DETROIT METRO ▪ WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

Technical Advisory Committee: Airfield Subcommittee

Detroit Metropolitan Wayne County Airport Master Plan Update

Meeting #2: Issues and Facility Requirements

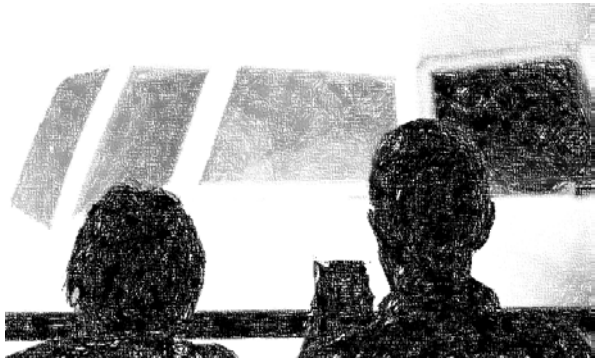
June 7, 2016

Leigh | Fisher HNTB

Introduction

Today's agenda and discussion topics

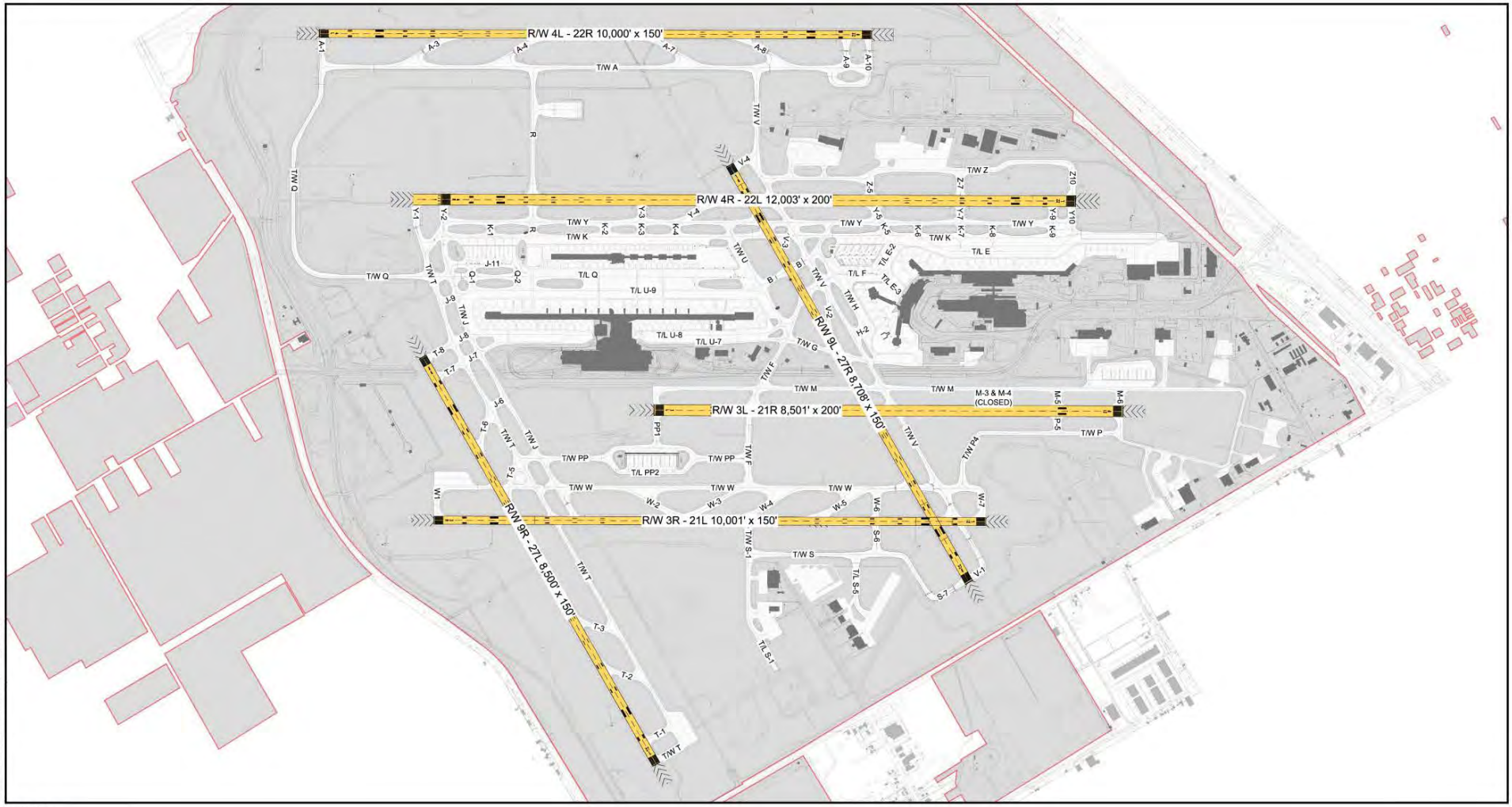
1. Introductions
2. Deviation from FAA Design Standards
3. Hot Spots and Runway Incursion Mitigation (RIM)
4. Deicing Pads
5. Remain Over Night (RON) Pads and Runway Sequencing Pads (Penalty Boxes)
6. Runway 3L-21R Conceptual Design
7. Potential Taxiway Improvements
8. Action Items



Subcommittee Role and Expectations

- Provide input and guidance on technical analyses
- Review and comment on technical work products
- Provide ideas for consideration in the Master Plan

Airfield Configuration: Existing Conditions



LEGEND

- RUNWAY PAVEMENT
- TAXIWAY / APRON PAVEMENT
- OTHER PAVEMENT IN USE
- BUILDING - EXISTING - On Airport
- BUILDING - EXISTING - Off Airport
- FENCE
- AIRPORT PROPERTY LINE
- R/W RUNWAY
- T/W TAXIWAY
- T/L TAXILANE

Source: HNTB

Figure 2-1
DTW AIRFIELD CONFIGURATION

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

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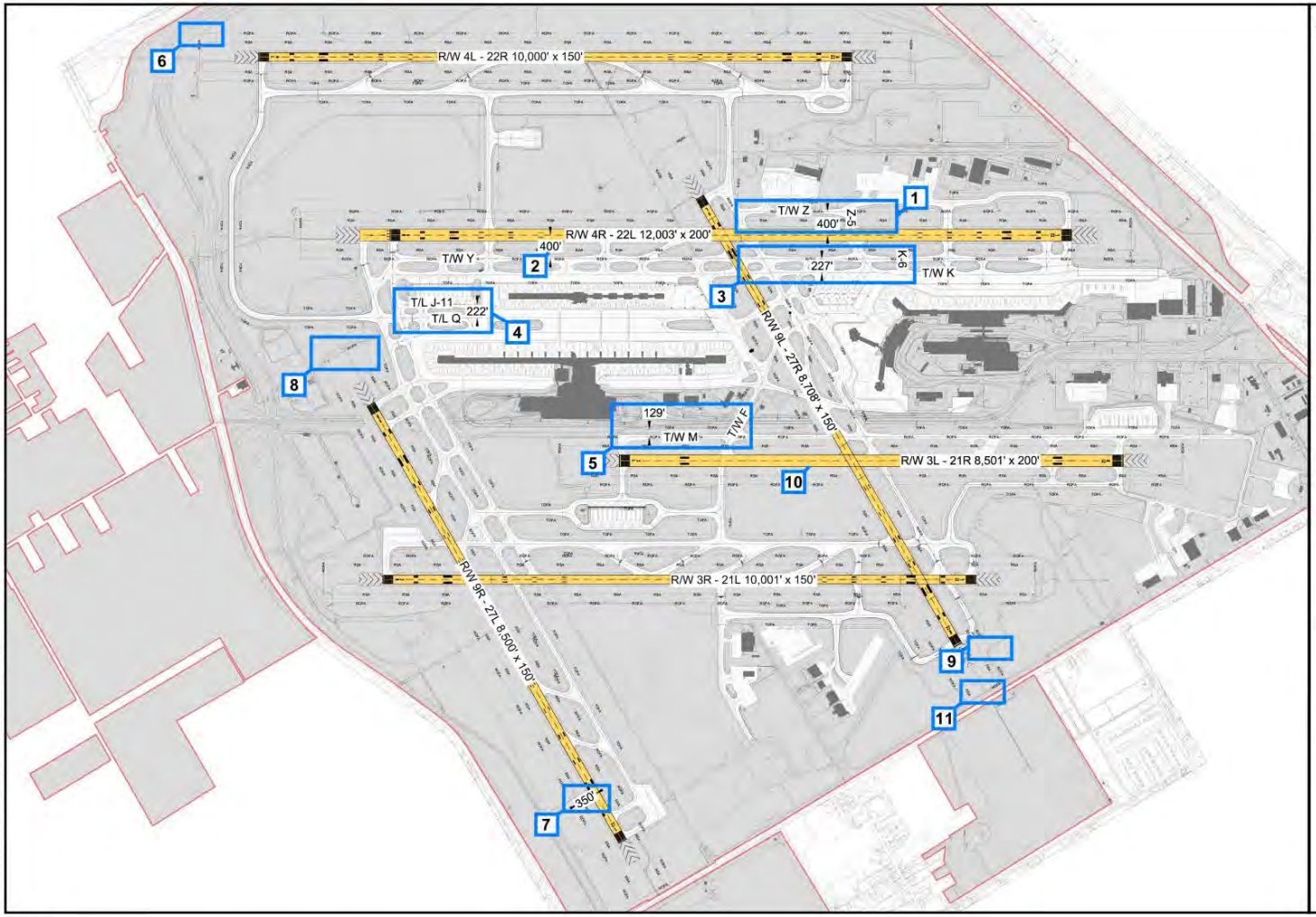
Deviation from FAA Design Standards

Airfield Geometry/Standards Issues



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
- FENCE
- R/W RUNWAY
- T/W TAXIWAY
- GEOMETRY DEVIATION FROM DESIGN STANDARD
- AIRPORT PROPERTY LINE

North

0 900' 1800' 3600'

Source: HNTB ANALYSIS

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

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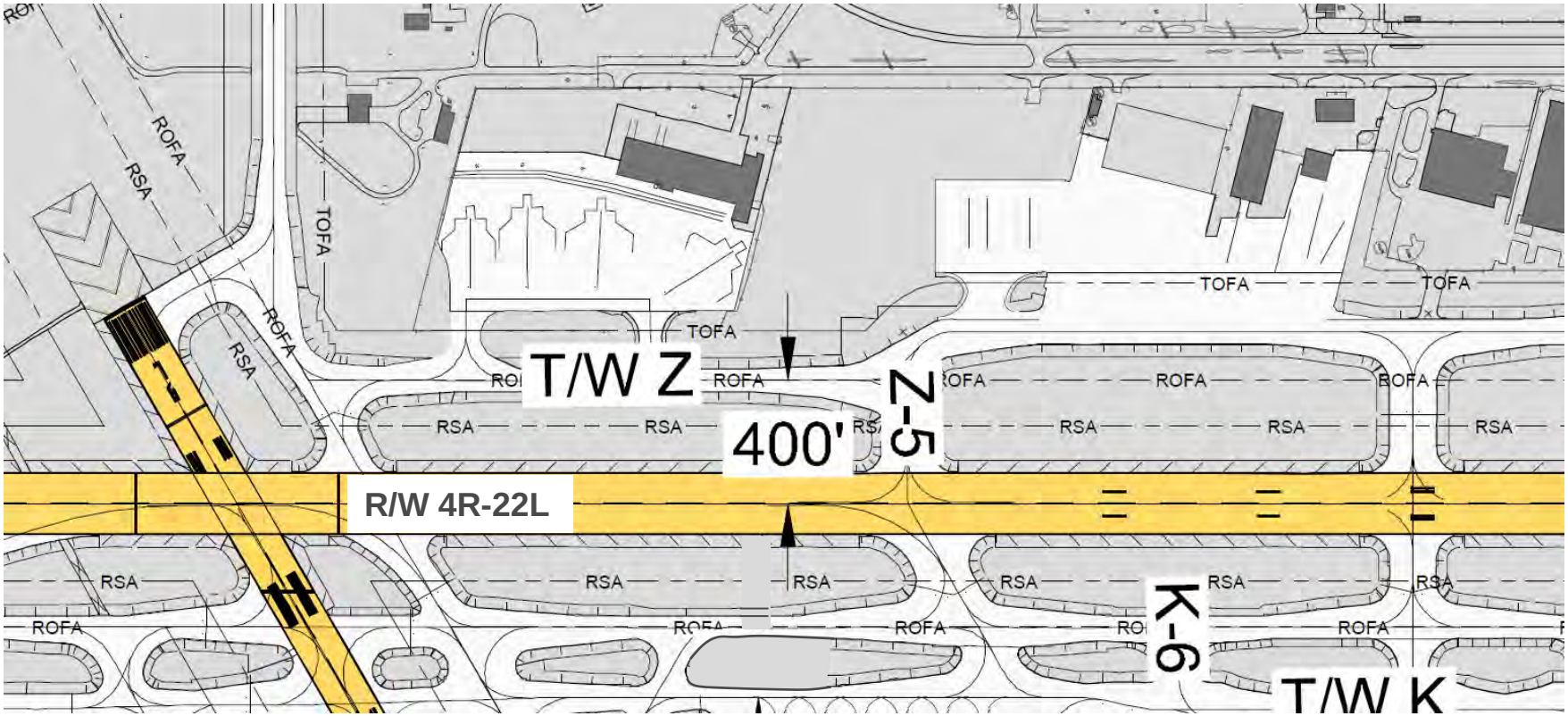
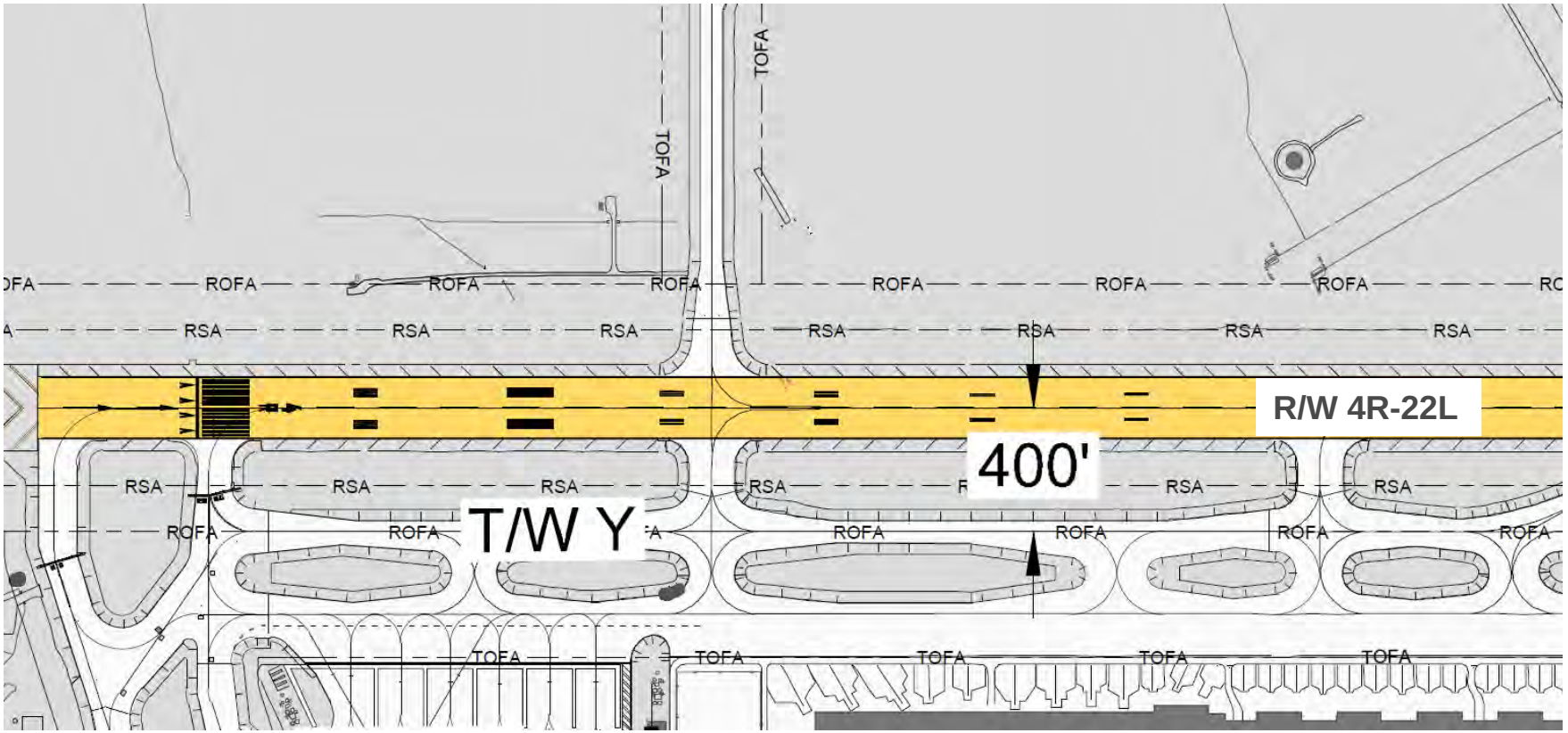
Airfield Geometry/Standards - Area 1



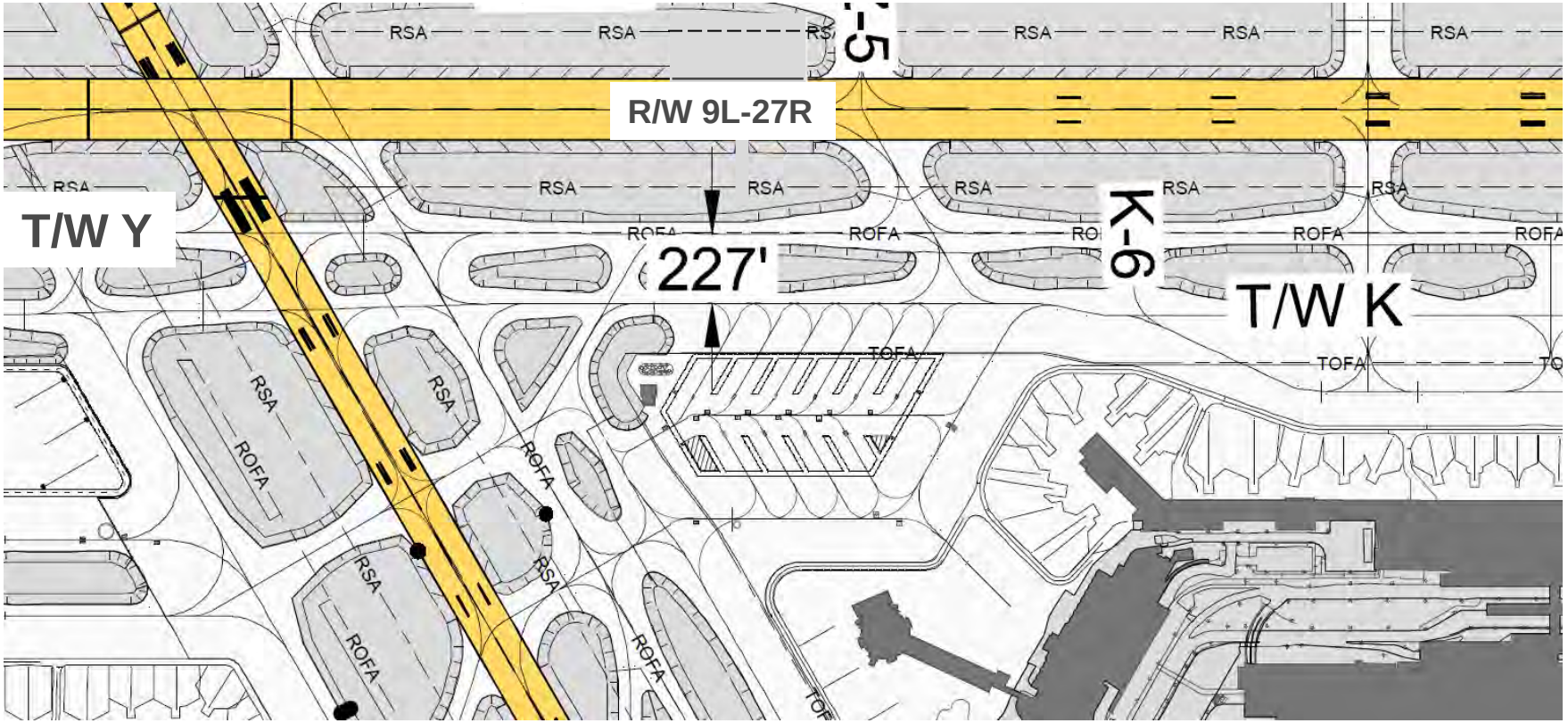
Runway 4R-22L centerline to parallel Taxiway Z centerline is separated by 400’ south of Taxiway Z-5. This does not meet standards (500’) when weather conditions fall below CAT I conditions.

Airfield Geometry/Standards - Area 2



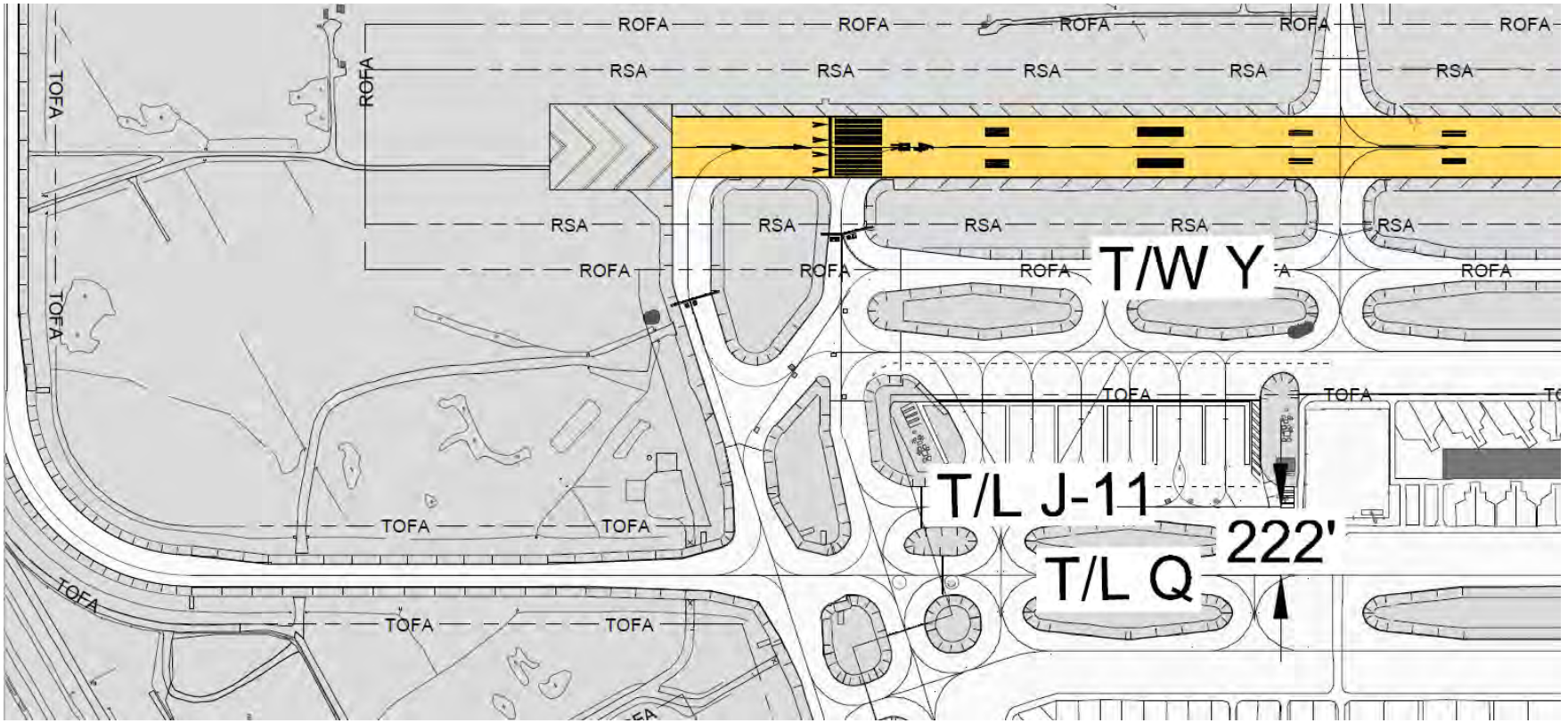
Runway 4R-22L centerline to parallel Taxiway Y centerline is separated by 400'. This does not meet standards (500') when weather conditions fall below CAT I conditions.

Airfield Geometry/Standards – Area 3



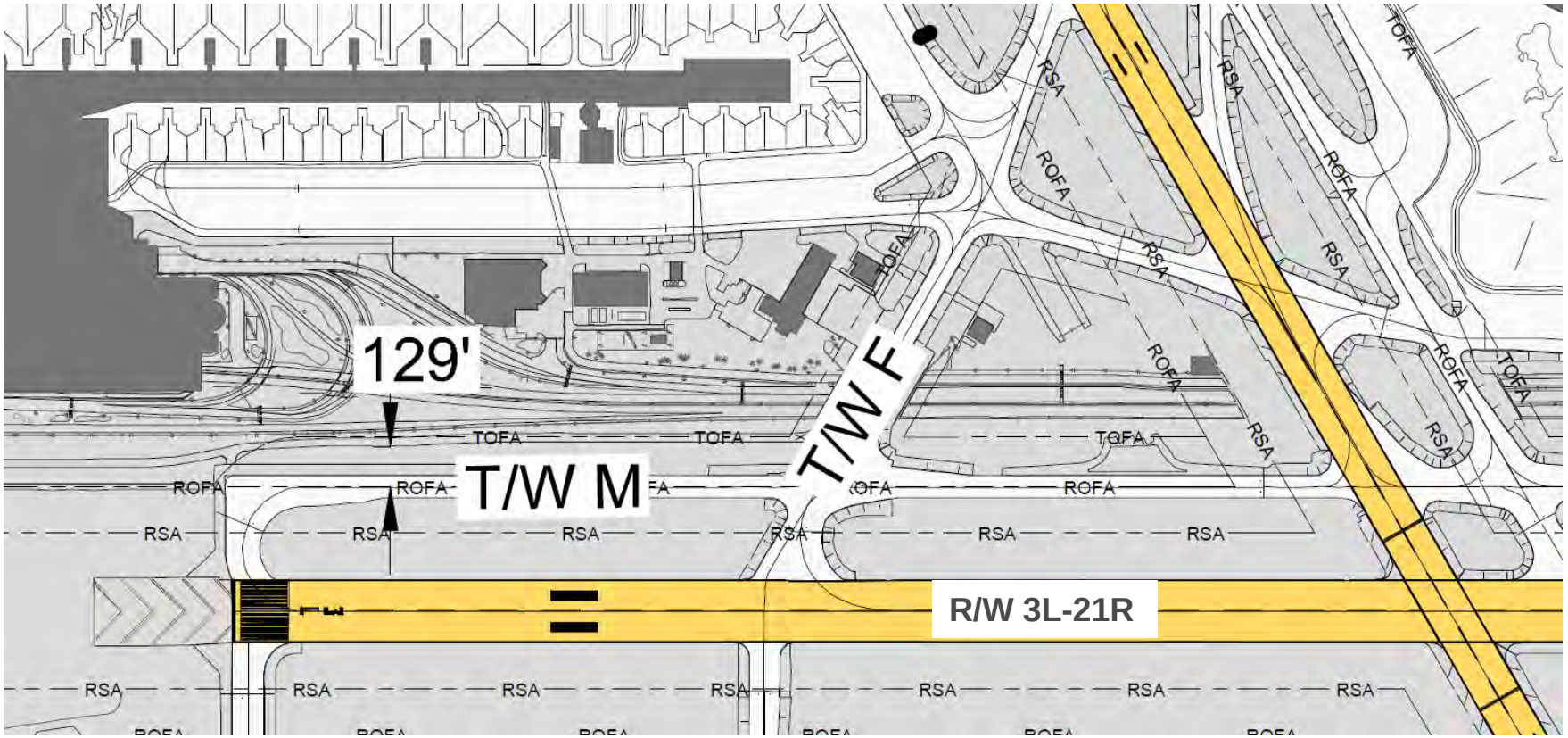
Taxiway Y centerline to Taxiway K centerline between Runway 9L-27R and Taxiway K-6 is separated by 227'. This does not meet ADG-V taxiway to taxiway separation standards of 267'.

Airfield Geometry/Standards – Area 4



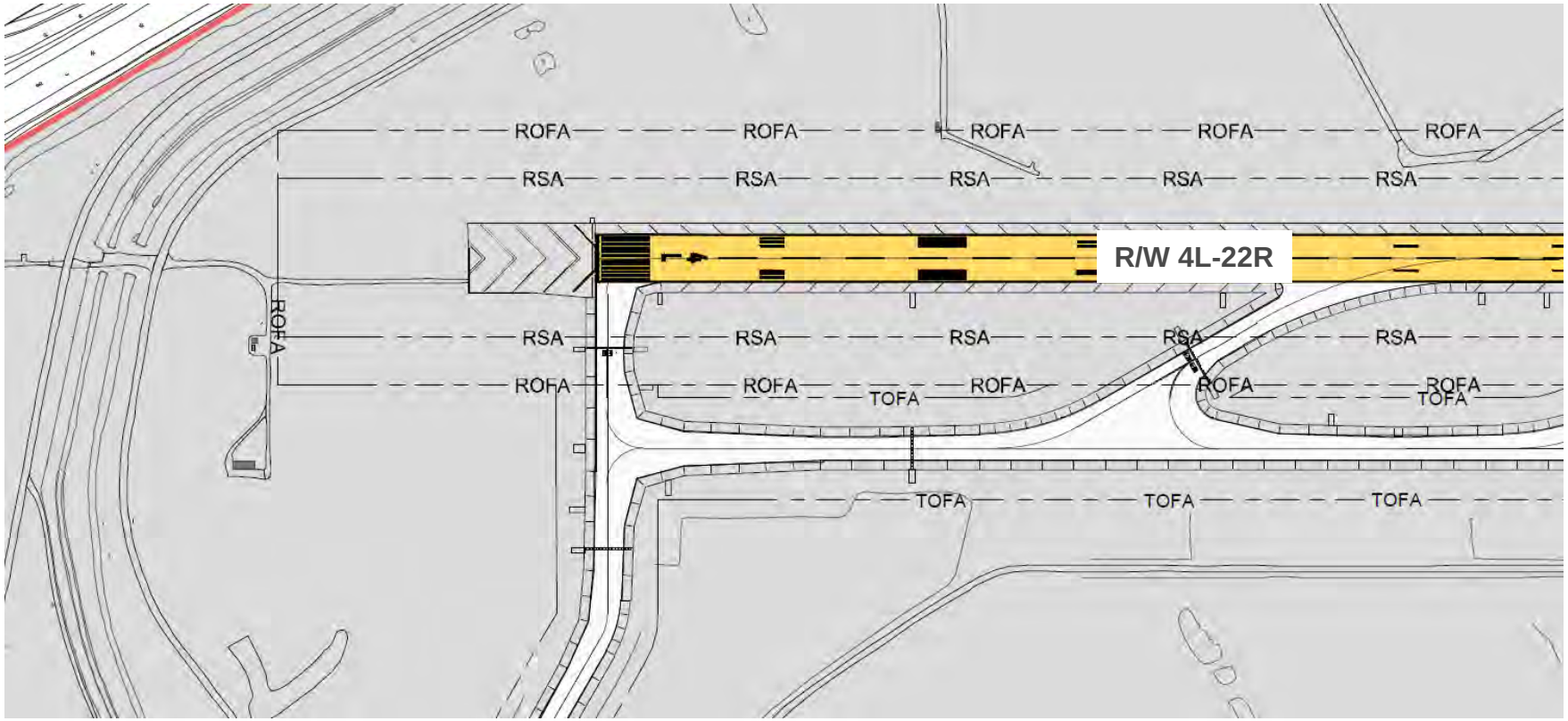
Taxilane J-11 centerline to Taxilane Q centerline is separated by 222'. This does not meet the required taxilane to taxilane separation standards of 245'.

Airfield Geometry/Standards – Area 5



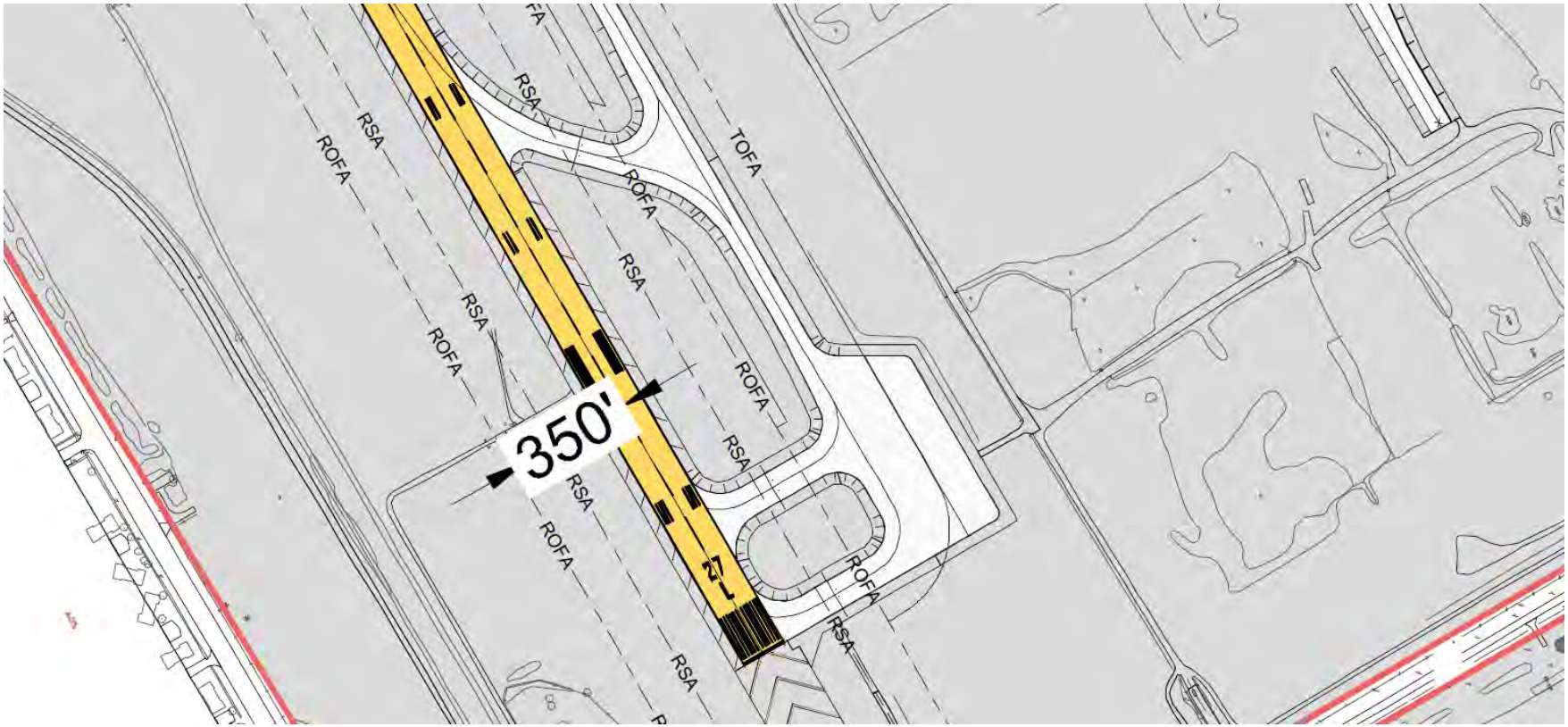
VSR penetrates Taxiway M TOFA south of Taxiway F, by as much as 31’.

Airfield Geometry/Standards – Area 6



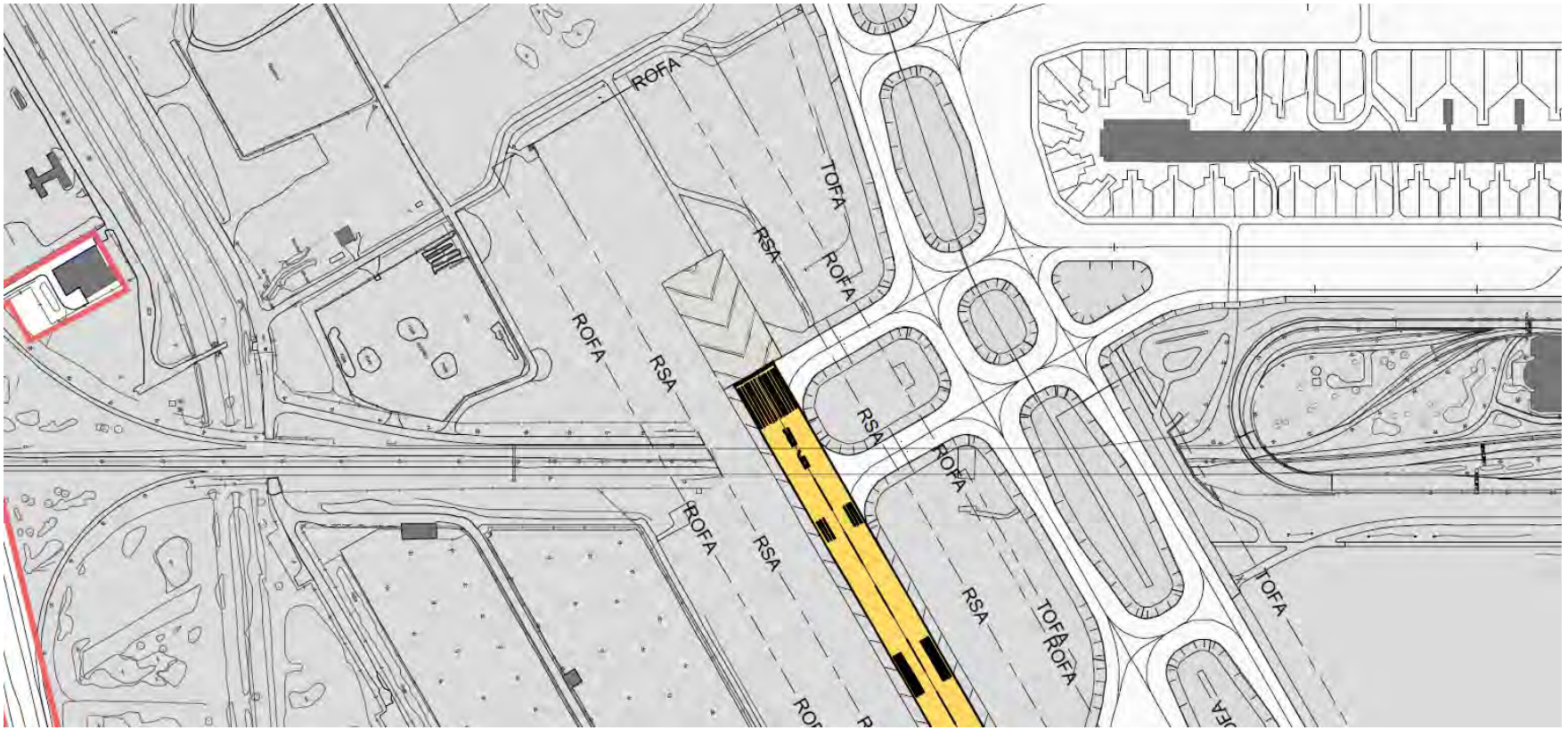
VSR penetrates Runway 22R ROFA beyond the stop end of the runway by 12', reducing the available ROFA to 988'.

Airfield Geometry/Standards – Area 7



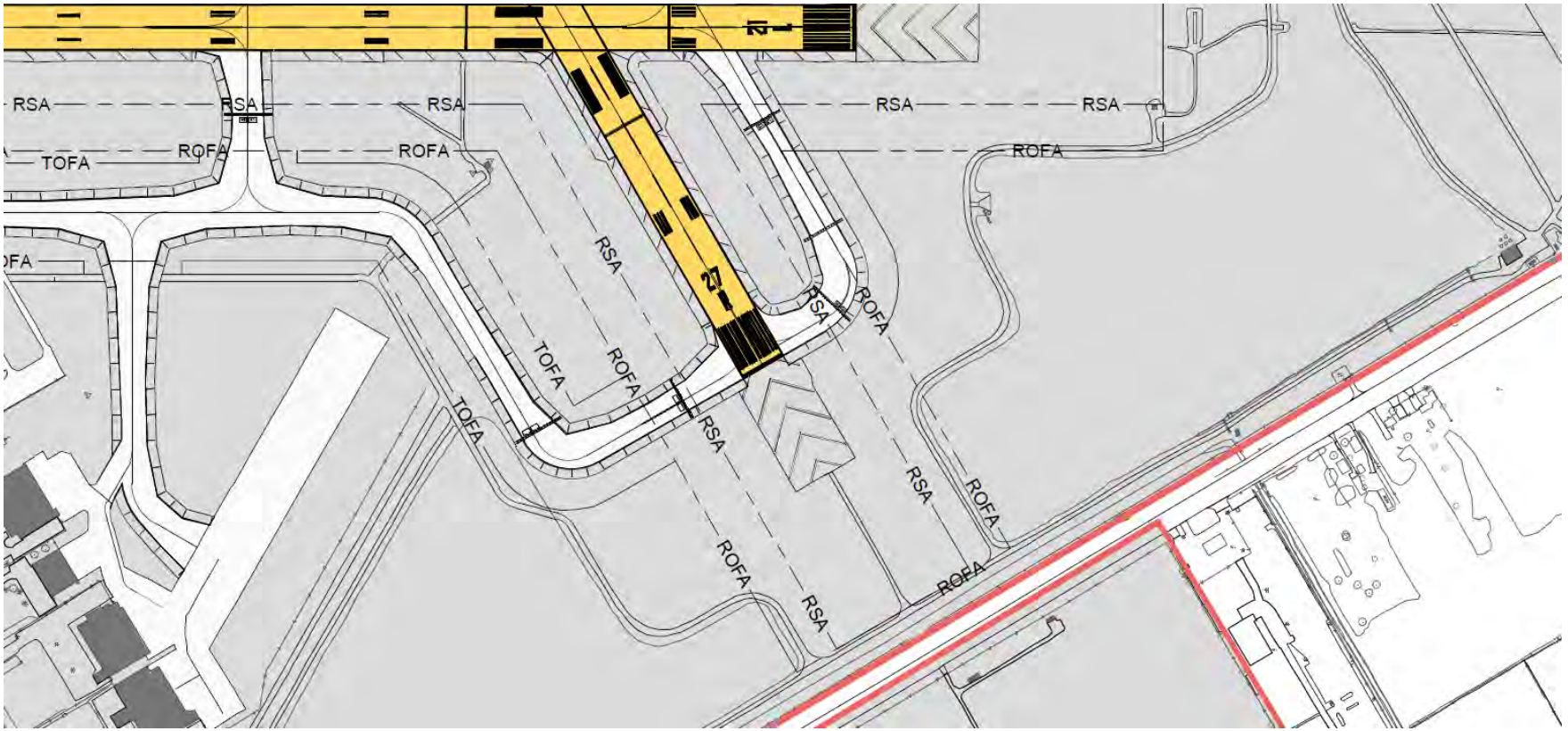
Runway 9R-27L centerline to the Runway 27L glideslope antenna is separated by 350’ (should be outside ROFA, 400’ in this case).

Airfield Geometry/Standards – Area 8



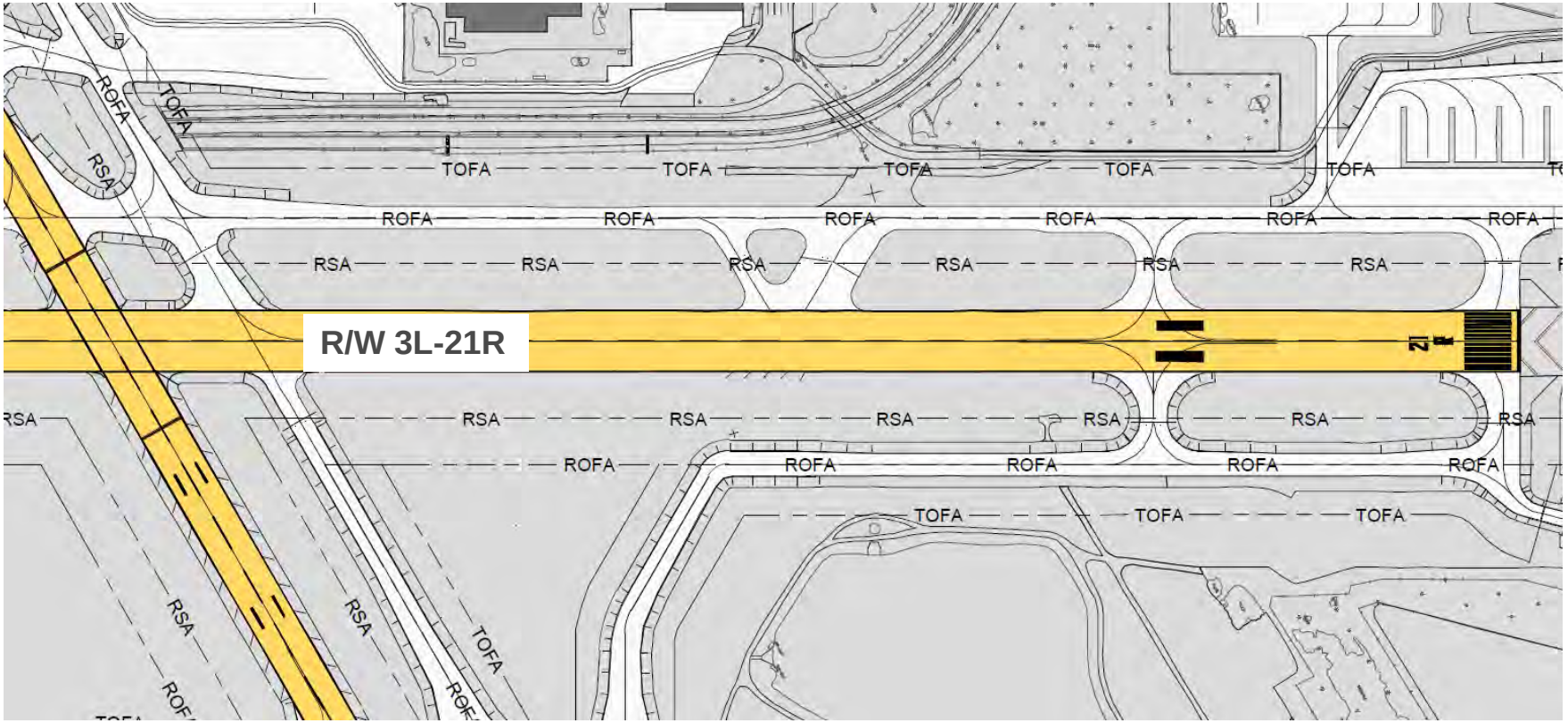
VSR penetrates Runway 27L ROFA beyond the stop end of the runway by 74', reducing the available ROFA to 926'.

Airfield Geometry/Standards – Area 9



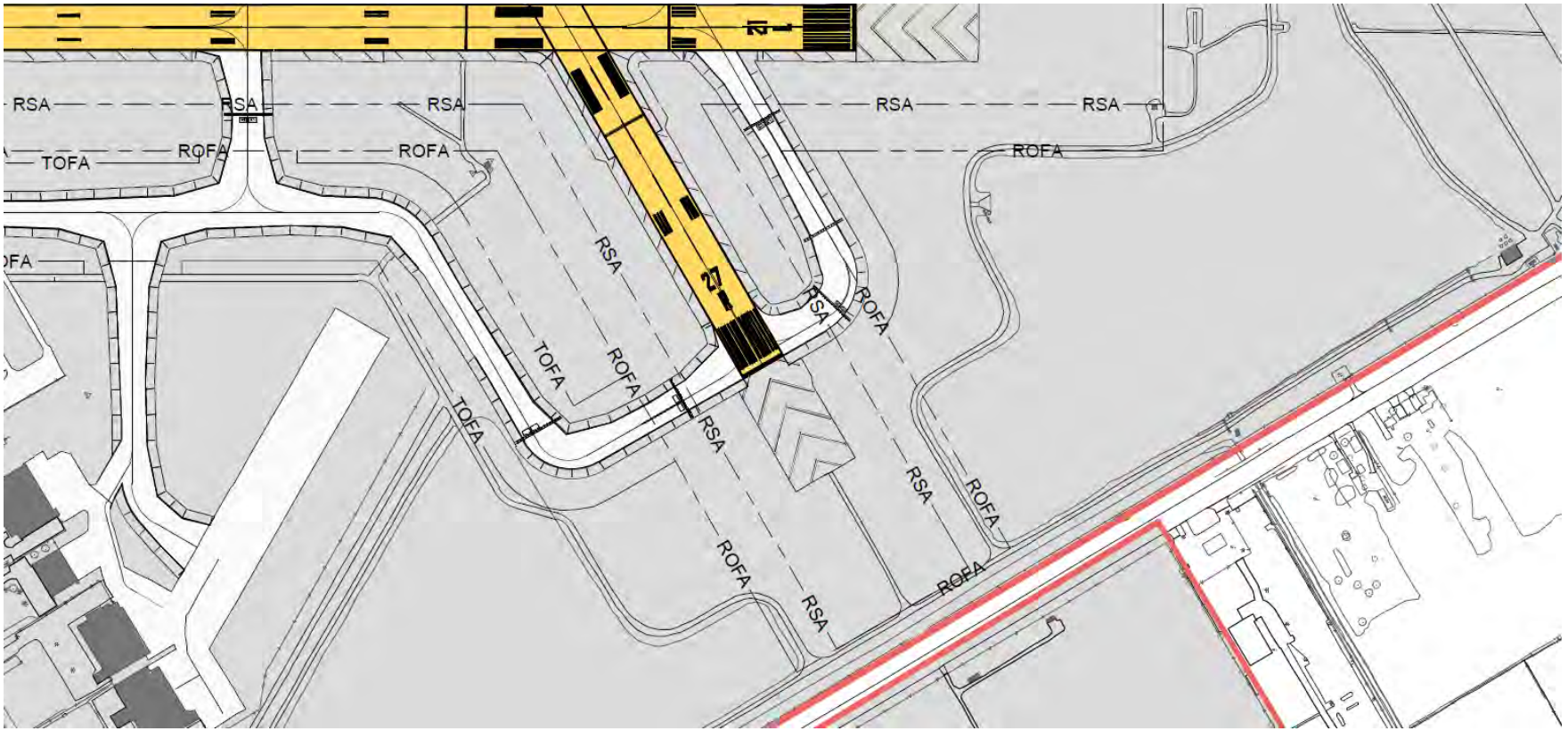
VSR penetrates Runway 9L ROFA beyond the stop end of the runway by 608', reducing the available ROFA to 392'.

Airfield Geometry/Standards - Area 10



Runway 3L-21R does not currently have 35’ wide paved shoulders.

Airfield Geometry/Standards – Area 11

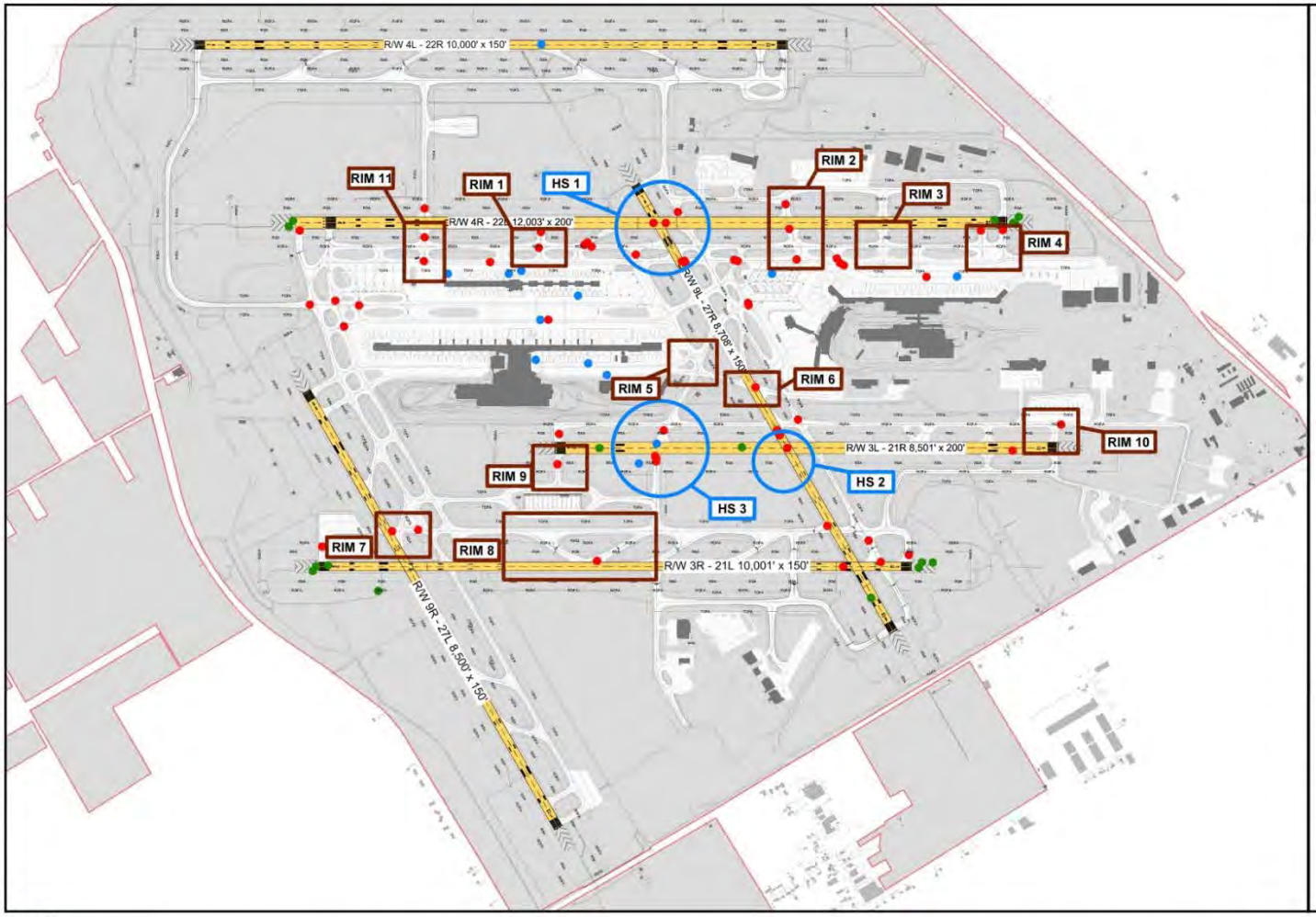


RSA beyond the stop end of Runway 9L is limited by 90’. Declared distances are currently applied to the runway to mitigate this non-standard condition.

Hot Spots and Runway Incursion Mitigation (RIM)

Hot Spots and Runway Incursion Mitigation (RIM)

All identified RIM will be reviewed in the evaluation of alternatives



RUNWAY INCURSION MITIGATION (RIM) AREAS DESCRIPTION

RUNWAY INCURSION MITIGATION (RIM):

1. Taxiways K3 and Y3 lead directly from the air carrier apron directly to a runway, which is in conflict with recommended RIM criteria.
2. The Runway 4R-22L crossing at Taxiways Z5, Y5, and K5 is at an acute angle which can limit the visibility of the runway for the crossing aircraft and increases distance and travel time of the runway crossing. Additionally the crossing is within the high-energy middle third portion of the runway. These elements conflict with recommended RIM criteria.
3. Taxiways K7 and Y7 lead directly from the air carrier apron directly to a runway, which is in conflict with recommended RIM criteria.
4. The entrances to Runway 4R-22L at Taxiways Y9 and Y10 create a wide expanse of pavement where signage can potentially be located outside the view angle of a pilot's window. Additionally, these entrances lead directly to and from the air carrier apron. These elements conflict with recommended RIM criteria.
5. The intersection of Taxiways F, G, U, U7, and U8 creates a complex intersection with greater than 3 nodes. Additionally, the Runway 9L-27R crossing at Taxiway F is at an acute angle which can limit the visibility of the crossing aircraft and increases distance and travel time of the runway crossing.
6. The intersection of Taxiways G and V2 with Runway 9L-27R creates a wide expanse of pavement and is a high-energy runway crossing.
7. The intersection of Taxiways W and T5 with Runway 9R-27L is an area with a complex taxiway/runway intersection, wide expanse of pavement, and an acute angle crossing of the runway, which can limit the visibility of the crossing aircraft and increases distance and travel time of the runway crossing.
8. The intersection of Taxiways W2 and W3 with Runway 3R-21L creates a wide expanse of pavement where signage can potentially be located outside the view angle of a pilot's window. Additionally the co-location of the exit taxiways can potentially cause confusing geometry for taxiing pilots in low visibility conditions.
9. Taxiway PP1 leads directly from the de-icing apron to the Runway 3L-21R threshold.
10. Taxiway M6 leads directly from the de-icing apron to the Runway 3L-21R threshold.
11. Taxiway R leads directly from the air carrier apron directly to a runway, which is in conflict with recommended RIM criteria

HOT SPOT (HS):

1. The intersection of Runways 9L-27R and 4R-22L is identified as Hot Spot 1. Aircraft taxiing on Runway 9L-27R should be prepared to hold at the holding position markings on the runway.
2. The intersection of Runways 9L-27R and 3L-21R is identified as Hot Spot 2. Aircraft taxiing on Runway 9L-27R should be prepared to hold at the holding position markings on the runway.
3. The intersection of Taxiway F with Runway 3L-21R is identified as Hot Spot 3. Aircraft taxiing on Taxiway F sometimes enter Runway 3L-21R without clearance.

LEGEND

- RUNWAY PAVEMENT
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- TAXIWAY OBJECT FREE AREA
- FENCE
- R/W RUNWAY
- AIRPORT PROPERTY LINE
- HOT SPOT
- RUNWAY INCURSION MITIGATION
- AVIATION SAFETY REPORTING SYSTEM REPORT NUMBER ACCIDENT/INCIDENT LOCATION MARKING
- AVIATION SAFETY REPORTING SYSTEM REPORT NUMBER ACCIDENT/INCIDENT LOCATION MARKING (DEPARTURE & APPROACH RELATED)
- ACCIDENT & INCIDENT DATA SYSTEM ACCIDENT/INCIDENT LOCATION MARKING

North

0 1800' 3600'

Source: HNTB ANALYSIS, AVIATION SAFETY REPORTING SYSTEM DATABASE, FAA ACCIDENT & INCIDENT DATA SYSTEM (AIDS)

Figure X-X
RUNWAY INCURSION MITIGATION (RIM) AREAS TO ADDRESS
Assessment of Existing Conditions
Airport Master Plan Update
Detroit Metropolitan Wayne County Airport
April 2016

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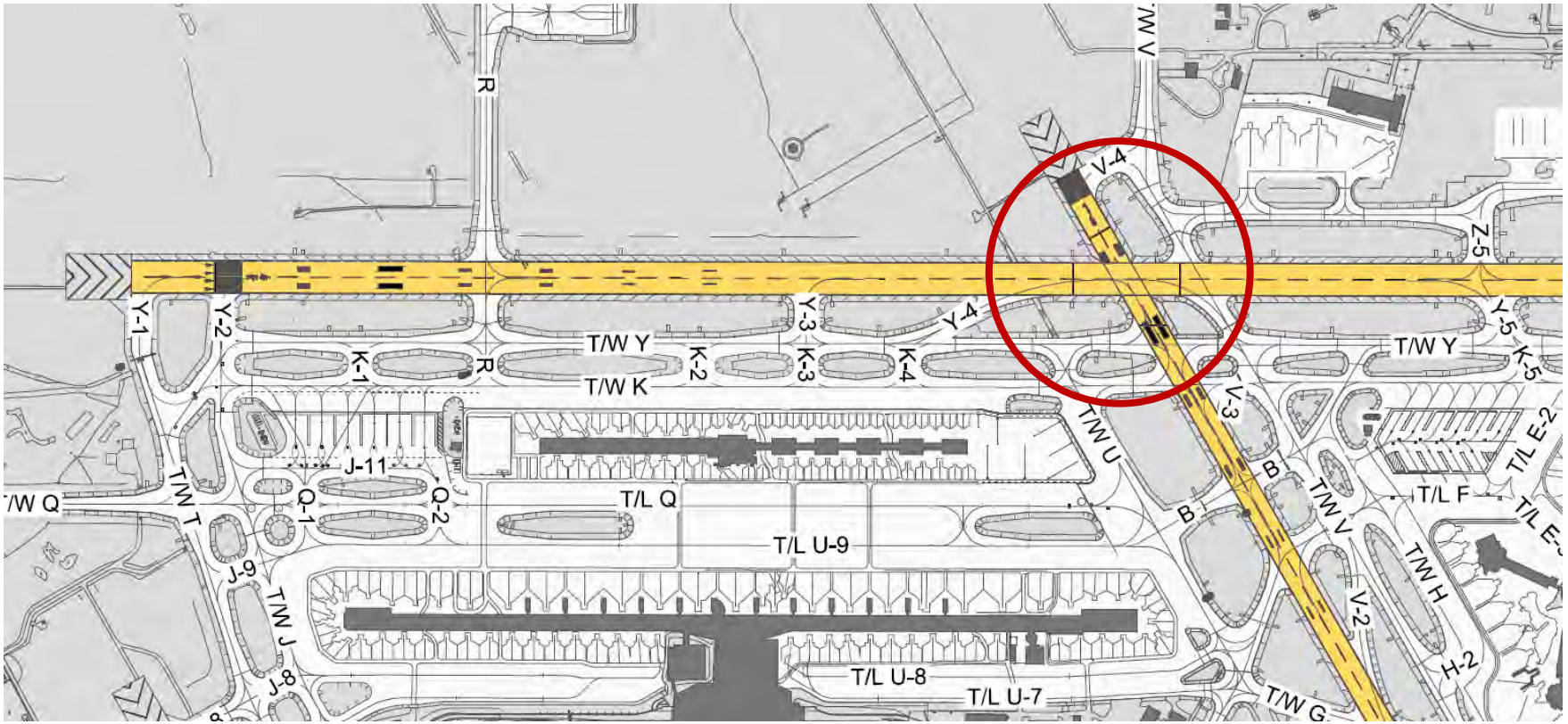
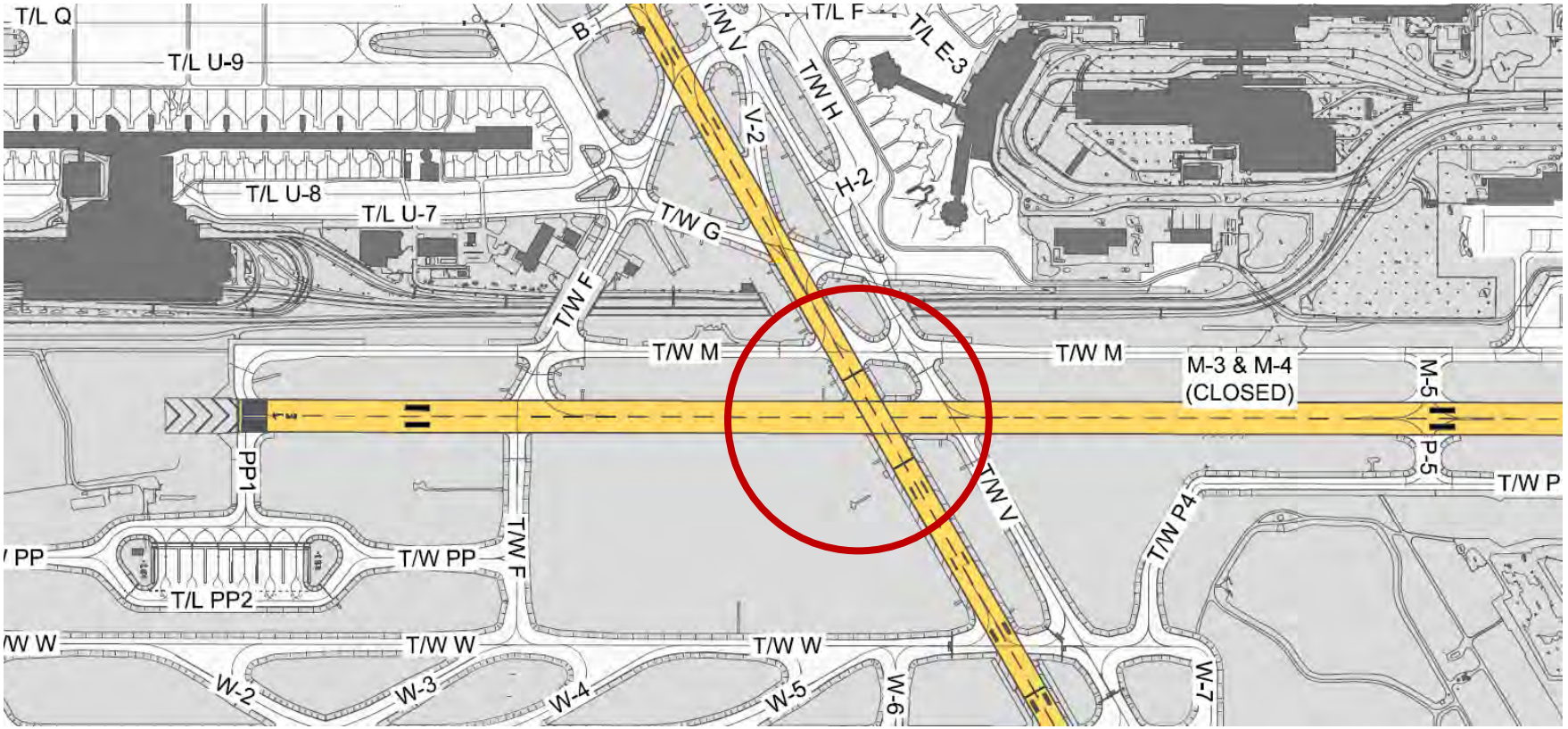
Hot Spot 1



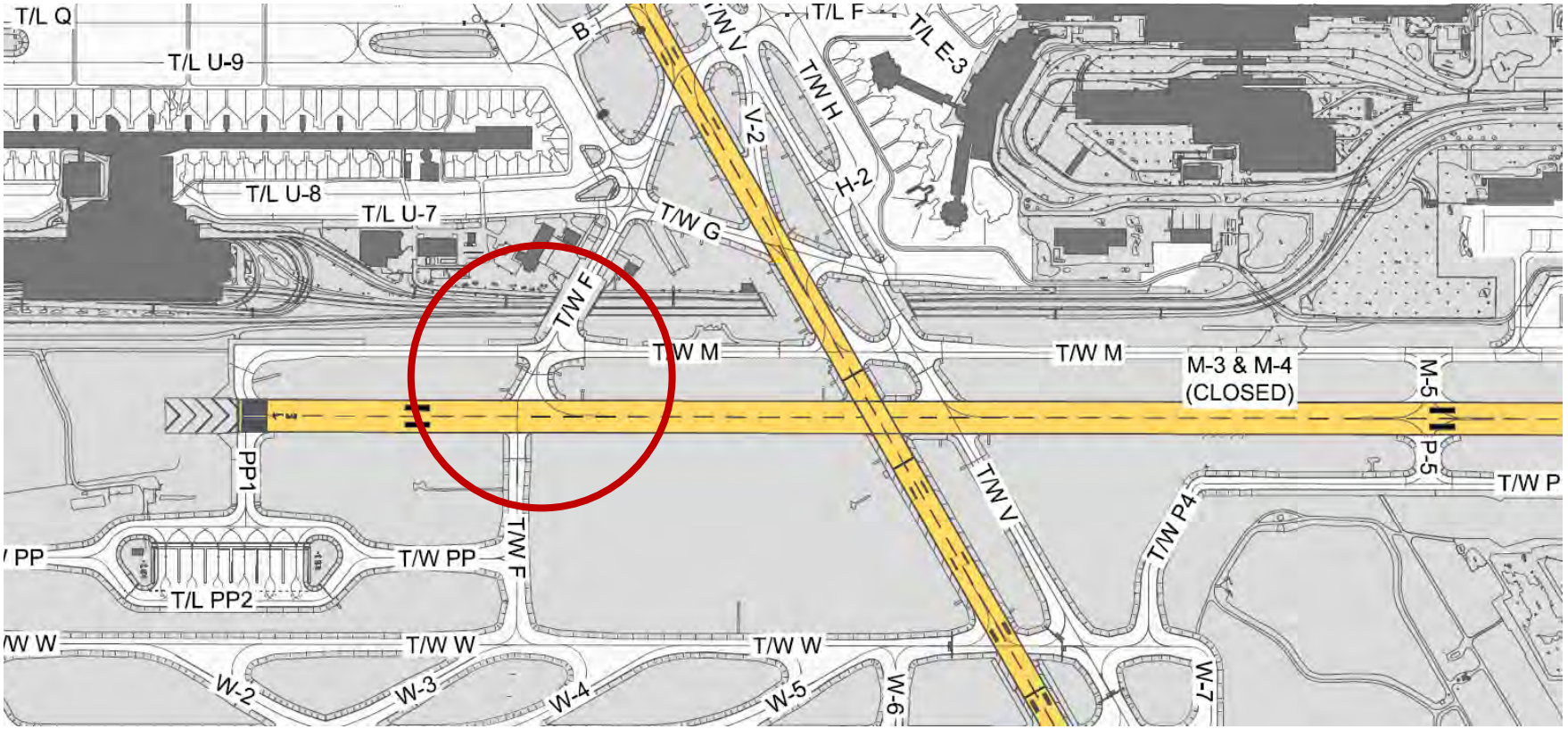
Intersection of Runways 9L-27R and 4R-22L is identified as Hot Spot 1. Aircraft taxiing on Runway 9L-27R should be prepared to hold at the holding position markings on the runway.

Hot Spot 2



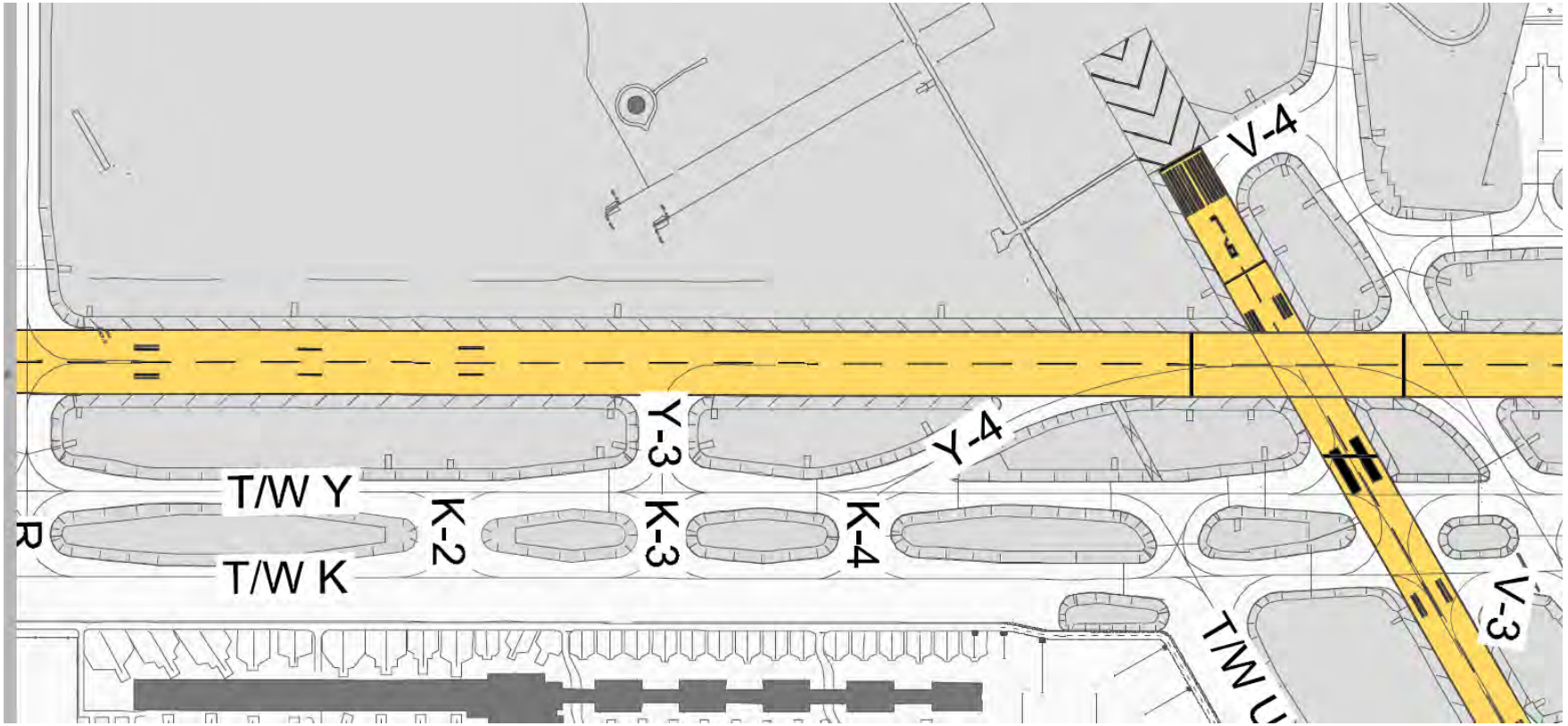
Intersection of Runways 9L-27R and 3L-21R is identified as Hot Spot 2. Aircraft taxiing on Runway 9L-27R should be prepared to hold at the holding position markings on the runway.

Hot Spot 3



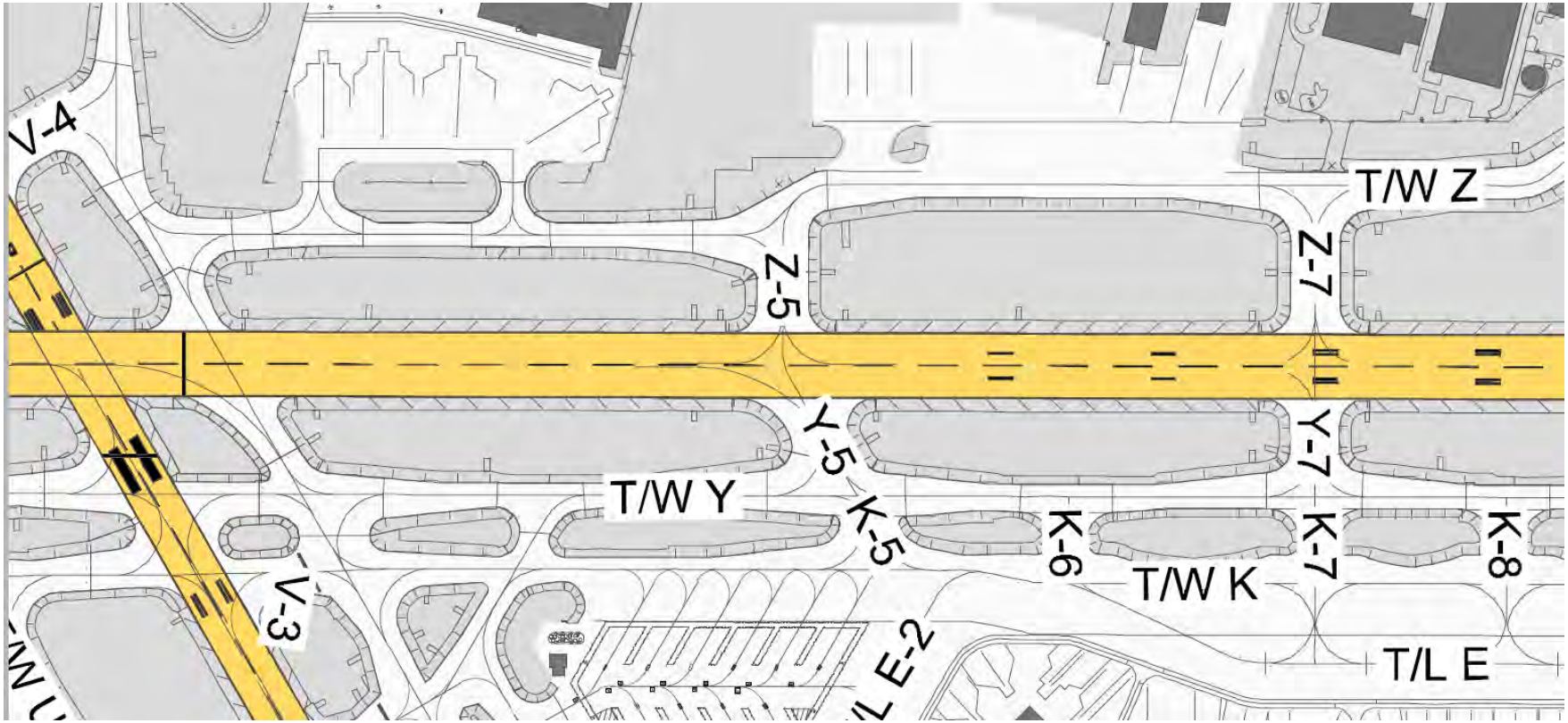
Intersection of Taxiway F with Runway 3L-21R is identified as Hot Spot 3. Aircraft taxiing on Taxiway F sometimes enter Runway 3L-21R without clearance.

RIM Area 1



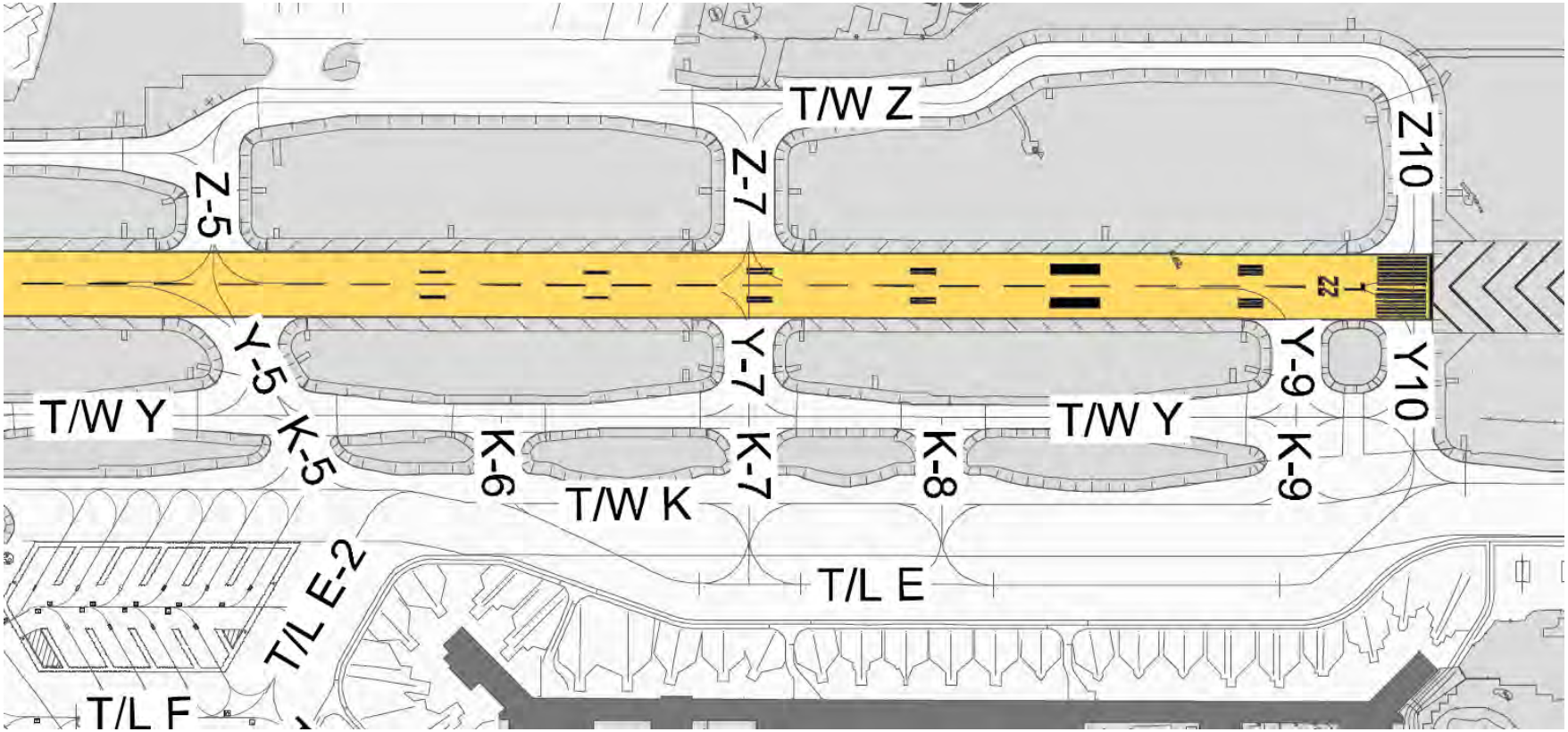
Taxiways K-3 and Y-3 lead directly from the air carrier apron directly to a runway.

RIM Area 2



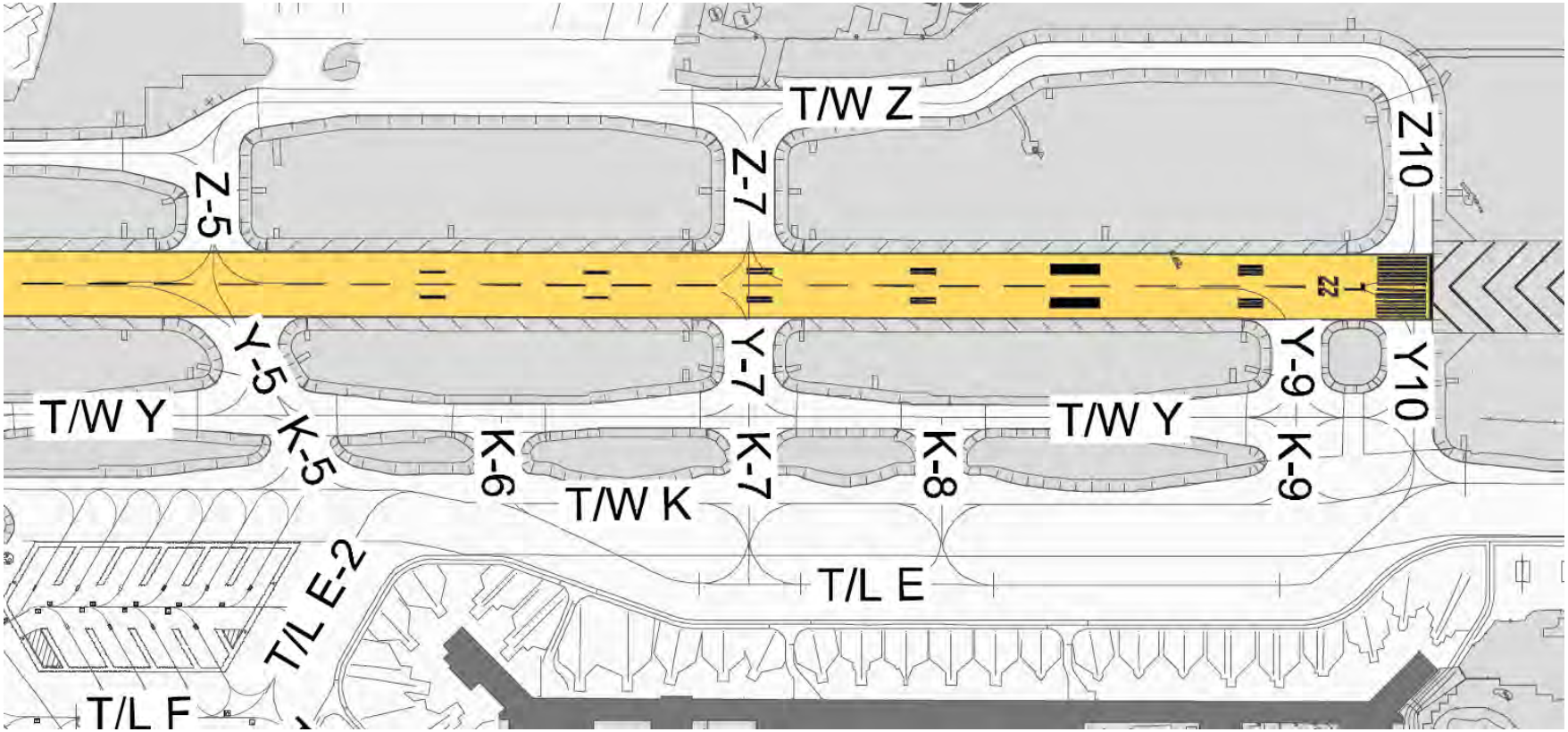
Runway 4R-22L crossing at Taxiways Z-5, Y-5, and K-5 is at an acute angle which can limit the visibility of the runway for the crossing aircraft and increases distance and travel time of the runway crossing. Additionally the crossing is within the high-energy middle third portion of the runway.

RIM Area 3



Taxiways K-7 and Y-7 lead directly from the air carrier apron directly to a runway.

RIM Area 4

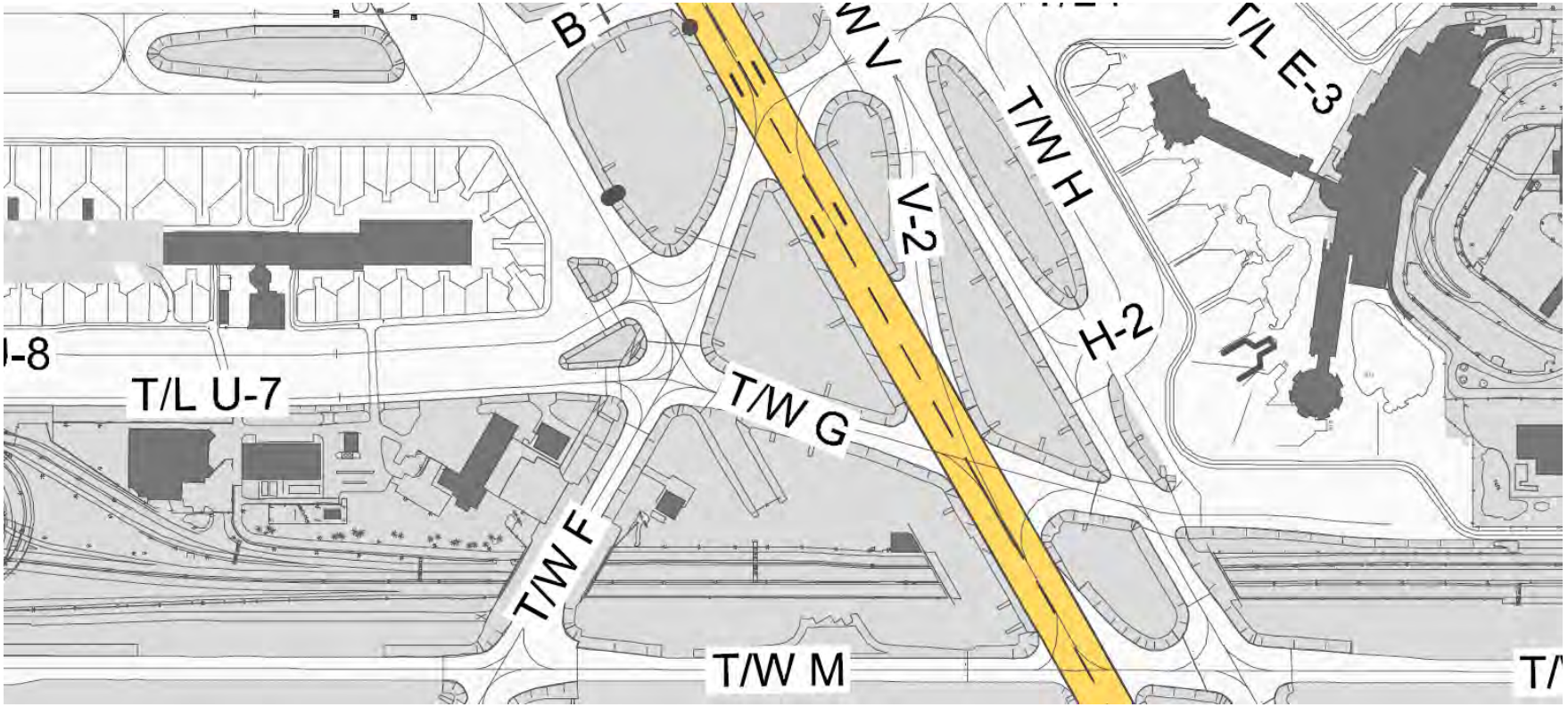


Entrances to Runway 4R-22L at Taxiways Y-9 and Y-10 create a wide expanse of pavement where signage can potentially be located outside the view angle of a pilot's window. Additionally, these entrances lead directly to and from the air carrier apron. These elements conflict with recommended RIM criteria.

RIM Area 5

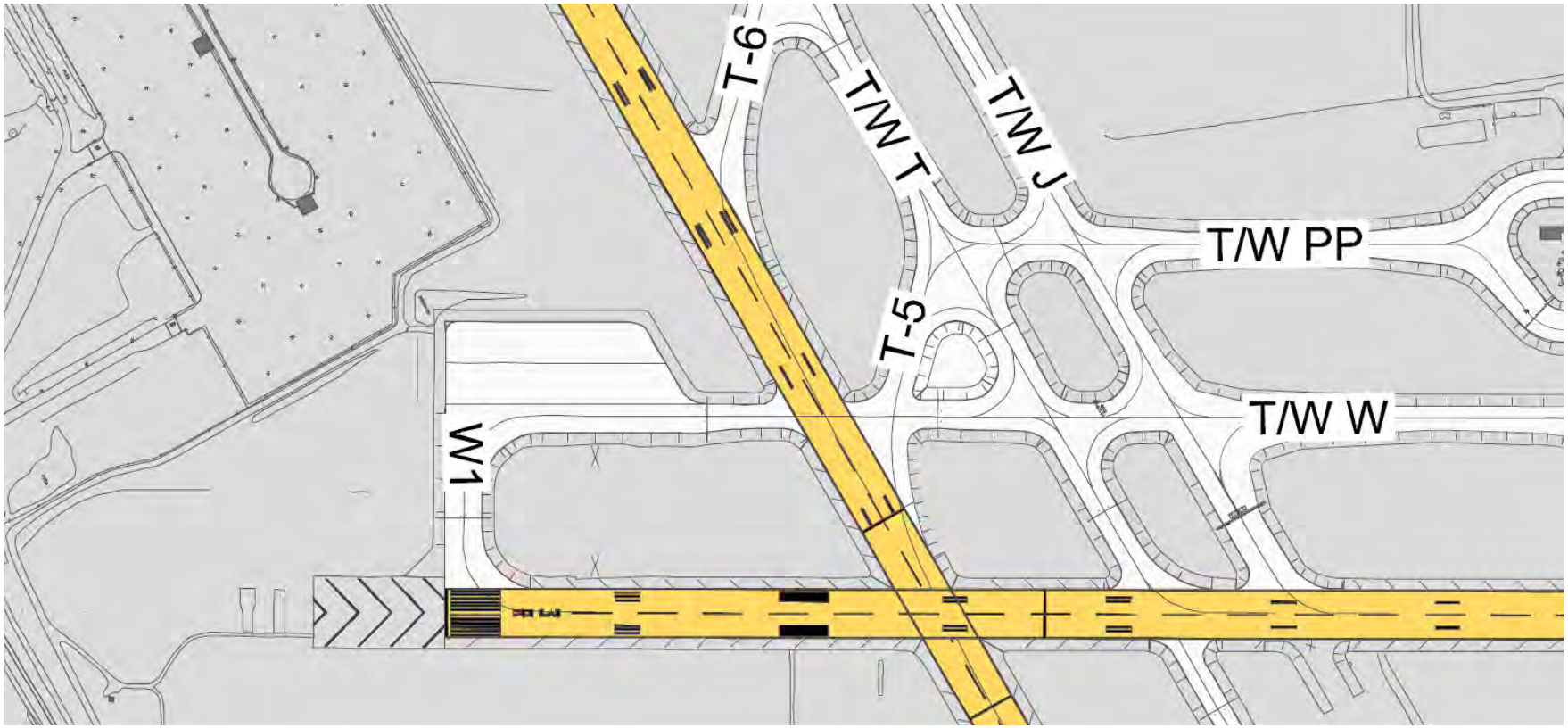
Intersection of Taxiways F, G, U, U-7, and U-8 creates a complex intersection with greater than 3 nodes. Additionally, the Runway 9L-27R crossing at Taxiway F is at an acute angle which can limit the visibility of the crossing aircraft and increases distance and travel time of the runway crossing.

RIM Area 6



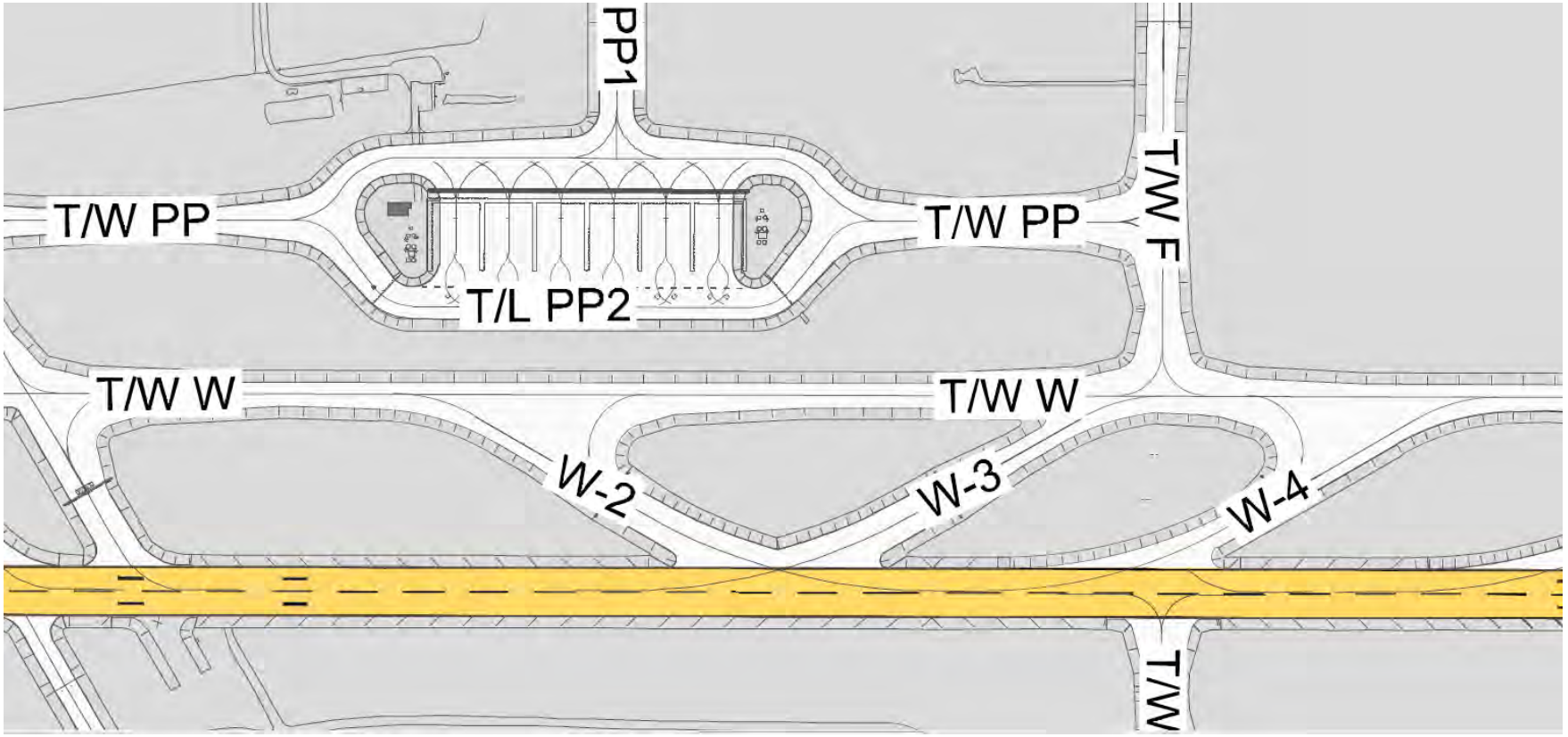
Intersection of Taxiways G and V-2 with Runway 9L-27R creates a wide expanse of pavement and is a high-energy runway crossing.

RIM Area 7



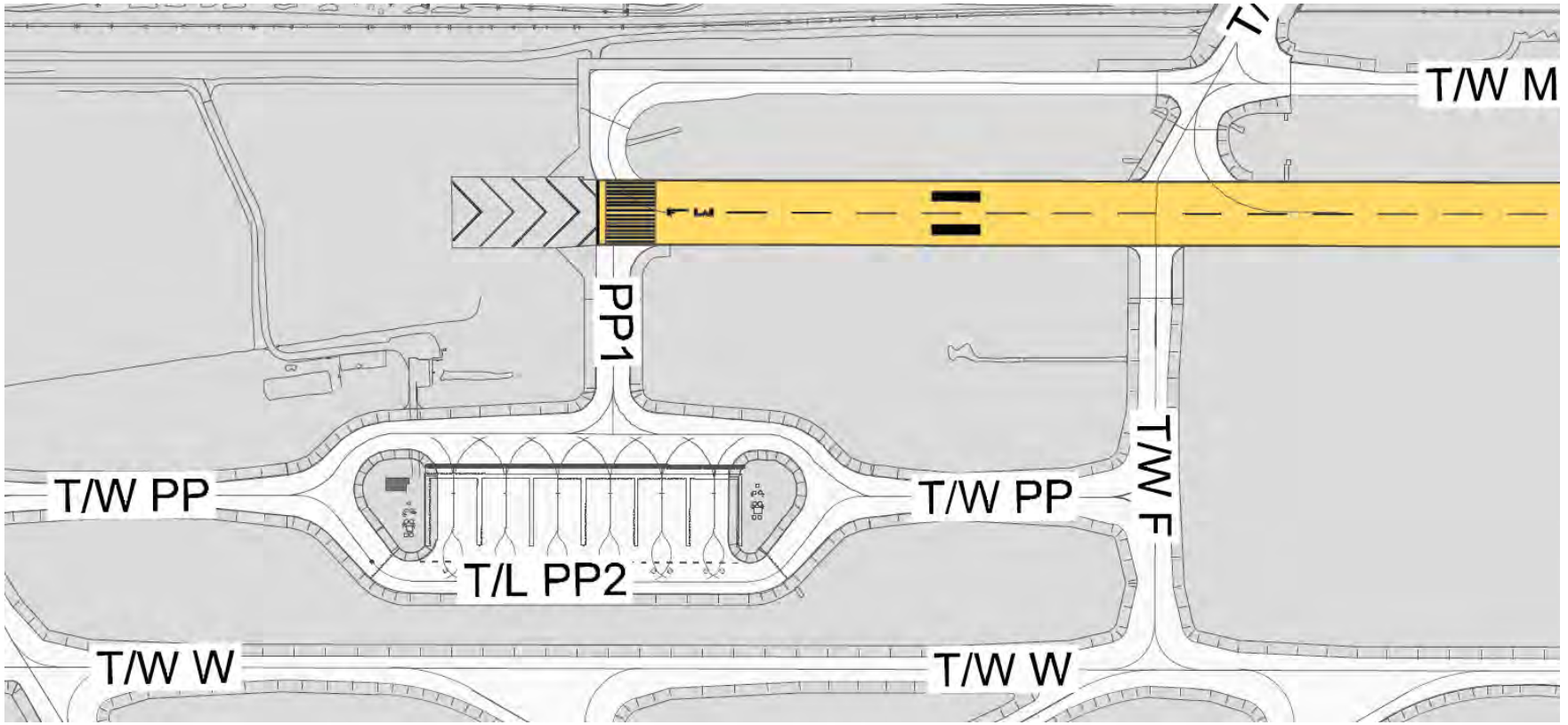
Intersection of Taxiways W and T-5 with Runway 9R-27L is an area with a complex taxiway/runway intersection, wide expanse of pavement, and an acute angle crossing of the runway which can limit the visibility of the crossing aircraft and increase distance and travel time of the runway crossing.

RIM Area 8



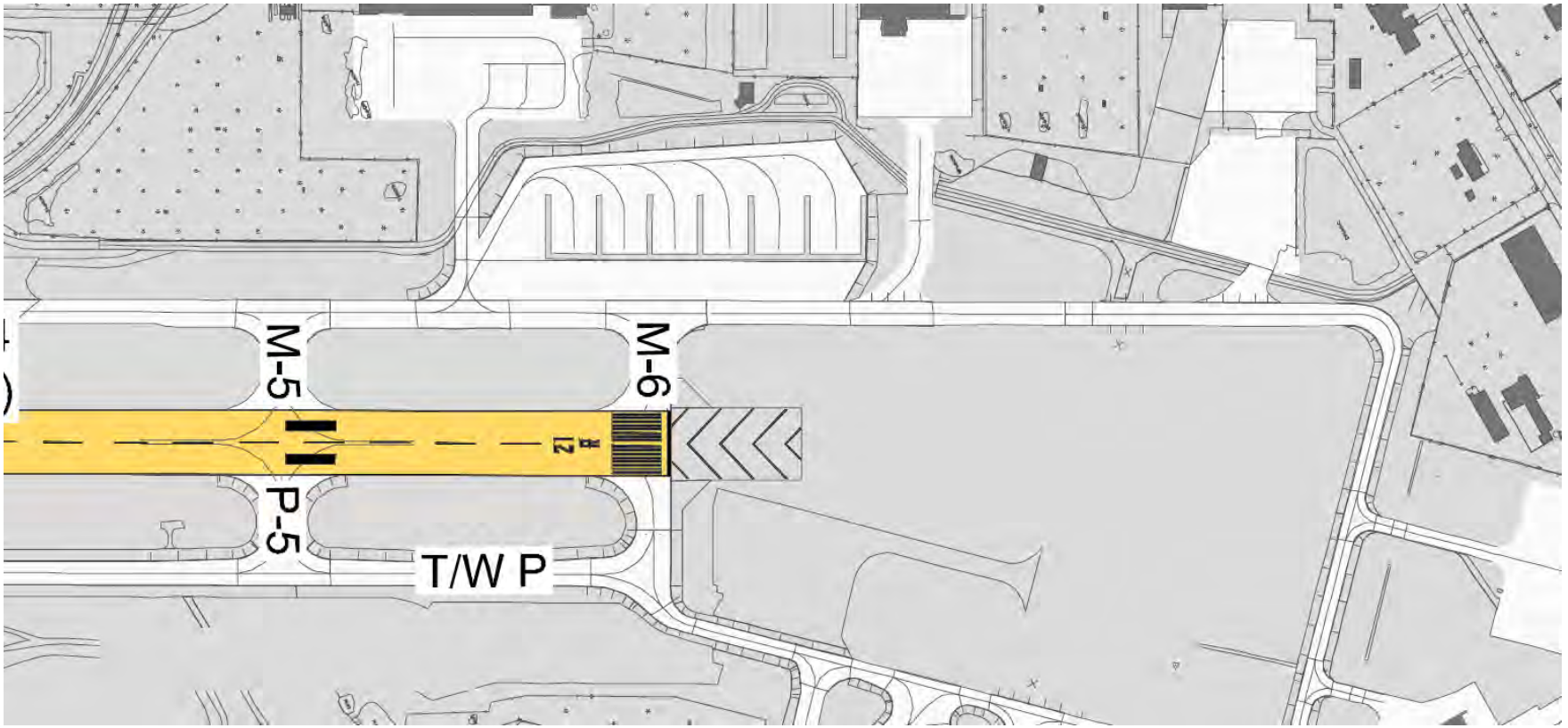
Intersection of Taxiways W-2 and W-3 with Runway 3R-21L creates a wide expanse of pavement where signage can potentially be located outside the view angle of a pilot's window. Additionally the co-location of the exit taxiways can potentially cause confusing geometry for taxiing pilots in low visibility conditions.

RIM Area 9



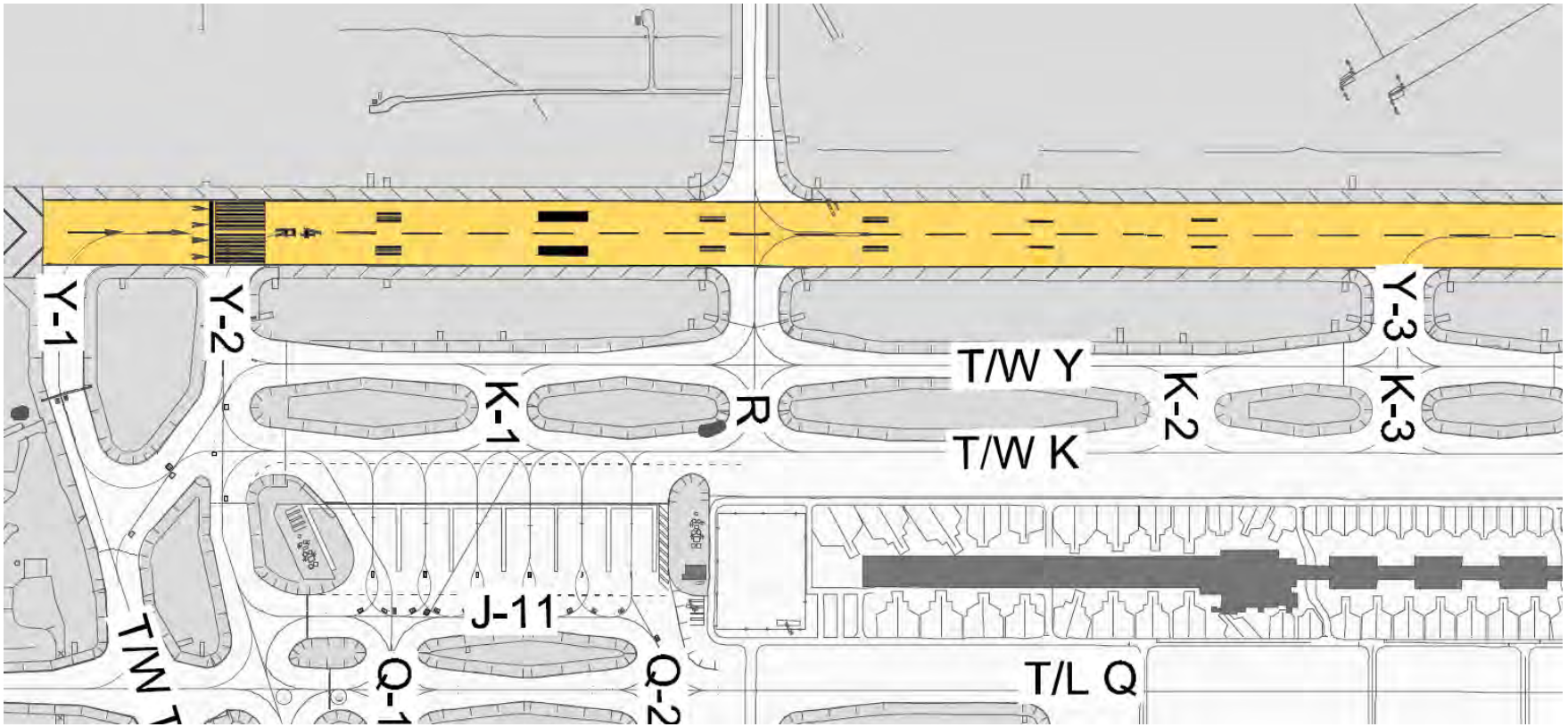
Taxiway PP1 leads directly from the de-icing apron to the Runway 3L-21R threshold.

RIM Area 10



Taxiway M-6 leads directly from the de-icing apron to the Runway 3L-21R threshold.

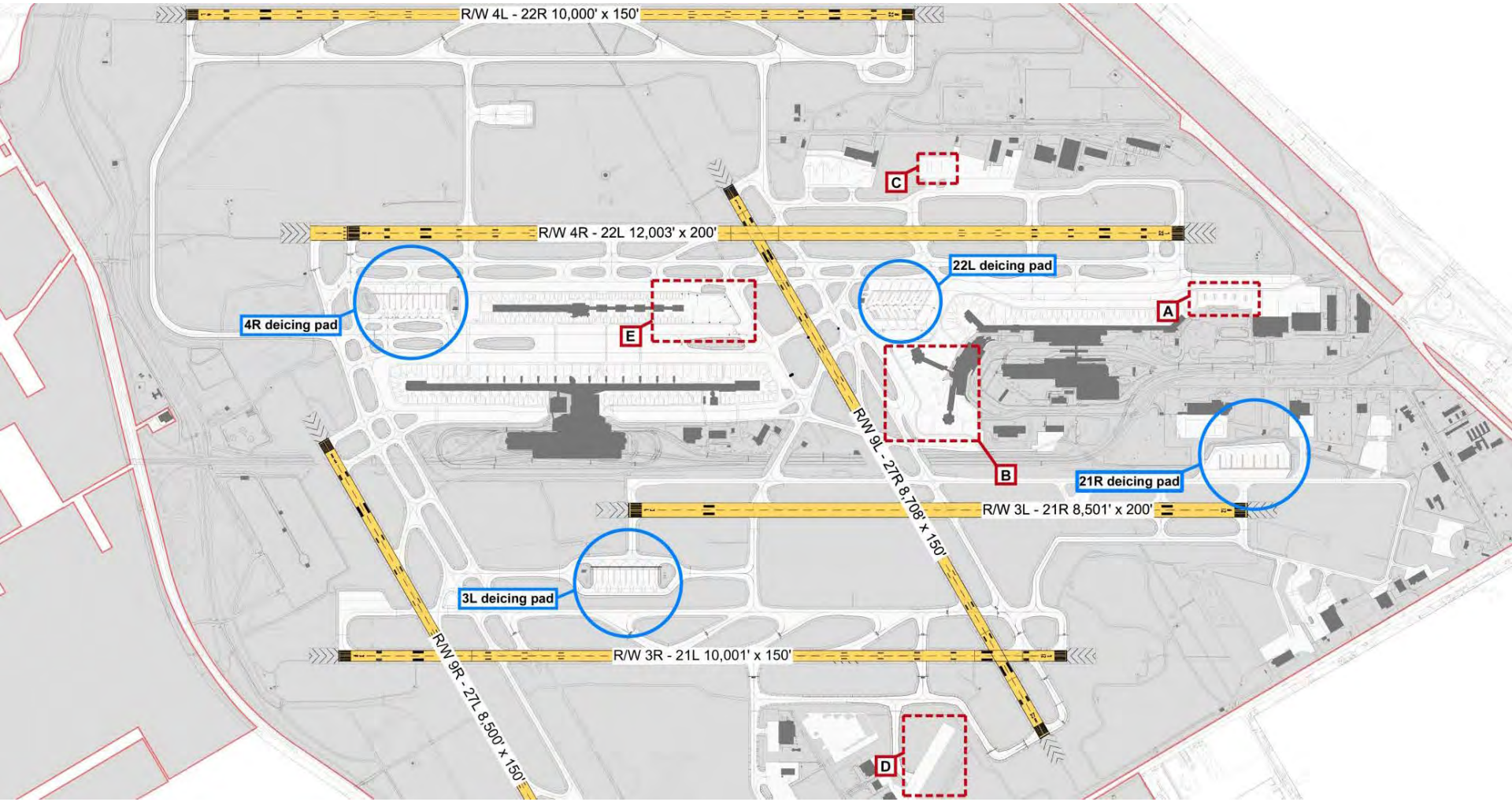
RIM Area 11



Taxiway R leads directly from air carrier apron to runway.

Deicing

Deicing Pads



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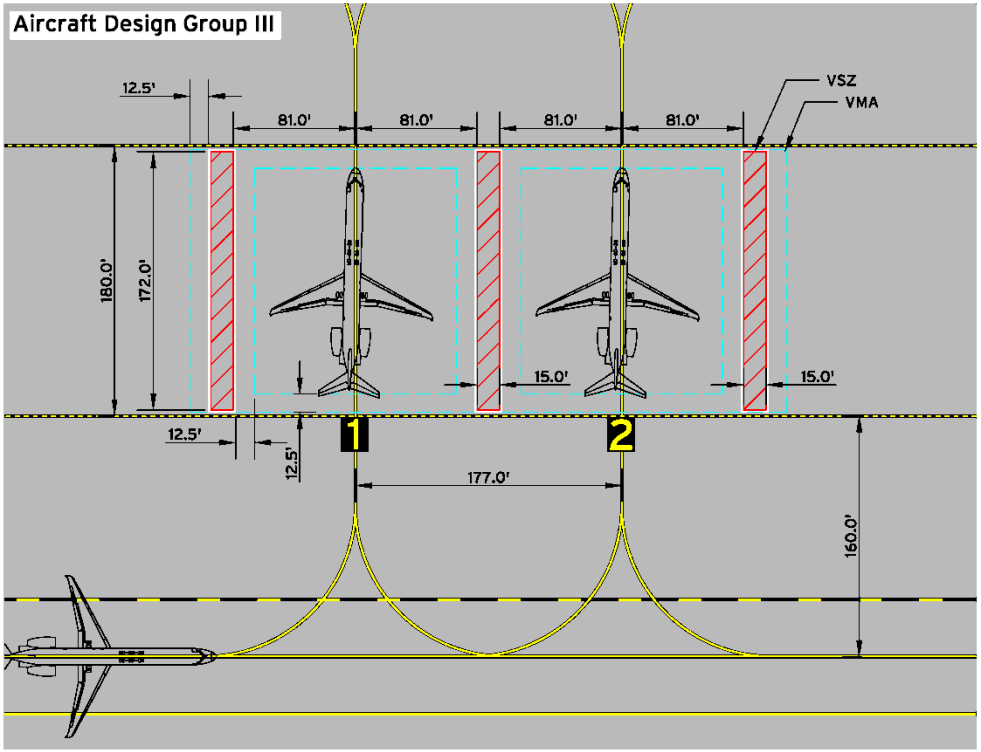
Deicing Pad Requirements

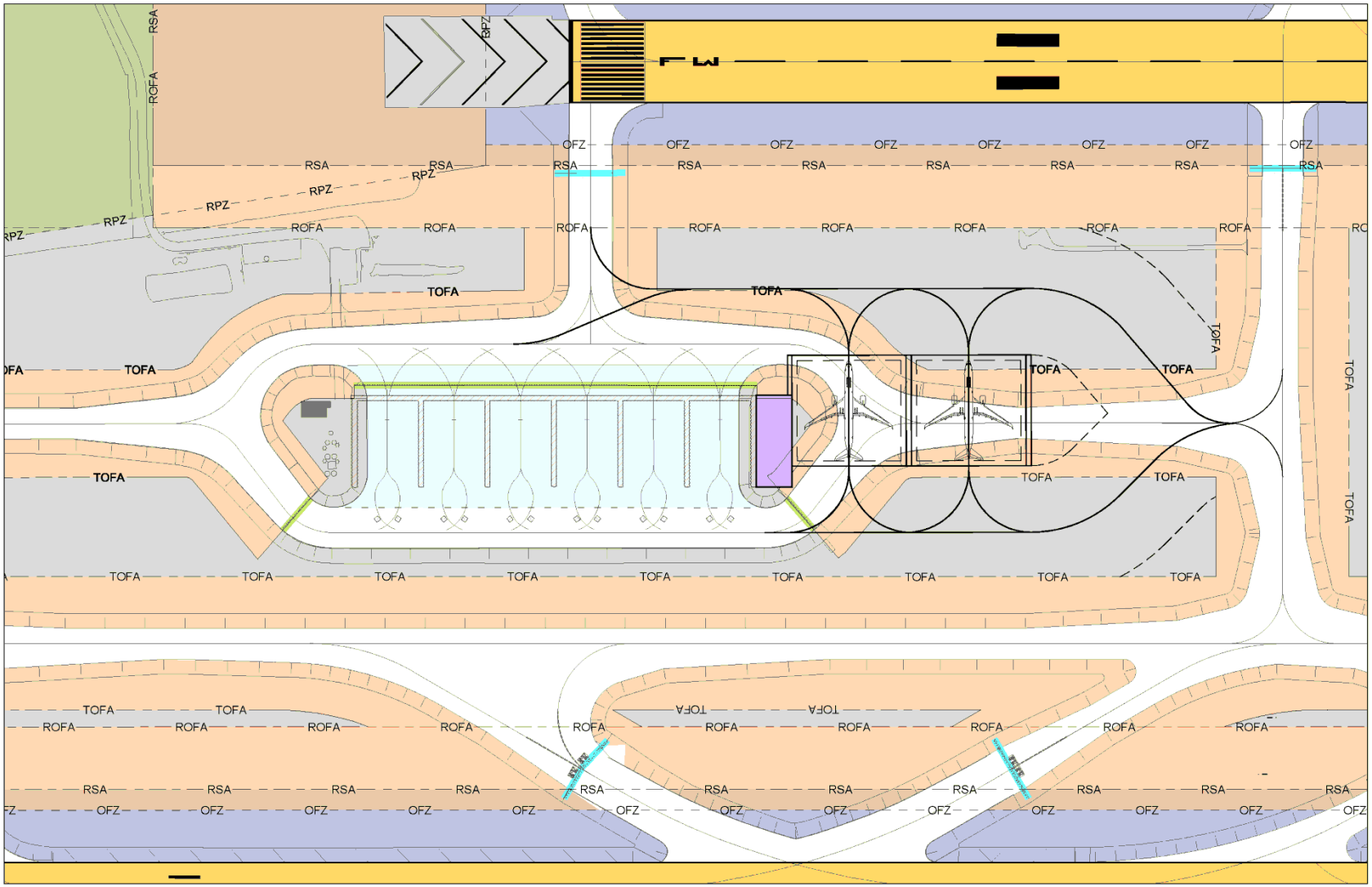
Deicing pad modifications will be evaluated using SIMMOD

- 1 or 2 additional widebody spots needed for SkyTeam
- 1 or 2 widebody spots needed for other airlines
- Deicing pads eventually need to be expanded to meet new deicing FAA AC requirements

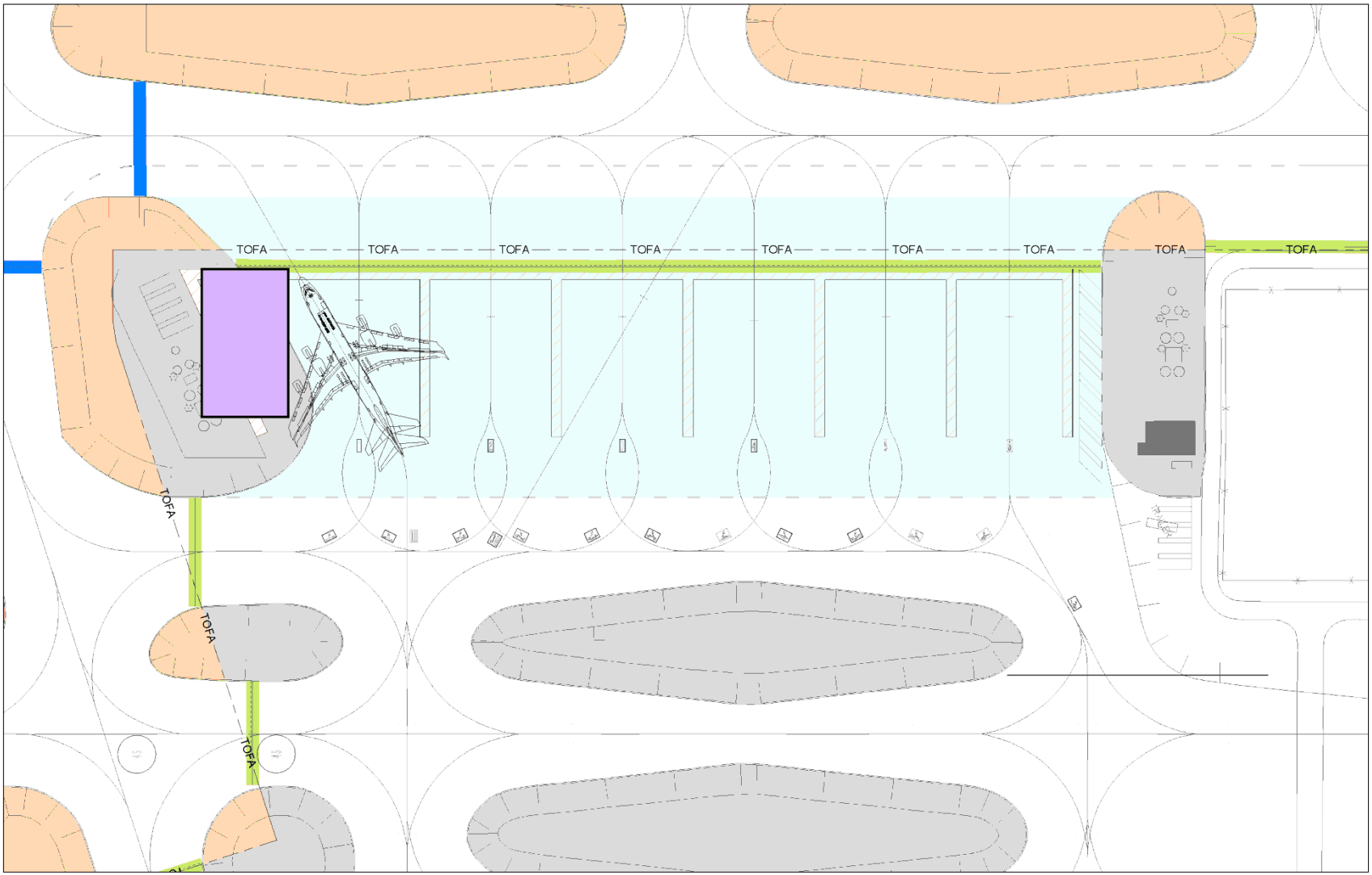


Pad	ADG	# of Positions	Ex Length	Ex Width	Ex Sq Ft	Pro Length	Pro Width	Pro Sq Ft	Additional Sq Ft	Lost Positions
4R	III	6*	954.0'	203.7'	194,329.8	1,059.5'	203.7'	215,820.2	21,490.4	1
3L	III	6	973.4'	222.8'	216,873.5	1,059.5'	222.8'	236,056.6	19,183.1	1
21R	III	6	981.7'	195.6'	192,020.5	1,059.5'	195.6'	207238.2	15,217.7	1
22L West	II	6	701.2'	136.3'	95,573.6	777.5'	136.3'	105973.3	10,399.7	1
22L East	II	4	479.0'	136.3'	65,287.7	522.5'	136.3'	71,216.8	5,929.1	0

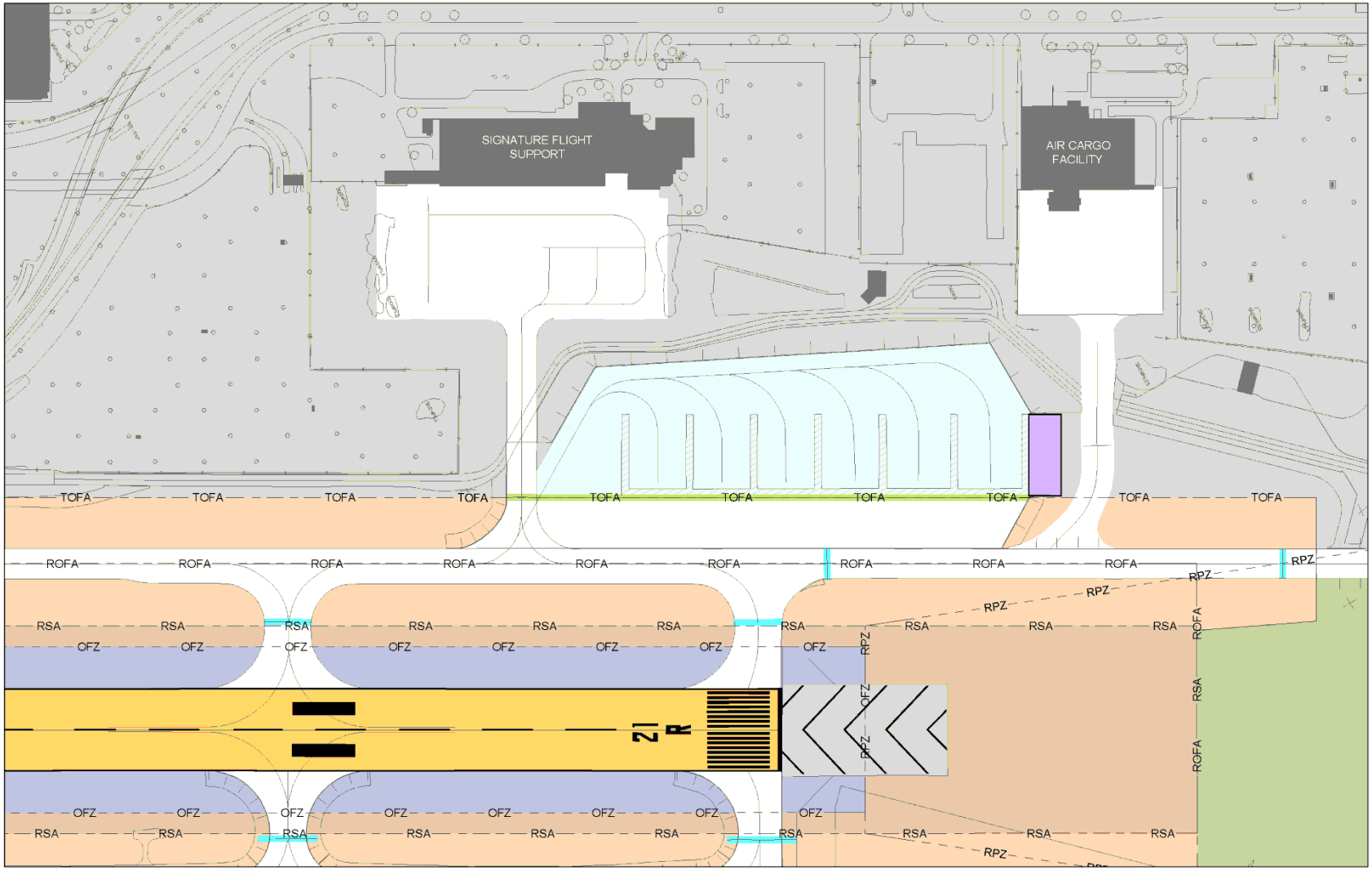
3L Deicing Pad



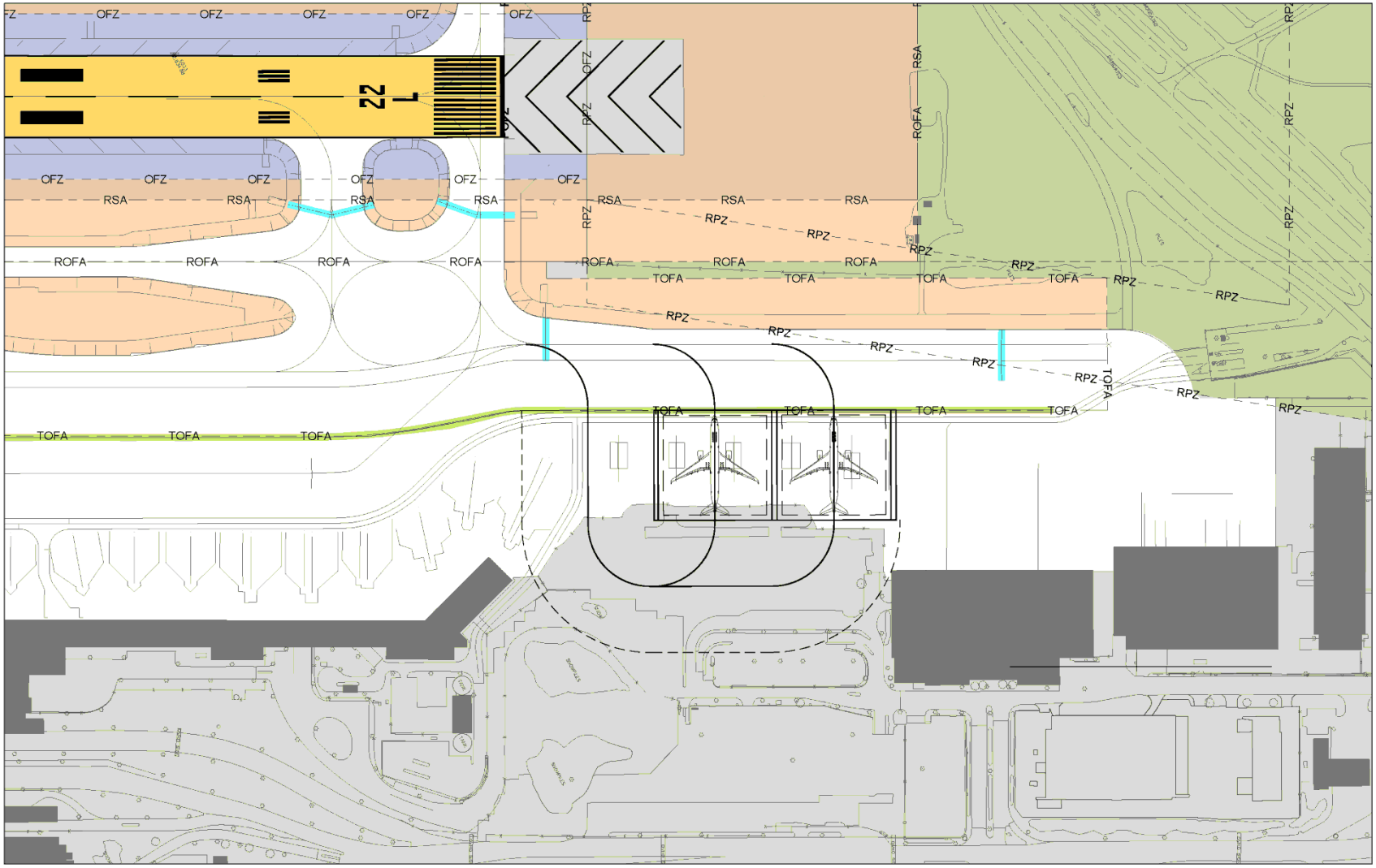
4R Deicing Pad



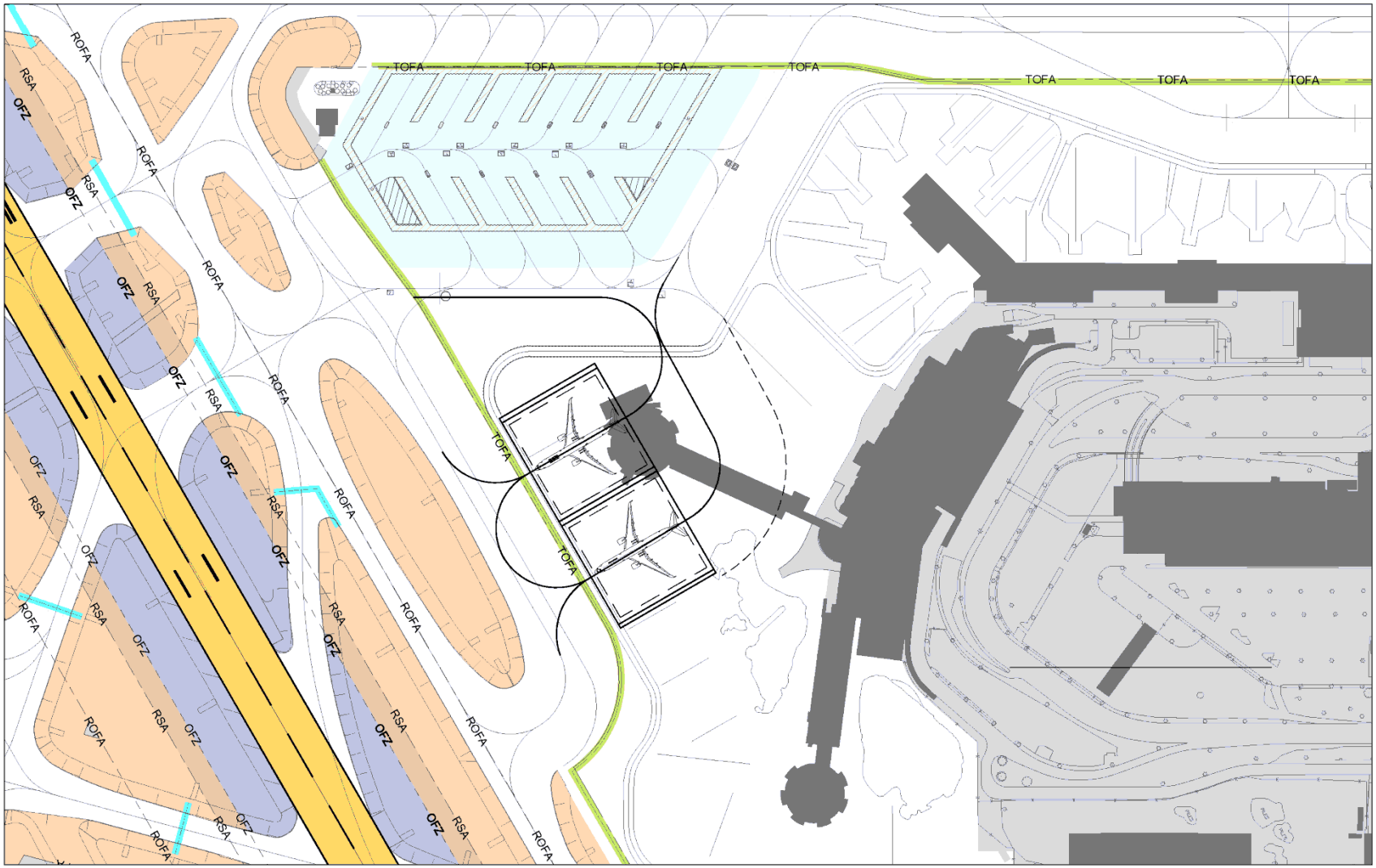
21R Deicing Pad



22L Deicing Pad

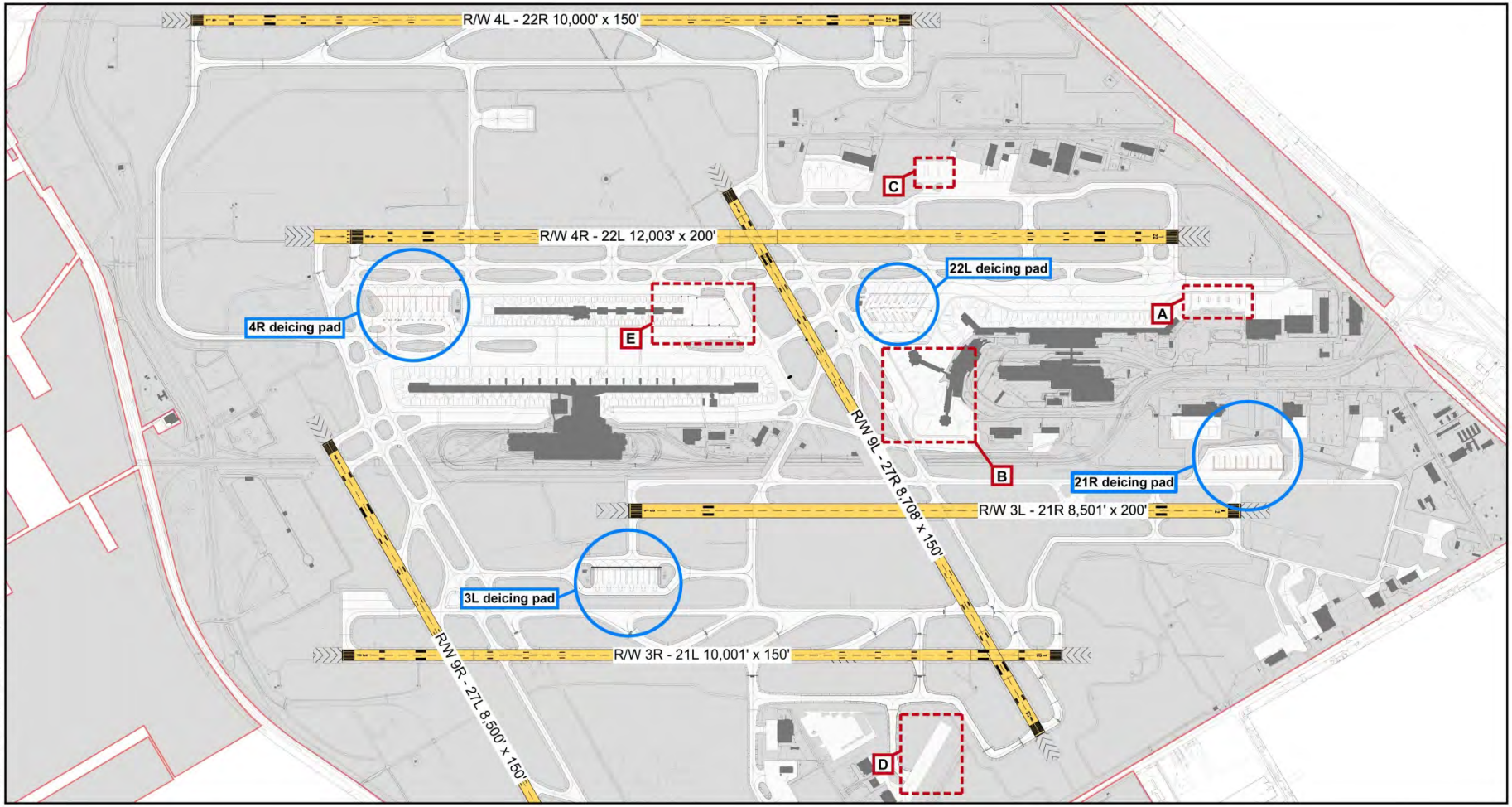


22L Deicing Pad



Remain Overnight (RON) and Runway Sequencing Pads

Airfield Efficiency: Hold Pad (Penalty Boxes)



Source: HNTB ANALYSIS

Figure 2-X
AIRPORT-WIDE DEICING PAD AND RON PARKING LOCATIONS

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

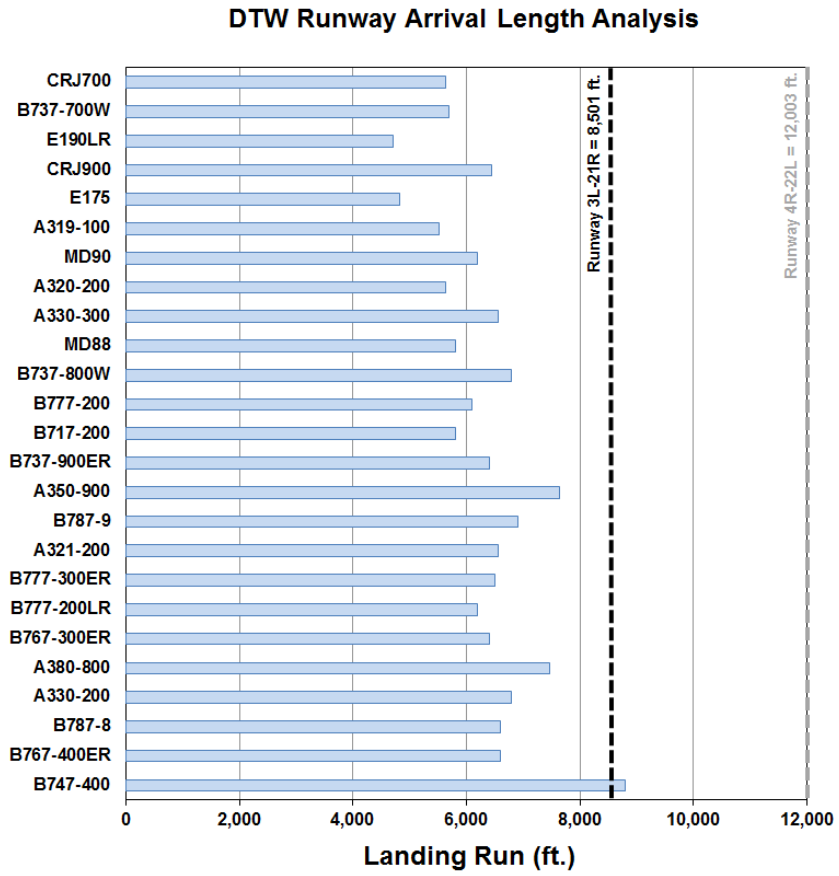
Leigh|Fisher

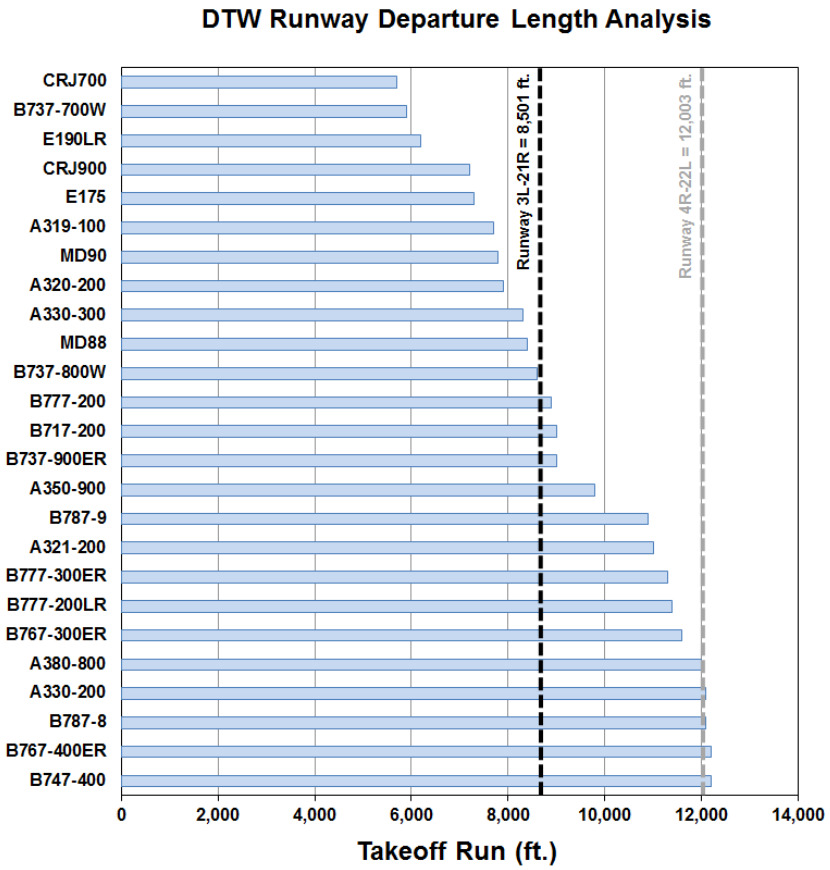
Runway 3L-21R Conceptual Design

Design Criteria for Runway 3L-21R Conceptual Design

- Runway length
- Runway width
- Shoulders
- Runway NAVAIDs / Approach Minima
- Marking / Lighting
- RIM / Hot Spot mitigation
- Construction Phasing

Runway Length Requirements





Existing Runway Lengths

4L-22R 10,000’ x 150’
4R-22L 12,003’ x 200’
3L-21R 8,501’ x 200’
3R-21L 10,001’ x 150’
9L-27R 8,708’ x 150’
9R-27L 8,500’ x 150’

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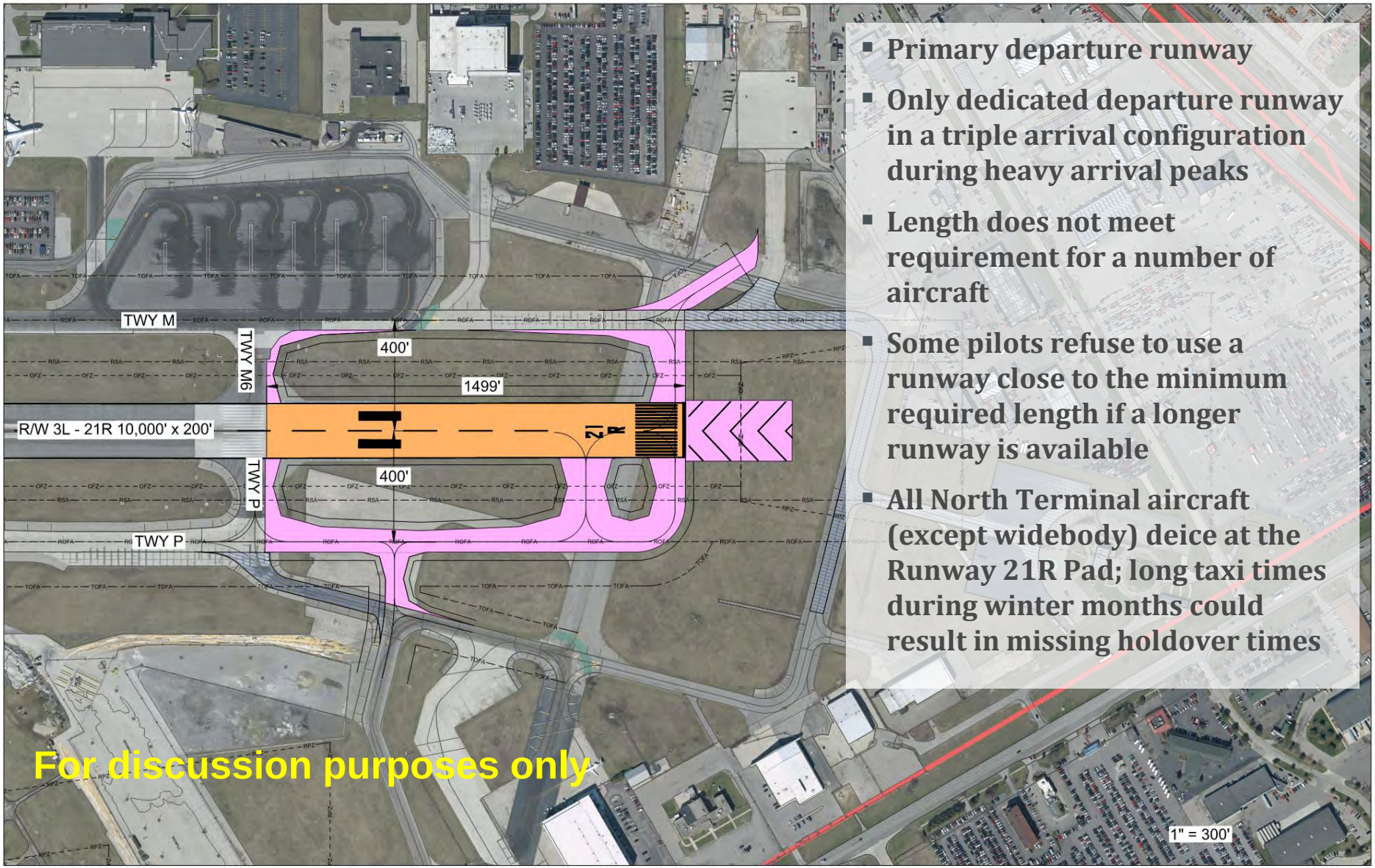
Potential Runway 3L-21R Extension

Extension to be studied further in alternatives analysis

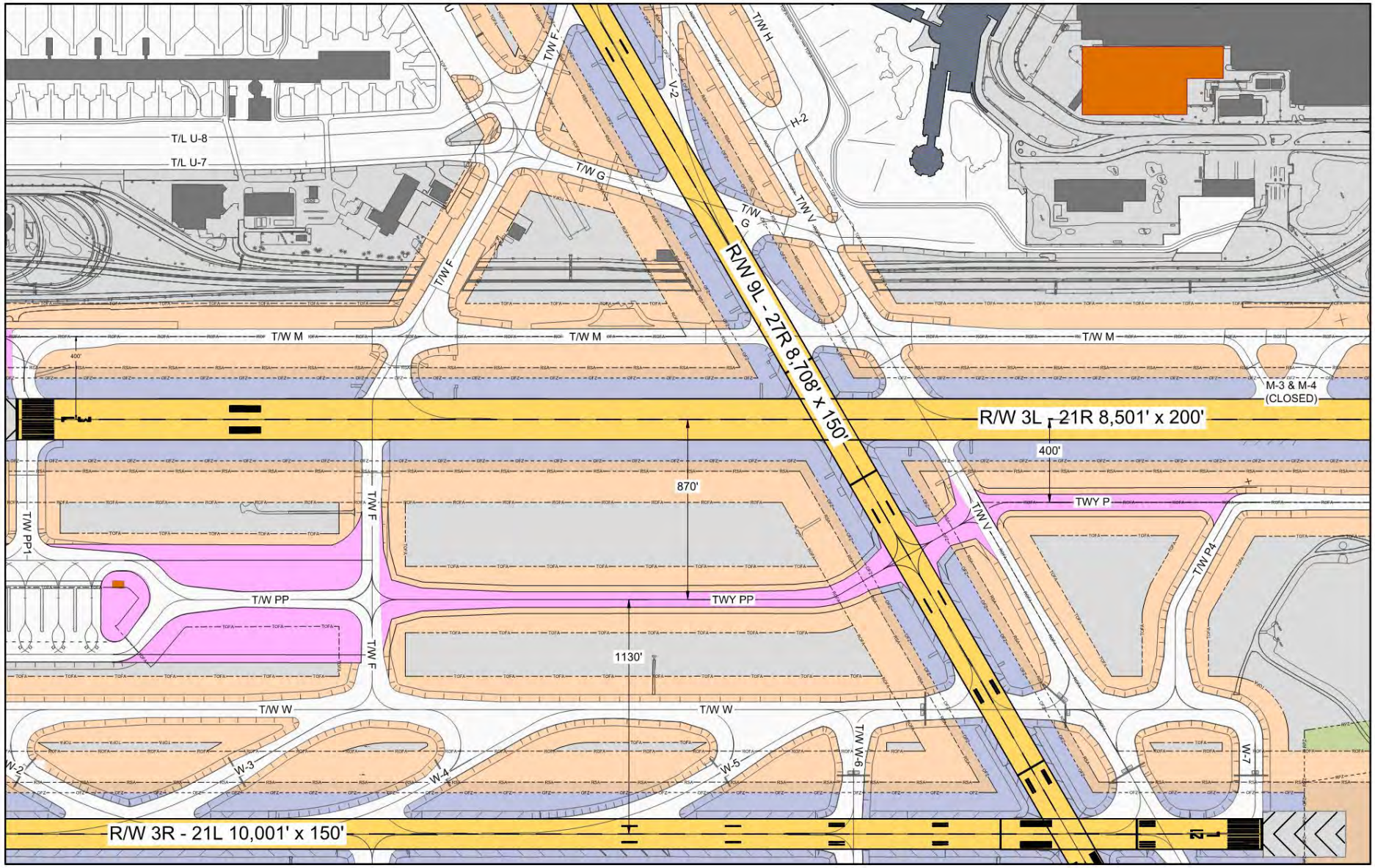


- Primary departure runway
- Only dedicated departure runway in a triple arrival configuration during heavy arrival peaks
- Length does not meet requirement for a number of aircraft
- Some pilots refuse to use a runway close to the minimum required length if a longer runway is available
- All North Terminal aircraft (except widebody) deice at the Runway 21R Pad; long taxi times during winter months could result in missing holdover times

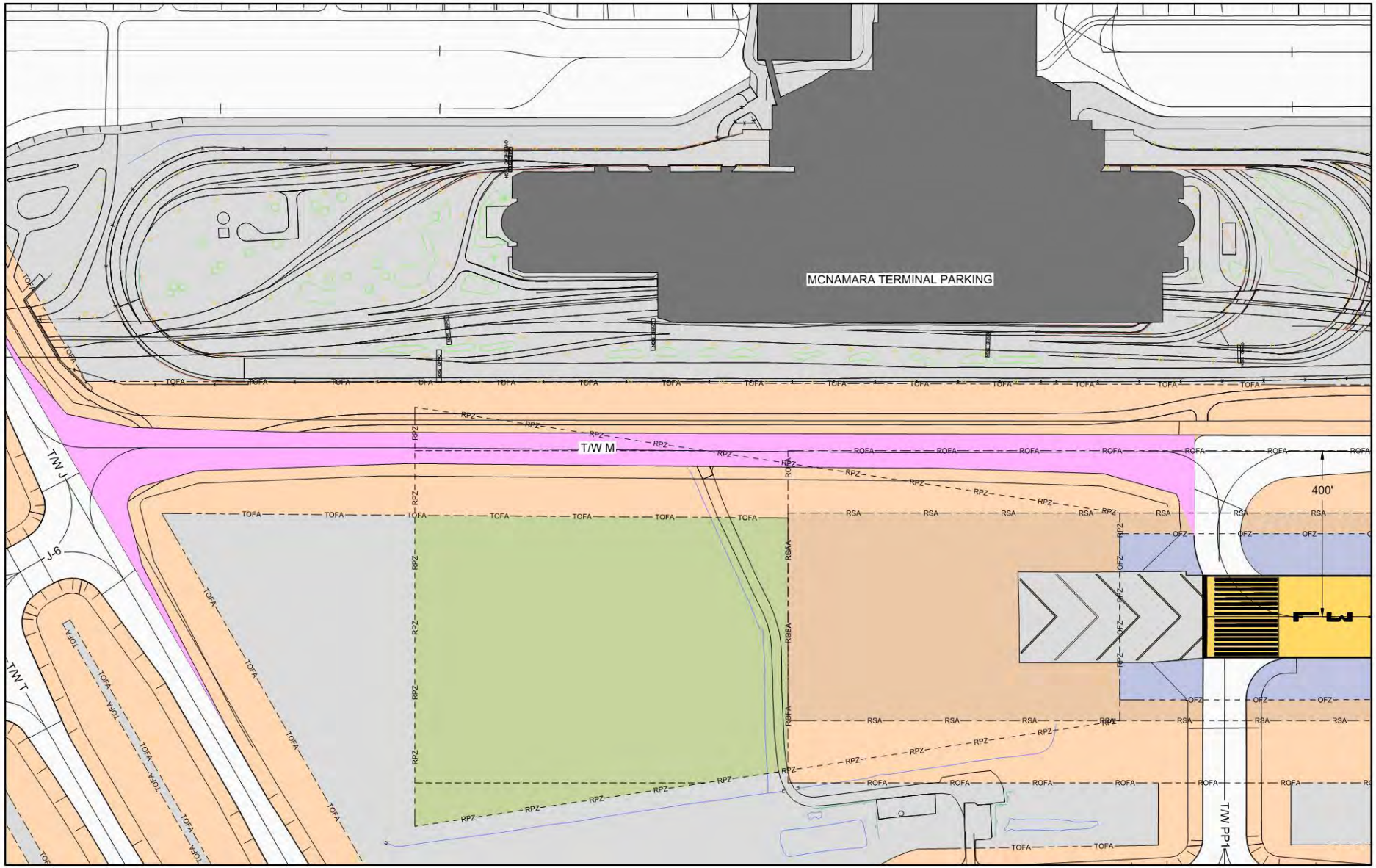
For discussion purposes only

Potential Taxiway Improvements

ADG V & TDG 6 Taxiway PP & P Ext

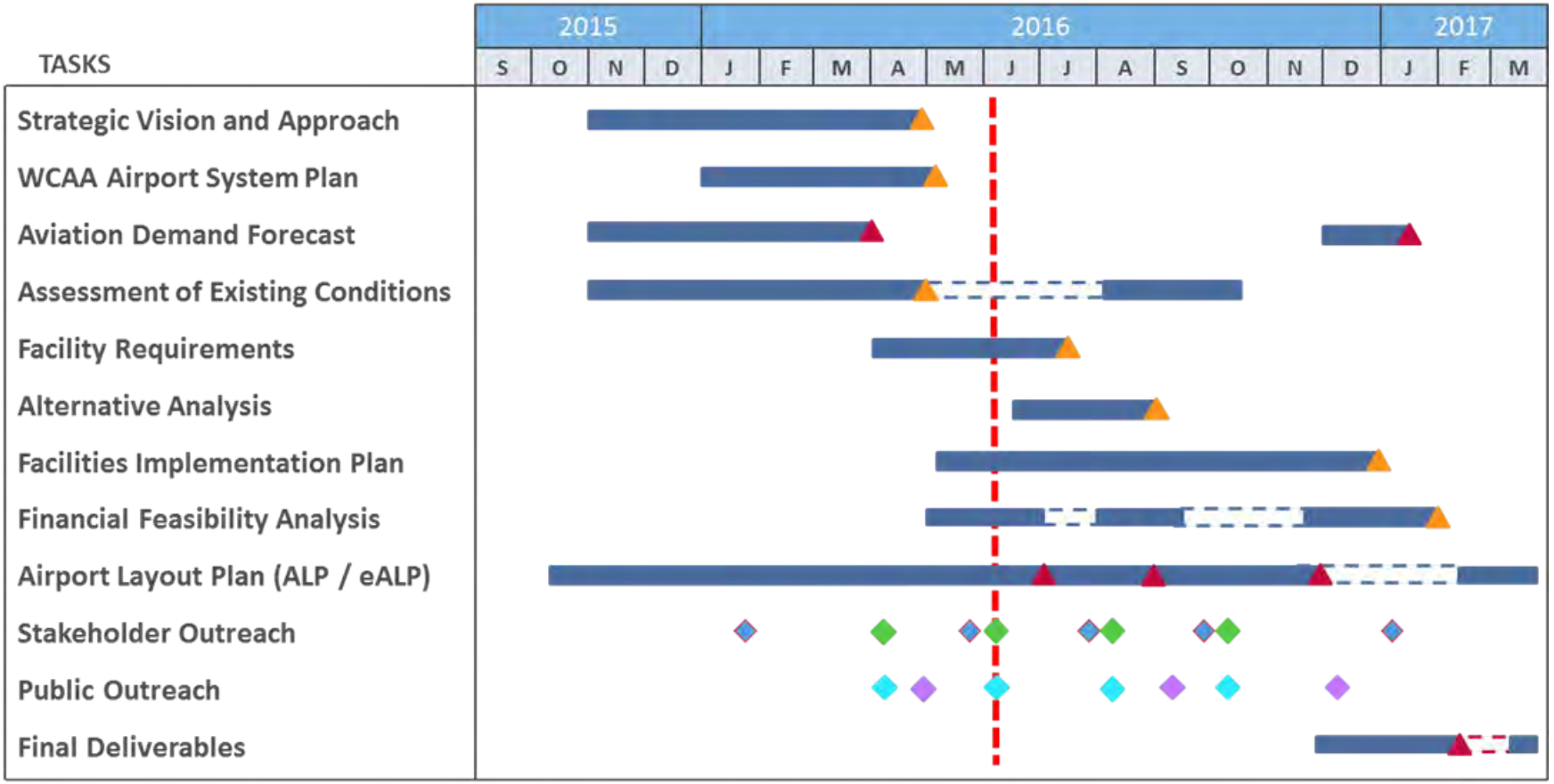


ADG V & TDG 6 Taxiway M Ext



Action Items & Next Steps

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.

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Upcoming Meetings and Topics for Discussion

Timeframe	Discussion topics
June	Facilities needed to accommodate future demand; initial alternatives
June/July	Alternatives evaluation
August	Final alternatives
October	Recommended development plan and implementation strategies
Ad Hoc	Other Meetings may be organized on an as needed basis and can be accomplished via **WebEx**