



DETROIT METRO ▪ WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY



Technical Advisory Committee Meeting

Detroit Metropolitan Airport Master Plan Update

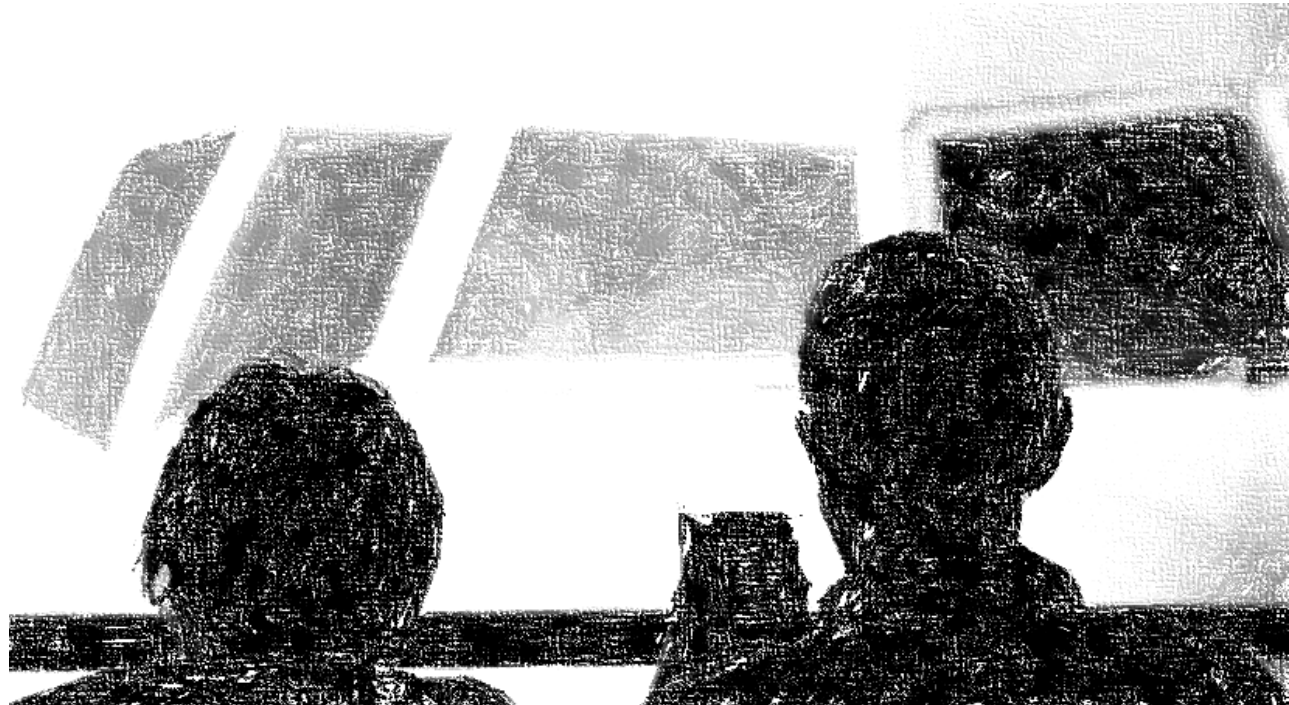
Meeting #4: Preferred Concept Alternatives

November 2, 2016

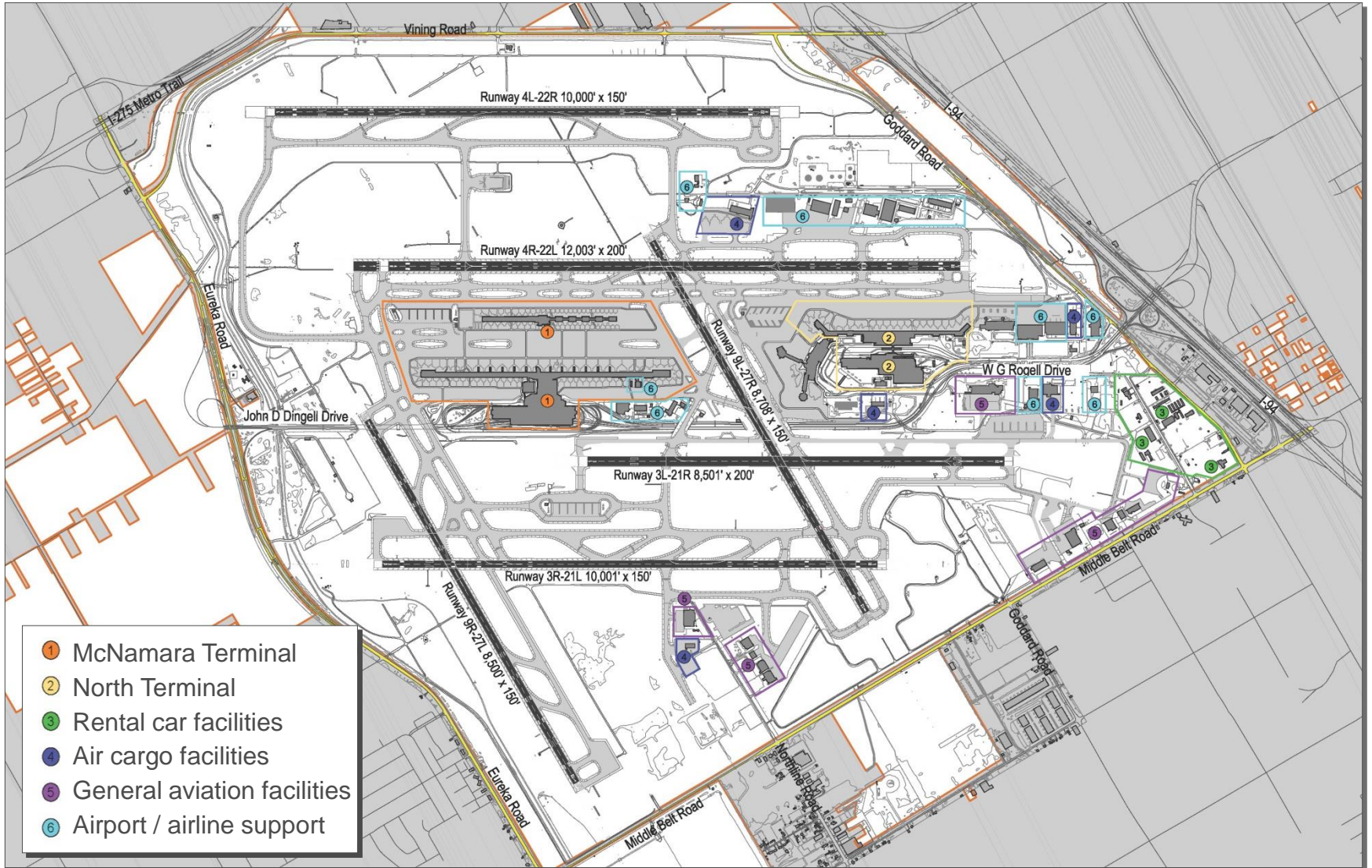
Leigh | Fisher

Today's agenda and discussion topics

- 1. Project overview and applicable background**
- 2. Preferred concept alternatives**
 - Airfield
 - Passenger terminals
 - Ground transportation facilities
 - Airport maintenance campus
- 3. Closing/summary**

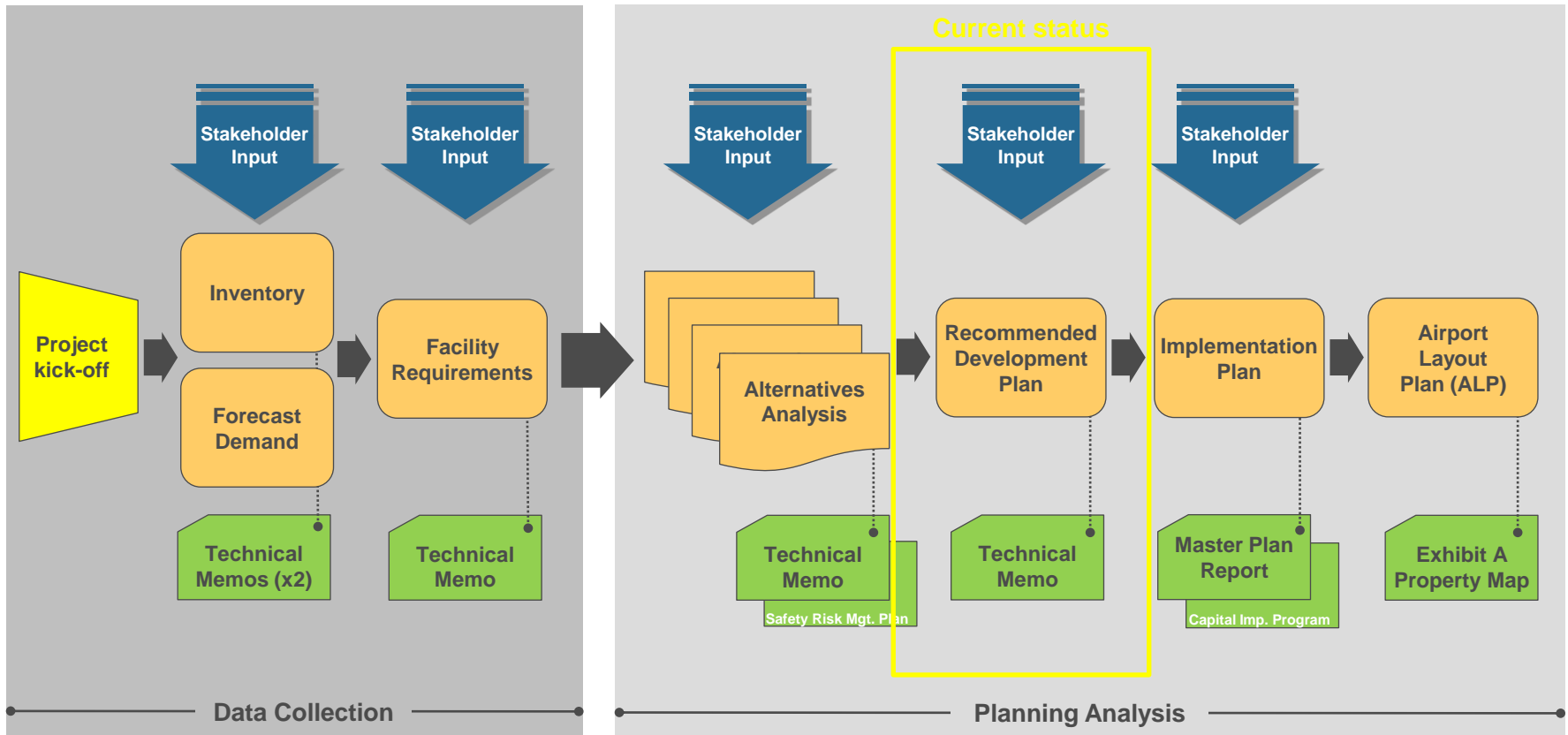


Detroit Metropolitan Wayne County Airport



The Master Planning Process

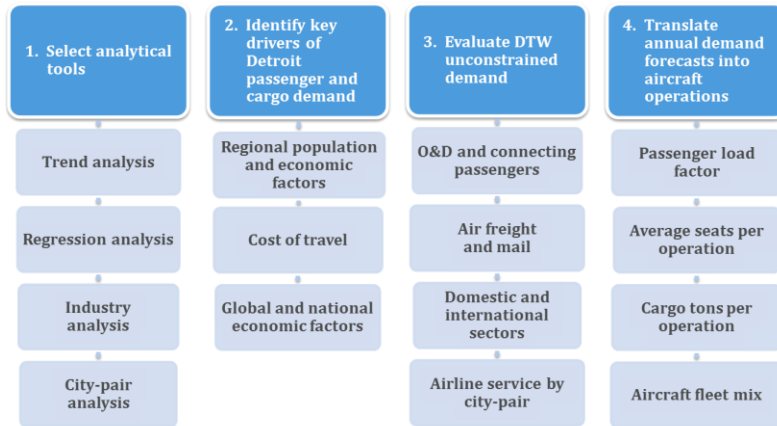
The master planning process includes a series of technical analyses and summary documents, as well as opportunities for stakeholder and community input



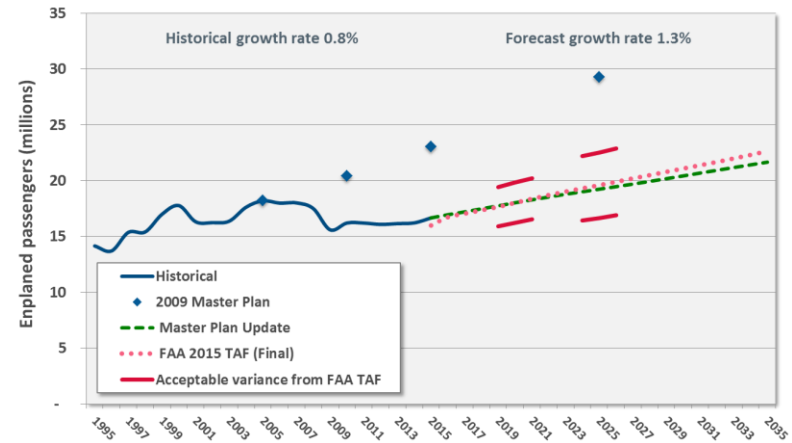
Forecast Aviation Activity

Total annual passengers and operations are forecast to increase an average of 1.3% and 0.7% respectively per year between 2015 and 2035

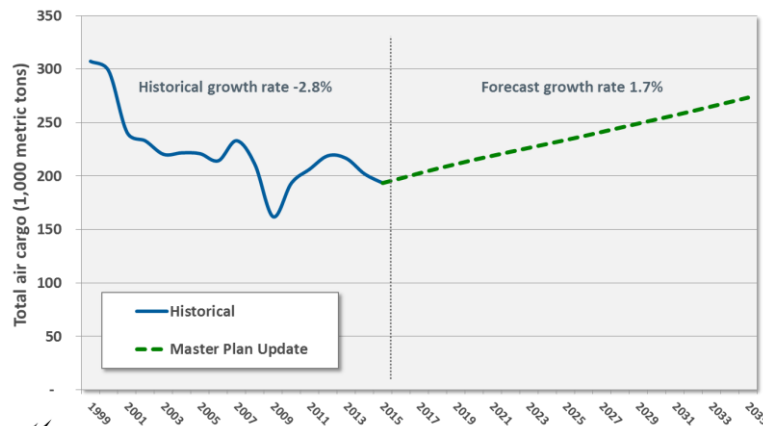
Forecast Methodology and Approach



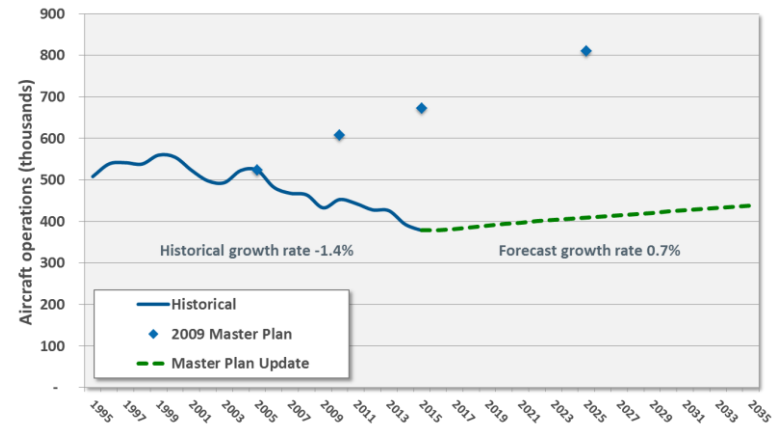
Forecast Passengers



Forecast Air Cargo



Forecast Aircraft Operations



Preferred Alternatives:
Airfield

Airfield Simulation Modeling Video

Operation Pattern During Deice & Defrost Conditions

calm = south flow						
Operation Pattern	Frozen		Frost		Overall	
	Departures	Percentage	Departures	Percentage	Departures	Percentage
North Flow	3,994	40%	1,340	44%	5,334	41%
South Flow	6,030	60%	1,706	56%	7,737	59%
Total	10,024	100%	3,046	100%	13,071	100%

Source: NCDC Weather Data and HNTB Analysis 2016.

calm = north flow						
Operation Pattern	Frozen		Frost		Overall	
	Departures	Percentage	Departures	Percentage	Departures	Percentage
North Flow	4,355	43%	1,644	54%	5,999	46%
South Flow	5,669	57%	1,402	46%	7,071	54%
Total	10,024	100%	3,046	100%	13,071	100%

Source: NCDC Weather Data and HNTB Analysis 2016.

Weather Data from 2006-2015

Operating Costs Comparison – North Flow

Scenario	Operation Type	Air/Ground	Travel Time and Delay (in minutes)	Cost (in 2016 dollars)	
				Average (\$/minute)	Total (\$)
North Base Deice	Arrival	Air	2,202	\$ 45.2	\$ 99,595
		Ground	7,242	\$ 21.1	\$ 152,762
	Departure	Air	753	\$ 45.2	\$ 34,067
		Ground	16,086	\$ 21.1	\$ 339,342
<i>North Base Deice Total</i>			26,284		\$ 625,765
North Standardize	Arrival	Air	2,202	\$ 45.2	\$ 99,595
		Ground	7,273	\$ 21.1	\$ 153,416
	Departure	Air	753	\$ 45.2	\$ 34,067
		Ground	16,757	\$ 21.1	\$ 353,484
<i>North Standardize Total</i>			26,985		\$ 640,561
North Deice Alt1	Arrival	Air	2,202	\$ 45.2	\$ 99,595
		Ground	7,263	\$ 21.1	\$ 153,204
	Departure	Air	753	\$ 45.2	\$ 34,067
		Ground	15,512	\$ 21.1	\$ 327,224
<i>North Deice Alt1 Total</i>			25,731		\$ 614,089
North Deice Alt1A	Arrival	Air	2,202	\$ 45.2	\$ 99,595
		Ground	7,236	\$ 21.1	\$ 152,646
	Departure	Air	753	\$ 45.2	\$ 34,067
		Ground	15,149	\$ 21.1	\$ 319,557
<i>North Deice Alt1A Total</i>			25,341		\$ 605,864
North Deice Alt2	Arrival	Air	2,202	\$ 45.2	\$ 99,595
		Ground	7,260	\$ 21.1	\$ 153,155
	Departure	Air	753	\$ 45.2	\$ 34,070
		Ground	16,922	\$ 21.1	\$ 356,957
<i>North Deice Alt2 Total</i>			27,138		\$ 643,776

Operating Costs Comparison – South Flow

Scenario	Operation Type	Air/Ground	Travel Time and Delay (in minutes)	Cost (in 2016 dollars)	
				Average (\$/minute)	Total (\$)
South Base Deice	Arrival	Air	2,150	\$ 45.2	\$ 97,222
		Ground	6,952	\$ 21.1	\$ 146,645
	Departure	Air	813	\$ 45.2	\$ 36,762
		Ground	15,564	\$ 21.1	\$ 328,319
<i>South Base Deice Total</i>			25,479		\$ 608,948
South Standardize	Arrival	Air	2,150	\$ 45.2	\$ 97,222
		Ground	6,948	\$ 21.1	\$ 146,576
	Departure	Air	820	\$ 45.2	\$ 37,074
		Ground	16,422	\$ 21.1	\$ 346,423
<i>South Standardize Total</i>			26,341		\$ 627,295
South Deice Alt1	Arrival	Air	2,150	\$ 45.2	\$ 97,242
		Ground	6,922	\$ 21.1	\$ 146,021
	Departure	Air	818	\$ 45.2	\$ 36,988
		Ground	16,597	\$ 21.1	\$ 350,103
<i>South Deice Alt1 Total</i>			26,487		\$ 630,353
South Deice Alt1A	Arrival	Air	2,150	\$ 45.2	\$ 97,242
		Ground	6,892	\$ 21.1	\$ 145,390
	Departure	Air	818	\$ 45.2	\$ 36,980
		Ground	16,294	\$ 21.1	\$ 343,710
<i>South Deice Alt1A Total</i>			26,154		\$ 623,322
South Deice Alt2	Arrival	Air	2,150	\$ 45.2	\$ 97,242
		Ground	6,964	\$ 21.1	\$ 146,904
	Departure	Air	819	\$ 45.2	\$ 37,047
		Ground	16,562	\$ 21.1	\$ 349,376
<i>South Deice Alt2 Total</i>			26,496		\$ 630,568

PRELIMINARY

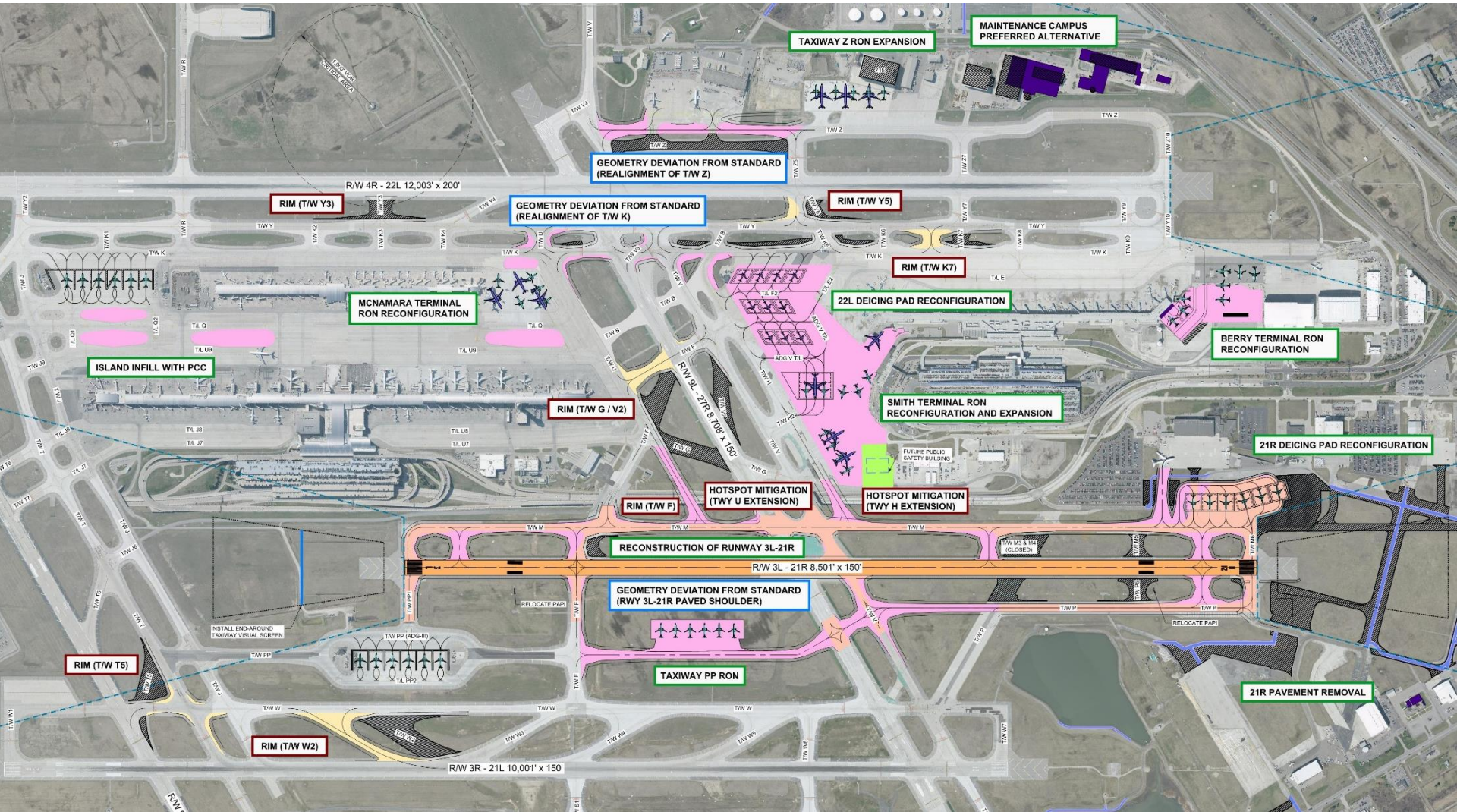
Runway 3L-21R

- Reconstruct at 150' wide
- No north extension
- Pursue non-precision instrument approach (1 mile visibility)
- Extend Taxiway P
- Improve departure surface penetrations
- No extension of Taxiway M
- Maintain centerline alignment (35' credit)

Deicing Pads

- Centralized deicing is not practical or feasible
- Address standards for new/reconfigured deicing pads
- Add two new wide-body positions (1 Sky Team and 1 OAL)
- Improve Departure Surface Penetrations
- Reconfiguration of 21R and 22L pad
- Long term utilization strategies for deicing

Preferred Airfield Alternative

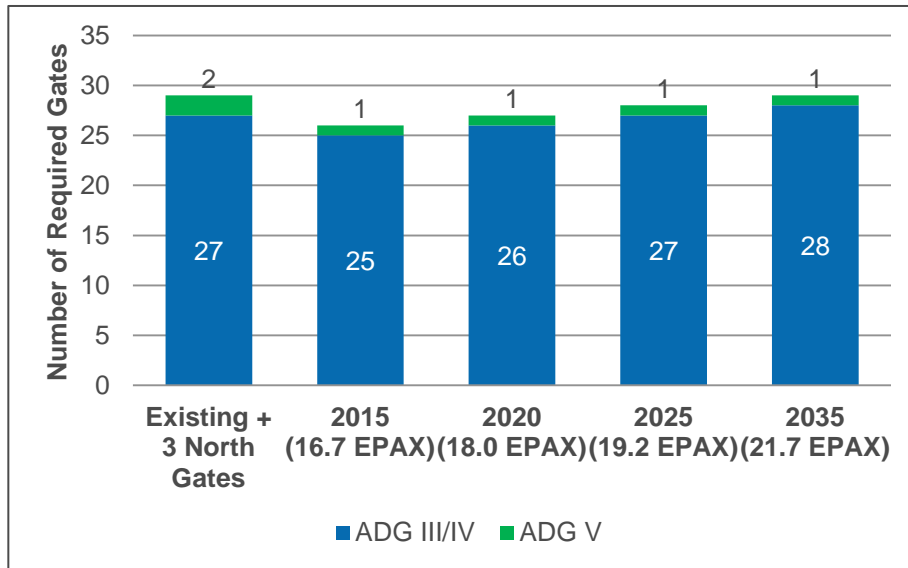


*Preferred Alternatives:
Passenger Terminals*

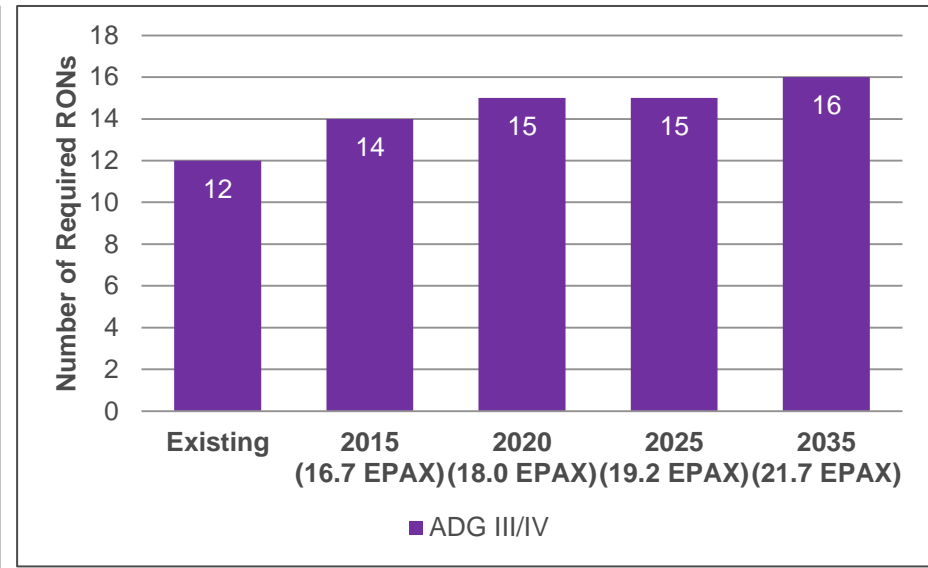
North Terminal Gate and Remote Parking Requirements

Developed gate analysis assuming three north gates will be added in near-term

Contact Gate Requirements



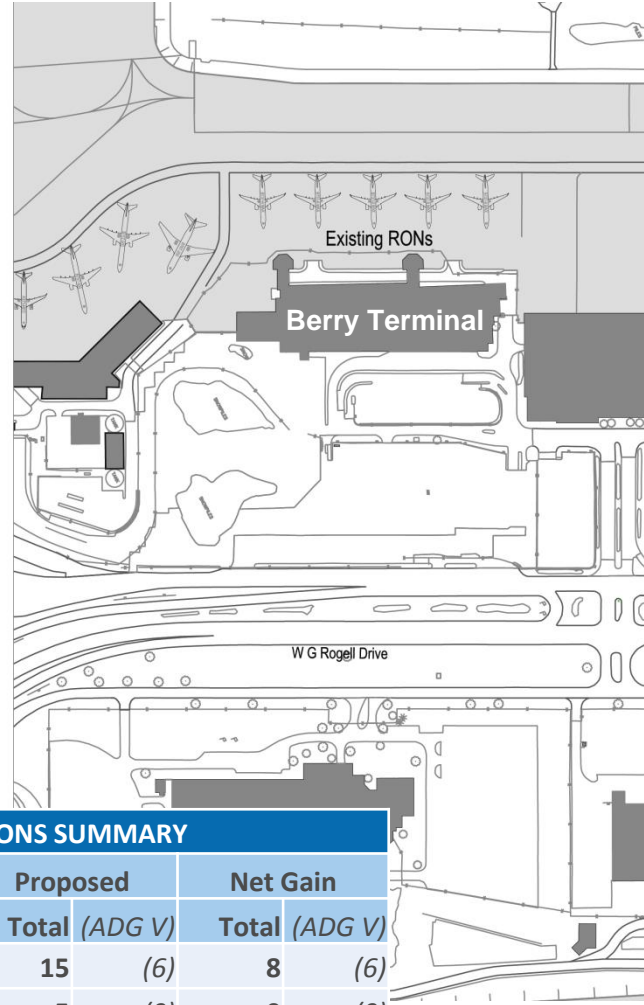
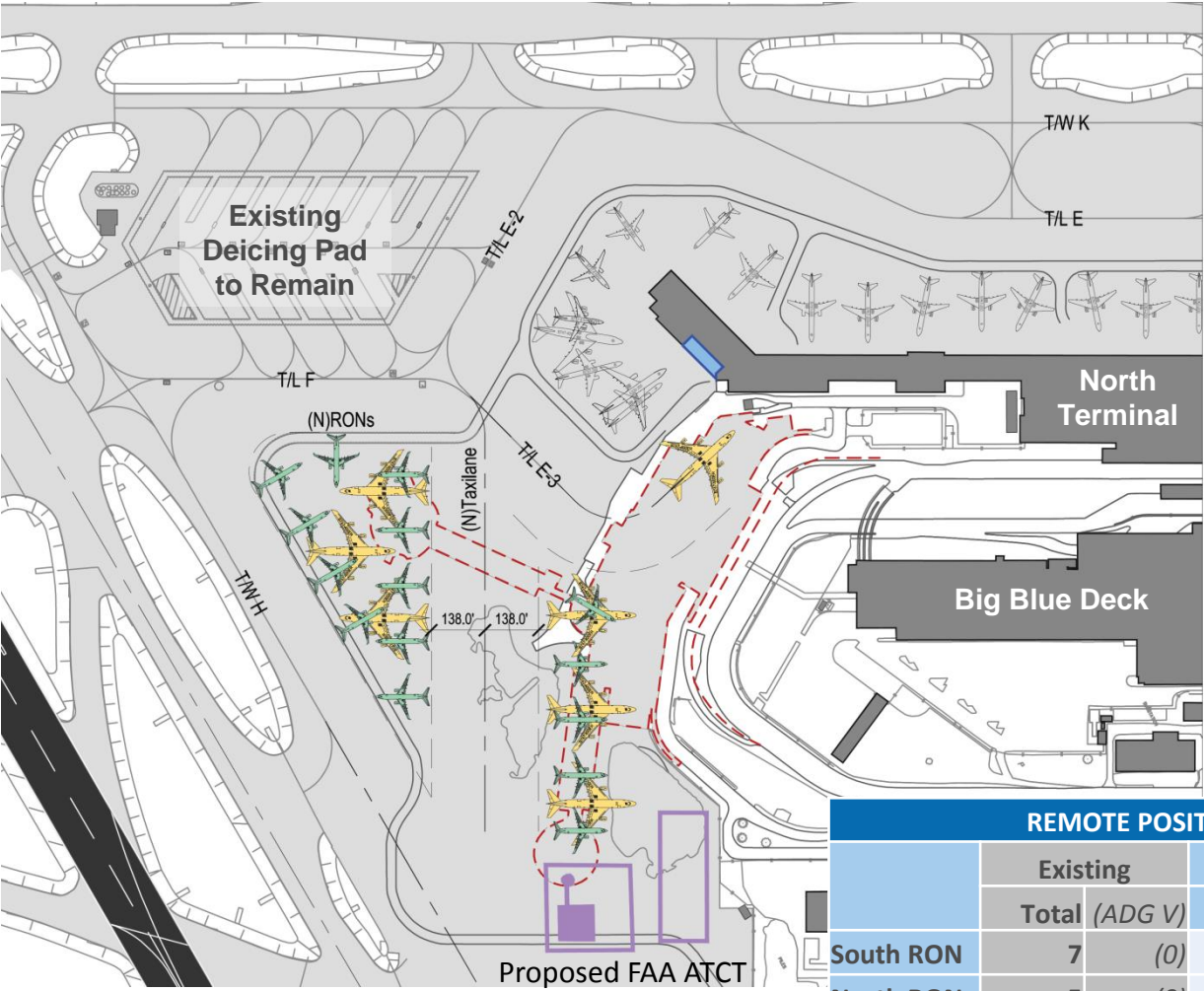
Remote Position (RON) Requirements



- A total of **29 contact gates** required by **2035**
- The three (3) north ADG-III gates added in the near-term will be sufficient to handle 20-year gate demand
- A total of **16 ADG-III remote aircraft parking positions** will be required by **2035**

Proposed Near-term Remote Aircraft Parking Positions

15 south remote positions + 5 north remote positions = 20 total RONs



REMOTE POSITIONS SUMMARY						
	Existing		Proposed		Net Gain	
	Total	(ADG V)	Total	(ADG V)	Total	(ADG V)
South RON	7	(0)	15	(6)	8	(6)
North RON	5	(0)	5	(0)	0	(0)
TOTAL:	12	(0)	20	(6)	8	(6)

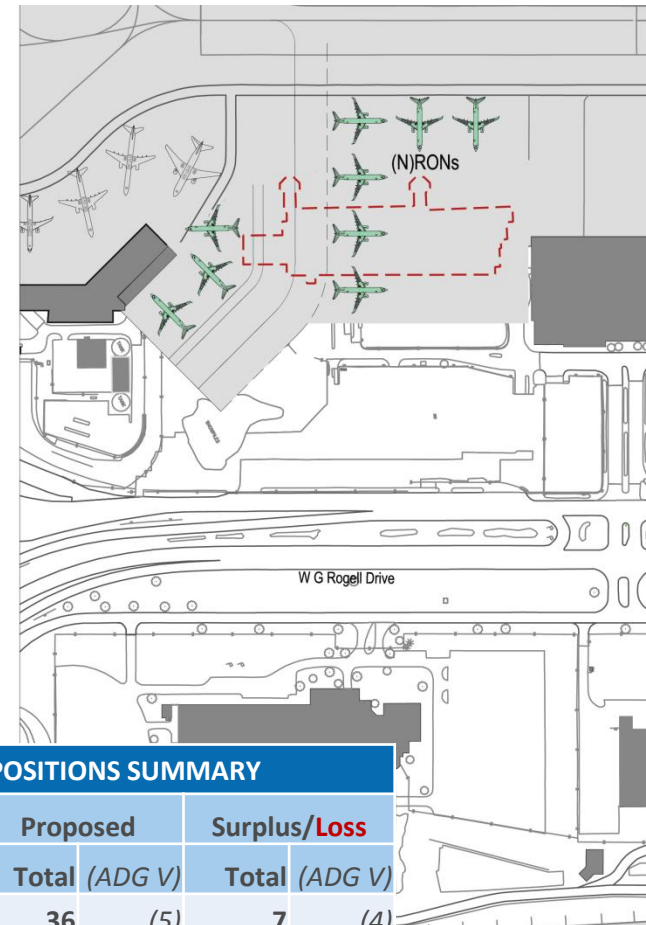
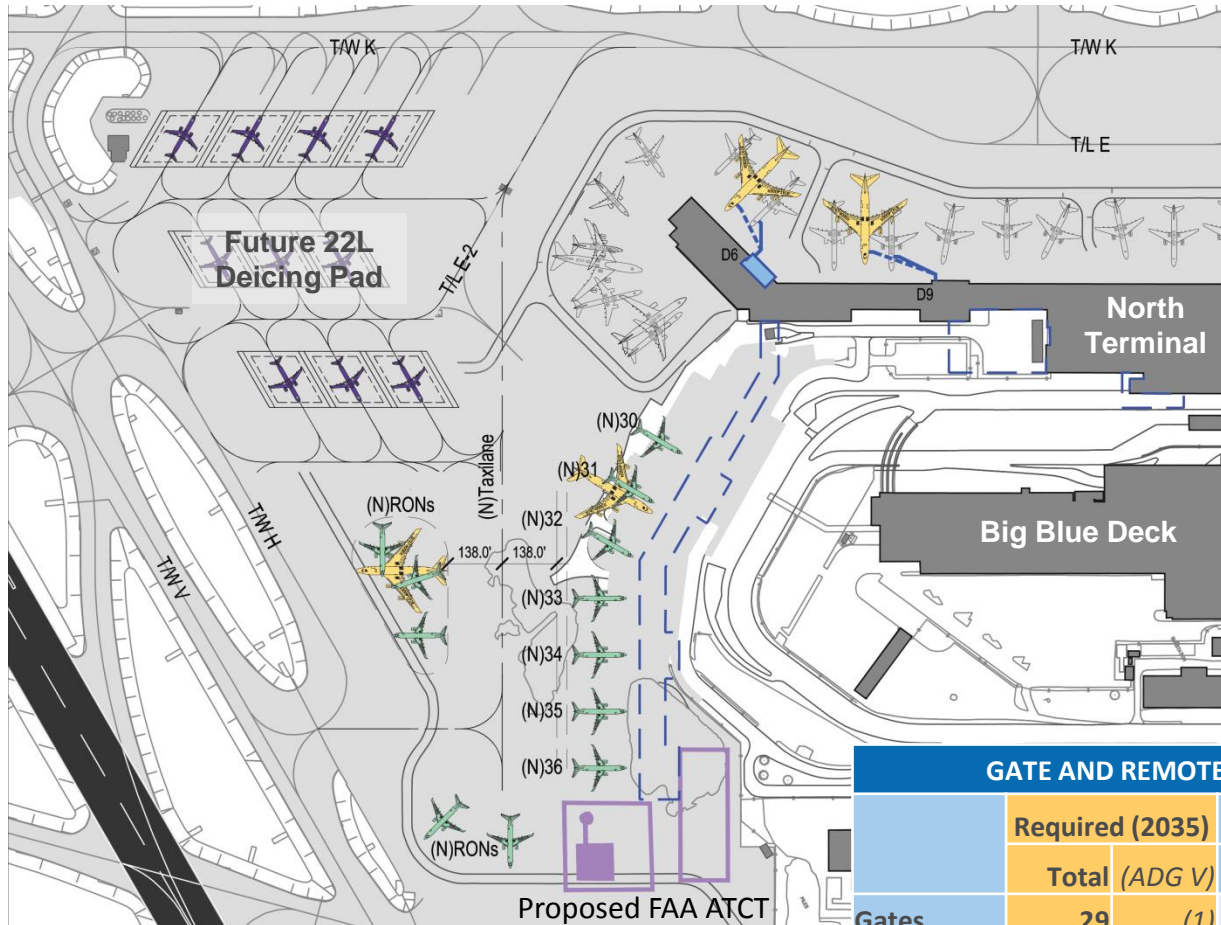
Italics: ADG-V positions indicated are proposed 3-for-1 or 2-for-1 substitutions of ADG-III positions.



North Terminal Long-term Gate Expansion - Preferred

Single-loaded concourse with connector bridge

Preferred Alternative



GATE AND REMOTE POSITIONS SUMMARY						
	Required (2035)		Proposed		Surplus/Loss	
	Total	(ADG V)	Total	(ADG V)	Total	(ADG V)
Gates	29	(1)	36	(5)	7	(4)
Remotes	16	(0)	11	(1)	-5	(1)

Italics: ADG-V positions indicated are proposed 3-for-1 or 2-for-1 substitutions of ADG-III positions.

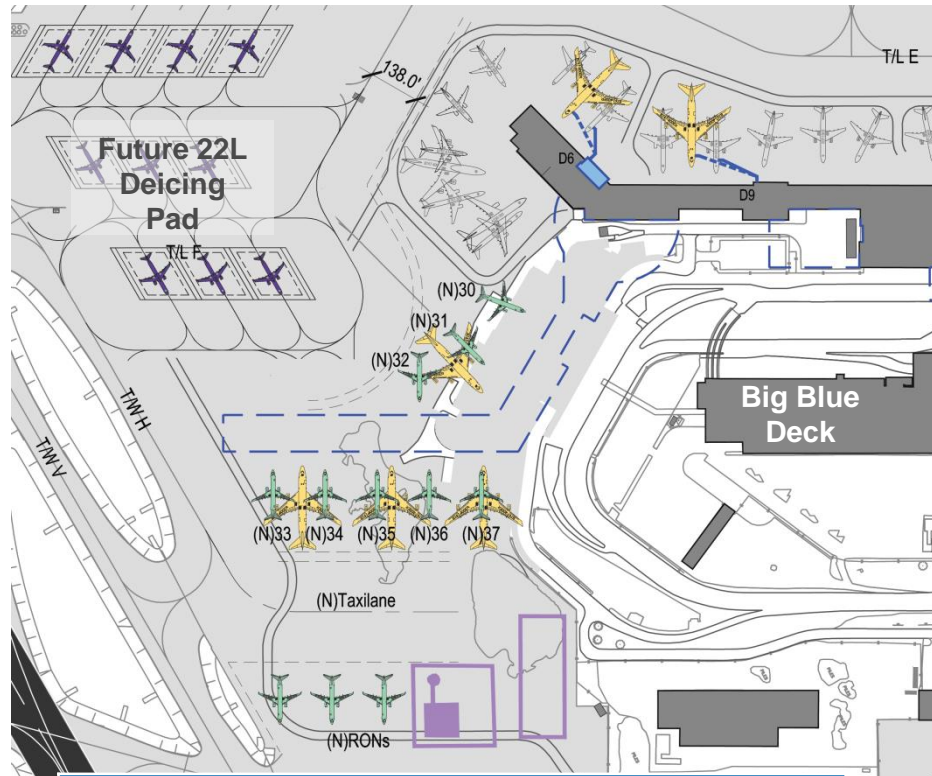
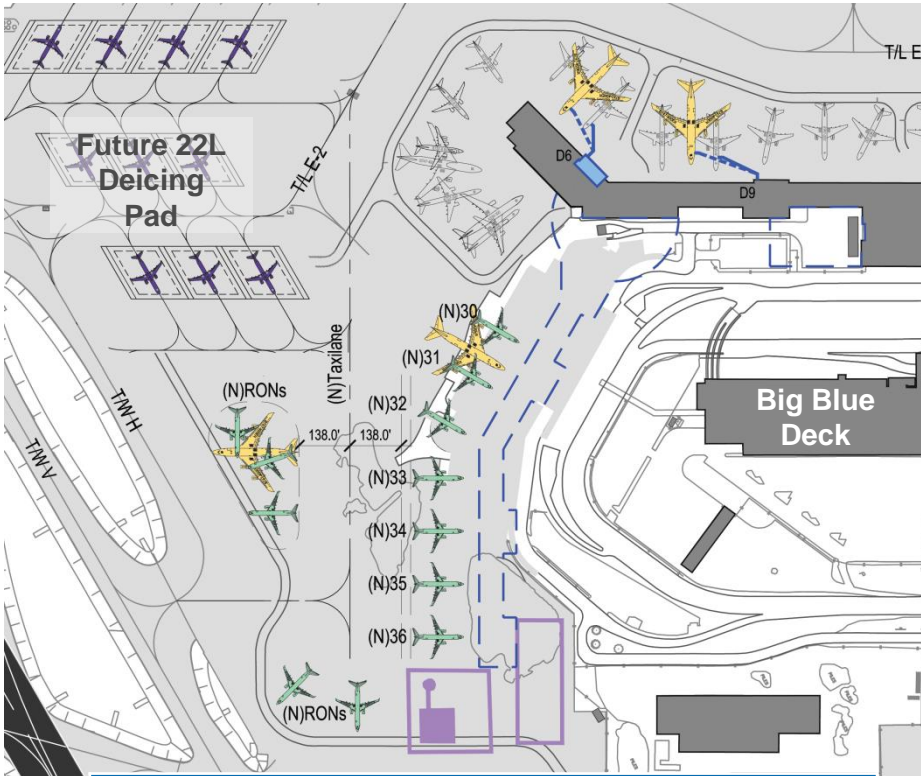


North Terminal Long-term Gate Expansion - Other Alternatives

Single- and double-loaded concourses with rotunda

Other Alternatives - Option 1b

Other Alternatives - Option 2






GATE AND REMOTE POSITIONS SUMMARY						
	Required (2035)		Proposed		Surplus/Loss	
	Total	(ADG V)	Total	(ADG V)	Total	(ADG V)
Gates	29	(1)	36	(5)	7	(4)
Remotes	16	(0)	11	(1)	-5	(1)

GATE AND REMOTE POSITIONS SUMMARY						
	Required (2035)		Proposed		Surplus/Loss	
	Total	(ADG V)	Total	(ADG V)	Total	(ADG V)
Gates	29	(1)	37	(8)	8	(7)
Remotes	16	(0)	9	(0)	-7	(0)



Italics: ADG-V positions indicated are proposed 3-for-1 or 2-for-1 substitutions of ADG-III positions.

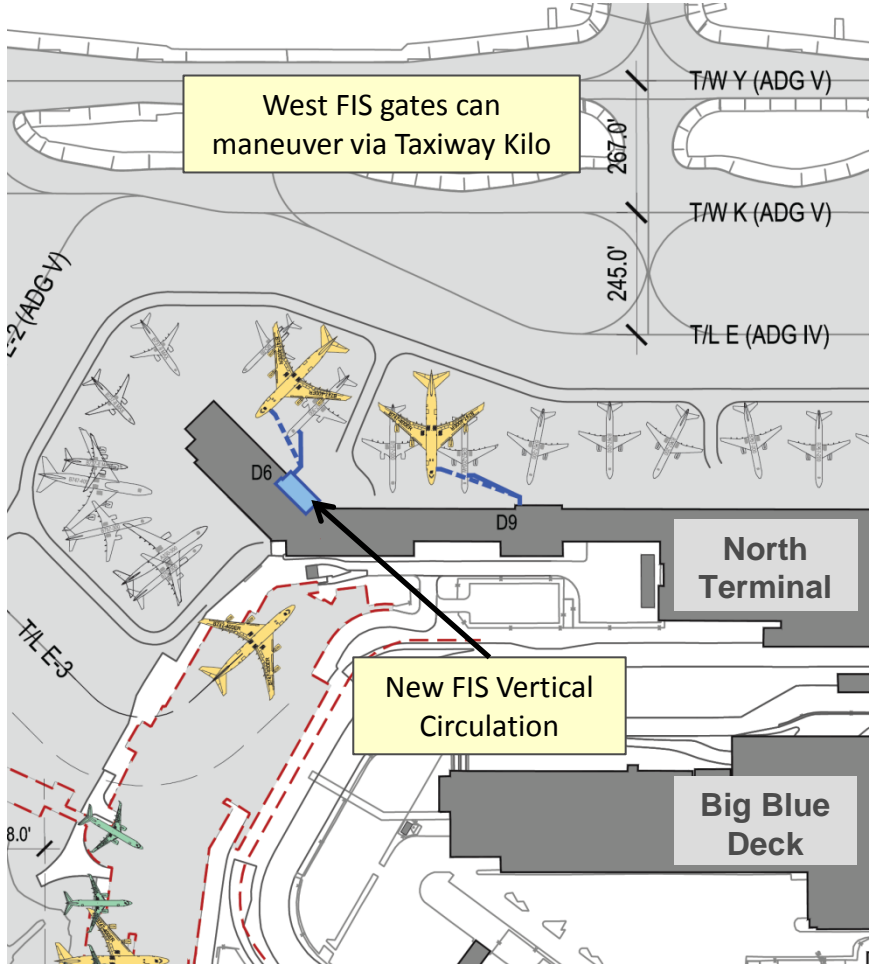
North Terminal Long-term Gate Expansion - Evaluations Matrix

	Gates/RONs	ROM Cost	Efficiency of Space	Level of Service	Concession Space
Preferred 	36 gates +7 gates (4 ADG-V) 11 RONs -5 RONs (1 ADG-V)	\$236 M (Baseline)	90,000 sf / 7 gates <u>13,000 sf / gate</u>	12,500 sf bridge/500 pax <u>25 sf/pax</u> (LOS C = 24.7sf)	<u>11.9 sf</u> per 1,000 EPAX in 2035 <i>(Average medium hub metric = 12.2 sf/1,000 EPAX)</i>
Option 1b 	36 gates +7 gates (4 ADG-V) 11 RONs -5 RONs (1 ADG-V)	\$345 M (+\$109 M)	145,000 sf / 7 gates <u>20,700 sf / gate</u>	29,000 sf rotunda/500 pax <u>58 sf/pax</u> (LOS C = 24.7sf)	<u>17.7 sf</u> per 1,000 EPAX in 2035 <i>(Average medium hub metric = 12.2 sf/1,000 EPAX)</i>
Option 2 	37 gates +8 gates (7 ADG-V) 9 RONs -7 RONs (0 ADG-V)	\$393 M (+\$157 M)	174,000 sf/12 gates <u>14,500 sf / gate</u>	29,000 sf rotunda/870 pax <u>33 sf/pax</u> (LOS C = 24.7sf)	<u>19.0 sf</u> per 1,000 EPAX in 2035 <i>(Average medium hub metric = 12.2 sf/1,000 EPAX)</i>

Note: All options require removal/relocation of ADG-V deicing position

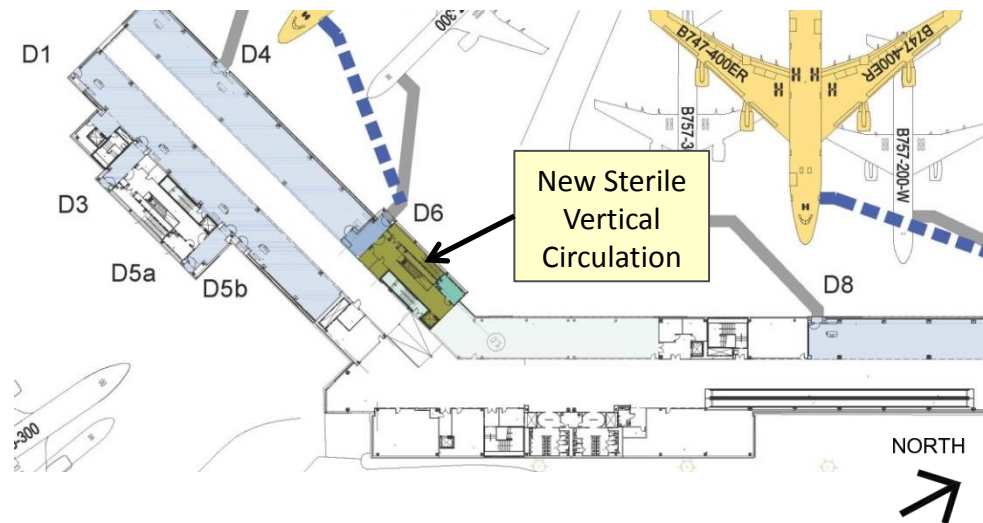
West FIS Gate Expansion Option

Convert existing vertical core at Gate D6 to "sterile" vertical core

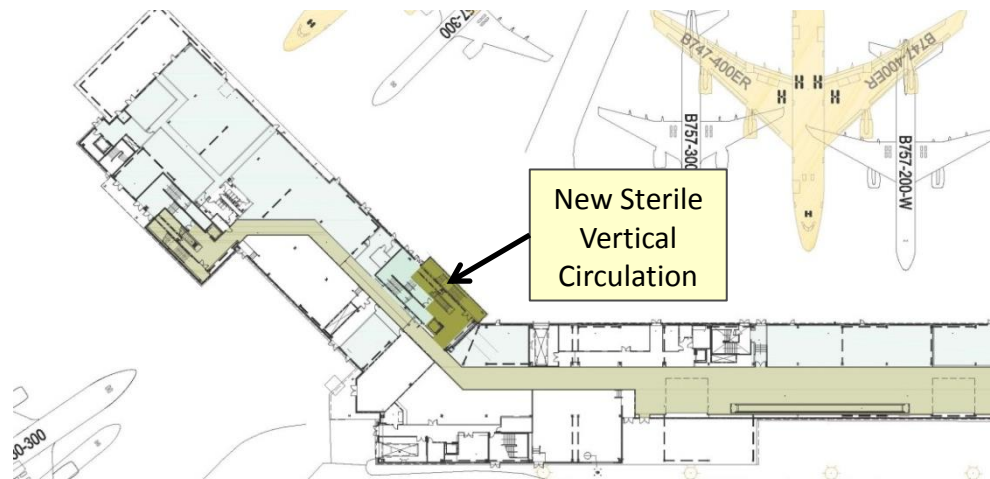


**Rough Order of Magnitude (ROM)
Cost Estimate: \$11M**

Departure Level



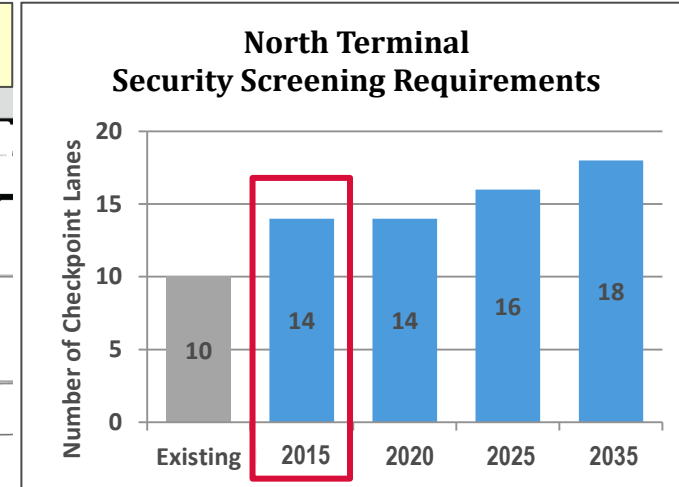
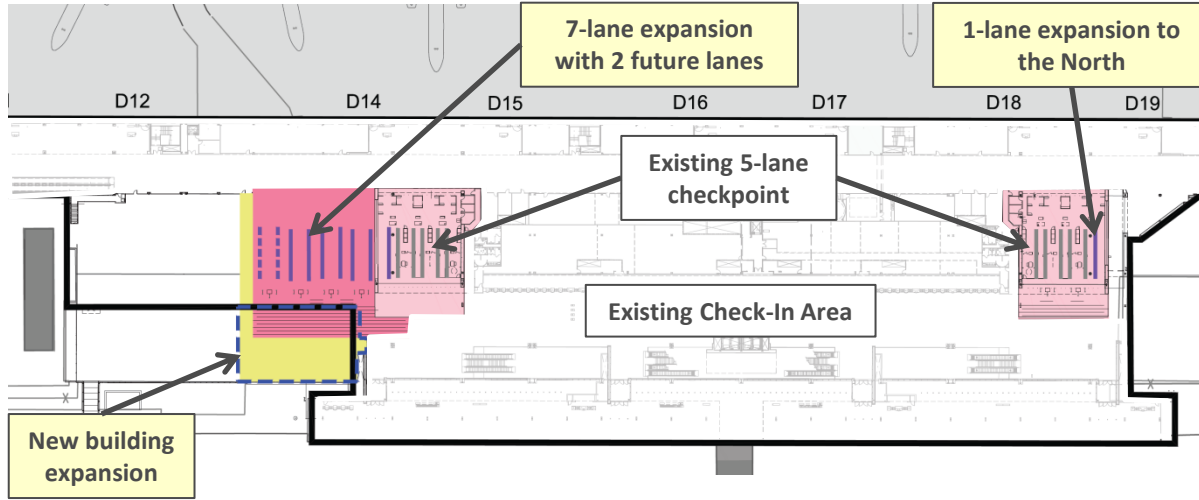
Arrivals Level



North Terminal Security Screening Options

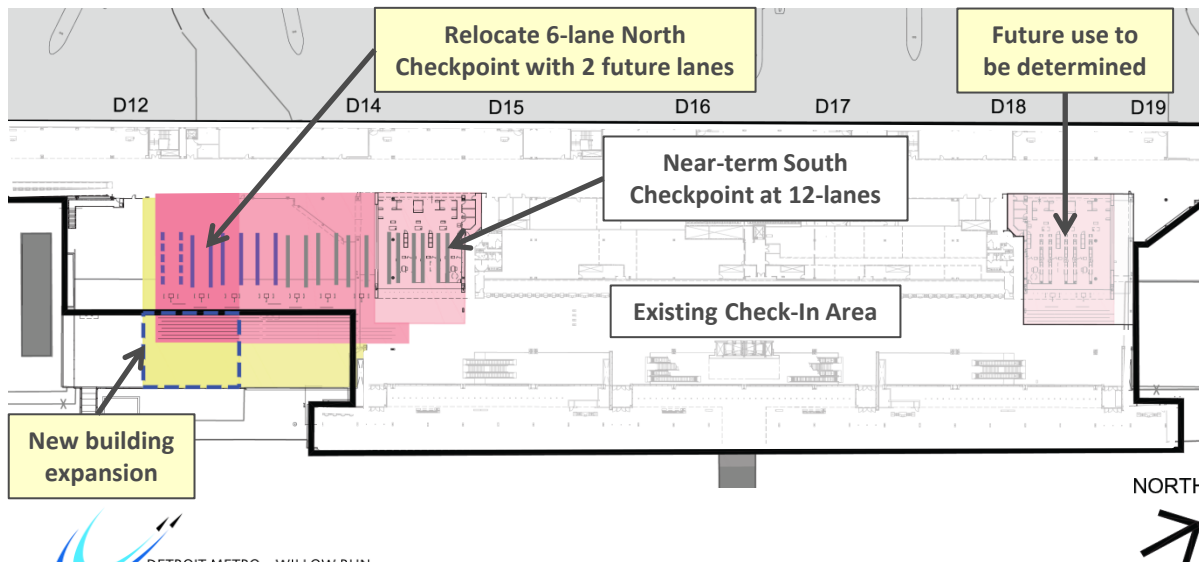
Expanded Dual Checkpoint (Near-term)

Estimate: \$15M



Consolidated Checkpoint (Long-term)

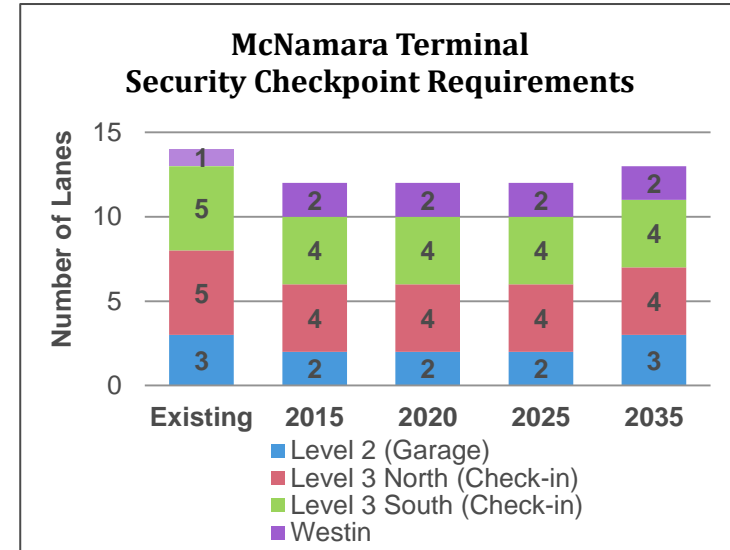
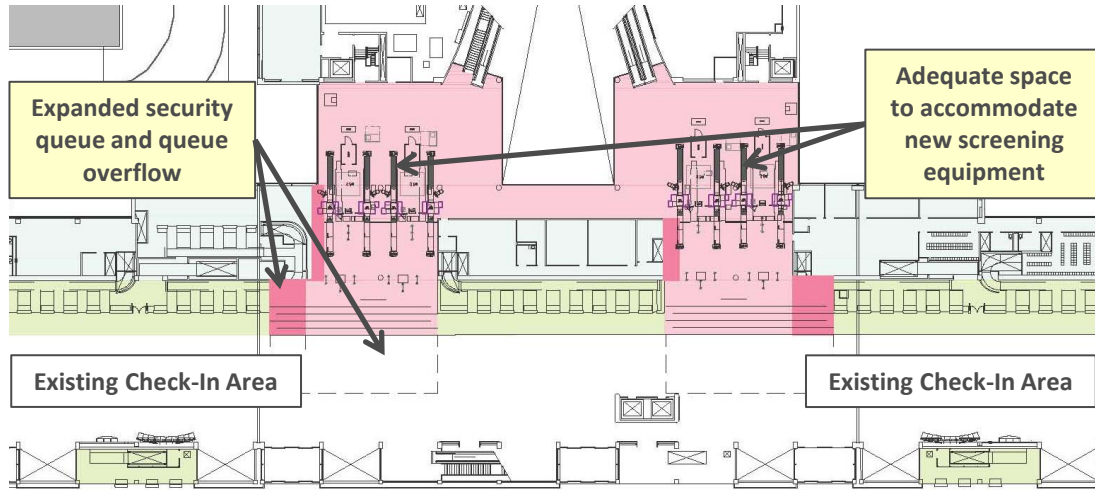
Estimate: \$12M+



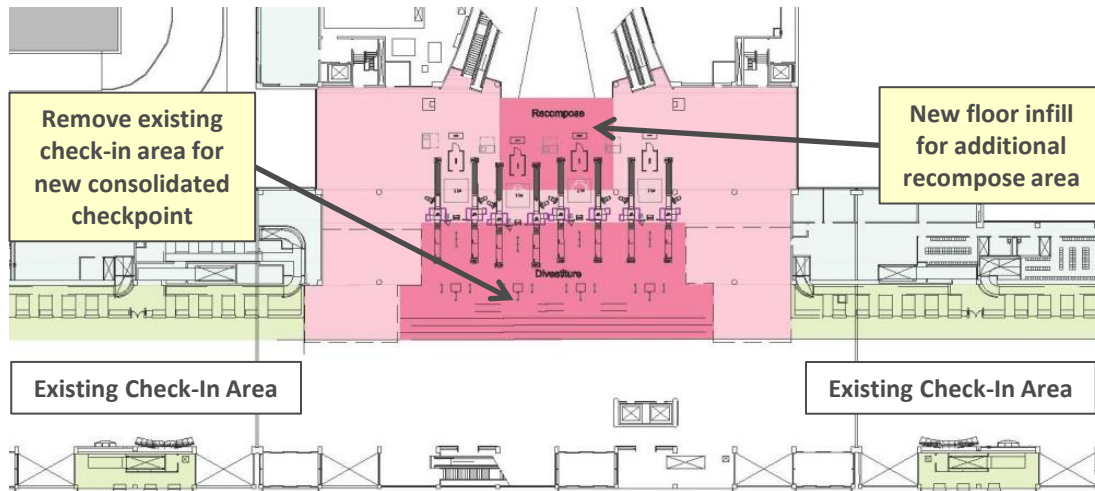
- **Near-term (0-5 years): 2 additional lanes required** at both north and south banks
- **Beyond 2035:** 1) consolidate checkpoint operations and expand south, or 2) expand south end of dual checkpoint option

Level 3 - McNamara Terminal Security Screening Options

Expanded Dual Checkpoint (Near-term) Estimate: \$2.3M



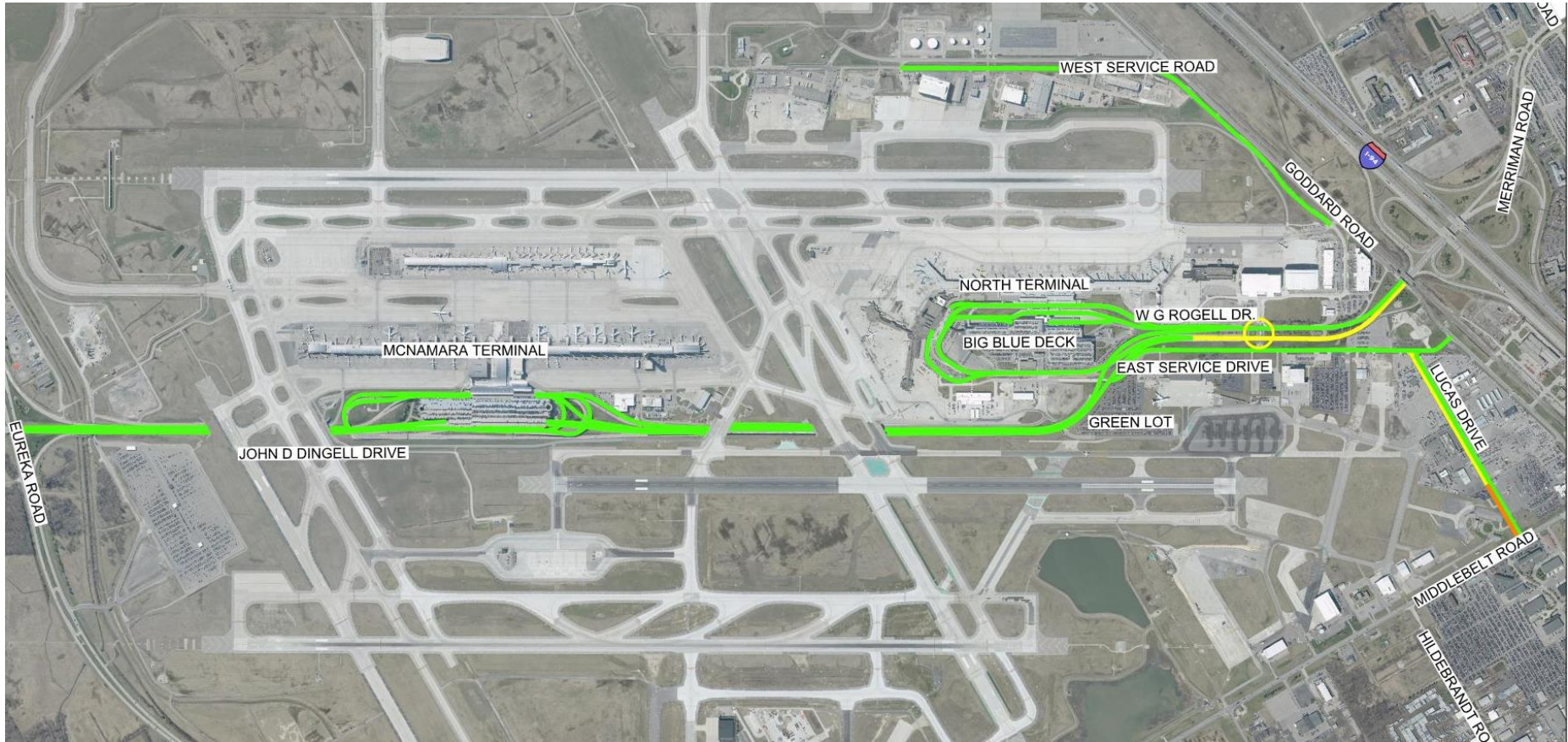
Consolidated Checkpoint (Long-term) Estimate: \$4.2M



- **Near-term (0-5 years):** More spaces required for longer and wider screening equipment, passenger queue, and new TSA Automated Screening Lane (ASL) technology
- **Beyond 2035:** Consolidate checkpoint for more efficient screening operation and future expansion

***Preferred Alternatives:
Ground Transportation Facilities***

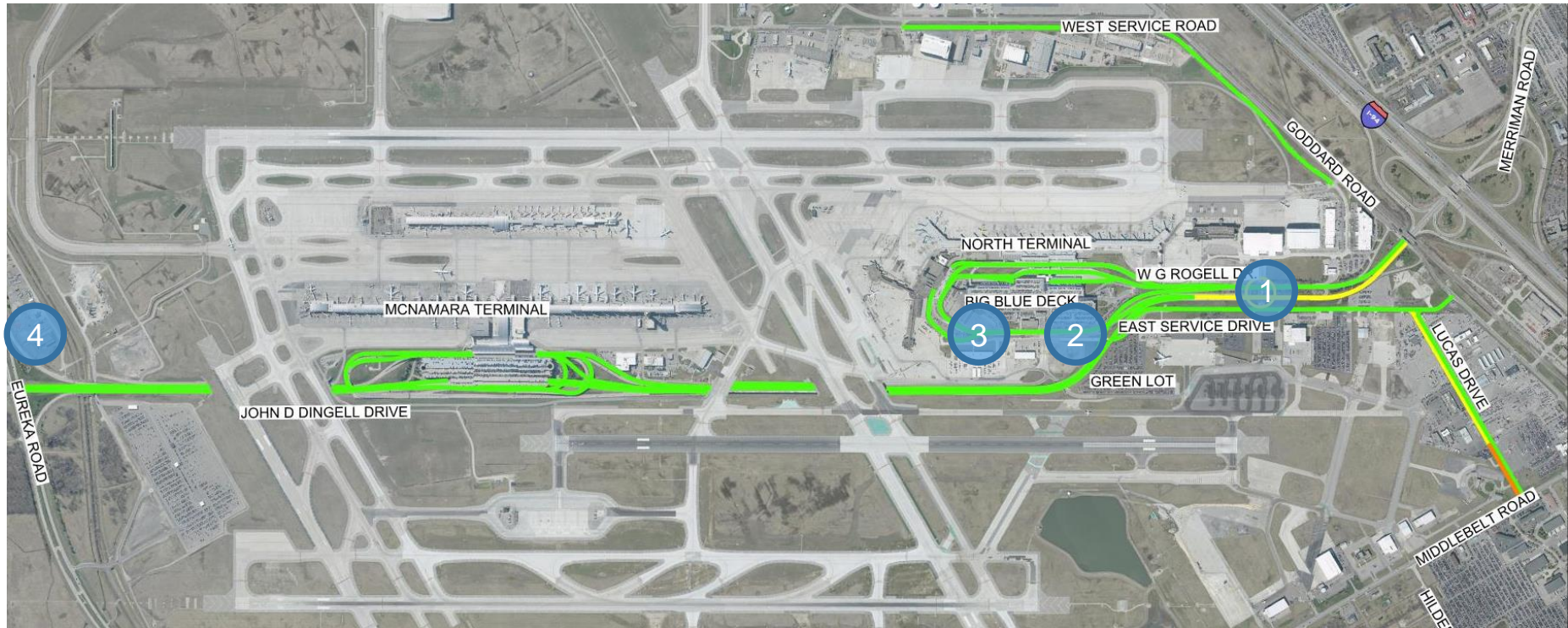
Roadway Traffic Model Drives Key Decisions



Roadway Simulation Modeling Video

Primary Landside Focus Areas

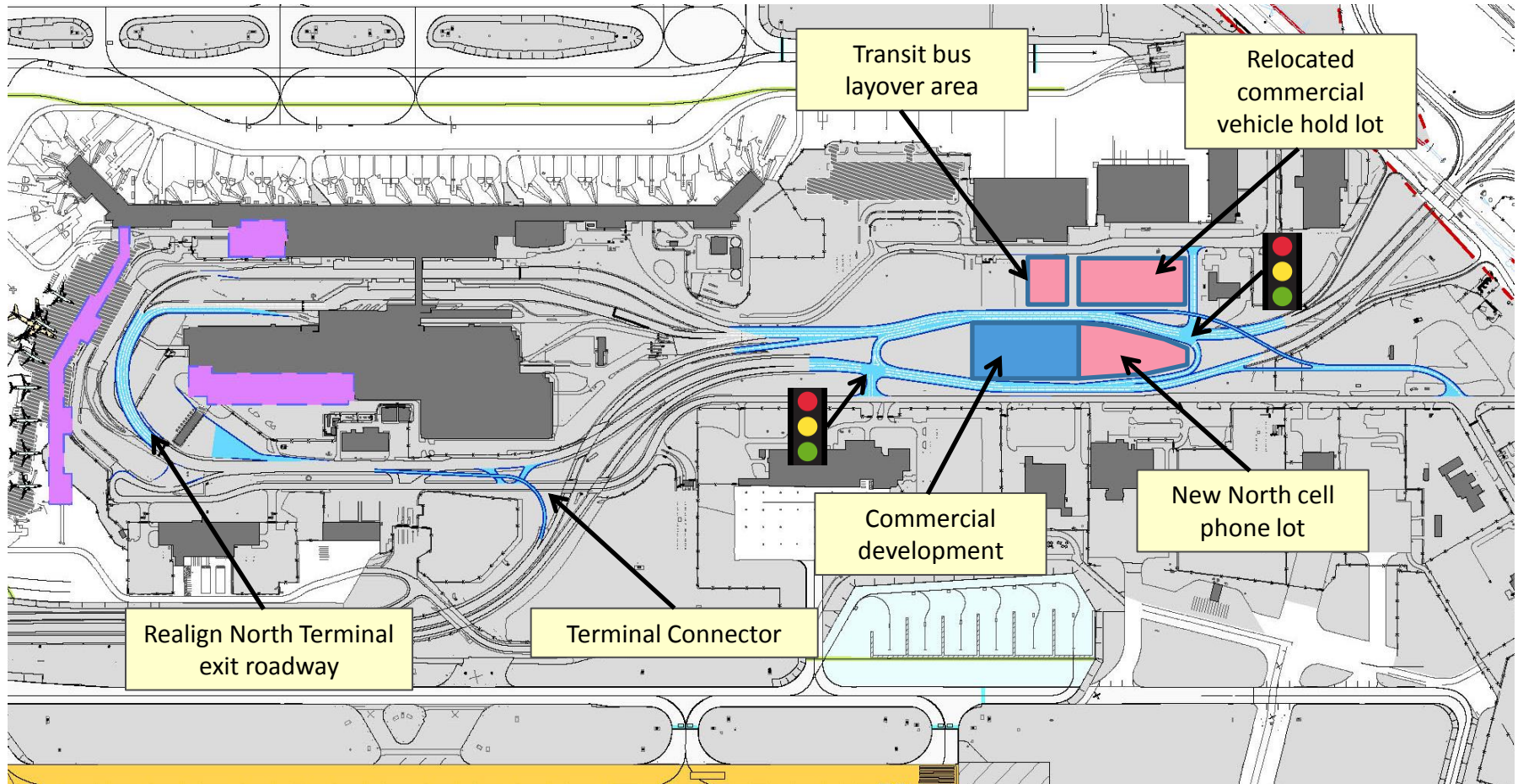
Five Focus Areas Identified for Improvements



1. Rogell Drive Realignment / Return to Terminal
2. Terminal Connector Flyover
3. Big Blue Parking Deck Expansion
4. Remote / Long-Term Parking

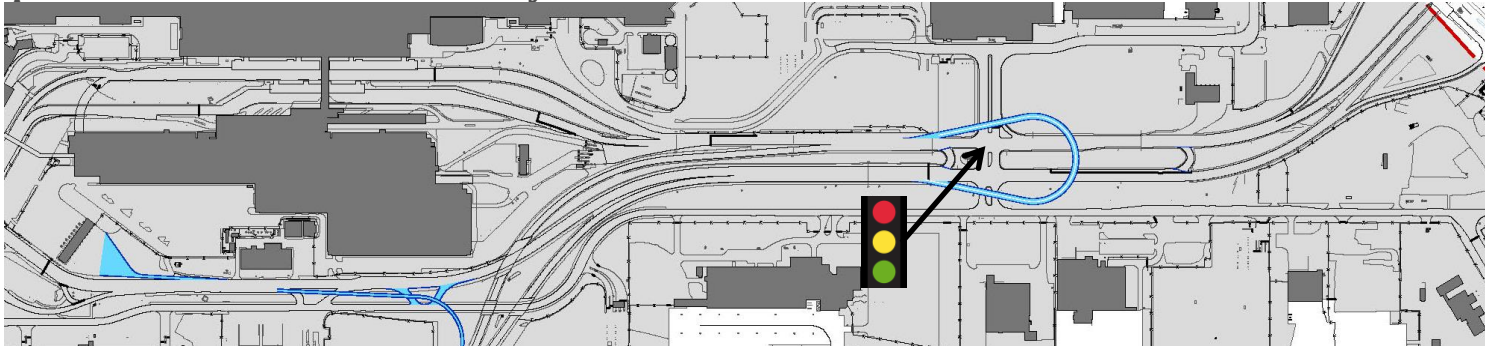
Preferred Rogell Realignment / Return to Terminal

Rogell Drive realignment will eliminate the Rogell-Burton intersection and replace it with two signals - one in the southbound and one in the northbound direction



Rogell Realignment / Return to Terminal Options

Option 1: Return-to-Terminal Flyover



Option 2: Rogell Realignment - Non-signalized

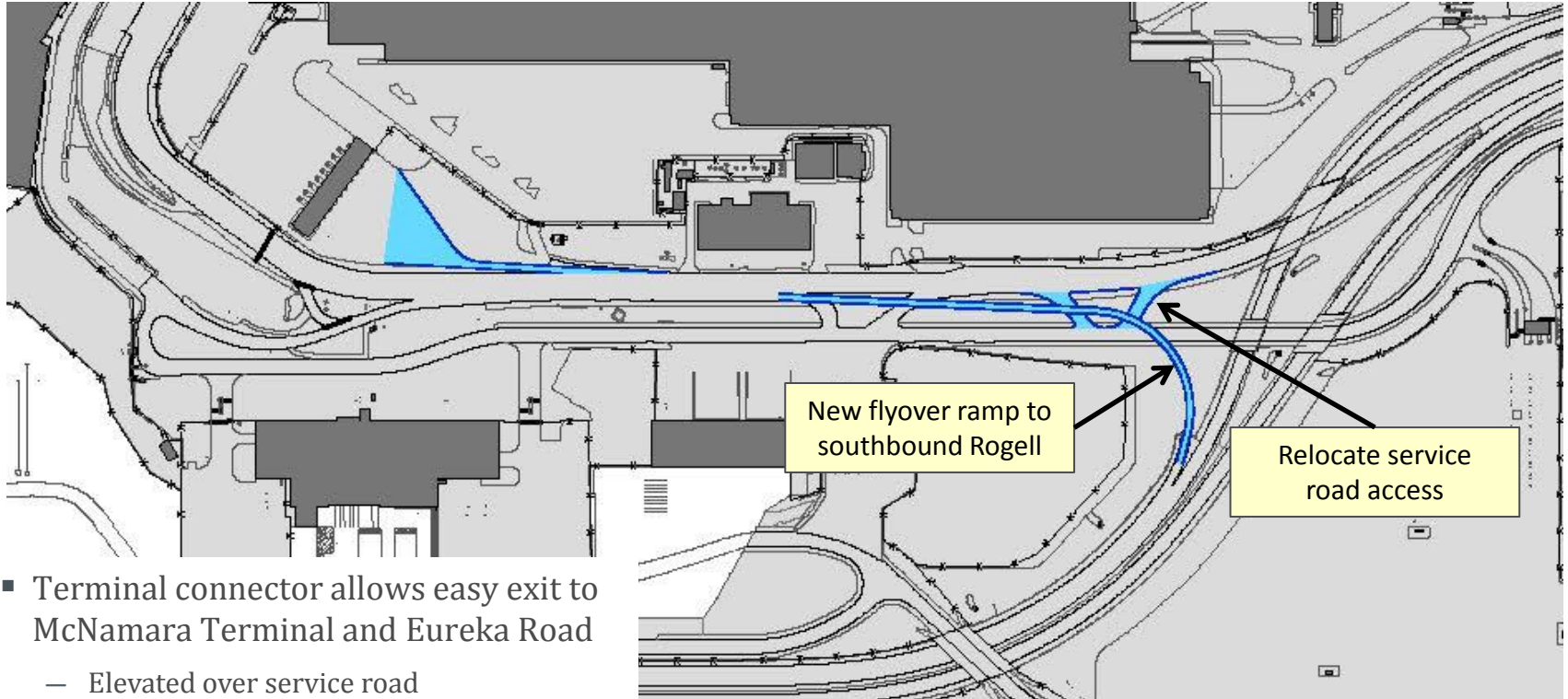


Rogell Realignment / Return to Terminal Evaluation Matrix

	Configuration	ROM Cost	Vehicle movement	Impacts
Preferred Rogell Realignment / Return to Terminal	Provides return-to-North Terminal movement and realignment of Rogell	\$22.8 M	Signals on main roadway but allows direct crossings to service roads and simplified movements	Removal and reconfiguration of Rogell-Burton intersection
Option 1: Return-to-Terminal Flyover	Provides return-to-North terminal movement	\$13.4 M	Does not address Rogell-Burton intersection congestion	No roadway/facility demolition
Option 2: Rogell Realignment – Non-signalized	Provides return-to-North Terminal movement and realignment of Rogell	\$23.8 M	Free flow vehicle movements but no direct crossings to access service roads	Removal and reconfiguration of Rogell-Burton intersection

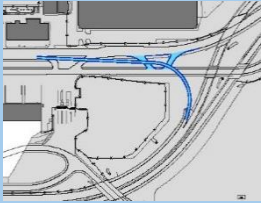
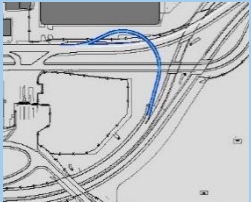
Note: Flyover in Options 2 and 3 accounts for \$4 M

Preferred Terminal Connector Flyover

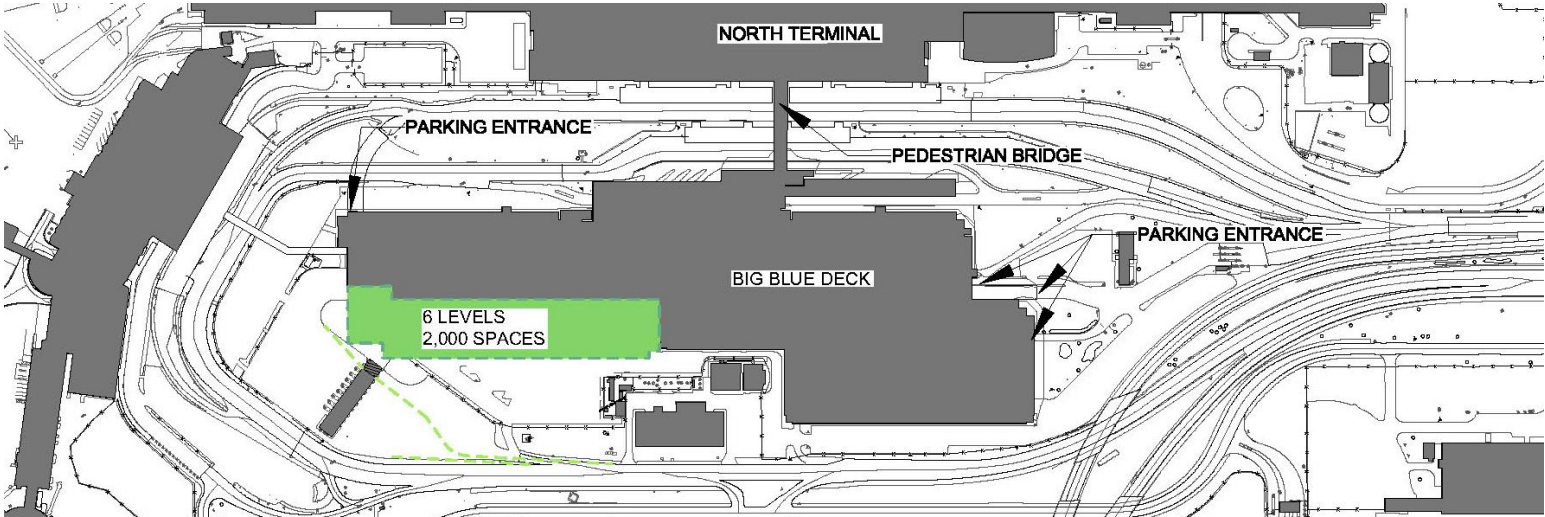


- Terminal connector allows easy exit to McNamara Terminal and Eureka Road
 - Elevated over service road
 - Service road access would be relocated
 - Sufficient length for vehicles movements to reach flyover
- Access to service roadway is relocated but maintained

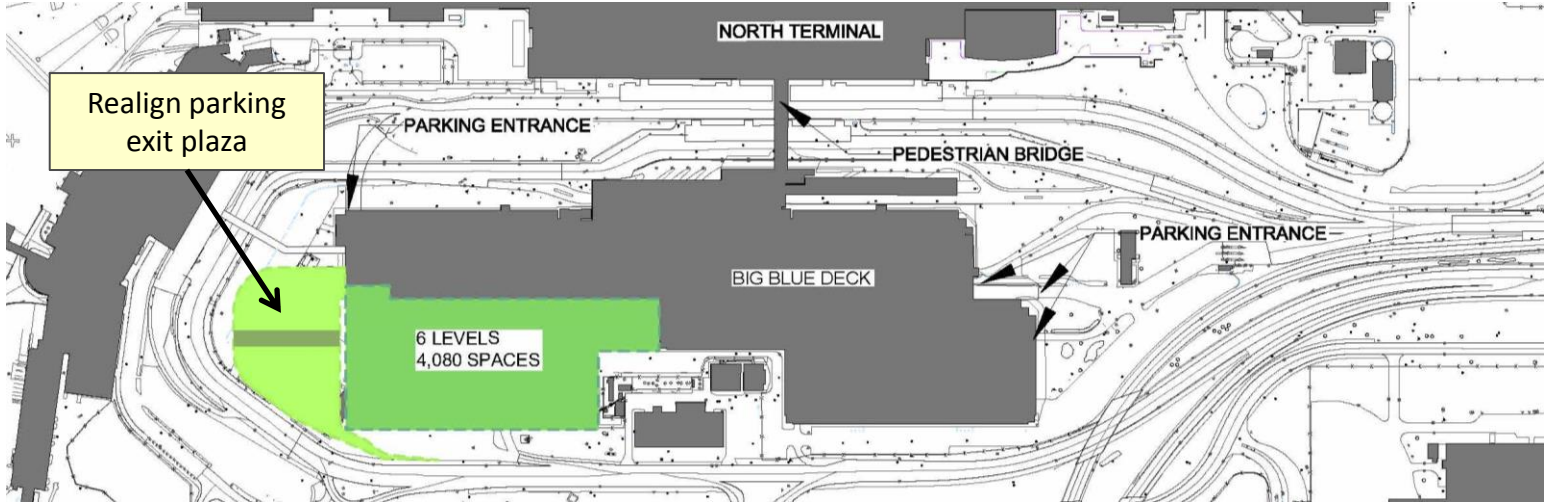
Terminal Connector Flyover Evaluation Matrix

	Configuration	ROM Cost	Vehicle movement	Impacts
Outside Flyover 	Shorter elevated section	\$7.5 M	Sufficient length for vehicles movements	Requires relocation of service road access
Inside Flyover 	Longer elevated section, limited space adjacent to garage	\$10 M* Includes exit plaza reconfiguration	Sufficient length for vehicles movements but all vehicles weave across parking exit	Requires full reconfiguration of parking exit to allow sufficient space for vehicle movements

Initial parking expansion 2,000 spaces

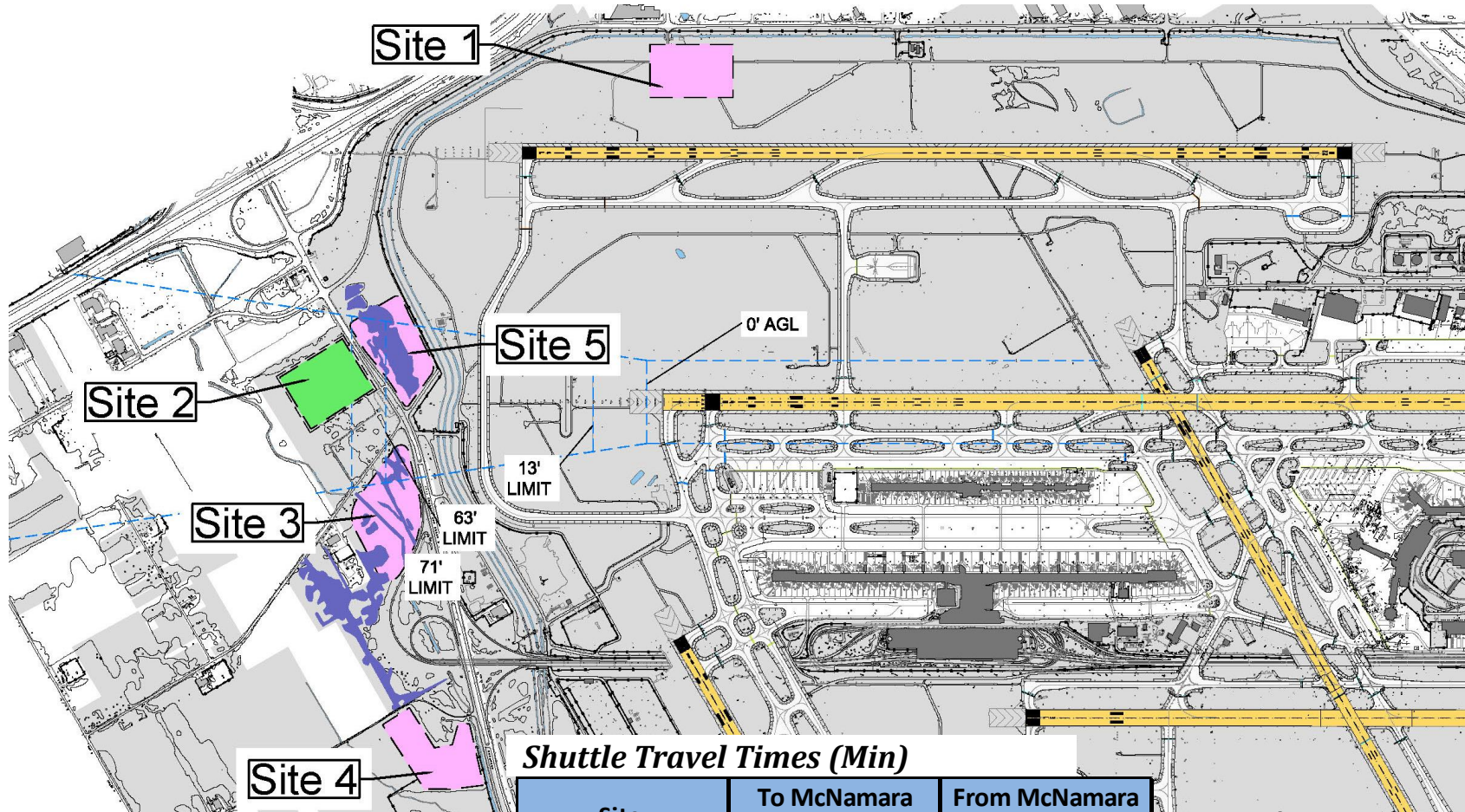


Ultimate parking expansion 4,100 spaces



Rough Order of Magnitude (ROM) Cost Estimate: \$134 M for full garage

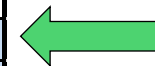
Preferred Remote/ Long-Term Parking



Rough Order of Magnitude (ROM) Cost Estimate: \$13 M for 2,000 spaces

Shuttle Travel Times (Min)

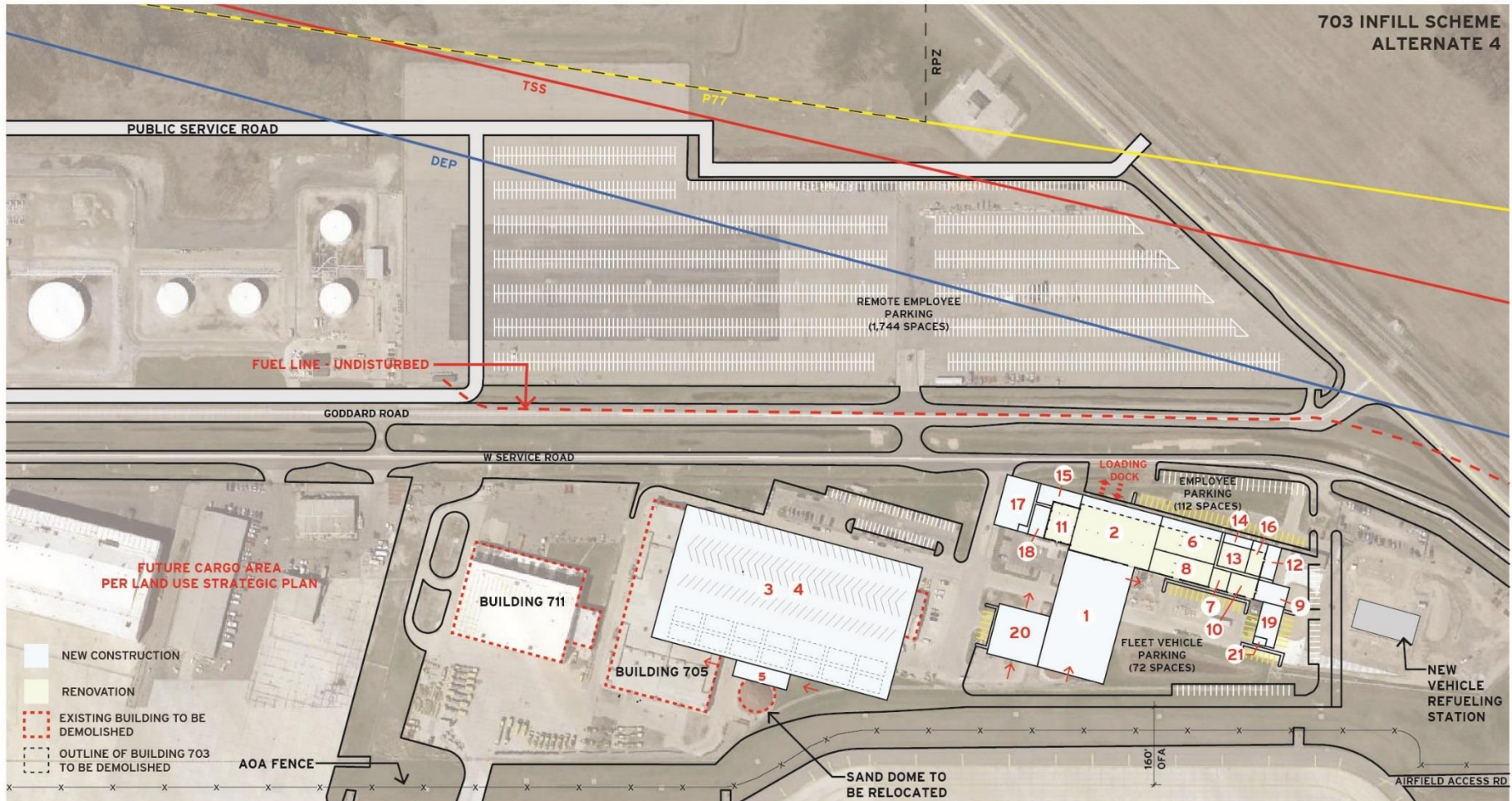
Site	To McNamara Terminal	From McNamara Terminal
1	7:00	6:00
2	5:00	4:00
3	5:00	4:00
4	6:00	4:00
5	6:00	4:00



***Preferred Alternatives:
Airport Maintenance Campus***

Preferred Maintenance Campus Alternative

Rough Order of Magnitude (ROM) Cost Estimate: \$118M

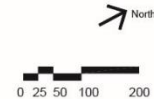


LEGEND

- | | | | |
|----|------------------------------------|----|----------------------------------|
| 1 | FLEET SERVICE MAINTENANCE | 11 | CONFERENCE CENTER |
| 2 | INVENTORY LOGISTICS | 12 | TRAINING/LEARNING |
| 3 | FLEET VEHICLE STORAGE - SHORT TERM | 13 | LOCKERS |
| 4 | FLEET VEHICLE STORAGE - LONG TERM | 14 | EXERCISE FACILITY |
| 5 | VEHICLE WASH BAY | 15 | RESTROOMS |
| 6 | SKILLED TRADES | 16 | BREAKROOM |
| 7 | HVAC SHOP | 17 | ADMINISTRATION OFFICES |
| 8 | ELECTRICAL SHOP | 18 | MEETING ROOMS |
| 9 | SIGN SHOP | 19 | AIRFIELD OPERATIONS |
| 10 | PAINT SHOP | 20 | VAMMAS MAINTENANCE DRIVE THROUGH |
| | | 21 | OBSERVATION ROOM (@ ROOFTOP) |



Source: HNTB

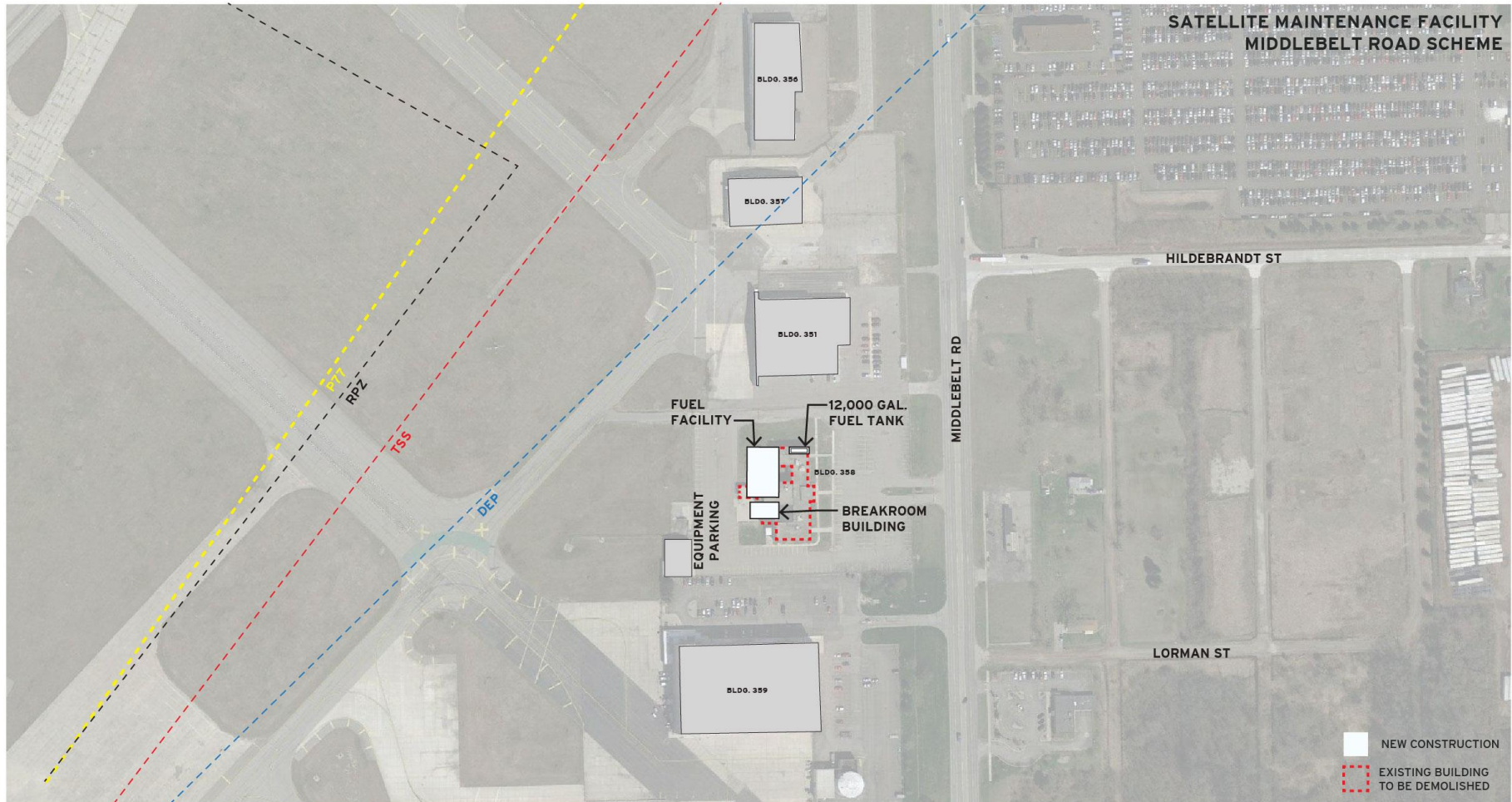


MAINTENANCE FACILITIES
Development Alternative
Airport Master Plan Update - August 2016
Detroit Metropolitan Wayne County Airport



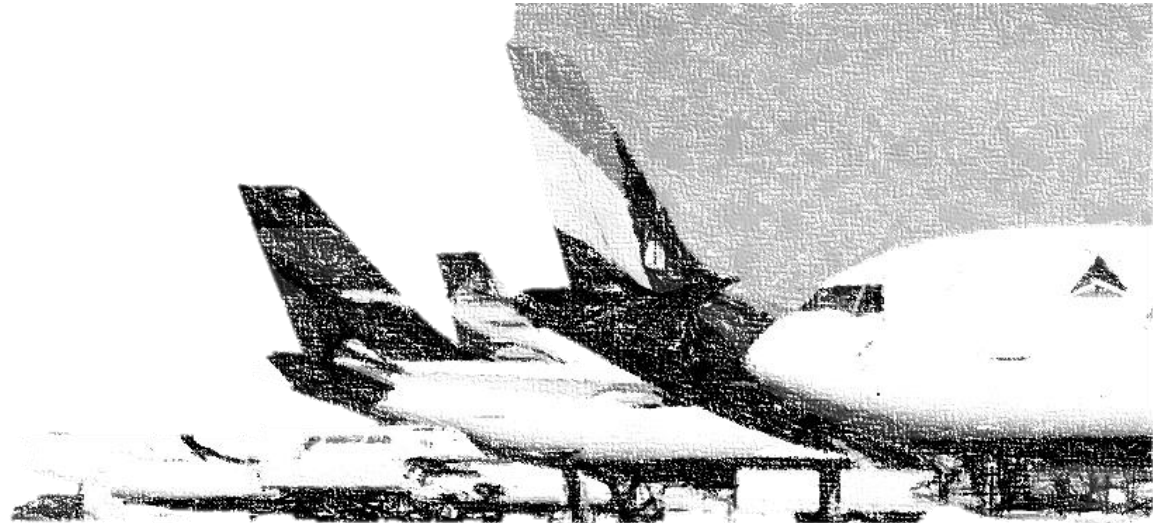
Satellite Maintenance Facility

Rough Order of Magnitude (ROM) Cost Estimate: \$7M

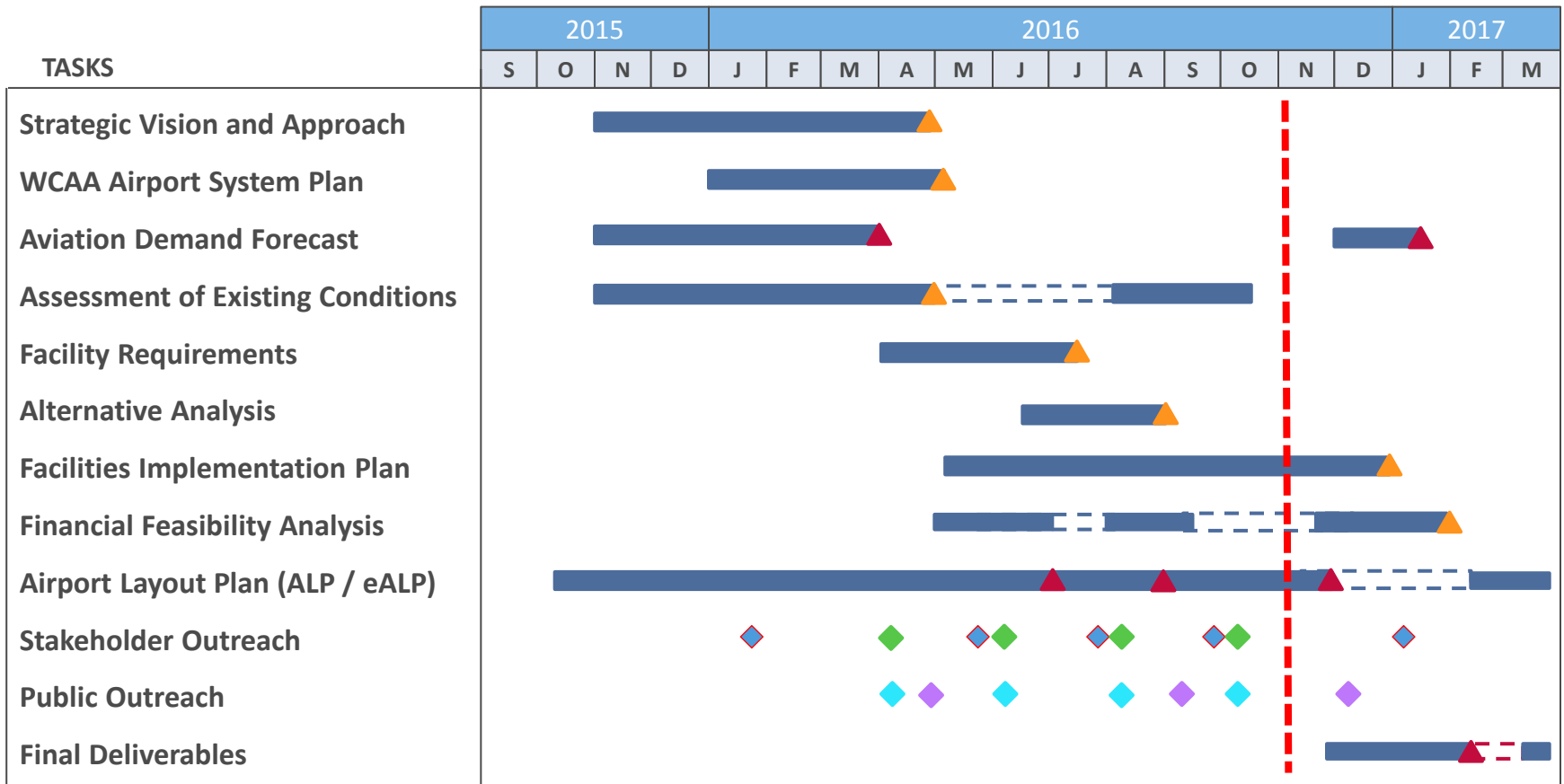


Closing / Summary

1. Finalize preferred alternatives into the Recommended Development Plan (RDP)
2. Financial assessments and development of the Capital Improvement Program (CIP)
3. Submit Future ALP for FAA review mid-December
4. Public Information Workshop 12/6/16



Master Plan Project Schedule



- ◆ Project Steering Committee (PSC) meeting
- ◆ Technical Advisory Committee (TAC) meeting
- ◆ Citizen Advisory Committee (CAC) meeting
- ◆ Public workshop
- ▲ Draft Technical Memorandum
- ▲ FAA review and approval

Note: Not all Scope of Work tasks are depicted; some tasks assumed to occur within the primary tasks shown above.

Committee Meetings and Topics for Discussion

Dates are tentative and subject to change

Target dates	Discussion topics
April 6	<input checked="" type="checkbox"/> Project kick off; Airport Master Plan introduction; project progress and initial findings
June 8	<input checked="" type="checkbox"/> Facilities needed to accommodate future demand; initial alternatives
August 25	<input checked="" type="checkbox"/> Alternatives
November 2	<input checked="" type="checkbox"/> Recommended Development Plan
April 28	<input checked="" type="checkbox"/>
September 8	<input checked="" type="checkbox"/> Public meetings to present master plan findings
December 6	<input checked="" type="checkbox"/>
Subcommittees	<input checked="" type="checkbox"/> Over 20 Airside, Terminal, and Ground Transportation technical subcommittee working meetings completed

Questions and Closing Remarks

