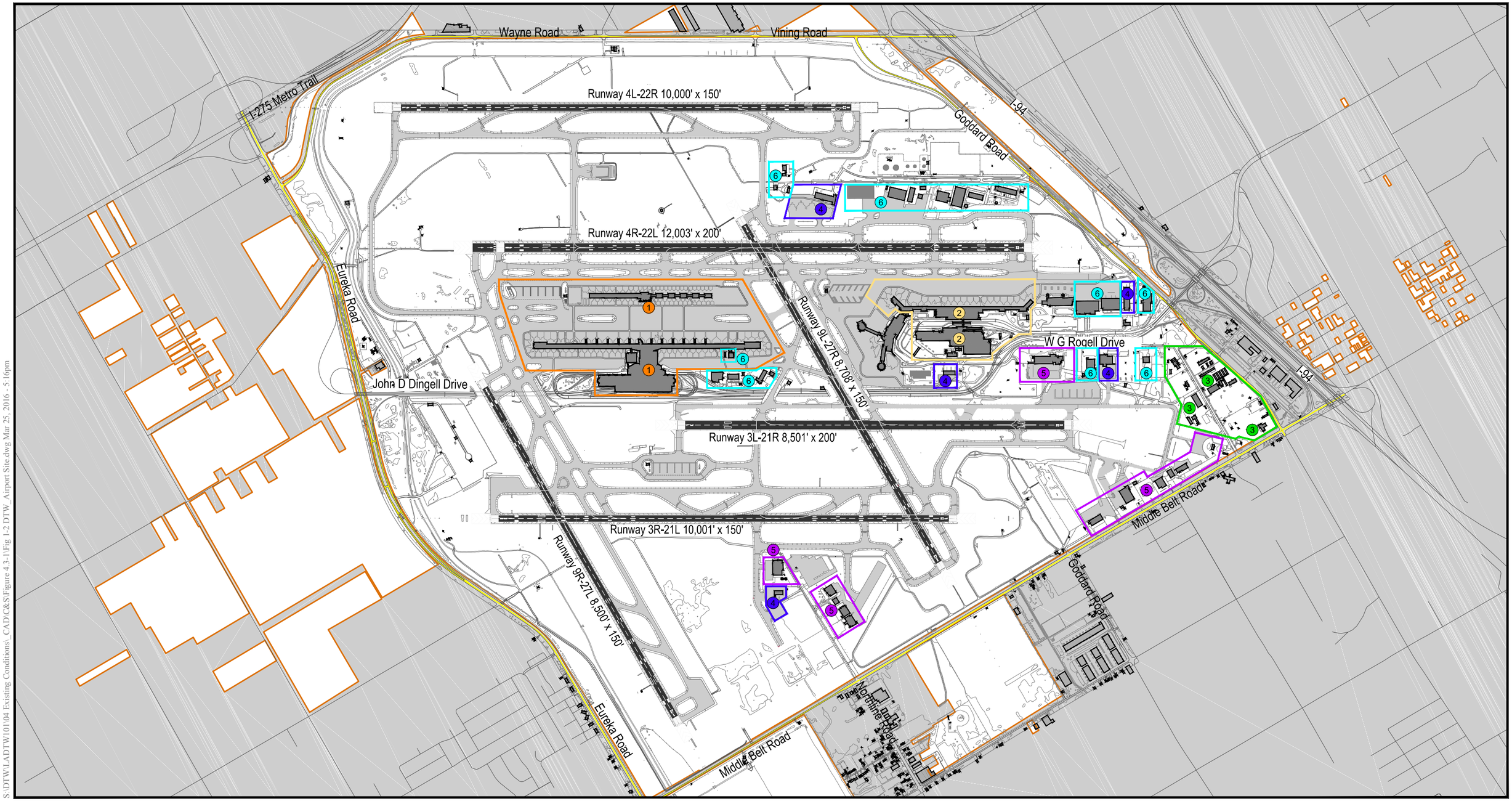
- **Rental Car** – Rental car storage, customer processing and ready/return facilities are located on the north side of the Airport, along Lucas Drive. Customers are bussed to and from the terminal Ground Transportation Centers (GTCs) via company-operated shuttles.

- **Support Facilities** – Primary support facilities are located throughout the site, and include: airline maintenance facilities; airline catering and flight kitchens; a fuel farm located on the northwest side of the Airport; deicing control facilities; FAA airport traffic control facilities; employee parking; Aircraft Rescue and Firefighting (ARFF); and airfield maintenance and support facilities.

1.3 Airport Access

Access to the Airport is provided predominately via Interstate 94 (I-94), Interstate 275 (I-275), Merriman Road, Eureka Road, and John D Dingell Drive. Vehicles traveling to the passenger terminal complex from I-94 typically use Merriman Road, which provides direct entry to the passenger terminal curbsides and parking facilities and is renamed W G Rogell Drive once on Airport property. Secondary access to and from the terminal complex is also provided via Eureka Road which connects to John D Dingell Drive. Eureka Road connects to I-275 just west of the Airport.

Vehicles traveling to and from the aviation-related facilities located along Lucas Drive, which include the rental car facilities, use Middle Belt Road to connect to I-94. Access to facilities on the west side of the airfield is provided by Goddard Road and West Service Road.



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LEGEND

- Airport property line
- Airport perimeter roadways

1. McNamara Terminal and parking facilities
2. North Terminal and parking facilities
3. Rental car facilities
4. Air cargo facilities
5. General aviation facilities
6. Airline and Airport support facilities

NORTH

0 1000' 2000' 4000'

Figure 1-2
AIRPORT SITE

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
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1.4 Existing Land Uses

Existing Airport land uses are depicted on Figure 1-3. The use and acreage of Airport land by functional designation is presented in Table 1-1, and defined below.

- **Airfield** – Runways, taxiways, aprons and safety areas related to the movement of aircraft
- **Passenger Terminal** – Passenger terminal/concourse buildings
- **Ground Transportation and Parking** – Landside facilities including primary roadways, terminal curbsides, and vehicle parking
- **Air Cargo** – Areas utilized and dedicated to the movement, distribution, and delivery of cargo
- **General Aviation** – FBO and aircraft service areas where aviation services are provided to general aviation users; includes hangars, parking aprons, offices, fuel storage, etc.
- **Aviation Support** – Facilities associated with, but not part of, the passenger terminal facilities, include car rental, airline catering, ground support equipment, employee parking, etc.
- **Vacant/Reserved** – Areas owned and controlled by the Authority for future aviation- and/or non-aviation related development
- **Commercial Development** – Properties leased to private entities for office, warehouse, and other revenue-generating development

Large areas of Airport property located south of the Airport were acquired by the Authority for noise mitigation purposes. Although much of this land is currently undeveloped, the areas are available for future aviation and non-aviation related development.

Table 1-1
EXISTING AIRPORT LAND USES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Land use	Area (acres)	% of total
Airfield	3,404	55%
Passenger Terminal	139	2
Ground Transportation and Parking	376	6
Air Cargo	38	1
General Aviation	86	1
Aviation Support	131	2
Vacant/Reserved	2,032	33
Commercial Development	17	>1
Total	6,224	100%

Source: LeighFisher, January 2016.

VINING ROAD
I-275 METRO TRAIL
RUNWAY 4L-22R 10,000' X 150'
RICHARD ROAD
DETROIT INDUSTRIAL EXPRESSWAY (I-94)
RUNWAY 4R-22L 12,003' X 200'
EUREKA ROAD
JOHN D DINGELL DRIVE
W G ROGELL DRIVE
JOHN D DINGELL DRIVE
RUNWAY 3L-21R 8,501' X 200'
RUNWAY 9L-27R 8,708' X 150'
RUNWAY 3R-21L 10,001' X 150'
RUNWAY 9R-27L 8,500' X 150'
MIDDLEBELT ROAD
GOODNER ROAD
EUREKA ROAD
NORTHLINE ROAD
MIDDLEBELT ROAD

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LEGEND

- Airfield
- Passenger terminal
- Ground transport and parking
- Air cargo
- General aviation
- Aviation support
- Vacant / reserved
- Commercial development

NORTH

0 1000' 2000' 4000'

Figure 1-3
ON-AIRPORT LAND USES

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
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1.5 On-Going Studies

The Authority has several ongoing studies that are being prepared concurrent with the Master Plan Update. These studies include:

- Project OASIS – beautification and wayfinding project for the north entrance to the Airport
- Economy parking – expanding economy parking south of the McNamara Terminal to help balance demand and increase customer service
- Yellow Lot conversion – exploring the potential of reopening the Yellow Lot for employee parking
- Rogell-Burton Intersection Geometry Study – studying the use of a "Michigan u-turn" to improve flow at this intersection
- Planning and Design Related Services for Rental Car Facility Improvements – on-call contract for rental car related projects

The results and conclusions of these studies will be incorporated into relevant portions of the Master Plan Update throughout the planning process.

2.0 AIRFIELD AND AIRSPACE

This section provides an overview of existing airfield facilities at the Airport as well as aids to navigation and airspace provisions.

2.1 Airfield

Airfield facilities include those that directly support aircraft operations such as the runways, taxiways, aprons, and navigational aids (NAVAIDs). Figure 2-1 depicts the Airport's airfield configuration.

2.1.1 Runways

The Airport has six runways, including four parallel runways oriented northeast-southwest (designated 4L-22R, 4R-22L, 3L-21R, and 3R-21L) and two parallel runways oriented east-west (designated 9L-27R and 9R-27L). The published lengths and widths of each runway are presented in Table 2-1. Runway 4R has a displaced arrival threshold of 509 feet, which impacts the landing distance available.

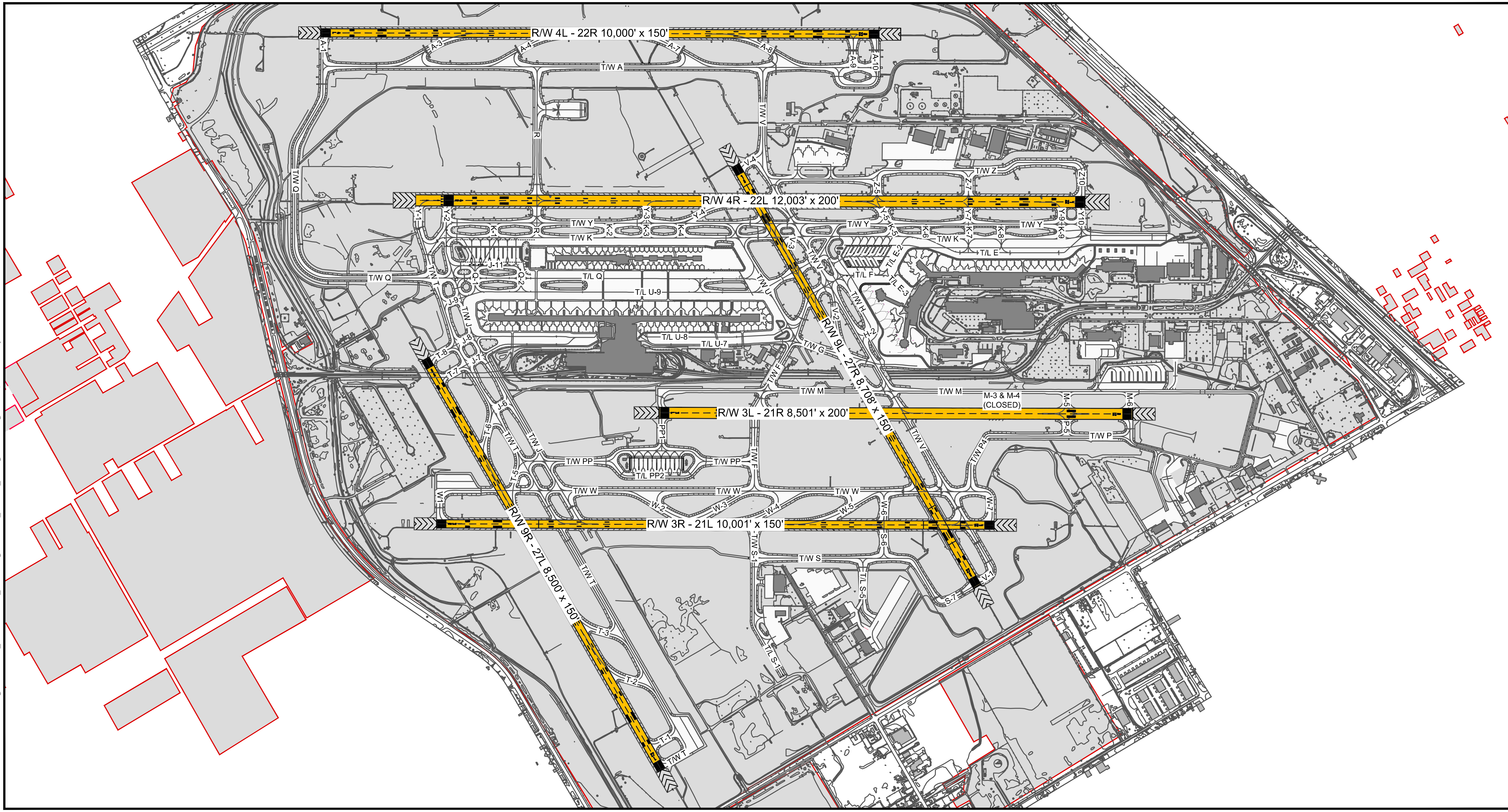
Table 2-1
RUNWAY DIMENSIONS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Runway	Length (ft)	Width (ft)
4L-22R	10,000	150
4R-22L	12,003	200
3L-21R	8,501	200
3R-21L	10,001	150
9L-27R	8,708	150
9R-27L	8,500	150

Source: Federal Aviation Administration, Airport Facility Directory, February 2016.

2.1.1.1 Runway Design Code

The existing Runway Design Codes (RDC) for each runway end are summarized in Table 2-2, which also presents approach visibility minima, decision height, and the instrument approach category for each runway end. The approach visibility minima and decision height is determined by the lowest available approach for Aircraft Approach Category (AAC) D aircraft for each runway end.



LEGEND

- Runway pavement
- Taxiway / Apron pavement
- Airport properrty line
- Existing building on-airport

Source: HNTB

NORTH

0 850' 1700' 3400'

Figure 2-1
AIRFIELD CONFIGURATION

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

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Table 2-2
RUNWAY DESIGN CODE DESIGNATIONS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Runway	RDC	Approach visibility minimum	Decision height (ft)	Instrument approach category
4L	D/V/1200	600 feet	0	CAT IIIB
22R	D/V/1600	1,200 feet	100	SA CAT II
4R	D/V/1200	600 feet	0	CAT IIIB
22L	D/V/1600	1,200 feet	100	SA CAT II
3L	D/V/VIS	3 miles	1,000	Visual
21R	D/V/VIS	3 miles	1,000	Visual
3R	D/V/1200	600 feet	0	CAT IIIB
21L	D/V/1600	1,200 feet	100	SA CAT II
9L	D/V/VIS	3 miles	1,000	Visual
27R	D/V/2400	1/2 mile	200	CAT I
9R	D/V/VIS	3 miles	1,000	Visual
27L	D/V/1600	1,600 feet	100	SA CAT II

Source: Federal Aviation Administration, Terminal Procedures Publication/Airport Diagrams, February 2016.

2.1.1.2 Runway Bearing Strengths

Table 2-3 summarizes the runway pavement bearing strengths for each runway at the Airport.

Table 2-3
RUNWAY STRENGTH
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Landing gear system	4L-22R	4R-22L	3L-21R	3R-21L	9L-27R	9R-27L
Single wheel (SW)	100	100	100	100	100	100
Double wheel (DW)	200	185	185	200	185	185
Dual tandem (DTW)	350	350	350	350	350	350
Double dual tandem (DDTW)	750	N/A	N/A	750	N/A	N/A

Note: Runway bearing strengths are shown in thousand pounds (000 pounds).

Source: Federal Aviation Administration, Airport Facility Directory, February 2016.

2.1.1.3 Declared Distances

Table 2-4 presents the declared distances for each runway end for takeoff run available (TORA), takeoff distance available (TODA), accelerate-stop distance available (ASDA), and the landing distance available (LDA).

Table 2-4
RUNWAY DECLARED DISTANCES (in feet)
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Runway	TORA *(a)*	TODA *(b)*	ASDA *(c)*	LDA *(d)*
4L	10,000	10,000	10,000	10,000
22R	10,000	10,000	10,000	10,000
4R	12,003	12,003	12,003	11,494
22L	12,003	12,003	12,003	12,003
3L	8,501	8,501	8,501	8,501
21R	8,501	8,501	8,501	8,501
3R	10,001	10,001	10,001	10,001
21L	10,001	10,001	10,001	10,001
9L	8,708	8,708	8,618	8,618
27R	8,708	8,708	8,708	8,708
9R	8,500	8,500	8,500	8,500
27L	8,500	8,500	8,500	8,500

(a) The length of the runway less any length of runway available and or unsuitable for takeoff run computations.
(b) The TORA plus any length of any remaining runway and or clearway beyond the far end of the TORA.
(c) The length of the runway plus the length of any stopway beyond the far end of the runway less any length of runway and or stopway unavailable and / or unsuitable for landing distance computations.
(d) The runway length declared available and suitable for a landing aircraft.

Source: Federal Aviation Administration, Airport Facility Directory, February 2016.

2.1.1.4 Runway Protected Areas

The dimensions of Runway protected areas are presented in Table 2-5. The protected areas are generally based on the size of the aircraft utilizing the runway and approach visibility minimums, with larger aircraft and lower approach visibility minima resulting in larger required protected areas.

Table 2-5
RUNWAY DIMENSIONAL STANDARDS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Geometry Element	Runway 4L	Runway 22R	Runway 4R	Runway 22L	Runway 3L	Runway 21R	Runway 3R	Runway 21L	Runway 9L	Runway 27R	Runway 9R	Runway 27L
Runway Length	10,000’	10,000’	12,003’	12,003’	8,501’	8,501’	10,001’	10,001’	8,708’	8,708’	8,500’	8,500’
Displaced Threshold Length	N/A	N/A	509’	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Runway Width	150’	150’	200’	200’	200’	200’	150’	150’	150’	150’	150’	150’
Runway Design Code	D/V/1200	D/V/1600	D/V/1200	D/V/1600	D/V/VIS	D/V/VIS	D/V/1200	D/V/1600	D/V/VIS	D/V/2400	D/V/VIS	D/V/1600
Approach Visibility Minimum	600’	1,200’	600’	1,200’	3 miles	3 miles	600 feet	1,200’	3 miles	0.5 mile	3 miles	1,600’
Runway Shoulder Width	35’	35’	39’	39’	*0’*	*0’*	35’	35’	35’	35’	35’	35’
Runway Blast Pad Width	220’	220’	281’	281’	220’	220’	220’	220’	220’	220’	220’	220’
Runway Blast Pad Length	400’	400’	400’	434’	443’	400’	400’	400’	400’	400’	400’	400’
Runway Centerline to Holdbars Distance	286’	286’	286’	286’	256’	256’	286’	286’	286’	286’	286’	286’
Maximum Crosswind Component	20 knots	20 knots	20 knots	20 knots	20 knots	20 knots	20 knots	20 knots	20 knots	20 knots	20 knots	20 knots
Runway Marking Type	Precision	Precision	Precision	Precision	Non Precision	Non Precision	Precision	Precision	Precision	Precision	Precision	Precision
Pavement Surface Type	PCC	PCC	PCC	PCC	PCC/AC	PCC/AC	PCC	PCC	PCC	PCC	PCC	PCC
Runway Safety Area Width	500'	500’	500’	500’	500’	500’	500’	500’	500’	500’	500’	500’
Runway Safety Area Length Beyond Stop End	1,000'	1,000'	1,000'	1,000'	1,000'	1,000'	1,000'	1,000'	*911’*	1,000'	1,000'	1,000'
Runway Safety Area Length Prior to Landing Threshold	600'	600'	600'	600'	600'	600'	600'	600'	600'	600'	600'	600'
Runway Object Free Area Width	800'	800'	800'	800'	800'	800'	800'	800'	800'	800'	800'	800'
Runway Object Free Area Length Beyond Stop End	1,000'	*988'*	1,000'	1,000'	1,000'	1,000'	1,000'	1,000'	*392’*	1,000’	1,000'	*926’*
Runway Object Free Area Length Prior to Landing Threshold	600'	600'	600'	600'	600'	600'	600'	600'	600'	600'	600'	600'
Runway Obstacle Free Zone Width	400'	400'	400'	400'	400'	400'	400'	400'	400'	400'	400'	400'
Runway Obstacle Free Zone Length Beyond Stop End	200'	200'	200'	200'	200'	200'	200'	200'	200'	200'	200'	200'
Arrival Runway Protection Zone Length	2,500’	2,500’	2,500’	2,500’	1,700’	1,700’	2,500’	2,500’	1,700’	2,500’	1,700’	2,500’
Arrival Runway Protection Zone Inner Width	1,000’	1,000’	1,000’	1,000’	500’	500’	1,000’	1,000’	500’	1,000’	500’	1,000’
Arrival Runway Protection Zone Outer Width	1,750’	1,750’	1,750’	1,750’	1,010’	1,010’	1,750’	1,750’	1,010’	1,750’	1,010’	1,750’
Departure Runway Protection Zone Length	1,700’	1,700’	1,700’	1,700’	1,700’	1,700’	1,700’	1,700’	1,700’	1,700’	1,700’	1,700’
Departure Runway Protection Zone Inner Width	500’	500’	500’	500’	500’	500’	500’	500’	500’	500’	500’	500’
Departure Runway Protection Zone Outer Width	1,010’	1,010’	1,010’	1,010’	1,010’	1,010’	1,010’	1,010’	1,010’	1,010’	1,010’	1,010’

Note: Red, italicized text denotes that a standard is not met
PCC: Portland Cement Concrete
AC: Asphalt Concrete

Source: Federal Aviation Administration, Advisory Circular 150/5300-13A*, Airport Design* Change 1 and HNTB Analysis, February 2016.

2.1.1.5 Runway Protection Zone Inventory

An inventory of objects and land uses in the Runway Protection Zone (RPZ) for each runway end was completed and is summarized in Appendix A. Objects are classified by their type, description, designation of on- or off-airport, whether or not they are within the Central Portion of the RPZ, and whether or not it is an allowable use. Land use is controlled based on various guidance, including FAA AC 150/5300-13A, *Airport Design* and FAA's *Memorandum for Interim Guidance on Land Uses Within a Runway Protection Zone* (September 27, 2012).

2.1.2 Taxiways

FAA criteria for taxiway width and taxiway shoulder width are defined in terms of the Taxiway Design Group (TDG) of an aircraft, which is a function of undercarriage dimensions. The Airport's critical TDG is 6, representative of the Boeing 777-300ER aircraft. The taxiway network is depicted on Figure 2-1.

Starting on the west side of the Airport, Taxiway A is a full-length parallel taxiway for Runway 4L-22R and is connected to the runway by eight exit-taxiways. Taxiway A is 75 feet wide while the exit-taxiways are each at least 115 feet wide. Taxiway Q is a 75 feet wide end-around taxiway connecting to the 4L end of Runway 4L-22R. North of Taxiway Q, connecting Taxiway A with the McNamara Terminal ramp area, is Taxiway R. This ramp connector is 75 feet wide. Also connecting to Taxiway A and located north of Taxiway R is Taxiway V. Taxiway V also serves as a full-length parallel to Runway 9L-27R and is connected to the runway by four exit-taxiways.

Taxiway Z runs parallel to Runway 4R-22L, from Taxiway V to the end of Runway 22L. It is 75 feet wide and connects to the runway by three exit-taxiways. Taxiway Z also serves cargo and maintenance facilities. Taxiway Y also runs parallel to Runway 4R-22L and is 75 feet side, but is located on the east side of the runway. Unlike Taxiway Z, Taxiway Y is a full-length parallel and connects to the runway with eight exit-taxiways.

Taxiway K runs parallel to Taxiway Y and connects to the ramps at the McNamara and North Terminals. There are nine ramp-connectors used to access these terminals. Taxiway U runs parallel to Runway 9L-27R but only serves the northern apron of the McNamara Terminal. On the north side of Runway 9L-27R, adjacent to the Smith Terminal, Taxiway H serves a similar purpose.

Taxiway G crosses Runway 9L-27R and connects the McNamara Terminal apron with the North Terminal apron. Taxiway F also connects the two terminals, but continues across Runway 3L-21R before terminating at Taxiway W.

Taxiways J and T run parallel to Runway 9R-27L and also connect to Runway 4R-22L. Taxiway T is a full-length parallel, while Taxiway J terminates at Runway 3R-21L. Taxiway T connects to the runway with seven exit-taxiways and Taxiway J connects to Taxiway T with five ramp-connectors.

Taxiway PP is located between the 3-21 parallel runways. It connects Taxiway J with Taxiway F and provides access to deicing facilities. It has one exit-taxiway connecting directly to the 3L end of Runway 3L-21R.

Taxiway M is a 75-foot wide full-length parallel taxiway for Runway 3L-21R and is connected to the runway by two exit-taxiways. Taxiway P is located on the east side of Runway 3L-21R and only operates north of Runway 9L-27R.

Taxiway W is a 75-foot wide full-length parallel taxiway for Runway 3R-21L and is connected to the runway by seven exit-taxiways. Taxiway S is located on the east side of Runway 3R-21L and serves facilities located on the east side of the Airport. There are four exit-taxiways to connect to Runway 3R-21L.

2.1.3 Remain-Over-Night Parking

As depicted on Figure 2-2, the Airport currently has five designated Remain-Over-Night (RON) parking areas. Area A is located near the Berry Terminal Building and can accommodate up to five narrow-body aircraft. Area B is located adjacent the Smith Terminal Building and can accommodate six narrow-body aircraft, three 757-300 aircraft and two large regional aircraft simultaneously. Area B can also accommodate two wide-body aircraft. When these wide-body aircraft are present, one narrow-body spot is eliminated and only one of the three 757-300 positions is available. Area C is located along Taxiway Z adjacent to connector Taxiway Z-5 and can accommodate two narrow-body aircraft or one wide-body aircraft. Area D is located east of Runway 3R-21L between Taxiways S and S-5, and can accommodate two wide-body parking positions. Area E is located north of the McNamara Terminal Concourse C and can accommodate three narrow-body aircraft and one wide-body aircraft.

In total, the RON areas can accommodate a maximum of 21 narrow-body or smaller aircraft, and up to 15 aircraft if the maximum number of wide-body aircraft positions are used.

2.1.4 Deicing Pads

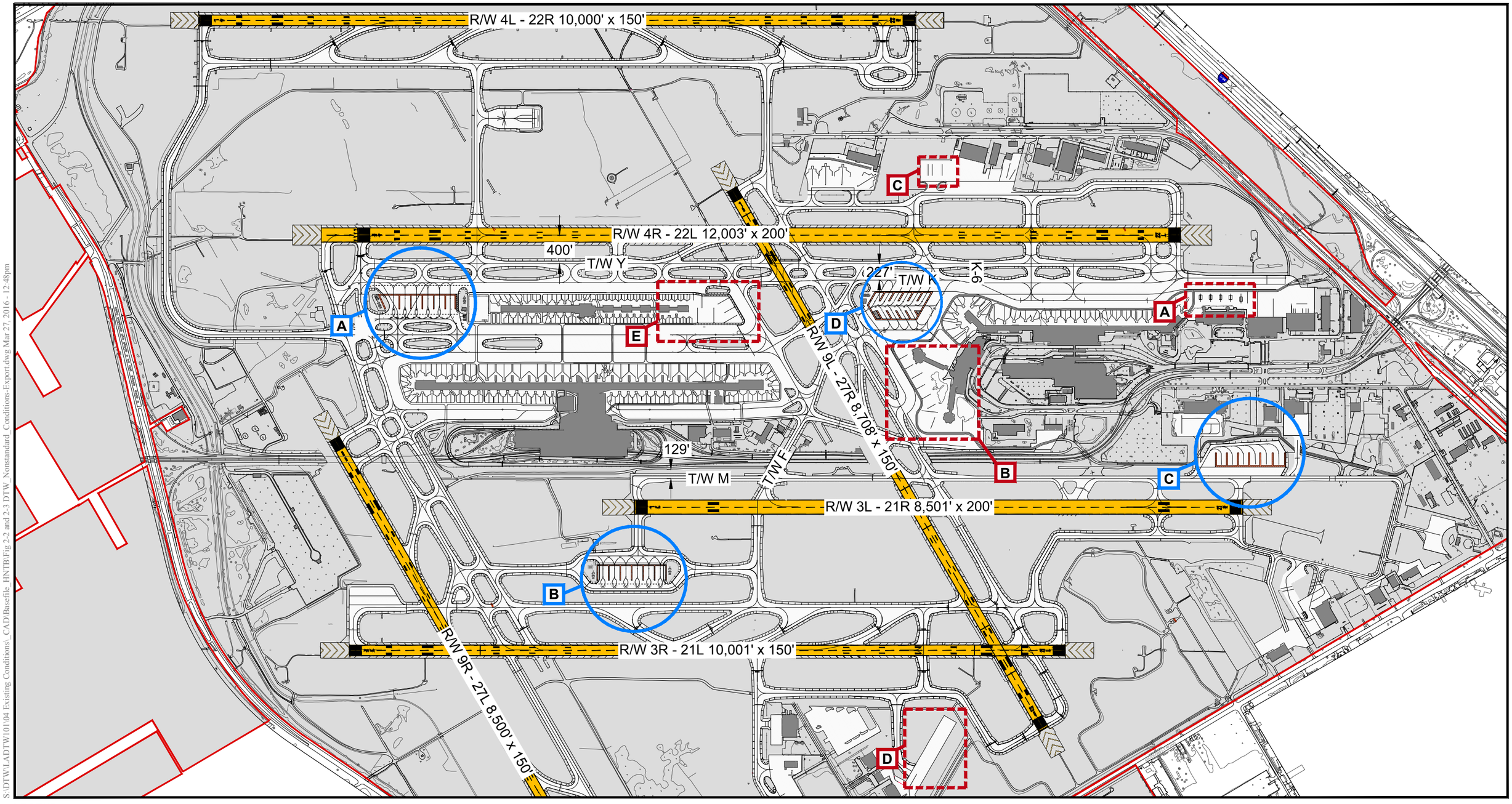
The Airport includes four deicing pads as shown in Figure 2-2. Deicing Pad A is located furthest to the south and primarily serves Delta Air Lines and can accommodate six narrow-body aircraft or two wide-body aircraft. Deicing Pad B is located west of Runway 3L is also primarily used by Delta Airlines' and can also accommodate six narrow-body aircraft. Deicing Pad C is located furthest to the north, serves all other airlines and can accommodate six narrow-body aircraft. Deicing Pad D is located adjacent the North Terminal, serves only regional jet aircraft and can accommodate 10 aircraft. In total, the deicing pads can accommodate a maximum of 18 narrow-body aircraft and 10 regional jet aircraft. A maximum of 14 narrow-body spots are available if two wide-body aircraft are using Deicing Pad A.

2.1.5 Deviations from Design Standards

The following identifies airport-wide geometry deviations from design standards*. Geometric deviations from design standards are depicted in Figure 2-3.

- The Runway 4R-22L centerline to parallel Taxiway Z centerline is separated by 400 feet south of Taxiway Z5. This does not meet standards when weather conditions fall below CAT I conditions, which requires 500 feet of separation.
- The Runway 4R-22L centerline to parallel Taxiway Y centerline is separated by 400 feet. This does not meet standards when weather conditions fall below CAT I conditions, which requires 500 feet of separation.
- The Taxiway Y centerline to Taxiway K centerline between Runway 9L-27R and Taxiway K6 is separated by 227 feet. This does not meet ADG-V taxiway to taxiway separation standards of 267 feet as required.

*Deviations from design standards under other categories (obstructions, marking and signing) will be determined in later phases of the Master Plan Update and are pending completion of Airports-GIS survey data. Runway Incursion Mitigation (RIM) criteria primarily involve taxiway and runway geometry. RIM criteria, however, are not absolute standards, but rather principles that need to guide future updates of the airfield and need to be evaluated in connection with current and projected operational data.



S:\DTW\LAD\TW101\04 Existing Conditions_CAD Basefile_HNTB\Fig 2-2 and 2-3 DTW_Nonstandard_Conditions-Export.dwg Mar 27, 2016 - 12:48pm

LEGEND

- Runway pavement
- Taxiway / Apron pavement
- Airport property line
- Existing building on-airport
- Deicing pad area
- Remain overnight parking area

Source: HNTB

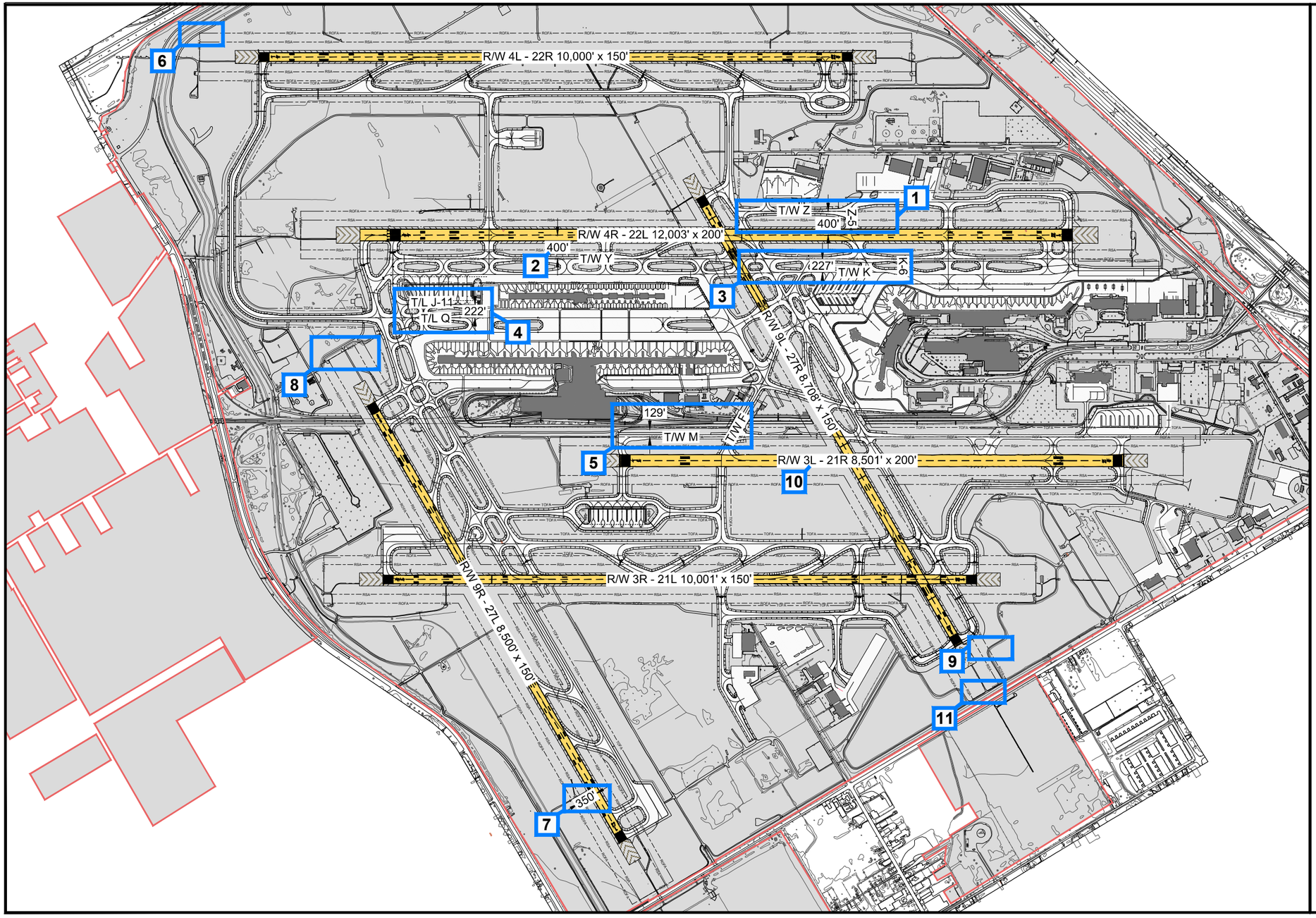
NORTH

0 650' 1300' 2600'

Figure 2-2
DEICING PAD AND RON PARKING LOCATIONS

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher



GEOMETRY DEVIATION FROM DESIGN STANDARD DESCRIPTION

1. The Runway 4R-22L centerline to parallel Taxiway Z centerline is separated by 400 feet south of Taxiway Z5. This does not meet standards when weather conditions fall below CAT I conditions, which requires 500 feet of separation.
2. The Runway 4R-22L centerline to parallel Taxiway Y centerline is separated by 400 feet. This does not meet standards when weather conditions fall below CAT I conditions, which requires 500 feet of separation.
3. The Taxiway Y centerline to Taxiway K centerline between Runway 9L-27R and Taxiway K6 is separated by 227 feet. This does not meet ADG-V taxiway to taxiway separation standards of 267 feet as required.
4. The Taxilane J11 centerline to Taxilane Q centerline is separated by 222 feet. This does not meet the required taxilane to taxilane separation standards of 245 feet.
5. The vehicle service road (VSR) penetrates the Taxiway M Taxiway Object Free Area (TOFA) south of Taxiway F by as much as 31 feet. TOFAs are required to be clear of service roads.
6. The VSR penetrates the Runway 22R Runway Object Free Area (ROFA) beyond the stop end of the runway by 12 feet, reducing the available ROFA beyond the stop end of the runway to 988 feet. This does not meet ROFA clearance standards.
7. The Runway 9R-27L centerline to Runway 27L glideslope antenna is separated by 350 feet. This does not meet standards for runway centerline to glideslope separation.
8. The VSR penetrates the Runway 27L ROFA beyond the stop end of the runway by 74 feet, reducing the available ROFA beyond the stop end of the runway to 926 feet. This does not meet ROFA clearance standards.
9. The VSR penetrates the Runway 9L ROFA beyond the stop end of the runway by 608 feet, reducing the available ROFA beyond the stop end of the runway to 392 feet. This does not meet ROFA clearance standards.
10. Runway 3L-21R does not currently have paved shoulders. 35 foot wide shoulders are required for Runway 3L-21R.
11. The RSA beyond the stop end of Runway 9L is limited by 90 feet. Declared distances are currently applied to the runway to mitigate this non-standard condition.

LEGEND

- Runway pavement
- Taxiway / Apron pavement
- Other pavement in use
- Building - Existing - On-airport
- Runway object free area
- Runway safety area
- Taxiway object free area
- Geometry deviation from design standard
- Fence
- Airport property line
- R/W Runway
- T/W Taxiway

North

0 900' 1800' 3600'

Source: HNTB

Figure 2-3
GEOMETRY DEVIATIONS FROM DESIGN STANDARDS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

T:\00_CADD\Exhibits\FIGURES\DTW_Nonstandard_Conditions-Export-LF.dwg Mar 28, 2016

- The Taxilane J11 centerline to Taxilane Q centerline is separated by 222 feet. This does not meet the required taxilane to taxilane separation standards of 245 feet.
- The vehicle service road (VSR) penetrates the Taxiway M Taxiway Object Free Area (TOFA) south of Taxiway F by as much as 31 feet. TOFAs are required to be clear of service roads.
- The VSR penetrates the Runway 22R Runway Object Free Area (ROFA) beyond the stop end of the runway by 12 feet, reducing the available ROFA beyond the stop end of the runway to 988 feet. This does not meet ROFA clearance standards.
- The Runway 9R-27L centerline to the Runway 27L glideslope antenna is separated by 350 feet. This does not meet standards for runway centerline to glideslope separation.
- The VSR penetrates the Runway 27L ROFA beyond the stop end of the runway by 74 feet, reducing the available ROFA beyond the stop end of the runway to 926 feet. This does not meet ROFA clearance standards.
- The VSR penetrates the Runway 9L ROFA beyond the stop end of the runway by 608 feet, reducing the available ROFA beyond the stop end of the runway to 392 feet. This does not meet ROFA clearance standards.
- Runway 3L-21R does not currently have paved shoulders. 35-foot wide shoulders are required for Runway 3L-21R
- The RSA beyond the stop end of Runway 9L is limited by 90 feet. Declared distances are currently applied to the runway to mitigate this non-standard condition.

2.2 Lighting and Navigational Aids

A summary of Airport navigational aids and lighting systems is summarized in the following sections.

2.2.1 Lighting

The Airport has several different lighting systems to facilitate operations during period of low visibility or at night. A summary of lighting features for each runway end is presented in Table 2-6. Lighting installations include the following:

- **Runway Edge Lighting** – All runways have high intensity runway edge lighting (HIRL). These lights are clear, amber, yellow, red or green depending on their location on the runway.
- **Runway Centerline Lighting (RCL)** – In-pavement RCLs are installed on precision instrument runways that offer the lowest minima. They are a requirement for CAT II and II runways and for CAT I runways with RVR below 2,400 feet. They are spaced every 50 feet along the entire length of the runway. All runways except Runway 9L-27R contain RCLs.
- **Approach Light System (ALS)** – An ALS is installed for runways supporting ILS CAT I approaches and below. Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) extends 1,400 feet from the runway's arrival threshold. High Intensity Approach Lighting System with Sequenced Flashers (ALSF2) extends 2,400 feet from the runway's threshold. The ALSF2 system is in operation when runway approach visibility falls below one mile.

- **Runway Status Lights (RWSL)** – The RWSLs prevent runway incursions by providing a critical visual queue if the runway is in-use and therefore unsafe for entry or crossing. There are two types of RWSLs including Takeoff Hold Lights which are near the end of the runway and Runway Entrance Lights which indicate when it is safe to enter or cross a runway.

- **Runway End Identifier Lights (REIL)** – REILs provide synchronized flashing light information to the pilot to assist in acquiring the runway end during approach.

- **Precision Approach Path Indicator (PAPI)** – PAPI is a lighting system that provides decent angle information, and uses a combination of red and white lights which are only visible at correct or incorrect descent angles.

- **Airport Beacon** – The Airport Beacon is located east of Runway 3R-21L near the general aviation/corporate/charter area. The beacon indicates the approximate location of the airport to pilots at night.

- **Taxiway Lighting** – All taxiways have high intensity taxiway edge lighting (HITL) and in-pavement Taxiway Centerline Lighting (TCL).

Table 2-6
EXISTING RUNWAY LIGHTING
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Lighting	4L	22R	4R	22L	3R	21L	3L	21R	9L	27R	9R	27L
MALSR		X		X		X				X		X
ALSF2	X		X		X							
PAPI	X	X			X	X	X	X		X		X
REIL						X	X	X	X		X	
HIRL	X	X	X	X	X	X	X	X	X	X	X	X
RCL	X	X	X	X	X	X	X	X			X	X

Source: Alpine Engineering, *Obstruction Survey Report* (2013) and HNTB analysis, February 2016.

2.2.2 NAVAIDS

Navigational Aids enhance the wayfinding ability and approach visibility of an airport. NAVAIDs are generally classified into three categories:

- **Precision NAVAIDs** – Include the components of a precision instrument approach: vertical and horizontal instrument guidance. These usually include: glideslope, localizer, precision approach radar, and select Global Positioning Systems (GPS)

- **Non-precision NAVAIDs** – Include GPS, Airport Surveillance Radar 9 (ASR-9), Airport Surveillance Detection Equipment-X (ASDE-X), near-by very high frequency (VHF) omni-directional range (VOR) with or without distance measuring equipment (DME), non-directional beacon (NDB), and tactical air navigation (TAC)

- **Visual NAVAIDs** – Include the airfield lighting features presented in the preceding section

A summary of the various NAVAIDs is presented in Table 2-7 for each runway end. In addition to runway specific NAVAIDs, the Airport operates the following airport-wide NAVAIDS: ASR-9, ASDE-X, VOR, VORTAC, and NDB.

Table 2-7
EXISTING NAVAIDS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

NAVAID	4L	22R	4R	22L	3R	21L	3L	21R	9L	27R	9R	27L
DME	X	X	X			X						X
Glide Slope *(a)*	X	X	X	X	X	X				X		X
Localizer	X	X	X	X	X	X				X		X
Offset Localizer	X	X										
Runway Visual Range	X	X	X	X	X					X		X
Inner Marker Beacons	X		X		X							

(a) Runway 4L-22R includes a Glide Slope to the left and right.

Source: Alpine Engineering, *Obstruction Survey Report* (2013) and HNTB analysis, February 2016.

2.2.3 Instrument Procedures

Airport runways include multiple precision instrument approach procedures to allow aircraft operations during periods of low visibility. A precision approach utilizes ground- or satellite-based navigational aids to provide pilots with definitive guidance on the horizontal and vertical position of the aircraft. There are 37 existing instrument approach procedures (IAPs) published by the FAA for the Airport. Approaches include:

- **CAT I ILS** – In inclement weather conditions, the ILS system allows a pilot to ascertain the orientation of the aircraft relative to runway centerline as well as angle of approach to the runway. Runways 3R, 4R, 4L, 21L, 22R, 22L, 27R and 27L are equipped with these procedures. Special Authorized (SA) CAT I ILS procedures offer improved landing minima over a standards ILS system. FAA Order 8400.13D explains the ground equipment requirements to be eligible for approaches as low as RVR 1,400 feet and a decision height of 150 feet. These requirements include, but are not limited to, minimum runway length, use of certain NAVAIDs, commissioned GPA of 3.0 degrees, maximum TCH of 60 feet, etc. Runways 3R, 4R, 21L, 22L, 27L and 22R are equipped with these procedures.

- **CAT II ILS** – These approaches are eligible for minimums as low as RVR 1,200 feet and a decision height of 100 feet. Runways 3R, 4R and 4L are equipped with these procedures. SA CAT II ILS procedures are similar to standard CAT II procedures in that they offer minimums as low as RVR 1,200 feet and a decision height of 100 feet. However, they do not require the same amount of ground equipment infrastructure as does a standard CAT II ILS. Runways 21L, 22L, 27L and 22R are equipped with these procedures.

- **CAT III ILS** – These approaches offer the best possible minimums as low as RVR 300 feet without a decision height, and can provide guidance all the way to the ground. FAA Order 8400.13D explains the ground equipment requirements, operational requirements, and specific approvals needed. Runways 3R, 4R and 4L are equipped with these procedures.

- **PRM ILS** – Precision Runway Monitor (PRM) permits simultaneous arrivals between closely spaced parallel runways. The separation distance must be at least 3,400 feet. The distance between Runway 4L-22R and Runway 4R-22L is 3,000 feet and therefore Runways 4L and Runway 22R offer an offset course to allow adequate spacing for three simultaneous arrivals to Runways 4L, 4R and 3R in north flow and Runways 21L, 22L, and 22R in south flow.

- **Area Navigation (RNAV [GPS])** – Runways 3R, 4R, 4L, 21L, 22L, 22R, 27L and 27R have RNAV approaches that utilize pre-determined waypoints and global positioning system (GPS) guidance to enable aircraft to fly point-to-point until reaching the runway.

2.3 Airfield Operations

The operational configuration of the Airport's runway and taxiway system is primarily dictated by the prevailing wind and weather conditions.

2.3.1 Runway Use Configuration

The Airport primarily operates under one of two runway use configurations.

- **South flow** – South flow is characterized by all takeoffs and landings originating from the north towards the south using Runways 22R, 22L, 21R, and 21L. In south flow, Runways 22R and 21L are primarily used as arrival runways with Runways 22L and 21R used as departure runways. South flow is the preferred runway use configuration and is typically in effect up to a tailwind of 5 to 10 knots.

- **North flow** – North flow is characterized by all takeoffs and landings originating from the south towards the north using Runways 4L, 4R, 3L and 3R. In north flow, Runways 4L and 3R are primarily used as arrival runways with Runways 4R and 3L used as departure runways.

Crosswind Runways 9L-27R and 9R-27L are used sparingly and typically only when the crosswind component for north or south flow exceeds 20 knots.

During heavy arrival periods, the Airport can operate with three simultaneous arrival streams making use of Runway 4L-22R, 4R-22L, and 3R-21L. The three simultaneous independent approaches can be conducted in both VFR using visual approaches and IFR conditions when the PRM is in use.

Average runway use configuration utilization percentages were identified in the Airport's Federal Aviation Regulations Part 150 study, which was completed in 2006. South flow is the predominant runway use configuration, with approximately 68% annual utilization. North flow averages approximately 31% annual utilization. West and east flows on the crosswind runways are used less than 1% of the time. Table 2-8 presents specific runway utilization for day and nighttime operations.

Table 2-8
RUNWAY UTILIZATION
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

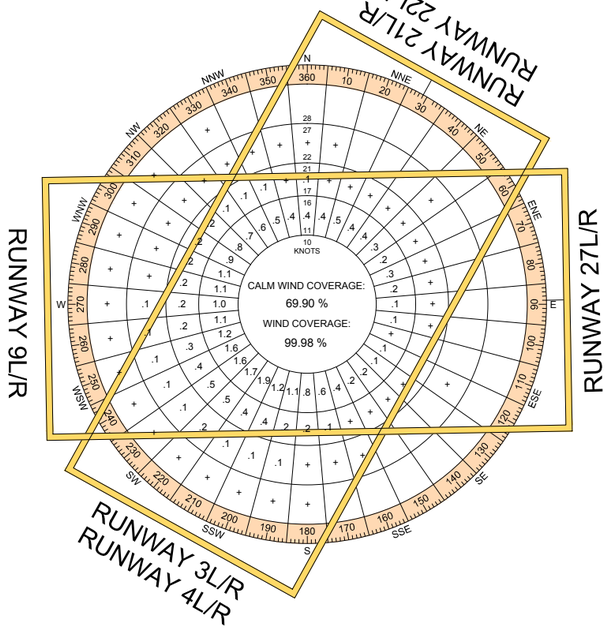
Runway	Flow	Location	Arrival daytime	Arrival nighttime	Departure daytime	Departure nighttime
4L	North	West Outboard	14%	13%	0%	0%
22R	South	West Outboard	32	36	1	1
4R	North	West Inboard	3	4	15	15
22L	South	West Inboard	9	11	31	32
3L	North	East Inboard	1	1	15	15
21R	South	East Inboard	4	4	34	33
3R	North	East Outboard	12	11	1	1
21L	South	East Outboard	23	18	1	1
9L	East	North Runway	<1	<1	<1	<1
27R	West	North Runway	<1	<1	<1	<1
9R	East	South Runway	<1	<1	<1	<1
27L	West	South Runway	<1	<1	<1	<1

Source: BridgeNet International and HNTB analysis, February 2016.

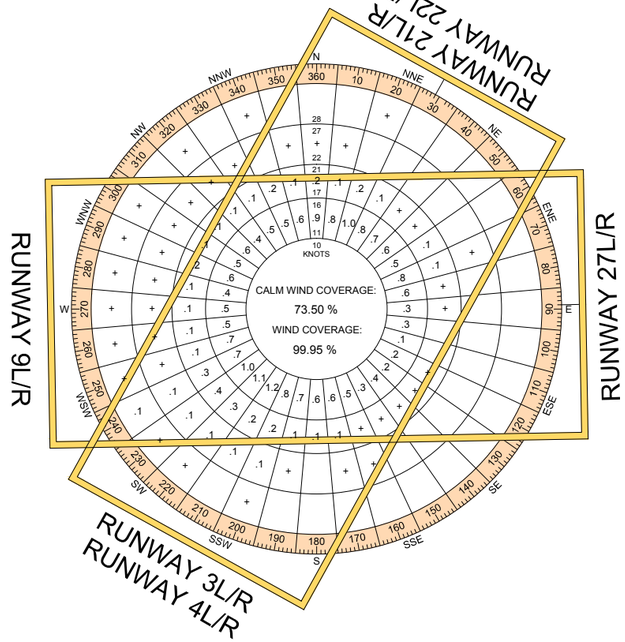
Figure 2-4 presents the Airport's all-weather wind coverage diagram based on 75,020 observations from the National Oceanographic and Atmospheric Administration's National Climactic Data Center between January 2006 and January 2016.

Wind coverage data are shown in Table 2-9 for all runways, north and south flow, and east and west flow, respectively. Under VFR, the runways cover 99.98% of historical wind observations; under IFR, the runways cover 99.95% of historical wind observations. Under both VFR and IFR, the runways cover 99.97% of historical wind observations. As shown, the existing runway network is oriented to best maximize prevailing wind coverage and minimize cross-wind components. Calm wind coverage allows for a runway operating condition that enables maximum flexibility and operating capacity. During all weather conditions, calm winds (when wind velocities are less than 3 knots) occur approximately 71% of the time. IMC conditions occur approximately 19.77% of the year.

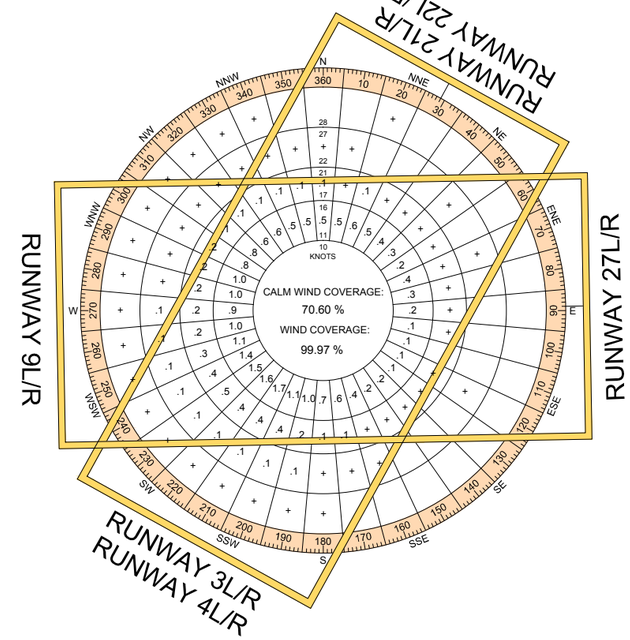
VFR WIND ROSE	IFR WIND ROSE	ALL WEATHER WIND ROSE



20 Knot Wind Rose - ARC: D-V



20 Knot Wind Rose - ARC: D-V



20 Knot Wind Rose - ARC: D-V

Figure 2-4
WIND ROSES AND WIND COVERAGE

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

Table 2-9
WIND COVERAGE SUMMARY
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Crosswind component	VFR coverage	IFR coverage	All weather coverage
		All Runways	
10.5 knots	97.30%	97.12%	97.26%
13 knots	99.24%	99.06%	99.21%
16 knots	99.82%	99.77%	99.81%
20 knots	99.98%	99.95%	99.97%
		North and South Flow	
10.5 knots	89.36%	91.45%	89.78%
13 knots	94.22%	95.53%	94.48%
16 knots	98.20%	98.54%	98.27%
20 knots	99.51%	99.59%	99.52%
		West and East Flow	
10.5 knots	86.09%	86.19%	86.11%
13 knots	92.44%	92.27%	92.41%
16 knots	97.58%	97.56%	97.58%
20 knots	99.33%	99.40%	99.35%

Source: National Oceanic and Atmospheric Administration, National Climatic Data Center and HNTB analysis, February 2016.

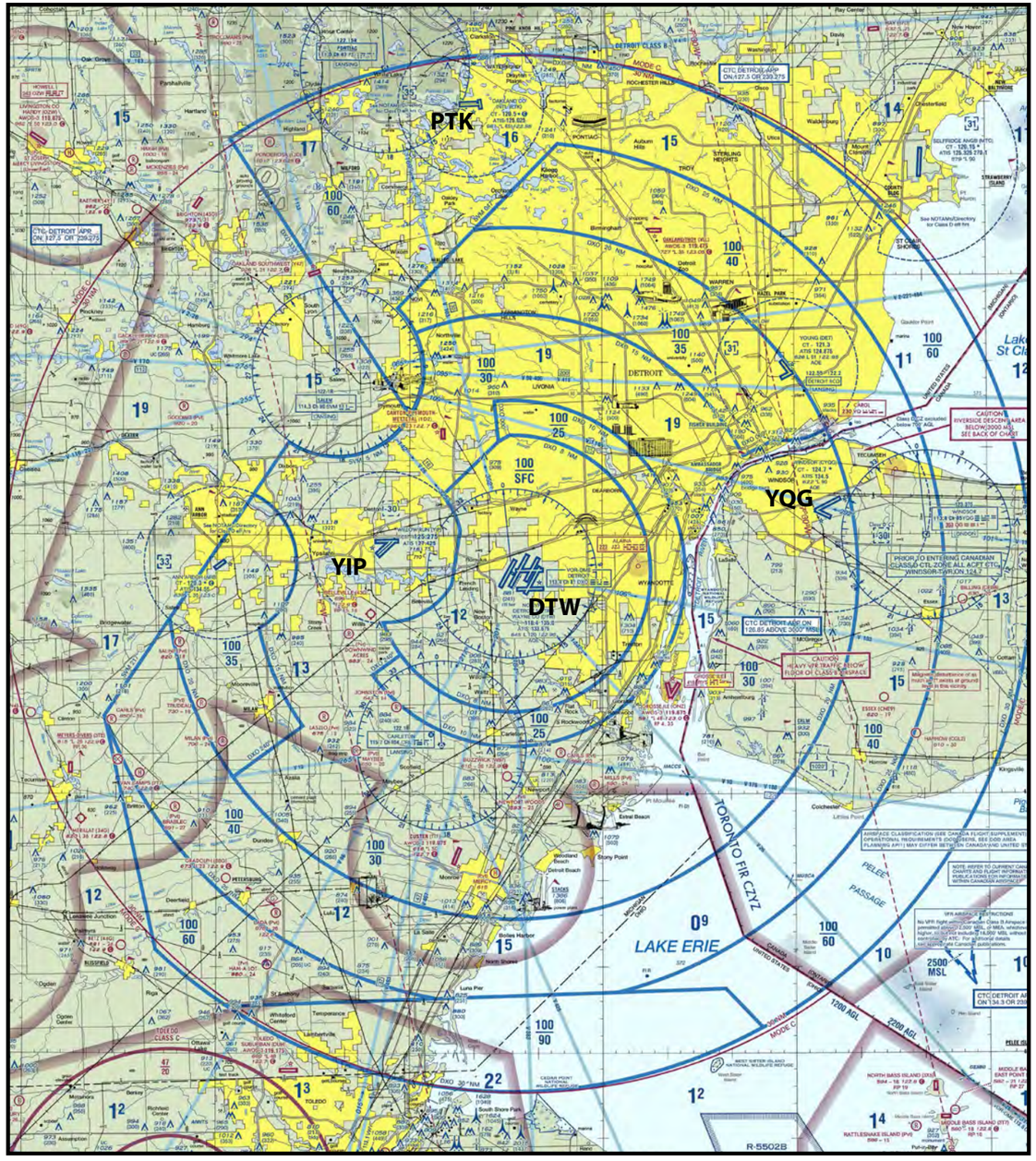
2.4 Airspace and Air Traffic Control

This section describes airspace and air traffic control (ATC) provisions that affect aircraft operations and includes descriptions of airspace procedures, air traffic control jurisdictions, and obstructions affecting navigable airspace.

2.4.1 Airspace Structure

The National Airspace System (NAS) is the network of U.S. airspace which includes navigation facilities, equipment, procedures, airports, and air traffic controllers. The NAS consists of six, 3-dimensional classes of airspace (A, B, C, D, E, and G) that differ based on flight rules and level of interaction with ATC.

Figure 2-5 depicts the existing sectional chart for Detroit. The classification of airspace above the Airport is Class B, which is also referred to as a terminal control area. Class B airspace exists from the ground to 10,000 feet above mean sea level. This airspace is individually designed for each airport and consists of a surface area and two or more layers of controlled airspace. Operations under both VFR and IFR are permitted as long as ATC clearance has been received.



LEGEND

AIRPORTS

- Other than hard-surfaced runways
- Seaplane Base
- Hard-surfaced runways 1500 ft. or greater
- Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

ADDITIONAL AIRPORT INFORMATION

- R — Private "(Pvt)" - Non-public use having emergency or landmark value
- Military - Other than hard-surfaced; all military airports are identified by abbreviations AFB, NAS, AAF, etc. DoD users, for complete airport information consult DoD FLIP.
- H — Heliport Selected
- U — Unverified
- Abandoned - paved having landmark value, 3000 ft. or greater
- F — Ultralight Flight Park Selected

Services - fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. (Normal working hours are Mon thru Fri 10:00 A.M. to 4:00 P.M.) Consult A/FD for service availability at airports with hard-surfaced runways 1500 ft. or greater.

★ Rotating airport beacon in operation Sunset to Sunrise

OBJECTIONABLE - Airport may adversely affect airspace use.

AIRPORT DATA

Box indicates FAR 93 Special Air Traffic Rules & Airport Traffic Patterns.
Runways with Right Traffic Patterns (public use)
RP ★ Special conditions exist - see A/FD.

FSS — FAR 91
NO SVFR — Location Identifier
NAME (NAM) (PNAM) — ICAO Location Indicator shown outside contiguous U.S.
CT - 118.3 ★ Ⓒ ATIS 123.8
285 L 72 122.95
RP 23, 34
VFR Advsy 125.0 — UNICOM
AOE — Airport of Entry

FSS - Flight Service Station
NO SVFR - Fixed-wing special VFR flight is prohibited.
CT - 118.3 - Control Tower (CT) - primary frequency
★ - Star indicates operation part-time. See tower frequencies tabulation for hours of operation.
Ⓒ - Follows the Common Traffic Advisory Frequency (CTAF)
ATIS 123.8 - Automatic Terminal Information Service
ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems (shown where full-time ATIS not available). Some ASOS/AWOS facilities may not be located at airports.
UNICOM - Aeronautical advisory station
VFR Advsy - VFR Advisory Service shown where full-time ATIS not available and frequency is other than primary CT frequency.
285 - Elevation in feet
L - Lighting in operation Sunset to Sunrise
*L - Lighting limitations exist; refer to Airport/Facility Directory.
72 - Length of longest runway in hundreds of feet; usable length may be less.
When information is lacking, the respective character is replaced by a dash. Lighting codes refer to runway edge lights and may not represent the longest runway or full length lighting.

AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION

Only the controlled and reserved airspace effective below 18,000 ft. MSL are shown on this chart.

- Class B Airspace
- Class C Airspace (Mode C - see FAR 91.215/AIM.)
- Class D Airspace
- 40 — Ceiling of Class D Airspace in hundreds of feet (A minus ceiling value indicates surface up to but not including that value.)
- Class E (sfc) Airspace
- CLASS G — Class E Airspace with floor 700 ft. above surface that laterally abuts Class G Airspace.
- Class E Airspace with floor 700 ft. above surface that laterally abuts 1200 ft. or higher Class E Airspace
- Class E Airspace with floor 1200 ft. or greater above surface that laterally abuts Class G Airspace
- 2400 MSL / 4500 MSL — Differentiates floors of Class E Airspace greater than 700 ft. above surface.

Class E Airspace exists at 1200' AGL unless otherwise designated as shown above.
Class E Airspace low altitude Federal Airways are indicated by center line.
Intersection - Arrows are directed towards facilities which establish intersection.

- 132° → V 69 / 169 — Total mileage between NAVAIDs on direct Airways
- Class E Airspace low altitude RNAV 2 Routes are indicated by center line.
- T 319 — RNAV Waypoint
- TK 313 — (Helicopter Only)
- Prohibited, Restricted, and Warning Areas; Canadian Advisory, Danger, and Restricted Areas
- Alert Area and MOA - Military Operations Area
- Special Airport Traffic Area (See FAR 93 for details.)
- ADIZ - Air Defense Identification Zone
- MODE C (See FAR 91.215/AIM.)
- National Security Area
- Terminal Radar Service Area (TRSA)
- IR211 — MTR - Military Training Route
- IFR Departure Route
- IFR Arrival Route
- IFR Arrival/Departure Route

COMMUNICATION BOXES

122.1R 122.6 123.6
OAKDALE (H)
362★ 396.6 OAK
122.1R
CHICAGO CHI

Underline indicates no voice on frequency.
Crosshatch indicates Shutdown status.
★ - Operates less than continuous or On-Request.
A - ASOS/AWOS
H - HIWAS
Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2, 243.0 and 255.4 (Canada - 121.5, 126.7 and 243.0) are available at many FSSs and are not shown above boxes. All other frequencies are shown.
Certain FSSs provide Airport Advisory Service, see A/FD.
R - Receive only
122.1R — MIAMI — FSS radio providing voice communication
Frequencies above thin line box are remoted to NAVAID site. Other FSS frequencies providing voice communication may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

RADIO AIDS TO NAVIGATION

- VHF OMNI RANGE (VOR)
- VORTAC
- VOR-DME
- Other facilities, i.e., FSS Outlet, RCO, etc.
- Non-Directional Radio Beacon (NDB)
- NDB - DME

OBSTRUCTIONS

1000 ft and higher AGL
Below 1000 ft AGL
Group Obstruction
Obstruction with high-intensity lights; may operate part-time
Wind Turbine
Wind Turbine Farm
2894' UC
Elevation of the top above mean sea level
Height above ground
Under construction or reported; position and elevation unverified
2049 (1149) UC
NOTICE: Guy wires may extend outward from structures.

MISCELLANEOUS

G - Glider Operations
H - Hang Glider Activity
U - Ultralight Activity
UA - Unmanned Aircraft Activity
Parachute Jumping Area (See Airport/Facility Directory.)
Space Launch Activity Area (See Airport/Facility Directory.)
VPXYZ — VFR Waypoints (See chart tabulation for latitude/longitude.)
NAME (VPXYZ)
Marine Light
1°E — Isogonic Line (2015 VALUE)

TOPOGRAPHIC INFORMATION

- Power Transmission Line
- Aerial Cable
- Lookout Tower 618 (Elevation Base of Tower)
- Mountain Pass 11823 (Elevation of Pass)

Pass symbol does not indicate a recommended route or direction of flight and pass elevation does not indicate a recommended clearance altitude. Hazardous flight conditions may exist within and near mountain passes.

Figure 2-5
DTW/DETROIT AIRSPACE

The major airspace structure has not changed significantly since the last airport master plan was completed. However, a major redesign of the airspace is now underway to take advantage of the benefits that will be provided by the NextGen Air Traffic Management System, which is the updated system for ATC that is being incorporated into the NAS. The official program that will affect the Airport's airspace is called the DTW-CLE Metroplex; and the intent of this program is to improve the efficiency of the regional airspace while minimizing impacts to surrounding communities

2.4.2 Air Traffic Control Jurisdictions

Airspace in the Detroit area falls under the jurisdiction of the following entities: Cleveland Air Route Traffic Control Center (ARTCC), Detroit TRACON, and Detroit airport traffic control tower (ATCT).

- **Cleveland Center** – The airspace over the continental U.S. is divided into 20 geographically defined ATC jurisdictions based on ARTCCs, which provide radar service and other ATC services to en route aircraft (i.e., those aircraft that are not landing or taking off). Cleveland ARTCC has jurisdiction of en route traffic over portions of Maryland, Michigan, New York, Ohio, Pennsylvania, West Virginia, as well as the southernmost portion of Ontario, Canada.
- **Detroit TRACON** – The TRACON provides radar approach and departure control as well as other ATC services to aircraft flying in terminal area airspace. Detroit Center has delegated control over certain airspace in the Detroit area to the Detroit TRACON, located at the Airport.
- **FAA ATCT** – The ATCT provides air traffic control services to aircraft at and in the immediate vicinity of an airport, ensuring the safe, orderly, and expeditious flow of traffic. Controllers are responsible for separating aircraft on the ground and in the traffic pattern, giving arrival and departure clearances, and providing weather information to pilots. The ATCT at Detroit is located along the Airport's primary entrance road to the north of the passenger terminal.

3.0 PASSENGER TERMINAL COMPLEX

The Airport passenger terminal complex is comprised of two terminals – the Edward H. McNamara Terminal, located on the south side of the Airport; and the North Terminal, located on the north side. The passenger terminal complex is depicted in Figure 1-2, and occupies approximately 139 acres.

The total area within the McNamara and North terminals is summarized in Table 3-1. The following sections provide a description of the terminal buildings and concourses and the various passenger processing functions.

Table 3-1
PASSENGER TERMINAL GROSS AREA (SQ FT)
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

	Lower level	Level 1	Level 2	Level 3	Total
Terminals					
McNamara	207,600	150,500	136,900	121,500	616,500
North	81,000	199,900	133,000	0	413,900
Total	288,600	350,400	269,900	121,500	1,030,400
Concourses					
Concourse A	166,300	480,500	542,600	73,900	1,263,300
Concourse B	68,600	87,100	92,000	0	247,700
Concourse C	0	77,100	74,900	0	152,000
Concourse D	65,500	208,900	234,800	0	509,200
Total	300,400	853,600	944,300	73,900	2,172,200
Grand total	589,000	1,204,000	1,214,200	195,400	3,202,600

Notes: Calculations based on gross areas measured to the outside edge of exterior walls, rounded to the nearest hundred square feet.
Concourses A, B, and C are associated with the McNamara Terminal.

Source: LeighFisher, based on terminal drawings provided by Wayne County Airport Authority, February 2016.

3.1 McNamara Terminal

The Edward H. McNamara terminal was opened in February 2002. The terminal was originally constructed to serve as a hub for Northwest Airlines, but is now used exclusively by Delta Air Lines and its SkyTeam Alliance partners. At the time of its opening, the terminal and concourses provided 97 aircraft gates and an adjacent Westin Hotel with direct connection to the terminal. The one mile long Concourse A was the first airport in the U.S. to operate an indoor tram that traverses the length of the concourse. Concourse B and C are located in the midfield with an underground tunnel for connection with Concourse A. In 2005, Concourse B and C were expanded to accommodate increased service raising the aircraft gate total to 122 gates.

3.1.1 Terminal Processor

The terminal processor provides approximately 600,000 square feet of space on four levels:

- Lower Level – International Arrivals
- Level 1 – Domestic Arrivals
- Level 2 – Concourse
- Level 3 – Departures

Table 3-2 summarizes the space allocation within the McNamara Terminal. Terminal floor plans for all levels of the McNamara Terminal are depicted in Figures 3-1 through 3-4.

The Lower Level contains the Federal Inspections Services (FIS), customs facility, and international passenger baggage claim. It also contains offices for Customs and Border Protection, as well as airline support space, and security recheck for connecting passengers.

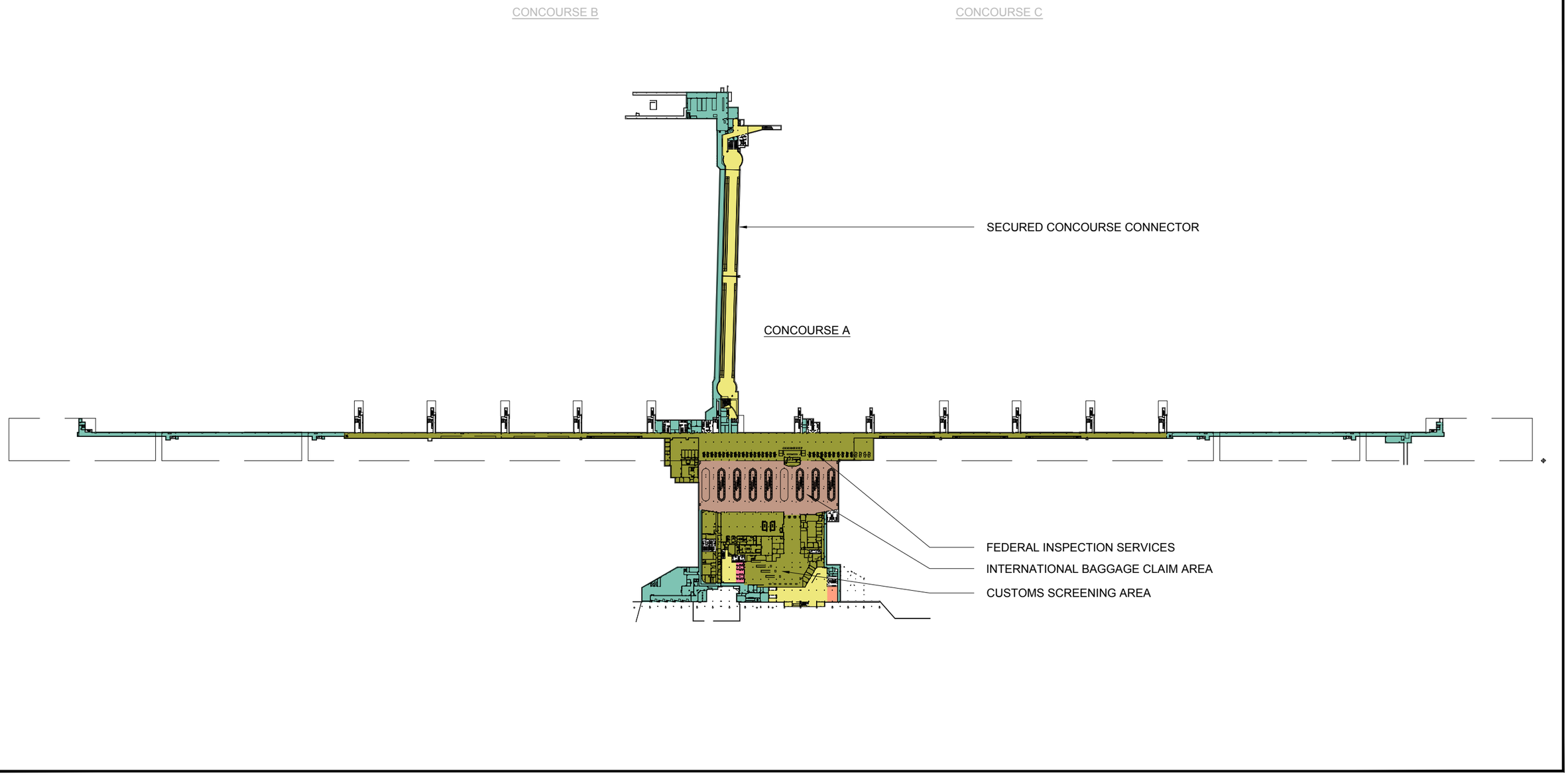
Table 3-2
McNAMARA TERMINAL SPACE ALLOCATION
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Space category	Lower level	Level 1	Level 2	Level 3	Total
Airline space *(a)*	0	356,700	268,800	50,000	675,500
Airport administration	99,000	21,500	15,800	22,500	158,800
Baggage claim	71,600	56,000	0	0	127,600
Baggage handling	0	170,800	0	0	170,800
Concessions	1,700	17,000	133,800	0	152,500
Customs and immigration *(b)*	176,600	0	0	0	176,600
Open/vacant	0	0	0	0	0
Other *(c)*	32,500	120,200	128,900	61,200	342,800
Public space	59,400	21,800	292,000	51,800	425,000
Security screening *(d)*	1,700	31,200	7,100	9,900	49,900
Total	442,500	747,700	846,400	195,300	2,279,500

Note: Calculations based on gross areas measured to the outside edge of exterior walls and the center of interior walls, rounded to the nearest hundred square feet.

(a) Includes ticket counters, operations space, departure lounges, and secure office space.
(b) Includes all space allocated for the Federal Inspection Service.
(c) Includes building systems, utilities, and other non-leased spaces within the building.
(d) Includes TSA-leased space within the terminal building.

Source: LeighFisher, based on terminal drawings provided by Wayne County Airport Authority, February 2016.



LEGEND

- Public circulation
- Concessions
- Security screening checkpoint
- Baggage claim area
- Customs and Border Protection
- Airport support

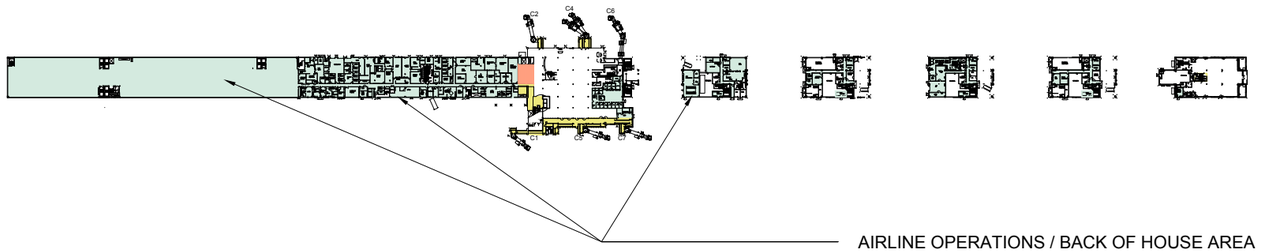
NORTH

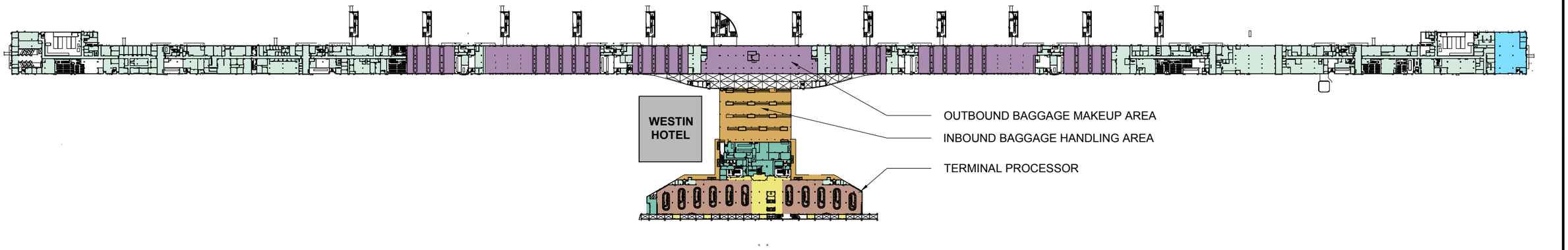
0 160' 320' 640'

Source: Wayne County Airport Authority

Figure 3-1
McNAMARA TERMINAL LOWER LEVEL
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher





LEGEND

- Public circulation
- Concessions
- Baggage claim area
- Airport support
- BSO / Airline support
- Miscellaneous / Others
- Outbound baggage makeup area
- Inbound baggage delivery area

NORTH

0 160' 320' 640'

Source: Wayne County Airport Authority

Figure 3-2
McNAMARA TERMINAL LEVEL 1
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

CONCOURSE B

CONCOURSE C

CONCOURSE A

WESTIN HOTEL

POST SECURITY CONCESSIONS ROTUNDA

SECURITY SCREENING CHECKPOINT

CONNECTOR TO GROUND TRANSPORTATION CENTER

LEGEND

- Public circulation
- Holdrooms
- Concessions
- Security screening checkpoint
- Airport support
- BSO / Airline support

NORTH

0 160' 320' 640'

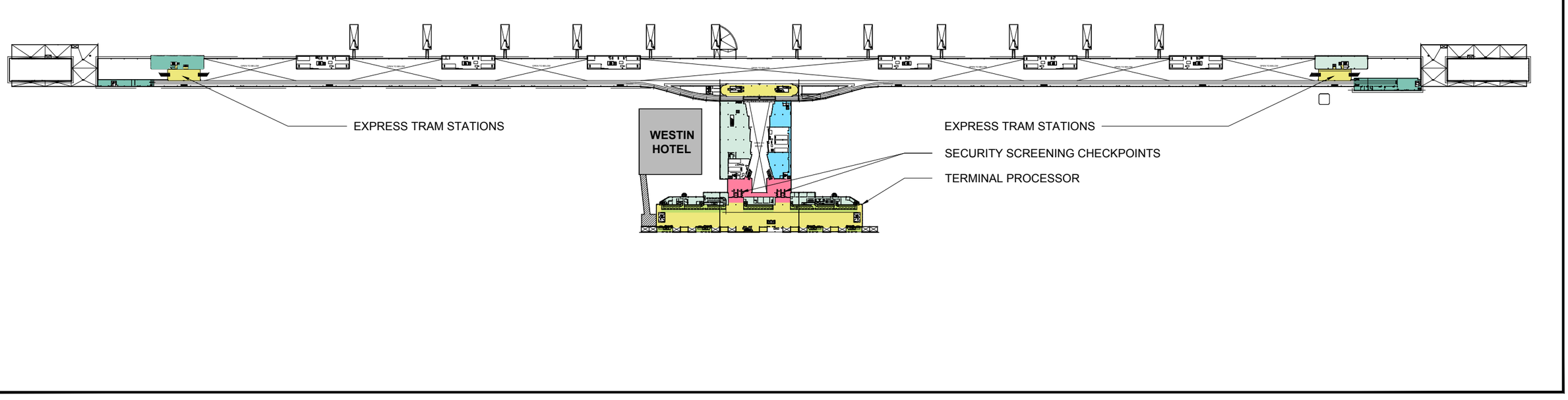
Source: Wayne County Airport Authority

Figure 3-3

McNAMARA TERMINAL
LEVEL 2

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher



LEGEND

- Public circulation
- Security screening checkpoint
- Ticketing / Airline ticket office
- Airport support
- BSO / Airline support
- Miscellaneous / Others

NORTH

0 160' 320' 640'

Source: Wayne County Airport Authority

Figure 3-4
McNAMARA TERMINAL LEVEL 3
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

Level 1 contains domestic passenger baggage claims and the baggage handling and sorting areas used by airline personnel. Additionally, there are airline office spaces adjacent to the claim areas to support passenger luggage retrieval.

Level 2 contains a centrally located TSA passenger security screening checkpoint, the bridge connection to the McNamara Garage and Ground Transportation Center, airline and airport support space, and secure area concessions. A ten-level pubic parking garage connects to the terminal on the Level 2.

Level 3 contains ticket counter check-in positions, airline electronic kiosks for passenger check-in, airline office space, two security screening checkpoints (located one each on the north and south sides of the processor), a Delta Air Lines Sky Club lounge, and building mechanical rooms. There is also a connection to the Westin Hotel.

3.1.1.1 Baggage

Domestic baggage claim facilities are located on Level 1 of the terminal processor. There are 11 carousel claim devices in use by Delta Air Lines. International baggage claim facilities are located on the Lower Level of the terminal. There are seven carousel claim devices to serve international arriving flights. Inbound and outbound baggage make-up facilities, in which airline personnel transfer baggage to and from conveyor belt systems onto carts to be transported directly to aircraft, are located on the same level as the domestic claim devices. Baggage originating at the ticketing facilities on Level 3 is transported downstairs via conveyor belt onto baggage carousels or laterals, around which carts are staged and manually loaded.

3.1.1.2 Ticketing

There is a ticketing lobby on Level 3 providing positions for airline agents and electronic kiosks to support the checking-in of airline passengers and baggage. In total, there are 81 positions allocated to individual airlines on an exclusive-use basis. The location and number of positions occupied by each airline is summarized in Table 3-3.

Table 3-3
McNAMARA TERMINAL AIRLINE TICKETING POSITIONS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Airline	Agent positions	Kiosk positions *(a)*	Curbside positions	Total
Air France	8	0	0	8
Delta Air Lines *(b)*	69	49	4	122
Virgin Atlantic	7	0	0	7

(a) Includes kiosks located at both the ticket counter as well as remotely in lobby for passengers not checking baggage.
(b) Eight agent positions and four kiosk positions are located in the McNamara Garage.

Source: LeighFisher field verification, February 2016.

3.1.1.3 Passenger Security Screening Checkpoints

There are five passenger security screening checkpoints which provide metal detector and x-ray screening of passenger and baggage to facilitate access to the secure concourse areas. Two checkpoints are located on Level 3 adjacent to airline ticketing, one is located on Level 2 across from the bridge, one is located on the lower level at the exit to the FIS to serve international arrivals connecting to domestic flights, and one is located in the Westin Hotel. For originating passengers, there are 11 checkpoint lanes: four on the north side of Level 3, four on the south side of Level 3, two on Level 2, and one in the Westin Hotel. The Westin Hotel security checkpoint also provides access for Known Crewmembers.

3.1.1.4 Federal Inspection Service Facility

Centrally located on the terminal processor, the FIS facility is directly connected to sterile corridors serving 12 frontal gates at Concourse A, which occupies approximately 180,000 square feet on the Lower Level. The FIS provides immigration processing for passengers arriving from abroad, and includes baggage claim devices, customs screening, office space for the U.S. Customs and Border Protection, and a security screening checkpoint for passengers who are connecting to a domestic flight. Once arriving passengers and their bags have been processed, an escalator transports connecting passengers to Level 2 – Concourse adjacent to Gate A38.

3.1.2 Passenger Concourses

The Airport's three passenger concourses – Concourses A, B, and C – together provide a total of 120 gates available for active loading and unloading of passengers, baggage, and belly cargo. Concourse A and Concourse B/C are oriented linear in a north-south orientation to the terminal processor, with Concourse A attached to the terminal processor. Concourse B/C is a midfield satellite concourse connected via tunnel from Concourse A, with Concourse B extending southward and Concourse C extending northward. All concourses are double-loaded (gates on both sides of the building), except for the portion of Concourse A adjacent to the terminal processor.

Concourse A has four levels: a lower level used for transporting international arriving passengers from aircraft to the FIS; an apron level, the majority of which is used by airline tenants; a passenger level containing passenger gates, departure lounges, concessions, and restrooms; and a mezzanine level containing the Express Train and airline club rooms.

Concourses B and C have two levels: an apron level, the majority of which is used by airline tenants, and a passenger level containing passenger gates, departure lounges, concessions, and restrooms. In total, the three concourses at McNamara provide approximately 1,663,000 square feet of usable space.

Delta Air Lines occupies all 63 gates on Concourse A and 41 gates on Concourses B and C. Sixteen gates on Concourse C are currently not in-use. SkyTeam Alliance partners have access to the FIS equipped gates on Concourse A, with Virgin Atlantic primarily using gate A-46 and Air France primarily using gate A-56. A summary of airline gate assignments and aircraft parking capabilities is provided in Table 3-4.

Table 3-4
SUMMARY OF PASSENGER GATES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Gate	Airline *(a)*	Gate type	Largest aircraft	Notes
McNamara Terminal				
Concourse A				
A1	Delta Air Lines	Bridge	A-320	
A2	Delta Air Lines	Bridge	A-320	
A3	Delta Air Lines	Bridge	A-320	
A4	Delta Air Lines	Bridge	737-800	
A5	Delta Air Lines	Bridge	A-320	
A6	Delta Air Lines	Bridge	757-200	
A7	Delta Air Lines	Bridge	737-900	
A8	Delta Air Lines	Bridge	757-200	
A9	Delta Air Lines	Bridge	727-200	
A10	Delta Air Lines	Bridge	757-200	
A11	Delta Air Lines	Bridge	A-319	
A12	Delta Air Lines	Bridge	757-200	
A15	Delta Air Lines	Bridge	A-320	
A17	Delta Air Lines	Bridge	727-200	
A18	Delta Air Lines	Bridge	757-200	
A19	Delta Air Lines	Bridge	727-200	
A20	Delta Air Lines	Bridge	757-200	
A21	Delta Air Lines	Bridge	727-200	
A23	Delta Air Lines	Bridge	727-200	
A24	Delta Air Lines	Bridge, dual	747-400	FIS access
A25	Delta Air Lines	Bridge	A-320	
A27	Delta Air Lines	Bridge	A-320	
A28	Delta Air Lines	Bridge, dual	747-400	FIS access
A29	Delta Air Lines	Bridge	A-320	
A30	Delta Air Lines	Bridge, dual	747-400	FIS access
A31	Delta Air Lines	Bridge	A-320	
A33	Delta Air Lines	Bridge	717-200	
A34	Delta Air Lines	Bridge, dual	747-400	FIS access
A35	Delta Air Lines	Bridge	EMB-175	
A36	Delta Air Lines	Bridge, dual	747-400	FIS access
A38	Delta Air Lines	Bridge, dual	747-400	FIS access
A40	Delta Air Lines	Bridge, dual	EMB-175	FIS access
A43	Delta Air Lines	Bridge	717-200	
A45	Delta Air Lines	Bridge	MD-80	
A46	Delta Air Lines	Bridge, dual	747-400	FIS access (Virgin Atlantic)
A47	Delta Air Lines	Bridge	EMB-175	
A49	Delta Air Lines	Bridge	A-320	
A50	Delta Air Lines	Bridge, dual	747-400	FIS access
A51	Delta Air Lines	Bridge	A-320	
A53	Delta Air Lines	Bridge	A-320	
A54	Delta Air Lines	Bridge, dual	747-400	FIS access
A55	Delta Air Lines	Bridge	A-320	

Gate	Airline *(a)*	Gate type	Largest aircraft	Notes
A56	Delta Air Lines	Bridge, dual	747-400	FIS access (Air France)
A57	Delta Air Lines	Bridge	A-320	
A59	Delta Air Lines	Bridge	A-320	
A60	Delta Air Lines	Bridge, dual	747-400	FIS access
A61	Delta Air Lines	Bridge	A-320	
A63	Delta Air Lines	Bridge	727-200	
A64	Delta Air Lines	Bridge	747-400	
A65	Delta Air Lines	Bridge	A-320	
A66	Delta Air Lines	Bridge	747-400	
A67	Delta Air Lines	Bridge	A-320	
A68	Delta Air Lines	Bridge	757-200	
A69	Delta Air Lines	Bridge	A-320	
A70	Delta Air Lines	Bridge	757-200	
A71	Delta Air Lines	Bridge	A-320	
A72	Delta Air Lines	Bridge	757-200	
A73	Delta Air Lines	Bridge	A-320	
A74	Delta Air Lines	Bridge	757-200	
A75	Delta Air Lines	Bridge	A-320	
A76	Delta Air Lines	Bridge	757-200	
A77	Delta Air Lines	Bridge	A-320	
A78	Delta Air Lines	Bridge	A-320	
Concourse B				
B1	Delta Air Lines	Bridge	EMB-175	
B2	Delta Air Lines	Bridge	EMB-175	
B3	Delta Air Lines	Bridge	EMB-175	
B4	Delta Air Lines	Bridge	EMB-175	
B5	Delta Air Lines	Bridge	737-900	
B6	Delta Air Lines	Bridge	EMB-175	
B7	Delta Air Lines	Bridge	EMB-175	
B8	Delta Air Lines	Bridge	737-800	
B10	Delta Air Lines	Bridge	EMB-175	
B11	Delta Air Lines	Bridge	A-319	
B12	Delta Air Lines	Bridge	A-319	
B15	Delta Air Lines	Bridge	A-319	
B16	Delta Air Lines	Bridge	A-320	
B18	Delta Air Lines	Bridge	A-320	
B19	Delta Air Lines	Bridge	A-320	
B20	Delta Air Lines	Bridge	EMB-175	
B21	Delta Air Lines	Bridge	A-320	
Concourse C				
C1	Delta Air Lines	Bridge	CRJ-200	
C2	Delta Air Lines	Bridge	CRJ-200	
C3	Delta Air Lines	Bridge	CRJ-200	
C4	Delta Air Lines	Bridge	CRJ-200	
C6	Delta Air Lines	Bridge	CRJ-200	
C7	Delta Air Lines	Bridge	CRJ-200	
C8	Delta Air Lines	Bridge	CRJ-200	
C9	Delta Air Lines	Bridge	CRJ-200	
C10	Delta Air Lines	Bridge	CRJ-200	

Gate	Airline *(a)*	Gate type	Largest aircraft	Notes
C11	Delta Air Lines	Bridge	CRJ-900	
C12	Delta Air Lines	Bridge	CRJ-200	
C14	Delta Air Lines	Bridge	CRJ-200	
C15	Delta Air Lines	Bridge	CRJ-900	
C16	Delta Air Lines	Bridge	CRJ-200	
C17	Delta Air Lines	Bridge	CRJ-200	
C18	Delta Air Lines	Bridge	CRJ-200	
C19	Delta Air Lines	Bridge	CRJ-900	
C20	Delta Air Lines	Bridge	CRJ-200	
C21	Delta Air Lines	Bridge	CRJ-900	
C22	Delta Air Lines	Bridge	CRJ-200	
C23	Delta Air Lines	Bridge	CRJ-900	
C24	Delta Air Lines	Bridge	CRJ-200	
C25	Delta Air Lines	Bridge	CRJ-900	
C26	Not in-use	Bridge	CRJ-200	
C27	Delta Air Lines	Bridge	CRJ-900	
C28	Not in-use	Bridge	CRJ-200	
C29	Not in-use	Bridge	CRJ-900	
C30	Not in-use	Bridge	CRJ-200	
C31	Not in-use	Bridge	CRJ-900	
C32	Not in-use	Bridge	CRJ-200	
C33	Not in-use	Bridge	CRJ-900	
C34	Not in-use	Bridge	CRJ-200	
C35	Not in-use	Bridge	CRJ-200	
C36	Not in-use	Bridge	CRJ-200	
C37	Not in-use	Bridge	CRJ-200	
C38	Not in-use	Bridge	CRJ-200	
C39	Not in-use	Bridge	CRJ-200	
C40	Not in-use	Bridge	CRJ-900	
C41	Not in-use	Bridge	CRJ-700	
C43	Not in-use	Bridge	CRJ-200	
North Terminal				
Concourse D				
D1	United Airlines	Bridge	737-800	
D2	United Airlines	Bridge	737-900	
D3	Common Use	Bridge	767-200	FIS access, D3W accommodates B747-400 ER and restricts D3 and D5B
D4	United Airlines	Bridge	MD-88	
D5A	Common Use	Bridge	757-300WL	FIS access; D5 accommodates A-330-200 and restricts D5A and D5B
D5B	Common Use	Bridge	757-300WL	
D6	United Airlines	Bridge	737-800	
D8	United Airlines	Bridge	757-300	
D9	Common Use	Bridge	757-200	FIS access
D10	Common Use	Bridge	757-200	FIS access
D11	Spirit Airlines	Bridge	757-200	
D12	Spirit Airlines	Bridge	757-200	
D14	Spirit Airlines	Bridge	757-200	

Gate	Airline *(a)*	Gate type	Largest aircraft	Notes
D15	JetBlue Airways	Bridge	757-200	
D16	Frontier Airlines	Bridge	757-200	
D17	Common Use	Bridge	757-200	
D18	American Airlines	Bridge	757-200	
D19	Southwest Airlines	Bridge	737-900WL	
D20	Southwest Airlines	Bridge	737-900WL	
D21	Southwest Airlines	Bridge	737-900WL	
D23	Southwest Airlines	Bridge	737-900WL	
D24	American Airlines	Bridge	A-321-NEO	
D25	American Airlines	Bridge	A-321-NEO	
D26	American Airlines	Bridge	A-321-NEO	
D28	American Airlines	Bridge	757-300	
D30	American Airlines	Bridge	757-300WL	
D32	American Airlines	Bridge	737-800WL	

(a) Includes each airline's regional affiliates.

Source: LeighFisher, based on terminal drawings provided by Wayne County Airport Authority and field verification, January 2016.

3.2 North Terminal

The North Terminal was opened for operation in September 2008 and accommodates all non-SkyTeam affiliated airlines. It was constructed to replace the Berry and Smith Terminals.

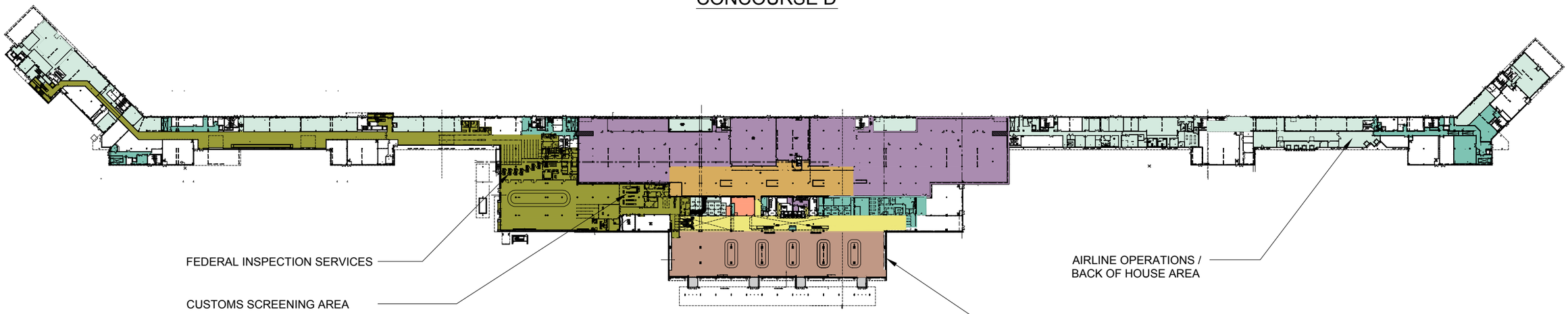
3.2.1 Terminal Processor

The terminal processor provides approximately 413,900 square feet of space on three levels:

- Tunnel Level
- Lower Level
- Upper Level

A six-level terminal parking garage connects to the terminal building on the mezzanine level, which is accessed from the Upper Level. Table 3-5 summarizes space allocation for the North Terminal. Terminal floor plans for the lower and upper levels of the North Terminal are depicted on Figures 3-4 and 3-5. The Tunnel Level is not open for public access and is primarily used for airport support and utility/maintenance access.

CONCOURSE D



LEGEND

- Public circulation
- Baggage claim area
- Airport support
- BSO / Airline support
- Outbound baggage makeup area
- Inbound baggage delivery area
- Customs and Border Protection

NORTH

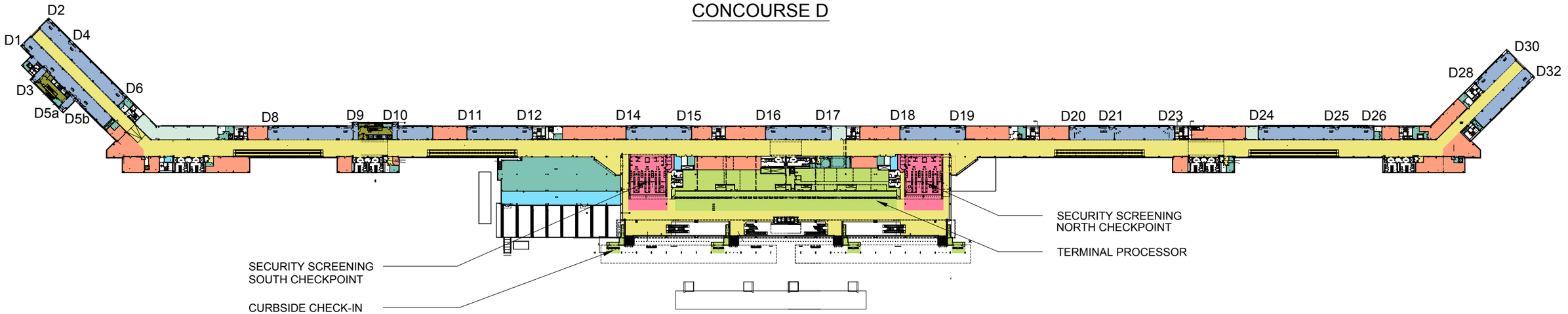
0 100' 200' 400'

Source: Wayne County Airport Authority

Figure 3-5
NORTH TERMINAL LOWER LEVEL
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

CONCOURSE D



LEGEND

- Public circulation
- Concessions
- Security screening checkpoint
- Ticketing / Airline ticket office
- Customs and Border Protection
- Airport support
- BSO / Airline support
- Miscellaneous / Others

NORTH

0 100' 200' 400'

Source: Wayne County Airport Authority

Figure 3-6
NORTH TERMINAL
UPPER LEVEL
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh | Fisher

Table 3-5
NORTH TERMINAL SPACE ALLOCATION
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Space category	Tunnel level	Lower level	Upper level	Total
Airline space *(a)*	80,400	73,200	78,600	232,200
Airport administration	0	24,700	14,700	39,400
Baggage claim	0	35,900	0	35,900
Baggage handling	0	115,200	0	115,200
Concessions	0	14,400	76,000	90,400
Customs and immigration *(b)*	0	64,700	0	64,700
Open/vacant	0	0	7,900	7,900
Other *(c)*	62,200	56,900	37,000	156,100
Public space	0	13,800	127,100	140,900
Security screening *(d)*	0	22,000	18,400	40,400
Total	142,600	420,800	359,500	923,100

Note: Calculations based on gross areas measured to the outside edge of exterior walls and the center of interior walls, rounded to the nearest hundred square feet.

(a) Includes ticket counters, operations space, departure lounges, and secure office space.
(b) Includes all space allocated for the Federal Inspection Service.
(c) Includes building systems, utilities, and other non-leased spaces within the building.
(d) Includes TSA-leased space within the terminal building.

Source: LeighFisher, based on terminal drawings provided by Wayne County Airport Authority and field verification, February 2016.

The Lower Level contains both the passenger baggage claim and the baggage handling and sorting areas used by airline personnel. Additionally, there are airline office spaces adjacent to the claim areas to support passenger luggage retrieval, Airport police, Authority building maintenance office space, and storage and mechanical spaces.

The Upper Level contains ticket counter check-in positions, airline electronic kiosks for passenger check-in, airline office space, two passenger security screening checkpoints, several concessions spaces in the secure areas of the building, and building mechanical rooms. There is a vertical circulation core at the front of the building that provides access to a bridge over the departures level roadway. This bridge connects to the Ground Transportation Center and parking garage.

3.2.1.1 Baggage

Baggage claim facilities are located on the Lower Level of the terminal processor. There are five common-use carousel claim devices for domestic flights and one carousel claim device for international flights (located within the FIS facility). Spirit Airlines, American Airlines, and Southwest Airlines each occupy one carousel claim. United Airlines, Air Canada, and Alaska Airlines share a single carousel that is also used by Spirit Airlines during off-peak times. The remaining domestic carousel is allocated based on airline demand and is used primarily during peak times. There is one central oversized baggage claim. All airlines maintain baggage service offices to handle passenger baggage inquiries. Inbound and outbound baggage make-up

facilities, in which airline personnel transfer baggage to and from conveyor belt systems onto carts to be transported directly to aircraft, are located on the Lower Level, to the west of the claim devices. Baggage originating at the ticketing facilities on the Upper Level is transported downstairs to the baggage screening facility, then onto baggage makeup carousels or laterals.

3.2.1.2 Ticketing

There is a ticketing lobby on the terminal processor's Upper Level that provides positions for airline agents and electronic kiosks to support the checking-in of airline passengers and baggage. In total, there are 86 positions allocated to individual airlines on an exclusive-use basis, with the exception of seven positions allocated as common-use for international carriers. The location and number of positions occupied by each airline is summarized in Table 3-6. TSA screening of checked baggage is located on the Lower Level.

3.2.1.3 Passenger Security Screening Checkpoints

There are two passenger security screening checkpoints, one on each side of the ticketing lobby, that provide metal detector and x-ray screening of passenger and baggage to facilitate access to the secure concourse areas. In total, there are 10 checkpoint lanes: five on the north side and five on the south side.

Table 3-6
NORTH TERMINAL AIRLINE TICKETING POSITIONS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Airline	Agent positions	Kiosk positions *(a)*	Total
Air Canada	5	0	5
Alaska Airlines	8	0	8
American Airlines	14	11	25
Common-use International	7	0	7
Frontier Airlines	4	0	4
JetBlue	4	3	7
Lufthansa	6	0	6
Southwest Airlines	10	0	10
Spirit Airlines	16	8	24
United Airlines	12	2	14

(a) An additional six kiosks are provided in the ticket lobby and serve as common-use for multiple airlines.

Source: LeighFisher field verification, February 2016.

3.2.1.4 Federal Inspection Service Facility

Four gates at the southern end of Concourse D are tied to sterile corridors that connect the passenger loading bridges to the Airport's FIS screening facility. They occupy approximately 65,000 square feet on the Lower Level beneath the concourse. The FIS provides immigration processing for passengers arriving from abroad, baggage claim devices, customs screening of baggage, and office space for the U.S. Customs and

Border Protection. Once arriving passengers and their bags have been processed, they are directed into the domestic baggage claim lobby.

3.2.2 Passenger Concourse

Concourse D provides a total of 26 gates available for active loading and unloading of passengers, baggage, and belly cargo. The concourse is linear in a north-south orientation to the terminal processor. The portions of Concourse D adjacent to the terminal processor are single-loaded (i.e., containing passenger gates on only one side), while areas at the end to the south are double-loaded.

Most of concourse D has two levels: a Lower Level used by airline tenants as operation space; and an Upper Level containing passenger gates, departure lounges, concessions, restrooms, and a Lufthansa Senator Lounge. The Lower and Upper Levels of Concourse D are depicted on Figures 3-21 through 3-26. In total, the concourse provides approximately 509,200 square feet of usable space.

Six airlines possess preferential lease agreements for gate use on Concourse D. The Authority controls the remaining five gates (D3, D5A/D5B, D9, D10, and D17). A summary of airline gate assignments and aircraft parking capabilities is provided in Table 3-4.

3.3 Aircraft Parking Apron

Approximately 139 acres of apron are available for aircraft maneuvering and parking at the passenger terminal. The apron is currently configured to accommodate aircraft ranging from small regional jet aircraft (CRJ-200 and ERJ-145) to large widebody aircraft (B747-400). Currently, there are 147 aircraft parking positions that provide direct access to the terminal. All parking positions are equipped with passenger loading bridges. Some of the gates on the west side of Concourse A are equipped with dual loading bridges to accommodate larger aircraft. The largest aircraft that can be accommodated at each parking position is identified in Table 3-4.

As shown on Figure 2-1, gates on the north east side of Concourse A are accessed from Taxiway U via dual taxilanes U-7 and U-8. Gates on the south east side of Concourse A are accessed from Taxiway J via dual taxilanes J-7 and J-8. Two taxilanes, Q and U-9, provide access to the gates on the west side of Concourse A and the east side of Concourses B and C. Gates on the west side of Concourses B and C are accessed directly from Taxiway K. Aircraft accessing Concourse D utilize Taxilanes E, E-2 and E-3. Taxilane E runs parallel to Taxiway K.

A system of service roadways located around the concourses allows for the safe and efficient movement of ground support equipment and other motorized vehicles on the aircraft apron. These roadways are striped on the apron. There are several locations beneath all four concourses through which low-clearance ground support equipment can pass, avoiding what can be a lengthy drive around the ends of the concourses.

4.0 GROUND TRANSPORTATION AND PARKING

This section summarizes the Airport's ground access and parking facilities, and the current levels of activity occurring at those facilities. Figure 4-1 depicts key ground access and parking facilities referenced throughout.

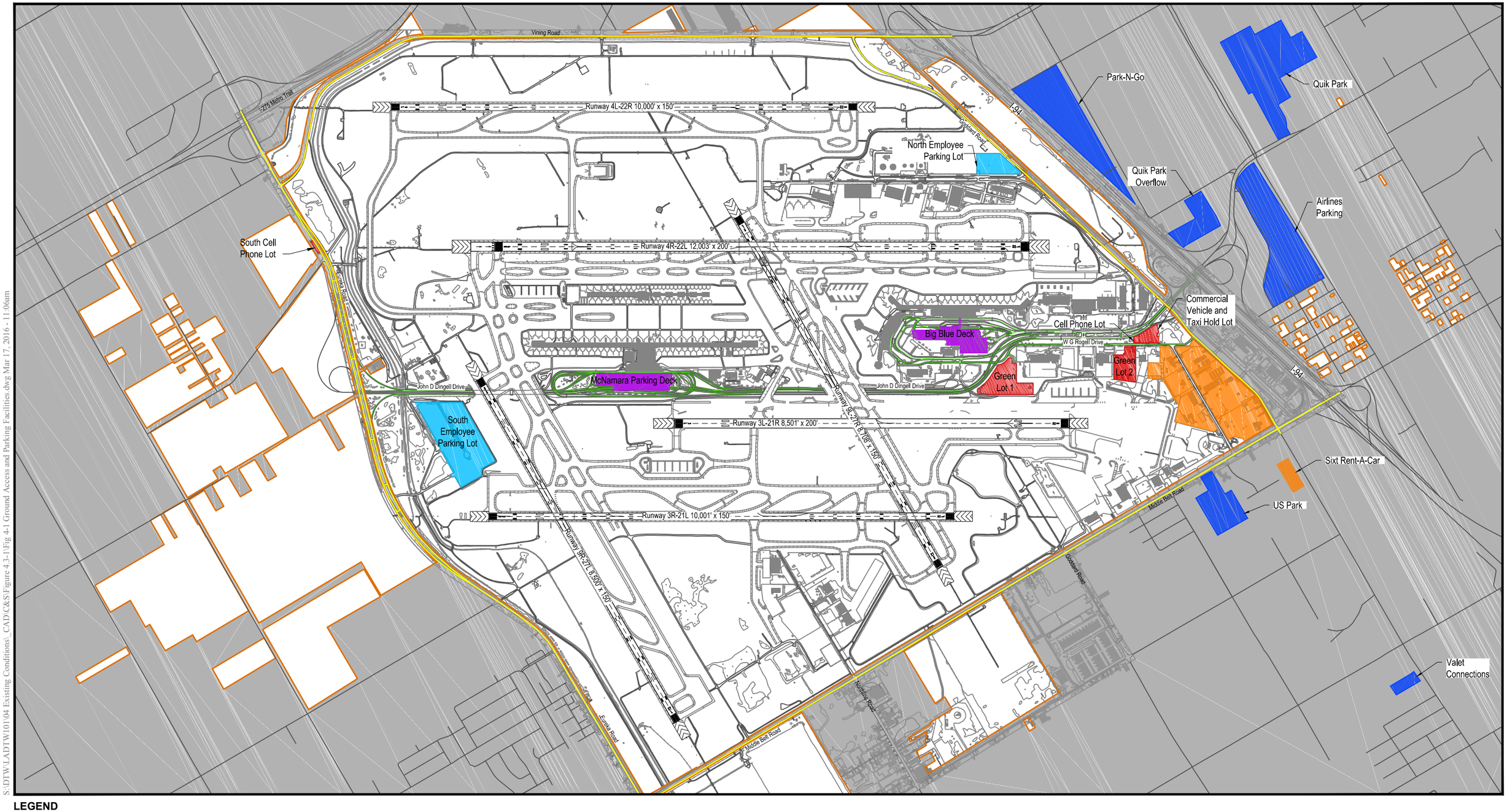
4.1 Data Sources and Assumptions

Previously prepared reports, available traffic data, and surveys of on-Airport traffic were reviewed and conducted to assess existing levels of activity on ground transportation and parking facilities. The following identifies the traffic surveys conducted as part of this Master Plan Update.

- **Vehicle Dwell Time Survey** – Surveyors used a predetermined randomization methodology to track the length of time vehicles are stopped at the curbside or in the second lane adjacent to the curb. Randomization methodology consisted of monitoring several cars at once and watching the fourth or fifth vehicle that enters the curbside after a previous monitored car has exited. Surveying occurred during a three-hour AM peak period and a three-hour PM peak period* for two days at each terminal during the week of January 25th, 2016. Data were collected at the following curbside locations: North Terminal Departures and Arrivals Level, North Terminal GTC, McNamara Terminal Departures and Arrivals Level, McNamara Terminal International Level, and McNamara Terminal GTC.
- **Commercial Vehicle Split/Classification Survey** – Surveyors located along the entry-road of the GTCs counted the volume of entering vehicles and recorded the type of vehicle, including: taxi, limos, shared-ride shuttles, hotel shuttles, off-airport parking shuttles, transit bus, green lot bus, rental car shuttle/bus, private autos, and others (police, delivery, etc.). Surveying occurred during a three-hour AM peak period and a three-hour PM peak period.
- **GTC Entry Surveys** – North Terminal (January 25/26 2016); McNamara Terminal (January 27 and 28, 2016).
- **Traffic and Turning Movement Counts** – Traffic counts were conducted during the week of January 25, 2016 at locations depicted on Figures 4-2 and 4-3. Traffic counts completed in 2011 for 24-hour periods at 56 locations are also shown on Figures 4-2 and 4-3 - see Appendix B. Turning movement counts were conducted at the intersection of William G. Rogell Drive and Service Drive for a three-hour AM peak period and a three-hour PM peak period on January 27, 2016.

Several ground transportation improvements are planned in the near term. The improvements to the Rogell-Burton intersection, as shown in Figure 4-4 include the addition of two U-turns, one to the north of the intersection and one to the south. The improvements will result in the removal of the existing U-turn just south of the intersection. This project is being completed to alleviate queueing and improve traffic flow. It is anticipated that the former Yellow Lot will be reopened for employee parking.

*The two peak periods at the Airport are 5:30 AM to 9:30 AM and 6:00 PM to 9:00 PM.



S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4.3-1\Fig 4-1 Ground Access and Parking Facilities.dwg Mar 17, 2016 - 11:06am

LEGEND

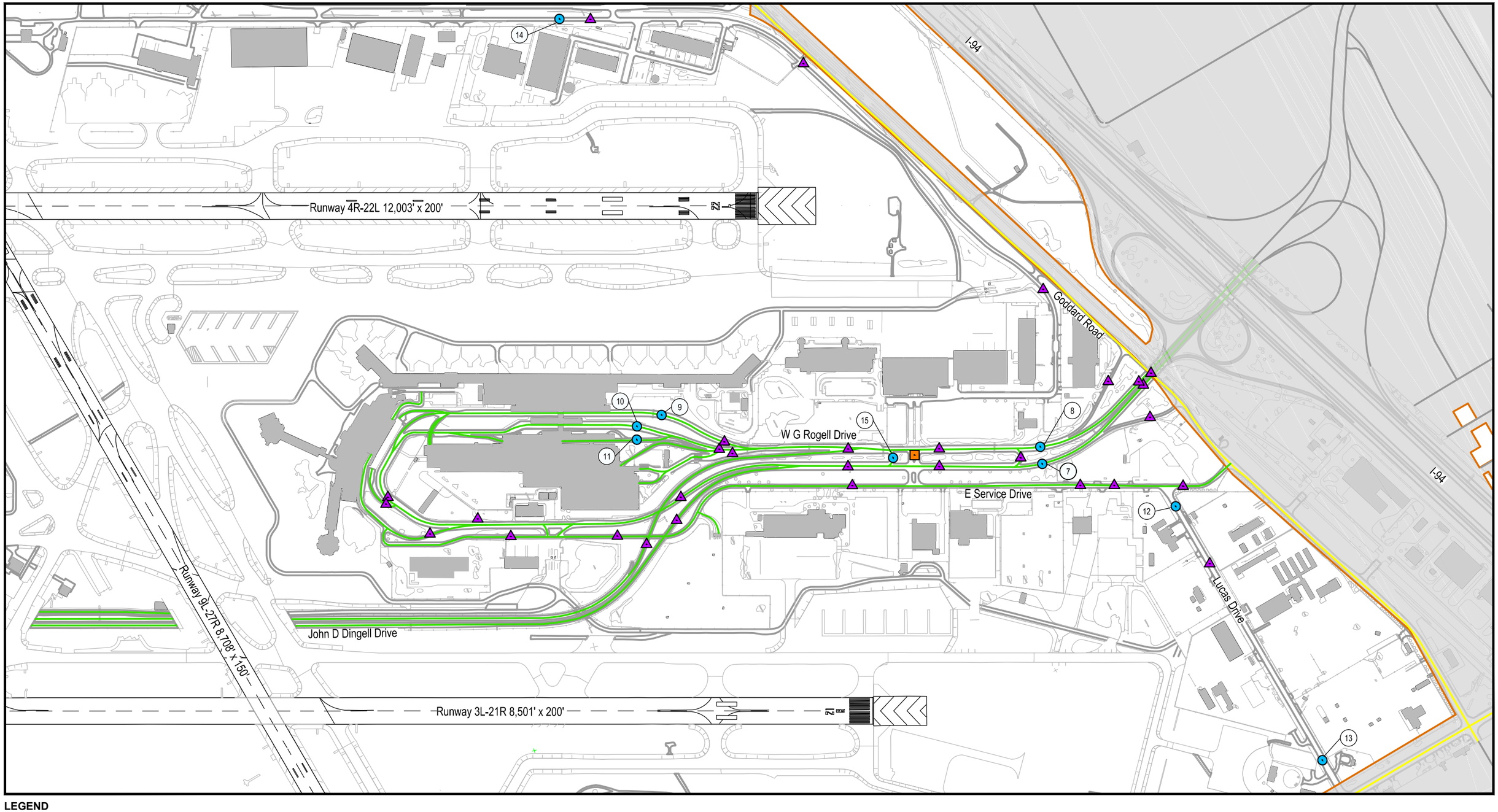
- Airport property line
- Airport perimeter roadways
- Primary access and terminal circulation
- Employee Surface Parking
- Off-airport parking facilities
- Public parking - surface
- Public parking - structure
- Rental car facilities

NORTH

0 1000' 2000' 4000'

Figure 4-1
GROUND TRANSPORTATION ACCESS AND PARKING FACILITIES
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher



F:\Project\899 - WCAA 899019001 - DTW Airport Master Plan\Planning-Study\CADD Sheet Files\X-X-X Traffic Volume Count Locations - North.dwg Feb 29, 2016

LEGEND

- Airport property line
- Airport perimeter roadways
- Primary access and terminal circulation
- Daily traffic count locations (2011)
- Week long traffic count locations (2016)
- Traffic turning movement count locations (2016)

NORTH

0 350' 700' 1400'

Figure 4-2
TRAFFIC VOLUME
COUNT LOCATIONS - NORTH
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh | Fisher

Eureka Road

John D Dingell Drive

McNamara
Parking Deck

Runway 9L-27R 8,708' x 150'

Runway 3L-21R 8,501' x 200'

Runway 9R-27L 8,500' x 150'

Runway 3R-21L 10,001' x 150'

1 2 3 4 5 6

LEGEND

- Airport property line
- Airport perimeter roadways
- Primary access and terminal circulation
- Daily traffic count locations (2011)
- Week long traffic count locations (2016)
- Traffic turning movement count locations (2016)

NORTH

0 350' 700' 1400'

Figure 4-3
TRAFFIC VOLUME COUNT LOCATIONS - SOUTH
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh | Fisher

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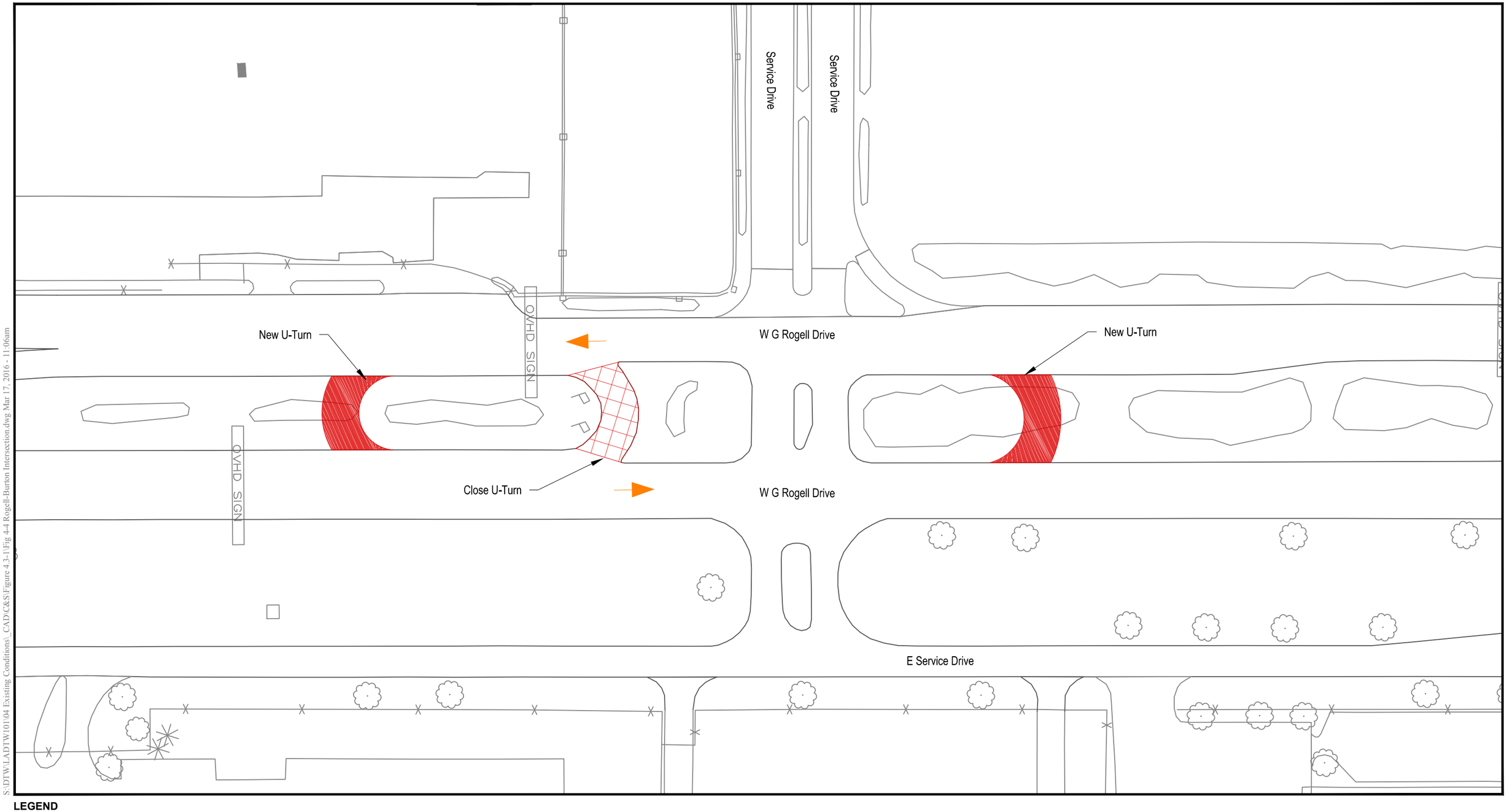

LEGEND

- Proposed pavement
- Proposed pavement removal
- Direction of flow

NORTH

0 40' 80' 160'

Figure 4-4
ROGELL/BURTON INTERSECTION IMPROVEMENTS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4-3-1\Fig 4-4 Rogell-Burton Intersection.dwg Mar 17, 2016 - 11:06am

4.2 Regional Transportation Plans

The Southeast Michigan Council of Governments (SEMCOG) developed a Regional Transportation Plan in 2004 which will invest more than $40 billion in preserving, enhancing, and operating Southeast Michigan's roadways, bridges, airports, non-motorized pathways, transit vehicles, and facilities by 2030.

One regional initiative of this long-range plan is to provide rail service in the Ann Arbor-Detroit corridor by upgrading existing infrastructure to provide commuter rail service with stops in Ann Arbor, Ypsilanti, Detroit Metropolitan Airport, Dearborn, and Detroit. An Alternatives Analysis/Environmental Impact Statement is also being conducted to determine the most sustainable practices for this project.

Various infrastructure improvement such as traffic signal modernization, road reconstruction and rehabilitation, bridge improvements, lane expansions, and safety improvements have also been identified for various roads and streets in Wayne County. The closest specified transportation project to the Airport, based on the 2004 Project List, is on the eastern airport property line where Middle Belt Road will be widened from two to five lanes from Eureka Road to North Line Road. Other locations within the Airport vicinity where lane widening to five lanes is occurring include: Ecorse Road, from Merriman to Inkster (roughly one mile north of the Airport); Sibley Road, from Telegraph to Toledo (roughly two miles south of the Airport); and Belleville Road, from Tyler to Ecorse (roughly six miles west of the Airport).

4.3 Airport Perimeter Roadways and Intersections

The Airport is bound by I-94 to the north, I-275 to the west, Middle Belt Road to the east, and Eureka Road to the south. Access to the North and McNamara terminals is as follows and highlighted on Figure 4-1:

- Merriman Road provides the principal access route to the north end of the Airport from I-94 and points north before turning into William G. Rogell Drive approaching the North Terminal complex.

- From the south, the Airport is accessed from I-275 via Eureka Road to John D. Dingell Drive. John D. Dingell Drive provides access to the McNamara Terminal from the south and continues northward to connect to the North Terminal.

- Locally, the Airport can be accessed from the east via Middle Belt Road and from the west via Vining Road, both of which connect to I-94 Service Drive/Goddard Road Extension and William G. Rogell Road at the north end of the Airport and Eureka Road and John D. Dingell Drive at the south end. The western perimeter of the Airport is bordered by Wayne Road from the south before becoming Vining Road. Wayne Road can be accessed from the south at the intersection of Eureka Road and Wahrman Street, which runs parallel to I-275.

Table 4-1 summarizes peak AM and PM traffic volumes for surrounding off-airport and perimeter roadways.

Table 4-1
OFF-AIRPORT PEAK HOUR TRAFFIC VOLUMES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Route	Direction	Location	AM Peak	AM Volume	PM Peak	PM Volume
Wahrman Rd.	South	Between Northline Rd. and Eureka Rd.	8:00	166	17:00	289
Wahrman Rd.	North	Between Northline Rd. and Eureka Rd.	8:00	297	15:00	201
Wayne Rd.	South	0.3 Miles of Goddard Rd.	8:00	120	16:00	167
Wayne Rd.	North	0.3 Miles of Goddard Rd.	9:00	169	16:00	165
Merriman Rd.	South	At I-94 Overpass	12:00	1,305	13:00	1,701
Merriman Rd.	North	At I-94 Overpass	11:00	1,119	15:00	1,799
Middle Belt Rd.	South	Between Northline Rd. and Eureka Rd.	N/A	N/A	18:00	623
Middle Belt Rd.	North	Between Northline Rd. and Eureka Rd.	8:00	664	16:00	457
I-275	South	0.5 Miles North of Eureka Rd. Interchange	8:00	2,922	17:00	3,627
I-275	North	0.5 Miles North of Eureka Rd. Interchange	8:00	3,898	18:00	2,875

Note: Data collected for Wahrman Road on 12/14/15, Wayne Road on 12/14/15, Merriman Road on 12/15/15, Middle Belt Road on 12/8/15, and I-275 on 11/2/15.

Source: MDOT Bureau of Transportation, Planning-Traffic Monitoring Information System (TMIS) database.

4.4 Passenger Terminal Circulation Roadways

Both passenger terminals are served by one-way, counterclockwise loop roads that separate departure and arrival traffic, parking and ground transportation services, and commercial vehicles.

At the North Terminal, the loop splits into three roadways. These three roadways serve the departures curbside, arrivals curbside, and GTC. The roadways also provide entrances for short- and long-term parking at the Big Blue Deck. The exit loop for the North Terminal runs to the North where access ramps to I-94 are located. To continue south, drivers must use a U-turn at Service Drive in order to proceed south on John D. Dingell Drive to the McNamara Terminal and points south. Figure 4-5 shows the circulation roadways associated with the McNamara Terminal and Figure 4-6 shows the circulation roadways associated with the North Terminal.

The McNamara Terminal loop road splits into four roadways that serve the departures curbside, arrivals curbside, international arrivals curbside, and GTC. The loop also provides separate access to short-term parking, valet services, and long-term parking. As with the North Terminal, once past McNamara, drivers have the option of continuing on John D. Dingell Drive to Eureka Road, traveling northbound to the North Terminal or other points north, or returning to the McNamara Terminal.

Westin Hotel

McNamara Terminal

Long Term Parking Entrance (International)

Valet/Long Term/Short Term Parking Entrance (Domestic)

Parking Entrance (Departures)

McNamara Parking Deck

John D. Dingell Drive

John D. Dingell Drive

Short Term Parking Entrance

Runway 3L-21R 8,501' x 200'

LEGEND

- McNamara Terminal circulation roadways - Upper level (Departures)
- Terminal circulation roadways - Middle level (Domestic Arrivals)
- Terminal circulation roadways - Lower level (International Arrivals)
- Other terminal roadways
- Public parking - structure
- Direction of travel

NORTH

0 150' 300' 600'

Figure 4-5
McNAMARA TERMINAL CIRCULATION ROADWAYS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

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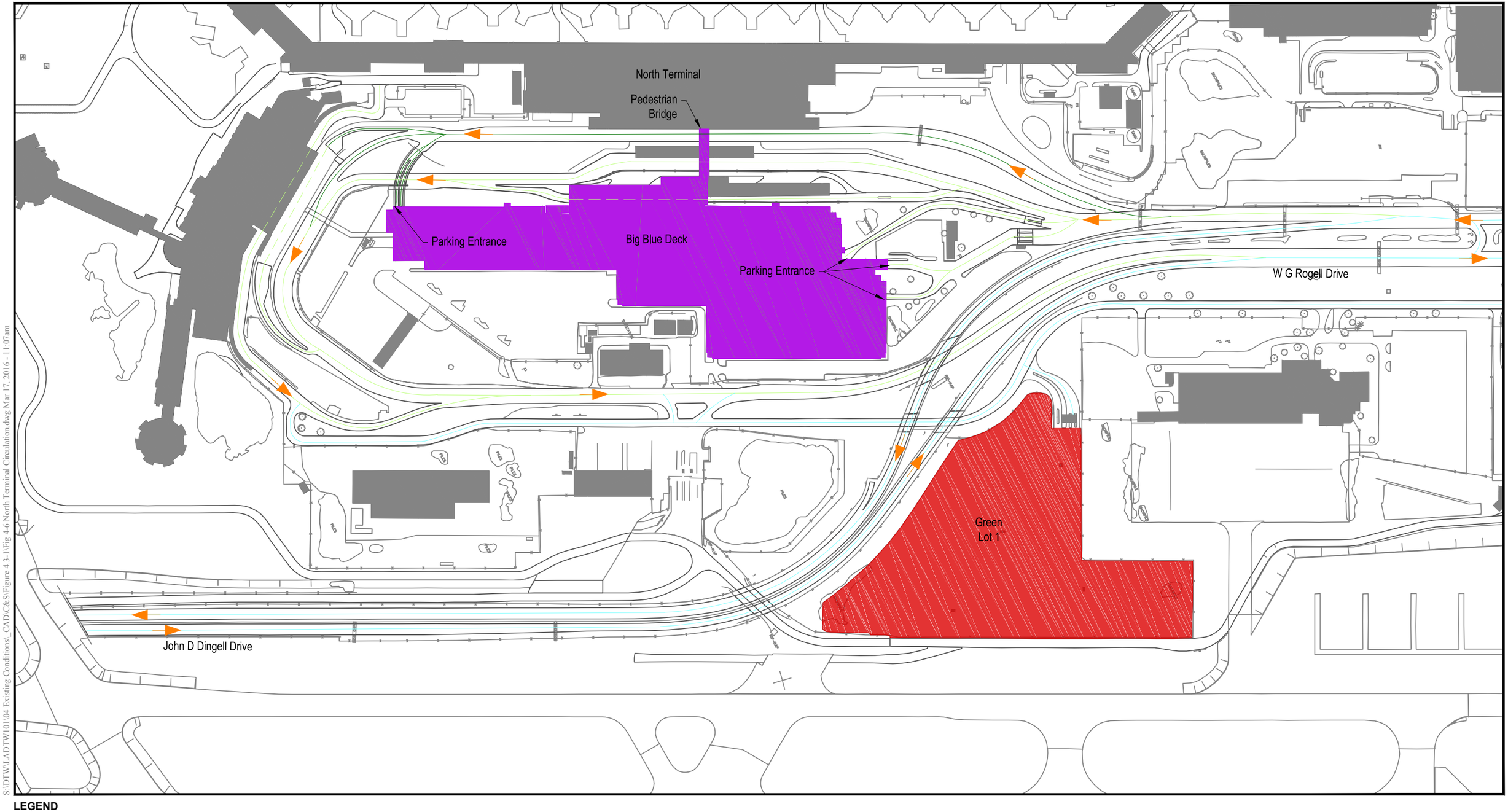

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LEGEND

- North terminal circulation roadways - Upper level (Departures)
- North terminal circulation roadways - Lower level (Arrivals)
- Other terminal roadways
- Public parking - surface
- Public parking - structure
- Direction of travel

NORTH

0 150' 300' 600'

Figure 4-6
NORTH TERMINAL
CIRCULATION ROADWAYS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

Table 4-2, in combination with Figures 4-2 and 4-3, presents hourly traffic volumes on Airport non-terminal roadways during peak periods. Table 4-3 shows the peak hour turning movement counts for the intersection of William G. Rogell Drive and Service Drive. Table 4-4 shows the vehicle split at this intersection.

Table 4-2
NON-TERMINAL PEAK HOUR TRAFFIC VOLUMES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

		AM Peak			PM Peak		
Count	Description	Peak hour	Day	Volume	Peak hour	Day	Volume
1 NB	Dingell Dr. (between tunnel & Eureka Rd.)	6:30 AM	Monday	657	1:30 PM	Sunday	514
2 SB	Dingell Dr. (between tunnel & Eureka Rd.)	11:00 AM	Friday	407	2:15 PM & 2:30 PM	Friday	707
7 SB	WG Rogell Dr. (1,000' North of Burton Dr.)	5:45 AM	Monday	1,820	1:30 PM	Thursday	1,686
8 NB	WG Rogell Dr. (1,150' North of Burton Dr.)	10:45 AM	Monday	1,115	2:30 PM	Friday	1,768
12 EB	Lucas Dr. (Southwest End- 150' East of E. Service Dr.)	11:00 AM	Friday	293	3:15 PM	Thursday	410
12 WB	Lucas Dr. (Southwest End- 200' East of E. Service Dr.)	9:00 AM	Tuesday	190	6:00 AM	Monday	208
13 EB	Lucas Dr. (Northeast End- 350' West of Middle Belt Rd.)	9:30 AM	Monday	491	3:00 PM	Monday	480
13 WB	Lucas Dr. (Northeast End- 400' West of Middle Belt Rd.)	11:00 AM	Friday	269	1:00 PM	Friday	377
14 NB	W. Service Rd. (100' South of Central Maintenance Dr.)	6:30 AM	Thursday	97	10:00 PM	Wednesday	42
14 SB	W. Service Rd. (350' South of Central Maintenance Dr.)	5:15 AM	Thursday	52	8:00 PM & 8:15 PM	Tuesday	44
15 NB	WG Rogell Dr. NB-SB Crossover (250' South of Burton Dr.)	11:45 PM	Saturday	461	1:15 PM	Thursday	465

Source: Traffic Data Collection, data collected January 22-30, 2016.

Table 4-3
PEAK HOUR TRAFFIC VOLUMES – INTERSECTION
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Direction	5:30 AM – 8:30 AM	6:00 PM – 9:00 PM
Rogell Drive Southbound		
Right	153	49
Thru	3,262	2,273
Left	252	186
Burton Drive Westbound		
Right	49	140
Thru	94	148
Left	104	169
Rogell Drive Northbound		
Right	164	137
Thru	2,124	2,937
Left	2	1
Buton Drive Eastbound		
Right	38	66
Thru	63	63
Left	115	95

Notes: The intersection of Rogell Drive and Burton Drive is signalized. Northbound Left Turns are prohibited.

Source: Traffic Data Collection, data collected January 27, 2016.

A larger vehicle volume was observed on non-terminal and circulation roadways in the evening than in the morning. The morning peak volume was observed at 1,820 vehicles on Rogell Drive southbound at 5:45 AM on a Monday. The lowest morning peak volume was observed on West Service Road southbound at 52 vehicles at 5:15 AM on a Thursday. The largest evening peak occurred on Rogell Drive northbound at 2:30 PM on a Friday at a volume of 1,768 vehicles. The smallest evening peak observed occurred on West Service Road northbound at 10:00 PM on a Wednesday at a volume of 41 vehicles.

Turning movement counts were recorded at the intersection of Rogell Drive and Burton Drive. During this six-hour survey, three vehicles were observed making an illegal left turn from Rogell Drive northbound onto Burton Drive westbound. The majority of vehicles observed at the intersection went straight through, continuing onto Rogell Drive northbound or southbound. A vehicle split of this intersection indicates that the majority of vehicles observed were passenger cars, followed by buses, single units, and then heavy trucks.

Table 4-4
PEAK HOUR VEHICLE SPLIT – INTERSECTION (% Total Volume)
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

	Passenger Cars		Buses		Single Units		Heavy Trucks	
Direction	AM	PM	AM	PM	AM	PM	AM	PM
Rogell Drive Southbound								
Right	94.4	92.9	1.9	7.1	1.9	0	1.9	0
Thru	87.4	81.4	12	18.4	0.2	0.2	0.3	0
Left	98	95.7	2	2.1	0	1.1	0	1.1
Burton Drive Westbound								
Right	95.2	100	0	0	0	0	4.8	0
Thru	95.0	97.8	5.0	0	0	2.2	0	0
Left	100.0	97.7	0	0	0	2.3	0	0
Rogell Drive Northbound								
Right	97.6	100	0	0	2.4	0	0	0
Thru	83.8	82.2	15.4	17.7	0.5	0.1	0.2	0
Left	0	0	0	0	0	0	0	0
Burton Drive Eastbound								
Right	100	100	0	0	0	0	0	0
Thru	75	100	10	0	15	0	0	0
Left	95.5	97.9	0	2.1	4.5	0	0	0
Total Combined	87.3	84.6	11.9	15.1	0.5	0.3	0.3	0

Notes: The intersection of Rogell Drive and Burton Drive is signalized without pedestrian signals. Northbound left turns are prohibited.

Source: Traffic Data Collection, data collected January 27, 2016 (5:30-8:30 AM and 6:00-9:00 PM).

Table 4-5 and Table 4-6, in combination with Figures 4-2 and 4-3, summarize peak hour traffic volumes at the McNamara Terminal and the North Terminal.

At the McNamara Terminal, morning hour traffic peaked at 772 vehicles at 6:15 AM on a Monday and evening hour traffic peaked at 555 vehicles at 1:30 PM on a Sunday. The largest morning peak in traffic observed at the North Terminal occurred at 5:15 AM on a Monday at 461 vehicles and the largest evening peak in traffic occurred at 2:00 PM on a Saturday at 440 vehicles.

Table 4-5
MCNAMARA TERMINAL PEAK HOUR TRAFFIC VOLUMES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

		AM Peak			PM Peak		
Count	Description	Peak hour	Day	Volume	Peak hour	Day	Volume
3 SB	Departures (Upper Level)	6:15 AM	Monday	772	1:30 PM	Sunday	555
4 SB	Arrivals (Middle Level)	11:00 AM	Saturday	397	8:45 PM	Sunday	524
5 SB	Ground Transportation Center	11:00 AM	Monday	225	4:15 PM	Monday	277
6 SB	International Arrivals (Lower Level)	6:15 AM	Monday	624	1:30 PM	Monday	358

Source: Traffic Data Collection, data collected January 22-30, 2016.

Table 4-6
NORTH TERMINAL PEAK HOUR TRAFFIC VOLUMES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

		AM Peak			PM Peak		
Count	Description	Peak hour	Day	Volume	Peak hour	Day	Volume
9 SB	Departures (Upper Level)	5:15 AM	Monday	461	1:30 PM	Friday	416
10 SB	Arrivals (Lower Level)	12:30 AM	Saturday	394	11:30 PM	Sunday	536
11 SB	Ground Transportation Center	10:15 AM	Tuesday	184	4:00 PM	Monday	204

Source: Traffic Data Collection, data collected January 22-30, 2016.

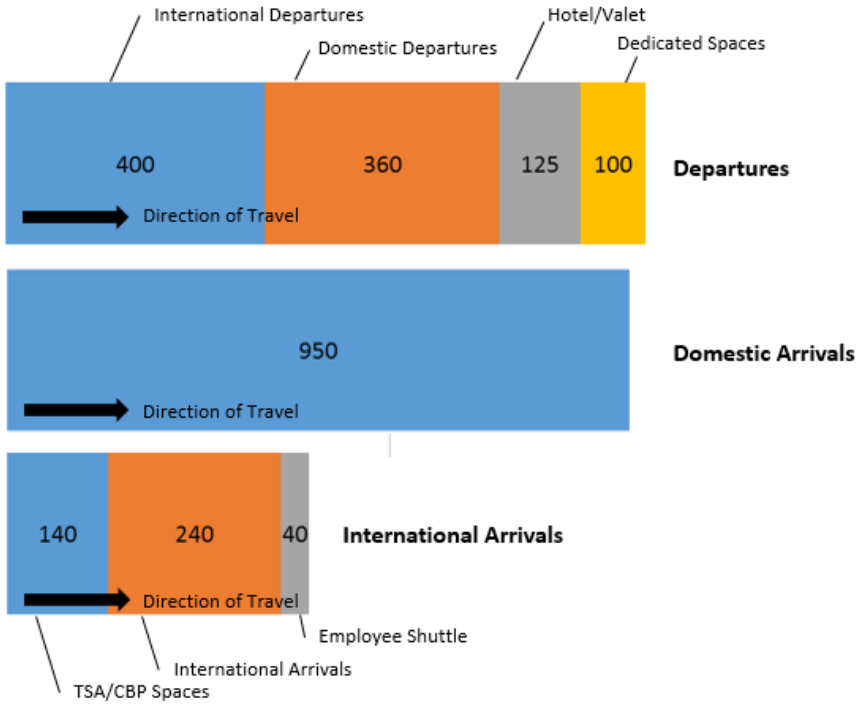
4.5 Terminal Curbside Facilities

The following describes the layout and use of the curbsides at the North and McNamara Terminals.

4.5.1 McNamara Terminal

Figure 4-7 shows the curb frontage roadways for the McNamara Terminal. The upper level roadway is dedicated to departures. Short-term and valet parking in the garage is also accessed from this roadway. The curb frontage is approximately 985 linear feet long. There is a dedicated lane at the far left to access parking, two through lanes, and two loading/unloading lanes. There are no pedestrian at-grade crossings on this or any other level of the McNamara Terminal.

Figure 4-7
McNAMARA TERMINAL CURB FRONTAGE
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport



Note: Image not to scale.

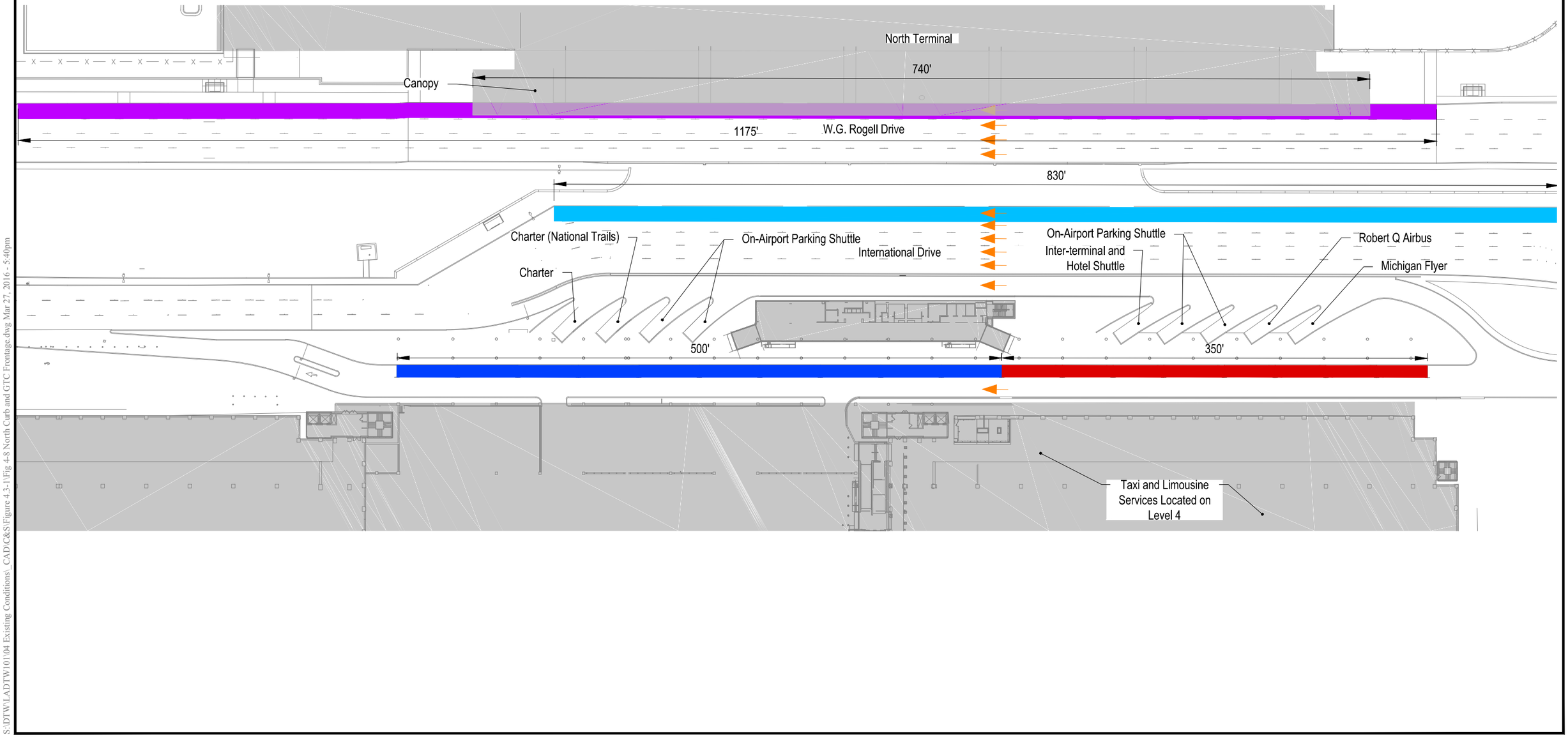
Source: C&S Engineers, Inc., February 2016.

The middle roadway level accommodates domestic arrivals as well as the GTC in the McNamara Parking Garage. There are three loading/unloading lanes and two through lanes.

The lower level at the McNamara Terminal is dedicated to international arrivals with Delta DASH Cargo and loading docks at the south end of the frontage area. There are three loading/unloading lanes and two through lanes along 420 linear feet of curbside. Access to the parking garage is provided to the left past the frontage area.

4.5.2 North Terminal

Figure 4-8 shows the curb frontage roadways for the North Terminal. Drivers dropping off passengers at the North Terminal use the upper level roadway. There is approximately 1,120 linear feet of curb frontage. This roadway consists of four lanes – a loading/unloading lane, two through lanes, and a lane that exits left for parking in the Big Blue Deck. Pedestrians from the Big Blue Deck or other ground transportation services are directed to use an above-ground pedestrian bridge; therefore, there are no at-grade pedestrian crossings at this level.



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LEGEND

- Direction of flow
- Arrivals
- Departures
- Off airport parking and hotel shuttles
- Rental car shuttles

NORTH

0 40' 80' 160'

Figure 4-8
NORTH TERMINAL CURB FRONTAGE AND GROUND TRANSPORTATION CENTER
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh | Fisher

The lower level at the North Terminal consists of five lanes – two marked loading/unloading lanes, and three through lanes. The curb frontage length is approximately 820 linear feet. Commercial vehicles and those looking for the Big Blue Deck are directed to their designated areas before approaching the curb frontage area. As with the upper roadway, there are no at-grade pedestrian crossings.

4.5.3 Vehicle Classifications

The vehicular fleet mix at each terminal was sorted into the vehicle classes of taxicab, limousine, shared-ride shuttle, hotel/motel shuttle, off-airport parking shuttle, public transit bus, green lot bus, rental car bus, private vehicle, and other. A summary of the vehicular fleet mix on the different roadways at each terminal is provided in Tables 4-7 and 4-8.

At the North Terminal, it was observed that the Departures Level was dominated by passengers unloading from private vehicles in the morning. Approximately 96% of the vehicles observed during the morning peak period were private vehicles and 99% were private vehicles in the evening peak period. Observations at the Arrivals Level were similar, with private vehicles occupying a majority of the curbside. Unlike the Departures Level, the Arrivals Level experienced a larger volume of private vehicle during the evening peak period representing 97% of the total observed volume, versus 93% of the total traffic during the morning peak period. It was also observed that on the Arrivals Level during the evening peak period, that airport police made a consistent effort to keep traffic moving and to make sure that only vehicles that were actively unloading or loading remained parked at the curbside.

At the McNamara Terminal, the Departures Level was primarily used by private vehicles (91% in both AM and PM peak), followed by taxicabs (7% in both AM and PM peak). The Departures level also had a higher vehicular traffic volume in the morning than in the evening. The Arrivals Level was equally dominated by private vehicles during the morning and evening peak periods. The International Level was split approximately even between private and other vehicles in the morning. In the evening, there was a split of approximately 73% private vehicles and 27% other vehicles.

4.5.4 Curbside Dwell Times

Tables 4-7 and 4-8 summarize the results of curbside dwell time surveys conducted during peak periods on the different roadways at each terminal.

At the McNamara Terminal, the longest observed dwell time at the Departures Level was approximately six and a half minutes for vehicles such as police and delivery cars during the morning peak period. The shortest dwell times for both the morning and evening peak periods were observed for public transit buses at 28 and 39 seconds respectively. On the Arrivals Level, dwell times for vehicles such as police and delivery cars were also observed to be the longest at almost nine minutes in the morning and seventeen minutes in the evening. Private vehicles also displayed a significantly longer dwell time on the Arrivals Level than the Departures Level, with an average dwell time of six minutes and one seconds. The longest average dwell time observed on the International Level was almost eight minutes by private vehicles in the evening.

Table 4-7

PEAK PERIOD VEHICLE SPLIT AND AVERAGE DWELL TIME – McNAMARA TERMINAL

Airport Master Plan Update

Detroit Metropolitan Wayne County Airport

	Departures				Arrivals				International				GTC			
	AM		PM		AM		PM		AM		PM		AM		PM	
Vehicle class	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent
Taxicab	0:01:57	7.4%	0:01:45	7.1%	0:02:26	0.9%	--	--	--	--	--	--	N/A	8.1%	N/A	23.4%
Limousine	0:01:35	0.3%	0:02:40	0.7%	--	--	--	--	--	--	--	--	--	--	--	--
Shared-ride shuttle	--	--	--	--	--	--	--	--	--	--	--	--	N/A	0.4%	N/A	0.1%
Hotel/motel shuttle	--	--	--	--	--	--	--	--	--	--	--	--	0:01:22	30.3%	0:01:45	24.0%
Off-airport parking shuttle	--	--	--	--	--	--	--	--	--	--	--	--	0:01:16	23.7%	0:01:42	20.7%
Public transit bus	0:00:28	0.3%	0:00:39	0.7%	--	--	--	--	--	--	0:05:18	0.7%	0:04:51	2.0%	0:04:31	1.0%
Green lot bus	--	--	--	--	--	--	--	--	--	--	--	--	0:01:43	6.4%	0:02:13	4.2%
Rental car bus	--	--	--	--	--	--	--	--	--	--	--	--	0:04:45	24.1%	0:05:34	21.2%
Private vehicle	0:01:39	90.9%	0:01:39	91.2%	0:04:43	87.9%	0:06:01	96.6%	0:02:35	51.2%	0:07:56	73.2%	--	--	--	--
Other (police, delivery)	0:06:29	1.1%	0:01:26	0.3%	0:09:16	11.2%	0:17:15	3.4%	0:02:46	48.8%	0:02:00	26.1%	N/A	5.0%	N/A	5.4%

Note: Vehicle split is calculated as an average.

N/A = Not applicable. Dwell time in the taxi queues was not recorded.

Source: Advanced Geomatics, January 27-28, 2016 for AM Peak Period of 5:30 am-8:30 am and PM Peak Period of 6:00 pm-9:00 pm.

Table 4-8
PEAK PERIOD VEHICLE SPLIT AND AVERAGE DWELL TIME – NORTH TERMINAL
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

	Departures				Arrivals				GTC			
	AM		PM		AM		PM		AM		PM	
Vehicle Class	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent	Avg dwell time	Percent
Taxicab	0:03:53	1.0%	--	--	--	--	--	--	N/A	0.4%	N/A	4.5%
Limousine	0:05:14	0.4%	--	--	--	--	--	--	--	--	--	--
Shared-ride shuttle	--	-	--	--	--	--	--	--	N/A	0.6%	N/A	0.3%
Hotel/motel shuttle	--	--	--	--	--	--	--	--	0:01:31	33.4%	0:01:37	28.0%
Off-airport parking shuttle	--	--	--	--	--	--	--	--	0:01:19	23.7%	0:02:39	26.8%
Public transit bus	0:01:43	0.4%	--	--	--	--	--	--	0:08:03	2.6%	0:09:01	2.4%
Green lot bus	--	--	--	--	--	--	--	--	0:02:30	6.3%	0:05:13	5.8%
Rental car bus	--	--	--	--	--	--	--	--	0:07:03	27.0%	0:05:07	27.9%
Private vehicle	0:01:48	96.4%	0:02:22	98.9%	0:08:24	92.7%	0:05:17	97.2%	--	--	--	--
Other (police, delivery)	0:02:48	1.8%	0:01:57	1.1%	0:04:14	7.3%	0:03:29	2.8%	N/A	6.0%	N/A	4.3%

Note: Vehicle split is calculated as an average.

N/A = Not applicable. Dwell time in the taxi queues was not recorded.

Source: Advanced Geomatics on January 25-26, 2016 for AM Peak Period of 5:30 am-8:30 am and PM Peak Period of 6:00 pm-9:00 pm.

At the North Terminal Departures Level, the longest average dwell time observed was for limousines in the morning peak period at five minutes and fourteen seconds. Public transit buses had the lowest average dwell time at one minute and forty-three seconds. Overall, the average dwell times of private vehicles observed in the morning was approximately one minute longer than the average dwell time of private vehicles observed in the evening. On the Arrivals Level, dwell times were longer in the morning than in the evening for both private vehicles and other vehicles. The average dwell time for private vehicles in the morning was approximately eight and a half minutes while in the evening it was approximately five minutes.

4.5.5 Pedestrian Activity

Pedestrian bridges connect each terminal to its respective garage and GTC. As a result, there are no pedestrian crosswalks across the curbsides. To travel from terminal to terminal, there is an inter-terminal shuttle that departs every ten minutes from each GTC and the Westin Hotel entrance.

4.6 GROUND TRANSPORTATION CENTERS

The garages at each passenger terminal include a GTC to accommodate courtesy shuttles (rental car, hotel, and off-Airport parking), Airport shuttles, public transit, taxis, and other charter services.

4.6.1 McNamara Terminal Ground Transportation Center

Figure 4-9 shows the allocation of space and curb frontage at McNamara Terminal GTC. The GTC is located on the fourth level of the McNamara Parking Garage, corresponding with the arrivals level of the terminal. Curbside frontage includes 275 feet for a pickup area for Metro Cab, Metro Car, or prearranged rides; 75 linear feet for terminal shuttles; 125 feet for courtesy shuttles; 125 feet for a prearranged queue; 125 feet for a Metro Cab queue; 125 feet for a Metro Car queue; 125 feet for rental car shuttles; and 125 feet for public transit and charters. Table 4-7 shows the curb dwell time and vehicle classification at the McNamara Terminal GTC.

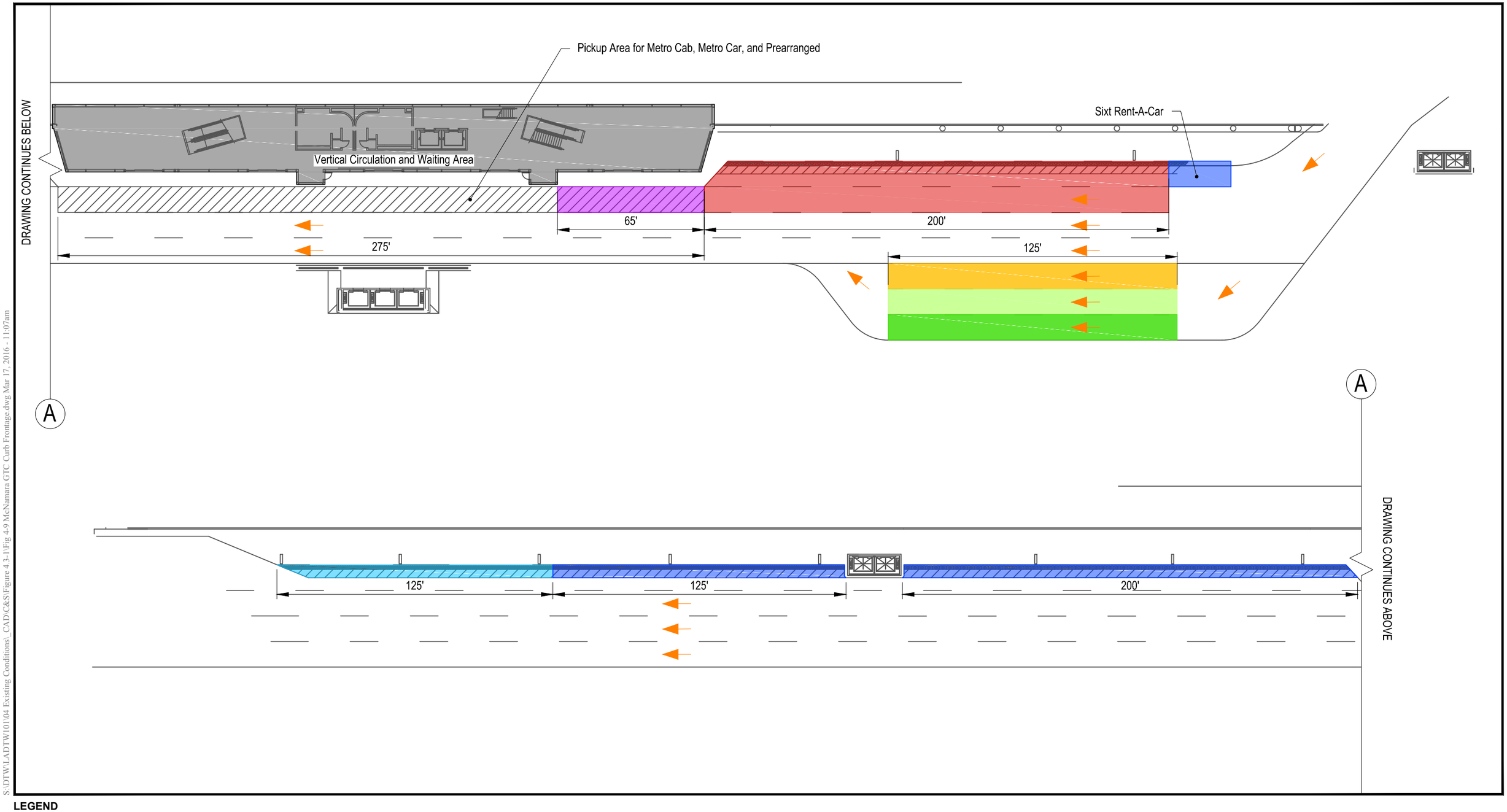
The McNamara GTC activity was primarily dominated by hotel/motel shuttles, off-airport parking shuttles and rental car buses in the morning. In comparison, during the evening peak period approximately 15% more taxicabs were observed. The longest average dwell time recorded at the McNamara GTC was rental car buses in the morning at approximately five minutes. In the evening, rental car buses had an average dwell time of approximately five and a half minutes.

4.6.2 North Terminal Ground Transportation Center

Figure 4-8 shows the allocation of space and curb frontage at the North Terminal GTC. The GTC is located on the lower level of the terminal, adjacent to the Big Blue Deck Parking Garage. Curbside frontage includes 500 linear feet of space dedicated to rental car shuttles and 350 feet of space dedicated to off-airport parking and hotel shuttles. Table 4-8 shows the curb dwell time and vehicle classification at the North Terminal GTC.

In the morning the North GTC activity was predominantly rental car buses, hotel/motel shuttles, and off-airport parking shuttles. In the evening, the North Terminal GTC was similar with a slight increase in taxicab activity with approximately 4% more taxicabs observed and 5% fewer hotel/motel shuttles.

The longest average dwell time observed at the North Terminal GTC was approximately nine minutes for public transit buses in the evening, one minute longer than the morning average dwell time. Average dwell times were also observed to be longer in the evening for hotel/motel shuttles, off-airport parking shuttles, and green lot shuttles. Only rental car buses displayed a longer morning than evening dwell time at the GTC.



S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4-3-1\Fig 4-9 McNamara GTC Curb Frontage.dwg Mar 17, 2016 - 11:07am

LEGEND

- Direction of flow
- Public transit and charters
- Rental car shuttle
- Inter-terminal shuttle
- Hotel and off-airport parking shuttle
- Metro Cab queue
- Metro Car queue
- Prearranged queue

NORTH

0 20' 40' 80'

Figure 4-9
McNAMARA TERMINAL
GROUND TRANSPORTATION CENTER
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh | Fisher

4.7 Curbside and Ground Transportation Center Level-of-Service

The Level-of-Service (LOS) analysis was conducted using the Quick Analysis Tool for Airport Roadways, developed as part of the Airport Cooperative Research Program (ACRP) – Report 40. The key inputs for the analysis included the peak hour traffic volumes described in Section 4.4 and the dwell times described in Section 4.5.4 and are based on conditions and observations during January 22 - 30, 2016. It is expected that the conditions are worse during peak months. LOS D or better are assumed to be acceptable. A summary of LOS for key curbside areas is presented in Table 4-9 and the full analysis is provided in Appendix C.

At the North Terminal, the Upper Level Departures curbside operates at LOS C. The analyzed curbside was assumed to include only the portion of the curbside covered by a canopy, although additional uncovered curbside is available. The Lower-Level Arrivals curbside operates at LOS F, primarily due to average dwell times exceeding five minutes. The GTC curbside at the North Terminal is split into two zones. The courtesy shuttle zone operates at LOS A and the RAC shuttle zone operates at LOS D, primarily because the RAC shuttles typically operate on a bump-and-run schedule.

At the McNamara Terminal, the Upper Level Departures curbside operates at LOS C. The Middle Level Arrivals curbside operates at LOS E, primarily due to average dwell times exceeding six minutes. The Lower Level International Arrivals curbside operates at LOS F. The peak hour dwell times at the International Arrivals curbside are close to national average at 2.5 minutes, but the available curbside is limited and often used by emergency and Customs and Border Protection vehicles. The curbside at the McNamara GTC has various zones. The courtesy shuttle zone operates at LOS D. The rental car shuttle zone technically operates at LOS F, although this is due to the bump-and-run operation used by the rental car operators, so the unacceptable LOS does not impact the overall operation of the GTC.

Table 4-9
PEAK-HOUR CURBSIDE AND GTC LEVEL OF SERVICE – JANUARY 2016
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

	Curbside length	Peak hour *(a)*	Volume	Level-of-service *(b)*
North Terminal				
Upper Level – Departures	740 *(c)*	5:15 AM Monday	461	C
Lower Level – Arrivals	830	11:30 PM Sunday	536	F
Ground Transportation Center	850	4:00 PM Monday	204	D
McNamara Terminal				
Upper Level – Departures	985	6:15 AM Monday	772	C
Middle Level – Arrivals	950	8:45 PM Sunday	524	E
Lower Level – Arrivals	420	6:15 AM Monday	624	F
Ground Transportation Center	1,010	4:15 PM Monday	277	D

(a) Peak hours identified from traffic counts conducted from 1/23/16 through 1/31/16.
(b) Level-of-service identified using the Quick Analysis Tool for Airport Roadways, developed as part of Airport Cooperative Research Program – Report 40.
(c) The total available curbside at the North Terminal Upper Level is 1,200 feet, but most activity occurs on the curbside covered by the canopy (740 feet).

Source: LeighFisher, February 2016

4.8 Parking Facilities

The following summarizes on- and off-Airport public and employee parking facilities as shown in Figure 4-1.

4.8.1 On-Airport Public Parking

On-Airport public parking is currently available in garages at both the McNamara Terminal and North Terminal. The McNamara Terminal provides a 10-level garage containing long-term parking for 8,690 vehicles and short-term parking for 723 vehicles. This garage also provides valet parking. The Big Blue Deck, a six-level garage, provides public parking at the North Terminal. Big Blue Deck provides long-term parking for 5,958 vehicles and short-term parking for 203 vehicles. The Airport also provides electric vehicle charging stations at both terminals. Six electric vehicle parking spaces are located on Level 4 of Big Blue Deck and on Level 8 of the McNamara Garage.

The Airport also provides additional public parking for a flat daily rate at two surface lots located near the North Terminal. Green Lot 1 contains 1,517 long-term parking spaces and Green Lot 2 contains 896 economy and short-term spaces available for public use. Free continuous shuttles are available to both the North and McNamara Terminals from these lots.

In addition, two cell phone lots are available near the northern and southern entrances of the Airport. These lots were created as part of an initiative to reduce curbside waiting at the Airport. The South Cell Phone Lot includes 2 electric vehicle spaces. Table 4-10 summarizes parking availability for each facility.

Table 4-10
ON-AIRPORT PUBLIC PARKING FACILITIES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility	Regular	Accessible
Surface Lots		
Green Lot 1	1,481	36
Green Lot 2	876	20
Total	2,357	56
Garages		
Big Blue Deck Long Term	5,824	134
Big Blue Deck Short Term	196	7
McNamara Garage Long Term	8,550	140
McNamara Garage Short Term	707	16
Valet	333	N/A
Total	15,610	297
Cell Phone Lots		
North Cell Phone Lot	37	N/A
South Cell Phone Lot *(a)*	47	N/A
Total	84	N/A
Grand Total	18,051	353

Source: 2013 Surface Parking Analysis Report, Wayne County Airport Authority and C&S Engineers, Inc. field inventory.

The Airport includes an average of 541 parking spaces for every million passengers, which is below the regional average of 558 spaces. In 2009, the terminal short-term parking rate was $25.00 per day ($3.05 above the regional average). The long-term parking rate for one week was $112.00 ($21.24 above the regional average)*. Daily rates have increased since 2009, and are shown in Table 4-11.

Table 4-11
2015 ON-AIRPORT PUBLIC PARKING RATES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility	Daily maximum
McNamara Garage	
Short term	$31.00
Long term	$23.00
Valet	$38.00
Big Blue Deck	
Short term	$31.00
Long term	$13.00
Surface Lots	
Green Lot 1	$11.00
Green Lot 2	$11.00

Source: Detroit Metropolitan Wayne County Airport website.

Historical transactions and parking revenues for on-Airport public surface lots and garages are summarized for FY 2010-2015 in Table 4-12. Monthly transactions for FY 2015 are summarized per public parking facility in Figure 4-10. Long-term parking grosses the highest amount of transactions compared to other types of parking. The McNamara Parking Garage also generates a greater number of transactions than the Big Blue Deck for both short- and long-term parking, although monthly transaction trends between both facilities are consistent. Green Lots 1 and 2, which both have a flat daily parking rate of $11.00, generate the least number of transactions. Records for Green Lot 2 indicate only three transactions for FY 2015. Green Lot 2 did not generate any transactions for the months of October, November, June, and September.

For each day of the year, the Airport calculates the number of transactions and revenue generated at each type of parking facility. Over the period between October 2014 and September 2015, the month of March generated the highest revenue. Table 4-13 presents the highest overnight occupancy day, and the 10th, 20th, and 30th highest overnight occupancy days experienced during this month for each parking facility.

4.8.2 Off-Airport Public Parking

There are four privately-operated off-airport parking facilities in operation since 2004, including: Qwik Park (and Qwik Park's overflow lot), Airlines Parking, Park-N-Go, and US Park. Combined, these operators have an inventory of approximately 18,950 parking spaces. Although each off-airport parking facility is not required to pay the Airport a percentage of their gross fees, they are required to pay a monthly access fee of

*Airport Service Quality, Benchmarking the Global Airport Industry-Best Practice Report Parking Facilities, ACI 2009.

$780 per vehicle. The name, location, and approximate capacity (estimated from aerial imagery and interviews with facility managers), are presented in Table 4-14.

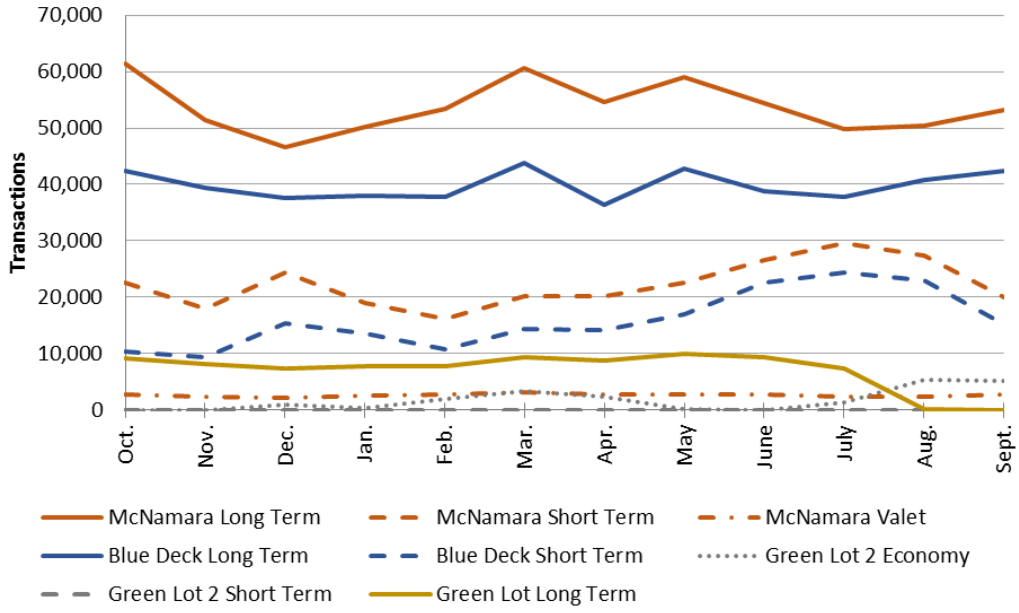
Table 4-12
HISTORICAL PUBLIC PARKING ANNUAL TRANSACTIONS AND REVENUES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility	Parking product	Revenue/ transaction	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
McNamara Garage	Long Term	Revenue	$40,011,276	$42,075,745	$44,324,694	$41,948,599	$46,308,462	$49,305,266
		Transactions	622,857	642,226	667,136	614,533	656,529	647,798
	Short Term	Revenue	$4,187,623	$4,290,188	$4,373,206	$4,258,452	$4,944,657	$5,276,679
		Transactions	353,297	321,768	301,422	286,078	265,070	266,394
	Valet	Revenue	$2,094,309	$2,205,645	$2,326,008	$2,333,443	$2,866,003	$3,211,758
		Transactions	24,428	24,941	26,092	25,120	29,744	31,144
	APS	Revenue	$0	$0	$5,451	$0	$0	$0
		Transactions	0	0	54	0	0	0
Big Blue Deck	Long Term	Revenue	$11,962,694	$14,984,814	$16,426,315	$15,567,736	$17,927,552	$20,677,954
		Transactions	327,230	456,765	485,063	446,613	503,148	478,780
	Short Term	Revenue	$1,143,242	$1,092,827	$1,113,531	$1,019,653	$1,215,556	$1,639,604
		Transactions	168,993	163,195	162,005	142,048	151,729	189,999
	Economy	Revenue	$0	$0	$2,540	$0	$0	$0
		Transactions	0	0	418	0	0	0
Yellow Lot & Green Lot 2	Economy	Revenue	$3,073,033	$1,524,234	$218,120	$32,826	$174,276	$1,059,736
		Transactions	60,917	34,850	4,056	822	4,797	21,042
	Short Term	Revenue	$0	$2,648	$0	$0	$0	$144
		Transactions	0	70	0	0	0	3
Green Lot 1	Long Term	Revenue	$0	$2,579,344	$3,713,712	$3,452,376	$4,348,770	$4,241,308
		Transactions	0	58,394	87,767	79,806	97,452	85,420
All Facilities	Total	Revenue	$62,472,177	$68,755,445	$72,503,577	$68,613,085	$77,785,276	$85,412,449
		Transactions	1,557,722	1,702,209	1,734,013	1,595,020	1,708,469	1,720,580
	Daily Average	Revenue	$171,627	$188,371	$199,734	$204,815	$213,696	$234,007
		Transactions	4,279	4,664	4,777	4,761	4,694	4,714

(a) Data missing/incomplete for dates: 10/1/09, 10/1/11, 10/2/11, 9/1/13 - 9/30/13, 10/1/13, 4/29/15 & 4/30/15.
(b) Yellow Lot closed in September 2011 (except for holidays and spring break) and closed permanently in April 2012.

Source: Detroit Metropolitan Wayne County Airport website.

Figure 4-10
FY 2015 MONTHLY PUBLIC PARKING TRANSACTIONS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport



Note: No transactions were reported in 2015 for McNamara APS and Big Blue Deck Economy.
Source: Revenue Reports, September 2011, 2013 & 2015, Wayne County Airport Authority.

Table 4-13
ON-AIRPORT OVERNIGHT PARKING OCCUPANCIES (MARCH 2015)
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility	Highest day	10th highest day	20th highest day	30th highest day
McNamara	7,777	7,117	5,125	4,430
Big Blue Deck	4,978	4,728	4,421	3,798
Green Lot	1,477	1,442	1,373	1,290
Total	14,232	13,287	10,919	9,518

Source: Parking Lot Car Count Report 2015, Wayne County Airport Authority, March 2015, 4AM Count.

Table 4-14
OFF-AIRPORT PUBLIC PARKING FACILITIES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility	Location	Approximate capacity
Qwik Park (including overflow)	7782 Merriman Rd	7,300
Airlines Parking	8325 Merriman Rd	5,900
Park-n-Go	31555 Wick Rd	750
US Park	9601 Middle Belt Rd	5,000
Total		18,950

Source: C&S Engineers, Inc., February 2016.

4.8.3 Employee Parking

The Airport currently provides approximately 6,000 employee parking spaces at four separate locations. The South Lot is designated an employee-only surface lot with approximately 4,500 spaces, situated off of Eureka Road just east of the South Airport Entrance. Other primary locations for employee parking are the McNamara Parking Garage, which contains approximately 780 designated employee parking spaces, and the Big Blue Deck Parking Garage, which contains approximately 440 designated employee parking spaces. There are also parking lots adjacent to the L.C. Smith Terminal with approximately 220 spaces and 172 parking spaces in Lots L-17 and L-19 outside of Building 610, which is currently Public Safety Headquarters. These spaces accommodate visitors to the nearby buildings and Authority employee permit holders.

4.9 Rental Car Facilities

The rental car complex is located in the northeast corner of the Airport, near the 21R Runway threshold. The complex is bound by Goddard Road (North), Middlebelt Road (East), and East Service Drive (West). Lucas Drive bisects the rental car complex and provides the primary access and egress to each of the on-Airport rental car sites. There are six on-Airport rental car sites (Budget-Payless, Hertz-Firefly, Avis, Alamo-National, Dollar-Thrifty, and Enterprise) and one off-Airport rental car site (Sixt). The locations of the rental car sites are depicted in Figure 4-11. A summary of the building-space, equipment, and vehicle parking stalls in Airport sites is in Table 4-15.

All rental car facilities are accessed by arriving passengers by following signage to each terminal's GTC and then riding the rental car company's shuttle. Shuttle service can also be requested for rental car customers by utilizing the rental car operators' courtesy phones located inside each terminal's baggage claim hall and the GTC. Approximate travel time from the GTC to the rental car complex ranges from four to eight minutes. Most rental car companies operate two independent shuttle routes, one for each terminal.

Customers returning their vehicles access Lucas Drive via the East Service Road to the west or Middle Belt Road to the east. Each rental car facility operates a shuttle that utilizes Lucas Drive, Goddard Road, and William G. Rogell Road to access the GTC for each terminal as shown on Figure 4-11.

W G Rogell Drive
Cell Phone Lot
E Service Drive
Commercial Vehicle and Taxi Hold Lot
Goddard Road
Green Lot 1
Green Lot 2
Budget
Payless
Enterprise
Dollar Thrifty
Hertz
Firefly
Lucas Drive
Alamo National
Avis
Middle Belt Drive
Sixt
Runway 3L-21R 8,501' x 200'
21R
3L

S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4-1\Fig 4-11 Rental Car Area.dwg Mar 17, 2016 - 11:07am

LEGEND

- Airport Property Line
- Airport perimeter roadways
- Typical rental car shuttle route
- Public parking - surface
- Public parking - structure
- Rental car facilities
- Direction of flow

NORTH

0 250' 500' 1000'

Figure 4-11
RENTAL CAR AREA

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

Table 4-15
ON-AIRPORT RENTAL CAR SITE INVENTORY
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Total Acres	64.9
Customer Service / Employee Areas	
Employee / visitor parking spaces (stalls)	565
Employee / visitor parking area (acres)	4.2
Customer Service Area / Administrative Offices (acres)	1.3
Total customer service / employee area	**5.4**
Ready return spaces	
Ready parking spaces (stalls)	1,437
Return parking spaces (stalls)	1,838
Total ready-return area (acres)	**19.4**
Service areas (Quick-turn around)	
Fueling and washing (acres)	1.9
Maintenance (acres)	1.3
Stacking, staging and storage (acres)	18.7
Total service area (acres)	**22.0**
Additional support areas/circulation	
Additional support (acres)	**18.0**

Source: LeighFisher, based on rental car questionnaire survey, February 2016.

4.10 Public Transit

Two public transit services from the surrounding region provide service to the Airport. Suburban Mobility Authority for Regional Transportation (SMART) provides service from downtown Detroit, Melvindale, River Rouge, Ecorse, Lincoln Park, Southgate, and Southland Center. As of 2015, SMART's average weekday ridership for fixed and connector routes is at 36,000 passengers. A detailed ridership survey was conducted in 2011 detailing passenger boardings, passenger maximum load, and the percentage of buses arriving on time. These results are summarized in Table 4-16. Figure 4-12 presents summary data on peak boarding periods for both routes that serve the Airport.

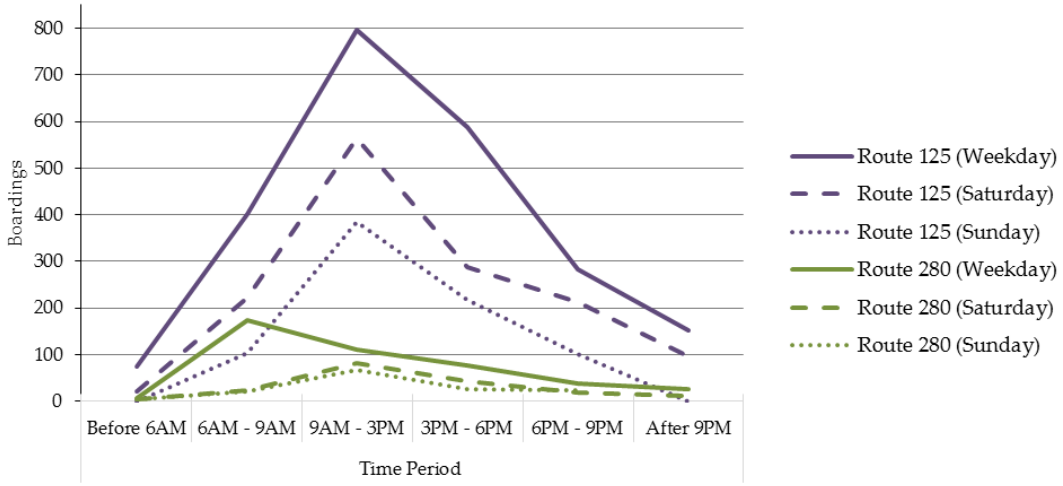
The other public transit service providing access to the Airport is the 2012 partnership between Ann Arbor Transportation Authority ("The Ride") and Michigan Flyer. This partnership provides public transit service via Route 787 (AirRide) to and from the GTCs to stations in the Ann Arbor Area, which provide connections to points throughout Washtenaw County and the SMART bus system for Wayne, Oakland, and Macomb counties. Blake Transit Center and Kensington Court Hotel are stops along this route that provide parking for passengers going to the Airport. In 2015, AirRide had a ridership of 72,394 passengers.

Table 4-16
SMART RIDERSHIP (2011)
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Day	Boardings	On time percentage	Maximum load
		Route 125	
Weekday	2,293	70.3%	44
Saturday	1,403	62.4%	32
Sunday	807	73.1%	36
		Route 280	
Weekday	331	90.4%	15
Saturday	182	84.6%	11
Sunday	139	85.9%	11

Source: SMART and AJM Consulting, *Executive Summary for the Conduct of a Passenger Count for Suburban Mobility Authority for Regional Transportation*, 2011.

Figure 4-12
SMART RIDERSHIP (2011)
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport



Source: SMART and AJM Consulting, *Executive Summary for the Conduct of a Passenger Count for Suburban Mobility Authority for Regional Transportation*, 2011.

5.0 AIR CARGO

The Airport accommodates exclusive air cargo operators and multiple airlines providing air cargo services. Approximately 38 acres of the Airport are designated for air cargo use.

5.1 On-Airport Cargo Facilities

The following summarizes on-Airport air cargo tenants and facilities, which are shown in Figure 5-1.

- **United Parcel Service**. United Parcel Service (UPS) operates a 305,671 square-foot cargo processing warehouse at the Airport (Building 427). This facility was opened in 1991 and is located between Runway ends 27R and 27L. This facility handles packages and freight that are destined for and originate in the Detroit metropolitan area.

- **Delta Cargo**. Delta Cargo operates out of Building 536, an approximately 15,632 square-foot facility located adjacent to the Green Lot 2. This facility is currently constrained by the number of loading docks available. This building has land available for expansion through its leasehold. Delta Air Freight utilizes the adjoining facility (Building 536-A) to support its cargo operations. Delta Cargo and Swissport are the current tenants of Building 514, which is a 53,450 square-foot building currently under construction.

- **FedEx**. FedEx operates out of Building 723 which is accessible airside via Taxiway Z. The facility is 62,600 square-feet and includes a 224,075 square-foot apron. The facility has four spaces available for aircraft parking. The southernmost parking position is restricted to Airbus A310s and Boeing 757s aircraft. The future realignment of Taxiway Z will render the aircraft parking position angled to the building unusable. FedEx also subleases buildings 714, 714A, and 714B. Building 714 is an 8,400 square-foot facility primarily used for vehicle maintenance operations. Buildings 714A and 714B are not in use.

- **DHL Express**. DHL Express operates from Building 714A, which it shares with two other tenants (Spirit Airlines and FedEx). This facility is 30,566 square-feet and is accessible airside by Taxiway Z. Due to the lack of space at this facility, DHL Express stores most of its equipment outside behind Building 715 where it also utilizes one aircraft parking position for its daily operations.

- **Combined Use Air Cargo Building**. The North Terminal Combined Used Air Cargo Building (Building 614) is a 20,029 square-foot facility, accessible landside by East Service Drive. This building houses two cargo carriers: Southwest Airlines Cargo and Air General Inc.

5.2 Off-Airport Cargo Facilities

Lufthansa Cargo is a German cargo airline and a subsidiary of Lufthansa, the largest airline in Europe. Lufthansa Cargo offers worldwide air freight and logistics services. Lufthansa Cargo is located on Highland Road, approximately 0.2 miles west of the Airport.

Runway 4L-22R 10,000' x 150'
Runway 4R-22L 12,003' x 200'
Runway 3L-21R 8,501' x 200'
Runway 9L-27R 8,708' x 150'
Runway 3R-21L 10,001' x 150'
Runway 9R-27L 8,500' x 150'
I-275
I-94
Eureka Road
John D Dingell Drive
Goddard Road
W G Rogell Drive
Lucas Drive
Middle Belt Road
723
FedEx Cargo
714A
DHL Express
Delta Cargo/Swissport
514
Combined Use Air Cargo Building
614
536
Delta Cargo
UPS Hangar
427

S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4.3-1\Fig 5-1 Air Cargo Tenant Locations.dwg Mar 27, 2016 - 6:52pm

LEGEND

- Airport property line
- Airport perimeter roadways
- Primary access and terminal circulation
- Air Cargo Tenant Locations

NORTH

0 750' 1500' 3000'

Figure 5-1
AIR CARGO TENANT LOCATIONS

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

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6.0 GENERAL AVIATION

General aviation facilities are summarized in Table 6-1 and shown in Figure 6-1.

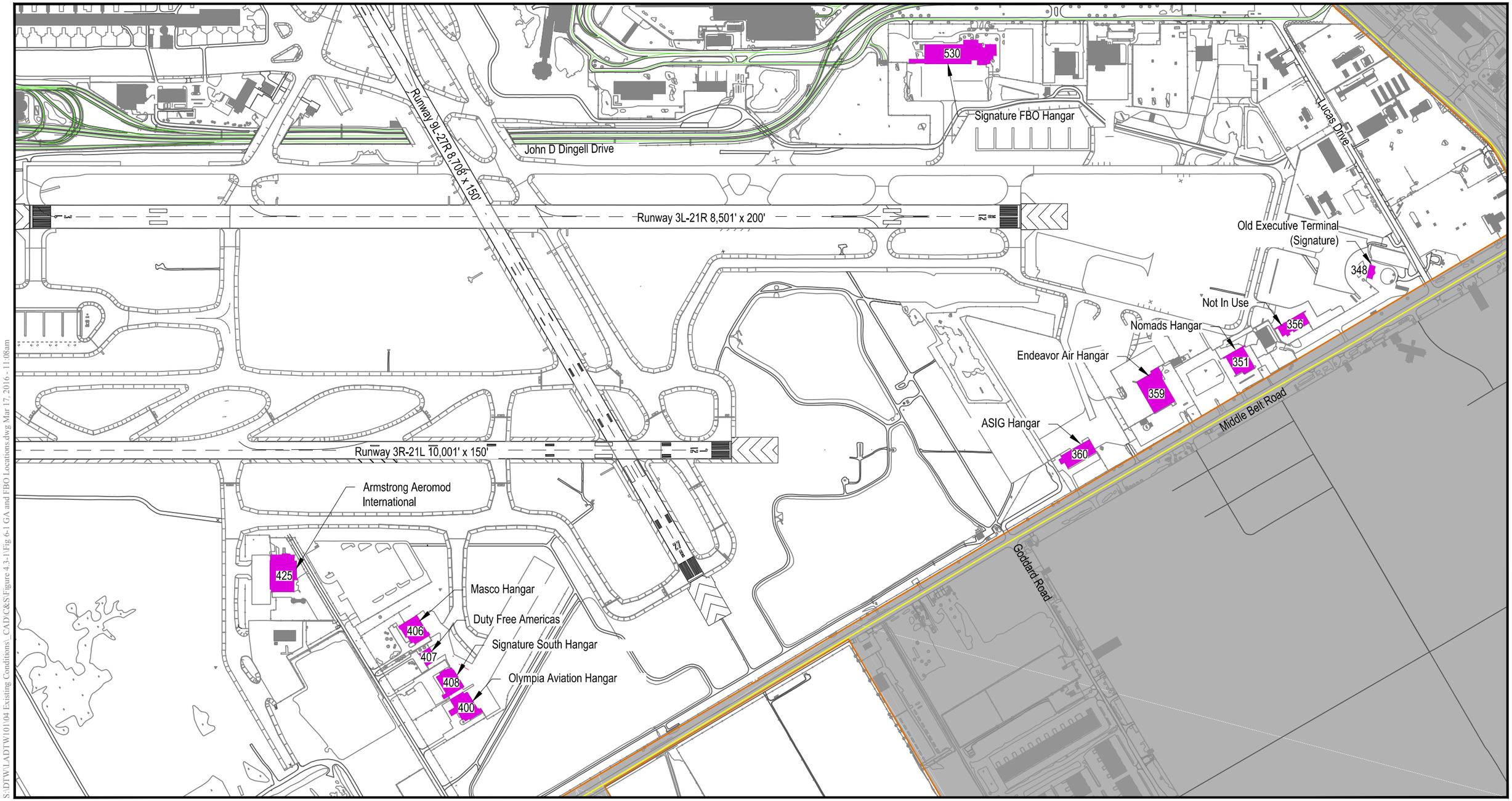
Table 6-1
GENERAL AVIATION HANGAR INVENTORY
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility number	Structure	Area (SF)	Constructed/ improvements	Owner
348	Old Executive Terminal	10,400	1938	Signature Flight
351	Nomads Hangar	32,136	1953; 2001 interior construction	WCAA Public Safety/HSS
356	Former GA Hangar	29,084	1975	Currently not in use
359	Endeavor Air Hangar	57,729	1961; 2001, 2007 tenant improvements	Endeavor Air/Delta
360	ASIG Hangar	33,096	N/A	ASIG/EPIC
400	Olympia Aviation Hangar	N/A	N/A	Olympia Air
406	Masco Hangar	37,140	1979; 2007 addition	Masco Flight Operations
407	Duty Free Americas	59,000	1978	Duty Free Americas
408	Signature South Hangar	23,623	1975	Signature Flight
425	Armstrong AeroMod International	30,171	1997	Armstrong AeroMod
530	Signature Hangar	110,516	1956; 2014 roofing improvement	Signature Flight

Source: C&S Engineers, Inc., Jan 2016, based on Wayne County Airport Authority Fixed Asset Database and field surveys.

Signature Flight Support is located in Building 530, adjacent to Green Lot 1. This building is 110,516 square-feet and located in a hangar. It offers features such as a crew lounge, hangar, and U.S. Customs. Services provided by Signature include: cabin cleaning, fueling, hangars, tie-downs, repairs, cargo services, deicing, and passenger services. Airfield access is provided via Taxiway M. Vehicular access is from East Service Road.

Other facilities used for general aviation purposes provide vehicle parking, aircraft storage, fueling, maintenance, warehousing, and office/meeting space.



S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4.3-1\Fig 6-1 GA and FBO Locations.dwg Mar 17, 2016 - 11:08am

LEGEND

- Airport property line
- Airport perimeter roadways
- Primary access and terminal circulation
- General Aviation and Fixed Based Operator Locations

NORTH

0 400' 800' 1600'

Figure 6-1
GENERAL AVIATION AND FIXED BASED OPERATOR LOCATIONS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

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7.0 AIRLINE AND AIRPORT SUPPORT

Airline and airport support facilities and functions are described in the following sections.

7.1 Airline Support

Airline support facilities are dedicated to supporting passenger and cargo airline operations. These facilities include aircraft maintenance facilities, airline catering and flight kitchen services, ground service equipment (GSE) storage and maintenance, fuel farm, fuel storage and dispensing systems, deicing fluid containment, ground run-up enclosures (GRE), and triturators. The location of airline support facilities are shown in Figure 7-1.

7.1.1 Aircraft Maintenance

Aircraft maintenance facilities provide a sheltered environment for the repair of aircraft and other airline equipment. Delta Air Lines is the primary tenant at the Airport with dedicated aircraft maintenance hangars. A new aircraft maintenance facility hangar for Spirit Airlines is expected to be completed in 2016. This hangar is expected to be located adjacent to Building 715. A summary of the aircraft maintenance hangar areas and construction dates are summarized in Table 7-1.

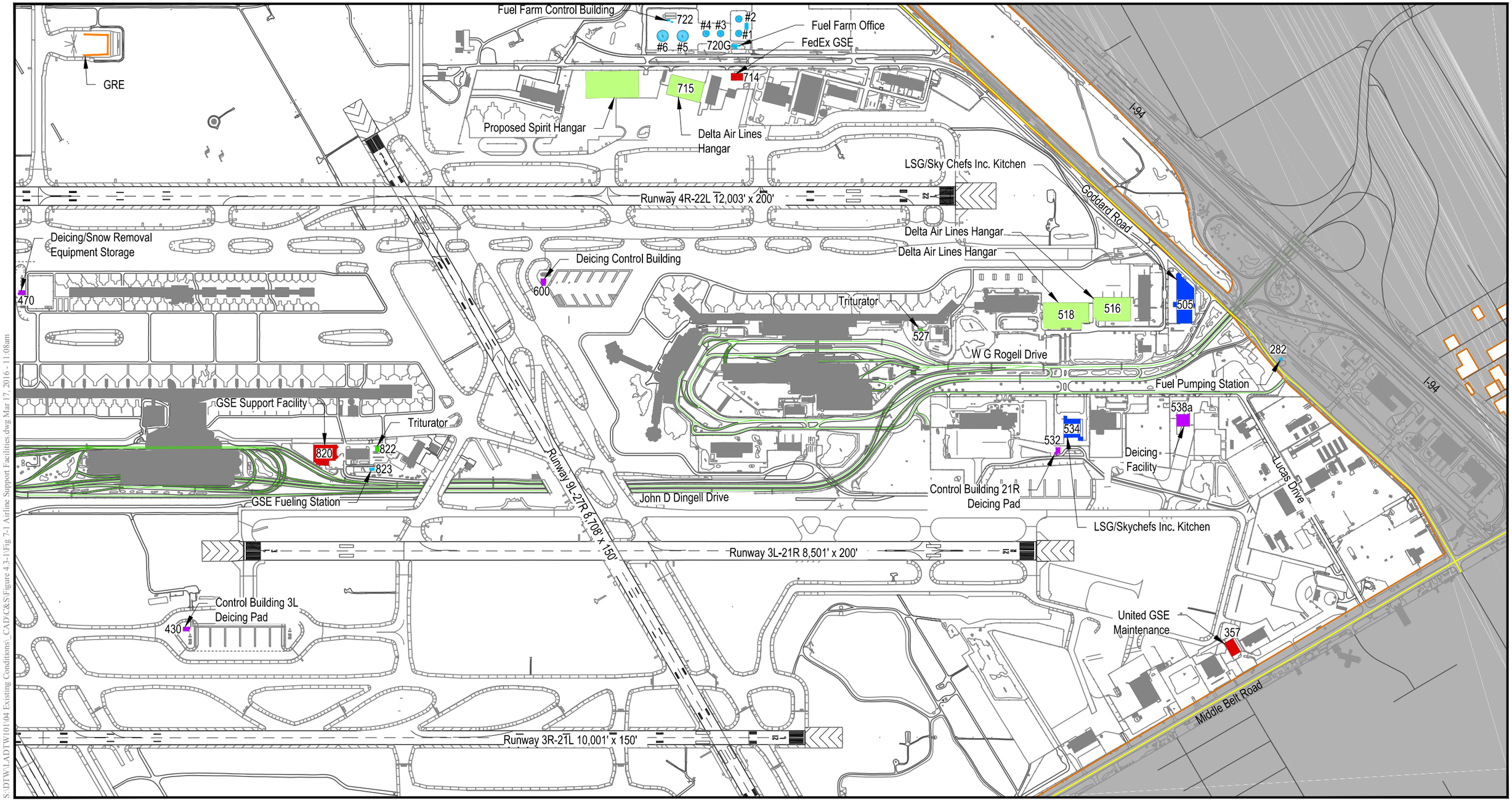
Table 7-1
AIRCRAFT MAINTENANCE FACILITIES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility number	Facility name	Area (SF)	Constructed/ improvements
516	Delta Air Lines Hangar	85,194	1998
518	Delta Air Lines Hangar	119,264	2002
715	Delta Air Lines Hangar	77,508	2011
N/A	Spirit Airlines Hangar	126,000	Anticipated 2016

Source: C&S Engineers, Inc., January 2016, based on Detroit Metropolitan Wayne County Airport Authority Fixed Asset Database.

7.1.2 Airline Catering and Flight Kitchen

LSG Sky Chefs, Inc. provides full catering and commissary services, including in-flight management and transportation of catered goods to and from aircraft. LSG Sky Chefs serves an average of 260 flights per day (approximately 10,000 meals). LSG Sky Chefs currently leases Building 505, a 72,928 square foot facility located on West Service Road near the North Terminal. However, this building is not easily accessible from the McNamara Terminal and the existing flight kitchen is expected to reach the end of its useful life in approximately eight years.



S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4.3-1\Fig 7-1 Airline Support Facilities.dwg Mar 17, 2016 - 11:08am

LEGEND

- Airport property line
- Airport perimeter roadways
- Primary access and terminal circulation
- Airline fuel facilities
- Airline catering/flight kitchen
- Deicing facility
- Ground Support Equipment (GSE)
- Ground Run-up Enclosure (GRE)
- Triturators
- Aircraft maintenance facilities

NORTH

0 500' 1000' 2000'

Figure 7-1
AIRLINE SUPPORT FACILITIES

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

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7.1.3 Fuel Storage and Dispensing System

The Airport has one main fuel farm currently operated by Delta Air Lines, which is located on Goddard Road on the northwest side of the Airport. Fuel is pumped from the fuel farm into fuel service vehicles and transported to service aircraft and airport motor vehicles. Building 720 houses the fuel farm electrical equipment, Building 720G houses the fuel farm office, and Building 722 houses the fuel farm control building.

Fuel is stored in six above-ground tanks located immediately adjacent to these facilities (which are restricted to a height of 39 feet to ensure a clear line of view with the existing ATCT). The location of these tanks is shown in Figure 7-1 and their capacities are summarized in Table 7-2.

Table 7-2
DELTA FUEL TANK CAPACITY
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Tank number	Building	Capacity (Gallons)
1	720A	840,000
2	720B	840,000
3	720C	840,000
4	720D	840,000
5	720E	2,500,000
6	720F	2,500,000

Source: Detroit Metropolitan Wayne County Airport Authority Fixed Asset Database.

The North Terminal was outfitted with a hydrant fueling system during construction in 2006. This system consists of a network of underground pipes that deliver fuel from the fuel farm directly to the gates at the terminal. This system reduces operational emissions and eliminates the need for fuel service trucks at the terminal. Twelve pumps and two pipelines feed the hydrant system, which is controlled by an automated fuels management system.

Fueling stations for ground support equipment are also available in two locations on the Airport. Building 823 is located immediately off of John D. Dingell Drive before the entrance to the McNamara Garage. These fueling stations draw fuel from one 30,000 gallon underground storage tank and one 15,000 gallon underground storage tank. The second location, Building 472, houses four underground storage tanks. Two tanks each have a capacity of 30,000 gallons for gasoline and two smaller tanks each have a capacity of 15,000 gallons of diesel.

An additional fuel pumping station with underground storage tanks is located at Building 282 on Goddard Road.

7.1.4 Deicing Fluid Operations and Containment

The Airport operates the largest aircraft deicing fluid (ADF) management system in the world. It has 27 deicing positions at four locations on the airfield, including: 4R DL Mainline, 3L DL Mainline, 22L Connection/RJs, and 21R OALs & DL. Information on deicing control facilities are summarized in Table 7-3. Delta Air Lines operates three pads, with the 21R deicing pad used for all other airlines and users. North Terminal airlines are only permitted to use the deicing pad at the end of Runway 21R. When the deicing pads are at capacity, aircraft are deiced at the gate.

Deicing pads are equipped with confined drainage systems that collect and separate used glycol from stormwater runoff. High concentrate runoff passes through pavement grates to underground storage tanks near the deicing pad. From there, all high-concentrate ADF runoff is recycled. For more dilute concentrate, once the glycol level in these tanks has decreased to an acceptable level, it is conveyed to Glycol Storage Pond 3W (West) for storage and eventual discharge into the stormwater system.

Since 2013, the Airport has utilized two wastewater treatment facilities to manage discharges. When temperatures are high, the Downriver Wastewater Treatment Facility in Wyandotte, Michigan is utilized, although the facility has limited ability to treat biochemical oxygen demand (BOD). During colder temperatures, the Detroit Water and Sewerage Department Treatment Plant is utilized given its higher BOD treatment capacity.

Delta Air Lines recently implemented a Blend-to-Temperature ADF Application System at the Airport through its partnership with Integrated Deicing Services (IDS). IDS is located in the 17,066 square-foot Building 538-A. This partnership with IDS allows for ADF ratios to be used in “real time” so that operations can be monitored live through interactions with the deicing control buildings. The deicing control buildings provide instant feedback on deicer spray performance so that deicing fluids can be blended to match the weather for temperatures needed to protect the aircraft. Overall, this creates a reduction in ADF and reduces airline operating costs.

Table 7-3
DEICING CONTROL FACILITIES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Building	Use	Owner	Area (SF)	Date constructed
430	Control Building at 3L deicing pad	Delta	5,004	2001
470	Control Building at 4R deicing pad and SRE storage	Delta	4,136	1980
532	Control Building at 21R deicing pad	IDS	3,424	2001
600	Control Building	IDS	1,700	2003

Source: C&S Engineers, Inc., based on Wayne County Airport Authority Fixed Asset Facilities Inventory and field surveys.

7.1.5 Ground Run-Up Enclosures

In 2012 the Airport implemented a 90,000 square-foot, three-sided, 42 foot-tall GRE to reduce noise created by aircraft run-up operations. This GRE is currently the largest jet blast deflector in North America and can reduce noise exposure from 20 square miles to 2.2 square miles. The GRE is currently utilized an average of three times per day.

7.1.6 Airline Waste Triturator

There are two airline waste triturators (waste processors) located at the Airport. Building 527 is a 510 square-foot facility that services lavatory trucks for the North Terminal. Building 822 is a 600 square-foot facility that services lavatory trucks at McNamara Terminal.

7.1.7 Ground Support Equipment Storage

Ground support equipment support facilities are summarized in Table 7-4.

Table 7-4
AIRLINE GSE SUPPORT FACILITIES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility number	Facility name	Area (SF)	Constructed/ improvements
357	United Airlines GSE	16,285	N/A
714	FedEx GSE	8,400	1982
820	GSE Support Facility	N/A	N/A

Source: C&S Engineers, Inc., January 2016, based on Detroit Metropolitan Wayne County Airport Authority Fixed Asset Database.

7.2 Airport Support

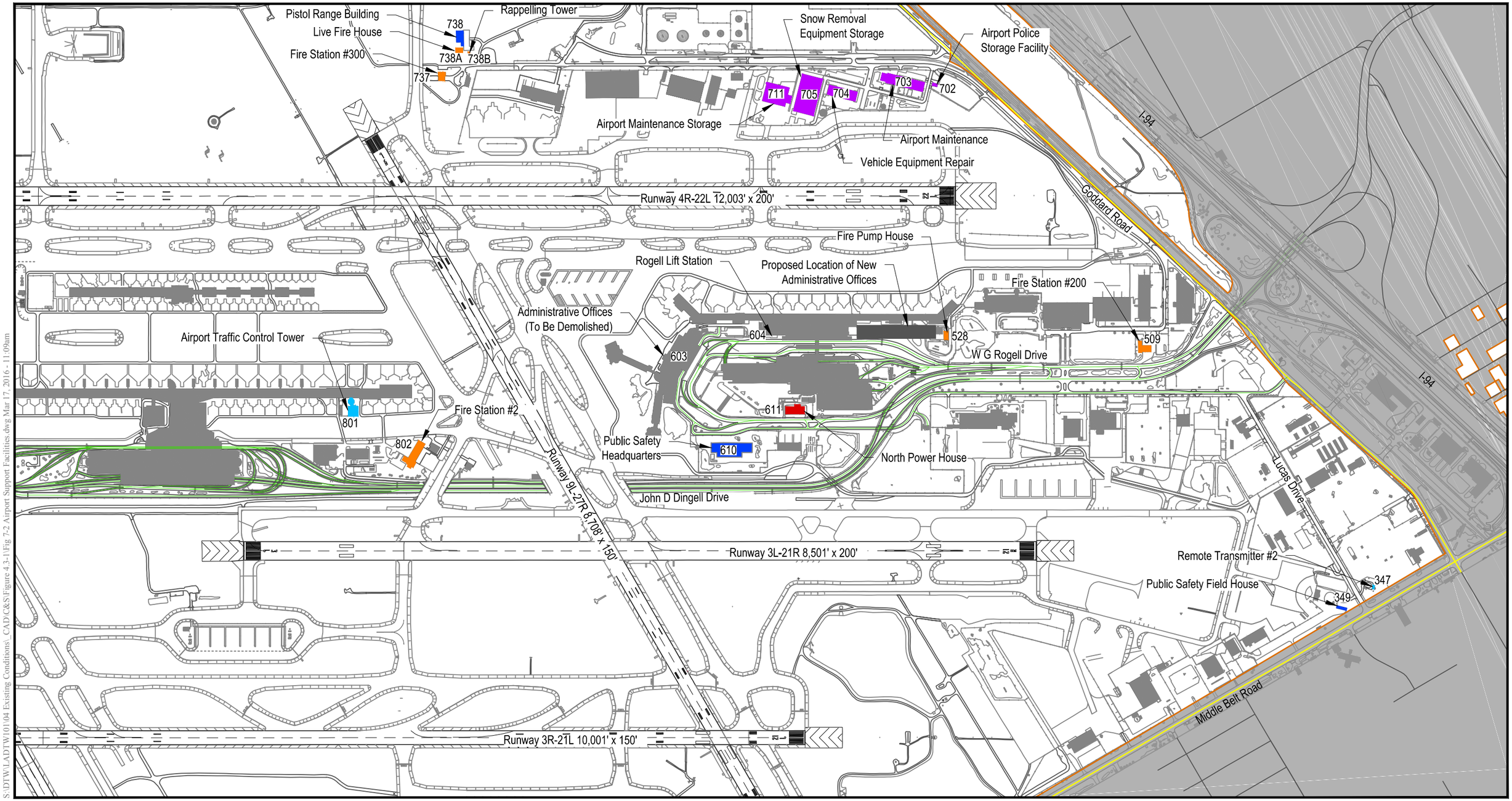
Airport support facilities are shown on Figure 7-2 and summarized in the following sections.

7.2.1 Wayne County Airport Authority Offices

Airport Authority administrative offices are located in Building 603 at the L.C. Smith Terminal. The Authority has plans to construct new office space located on the north side of the North Terminal.

7.2.2 Airport and Airfield Maintenance

The Airport's Maintenance and Fleet Services Department is comprised of four branches: Maintenance Administration, Facilities Maintenance, Field Maintenance, and Fleet Services. The majority of maintenance and fleet service facilities are located off of the West Service Road in the northwest corner of the Airport. Table 7-5 summarizes airport and airfield maintenance facilities.



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LEGEND

- Airport property line
- Airport perimeter roadways
- Primary access and terminal circulation
- FAA facilities
- Public safety
- Maintenance
- Electrical
- Aircraft Rescue and Fire Fighting (ARFF)

NORTH

0 500' 1000' 2000'

Figure 7-2
AIRPORT SUPPORT FACILITIES

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

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Table 7-5
AIRPORT AND AIRFIELD MAINTENANCE FACILITIES
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Facility number	Facility name	Area (SF)	Constructed/ improvements
703	Airport Maintenance	62,939	1993/2009
704	Vehicle Equipment Repair	30,709	1993/2002
705	Snow Removal Equipment Storage	90,505	1989/2013
711	Previous Northwest Hangar	44,307	1965

Source: C&S Engineers, Inc., January 2016, based on Detroit Metropolitan Wayne County Airport Authority Fixed Asset Database.

7.2.3 Public Safety and Airport Police

The Airport Police Department is responsible for law enforcement duties, but also provides support to the TSA by responding to passenger screening. The Wayne County Department of Public Safety Field House is located at Building 349 on Middle Belt Road and the Public Safety Headquarters is located at Building 610 on the East Service Dive. Authority Public Safety and HSS (non-TSA security) occupies Building 351.

7.2.4 Aircraft Rescue and Fire Fighting Facility

There are three ARFF facilities within the airfield. The ARFFs are located in buildings 802, 509 and 737. Building 802 is located in the middle of the airfield adjacent to the FAA control tower, providing the primary coverage for the airfield. Building 509, located on the West Service drive, is a landside station that primarily serves the North Terminal and also provides some additional coverage for the airfield. Building 737 is the newest facility and is located on the outer perimeter next to the Fed-Ex building on the western edge of the Airport. This building was necessary due to the opening of runway 4L-22R and the McNamara Terminal. The proposed site was based on a study completed in 2002. The Airport utilizes international fire code 2015 and the campus is ISO Fire Ratings 3. All fire alarms around the campus are directed to building 610.

7.2.5 FAA Facilities

The Airport's ATCT was constructed in 2002 and is located near the north end of the McNamara Terminal. The ATCT has a height of 250 feet and an observation height of 206 feet. The Terminal Radar Approach Control (TRACON) facility is located within the facility.

In 2012, the building was restored and underwent remediation for pervasive mold contamination. It was determined, however, that the ATCT will need to be replaced due to pervasive mold contaminating the building's shaft and substructure. Four preferred locations were determined (*ATCT Siting Report, Detroit Metropolitan Wayne County Airport Draft Report by the Airport Facilities Terminal Integration Laboratory*). The location of these sites are identified on Figure 7-3 and described below:

- Site 3B: Top of Tower (AMSL) at a minimum of 970 feet and an Eye Height above ground level (AGL) at 308 feet
- Site 3D: Top of Tower (AMSL) at a minimum of 970 feet and an Eye Height of 308 feet AGL

- Site 11: Top of Tower (AMSL) at a minimum of 935 feet and an Eye Height of 268 feet AGL
- Site 14: Top of Tower (AMSL) at a minimum of 905 feet and an Eye Height of 237 feet AGL

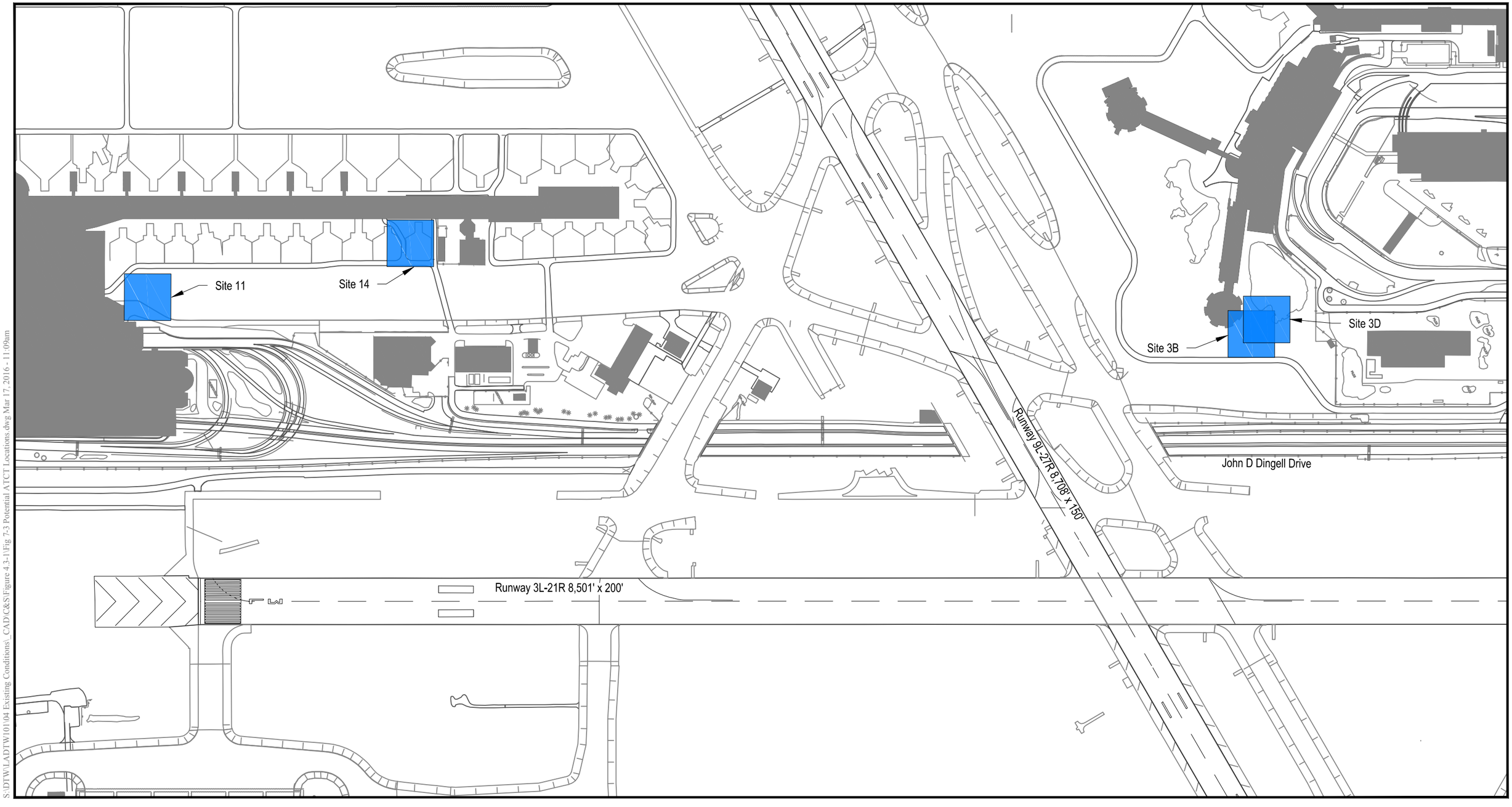
Based on FAA analysis, Sites 11 and 14 were eliminated as candidate sites due to the determination that the operational and economic impacts of locating the new ATCT at these places would be severe and unable to be mitigated. Site 3B, or a location site near Site 3B, was approved by FAA. The placement of an ATCT at Site 3B would require the reconfiguration of the future expansion of the deicing pad to shift the taxilane OFA away from the proposed ATCT site. The implementation of an ATCT at this location would also require the relocation of aircraft parking and the relocation of portions of the Air Operations Area zipper roads serving the cargo and terminal operations on the north side of the Airport.

7.2.6 Stormwater Detention

There are three stormwater detention ponds on the Airport:

- Stormwater Storage Pond 6 – located east of Middle Belt Road and south of Northline Road
- Stormwater Storage Pond 3E (East) – located northeast of the threshold for Runway 21L
- Stormwater Storage Pond 4 – located at the northwest corner of Northline and Middle Belt Roads

The stormwater detention system has the capacity to detain approximately 515 million gallons of stormwater. In the event that the stormwater system is empty, it could contain a 4.5 inch runoff event. A series of Stormwater Pump Stations exist throughout the Airport to control storm water runoff.



S:\DTW\LAD\TW101\04 Existing Conditions_CAD\C&S\Figure 4.3-1\Fig 7-3 Potential ATCT Locations.dwg Mar 17, 2016 - 11:09am

NORTH

0 1000' 2000' 4000'

Figure 7-3
POTENTIAL AIRPORT TRAFFIC CONTROL TOWER LOCATIONS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

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8.0 ENVIRONMENTAL CONDITIONS

Known environmental constraints pertaining to potential Airport development sites are summarized in the following sections. The following resource categories were identified as representing potential constraints to development at the Airport:

- **Department of Transportation Section 4(f) Lands** – Section 4(f) lands include publicly owned land of a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, State, or local significance.

- **Wetlands** –Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

- **Floodplains** –Floodplains are lowland areas adjoining inland and coastal waters which are periodically inundated by flood waters.

- **Air Quality** – 40 CFR Part 93 requires that projects undertaken in a nonattainment or maintenance area must be shown to conform to the State Implementation Plan.

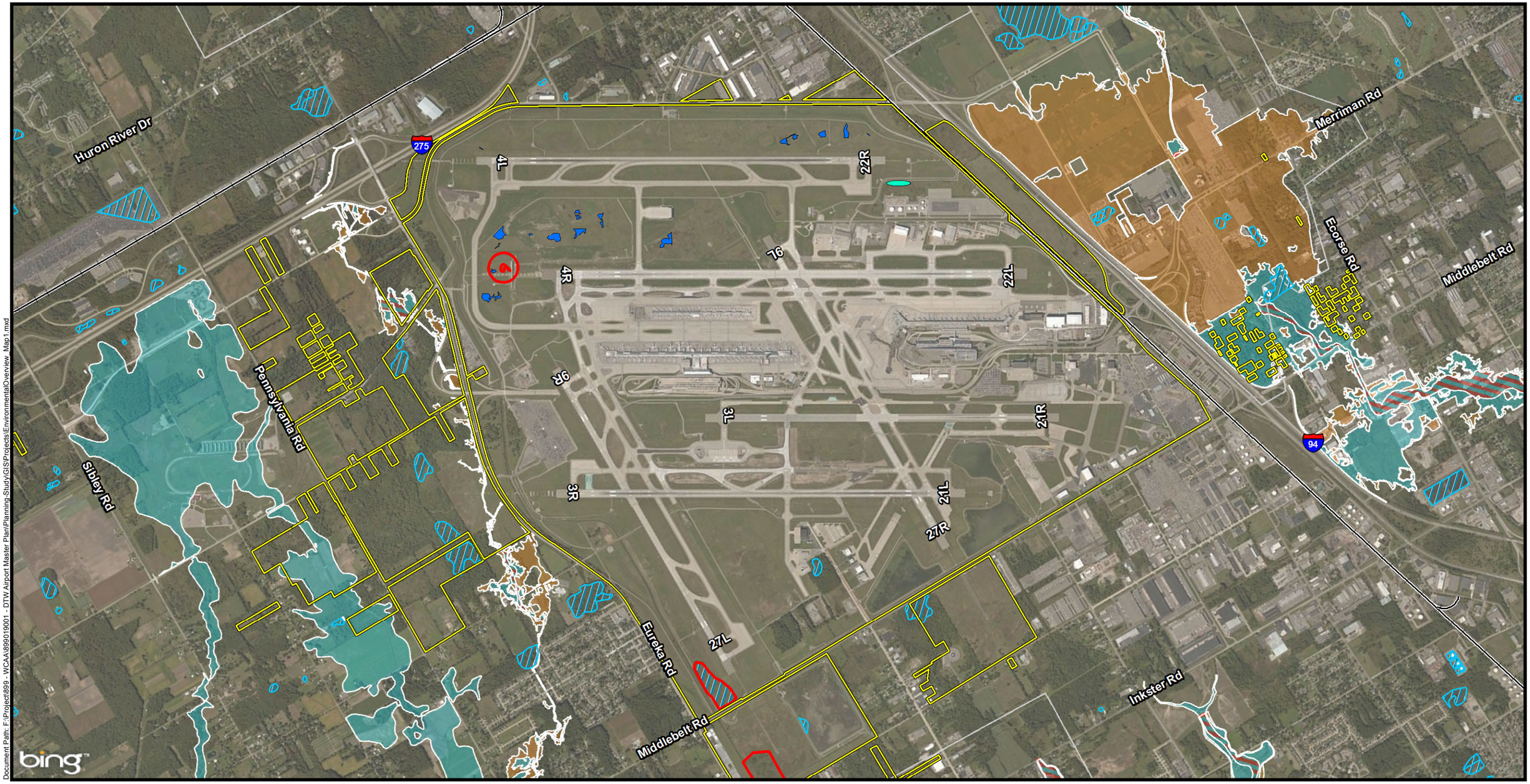
The physical location of known environmental constraints is depicted on Figure 8-1 Environmental Overview- Natural Environment, and Figure 8-2 Environmental Overview – Sites of Awareness. Figure 8-1 shows natural resource features such as wetlands, floodplains, and on-airport locations of threatened and endangered species. Figure 8-2, while showing some off-airport environmental features, identifies potential on-airport waste sites, and the location of Building 348 (Executive Terminal) which is a historic site. The following sections discuss these features.

8.1 DOT Section 4(f) Lands

No designated public parks, recreation areas, or wildlife or waterfowl refuges exist on Airport lands. Therefore, the consideration of DOT 4(f) lands focuses on lands that are on or potentially eligible for listing on the National Register of Historic Places (NRHP). Based on a search of the National Park Service web site, no sites presently on the NRHP are located at the Airport or in the immediate vicinity. Therefore, sites that may be eligible for the register were identified based on past evaluations.

The Authority commissioned a Cultural Resources Management Study (CRMS) in 2009 (updated in 2013) recognizing that a number of facilities at the Airport had been identified by the State Historic Preservation Office (SHPO) as of sufficient age to be considered under the National Historic Preservation Act. The CRMS identified 15 structures and portions of the airfield system as 50 years of age or older, and two buildings were considered eligible for listing in the NRHP*.

*In 2003, SHPO determined that Building 278 (Hertz Storage Facility, 1929), was eligible for listing on the NRHP. The 2013 update noted that Building 278 was determined eligible for the register and that its removal would have an adverse effect. Subsequently, that building was demolished after FAA completed a Section 106 consultation subject to a Memorandum of Agreement that contained mitigation measures.



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LEGEND

- Surveyed Wetland 2014
- NWI Wetland*
- Airport Identified Wetland

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard

- Location of Threated and Endangered Species
- Airport Property Line

NORTH

0 1,250' 2,500' 5,000'

Figure 8-1

ENVIRONEMENTAL OVERVIEW - NATURAL ENVIRONMENT
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

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*(a) Wetlands noted by the Airport staff as no longer existing (but indicated on National Wetlands Inventory maps) were removed.
*(b) Wetlands not noted on the National Wetlands Inventory map were added based on Airport staff indicating their presence.
Source: NWI Wetlands were originally downloaded from USFWS (US Fish & Wildlife Service), Wetlands located on the airport property are modified by C&S based on Airport staff indicating their presence; Endangered Species were originally extracted from survey data and then modified based on Airport staff indicating their presence; Flood Zones from FEMA NFHL Public Service Layer
Service Layer Credits: Image courtesy of USGS State of Michigan Earthstar Geographics SIO © 2016 Microsoft Corporation | *FRS - Facility Registry System, TRI - Toxic Resource Inventory, RCRA - Resource Conservation and Recovery Act, NPDES - National Pollutant Discharge Elimination System, Superfund Sites/CERCLIS - Comprehensive Environmental Response, Compensation and Liability Information System

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Huron River Dr
Romulus Athletic Center
Henry Ruff Park
Merriman Rd
Black Creek
Ecorse Rd
Middlebelt Rd
Pennsylvania Rd
Sibley Rd
Merriman Park
Eureka Rd
Middlebelt Rd
Flight 255 Memorial
Romulus Taylor
Inkster Rd
275
94
4L
22R
4R
22L
9L
9R
3L
21R
3R
21L
27R
27L

LEGEND

- School
- Church
- FRS RCRA
- FRS NPDES
- Restricted Deed Site
- Open LUST Site
- Areas of Potential Concern
- SHPO Listed Historic Property
- Rail
- Airport Fence Line
- Stream/River/County Drain
- Impaired Stream/River
- Internal Airport Drain
- Waterbody
- DNR Land and Mineral Ownership
- Stormwater Detention Pond
- DEQ Conservation Easement
- City Boundary

NORTH

0 1,250' 2,500' 5,000'

Figure 8-2

ENVIRONMENTAL OVERVIEW - SITES OF AWARENESS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh Fisher

Source: School, Park and Church were originally obtained from GNIS (Geographic Names Information System) maintained by US Board of Geographic Names and later modified by C&S based on Google Maps and survey data; FRS data was originally obtained from US EPA (Environmental Protection Agency) Clip and Ship application and later modified based on discussion with Airport Staff; Restricted Deed Site, Open LUST Site and Areas of Potential Concern are taken from DTW Environmental Management Plan, July 2014; SHPO property was marked based on discussion with Airport Staff; Airport Fence Line was taken from previous DTW Airport Layout Plan; Impaired stream data was downloaded from US EPA Geospatial data; Rail, road, water, streams and city boundary from Esri base map data; DEQ Conservation Easement and DNR Land and Mineral Ownership data downloaded from SEMCOG (South East Michigan Council of Governments) Online GIS database; Stormwater detention ponds are drawn as per discussion with Airport staff
Service Layer Credits: Image courtesy of USGS State of Michigan Earthstar Geographics SIO © 2016 Microsoft Corporation | *FRS - Facility Registry System, RCRA - Resource Conservation and Recovery Act, NPDES - National Pollutant Discharge Elimination System

Building 348, identified on Figure 8-2, also known as the Executive Terminal (built in 1938), is recognized for its architectural design and its association with the beginnings of air passenger service in Detroit. Building 348 is considered eligible for listing in the NRHP due to its architectural significance and the development of aviation in Michigan. Any projects that would require a use of the above facilities (or any other resources that are determined to be eligible for the NHRP), would require compliance with DOT Section 4(f) in addition to completion of the Section 106 consultation procedures under the National Historic Preservation Act. Projects that involve effects to DOT 4(f) resources require preparation of a DOT 4(f) Statement which is usually prepared in consultation with the NEPA document prepared for the project.

8.2 Wetlands

As shown on Figure 8-1, there are a number of wetlands on Airport property consisting of ponds, emergent wetlands, and forested/shrub. Surveyed wetlands are generally located west of Runway 4L-22R and between Runways 4L-22R and 4R-22L (on the southern portion of the open space). In addition, the ponds of the Airport are noted as open water wetlands.

A Clean Water Act Section 404 permit would be required for any development that results in fills to waters of the U.S. that are considered wetlands. Under Section 404, no discharge of dredged or fill material can be permitted if a practicable alternative exists that avoids or minimizes wetland impacts. Therefore, when an airport sponsor applies for a permit, the sponsor must demonstrate (1) steps taken to avoid wetland impacts where practicable; (2) steps taken to minimize potential impacts to wetlands; and (3) compensation for any remaining, unavoidable impacts through activities to restore or create wetlands.

8.3 Floodplains

Figure 8-1 shows floodplains are located south of Eureka Road and north of I-94. Similar to the discussion of wetlands, the Master Plan Update should identify alternatives that do not involve encroachment into floodplains.

All areas where permanent infrastructure would be built, and locations where temporary construction-related activity might occur, must be considered for direct or indirect construction-related impacts. If the only practicable alternative requires siting in the base floodplain, a floodplain encroachment would occur and further environmental analysis is needed during the NEPA process. Therefore, alternatives that would avoid the floodplain should be considered. The FAA may not select or approve a preferred alternative involving a significant floodplain encroachment, unless the responsible FAA official can make a written finding that (1) there is no practicable alternative to placing a project in the floodplain and that all measures to minimize harm will be included in a project; (2) the proposed action must be located in the floodplain, including a discussion of the alternative(s) and why they were not practicable; and the action conforms to applicable state and/or local floodplain protection standards.

8.4 Air Quality

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that are considered harmful to the health of the public and to the environment. Primary standards provide protection for the public's health and secondary standards protection the public's welfare (e.g., damage to buildings, vegetation, and visibility). There are currently NAAQS for six air pollutants that are referred to as the "criteria" air pollutants. The pollutants are:

- Ozone (O3)
- Nitrogen dioxide (NO2)

- Carbon monoxide (CO)
- Particulate matter (PM) – Less than or equal to 10 micrometers (coarse particulate matter or PM10) and less than or equal to 2.5 micrometers (fine particulate matter or PM2.5)
- Sulfur dioxide (SO2) and
- Lead (Pb)

In accordance with the CAA, all areas within the U.S. are designated with respect to the NAAQS as attainment, non-attainment, maintenance, or unclassifiable. An area with air quality better than the NAAQS is designated attainment; an area with historical air quality conditions worse than the NAAQS is designated non-attainment. Maintenance areas are non-attainment areas that have been re-designated to attainment status.

Wayne County, Michigan has been designated by the USEPA as a non-attainment area for sulfur dioxide, and maintenance for CO. In the past, the area was designated as non-attainment or maintenance for ozone and particulate matter, but the rules/standards that resulted in those designations have since been revoked and therefore the region is now in attainment. However, a new ozone standard was enacted by the USEPA in October 2015. When enacting a new standard, the USEPA has a period of time to then designate areas as attainment or nonattainment. Areas will not be designated for another year (late 2017). Based on the new standard and preliminary analysis, it is expected that the Detroit metropolitan region could become nonattainment with the new ozone standard resulting in the development of a new SIP.

The conformity provisions of the CAA, require that before a federal agency can approve a federal action, the agency must first show that actions occurring in a non-attainment or maintenance area conform with the applicable State Implementation Plan (SIP). A SIP is the State's plan for how it will attain and maintain the NAAQS. Federal approvals associated with Master Plan Update recommendations would require an air quality evaluation to show if emissions are sufficient to warrant a Conformity Determination and that the emissions conform to the SIP in place at the time of the approval.

8.5 Other Issues

If Master Plan Update recommendations induce activity or alter the use of the runway system, aircraft noise exposure contours would be needed to identify off-airport noise and land use effects. The Authority completed a Part 150 Noise Compatibility Planning Study in 2009 where noise exposure contours were prepared.

According to the Michigan Natural Features Inventory (NMFI), 140 species of plants, fish and wildlife in Wayne County are listed by at the federal and state level as endangered, threatened, candidate or of special concern. The Airport and nearby areas support two state-threatened plant species: three-awned grass (Aristida longespica) and short-fruited rush (Juncus brachycarpus). A Protected Species Area is managed on-Airport for these plants which is generally located under the approach to Runway 4R north of Eureka Road, as shown in Figure 8-1. A second area is located near the end of Runway 27L near the intersection of Middlebelt and Eureka Roads.

Given the age and nature of operations at the Airport, there have been spills of jet fuel and other hazardous materials on-site. Figure 8-2 shows the know location of contamination sites, largely located in the northern part of the Airport in the maintenance areas. Projects that would disturb hazardous material would require development of a clean-up plan and coordination with appropriate agencies.

Appendix A

RUNWAY PROTECTION ZONE INVENTORY

APPENDIX A RUNWAY PROTECTION ZONE INVENTORY

An inventory of objects and land uses in the RPZ for each runway end is summarized in Tables A-1 through A-12. Objects are classified by their type, description, designation as on- or off-airport, whether or not they are within the Central Portion, and whether or not it is an allowable land use. Allowable land uses are governed by various documentation including FAA Advisory Circular 150/5300-13A, Change 1 FAA memorandum, *Interim Guidance on Land Uses Within a Runway Protection Zone* (September 2012). Resolutions to incompatible land uses within the RPZ will be reviewed in the Master Plan during the evaluation of alternatives. The inventory is graphically depicted in Figures A-1 through A-12.

Table A-1: Runway 4L Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	ALSF II	Y	Y	Y
NAVAID	Inner Marker	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
NAVAID	Offset Localizer	Y	Y	Y
Road	Service Road	Y	Y	Y
Fence	Perimeter Fence	Y	Y	Y
Road	Wayne Road	Y	Y	*N*
Road	I-275 Freeway	N	Y	*N*
Road	I-275 Freeway Ramp	N	N	*N*
Culvert	Drainage Culvert	Y	Y	Y
Culvert	Drainage Culvert	Y	Y	Y
	Arrival Only RPZ			
Private Property	Greenspace - World Tek Industries 36310 Eureka Rd	N	N	Y
Parking Lot	Parking Lot - World Tek Industries 36310 Eureka Rd	N	N	*N*
Trail	I-275 Metro Trail	N	N	*N*

Source: HNTB February 2016.

Table A-2: Runway 22R Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	MALSR	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
NAVAID	DME	Y	Y	Y
Road	Service Road	Y	Y	Y
Railroad	Norfolk & Western Railroad	N	Y	*N*
Road	Goddard Road	Y	Y	*N*
Fence	Perimeter Fence	Y	Y	Y
	Arrival Only RPZ			
Road	I-94 Freeway	N	Y	N

Source: HNTB February 2016.

Table A-3: Runway 4R Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	ALSF II	Y	Y	Y
NAVAID	Inner Marker	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
	Arrival Only RPZ			
Taxiway	Taxiway Y1	Y	Y	Y
Taxiway	Taxiway Y	Y	Y	Y
Taxiway	Taxiway Q	Y	Y	Y

Source: HNTB February 2016.

Table A-4: Runway 22L Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	MALSR	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
NAVAID	DME	Y	Y	Y
Road	Service Rd	Y	Y	Y
Road	Western Service Road (Public)	Y	Y	*N*
Railroad	Norfolk & Western Railroad	N	Y	*N*
Road	Goddard Road	Y	Y	*N*
Fence	Perimeter Fence	Y	Y	Y
	Arrival Only RPZ			
Taxiway	Taxiway K	Y	N	Y
Support	AOA Security Checkpoint	Y	N	*N*
Support	GSE Storage Lot	Y	N	*N*
Sign	Billboard	N	N	*N*
Road	I-94 Freeway	N	Y	*N*
Road	I-94 Freeway Off/on ramp	N	Y	*N*
Building	Meter Pit 1	N	Y	*N*
Road	Wick Road	N	N	*N*
Building (Partial)	Arrow Leasing, 31555 Wick Rd	N	N	*N*
Parking Lot	Arrow Leasing, 31555 Wick Rd	N	N	*N*
Building (Partial)	The Metropolitan Hotel, 31500 Wick Rd	N	N	*N*
Parking Lot	The Metropolitan Hotel, 31500 Wick Rd	N	N	*N*
Parking Lot	Wyndham Garden Hotel, 9191 Wickham Rd	N	N	*N*

Source: HNTB February 2016.

Table A-5: Runway 3L Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
Road	Service Rd	Y	Y	Y

Source: HNTB February 2016.

Table A-6: Runway 21R Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
Taxiway	Taxiway M (Closed)	Y	Y	Y
Pavement	Abandoned Apron	Y	Y	Y
Road	Service Rd	Y	N	Y

Source: HNTB February 2016.

Table A-7: Runway 3R Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	ALSF-II	Y	Y	Y
NAVAID	Inner Marker	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
Road	Employee Access Road	Y	N	*N*
Road	Service Rd	Y	Y	Y
Fence	Perimeter Fence	Y	Y	Y
Road	Eureka Rd	N	Y	*N*
Culvert	Drainage Culvert	Y	Y	Y
Culvert	Drainage Culvert	Y	Y	Y
Culvert	Drainage Culvert	Y	Y	Y

Source: HNTB February 2016.

Table A-8: Runway 21L Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	MALSR	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
Road	Service Rd	Y	Y	Y
Fence	Perimeter Fence	Y	Y	Y
Basin	Water Retention Basin	Y	Y	*N*
Building	Downriver Treatment Metering Facility	Y	Y	*N*
Building	Meter Pit 2	Y	Y	*N*
Building	Gas Meter House Monitoring Equipment Building	Y	N	*N*
Building	Storm Water Pump Station No. 1	Y	N	*N*
	Arrival Only RPZ			
Apron	Portion of Metro Flight Apron	Y	Y	Y
Pavement	Large Expanse of Pavement (non-aviation)	Y	Y	*N*
Road	Middlebelt Rd	N	N	*N*
Road	Goddard Rd	N	N	*N*
Building	Clark Gas Station (Abandoned), 10885 Middle Belt Rd	N	N	*N*

Source: HNTB February 2016.

Table A-9: Runway 9L Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
Taxiway	Taxiway A	Y	Y	Y
Road	Service Rd	Y	Y	Y

Source: HNTB February 2016.

Table A-10: Runway 27R Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	MALSR	Y	Y	Y
Road	Service Rd	Y	Y	Y
Fence	Perimeter Fence	Y	Y	Y
Road	Middle Belt Rd	N	Y	*N*

Source: HNTB February 2016.

Table A-11: Runway 9R Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	ILS Localizer	Y	Y	Y
NAVAID	DME	Y	Y	Y
Taxiway	Taxiway Q	Y	Y	Y
Road	Service Rd	Y	Y	Y

Source: HNTB February 2016.

Table A-12: Runway 27L Arrival/Departure RPZ Inventory

Type	Description	On Airport	Central Portion	Allowable Land Use
	Arrival/Departure RPZ			
Pavement	Blast Pad	Y	Y	Y
NAVAID	MALSR	Y	Y	Y
Road	Service Rd	Y	Y	Y
Fence	Perimeter Fence	Y	Y	Y
Road	Middle Belt Rd	N	Y	*N*
Culvert	Drainage Culvert	Y	Y	Y

Source: HNTB February 2016.

APPENDIX B

2011 TRAFFIC COUNTS

3/5/2012 9:14 AM

HRC_OLW_Cir.CTB

V:\20101\20101024\C\To_WCAA\03-05-12\Aerial with 2011 Traffic Volumes.dwg

Nolan Ian

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

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HUBBELL, ROTH & CLARK, INC
Consulting Engineers

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DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	L.F.M.
DRAWN	I.M.N.
CHECKED	B.J.L.
APPROVED	C.L.H.

WAYNE COUNTY AIRPORT AUTHORITY

TASK 1: TRAFFIC DATA COLLECTION & FUTURE TRAFFIC FORECASTING

DETROIT METRO AIRPORT 24-HOUR VOLUME FORECASTS - NORTH END

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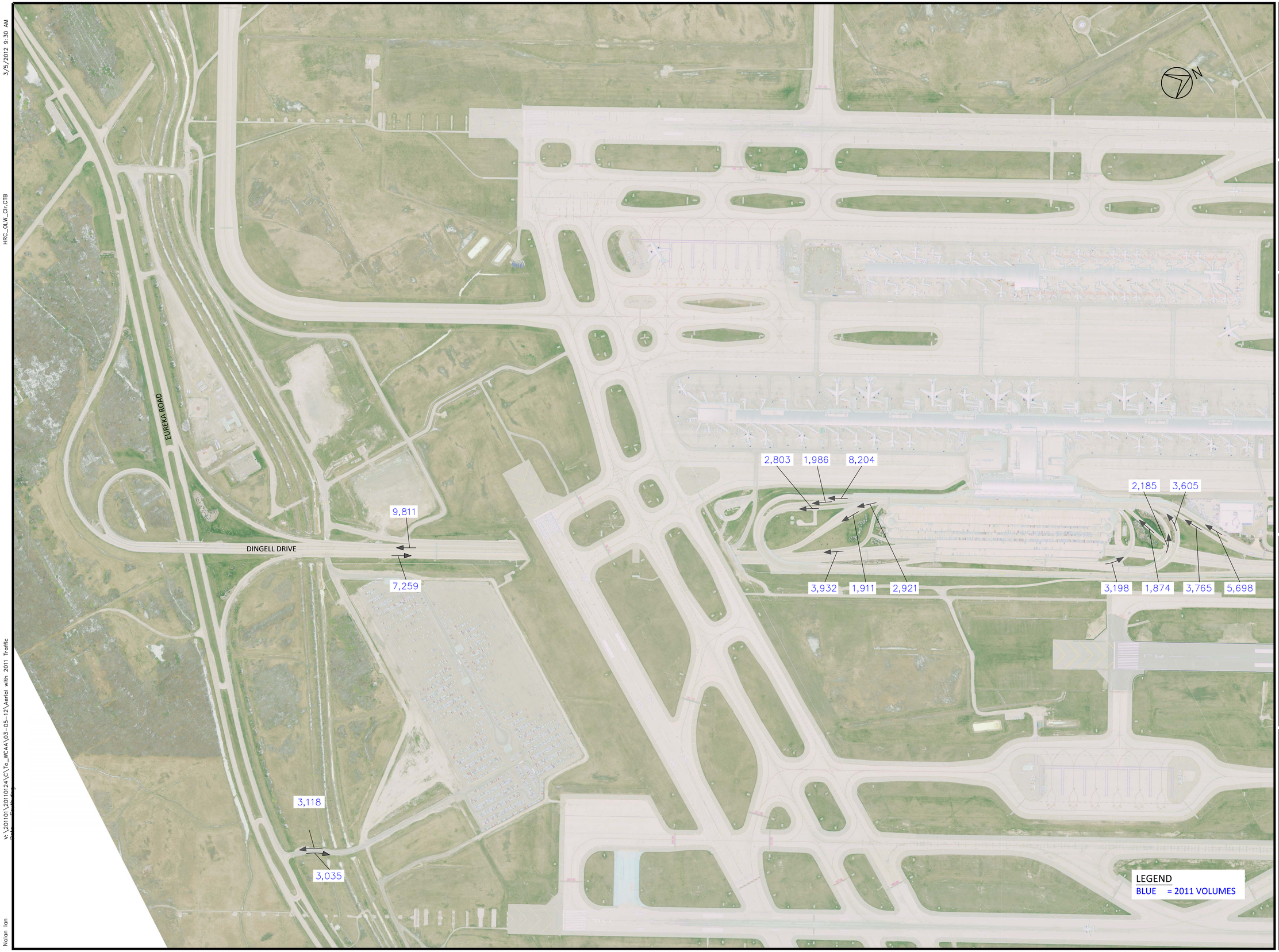
DATE: MARCH 1, 2012	SHEET NO. 1 OF 2



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DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
CHECKED	
APPROVED	

WAYNE COUNTY AIRPORT AUTHORITY

TASK 1: TRAFFIC DATA COLLECTION & FUTURE TRAFFIC FORECASTING

DETROIT METRO AIRPORT 24-HOUR VOLUME FORECASTS - SOUTH END

HRC JOB NO. 20110123	SCALE 1" = 300'
DATE March 1, 2012	SHEET NO. 2 OF 2

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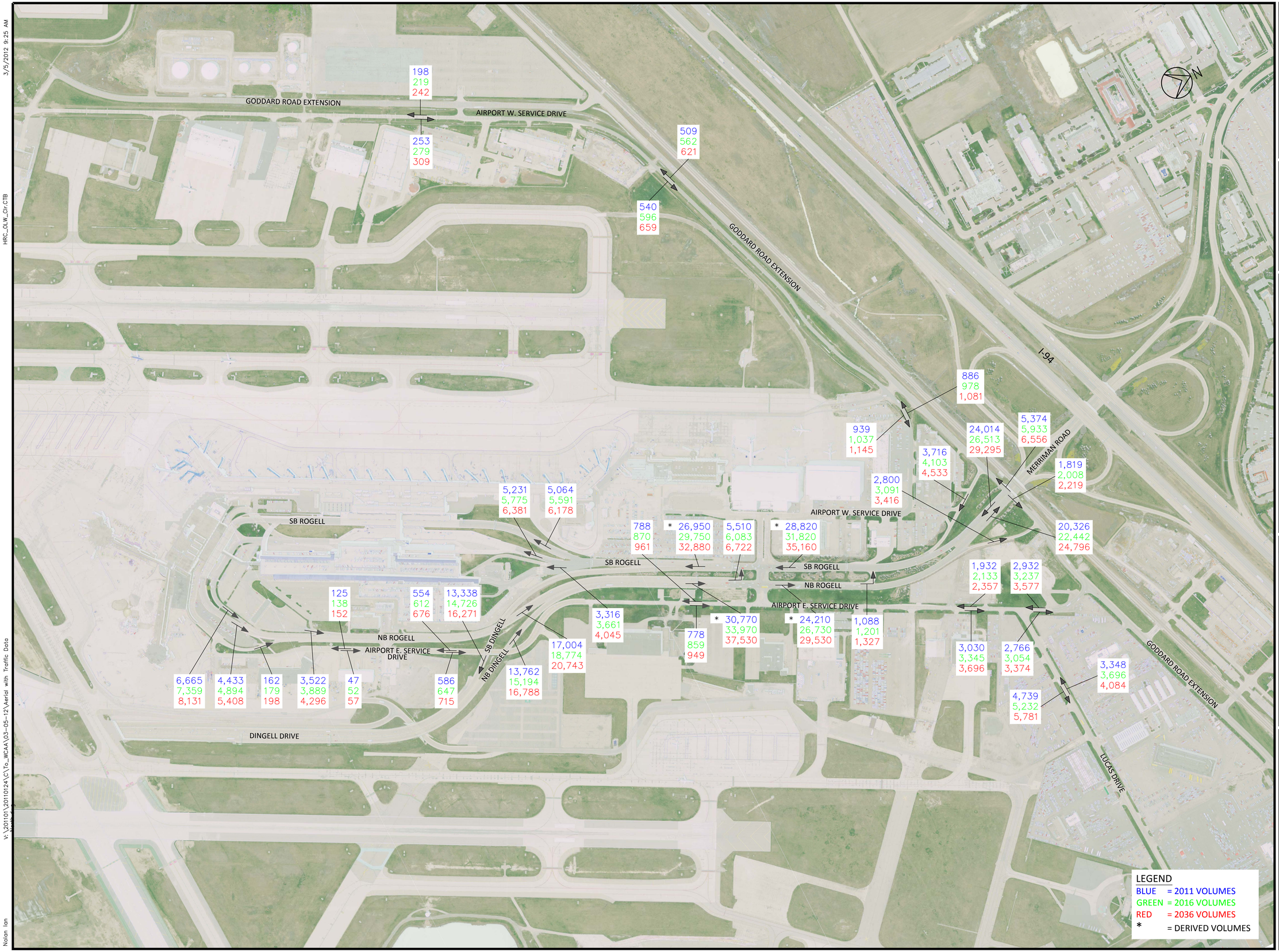
Nolan Ian



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DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	L.F.M.
DRAWN	I.M.N.
CHECKED	B.J.L.
APPROVED	C.L.H.

WAYNE COUNTY AIRPORT AUTHORITY

TASK 1: TRAFFIC DATA COLLECTION & FUTURE TRAFFIC FORECASTING

DETROIT METRO AIRPORT 24-HOUR VOLUME FORECASTS - NORTH END

HRC JOB NO.	SCALE
20110123	1" = 300'
DATE: JANUARY 11, 2012	SHEET NO. 1 OF 2

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

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DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	
DRAWN	
CHECKED	
APPROVED	

WAYNE COUNTY AIRPORT AUTHORITY

TASK 1: TRAFFIC DATA COLLECTION & FUTURE TRAFFIC FORECASTING

DETROIT METRO AIRPORT 24-HOUR VOLUME FORECASTS - SOUTH END

HRC JOB NO.	SCALE
20110123	1" = 300'
DATE: August 17, 2011	SHEET NO. 2 OF 2

Appendix C

CURBSIDE AND GROUND TRANSPORTATION CENTER LEVEL OF SERVICE ANALYSIS

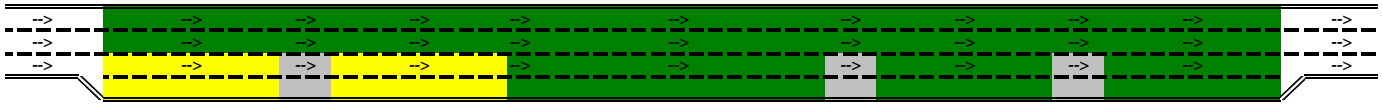
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - North Terminal
Roadway location	Upper - Departures
Scenario	Existing
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 3
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	one	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description									
Curb length (feet)	120	15	120	15	200	15	120	15	120
Zone type	active	no stop	active	activ e	active	no stop	active	no stop	active
Roadway volume (vph)	461	461	461	##	461	461	461	461	461
Roadway capacity (vph)	2,599	3,350	2,599	##	2,704	3,350	2,704	3,350	2,704
Roadway V/C ratio	0.177	0.138	0.177	##	0.171	0.138	0.171	0.138	0.171
Roadway LOS	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	6.0	N/A	6.0	##	8.0	N/A	5.0	N/A	5.0
Curb capacity per lane (vehicles)	5.0	N/A	5.0	##	8.0	N/A	5.0	N/A	5.0
Curb utilization ratio	1.200	N/A	1.200	##	1.000	N/A	1.000	N/A	1.000
Curb LOS	C	N/A	C	A	A	N/A	A	N/A	A

Level-of-service (LOS) key:

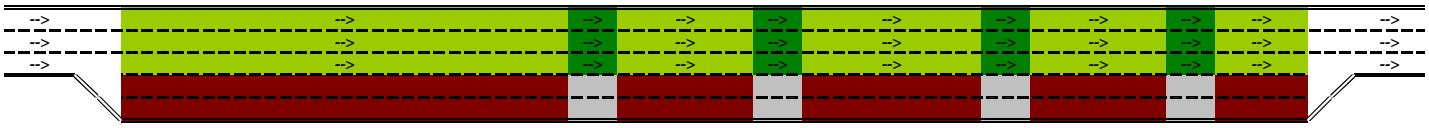
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - North Terminal
Roadway location	Lower - Arrivals
Scenario	Sunday PM - 1/24/16
Level / type of roadway	Arrivals
Total lanes / approach lanes	5 / 3
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description									
Curb length (feet)	340	15	100	15	130	15	100	15	70
Zone type	active	no stop	active	no stop	active	no stop	active	no stop	active
Roadway volume (vph)	536	536	536	536	536	536	536	536	536
Roadway capacity (vph)	2,046	3,404	1,721	3,404	1,833	3,404	1,721	3,404	1,912
Roadway V/C ratio	0.262	0.157	0.311	0.157	0.292	0.157	0.311	0.157	0.280
Roadway LOS	B	A	B	A	B	A	B	A	B
Curb demand (# in sys 95% of time)	31.0	N/A	10.0	N/A	12.0	N/A	10.0	N/A	7.0
Curb capacity per lane (vehicles)	14.0	N/A	4.0	N/A	5.0	N/A	4.0	N/A	3.0
Curb utilization ratio	2.214	N/A	2.500	N/A	2.400	N/A	2.500	N/A	2.333
Curb LOS	F	N/A	F	N/A	F	N/A	F	N/A	F

Level-of-service (LOS) key:

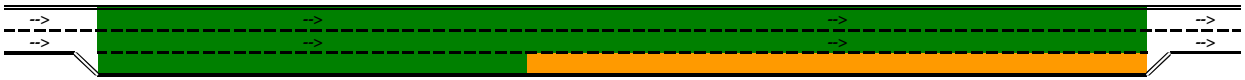
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - North Terminal
Roadway location	GTC
Scenario	Monday 1/25/16
Level / type of roadway	Mixed
Total lanes / approach lanes	3 / 2
Number of curbside zones	2



Zone ID	Zone 1	Zone 2
Name/description		RAC
Curb length (feet)	350	500
Zone type	active	active
Roadway volume (vph)	204	204
Roadway capacity (vph)	2,307	1,139
Roadway V/C ratio	0.088	0.179
Roadway LOS	A	A
Curb demand (# in sys 95% of time)	6.0	15.0
Curb capacity per lane (vehicles)	10.0	10.0
Curb utilization ratio	0.600	1.500
Curb LOS	A	D

Level-of-service (LOS) key:

A
B
C
D
E
F

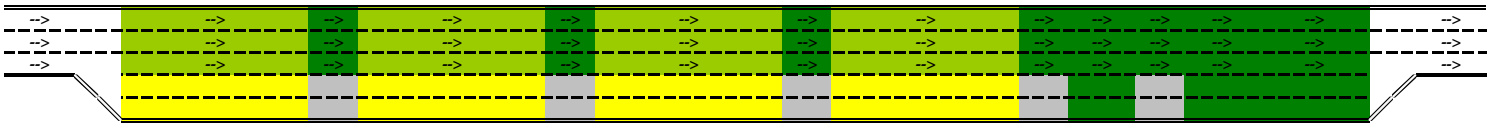
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	Upper - Departures
Scenario	Monday AM 1/25/16
Level / type of roadway	Departures
Total lanes / approach lanes	5 / 3
Number of curbside zones	12



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12
Name/description									Hotel/Taxi		Hotel/Taxi	Emergency
Curb length (feet)	175	15	175	15	175	15	175	15	60	15	65	100
Zone type	active	no stop	active	no stop	active	no stop	active	no stop	active	no stop	active	active
Roadway volume (vph)	772	772	772	772	772	772	772	772	772	772	772	772
Roadway capacity (vph)	2,976	3,404	2,976	3,404	2,976	3,404	2,976	3,404	3,404	3,404	3,385	3,308
Roadway V/C ratio	0.259	0.227	0.259	0.227	0.259	0.227	0.259	0.227	0.227	0.227	0.228	0.233
Roadway LOS	B	A	B	A	B	A	B	A	A	A	A	A
Curb demand (# in sys 95% of time)	9.0	N/A	9.0	N/A	9.0	N/A	9.0	N/A	0.0	N/A	1.0	3.0
Curb capacity per lane (vehicles)	7.0	N/A	7.0	N/A	7.0	N/A	7.0	N/A	2.0	N/A	2.0	4.0
Curb utilization ratio	1.286	N/A	1.286	N/A	1.286	N/A	1.286	N/A	0.000	N/A	0.500	0.750
Curb LOS	C	N/A	C	N/A	C	N/A	C	N/A	A	N/A	A	A

Level-of-service (LOS) key:

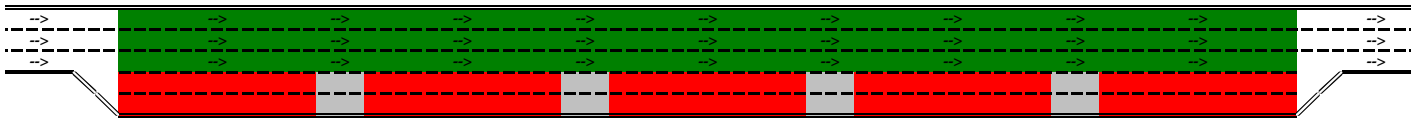
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	Middle - Arrivals
Scenario	Sunday PM 1/24/16
Level / type of roadway	Arrivals
Total lanes / approach lanes	5 / 3
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description									
Curb length (feet)	220	15	220	15	220	15	220	15	220
Zone type	active	no stop	active	no stop	active	no stop	active	no stop	active
Roadway volume (vph)	524	524	524	524	524	524	524	524	524
Roadway capacity (vph)	2,278	3,404	2,278	3,404	2,278	3,404	2,278	3,404	2,278
Roadway V/C ratio	0.230	0.154	0.230	0.154	0.230	0.154	0.230	0.154	0.230
Roadway LOS	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	18.0	N/A	18.0	N/A	18.0	N/A	18.0	N/A	18.0
Curb capacity per lane (vehicles)	9.0	N/A	9.0	N/A	9.0	N/A	9.0	N/A	9.0
Curb utilization ratio	2.000	N/A	2.000	N/A	2.000	N/A	2.000	N/A	2.000
Curb LOS	E	N/A	E	N/A	E	N/A	E	N/A	E

Level-of-service (LOS) key:

A
B
C
D
E
F

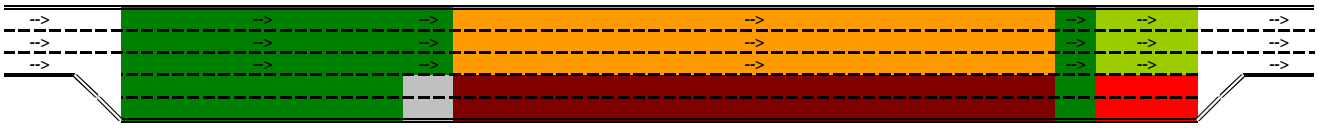
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	Lower - Int'l Arrivals
Scenario	Monday AM 1/25/16
Level / type of roadway	Arrivals
Total lanes / approach lanes	5 / 3
Number of curbside zones	5



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name/description	Emergency		Public		Employee
Curb length (feet)	120	15	260	15	40
Zone type	active	no stop	active	active	active
Roadway volume (vph)	624	624	624	624	624
Roadway capacity (vph)	3,361	3,404	818	####	2,278
Roadway V/C ratio	0.186	0.183	0.763	####	0.274
Roadway LOS	A	A	D	A	B
Curb demand (# in sys 95% of time)	3.0	N/A	34.0	0.0	2.0
Curb capacity per lane (vehicles)	5.0	N/A	10.0	0.0	1.0
Curb utilization ratio	0.600	N/A	3.400	####	2.000
Curb LOS	A	N/A	F	A	E

Level-of-service (LOS) key:

A
B
C
D
E
F

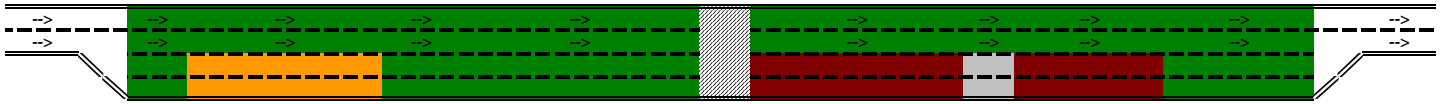
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	GTC
Scenario	Monday PM 1/25/16
Level / type of roadway	Mixed
Total lanes / approach lanes	4 / 2
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description	Sixt	Courtesy	Inter-terminal	Taxi/Limo		RAC	Elevator	RAC	Transit
Curb length (feet)	50	170	65	210	15	185	20	125	125
Zone type	active	active	active	active	xwalk	active	no stop	active	active
Roadway volume (vph)	277	277	277	277	277	277	277	277	277
Roadway capacity (vph)	2,710	2,514	2,710	2,706	2,708	1,264	2,706	1,122	2,720
Roadway V/C ratio	0.102	0.110	0.102	0.102	0.102	0.219	0.102	0.247	0.102
Roadway LOS	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	8.0	1.0	0.0	N/A	9.0	N/A	7.0	2.0
Curb capacity per lane (vehicles)	2.0	6.0	2.0	0.0	N/A	4.0	N/A	3.0	3.0
Curb utilization ratio	0.500	1.333	0.500	0.000	N/A	2.250	N/A	2.333	0.667
Curb LOS	A	D	A	A	N/A	F	N/A	F	A

Level-of-service (LOS) key:

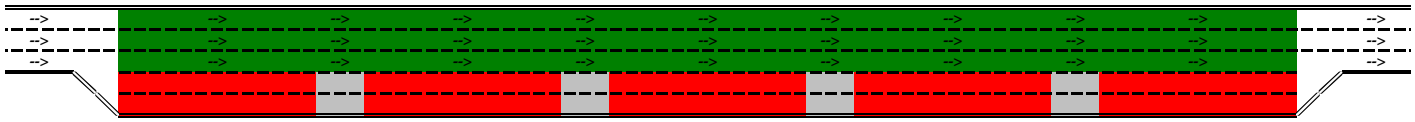
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	Middle - Arrivals
Scenario	Sunday PM 1/24/16
Level / type of roadway	Arrivals
Total lanes / approach lanes	5 / 3
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description									
Curb length (feet)	220	15	220	15	220	15	220	15	220
Zone type	active	no stop	active	no stop	active	no stop	active	no stop	active
Roadway volume (vph)	524	524	524	524	524	524	524	524	524
Roadway capacity (vph)	2,278	3,404	2,278	3,404	2,278	3,404	2,278	3,404	2,278
Roadway V/C ratio	0.230	0.154	0.230	0.154	0.230	0.154	0.230	0.154	0.230
Roadway LOS	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	18.0	N/A	18.0	N/A	18.0	N/A	18.0	N/A	18.0
Curb capacity per lane (vehicles)	9.0	N/A	9.0	N/A	9.0	N/A	9.0	N/A	9.0
Curb utilization ratio	2.000	N/A	2.000	N/A	2.000	N/A	2.000	N/A	2.000
Curb LOS	E	N/A	E	N/A	E	N/A	E	N/A	E

Level-of-service (LOS) key:

A
B
C
D
E
F

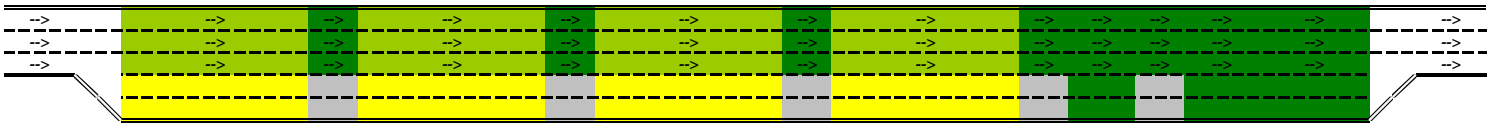
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	Upper - Departures
Scenario	Monday AM 1/25/16
Level / type of roadway	Departures
Total lanes / approach lanes	5 / 3
Number of curbside zones	12



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12
Name/description									Hotel/Taxi		Hotel/Taxi	Emergency
Curb length (feet)	175	15	175	15	175	15	175	15	60	15	65	100
Zone type	active	no stop	active	no stop	active	no stop	active	no stop	active	no stop	active	active
Roadway volume (vph)	772	772	772	772	772	772	772	772	772	772	772	772
Roadway capacity (vph)	2,976	3,404	2,976	3,404	2,976	3,404	2,976	3,404	3,404	3,404	3,385	3,308
Roadway V/C ratio	0.259	0.227	0.259	0.227	0.259	0.227	0.259	0.227	0.227	0.227	0.228	0.233
Roadway LOS	B	A	B	A	B	A	B	A	A	A	A	A
Curb demand (# in sys 95% of time)	9.0	N/A	9.0	N/A	9.0	N/A	9.0	N/A	0.0	N/A	1.0	3.0
Curb capacity per lane (vehicles)	7.0	N/A	7.0	N/A	7.0	N/A	7.0	N/A	2.0	N/A	2.0	4.0
Curb utilization ratio	1.286	N/A	1.286	N/A	1.286	N/A	1.286	N/A	0.000	N/A	0.500	0.750
Curb LOS	C	N/A	C	N/A	C	N/A	C	N/A	A	N/A	A	A

Level-of-service (LOS) key:

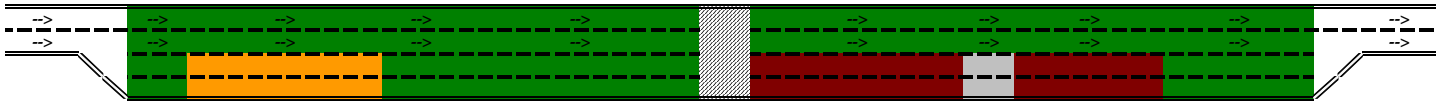
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	GTC
Scenario	Monday PM 1/25/16
Level / type of roadway	Mixed
Total lanes / approach lanes	4 / 2
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description	Sixt	Courtesy	Inter-terminal	Taxi/Limo		RAC	Elevator	RAC	Transit
Curb length (feet)	50	170	65	210	15	185	20	125	125
Zone type	active	active	active	active	xwalk	active	no stop	active	active
Roadway volume (vph)	277	277	277	277	277	277	277	277	277
Roadway capacity (vph)	2,710	2,514	2,710	2,706	2,708	1,264	2,706	1,122	2,720
Roadway V/C ratio	0.102	0.110	0.102	0.102	0.102	0.219	0.102	0.247	0.102
Roadway LOS	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	1.0	8.0	1.0	0.0	N/A	9.0	N/A	7.0	2.0
Curb capacity per lane (vehicles)	2.0	6.0	2.0	0.0	N/A	4.0	N/A	3.0	3.0
Curb utilization ratio	0.500	1.333	0.500	0.000	N/A	2.250	N/A	2.333	0.667
Curb LOS	A	D	A	A	N/A	F	N/A	F	A

Level-of-service (LOS) key:

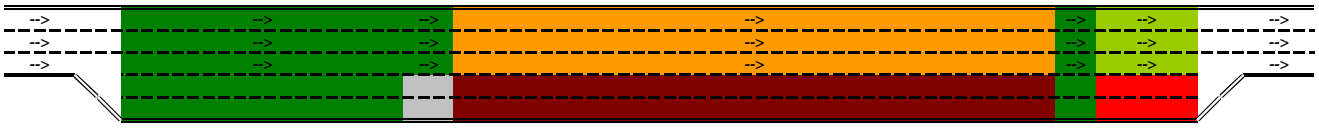
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - McNamara
Roadway location	Lower - Int'l Arrivals
Scenario	Monday AM 1/25/16
Level / type of roadway	Arrivals
Total lanes / approach lanes	5 / 3
Number of curbside zones	5



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Name/description	Emergency		Public		Employee
Curb length (feet)	120	15	260	15	40
Zone type	active	no stop	active	active	active
Roadway volume (vph)	624	624	624	624	624
Roadway capacity (vph)	3,361	3,404	818	####	2,278
Roadway V/C ratio	0.186	0.183	0.763	####	0.274
Roadway LOS	A	A	D	A	B
Curb demand (# in sys 95% of time)	3.0	N/A	34.0	0.0	2.0
Curb capacity per lane (vehicles)	5.0	N/A	10.0	0.0	1.0
Curb utilization ratio	0.600	N/A	3.400	####	2.000
Curb LOS	A	N/A	F	A	E

Level-of-service (LOS) key:

A
B
C
D
E
F

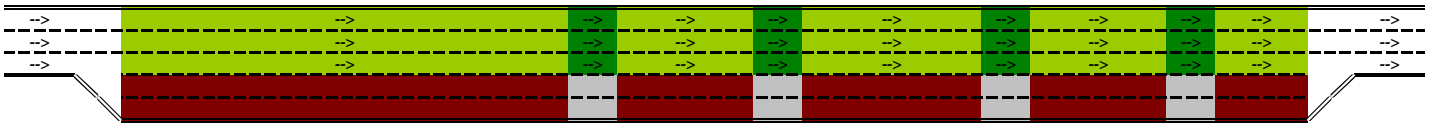
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - North Terminal
Roadway location	Lower - Arrivals
Scenario	Sunday PM - 1/24/16
Level / type of roadway	Arrivals
Total lanes / approach lanes	5 / 3
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description									
Curb length (feet)	340	15	100	15	130	15	100	15	70
Zone type	active	no stop	active	no stop	active	no stop	active	no stop	active
Roadway volume (vph)	536	536	536	536	536	536	536	536	536
Roadway capacity (vph)	2,046	3,404	1,721	3,404	1,833	3,404	1,721	3,404	1,912
Roadway V/C ratio	0.262	0.157	0.311	0.157	0.292	0.157	0.311	0.157	0.280
Roadway LOS	B	A	B	A	B	A	B	A	B
Curb demand (# in sys 95% of time)	31.0	N/A	10.0	N/A	12.0	N/A	10.0	N/A	7.0
Curb capacity per lane (vehicles)	14.0	N/A	4.0	N/A	5.0	N/A	4.0	N/A	3.0
Curb utilization ratio	2.214	N/A	2.500	N/A	2.400	N/A	2.500	N/A	2.333
Curb LOS	F	N/A	F	N/A	F	N/A	F	N/A	F

Level-of-service (LOS) key:

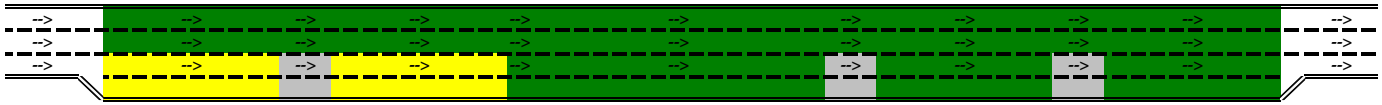
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - North Terminal
Roadway location	Upper - Departures
Scenario	Existing
Level / type of roadway	Departures
Total lanes / approach lanes	4 / 3
Number of curbside zones	9



Zone ID	Zone 1	Zone 2	Zone 3	one	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9
Name/description									
Curb length (feet)	120	15	120	15	200	15	120	15	120
Zone type	active	no stop	active	activ e	active	no stop	active	no stop	active
Roadway volume (vph)	461	461	461	##	461	461	461	461	461
Roadway capacity (vph)	2,599	3,350	2,599	##	2,704	3,350	2,704	3,350	2,704
Roadway V/C ratio	0.177	0.138	0.177	##	0.171	0.138	0.171	0.138	0.171
Roadway LOS	A	A	A	A	A	A	A	A	A
Curb demand (# in sys 95% of time)	6.0	N/A	6.0	##	8.0	N/A	5.0	N/A	5.0
Curb capacity per lane (vehicles)	5.0	N/A	5.0	##	8.0	N/A	5.0	N/A	5.0
Curb utilization ratio	1.200	N/A	1.200	##	1.000	N/A	1.000	N/A	1.000
Curb LOS	C	N/A	C	A	A	N/A	A	N/A	A

Level-of-service (LOS) key:

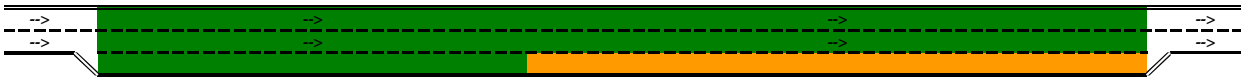
Quick Analysis Tool for Airport Roadways

QATAR v0.6 developed by LeighFisher in association with Dowling Associates, Inc.

Results: Level-of-Service by Zone

Model run by: D Barton on 2/29/2016

Airport	DTW - North Terminal
Roadway location	GTC
Scenario	Monday 1/25/16
Level / type of roadway	Mixed
Total lanes / approach lanes	3 / 2
Number of curbside zones	2



Zone ID	Zone 1	Zone 2
Name/description		RAC
Curb length (feet)	350	500
Zone type	active	active
Roadway volume (vph)	204	204
Roadway capacity (vph)	2,307	1,139
Roadway V/C ratio	0.088	0.179
Roadway LOS	A	A
Curb demand (# in sys 95% of time)	6.0	15.0
Curb capacity per lane (vehicles)	10.0	10.0
Curb utilization ratio	0.600	1.500
Curb LOS	A	D

Level-of-service (LOS) key:

A
B
C
D
E
F

Appendix D

UTILITIES CAPABILITY ASSESSMENT

APPENDIX D UTILITIES CAPABILITY ASSESSMENT

The objective of the utilities capacity assessment (UCA) is to review major utilities serving the proposed buildings within the development areas of concern, compare and contrast current capacity and reliability with future demand, and determine needed improvements for utility services, including power, water, chilled and heating water, fuel, sewer, stormwater, fiber optics and telecommunications.

D.1 Methodology

Existing utility information was determined through review of record drawings, previous studies, equipment data, client meetings, and design standards. Current utility usage was obtained through reviews of existing utility bills and the DTW Power Plant Master Plan.

Peak demands are estimated using building square footage and occupancy data. A gap analysis determines whether utility infrastructure is needed to meet future utility demands and determine the trigger points (dates) when new infrastructure is required. Utility condition assessment information is considered and recommendations provided for new utility infrastructure upgrades.

D.2 Existing Utilities Sources and Capacities

Existing utilities and capacities are summarized in the following sections.

D.2.1 Electricity

Utility distribution service to the Airport is supplied by DTE Energy Company. The Airport Authority owns, operates, and maintains the North Power Plant, which was built in 1965. The Authority owns the South Power Plant while Metro Energy, LLC provides operations and maintenance support. The South Power Plant was built in 2000. Figure D-1 depicts the locations of the North and South Power Plants.

The Power House (Building 611) receives three underground feeds at 40kV, which are stepped down by transformers to 4.8 kV. The east feed is connected via Goddard Road/Middlebelt Road. The west two feeds connect via Goddard Road/Vining Road. The three loops primarily serve the North Terminal, the Smith Administration Building, the Big Blue Deck, hangers, western support operations facilities, the northeast quadrant (primarily the car rentals along Lucas Drive), police and fire stations, and all the street and airfield lights. The Power House service has a combined peak demand of approximately 12.5 megawatts. The peak demand was determined using utility billing information.

The Central Power Plant (Building 821) receives two 120kV underground feeders. The feeds arrive via Eureka Rd/Dingell Drive and serve the south power plant, The McNamara Terminal, Westin Hotel, HVAC Chillers, pumping stations, south employee parking lot, security checkpoints, and the McNamara Garage. The Midfield service has a combined peak demand of approximately 15 MW. Table D-2 provides historical consumption data.

D.2.2 Back-up/Emergency Power

Critical electrical loads such as communications, data processing, security, baggage handling and life safety require redundant systems to minimize interruptions. These systems include uninterruptable power supplies (UPSs), automatic transfer switches (ATSs), and back-up generators. UPS equipment are used to back up sensitive equipment, such as TSA CTX machines, that cannot ride through power interruptions of one second or less. Back-up generators are used for longer term outages, such as blackouts.

The North Power Plant has a 14 megawatt natural gas turbine powered generator. The South Power Plant has 3-5.7 megawatt natural gas engine powered generators. There are 18 small 0.5-1.5 megawatt diesel/natural gas engine generators for facility and life safety located throughout the campus.

D.2.3 Natural Gas

Natural gas is provided by DTE. There are three main natural gas lines serving the Airport: (1) a 3-inch gas main that serves the McNamara Terminal; (2) a 2-inch service that supplies the area east of the McNamara Terminal; and (3) an 8-inch service that primarily serves the North Terminal and its surrounding area.

Gas main capacity information was not available from DTE; however, two new gas lines are planned for future installation to serve the existing McNamara Terminal, the Ground Transportation Buildings and the Spirit Airlines hanger. See Table D-2 for historical consumption data.

D.2.4 Water

There are three water main trunk lines serving separate areas of the Airport. One trunk line consists of a 12-inch water main and serves the McNamara Terminal and surrounding area. An additional 12-inch water main serves the area east of the McNamara Terminal. A 24-inch water main serves the North Terminal and surrounding area. See Table D-2 for historical consumption data.

D.2.5 Storm Sewer

The Airport's drainage is a complex system comprising of over 5,000 catch basins, several hundred miles of storm sewer pipe, and 13 large storm water pump stations that ultimately flow to storm water detention ponds 3E, 3W, 4, and 6. These detention ponds hold more than 500 million gallons of water. All ponds are located in the central eastern portion of the Airport along Middlebelt Road.

Pond #3W occasionally receives low concentrations of spent de-icing fluids. Storm water is released into the county storm sewer at acceptable permit levels of glycol. Storm water with de-icing fluid levels exceeding allowable permit levels is routed into the sanitary sewer line and transported to the Wyandotte Downriver Wastewater Treatment Facility (DWTF). A study was conducted to help address a capacity deficiency at the DWTF. The study concluded that the spent fluids should be redirected to the Detroit Water and Sewerage Department (DWSD).

D.2.6 Sanitary Sewer

There are six main sanitary sewer basins (pipe networks) serving various areas of the Airport. The location of the basins along with the outlet sizes and design capacities are provided in Table D-1.

Table D-1
SANITARY SEWER BASINS
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

Basin	Area serviced	Sewer pipe outlet	Design capacity *(a)*
1	McNamara Terminal	24-inch *(b)*	4,134,000 Gal/Day
2	West of the North Terminal	15-inch	1,616,000 Gal/Day
3	North Terminal	21-inch	3,237,000 Gal/Day
4	North of North Terminal	15-inch *(c)*	1,616,000 Gal/Day
5	Northeast of North Terminal	10-inch *(c)*	749,000 Gal/Day
6	East of North Terminal	12-inch	1,079,000 Gal/Day

(a) Based on the recommended minimum slope for each pipe size, as indicated by the "Recommended Standards for Wastewater Facilities" (1990 Edition).
(b) Outlets to a 42-inch pipe with design capacity of 12,504,000 Gal/Day.
(c) Basins combine to outlets to 24-inch pipe with design capacity of 4,134,000 Gal/Day.

Source: HNTB, February 2016.

D.2.7 Chilled and Heated Water

The North Power Plant contains four steam boilers for heating and four steam turbine centrifugal chillers for the production of chilled water for cooling. Per the 2015 Power Plant Master Plan, the existing boilers and chillers are as follows:

- **Boilers**: Four (4) new CBEX Elite-200-500-150ST (16,775 pound per hour each) fire-tube boilers were installed in 2012.

- **Chiller #1**: Half-way through its design life and the turbine was overhauled in 2011. This unit is currently used as-needed to reduce peak electrical demand. This primarily occurs during on-peak hours Monday – Friday 11:00 am – 7:00 pm. The cost of producing chilled water with this chiller is higher than the electric chillers.

- **Chiller #2**: Has failed tubes and does not meet the operational requirements of the Power Plant. This unit will be replaced with a modern high efficiency electric driven centrifugal chiller with variable frequency drive.

- **Chiller #3**: Near the end of its design life, but operates sufficiently and is currently the main source of cooling.

- **Chiller #4**: Installed in the early 1980's, this chiller is approaching twice the design life. It uses R-11 refrigerant (a regulated ozone-depleting substance which is required to be phased out by the Montreal Protocol). A modern variable-frequency driven replacement chiller will be much more efficient, reliable, and eliminates a potential for adverse environmental impact.

The South Power Plant contains three high-pressure hot water generators for heating and seven 1400-ton trane centrifugal chillers for the production of chilled water for cooling.

D.2.8 Aviation and Other Fuels

The Airport includes one main fuel farm located in the northwest area of the airfield. The fuel farm holds more than 200,000 barrels of fuel. Net usable fuel (subtracting for tank low levels and high-high levels) is 165,000 barrels. The fuel farm consists of four 20,000 barrel tanks and two 60,000 barrel tanks. Fuel is supplied to the terminal aircraft via into-hydrant fuel pumps and an underground distribution system. In addition, fuel is supplied to truck fuel stands. Trucks deliver fuel directly to cargo aircraft. The fuel farm is owned by the Authority, leased by Delta Air Lines and operated by Shell Oil. Unleaded gas and diesel fuels are stored in underground storage tanks. These fuels are dispensed into vehicles through fuel islands. Refer to Figure D-1 for the location of the fuel farm.

D.2.9 HVAC DDC Controls

Siemens Industry Inc. is the contact for the DDC Controls system at North Terminal, the Power House, McNamara Garage, Smith Building, firehouse, Blue Parking Deck, Ground and Transportation Centers, Buildings 610, 703, 704, 705 and the Triturator building.

D.3 Historical Utility Consumption

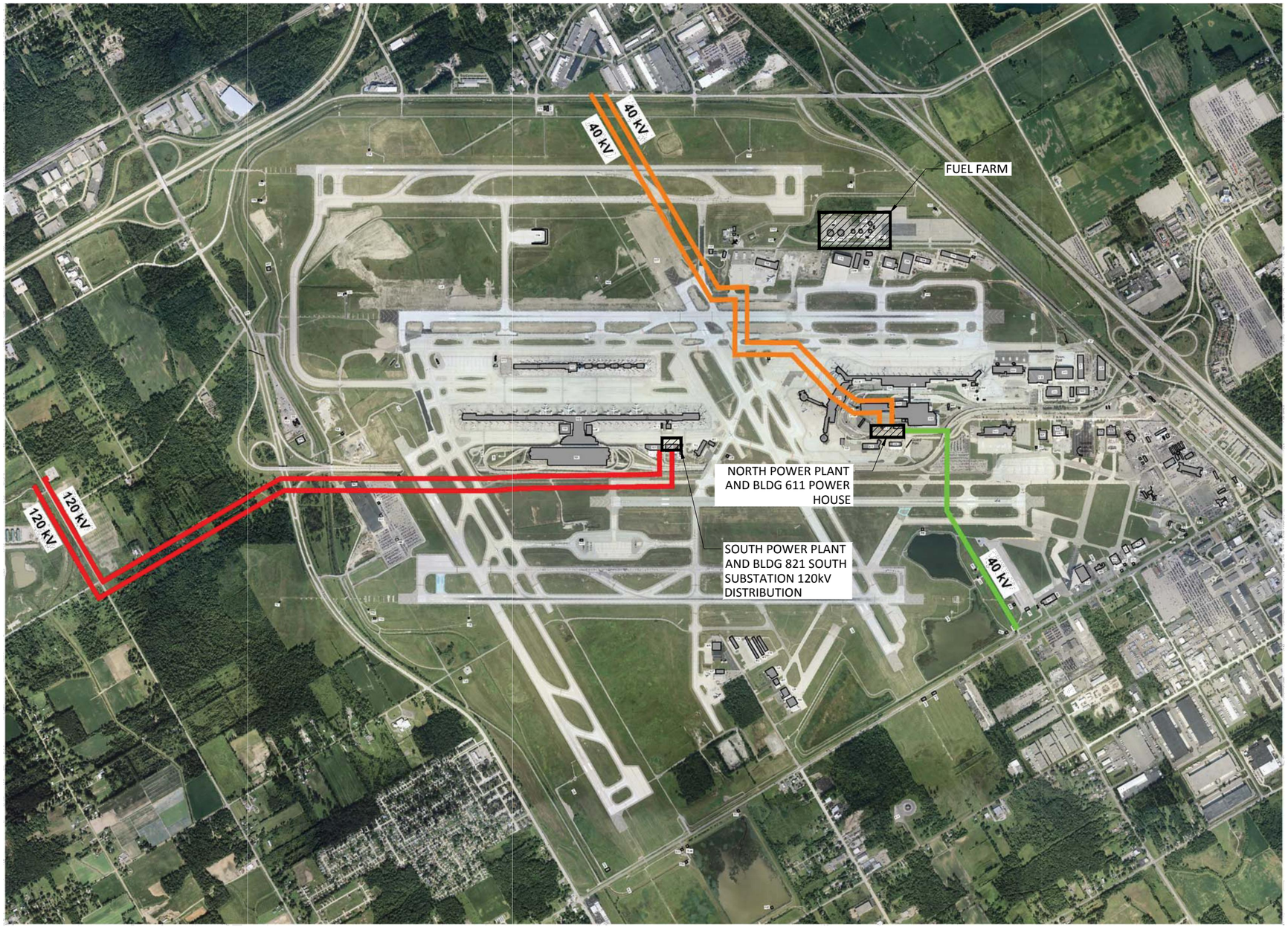
Table D-2 includes utility consumption data between 2011 and 2015. Data for 2015 includes the lowest utilities consumption of any other year with only two exceptions; natural gas consumption was lower in year 2012 and steam consumption was lower in 2013.

Table D-2
HISTORIC UTILITY CONSUMPTION
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport

	Electricity (kw/hr)	Natural gas (cubic ft x 100)	Chilled Water (gallons)	Steam (lb)	Jet fuel (gallons)
2011					
January	18,092,671	423,479	71	14,347,645	16,959,042
February	16,285,611	425,162	86	13,205,663	13,232,256
March	15,392,042	456,445	36	12,408,503	15,433,768
April	17,388,760	239,307	193	8,027,624	17,185,701
May	16,050,511	176,147	4,637	5,963,752	21,117,452
June	18,820,834	72,317	8,174	1,715,215	29,030,324
July	19,233,188	61,953	11,068	489,369	33,338,344
August	18,394,197	78,274	8,654	265,999	33,678,707
September	18,963,609	90,362	7,813	2,859,732	32,916,444
October	15,447,838	120,320	2,541	3,197,346	20,149,475
November	16,770,550	231,961	527	4,597,386	18,802,237
December	15,962,507	282,478	6	8,725,483	14,545,084
Annual total	**206,802,318**	**2,658,205**	**43,806**	**75,803,717**	**266,388,834**
2012					
January	16,951,546	406,328	0	9,950,154	14,908,637
February	18,191,994	301,923	0	10,168,143	15,704,562
March	15,218,606	193,124	1,055	5,000,464	16,965,026
April	15,280,099	151,002	1,094	3,891,807	16,628,403
May	18,380,058	132,058	4,897	2,959,781	26,317,895
June	16,943,150	101,312	9,730	1,945,468	34,711,016
July	19,731,730	82,395	10,877	1,198,397	40,521,120
August	20,430,148	76,799	11,098	1,605,993	40,028,156
September	16,009,490	81,533	6,475	2,001,287	27,143,742
October	15,692,579	178,565	3,189	3,750,603	21,652,307
November	16,782,131	233,836	342	6,109,995	16,585,765
December	16,641,935	287,601	67	11,046,200	14,992,418
Annual total	**206,253,466**	**2,226,476**	**48,824**	**59,628,292**	**286,159,047**

	Electricity (kw/hr)	Natural gas (cubic ft x 100)	Chilled Water (gallons)	Steam (lb)	Jet fuel (gallons)
2013					
January	18,359,041	429,145	30	9,487,293	16,609,702
February	16,091,396	361,815	0	10,288,857	14,824,107
March	15,746,099	320,604	61	8,430,606	15,210,101
April	15,675,240	273,198	379	6,038,122	18,543,411
May	17,905,452	106,201	5,611	2,930,167	24,687,894
June	16,608,943	83,468	8,522	1,514,694	32,586,554
July	19,370,101	104,886	11,100	1,167,153	35,560,801
August	19,587,475	78,381	9,522	1,664,455	30,021,491
September	17,024,232	86,187	7,190	1,716,771	25,369,368
October	17,306,168	139,188	4,150	2,483,453	25,217,514
November	14,367,654	204,954	101	4,081,616	14,173,303
December	16,980,971	367,349	340	6,199,532	17,255,269
Annual total	**205,022,772**	**2,555,376**	**47,006**	**56,002,719**	**270,059,515**
2014					
January	18,406,420	403,298	53	15,430,035	17,193,929
February	15,643,684	371,067	8	10,567,602	14,477,012
March	15,751,812	342,787	46	8,729,369	17,385,430
April	15,027,277	240,326	637	4,009,672	17,763,943
May	16,262,397	102,277	2,502	2,363,123	30,079,839
June	16,430,051	70,164	8,738	402,368	37,393,523
July	19,102,907	79,739	9,315	951,303	29,609,315
August	16,537,995	62,667	9,441	1,624,966	30,777,769
September	16,059,184	86,225	5,718	1,751,141	27,671,866
October	15,933,062	122,999	1,970	3,227,584	27,598,557
November	13,531,253	234,300	320	6,583,918	13,137,254
December	16,432,062	325,098	8	9,178,083	15,986,577
Annual total	**195,118,104**	**2,440,947**	**38,756**	**64,819,164**	**279,075,014**
2015					
January	17,177,501	345,189	28	12,506,020	14,646,071
February	15,276,314	375,113	45	10,838,153	14,623,629
March	15,714,446	358,578	43	8,116,668	15,173,446
April	15,472,472	162,915	775	3,014,956	18,510,497
May	14,681,006	99,367	4,205	1,793,471	19,961,714
June	16,609,971	95,165	5,937	1,167,888	23,844,094
July	18,735,663	62,047	5,792	756,621	27,102,600
August	16,424,910	70,356	6,509	1,018,250	30,033,459
September	16,082,348	89,485	6,111	1,230,498	23,028,719
October	16,105,650	118,861	2,963	3,164,750	20,869,847
November	15,362,897	183,500	323	5,343,230	15,674,640
December	16,504,368	315,600	105	8,787,325	15,694,837
Annual total	**194,147,546**	**2,276,176**	**32,836**	**57,737,830**	**239,163,554**

Source: Wayne County Airport Authority, February 2016.



S:\DTW\LADTW\101\04 Existing Conditions_CAD\Basefile_HNTB\Fig D-1 Utility Infrastructure Map.dwg Mar 27, 2016 - 7:11pm

LEGEND

NORTH

0 1250' 2500' 5000'

Figure D-1
UTILITY INFRASTRUCTURE MAP

Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
March 2016

Leigh | Fisher