Installation Recovery After Attack (IRAA)

Dynamic Software Solutions, Inc.
4506 HWY 20, Suite 200
Niceville, FL 32578
(850) 635-0198
(800) 725-7304
info@ds2corp.com
http://www.ds2corp.com

INSTALLATION RECOVERY AFTER ATTACK (IRAA)

The United States Air Force Civil Engineer Center (AFCEC), Civil Engineering community, and AF/A7C requires a software tool for managing the airfield damage repair process that will enable operators to manage the personnel, vehicles, equipment, and materials used during the recovery of an installation after attack.

IRAA is currently under development to provide support for installation recovery after attack for the Airfield Damage Repair (ADR) Program of Record (PoR) and will be used in both Garrison and Expeditionary environments by personnel at all echelons of the Air Force; Squadron, Group, Wing, and MAJCOM.

IRAA provides Command and Control (C2) of Airfield Damage Repair (ADR) for recovery of an installation after attack

IRAA CAPABILTIES

IRAA integrates data and information from multiple data sources and provides a much needed capability to manage repair team configurations including vehicles, equipment, personnel, warehouses, and batch plants; and to provide personnel recommendations based on Air Force Specialty Codes (AFSC) and personnel licensing.

IRAA performs repair material calculations and determines expected repair times based on repair size, repair type, and equipment performance parameters. IRAA also has the ability to account for, and plan for, issues encountered during the repair process and to show the effects on the current schedule.

IRAA Benefits

- *Management of the complete ADR Process*
- *Multi-User or Single User Capabilities*
- *Disconnected Editing and Synchronization*
- *Allow various clients to interact with IRAA (IRAA Clients, Mobile Clients, OCU, Sensors)*
- *Interoperable with GeoExPT and JCMS*
- *Ease of Deployment*

In addition, real-time repair team status, timelines, schedules, and production graphs are visualized in the IRAA dashboard enabling commanders to make better informed decisions in the ADR process.

IRAA Capabilities Include:

- Manage a master personnel roster; including AFSC, rank, name, qualifications, location, and training for each individual
- Manage a master equipment list; including consumption and production rates, fuel levels, and status

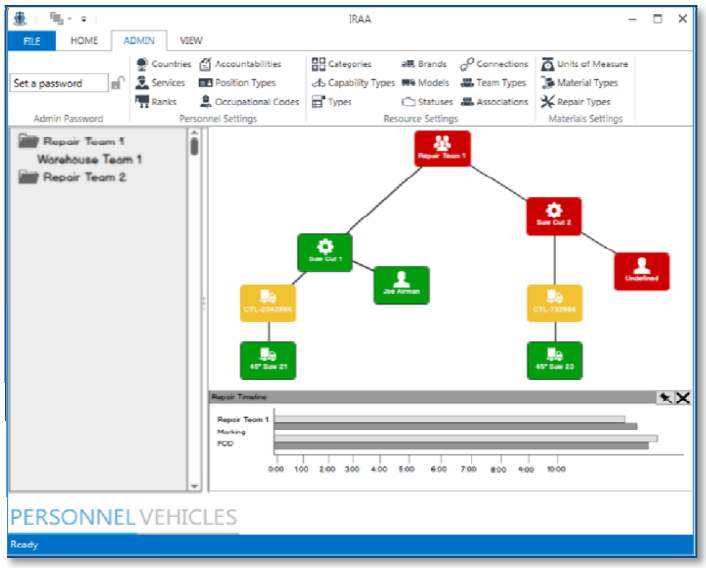
IRAA provides an ADR database and corresponding analysis tools to help in the management of personnel, vehicles, equipment, and materials

- Manage repair materials; including type, quantity on hand, and storage locations
- Manage repair teams and their make up; including vehicles, personnel, warehouses, and batch plants
- Manage UXO mitigation status
- Manage identified craters and repair zones including assignment to repair teams
- Manage the damage repair process and repair zones in real time as damage is repaired
- Manage repair quality for every repair team and repair zone completed

IRAA Adheres to USAF Standards and Regulations

- *AFMAN 91-201; Explosives Safety Standards*
- *AFPAM 10-219, v1; Contingency and Disaster Planning*
- *AFPAM 10-219, v2; CE Disaster and Attack Preparations*
- *AFPAM 10-219, v3; CE Disaster and Attack Recovery Procedures*
- *AFPAM 10-219 v4; Airfield Damage Repair Operations*
- *Technical Order 35E2-4-1; Repair Quality Criteria System for Rapid Runway Repair*

- Manage project timelines; including projected schedule and completion time
- Visualize production graphs and schedule; including charts per team and heat charts
- Account for injections of issues during the repair process and to show the effects on the existing schedule
- Account for logistics; including transportation times and management of warehouse storage locations and material management



- Manage at the team level, and report at the Emergency Operation Center (EOC) level

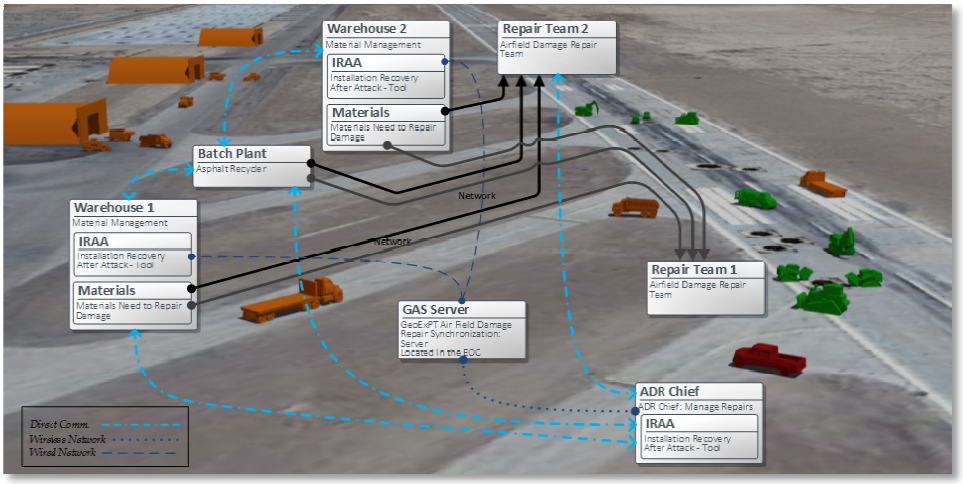
- Import and export functionality including simple and complex data transformations (e.g. export of damage spatial features for import into GeoExPT)
- Integrate data from other data sources, including but not limited to GeoExPT and Automated Civil Engineer System – Personnel Readiness (ACES-PR)
- Generate various reports (e.g., team production, schedule, and team list)

IRAA USER STORIES

User stories are short, simple description of a feature told from the perspective of the person (i.e. Logistics Chief) who desires the new capability in the system.

IRAA supports each user and their role in the airfield recovery process

User stories in IRAA help to illustrate the work flow and provide an overview of the different scenarios of how IRAA will be used by personnel in various IRAA roles.



The various ADR users and the roles they play in the airfield recovery process have been thoroughly research, observed (i.e. Silver Flag), and analyzed so that IRAA would be designed to effectively support the user community. Each intended user and their role is described in the following table. To understand how users will use IRAA and what they intend to achieve, please see the IRAA User Stories in the appendix.

IRAA Users	
User	**Role**
ADR OIC	Officer in Charge (OIC) of all airfield recovery activities
Crater Chief	Non-Commissioned Officer in Charge of all pavement repair activities

IRAA Users	
User	**Role**
Support Chief	Non-Commissioned Officer in Charge of ADR support teams (EALS, MAAS, MAOS Marking, and WaFERS)
Logistics Chief	Non-Commissioned Officer in Charge of ADR logistics support (batch plant and warehouse operations)
Crater Repair Team Lead	Non-Commissioned Officer in Charge of crater repair
FOD Team Lead	Non-Commissioned Officer in Charge of Foreign Object Debris (FOD) removal
Warehouse Team Lead	Non-Commissioned Officer in Charge of ADR materials and transport
Batch Plant Team Lead	Non-Commissioned Officer in Charge of asphalt batch plants
AAS Team Lead	Non-Commissioned Officer in Charge of the Aircraft Arresting Systems (AAS)
EALS Team Lead	Non-Commissioned Officer in Charge of Emergency Airfield Lighting System (EALS)
MAOS Marking Team Lead	Non-Commissioned Officer in Charge of the Minimum Airfield Operating Surface (MAOS) Marking and Striping
WaFERS Team Lead	Non-Commissioned Officer in Charge of the Water and Fuels Expeditionary Repair System (WaFERS)

SUMMARY

The Civil Engineer community is responsible for the repair of airfield pavement surfaces after an attack from non-friendly assaults. HQ AF/A7C currently utilizes spreadsheets and paper-based tools to support requirements for airfield surfaces that must be repaired in a timely fashion to support air operations within the Area of Responsibility (AOR).

With the development of IRAA, HQ AF/A7C will be able to use modern software tools and processes to streamline and perform installation recovery after attack.

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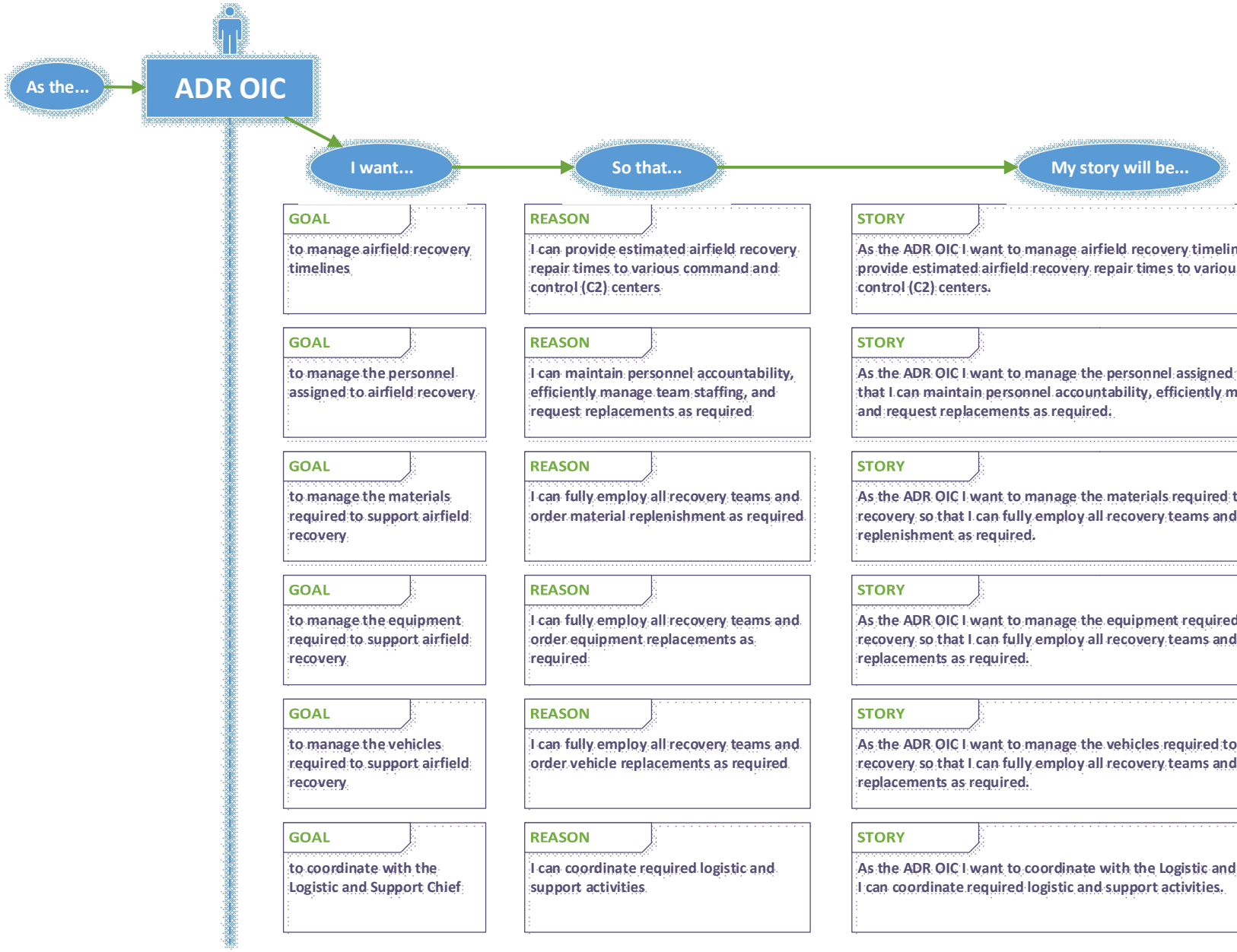
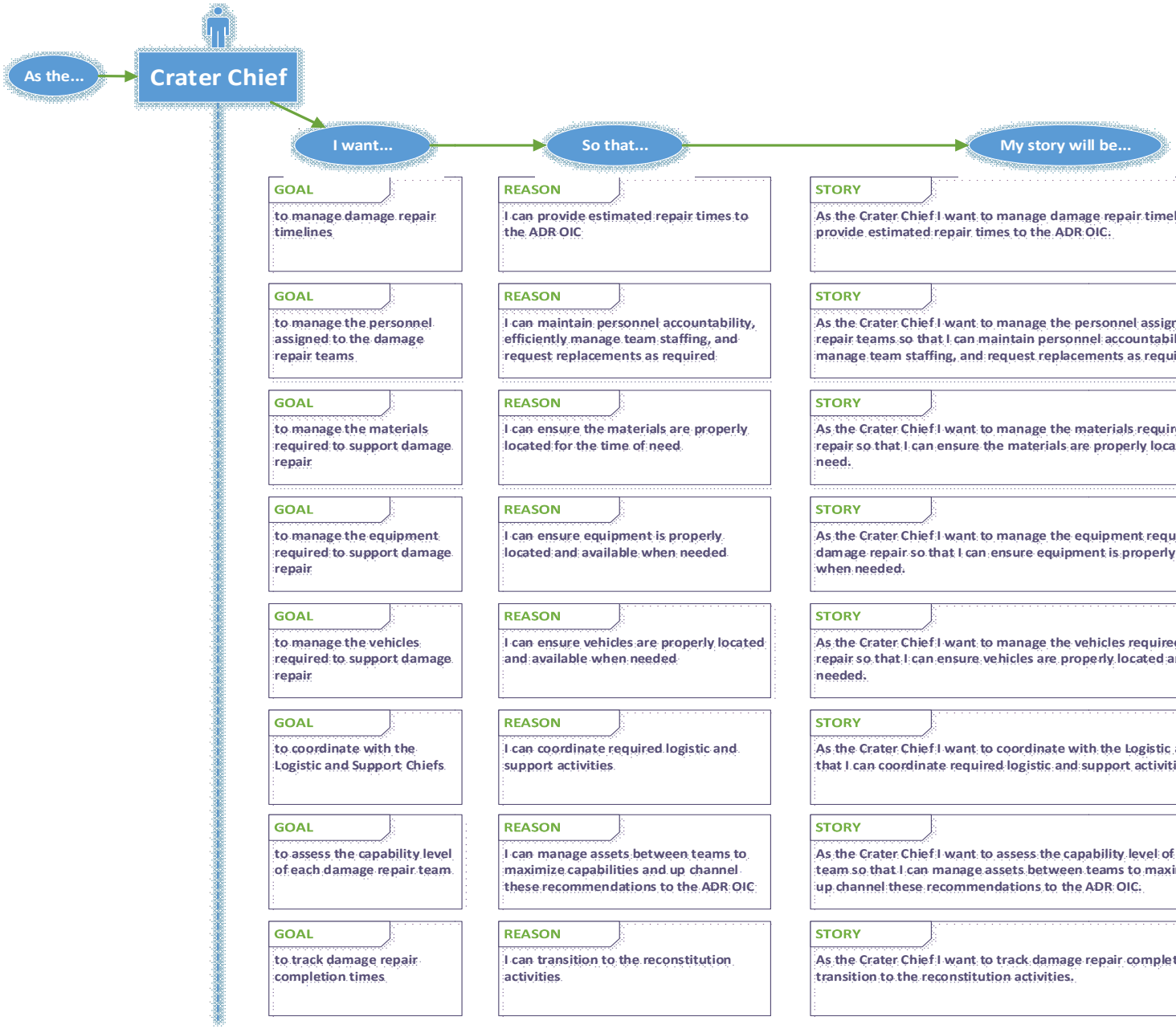
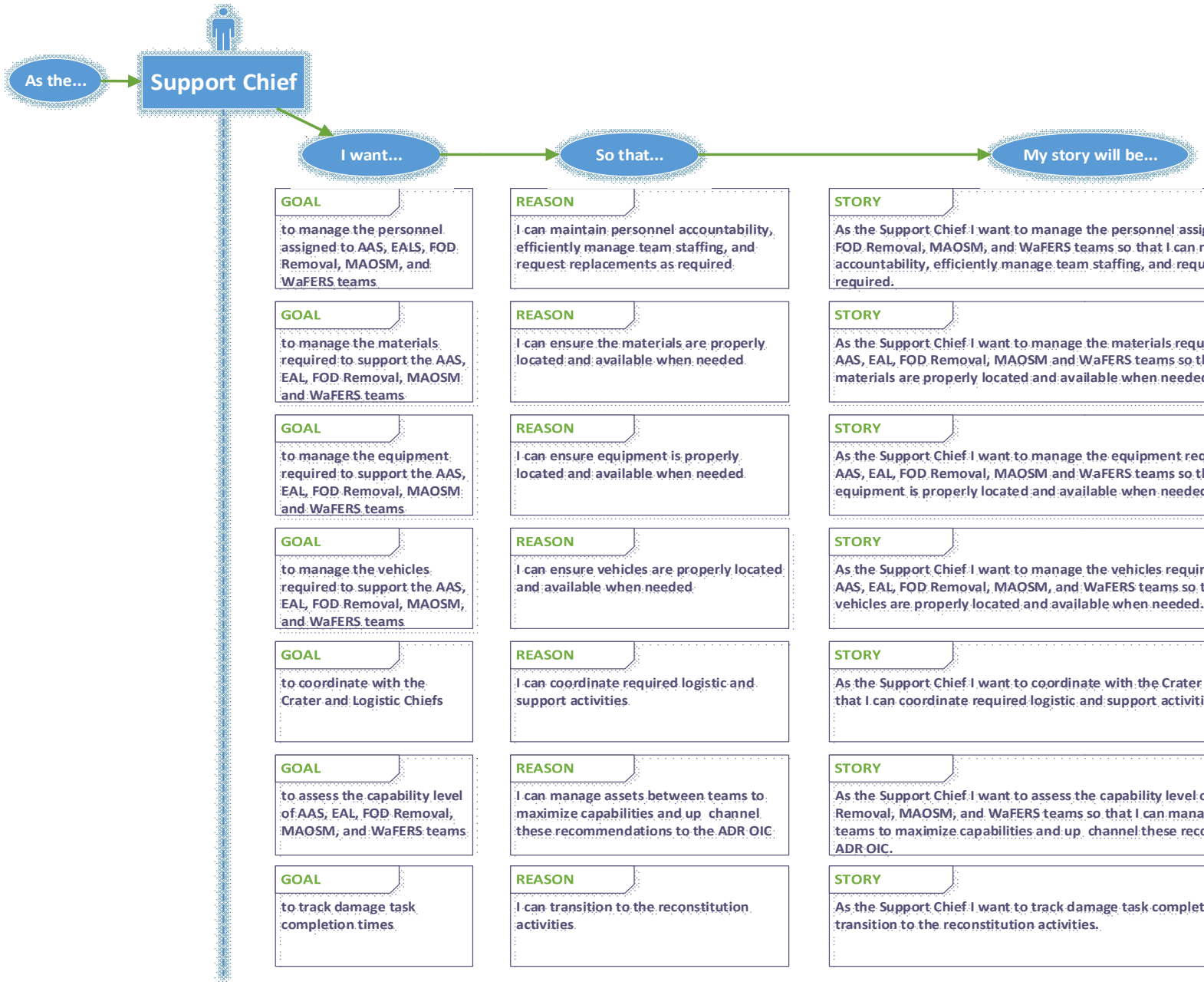


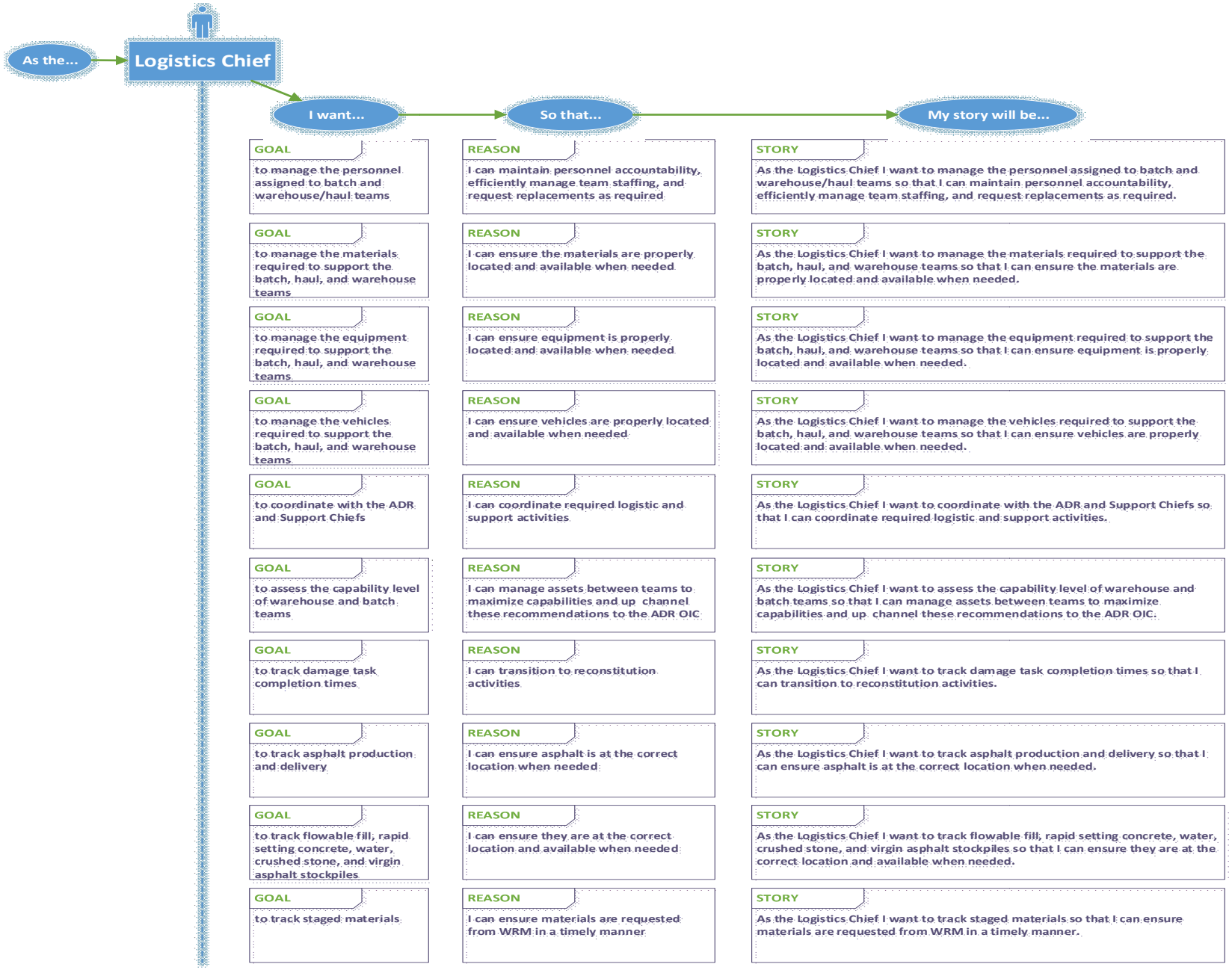
GOAL	REASON	STORY
to manage airfield recovery timelines	I can provide estimated airfield recovery repair times to various command and control (C2) centers	As the ADR OIC I want to manage airfield recovery timelines so that I can provide estimated airfield recovery repair times to various command and control (C2) centers.
to manage the personnel assigned to airfield recovery	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the ADR OIC I want to manage the personnel assigned to airfield recovery so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the materials required to support airfield recovery	I can fully employ all recovery teams and order material replenishment as required	As the ADR OIC I want to manage the materials required to support airfield recovery so that I can fully employ all recovery teams and order material replenishment as required.
to manage the equipment required to support airfield recovery	I can fully employ all recovery teams and order equipment replacements as required	As the ADR OIC I want to manage the equipment required to support airfield recovery so that I can fully employ all recovery teams and order equipment replacements as required.
to manage the vehicles required to support airfield recovery	I can fully employ all recovery teams and order vehicle replacements as required	As the ADR OIC I want to manage the vehicles required to support airfield recovery so that I can fully employ all recovery teams and order vehicle replacements as required.
to coordinate with the Logistic and Support Chief	I can coordinate required logistic and support activities	As the ADR OIC I want to coordinate with the Logistic and Support Chief so that I can coordinate required logistic and support activities.



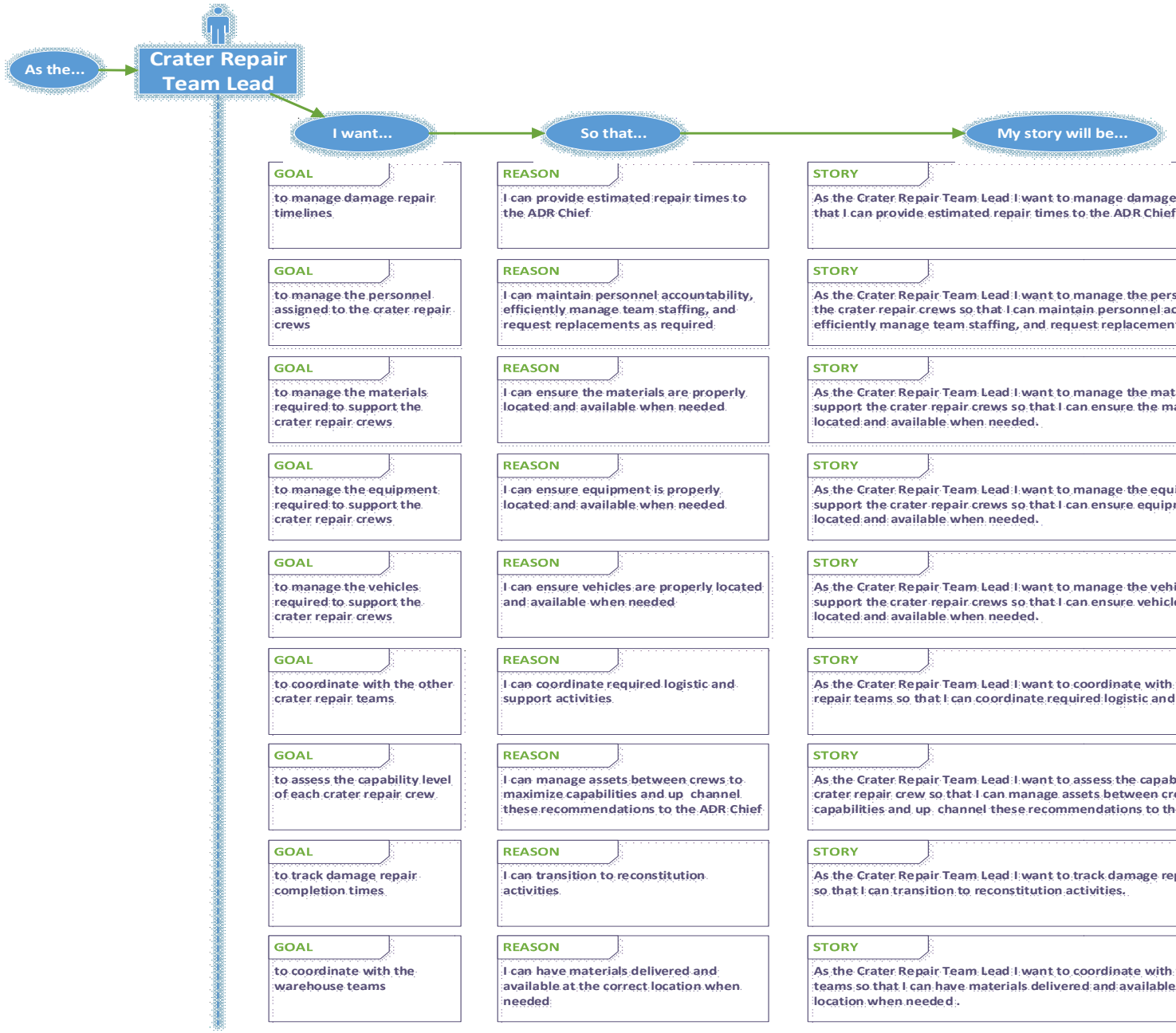
GOAL	REASON	STORY
to manage damage repair timelines	I can provide estimated repair times to the ADR OIC	As the Crater Chief I want to manage damage repair timelines so that I can provide estimated repair times to the ADR OIC.
to manage the personnel assigned to the damage repair teams	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the Crater Chief I want to manage the personnel assigned to the damage repair teams so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the materials required to support damage repair	I can ensure the materials are properly located for the time of need	As the Crater Chief I want to manage the materials required to support damage repair so that I can ensure the materials are properly located for the time of need.
to manage the equipment required to support damage repair	I can ensure equipment is properly located and available when needed	As the Crater Chief I want to manage the equipment required to support damage repair so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support damage repair	I can ensure vehicles are properly located and available when needed	As the Crater Chief I want to manage the vehicles required to support damage repair so that I can ensure vehicles are properly located and available when needed.
to coordinate with the Logistic and Support Chiefs	I can coordinate required logistic and support activities	As the Crater Chief I want to coordinate with the Logistic and Support Chiefs so that I can coordinate required logistic and support activities.
to assess the capability level of each damage repair team	I can manage assets between teams to maximize capabilities and up channel these recommendations to the ADR OIC	As the Crater Chief I want to assess the capability level of each damage repair team so that I can manage assets between teams to maximize capabilities and up channel these recommendations to the ADR OIC.
to track damage repair completion times	I can transition to the reconstitution activities	As the Crater Chief I want to track damage repair completion times so that I can transition to the reconstitution activities.



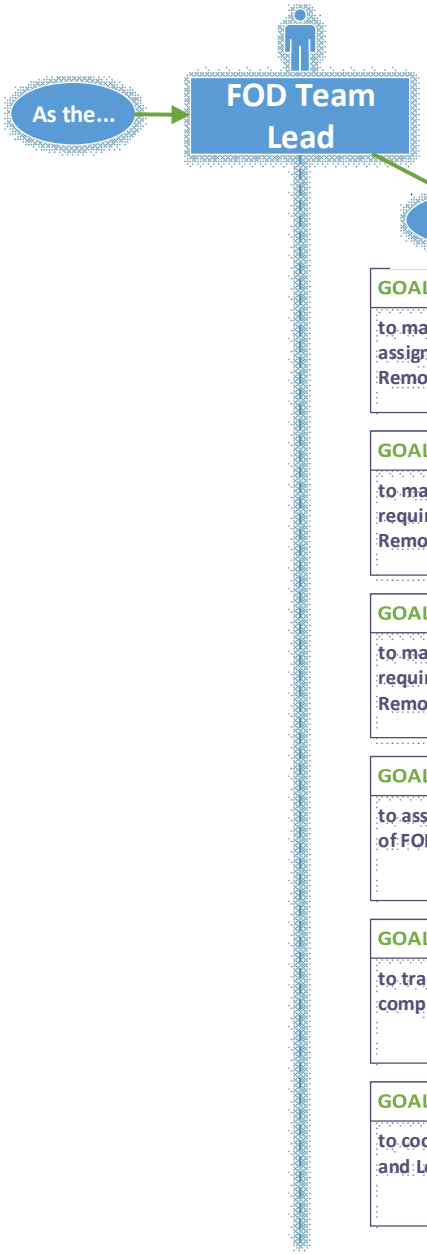
GOAL	REASON	STORY
to manage the personnel assigned to AAS, EALS, FOD Removal, MAOSM, and WaFERS teams	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the Support Chief I want to manage the personnel assigned to AAS, EALS, FOD Removal, MAOSM, and WaFERS teams so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the materials required to support the AAS, EAL, FOD Removal, MAOSM and WaFERS teams	I can ensure the materials are properly located and available when needed	As the Support Chief I want to manage the materials required to support the AAS, EAL, FOD Removal, MAOSM and WaFERS teams so that I can ensure the materials are properly located and available when needed.
to manage the equipment required to support the AAS, EAL, FOD Removal, MAOSM and WaFERS teams	I can ensure equipment is properly located and available when needed	As the Support Chief I want to manage the equipment required to support the AAS, EAL, FOD Removal, MAOSM and WaFERS teams so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the AAS, EAL, FOD Removal, MAOSM, and WaFERS teams	I can ensure vehicles are properly located and available when needed	As the Support Chief I want to manage the vehicles required to support the AAS, EAL, FOD Removal, MAOSM, and WaFERS teams so that I can ensure vehicles are properly located and available when needed.
to coordinate with the Crater and Logistic Chiefs	I can coordinate required logistic and support activities	As the Support Chief I want to coordinate with the Crater and Logistic Chiefs so that I can coordinate required logistic and support activities.
to assess the capability level of AAS, EAL, FOD Removal, MAOSM, and WaFERS teams	I can manage assets between teams to maximize capabilities and up channel these recommendations to the ADR OIC	As the Support Chief I want to assess the capability level of AAS, EAL, FOD Removal, MAOSM, and WaFERS teams so that I can manage assets between teams to maximize capabilities and up channel these recommendations to the ADR OIC.
to track damage task completion times	I can transition to the reconstitution activities	As the Support Chief I want to track damage task completion times so that I can transition to the reconstitution activities.



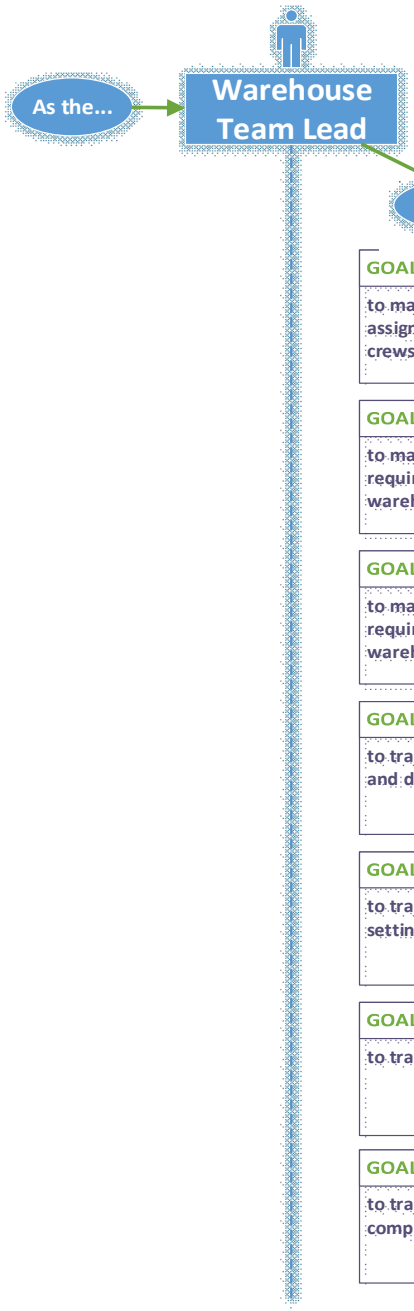
GOAL	REASON	STORY
to manage the personnel assigned to batch and warehouse/haul teams	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the Logistics Chief I want to manage the personnel assigned to batch and warehouse/haul teams so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the materials required to support the batch, haul, and warehouse teams	I can ensure the materials are properly located and available when needed	As the Logistics Chief I want to manage the materials required to support the batch, haul, and warehouse teams so that I can ensure the materials are properly located and available when needed.
to manage the equipment required to support the batch, haul, and warehouse teams	I can ensure equipment is properly located and available when needed	As the Logistics Chief I want to manage the equipment required to support the batch, haul, and warehouse teams so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the batch, haul, and warehouse teams	I can ensure vehicles are properly located and available when needed	As the Logistics Chief I want to manage the vehicles required to support the batch, haul, and warehouse teams so that I can ensure vehicles are properly located and available when needed.
to coordinate with the ADR and Support Chiefs	I can coordinate required logistic and support activities	As the Logistics Chief I want to coordinate with the ADR and Support Chiefs so that I can coordinate required logistic and support activities.
to assess the capability level of warehouse and batch teams	I can manage assets between teams to maximize capabilities and up channel these recommendations to the ADR OIC	As the Logistics Chief I want to assess the capability level of warehouse and batch teams so that I can manage assets between teams to maximize capabilities and up channel these recommendations to the ADR OIC.
to track damage task completion times	I can transition to reconstitution activities	As the Logistics Chief I want to track damage task completion times so that I can transition to reconstitution activities.
to track asphalt production and delivery	I can ensure asphalt is at the correct location when needed	As the Logistics Chief I want to track asphalt production and delivery so that I can ensure asphalt is at the correct location when needed.
to track flowable fill, rapid setting concrete, water, crushed stone, and virgin asphalt stockpiles	I can ensure they are at the correct location and available when needed	As the Logistics Chief I want to track flowable fill, rapid setting concrete, water, crushed stone, and virgin asphalt stockpiles so that I can ensure they are at the correct location and available when needed.
to track staged materials	I can ensure materials are requested from WRM in a timely manner	As the Logistics Chief I want to track staged materials so that I can ensure materials are requested from WRM in a timely manner.



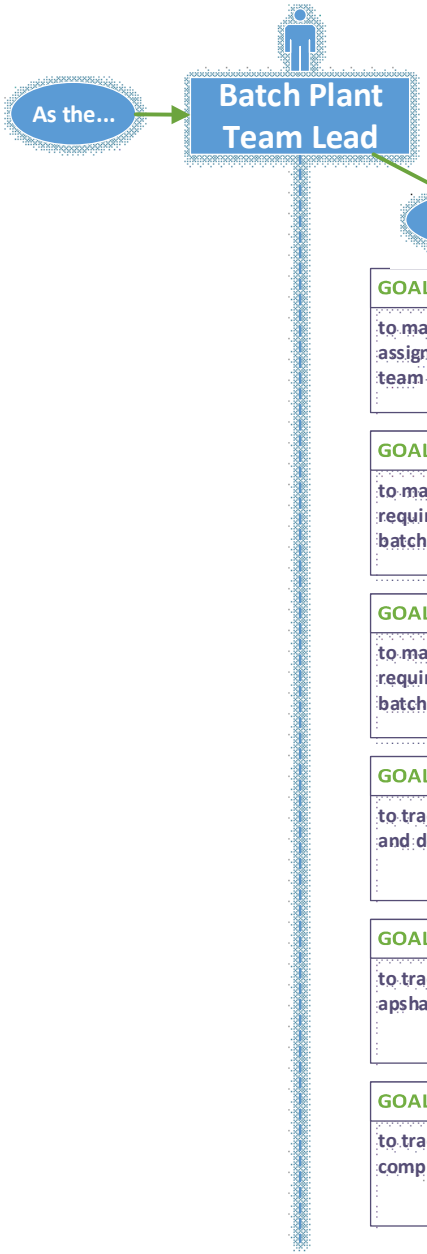
GOAL	REASON	STORY
to manage damage repair timelines	I can provide estimated repair times to the ADR Chief	As the Crater Repair Team Lead I want to manage damage repair timelines so that I can provide estimated repair times to the ADR Chief.
to manage the personnel assigned to the crater repair crews	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the Crater Repair Team Lead I want to manage the personnel assigned to the crater repair crews so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the materials required to support the crater repair crews	I can ensure the materials are properly located and available when needed	As the Crater Repair Team Lead I want to manage the materials required to support the crater repair crews so that I can ensure the materials are properly located and available when needed.
to manage the equipment required to support the crater repair crews	I can ensure equipment is properly located and available when needed	As the Crater Repair Team Lead I want to manage the equipment required to support the crater repair crews so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the crater repair crews	I can ensure vehicles are properly located and available when needed	As the Crater Repair Team Lead I want to manage the vehicles required to support the crater repair crews so that I can ensure vehicles are properly located and available when needed.
to coordinate with the other crater repair teams	I can coordinate required logistic and support activities	As the Crater Repair Team Lead I want to coordinate with the other crater repair teams so that I can coordinate required logistic and support activities.
to assess the capability level of each crater repair crew	I can manage assets between crews to maximize capabilities and up channel these recommendations to the ADR Chief	As the Crater Repair Team Lead I want to assess the capability level of each crater repair crew so that I can manage assets between crews to maximize capabilities and up channel these recommendations to the ADR Chief.
to track damage repair completion times	I can transition to reconstitution activities	As the Crater Repair Team Lead I want to track damage repair completion times so that I can transition to reconstitution activities.
to coordinate with the warehouse teams	I can have materials delivered and available at the correct location when needed	As the Crater Repair Team Lead I want to coordinate with the warehouse teams so that I can have materials delivered and available at the correct location when needed.



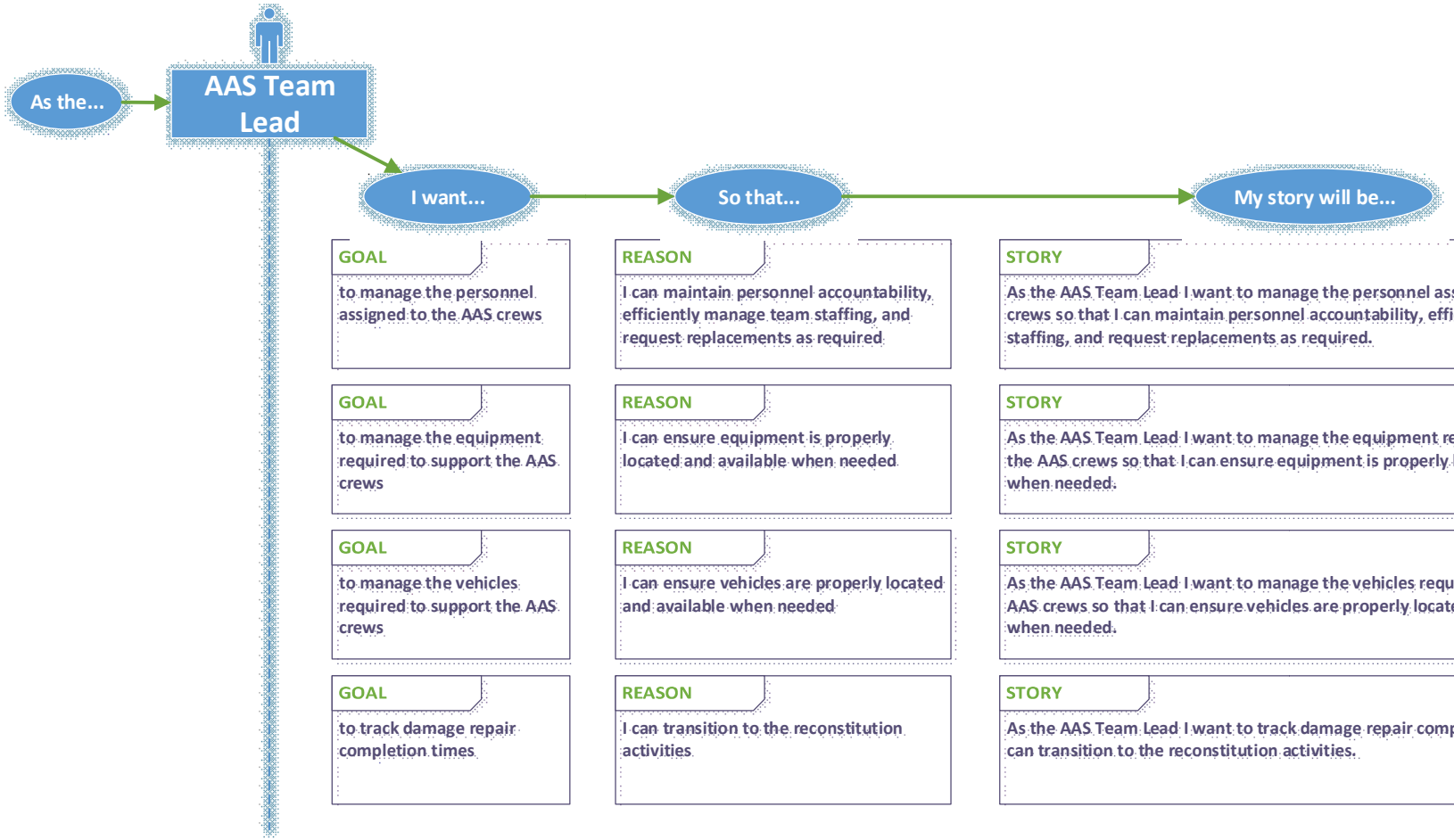
GOAL	REASON	STORY
to manage the personnel assigned to the FOD Removal crews	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the FOD Team Lead I want to manage the personnel assigned to the FOD Removal crews so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the equipment required to support the FOD Removal crews	I can ensure equipment is properly located and available when needed	As the FOD Team Lead I want to manage the equipment required to support the FOD Removal crews so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the FOD Removal crews	I can ensure vehicles are properly located and available when needed	As the FOD Team Lead I want to manage the vehicles required to support the FOD Removal crews so that I can ensure vehicles are properly located and available when needed.
to assess the capability level of FOD Removal crews	I can manage assets between crews to maximize capabilities and up channel these recommendations to the Support Chief	As the FOD Team Lead I want to assess the capability level of FOD Removal crews so that I can manage assets between crews to maximize capabilities and up channel these recommendations to the Support Chief.
to track damage repair completion times	I can transition to reconstitution activities	As the FOD Team Lead I want to track damage repair completion times so that I can transition to reconstitution activities.
to coordinate with the ADR and Logistics Chiefs	I can know where areas have opened for FOD removal activities	As the FOD Team Lead I want to coordinate with the ADR and Logistics Chiefs so that I can know where areas have opened for FOD removal activities.



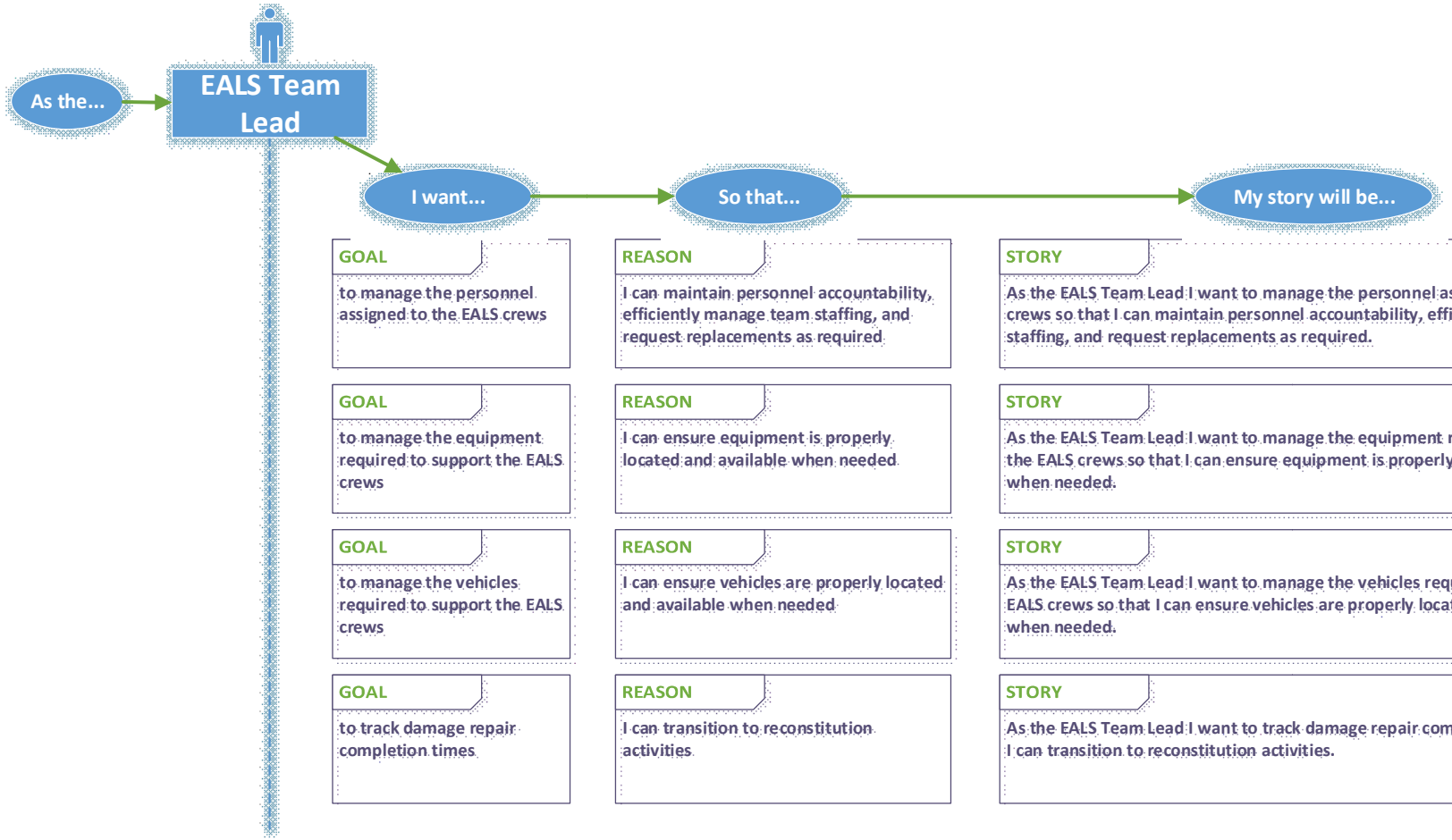
I want...	So that...	My story will be...
GOAL: to manage the personnel assigned to the warehouse crews	REASON: I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	STORY: As the Warehouse Team Lead I want to manage the personnel assigned to the warehouse crews so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
GOAL: to manage the equipment required to support the warehouse crews	REASON: I can ensure equipment is properly located and available when needed	STORY: As the Warehouse Team Lead I want to manage the equipment required to support the warehouse crews so that I can ensure equipment is properly located and available when needed.
GOAL: to manage the vehicles required to support the warehouse crews	REASON: I can ensure vehicles are properly located and available when needed	STORY: As the Warehouse Team Lead I want to manage the vehicles required to support the warehouse crews so that I can ensure vehicles are properly located and available when needed.
GOAL: to track asphalt production and delivery	REASON: I can ensure it is at the correct location and available when needed	STORY: As the Warehouse Team Lead I want to track asphalt production and delivery so that I can ensure it is at the correct location and available when needed .
GOAL: to track flowable fill, rapid setting concrete, and water	REASON: I can ensure it is at the correct location and available when needed	STORY: As the Warehouse Team Lead I want to track flowable fill, rapid setting concrete, and water so that I can ensure it is at the correct location and available when needed.
GOAL: to track staged materials	REASON: I can ensure materials are requested from WRM in a timely manne	STORY: As the Warehouse Team Lead I want to track staged materials so that I can ensure materials are requested from WRM in a timely manner.
GOAL: to track damage repair completion times	REASON: I can transition to reconstitution activities	STORY: As the Warehouse Team Lead I want to track damage repair completion times so that I can transition to reconstitution activities.



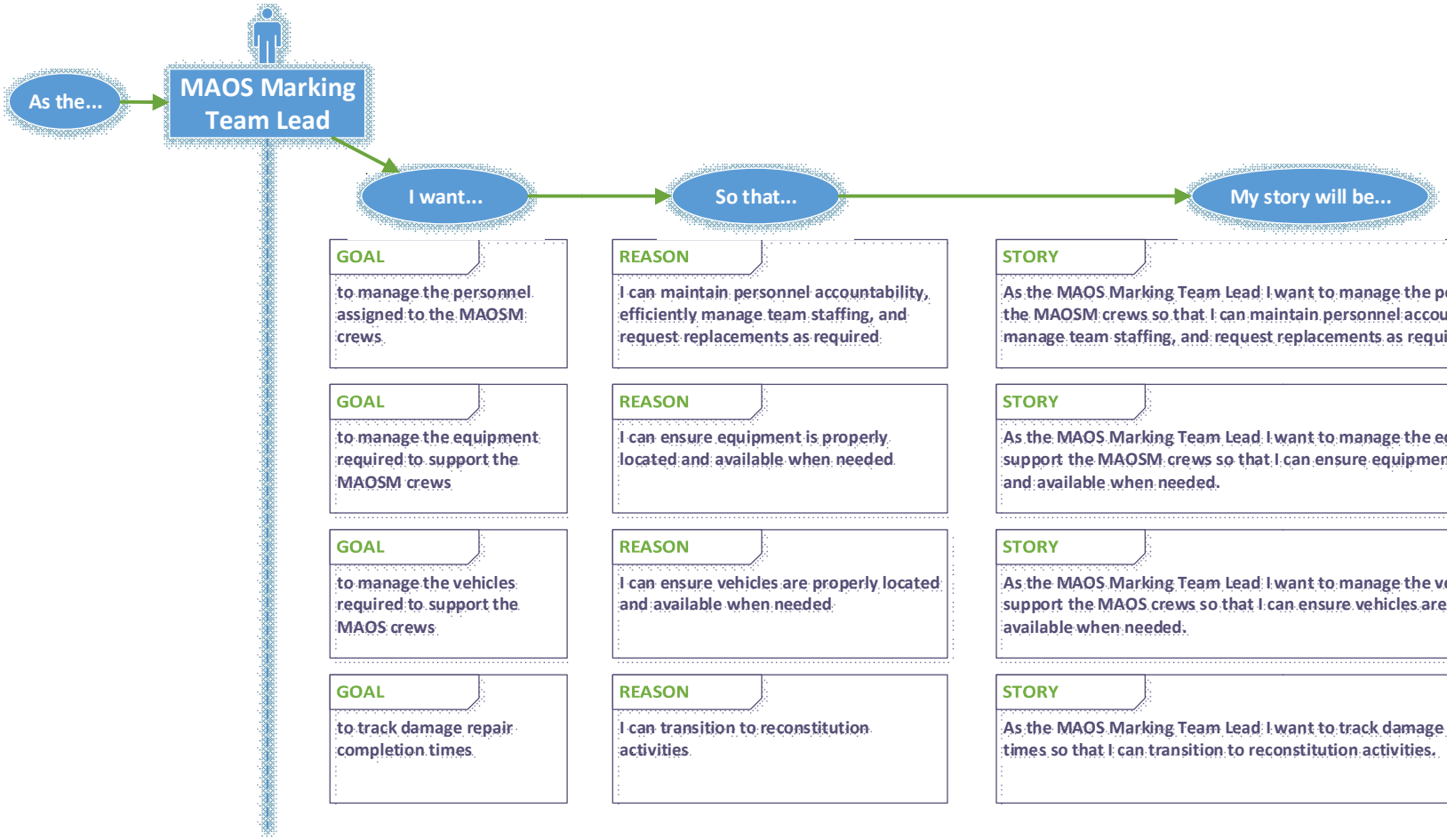
I want...	So that...	My story will be...
GOAL: to manage the personnel assigned to the batch plant team	REASON: I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	STORY: As the Batch Plant Team Lead I want to manage the personnel assigned to the batch plant team so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
GOAL: to manage the equipment required to support the batch plant	REASON: I can ensure equipment is properly located and available when needed	STORY: As the Batch Plant Team Lead I want to manage the equipment required to support the batch plant so that I can ensure equipment is properly located and available when needed.
GOAL: to manage the vehicle required to support the batch plant	REASON: I can ensure the vehicle is properly located and available when needed	STORY: As the Batch Plant Team Lead I want to manage the vehicle required to support the batch plant so that I can ensure the vehicle is properly located and available when needed.
GOAL: to track asphalt production and delivery	REASON: I can ensure asphalt is available at the correct location and and available when needed	STORY: As the Batch Plant Team Lead I want to track asphalt production and delivery so that I can ensure asphalt is available at the correct location and and available when needed.
GOAL: to track usable and waste apshalt quantities	REASON: I can efficiently manage asphalt production timelines	STORY: As the Batch Plant Team Lead I want to track usable and waste apshalt quantities so that I can efficiently manage asphalt production timelines.
GOAL: to track damage repair completion times	REASON: I can transition to reconstitution activities	STORY: As the Batch Plant Team Lead I want to track damage repair completion times so that I can transition to reconstitution activities.



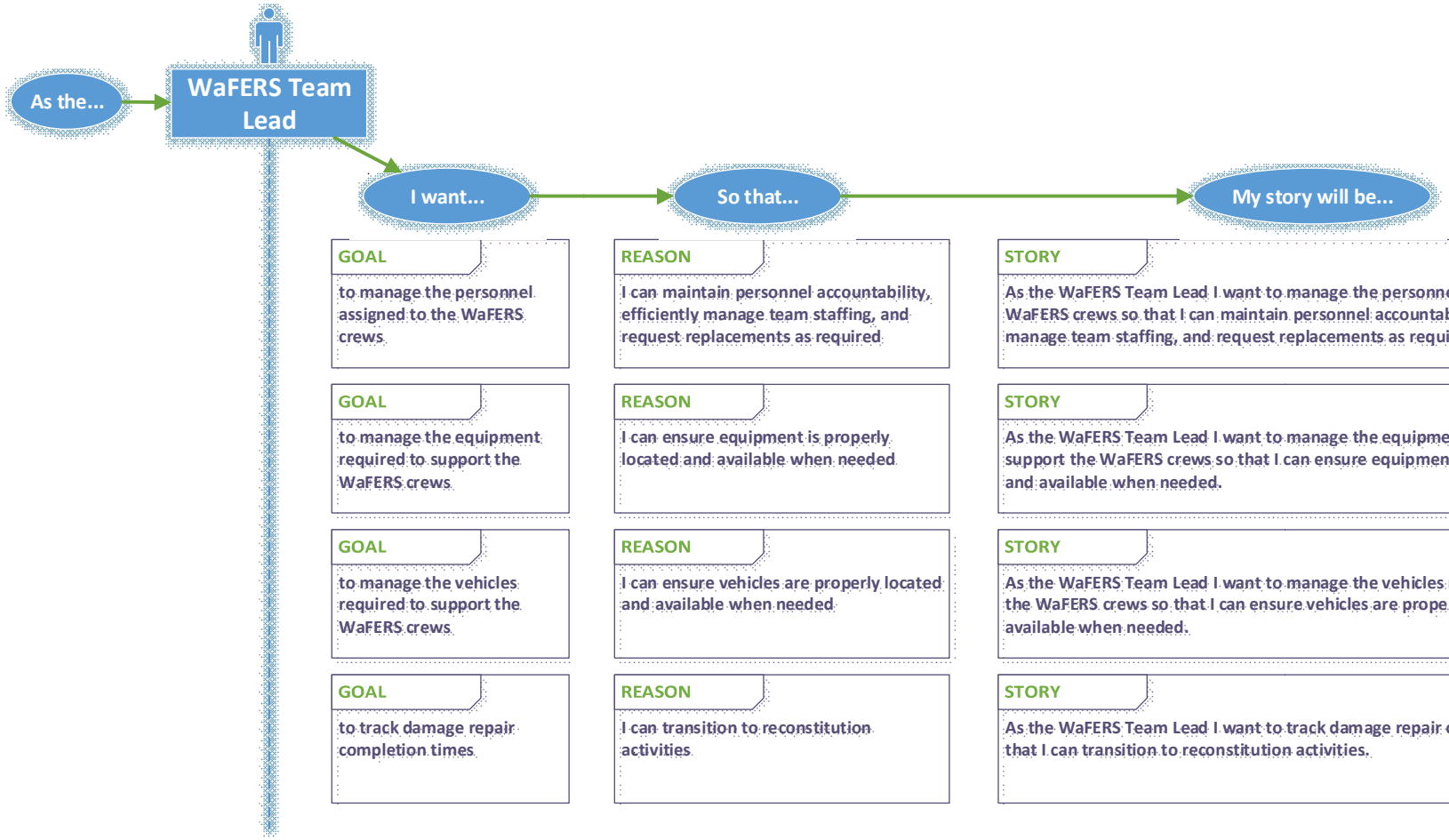
GOAL	REASON	STORY
to manage the personnel assigned to the AAS crews	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the AAS Team Lead I want to manage the personnel assigned to the AAS crews so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the equipment required to support the AAS crews	I can ensure equipment is properly located and available when needed	As the AAS Team Lead I want to manage the equipment required to support the AAS crews so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the AAS crews	I can ensure vehicles are properly located and available when needed	As the AAS Team Lead I want to manage the vehicles required to support the AAS crews so that I can ensure vehicles are properly located and available when needed.
to track damage repair completion times	I can transition to the reconstitution activities	As the AAS Team Lead I want to track damage repair completion times so that I can transition to the reconstitution activities.



GOAL	REASON	STORY
to manage the personnel assigned to the EALS crews	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the EALS Team Lead I want to manage the personnel assigned to the EALS crews so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the equipment required to support the EALS crews	I can ensure equipment is properly located and available when needed	As the EALS Team Lead I want to manage the equipment required to support the EALS crews so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the EALS crews	I can ensure vehicles are properly located and available when needed	As the EALS Team Lead I want to manage the vehicles required to support the EALS crews so that I can ensure vehicles are properly located and available when needed.
to track damage repair completion times	I can transition to reconstitution activities	As the EALS Team Lead I want to track damage repair completion times so that I can transition to reconstitution activities.



GOAL	REASON	STORY
to manage the personnel assigned to the MAOSM crews	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the MAOS Marking Team Lead I want to manage the personnel assigned to the MAOSM crews so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the equipment required to support the MAOSM crews	I can ensure equipment is properly located and available when needed	As the MAOS Marking Team Lead I want to manage the equipment required to support the MAOSM crews so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the MAOS crews	I can ensure vehicles are properly located and available when needed	As the MAOS Marking Team Lead I want to manage the vehicles required to support the MAOS crews so that I can ensure vehicles are properly located and available when needed.
to track damage repair completion times	I can transition to reconstitution activities	As the MAOS Marking Team Lead I want to track damage repair completion times so that I can transition to reconstitution activities.



GOAL	REASON	STORY
to manage the personnel assigned to the WaFERS crews	I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required	As the WaFERS Team Lead I want to manage the personnel assigned to the WaFERS crews so that I can maintain personnel accountability, efficiently manage team staffing, and request replacements as required.
to manage the equipment required to support the WaFERS crews	I can ensure equipment is properly located and available when needed	As the WaFERS Team Lead I want to manage the equipment required to support the WaFERS crews so that I can ensure equipment is properly located and available when needed.
to manage the vehicles required to support the WaFERS crews	I can ensure vehicles are properly located and available when needed	As the WaFERS Team Lead I want to manage the vehicles required to support the WaFERS crews so that I can ensure vehicles are properly located and available when needed.
to track damage repair completion times	I can transition to reconstitution activities	As the WaFERS Team Lead I want to track damage repair completion times so that I can transition to reconstitution activities.