

The Safety Case

*Initiating Risk
Management Analysis*

*Group
Exercise*

*ACI-NA/AAAE
SMS Workshop
2019*



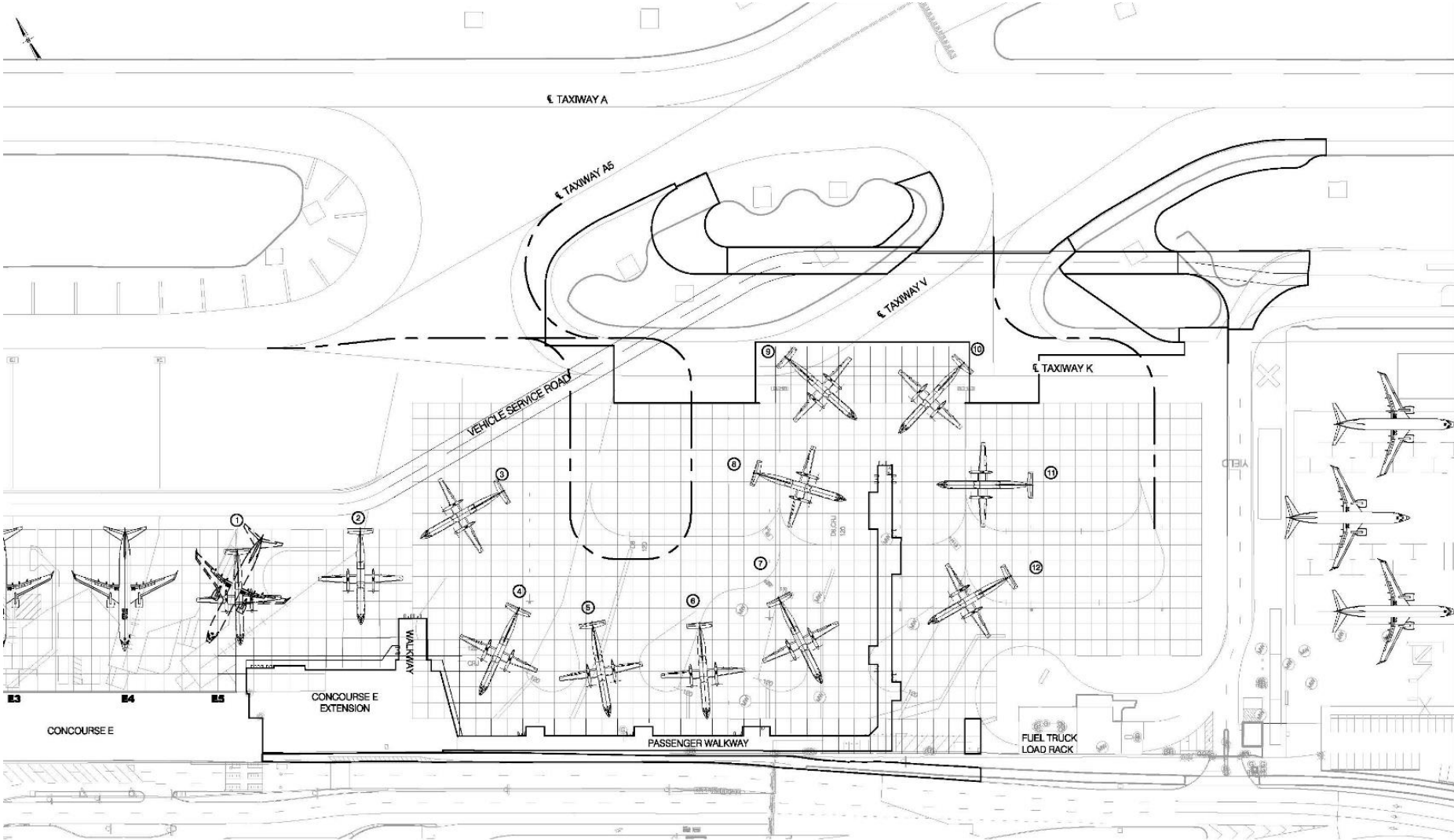
Today's Exercise 1 – Operational Change



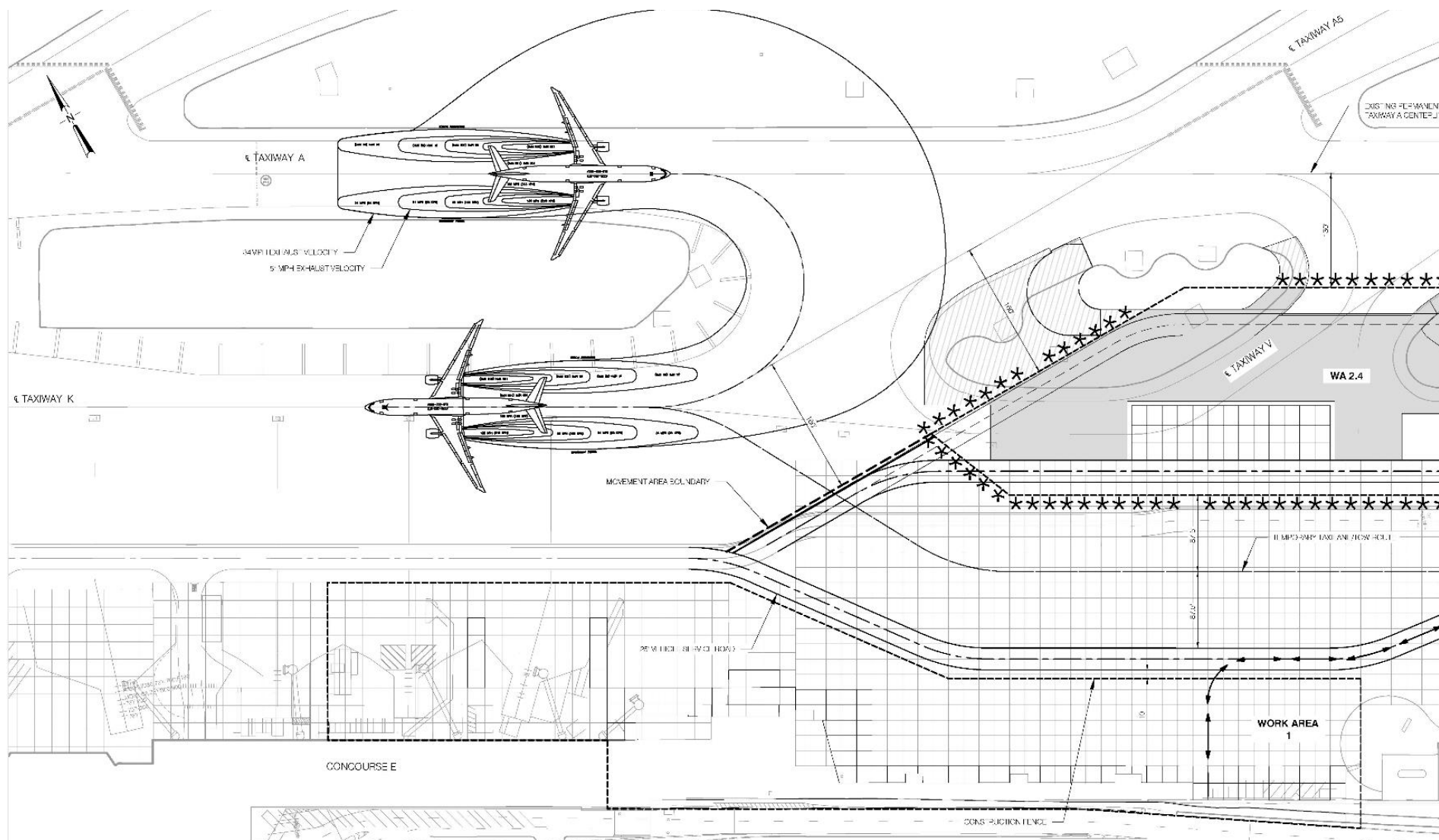
Terminal Rebalancing Work Areas/Location



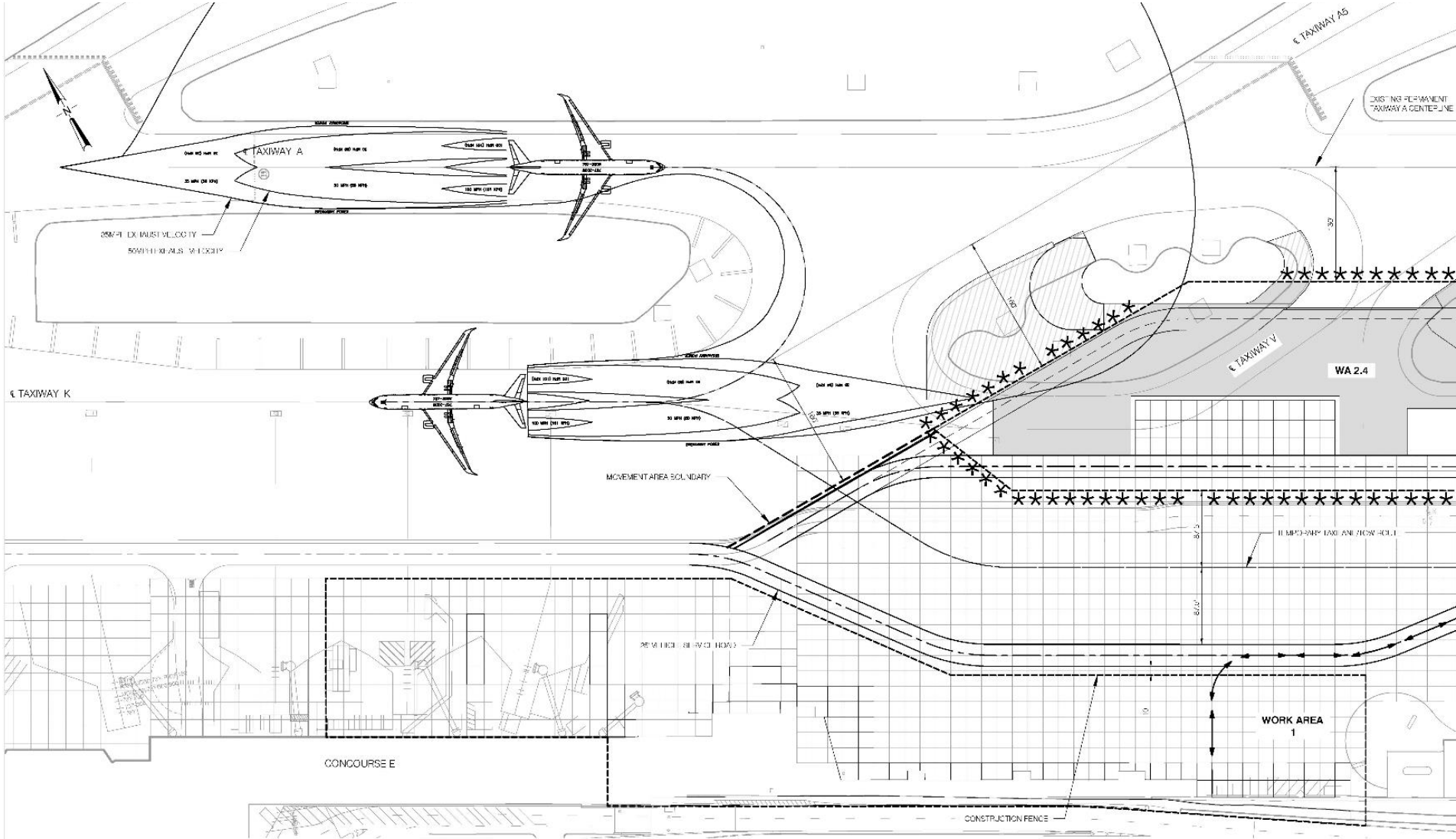
Terminal Rebalancing Work Areas/Location



A330-300 Jet Blast



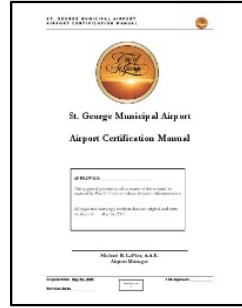
B767-300W Jet Blast



Limits of airfield construction work areas



Airport Certification Manual



Potential damage to aircraft



Airport maintenance



Pavement closures due to airfield construction



Air traffic control



Environmental concerns



Ramp/airline operations



Closed runway



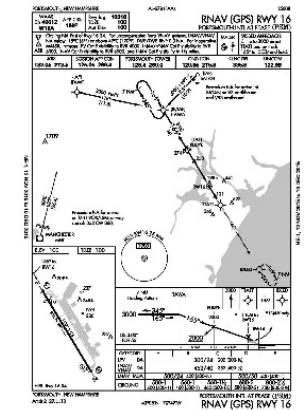
Passengers, workers, public



Nav aids



Instrument approach procedures



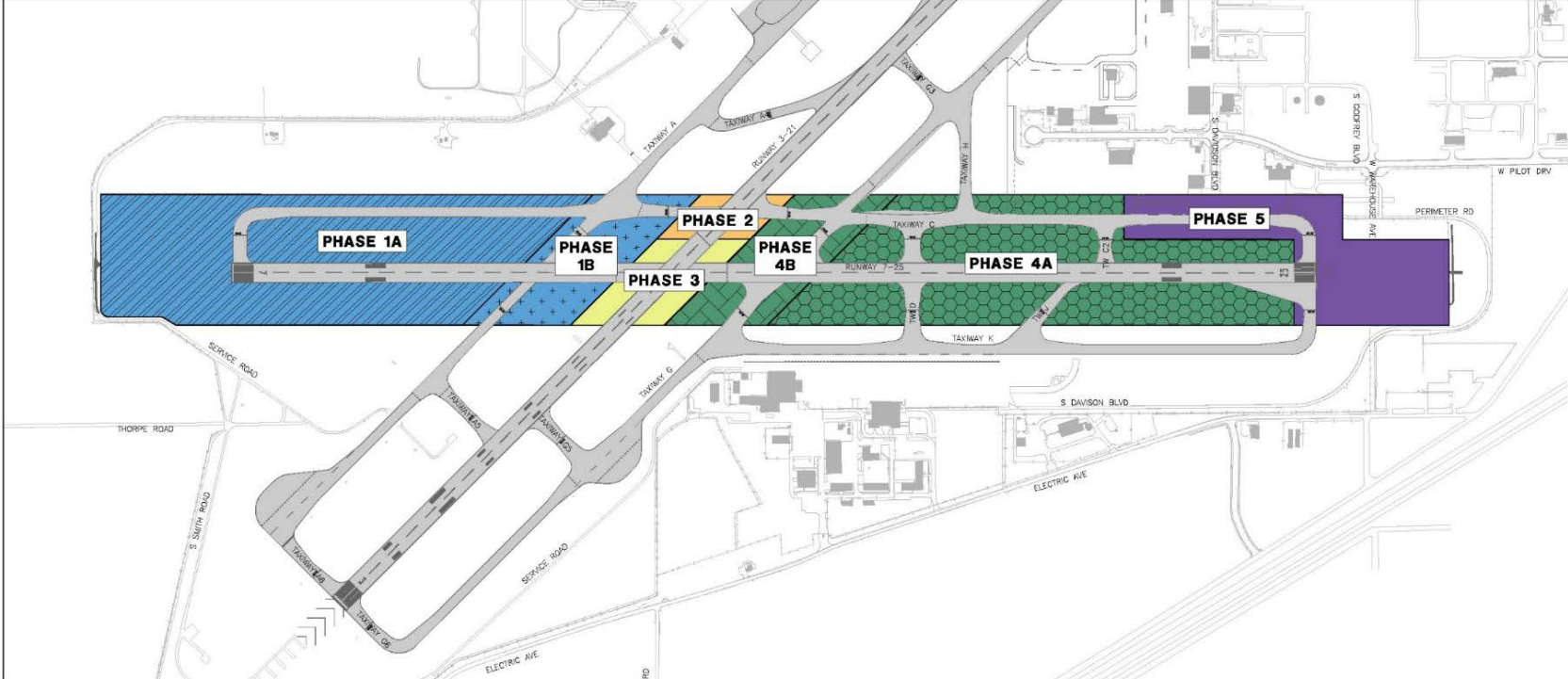
SRM Resources

System Element	Stakeholder	Panelist?
Construction crew		
Airport Cert Manual		
Aircraft operator		
Airfield Operations Dept		
Air Traffic Controllers		
Environmental		
Airline Operations		
Airport capacity		
Passengers/public		
NAVAIDs		
Instrument Approach Procedures		
Other		

Today's Exercise 2 – Project



Runway / Taxiway Improvement Project



CONSTRUCTION PHASING NARRATIVE

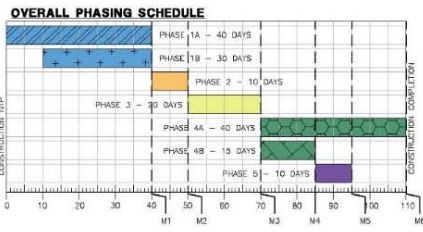
THE CONSTRUCTION PHASING OUTLINED IN THE PLANS IS BROKEN INTO 4 PHASES OF WORK. ALL WORK WITHIN THE LIMITS SHOWN ON THE PHASING DRAWINGS SHALL BE COMPLETED DURING THAT RESPECTIVE PHASE.

CONSTRUCTION NARRATIVE:

- PHASE 1**
 1. PERFORM WORK ON RUNWAY 7-25 AND TAXIWAY C WEST OF RUNWAY 3-21.
- PHASE 2**
 1. PERFORM WORK ON TAXIWAY C AT RUNWAY 3-21 INTERSECTION.
- PHASE 3**
 1. PERFORM WORK AT RUNWAY 7-25 AND RUNWAY 3-21 INTERSECTION.
- PHASE 4**
 1. PERFORM NIGHT WORK ON TAXIWAY C EAST OF RUNWAY 3-21.
- PHASE 5**
 1. PERFORM WORK ON TAXIWAY C BETWEEN TAXIWAY C2 AND TAXIWAY K.

MILESTONES:








- M1: MILESTONE 1 - PHASE 1A AND 1B COMPLETE (40 CALENDAR DAYS FROM NTP) BEGIN PHASE 2
- M2: MILESTONE 2 - PHASE 2 COMPLETE (50 CALENDAR DAYS FROM NTP) BEGIN PHASE 3
- M3: MILESTONE 3 - PHASE 3 COMPLETE (70 CALENDAR DAYS FROM NTP) BEGIN PHASE 4A AND 4B
- M4: MILESTONE 4 - PHASE 4B COMPLETE (85 DAYS FROM NTP) CONTINUE PHASE 4A; BEGIN PHASE 5
- M5: MILESTONE 5 - PHASE 5 COMPLETE (85 CALENDAR DAYS FROM NTP) CONTINUE PHASE 4A
- M6: MILESTONE 6 - ALL PHASES AND CONSTRUCTION COMPLETE (110 CALENDAR DAYS FROM NTP)

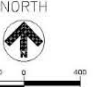


NOTES

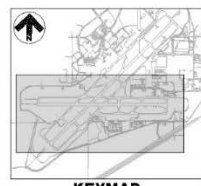
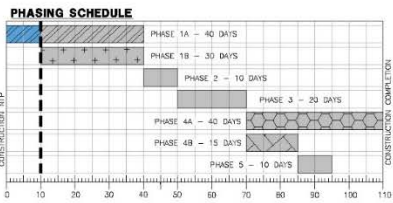
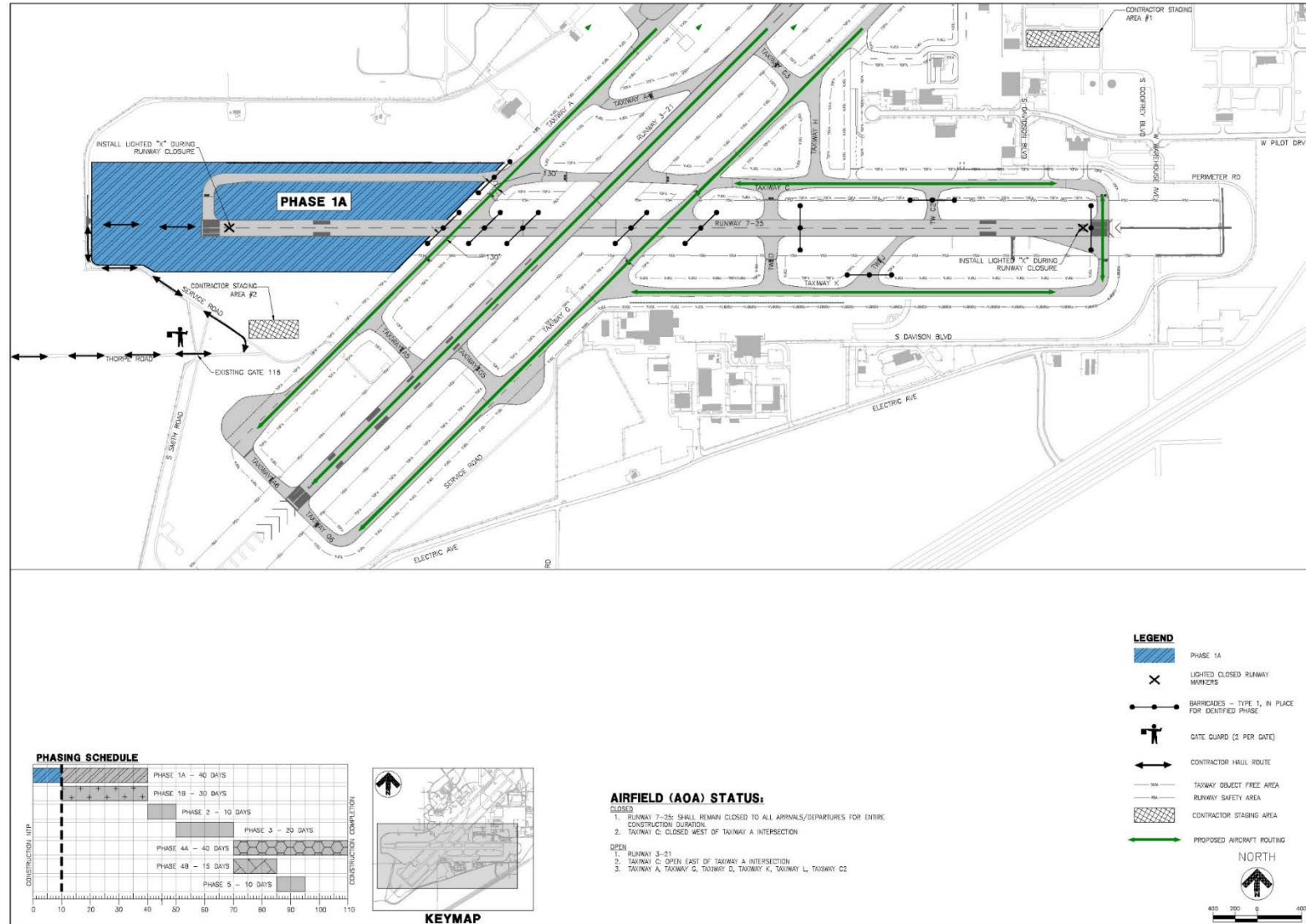
1. CONTRACTOR TO PERFORM REQUIRED WORK WITHIN THE LIMITS SHOWN.
2. ALL AIRCRAFT HAVE THE RIGHT OF WAY OVER CONSTRUCTION VEHICLES AND EQUIPMENT AT ALL TIMES.
3. NO EQUIPMENT, MATERIAL, AND/OR VEHICLES MAY BE STORED OR PARKED WITHIN THE TAXIWAY OBJECT FREE AREA.
4. DUE TO THE IMPORTANCE OF MAINTAINING AIRFIELD OPERATIONS, SAFETY AND SECURITY DURING CONSTRUCTION WITHIN THESE AREAS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE APPRAISED OF AND IMPLEMENT THE GUIDELINES ESTABLISHED IN THE SPECIAL PROVISIONS UNDER SAFETY AND SECURITY AND SPECIFICATION ITEM P-102 SAFETY AND SECURITY.
5. THE CONTRACTOR SHALL CONTINUOUSLY CLEAN UP DURING EACH PHASE OF THE PROJECT AND SHALL PERFORM FINAL CLEAN UP WORK PRIOR TO A FINAL INSPECTION. THE CONTRACTOR SHALL SWEEP ON A DAILY BASIS AS NECESSARY OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL ENSURE THAT ALL FOREIGN OBJECT DEBRIS (FOD) DEPOSITED BY AUTOMOBILE OR CONSTRUCTION EQUIPMENT OR BY WIND BLOWN DEBRIS OR MATERIALS ONTO THOSE ACTIVE AREAS IS IMMEDIATELY CLEANED UP. IT IS IMPERATIVE THAT NO DAMAGE BE DONE TO ANY AIRCRAFT DUE TO FOD. ANY DAMAGE TO AIRCRAFT ATTRIBUTABLE TO FOD FROM THE CONSTRUCTION AREAS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND TAKE APPROPRIATE MEASURES AS NECESSARY OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
7. ANY AREAS UTILIZED AS FIELD OPERATIONS AND STAGING AREAS SHALL BE MAINTAINED AT ALL TIMES IN A CLEAN AND ENVIRONMENTALLY SAFE CONDITION. THE CONTRACTOR SHALL PROVIDE A STABLE SURFACE FOR THE STORAGE EQUIPMENT AND MATERIALS. ANY MATERIALS UTILIZED TO PROVIDE A STABLE SURFACE WILL BE REMOVED AT THE END OF THE PROJECT AND DISPOSED OF AT A LOCATION ACCEPTABLE TO THE OWNER.
8. APPROPRIATE EROSION CONTROL MEASURES AS REQUIRED BY THE CONTRACT DOCUMENTS SHALL BE INSTALLED PRIOR TO BEGINNING THE RESPECTIVE PHASE. REMOVAL OF TEMPORARY EROSION CONTROL SHALL BE ACCOMPLISHED BY THE CONTRACTOR EITHER AT THE COMPLETION OF THE ASSOCIATED PHASE OR THEREAFTER AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND/OR OWNER.

LEGEND

-  PHASE 1A
-  PHASE 1B
-  PHASE 2
-  PHASE 3
-  PHASE 4A
-  PHASE 4B
-  PHASE 5



Phase 1A – Days 1-10



AIRFIELD (AOA) STATUS:

CLOSED

1. RUNWAY 7-25: SHALL REMAIN CLOSED TO ALL ARRIVALS/DEPARTURES FOR ENTIRE CONSTRUCTION DURATION.
2. TAXIWAY C: CLOSED WEST OF TAXIWAY A INTERSECTION.

OPEN

1. RUNWAY 3-21
2. TAXIWAY A: OPEN EAST OF TAXIWAY A INTERSECTION.
3. TAXIWAY A, TAXIWAY G, TAXIWAY S, TAXIWAY L, TAXIWAY O

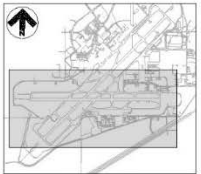
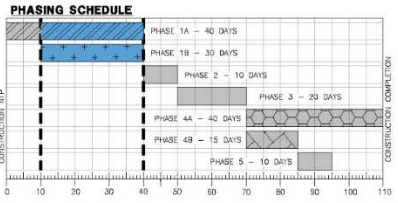
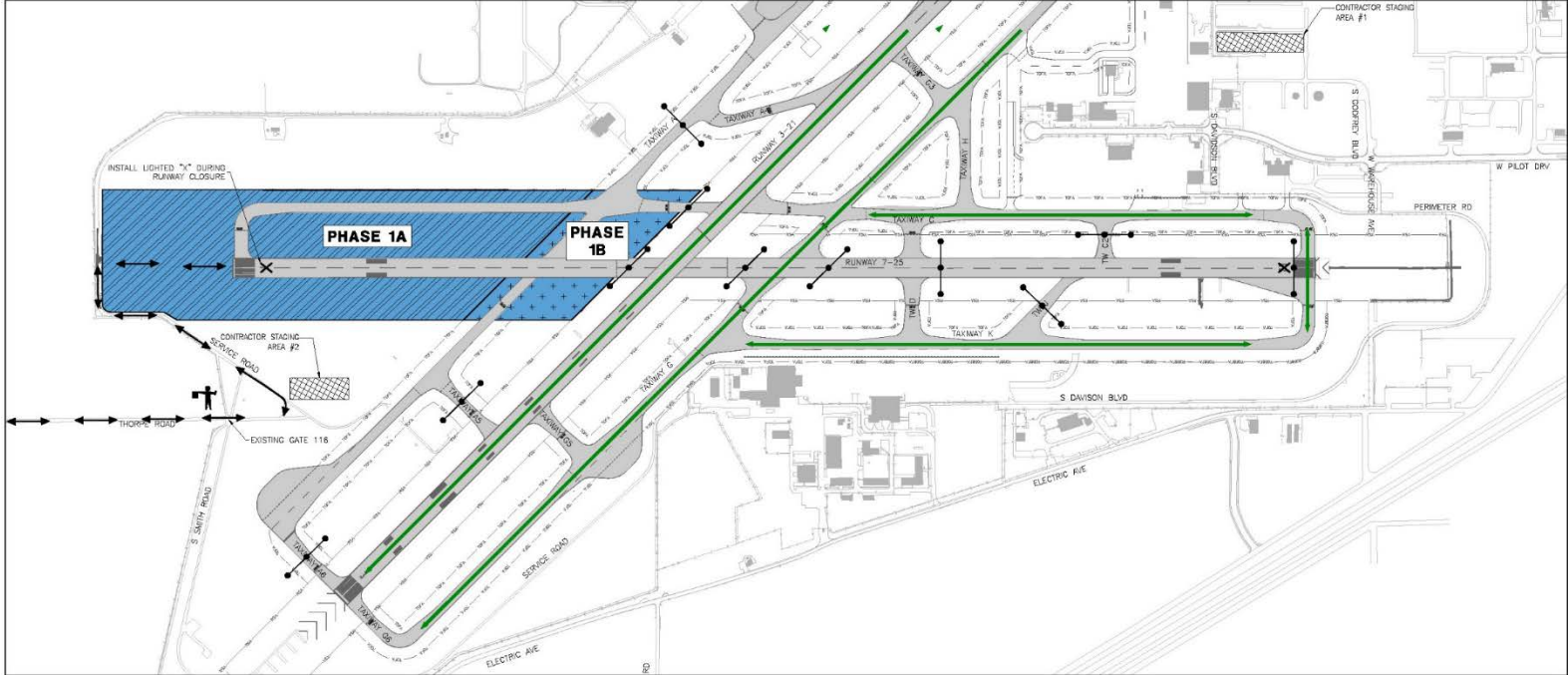
LEGEND

- PHASE 1A
- LIGHTED CLOSED RUNWAY MARKERS
- BARRICADES - TYPE 1, IN PLACE FOR IDENTIFIED PHASE
- GATE GUARD (2 PER GATE)
- CONTRACTOR HAUL ROUTE
- TAXIWAY OBJECT FREE AREA
- RUNWAY SAFETY AREA
- CONTRACTOR STAGING AREA
- PROPOSED AIRCRAFT ROUTING

NORTH

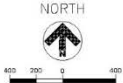
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Phase 1A & 1B – Days 10-40

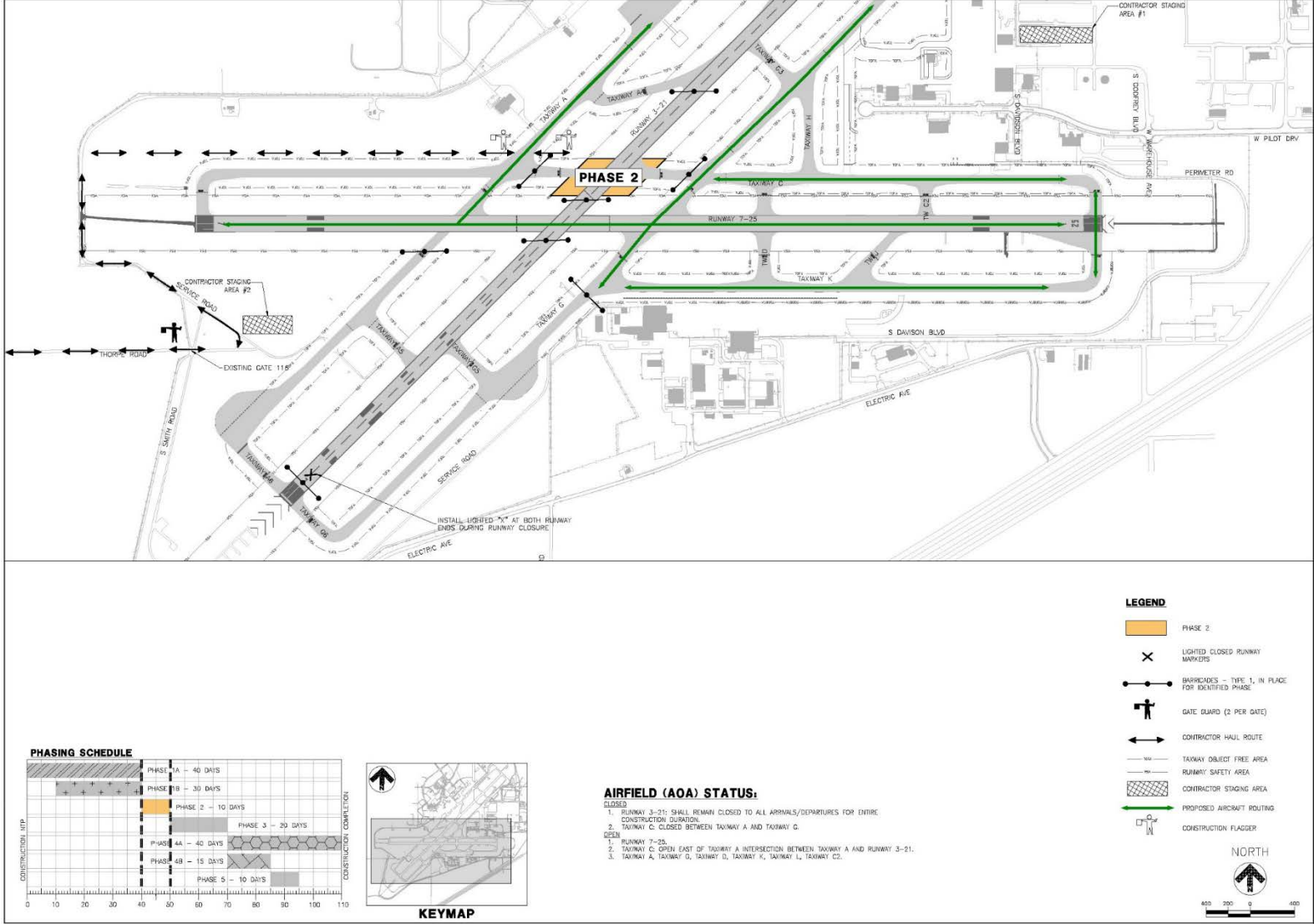


- AIRFIELD (AOA) STATUS:**
- CLOSED**
1. RUNWAY 7-25: SHALL REMAIN CLOSED TO ALL ARRIVALS/DEPARTURES FOR ENTIRE CONSTRUCTION DURATION.
 2. TAXIWAY C: CLOSED WEST OF RUNWAY 3-21
 3. TAXIWAY A: SOUTH OF TAXIWAY A4.
- OPEN**
1. RUNWAY 3-21
 2. TAXIWAY C: OPEN EAST OF RUNWAY 3-21
 3. TAXIWAY G, TAXIWAY D, TAXIWAY K, TAXIWAY L, TAXIWAY C2

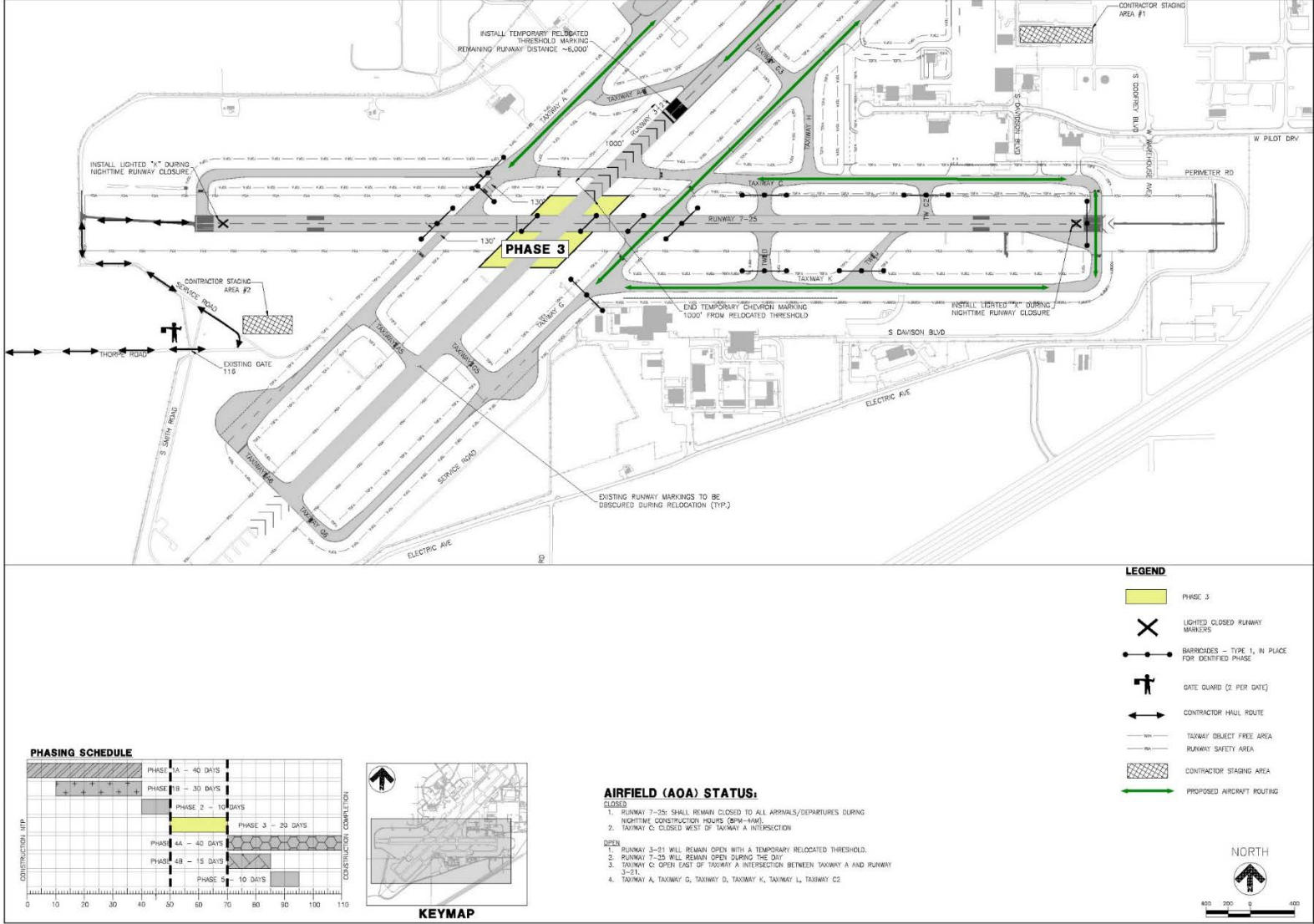
- LEGEND**
- PHASE 1A
 - PHASE 1B
 - LIGHTED CLOSED RUNWAY MARKERS
 - BARRICADES - TYPE 1, IN PLACE FOR IDENTIFIED PHASE
 - GATE GUARD (2 PER GATE)
 - CONTRACTOR HAUL ROUTE
 - TAXIWAY OBJECT FREE AREA
 - RUNWAY SAFETY AREA
 - CONTRACTOR STAGING AREA
 - PROPOSED AIRCRAFT ROUTING



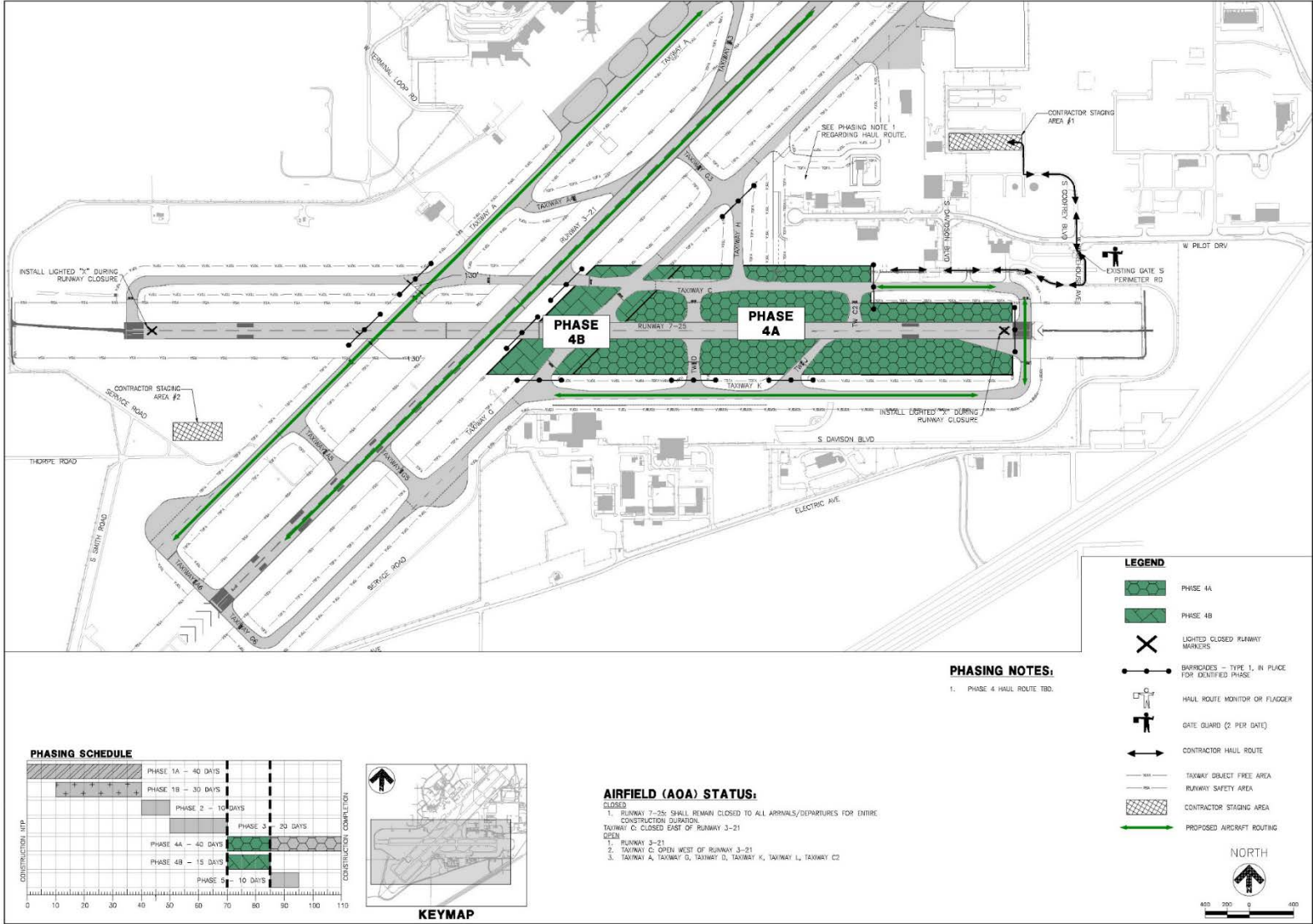
Phase 2 – Days 40-50



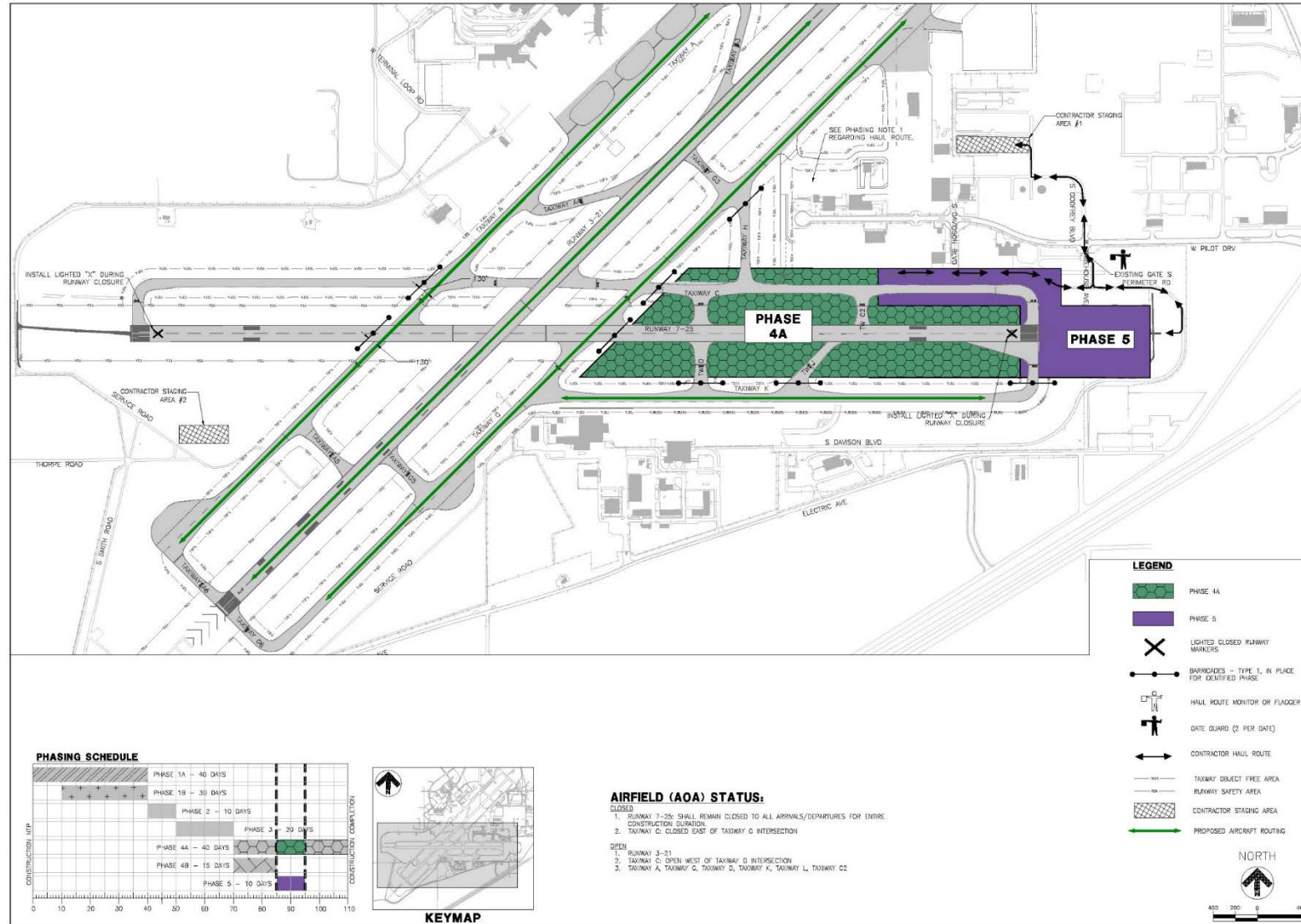
Phase 3 – Days 50-70



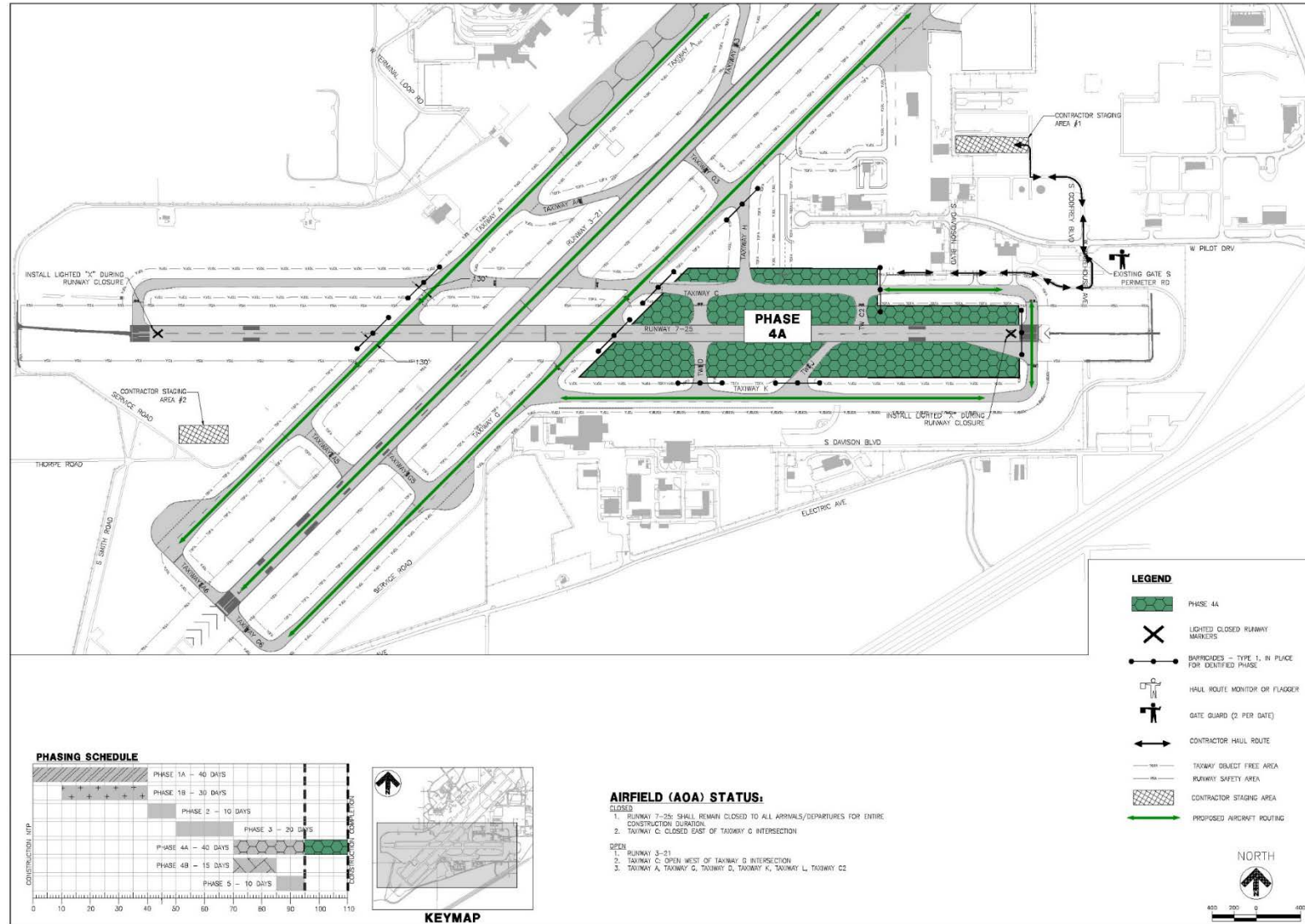
Phases 4A & 4B – Days 70-85



Phases 4A & 5 – Days 85-95



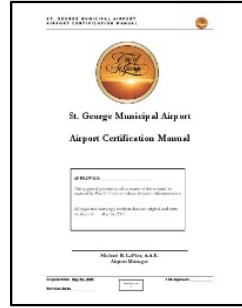
Phase 4A – Days 95-110



Limits of airfield construction work areas



Airport Certification Manual



Potential damage to aircraft



Airport maintenance



Pavement closures due to airfield construction



Air traffic control



Environmental concerns



Ramp/airline operations



Closed runway



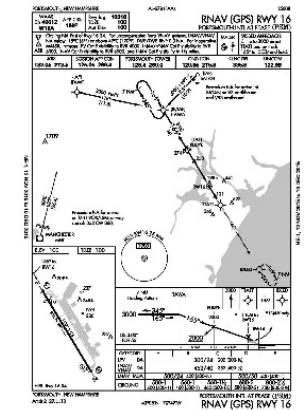
Passengers, workers, public



Nav aids



Instrument approach procedures



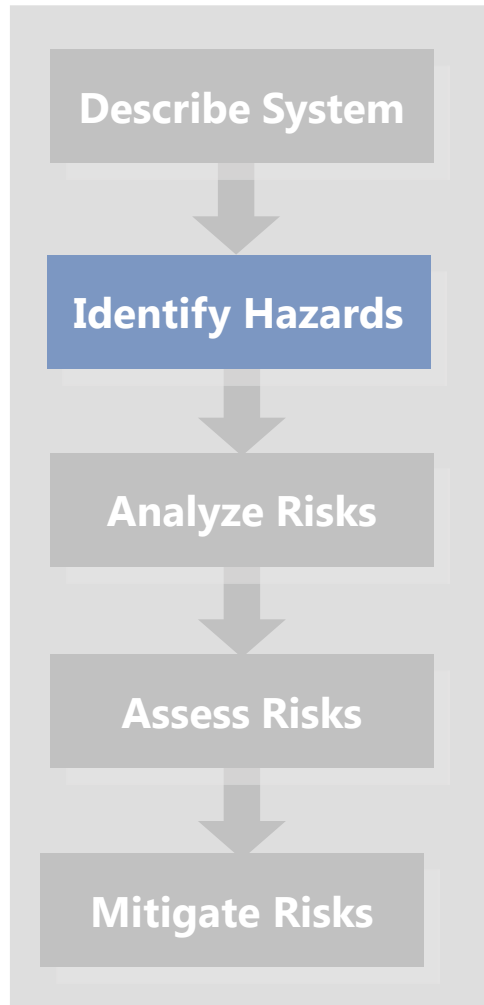
SRM Resources

System Element	Stakeholder	Panelist?
Construction crew		
Airport Cert Manual		
Aircraft operator		
Airfield Operations Dept		
Air Traffic Controllers		
Environmental		
Airline Operations		
Airport capacity		
Passengers/public		
NAVAIDs		
Instrument Approach Procedures		
Other		

Today's Exercise

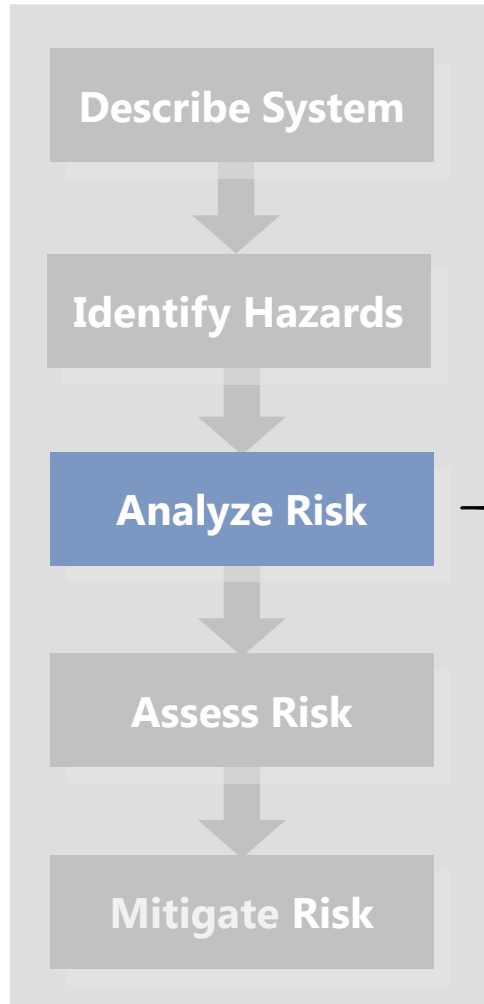


Step 2 – Identify Hazards



Identify any condition or situation that could create adverse safety consequences for the airport, users, and surrounding community. Include operational, personnel, organizational, and environmental factors.

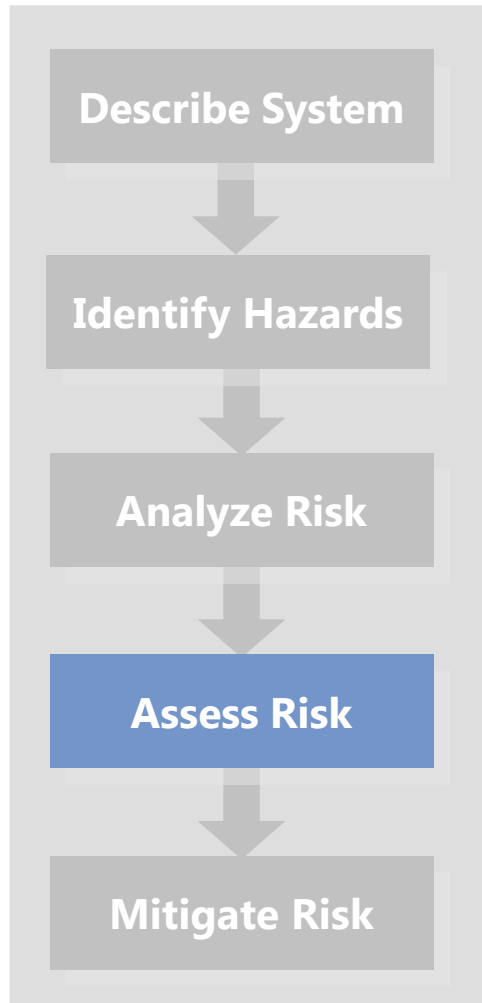
Step 3 – Analyze Risk



For each hazard, identify the worst case scenario that is reasonable or credible within the operational lifetime of the system. Determine severity first, then the likelihood of that severe incident occurring.

	Minimal 5	Minor 4	Major 3	Hazardous 2	Catastrophic 1
Frequent A					
Probable B					
Remote C					
Extremely Remote D					
Extremely Improbable E					

Step 4 – Assess Risk



Severity and likelihood are used to determine associated risk using predictive risk matrix; this is fundamentally mapping the severity and likelihood on the matrix.

	Minimal 5	Minor 4	Major 3	Hazardous 2	Catastrophic 1
Frequent A	Green	Yellow	Yellow	Red	Red
Probable B	Green	Yellow	Yellow	Red	Red
Remote C	Green	Green	Yellow	Red	Red
Extremely Remote D	Green	Green	Green	Yellow	Red
Extremely Improbable E	Green	Green	Green	Green	Yellow/Red

Step 5 – Mitigate the Risk



Identify actions, new or additional controls, mitigations, or other measures to reduce the likelihood or severity of the hazard.

Risk Mitigation

- » Mitigating risk involves:
 - Identifying feasible mitigation options
 - Selecting best response and corrective action
 - Implementing and verifying effectiveness
 - Monitoring the effectiveness of the mitigation through continuous review



