NAS Enterprise Architecture

Infrastructure Roadmaps v19.0

BASELINE

February 2025

Content Summary

Infrastructure Roadmap Overview

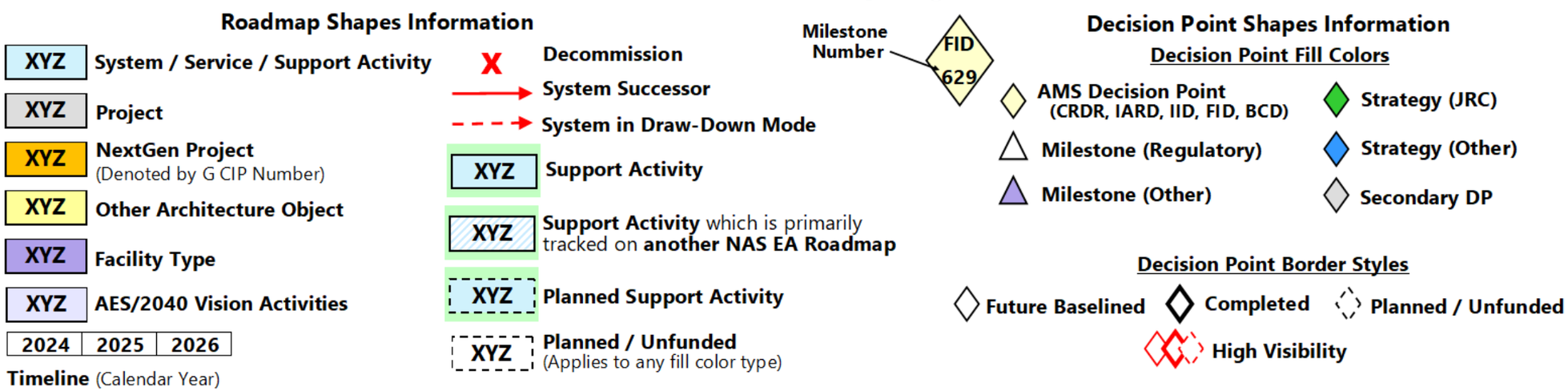
What are the Infrastructure Roadmaps?

- The FAA Infrastructure Roadmaps show the progression of system deployments, investments, and key decision points for major NAS acquisitions. They depict the acquisition strategy to evolve the NAS from the As-Is to the To-Be environment.
- The Infrastructure Roadmaps show all Capital Investment Plan (CIP) investment projects and systems identified in the NSIP that will deliver the necessary functionality to enable OIs and BTIs.

Guidelines for Understanding the Roadmaps

- The Infrastructure Roadmaps are organized by Domain (Automation, Communication, etc.) and depict projects, systems, services, decision points, and support activities.
- The timeline is in calendar years and shows a 17-year outlook.
- The roadmaps have swim lanes for Infrastructure (white), Support Activities (green), and Platform/Compute (purple).
- The DP diamonds represent the quarter in which a decision will occur.
- The Support Activity bars represent the dates that work is being performed on the activity.
- The Project bars represent the dates that CIP funding is allocated to a project.
- The System and Service bars represent the dates that a system or service is operational, with red lines indicating sustainment, drawdown, or convergence

Infrastructure Roadmap Legend



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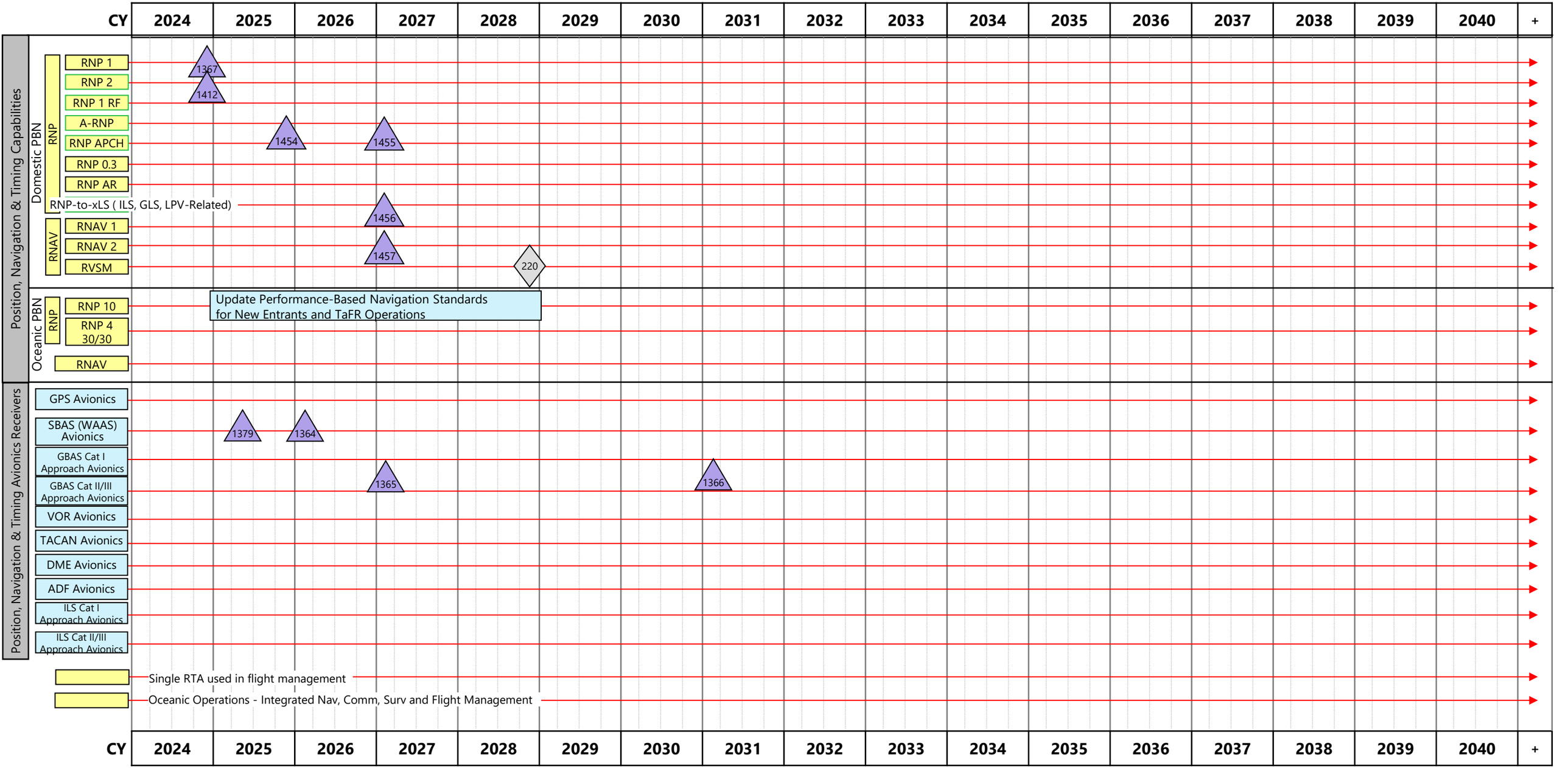
Aircraft

The Aircraft roadmap presents planned advances in Airframe and Avionics in coordination with NAS NextGen improvements.

Items with a green outline are components of the FAA Minimum Capability List (MCL)

Aircraft Roadmap (1 of 5)



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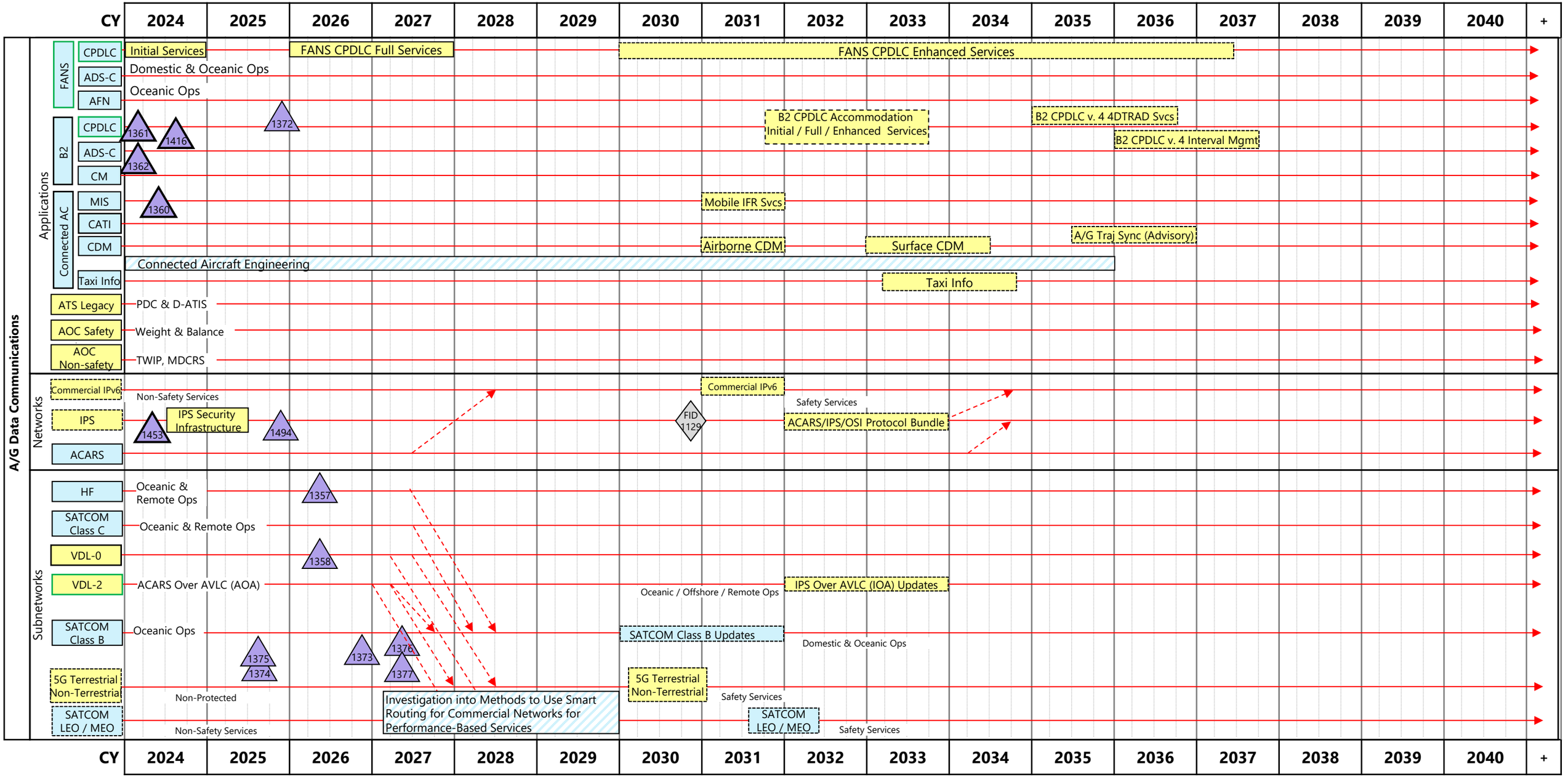
Aircraft Roadmap (2 of 5)

Items with a green outline are components of the FAA Minimum Capability List (MCL)



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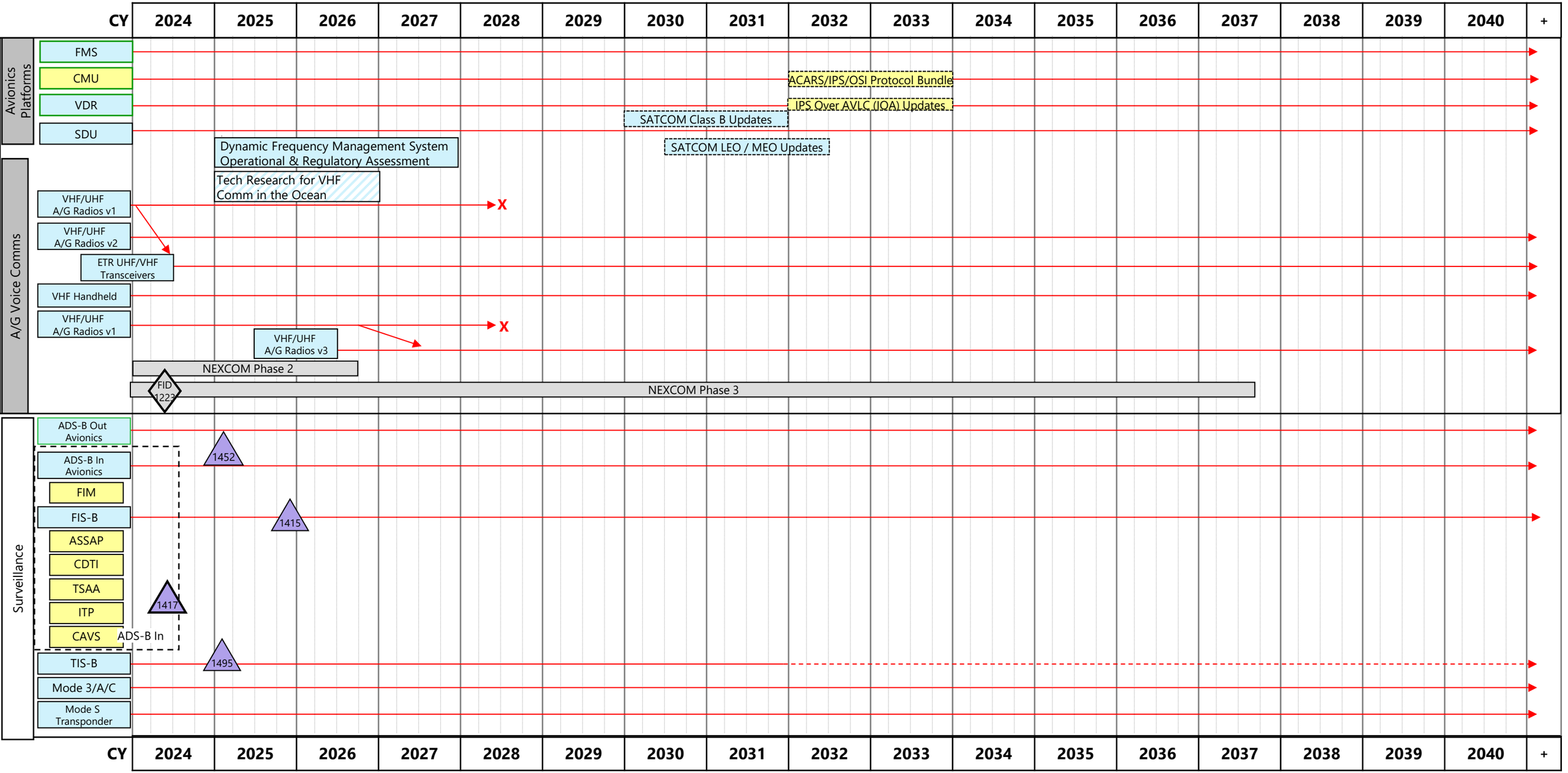
Items with a green outline are components of the FAA Minimum Capability List (MCL)

Aircraft Roadmap (3 of 5)



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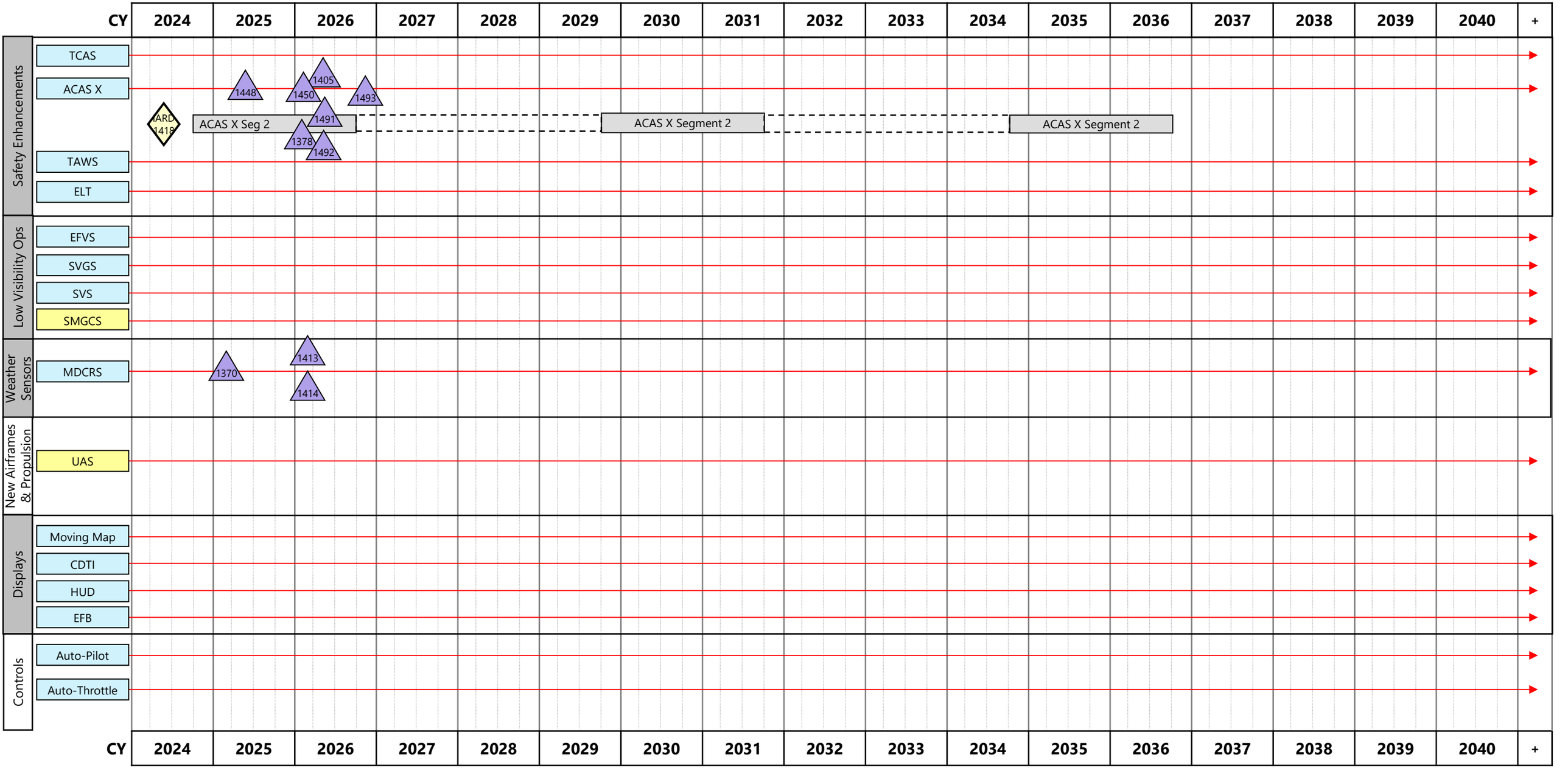
Aircraft Roadmap (4 of 5)



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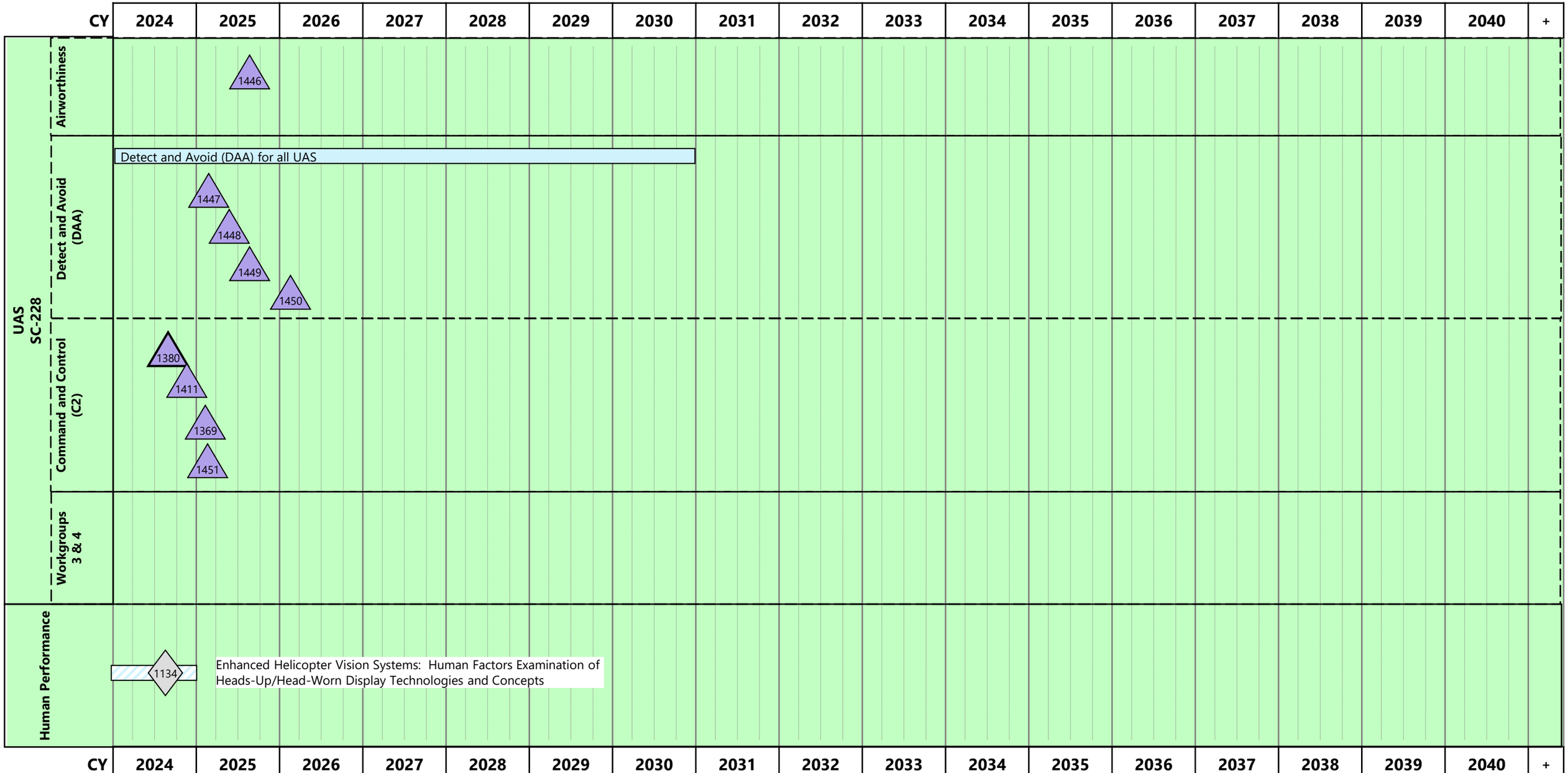
Items with a green outline are components of the FAA Minimum Capability List (MCL)

Aircraft Roadmap (5 of 5)



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Aircraft Roadmap: Assumptions

Identifier	Description
AC-01	The roadmap identifies four phases a) CONOPs development and R&D in required areas b) Standards development c) AVS Approval d) ATC Procedure development e) Deployment. After the standards process is complete, and manufacturers have developed, integrated, fully tested and made new avionics available, aircraft, engines and fuels available, an additional 7 to 10 years is needed to achieve wide scale equipage of a new capability 1. Different aircraft are expected to equip with different equipment. This roadmap does not currently distinguish between aircraft types.
AC-02	The aircraft roadmap includes environment research areas and assumptions and linkage to Mission Support EA.
AC-03	Any aircraft to include any UAS that participates in the NAS must operate in a way that is transparent to the ANSP and ATSP.
AC-04	The Minimum Capability (MCL) items documented in the Aircraft roadmap are accurate as of the September 2019 draft of the MCL.
AC-05	The Minimum Capabilities List (MCL) provides clear and comprehensive guidance to support equipage across all fleets operating in the National Airspace System (NAS). The MCL's purpose is to: • Define the minimum aircraft capabilities and associated equipment needed to maximize benefits from FAA investment and operational improvements • Guide "forward-fit" aircraft equipage and inform operator investment decisions • Maximize the return on investment for both the FAA and airspace users
AC-06	The yellow roadmap symbol is being utilized as aircraft operational capabilities on this roadmap.

Aircraft Roadmap: Decision Points

DP #	Target Date CY	Primary Domain	Type	Name
220	2028 Q4	Navigation	Strategy (Other)	Decision to cut over to Dual Frequency IOC Operations
1129	2030 Q4	Communication	FID	Final Investment Decision (FID) for Data Comm IP Gateway
1134	2024 Q3	Human Systems Integration	Strategy (Other)	Decision on the Approval and Implementation Strategy of Human Factors Guidance for Helicopter Advanced Vision Systems
1223	2024 Q2	Communication	FID	Final Investment Decision (FID) for NEXCOM Phase 3
1360	2024 Q2	Aircraft	Other Milestone	DO-351B, Interoperability Standard for Baseline 2 ATS Data Communications (Baseline 2 Interop Standard)
1361	2024 Q1	Aircraft	Other Milestone	DO-352B, Interoperability Standard for Baseline 2 ATS Data Communications, FANS 1/A Accommodation (FANS 1/A - Baseline 2 Interop Standard)
1362	2024 Q1	Aircraft	Other Milestone	DO-353B, Interoperability Standard for Baseline 2 ATS Data Communications, ATN Baseline 1 Accommodation (ATN Baseline 1 - Baseline 2 Interop Standard)
1364	2025 Q4	Aircraft	Other Milestone	GNSS (SBAS) L1/L5 MOPS Update to GPS/Galileo/SBAS MOPS for dual-frequency equipment
1365	2027 Q1	Aircraft	Other Milestone	GNSS (GBAS) L1/L5 MOPS and ICD Initial MOPS and ICD for Verification and Validation
1366	2031 Q1	Aircraft	Other Milestone	GNSS (GBAS) L1/L5 MOPS and ICD Validated GPS/Galileo/GBAS MOPS and ICD for dual-frequency equipment
1367	2024 Q4	Aircraft	Other Milestone	MOPS DO-283C
1369	2025 Q1	Aircraft	Other Milestone	C2 Link MOPS for Cellular Networks
1370	2025 Q1	Aircraft	Other Milestone	DO-364A / ED-XXX Minimum Aviation System Performance Standards (MASPS) for Aeronautical Information / Meteorological Data Link Services
1372	2025 Q4	Aircraft	Other Milestone	DO-XXX, ATS Data Communication Verification Test Standard
1373	2026 Q4	Aircraft	Other Milestone	DO-383A, Guidance on VDL Mode 2 Air/Ground Interoperability
1374	2024 Q2	Aircraft	Other Milestone	DO-343E MASPS – Inmarsat SBB and Iridium Certus Updates
1375	2024 Q2	Aircraft	Other Milestone	DO-262G MOPS - Inmarsat SBB and Iridium Certus Updates
1376	2027 Q2	Aircraft	Other Milestone	DO-343F MASPS – Iridium Certus updates for network update
1377	2027 Q2	Aircraft	Other Milestone	DO-262H MOPS – Iridium Certus updates for network update
1378	2026 Q1	Aircraft	Other Milestone	Minimal Operational Performance Standards (MOPS) for Active Surveillance Systems
1379	2025 Q2	Aircraft	Other Milestone	White Paper on BeiDou System and BeiDou SBAS
1380	2024 Q3	Aircraft	Other Milestone	DO-406 - Minimum Operational Performance Standards for Ultra High Frequency Airborne Radio Systems Supporting UAS C2 Link Systems
1405	2026 Q1	Aircraft	Other Milestone	Minimal Operational Performance Standards (MOPS) for ACAS Xr
1411	2024 Q4	Aircraft	Other Milestone	C2 Link MOPS (Terrestrial) (DO-362B)
1412	2024 Q4	Aircraft	Other Milestone	MASP DO-236E

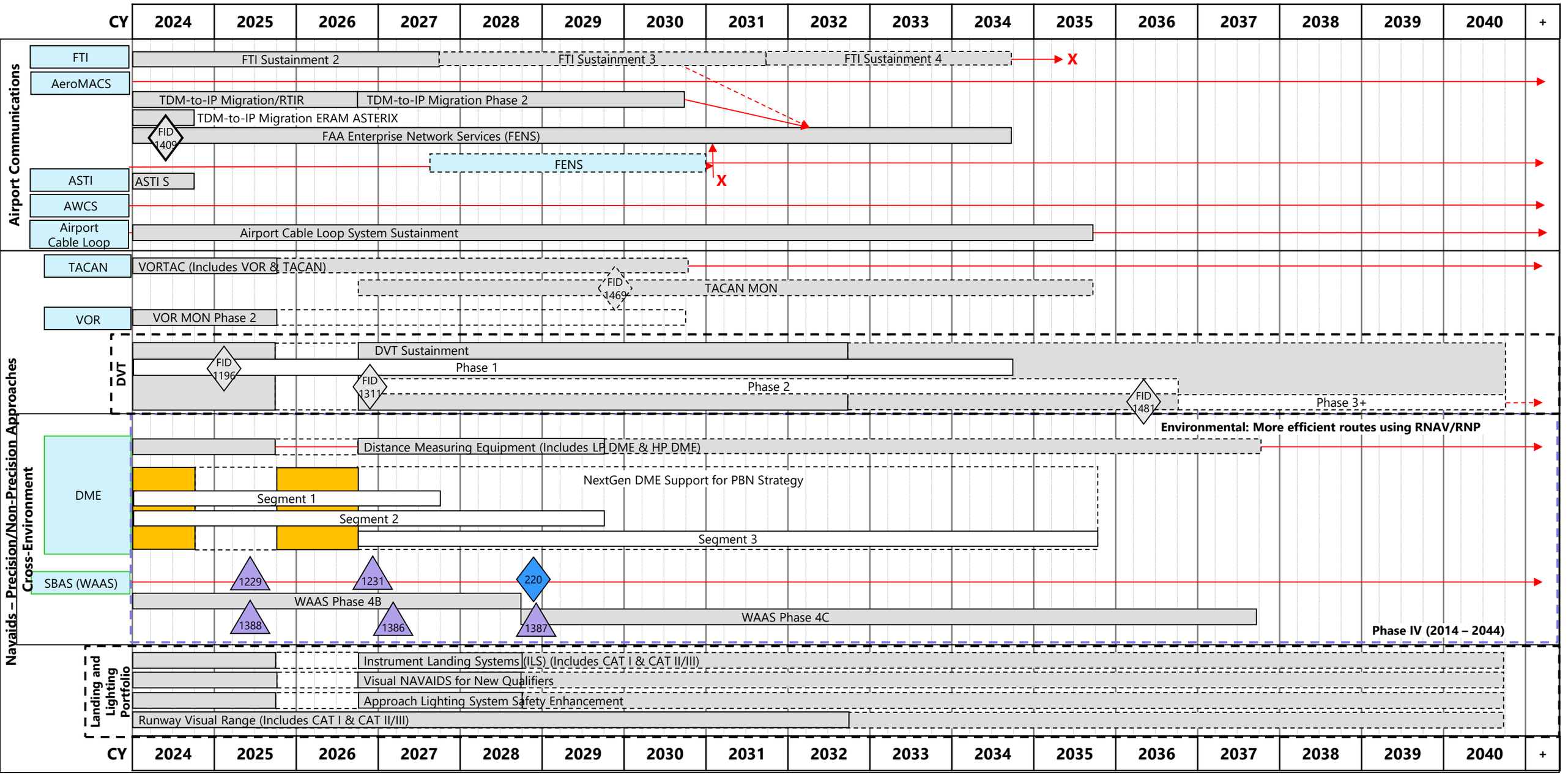
Aircraft Roadmap: Decision Points

DP #	Target Date CY	Primary Domain	Type	Name
1413	2026 Q1	Aircraft	Other Milestone	DO-XXX / ED-XXX Minimum Aviation System Performance Standards (MASPS) for Automated Atmospheric Turbulence Derivation Techniques
1414	2026 Q1	Aircraft	Other Milestone	RTCA Report - Recommendation(s) Regarding Possible Standards to Support Aircraft-Based Meteorological Observation Dependent Applications
1415	2025 Q4	Aircraft	Other Milestone	DO-358C Minimum Operational Performance Standards (MOPS) for Flight Information Services Broadcast (FIS-B) with Universal Access Transceiver (UAT)
1416	2024 Q3	Aircraft	Other Milestone	DO-280B Change 2: Interoperability Requirements Standard for Aeronautical Telecommunication Network Baseline 1 (ATN B1 Interop Standard) Change 2
1417	2024 Q2	Aircraft	Other Milestone	Change 1 to DO-317C, Aircraft Surveillance Applications (ASA) MOPS
1418	2024 Q2	Aircraft	IARD	Investment Analysis Readiness Decision (IARD) for ACAS-X Segment 2
1446	2025 Q3	Aircraft	Other Milestone	MASPS: Navigation for Automatic Taxi (DO-VVV)
1447	2025 Q1	Aircraft	Other Milestone	DAA MOPS (DO-365C Change 1)
1448	2025 Q2	Aircraft	Other Milestone	DAA Radar MOPS Update (DO-366B)
1449	2025 Q3	Aircraft	Other Milestone	MASPS for DAA Supporting Taxi Operations (DO-WWW)
1450	2026 Q1	Aircraft	Other Milestone	DAA MOPS (DO-365D)
1451	2025 Q2	Aircraft	Other Milestone	RTCA Report (RR) for Users of DO- 377B for Deriving C2 Link System Requirements
1452	2025 Q1	Aircraft	Other Milestone	DO-260C
1453	2024 Q3	Aircraft	Other Milestone	DO-379A - Technical Standard of Aviation Profiles for Internet Protocol Suite Update
1454	2025 Q2	Aircraft	Other Milestone	MOPS DO-ZZT
1455	2027 Q1	Aircraft	Other Milestone	MOPS DO-"ZZT" Revision A
1456	2027 Q1	Aircraft	Other Milestone	MOPS DO-283D
1457	2027 Q1	Aircraft	Other Milestone	MASPS DO-236F
1491	2026 Q2	Aircraft	Other Milestone	Minimum Operational Performance Standards (MOPS) for Cooperative Surveillance Systems
1492	2026 Q2	Aircraft	Other Milestone	Minimum Operational Performance Standards (MOPS) for ACAS Xu Revision A DO386(A)/ED275(A)
1493	2026 Q4	Aircraft	Other Milestone	Guidance for Validation of Collision Avoidance Systems
1494	2026 Q4	Aircraft	Other Milestone	Internal Report IR-XXX
1495	2025 Q1	Aircraft	Other Milestone	Change 2 to DO-260C, 1090MHz ADS-B / TIS-B MOPS

Airport

The Airport Roadmap identifies NextGen progression of services, procedures and systems in the airport environment.

Airport Roadmap (1 of 5)



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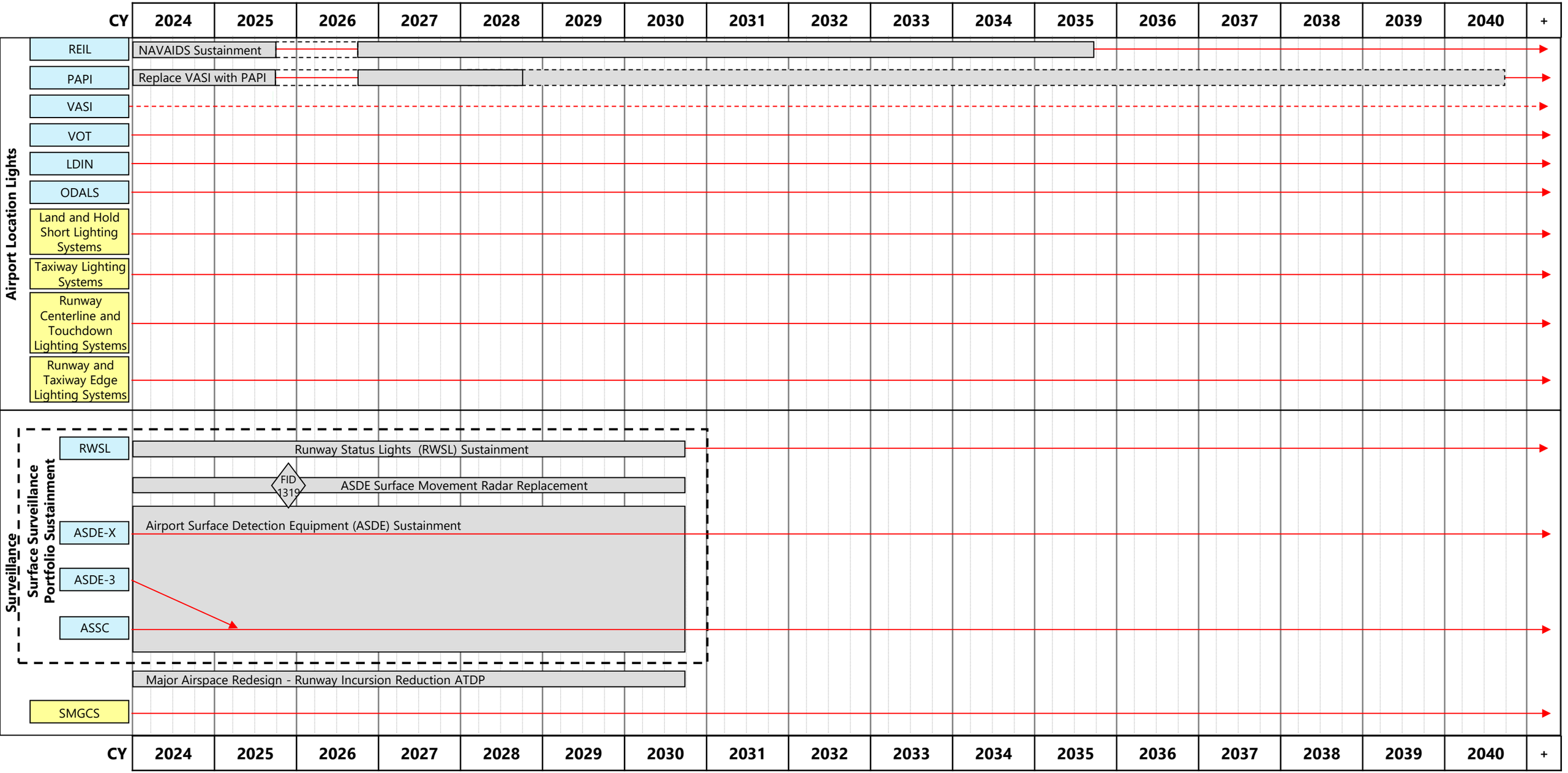
Airport Roadmap (2 of 5)



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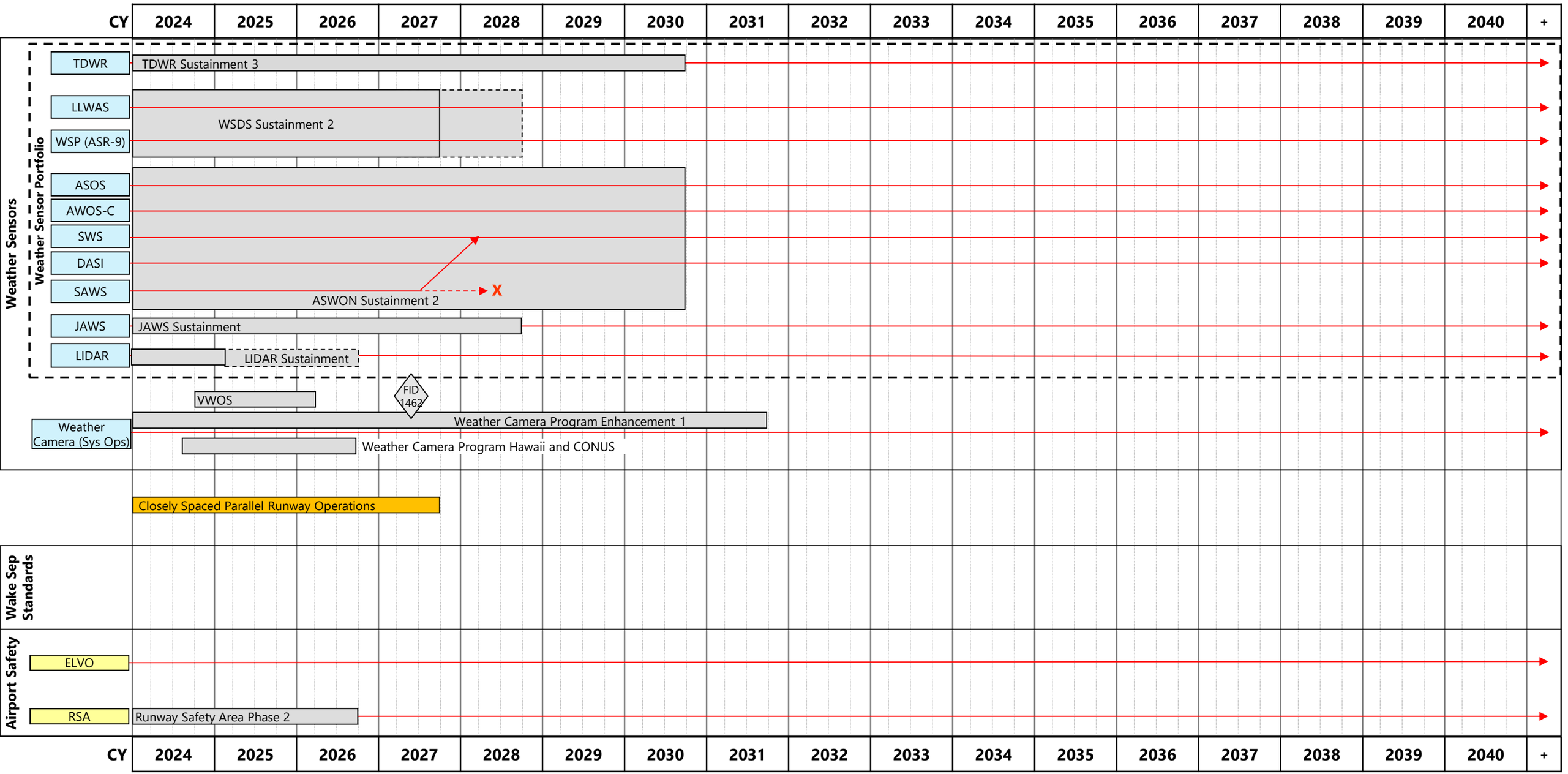
Airport Roadmap (3 of 5)



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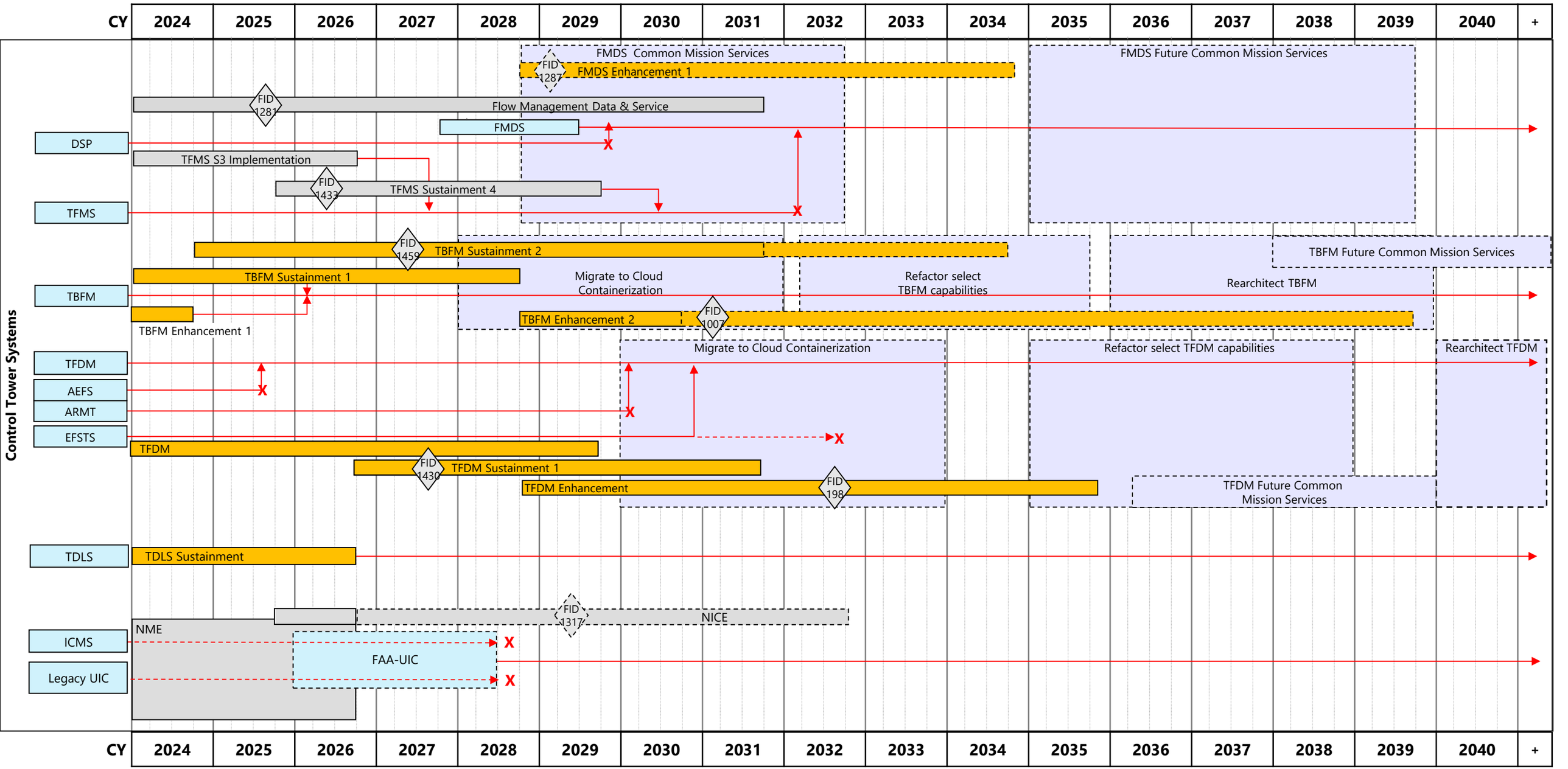
Airport Roadmap (4 of 5)



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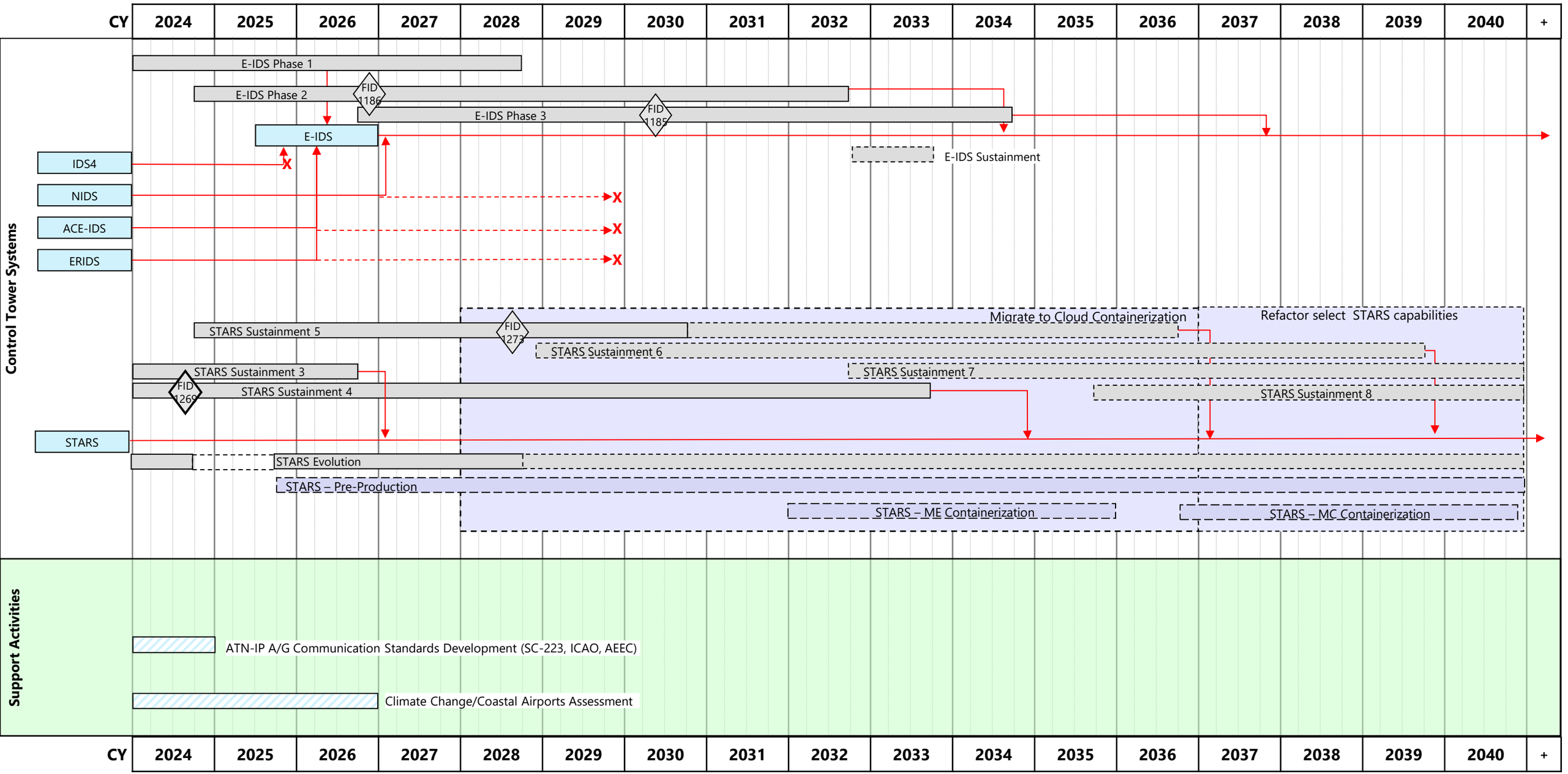
Airport Roadmap (5 of 5)



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Airport Roadmap: Assumptions

Identifier	Description
APT-01	The Airports roadmap will focus on systems and services operating and being performed airside at medium/large Airports and does not include functions/infrastructure internal to the Airport (i.e., security, ground transportation, or baggage handling, etc.).
APT-02	This roadmap is used to provide an evolutionary overview of medium to large Airports and does not convey infrastructure or service implementation specific to an Airport.
APT-04	Majority of this roadmap's content has been pulled from other roadmaps (i.e., Comm, Surveillance, Weather, etc.) if it is in support of Airport Airside Operations.
APT-07	Although there are Non-Fed Navigational Aids (NAVAIDS) and facilities located as some Airports, they may not be depicted fully on the Airports Infrastructure Roadmap.
APT-08	All FTI sub-systems will be assumed by FENS once the TDM-to-IP migration is complete.

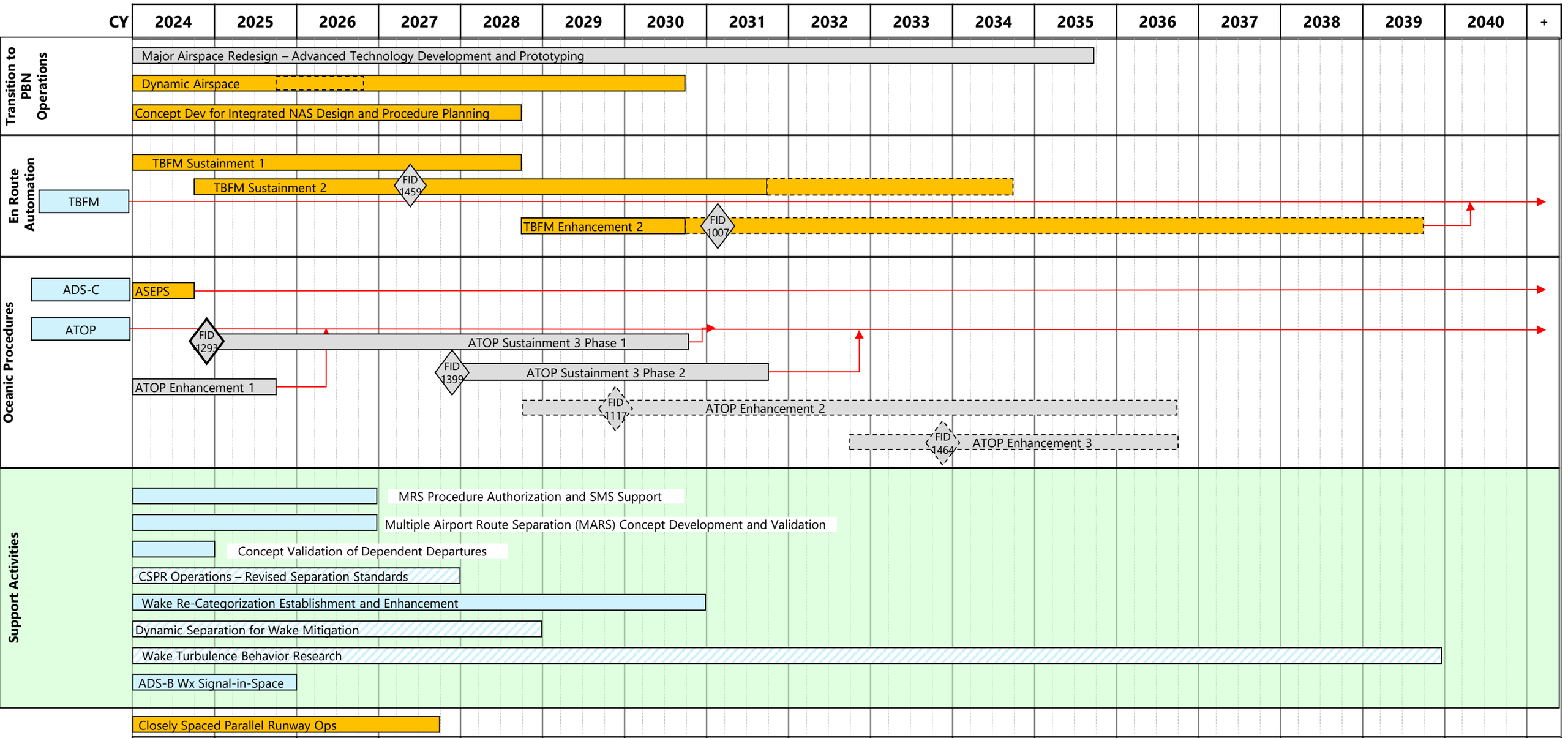
Airport Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
198	2032 Q3	Automation	FID	Final Investment Decision (FID) for TFDM Enhancement
220	2028 Q4	Navigation	Strategy (Other)	Decision to cut over to Dual Frequency IOC Operations
1007	2031 Q1	Automation	FID	Final Investment Decision (FID) for TBFM Enhancement 2
1185	2030 Q2	Automation	FID	Final Investment Decision (FID) for E-IDS Phase 3
1186	2026 Q4	Automation	FID	Final Investment Decision (FID) for E-IDS Phase 2
1196	2025 Q1	Navigation	FID	Final Investment Decision (FID) for DVT Sustainment Program Phase 1
1229	2025 Q2	Navigation	Other Milestone	SBAS L1/L5 MOPS Part 2
1231	2026 Q4	Navigation	Other Milestone	SBAS L1/L5 SARPS Part 2
1269	2024 Q3	Automation	FID	Final Investment Decision (FID) for STARS Sustainment 4
1273	2028 Q3	Automation	FID	Final Investment Decision (FID) for STARS Sustainment 5
1281	2025 Q3	Automation	FID	Final Investment Decision (FID) for Flow Management Data and Services
1287	2029 Q1	Automation	FID	Final Investment Decision (FID) for Flow Management Data and Service (FMDS) Enhancement 1
1311	2026 Q4	Navigation	FID	Final Investment Decision (FID) for DVT Sustainment Program Phase 2
1317	2029 Q2	Navigation	FID	Final Investment Decision (FID) for Navaids Interface-Connect Equipment (NICE)
1319	2025 Q4	Surveillance	FID	Final Investment Decision (FID) for ASDE-3 Surface Movement Radar (SMR) Replacement
1347	2028 Q1	Automation	FID	Final Investment Decision (FID) for Offshore Automation #2
1386	2027 Q1	Navigation	Other Milestone	H-ARAIM IOC
1387	2028 Q4	Navigation	Other Milestone	H-ARAIM FOC
1388	2025 Q2	Navigation	Other Milestone	DFMC H-ARAIM MOPS
1409	2024 Q2	Communication	FID	Final Investment Decision (FID) for FAA Enterprise Network Services (FENS) #2
1430	2027 Q3	Automation	FID	Final Investment Decision (FID) for Terminal Flight Data Management (TFDM) Sustainment 1
1459	2027 Q2	Automation	FID	Final Investment Decision (FID) for TBFM S2

Airspace and Procedures

The Airspace and Procedures roadmap presents an Executive View (EV) of systems and procedures, including associated research projects, with an effect on the large-scale redesign and optimization of major airspace.

Airspace and Procedures Roadmap (1 of 2)



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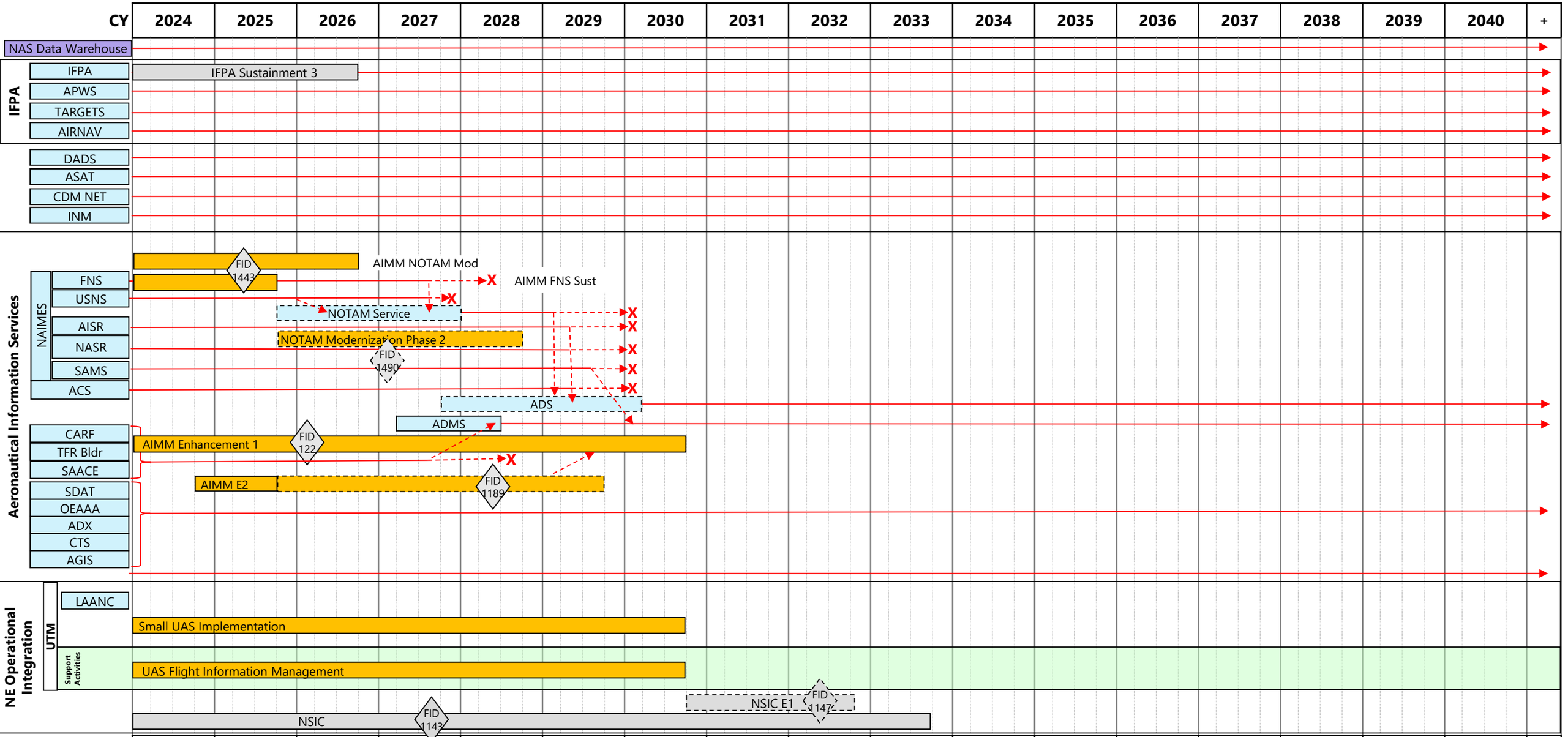
Airspace and Procedures Roadmap (2 of 2)



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Airspace & Procedures Roadmap: Assumptions

Identifier	Description
A&P-01	Integrated Arrival/Departure Airspace Assumptions a) Key Integrated Arrival/Departure Airspace enablers: 1. Extension of 3 Mile Separation & Terminal Procedures 2. Integrated arrival/departure airspace configurations 3. Flexible sector & bi-directional routes published 4. 5 mile lateral spacing for Required Navigation Performance (RNP) enables 5 mile lateral route spacing 5. New voice system (NAS Voice System), leased circuits, and Air-Ground communications channels to handle transition 6. Cost benefits are based on creating X Integrated Arrival/Departure (Big Airspace) facilities, covering X major metropolitan areas b) Cost analysis based on general assumptions about the concept, not on any detailed requirements or technical solutions c) Benefits analysis based on extrapolating results from FT simulations to other sites given traffic forecasts and historical weather patterns d) Sites identified where large TRACON facilities exist could accommodate additional BA operational positions with refurbishment. New buildings would be needed where no large TRACON exists.

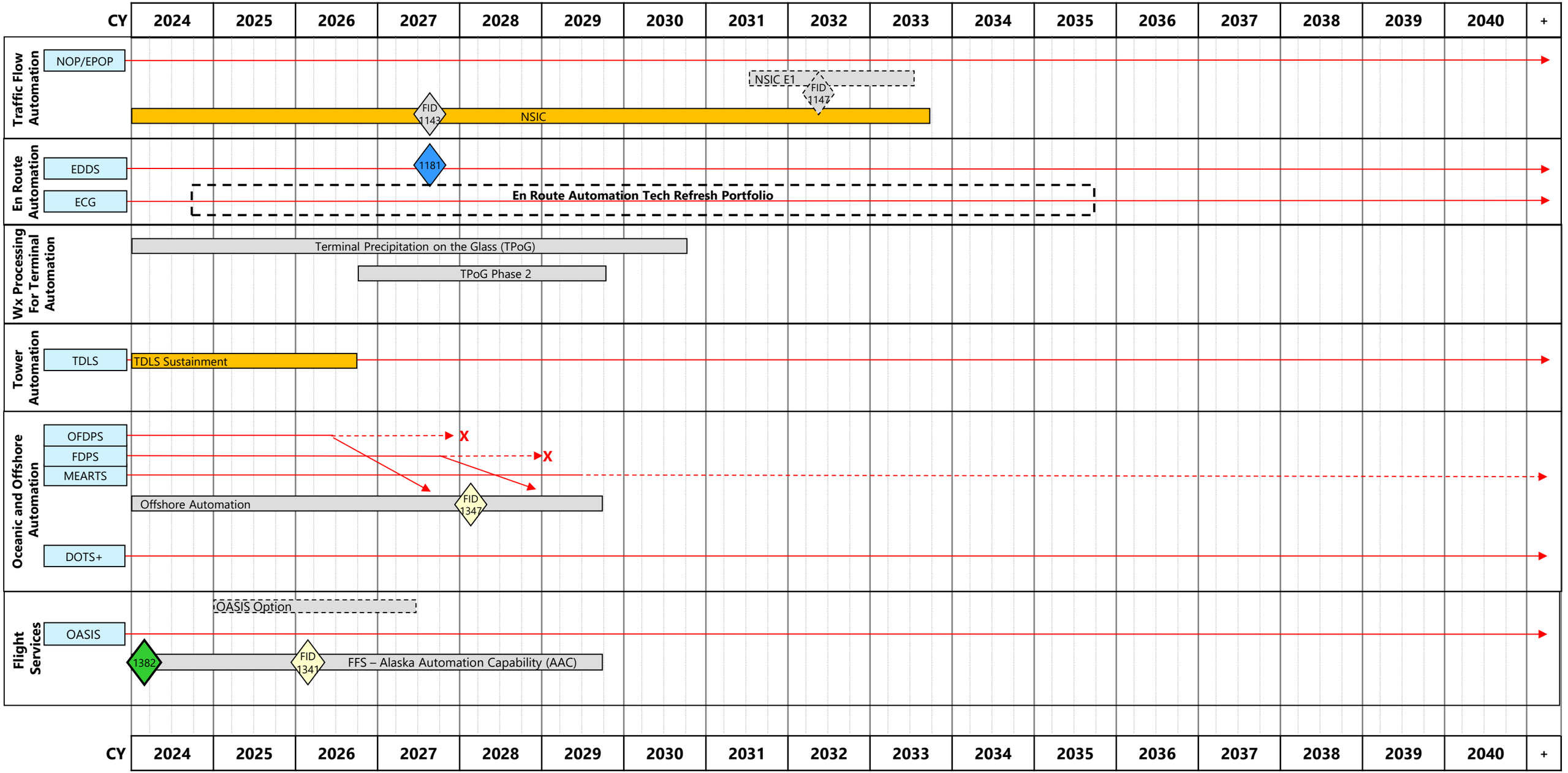
Airspace & Procedures Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
122	2026 Q1	Automation	FID	Final Investment Decision (FID) for AIMM Enhancement 1
1007	2031 Q1	Automation	FID	Final Investment Decision (FID) for TBFM Enhancement 2
1117	2029 Q4	Automation	FID	Final Investment Decision (FID) for ATOP Enhancement 2
1143	2027 Q3	Commercial Space	FID	Final Investment Decision (FID) for National Airspace System (NAS) Space Integration Capabilities (NSIC)
1147	2032 Q2	Commercial Space	FID	Final Investment Decision (FID) for National Airspace System (NAS) Space Integration Capabilities (NSIC) Enhancement 1
1189	2028 Q2	Automation	FID	Final Investment Decision (FID) for AIMM Enhancement 2
1293	2024 Q4	Automation	FID	Final Investment Decision (FID) for ATOP Sustainment 3 #1
1399	2027 Q4	Automation	FID	Final Investment Decision (FID) for ATOP Sustainment 3 #2
1443	2025 Q3	Automation	FID	Final Investment Decision (FID) for AIMM NOTAM Modernization
1459	2027 Q2	Automation	FID	Final Investment Decision (FID) for TBFM S2
1464	2033 Q4	Automation	FID	Final Investment Decision (FID) for ATOP E3
1490	2027 Q1	Automation	FID	Final Investment Decision (FID) for NOTAM Modernization Phase 2

Automation

The Automation Roadmap presents an Executive View (EV) of the current automation systems supporting the National Airspace System (NAS) and their enhancement, sustainment or replacement through major development programs and support activities. The Automation Roadmap is intended to convey the major automation program strategy and acquisition decision points as well as program execution through the In-Service Decision. The roadmap serves as a summary view of more detailed plans within each development program.

Automation Roadmap (1 of 5)



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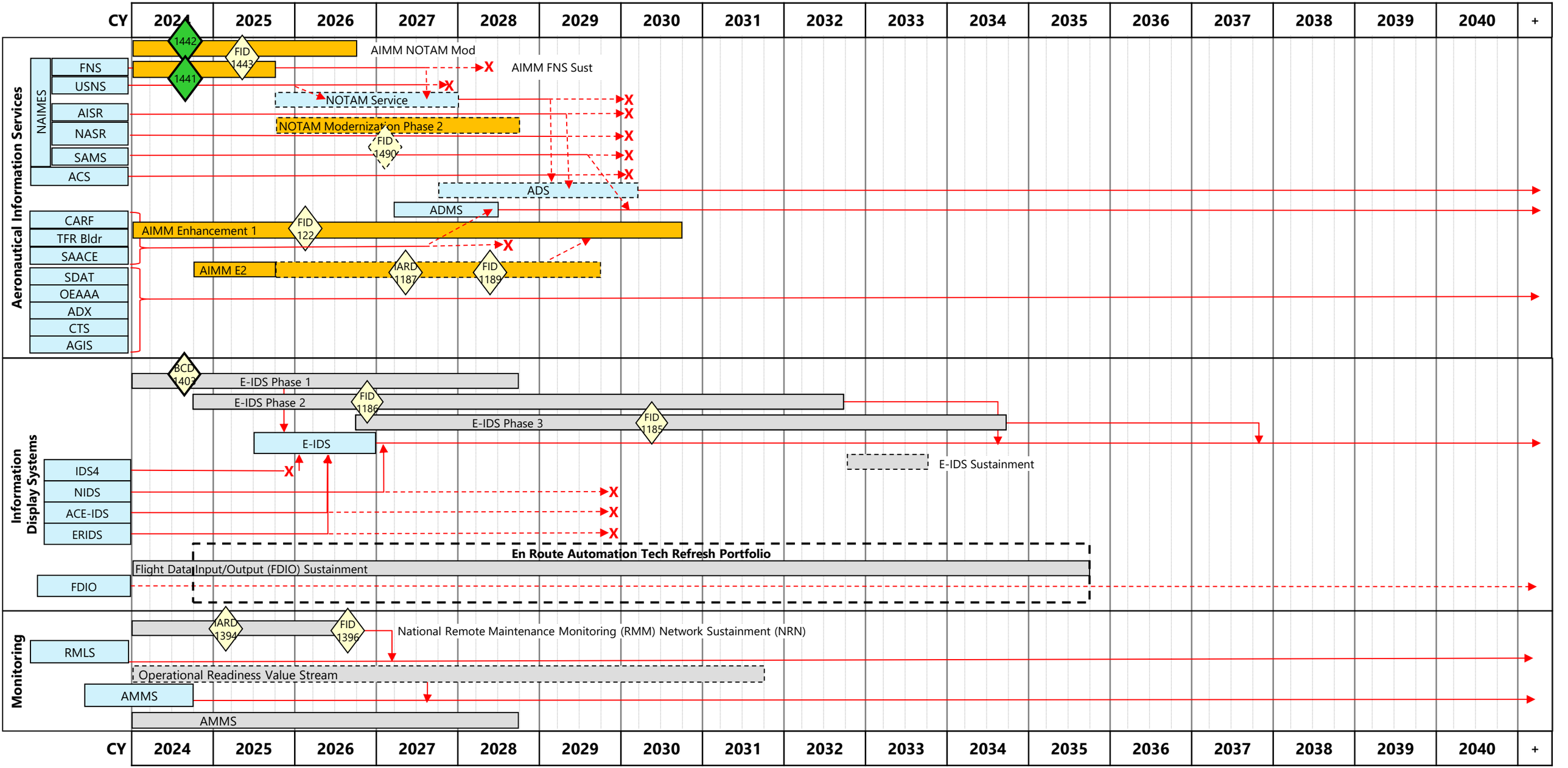
Automation Roadmap (2 of 5)



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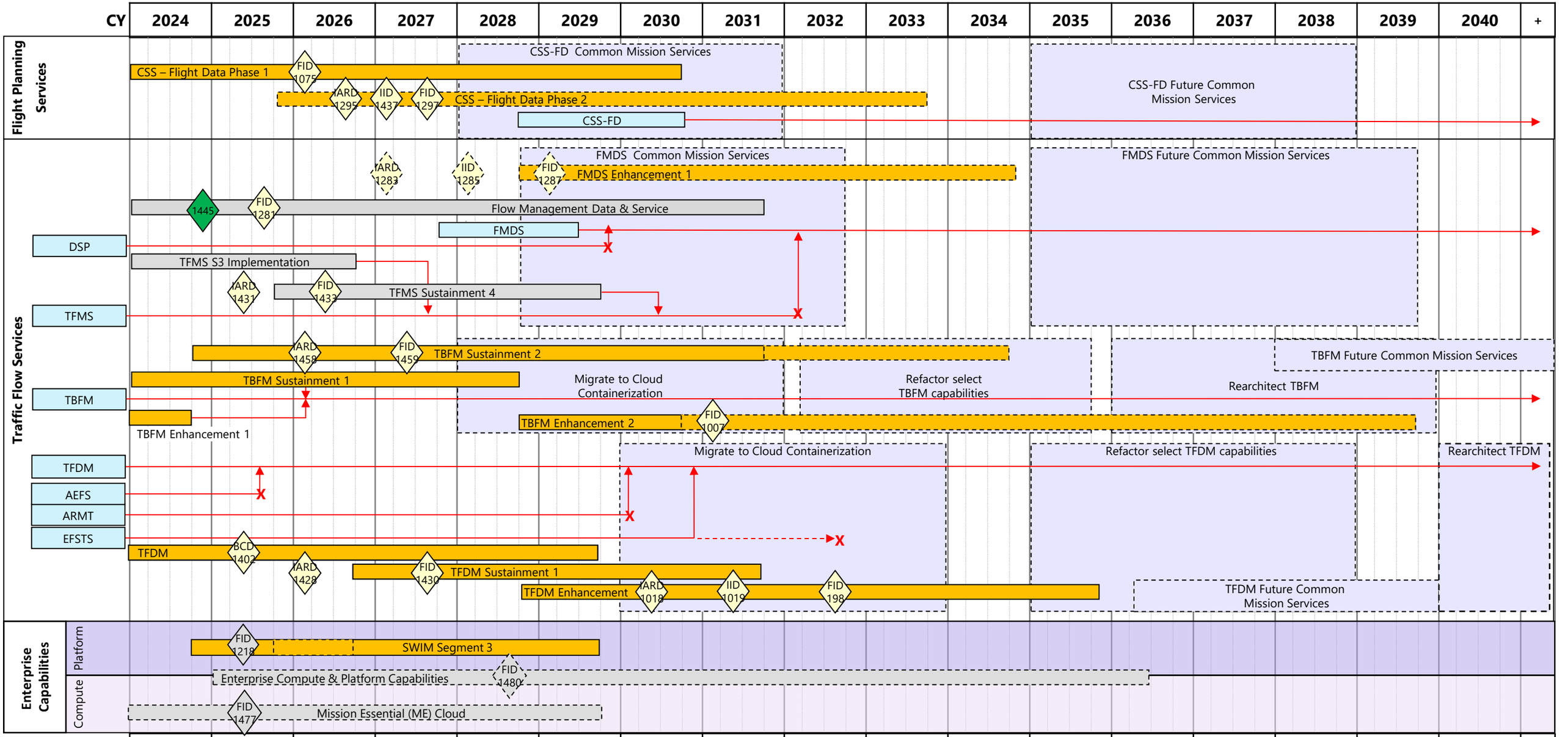
Automation Roadmap (3 of 5)



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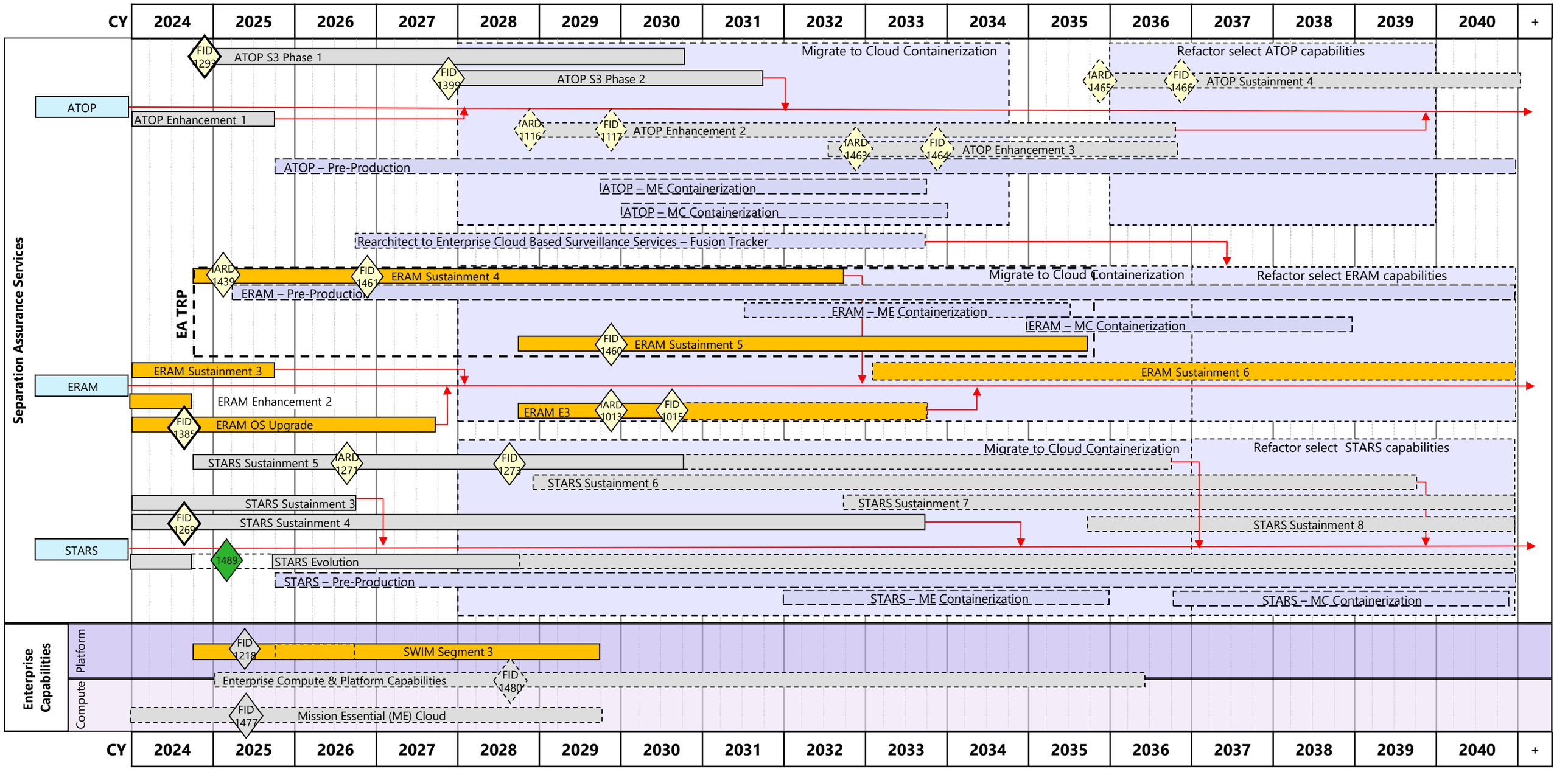
Automation Roadmap (4 of 5)



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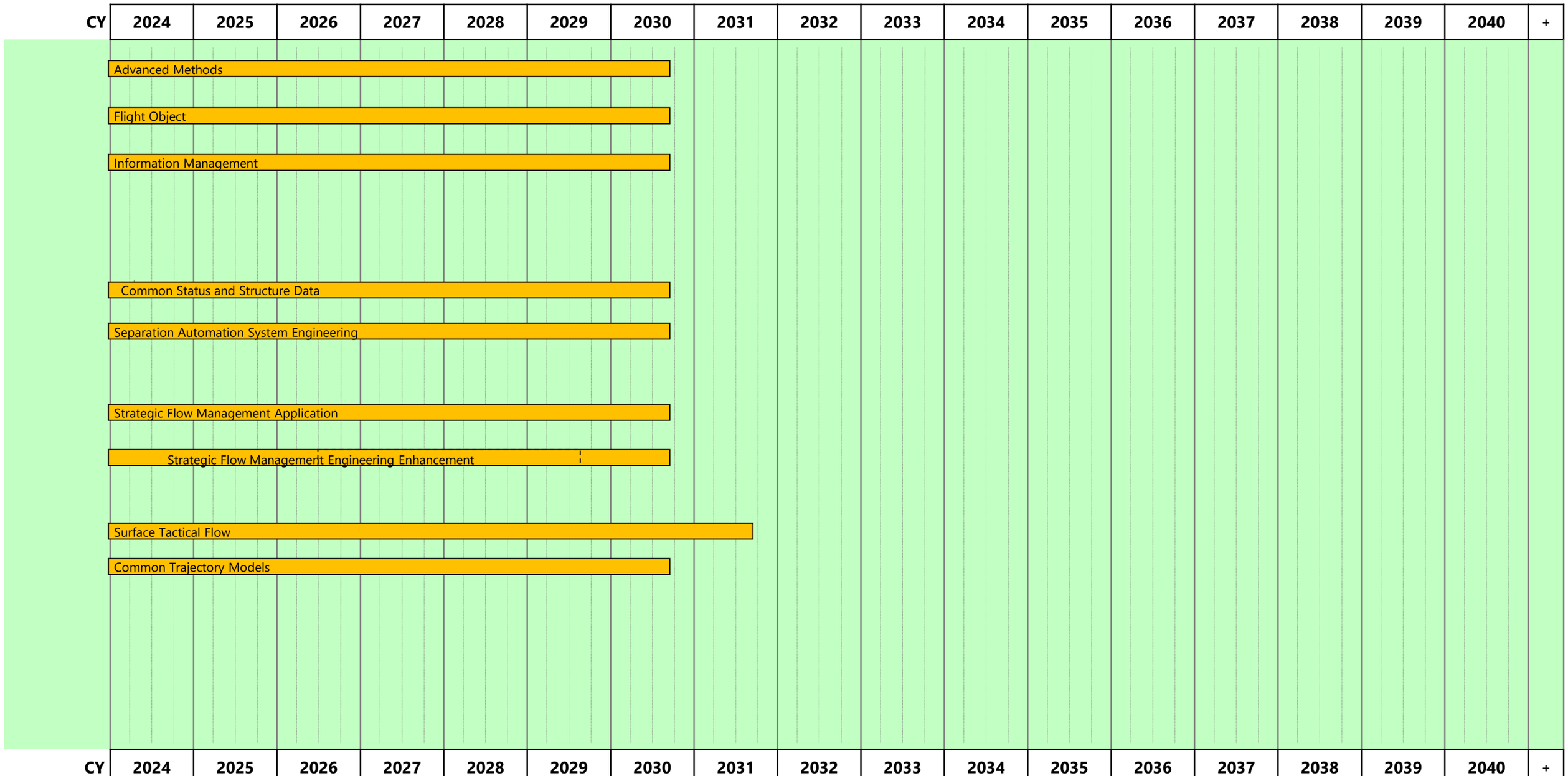
Automation Roadmap (5 of 5)



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Automation Roadmap: Assumptions

Identifier	Description
AUTO-01	Net-centric Enterprise Services will replace designated existing point to point interfaces with a system based on a Service Oriented Architecture providing enhanced data exchange, enhanced flexibility, and enhanced security for FAA Operations Personnel, and airspace users within a common information environment to support NextGen Operational Improvements.
AUTO-02	ADS-B is a necessary infrastructure element to support Trajectory Based Operations, Flexible Terminal, and High Density Terminal solution sets.
AUTO-03	Data Communication is a necessary infrastructure element to support Trajectory Based Operations, Flexible Terminal, and High Density Terminal solution sets.
AUTO-04	Operational Service Units will be responsible for JRC Final Investment Decisions.
AUTO-05	Policy and standards decisions prescribing the use of hand-held devices for data messaging by General Aviation pilots and aircraft are established.
AUTO-06	Consistent security management across Data Communication, Automation and SWIM support the evolution.
AUTO-07	Human-system integration will be conducted during analysis, design, development, and testing of Automation programs.
AUTO-08	Safety analysis and considerations will be included in all applicable phases of Automation analysis, design, development, and testing and platforms will provide data as required for safety monitoring and analysis.
AUTO-09	Automation platform designs will support environmental and energy saving initiatives.

Automation Roadmap: Decision Points (1 of 2)

DP #	Target Date CY	Primary Domain	Type	Name
122	2026 Q1	Automation	FID	Final Investment Decision (FID) for AIMM Enhancement 1
198	2032 Q3	Automation	FID	Final Investment Decision (FID) for TFDM Enhancement
1007	2031 Q1	Automation	FID	Final Investment Decision (FID) for TBFM Enhancement 2
1013	2029 Q4	Automation	IARD	Investment Analysis Readiness Decision (IARD) for ERAM Enhancement 3
1015	2030 Q3	Automation	FID	Final Investment Decision (FID) for ERAM Enhancement 3
1018	2030 Q2	Automation	IARD	Investment Analysis Readiness Decision (IARD) for TFDM Enhancement
1019	2031 Q2	Automation	IID	Initial Investment Decision (IID) for TFDM Enhancement
1075	2026 Q1	Automation	FID	Final Investment Decision (FID) for Common Support Services - Flight Data Phase 1
1116	2028 Q4	Automation	IARD	Investment Analysis Readiness Decision (IARD) for ATOP Enhancement 2
1117	2029 Q4	Automation	FID	Final Investment Decision (FID) for ATOP Enhancement 2
1143	2027 Q3	Commercial Space	FID	Final Investment Decision (FID) for National Airspace System (NAS) Space Integration Capabilities (NSIC)
1147	2032 Q2	Commercial Space	FID	Final Investment Decision (FID) for National Airspace System (NAS) Space Integration Capabilities (NSIC) Enhancement 1
1181	2027 Q3	Automation	Strategy (Other)	Strategy Decision for EDDS
1185	2030 Q2	Automation	FID	Final Investment Decision (FID) for E-IDS Phase 3
1186	2026 Q4	Automation	FID	Final Investment Decision (FID) for E-IDS Phase 2
1187	2027 Q2	Automation	IARD	Investment Analysis Readiness Decision (IARD) for AIMM Enhancement 2
1189	2028 Q2	Automation	FID	Final Investment Decision (FID) for AIMM Enhancement 2
1218	2025 Q2	Communication	FID	Final Investment Decision (FID) for SWIM Segment 3
1269	2024 Q3	Automation	FID	Final Investment Decision (FID) for STARS Sustainment 4
1271	2026 Q3	Automation	IARD	Investment Analysis Readiness Decision (IARD) for STARS Sustainment 5
1273	2028 Q3	Automation	FID	Final Investment Decision (FID) for STARS Sustainment 5
1281	2025 Q3	Automation	FID	Final Investment Decision (FID) for Flow Management Data and Services
1283	2027 Q1	Automation	IARD	Investment Analysis Readiness Decision (IARD) for Flow Management Data and Service (FMDS) Enhancement 1
1285	2028 Q1	Automation	IID	Initial Investment Decision (IID) for Flow Management Data and Service (FMDS) Enhancement 1
1287	2029 Q1	Automation	FID	Final Investment Decision (FID) for Flow Management Data and Service (FMDS) Enhancement 1
1293	2024 Q4	Automation	FID	Final Investment Decision (FID) for ATOP Sustainment 3 #1
1295	2026 Q3	Automation	IARD	Investment Analysis Readiness Decision (IARD) for Common Support Services - Flight Data Phase 2
1297	2027 Q3	Automation	FID	Final Investment Decision (FID) for Common Support Services - Flight Data (CSS-FD) Phase 2
1341	2026 Q1	Automation	FID	Final Investment Decision (FID) for Future Flight Service - Alaska Automation Capability (AAC)
1347	2028 Q1	Automation	FID	Final Investment Decision (FID) for Offshore Automation #2

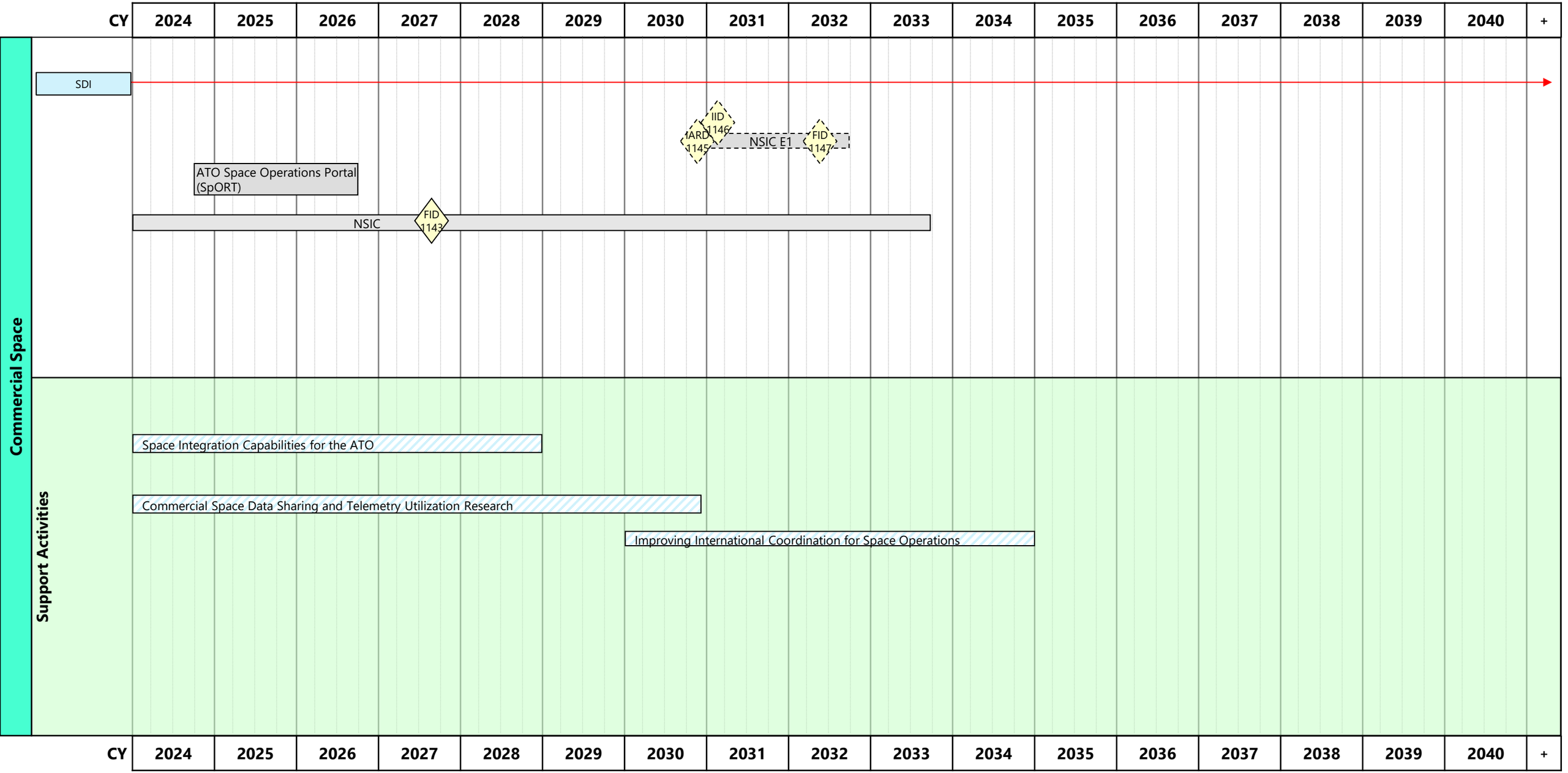
Automation Roadmap: Decision Points (2 of 2)

DP #	Target Date CY	Primary Domain	Type	Name
1382	2024 Q1	Automation	Strategy	JRC Strategy Decision for Future Flight Service - Alaska Automation Capability (AAC)
1385	2024 Q3	Automation	FID	Final Investment Decision (FID) for ERAM Operating System Upgrade
1394	2025 Q1	Automation	IARD	Investment Analysis Readiness Decision (IARD) for National RMLS Network Sustainment
1396	2026 Q3	Automation	FID	Final Invesment Decision (FID) for National RMLS Network Sustainment
1399	2027 Q4	Automation	FID	Final Investment Decision (FID) for ATOP Sustainment 3 #2
1402	2025 Q2	Automation	BCD	Baseline Change Decision (BCD) for Terminal Flight Data Management (TFDM)
1403	2024 Q3	Automation	BCD	Baseline Change Decision (BCD) for E-IDS Ph1
1406	2024 Q2	Communication	FID	Final Investment Decision (FID) for SWIM Segment 2D
1428	2026 Q1	Automation	IARD	Investment Analysis Readiness Decision (IARD) for Terminal Flight Data Management (TFDM) Sustainment 1
1430	2027 Q3	Automation	FID	Final Investment Decision (FID) for Terminal Flight Data Management (TFDM) Sustainment 1
1431	2025 Q2	Automation	IARD	Investment Analysis Readiness Decision (IARD) for Traffic Flow Management System (TFMS) Sustainment 4
1433	2026 Q2	Automation	FID	Final Investment Decision (FID) for Traffic Flow Management System (TFMS) Sustainment 4
1437	2027 Q1	Automation	IID	Initial Investment Decision (IID) for Common Support Services - Flight Data (CSS-FD) Phase 2
1439	2025 Q1	Automation	IARD	Investment Analysis Readiness Decision (IARD) for En Route Automation Tech Refresh Portfolio
1441	2024 Q3	Automation	Strategy	JRC Strategy Decision for FNS Sustainment
1442	2024 Q3	Automation	Strategy	JRC Strategy Decision for AIMM NOTAM Modernization
1443	2025 Q3	Automation	FID	Final Investment Decision (FID) for AIMM NOTAM Modernization
1445	2024 Q4	Automation	Strategy	JRC Strategy Decision for Flow Management Data and Services
1458	2026 Q1	Automation	IARD	Investment Analysis Readiness Decision (IARD) for Time Based Flow Management S2
1459	2027 Q2	Automation	FID	Final Investment Decision (FID) for TBFM S2
1460	2029 Q4	Automation	FID	Final Investment Decision (FID) for ERAM S5
1461	2026 Q4	Automation	FID	Final Investment Decision (FID) for En Route Automation Tech Refresh Portfolio, ERAM S4
1463	2032 Q4	Automation	IARD	Investment Analysis Readiness Decision (IARD) for ATOP E3
1464	2033 Q4	Automation	FID	Final Investment Decision (FID) for ATOP E3
1465	2035 Q4	Automation	IARD	Investment Analysis Readiness Decision (IARD) for ATOP S4
1466	2036 Q4	Automation	FID	Final Investment Decision (FID) for ATOP S4
1477	2025 Q2	Enterprise Services & Capabilities	FID	Final Investment Decision (FID) for Mission Essential (ME) Cloud
1480	2028 Q3	Enterprise Services & Capabilities	FID	Final Investment Decision (FID) for Enterprise Compute & Platform Capabilities
1489	2025 Q1	Automation	Strategy	JRC Strategy Decision for STARS Evolution
1490	2027 Q1	Automation	FID	Final Investment Decision (FID) for NOTAM Modernization Phase 2

Commercial Space

The Commercial Space Roadmap presents a view of the current systems supporting the National Airspace System (NAS) and their enhancement, sustainment or replacement through major development programs and support activities. The Commercial Space Roadmap is intended to convey the major program strategy and acquisition decision points as well as program execution through the In-Service Decision. The roadmap serves as a summary view of more detailed plans within each development program.

Commercial Space Roadmap (1 of 1)



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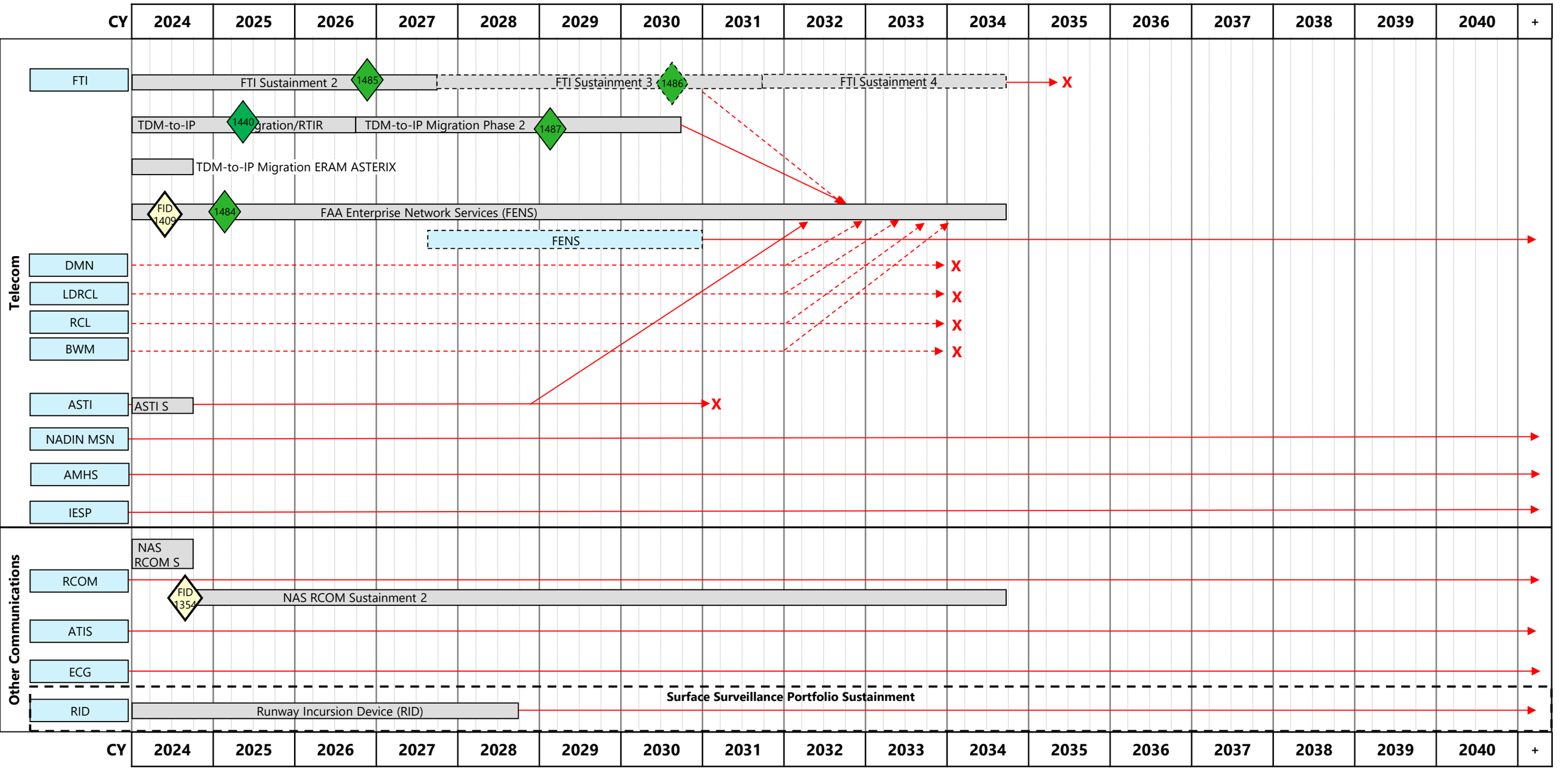
Commercial Space: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
1143	2027 Q3	Commercial Space	FID	Final Investment Decision (FID) for National Airspace System (NAS) Space Integration Capabilities (NSIC)
1145	2030 Q4	Commercial Space	IARD	Investment Analysis Readiness Decision (IARD) for National Airspace System (NAS) Space Integration Capabilities (NSIC) Enhancement 1
1146	2031 Q1	Commercial Space	IID	Initial Investment Decision (IID) for National Airspace System (NAS) Space Integration Capabilities (NSIC) Enhancement 1
1147	2032 Q2	Commercial Space	FID	Final Investment Decision (FID) for National Airspace System (NAS) Space Integration Capabilities (NSIC) Enhancement 1

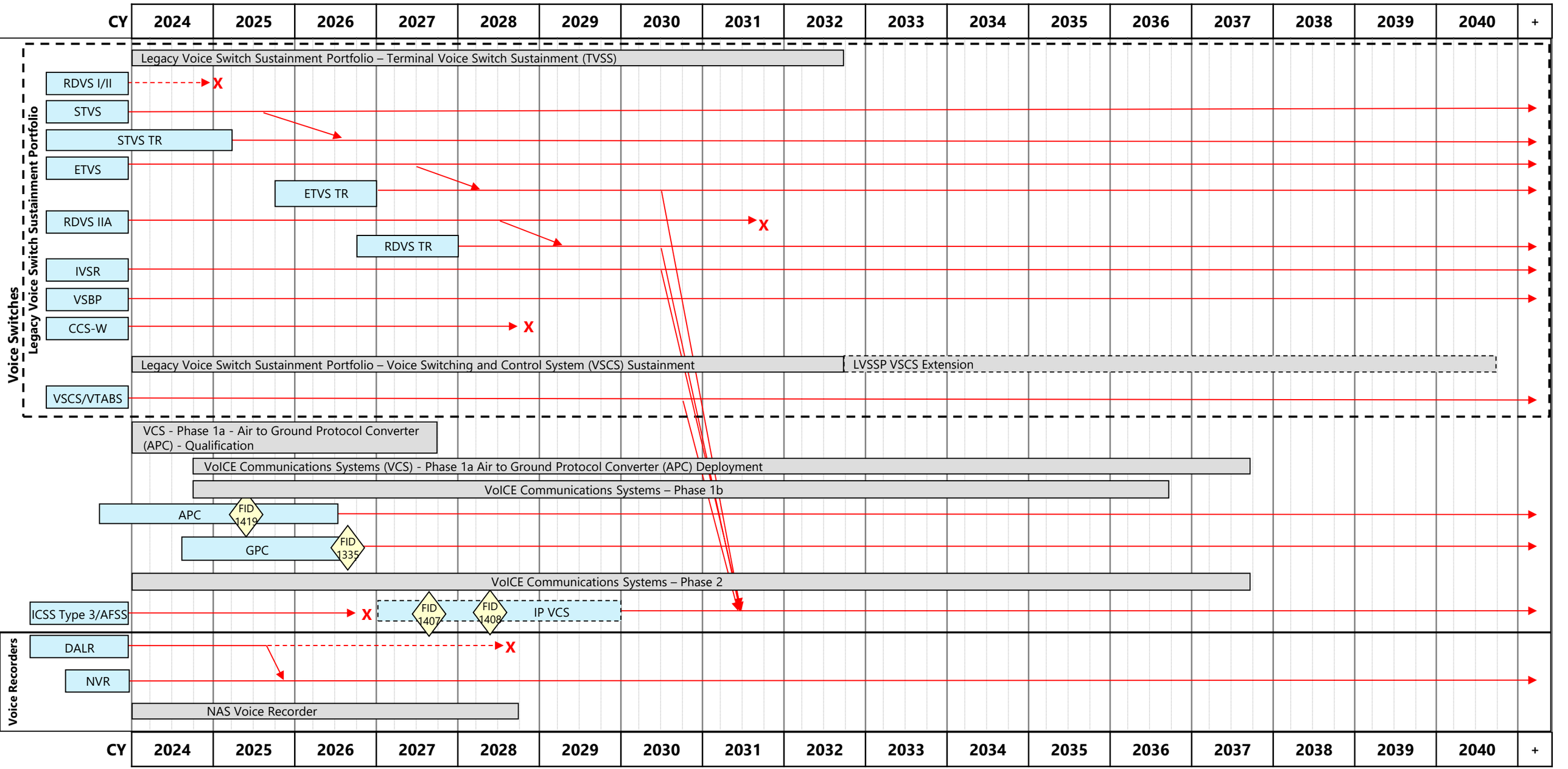
Communication

The Communication Roadmap presents an Executive View (EV) of the current communication systems supporting the National Airspace System and their enhancement, sustainment or replacement through major development programs and support activities. The Communications Roadmap is intended to convey the major communication program strategy and acquisition decision points as well as program funding. The roadmap serves as a summary view of more detailed plans within each development program.

Communication Roadmap (1 of 5)



Communication Roadmap (2 of 5)



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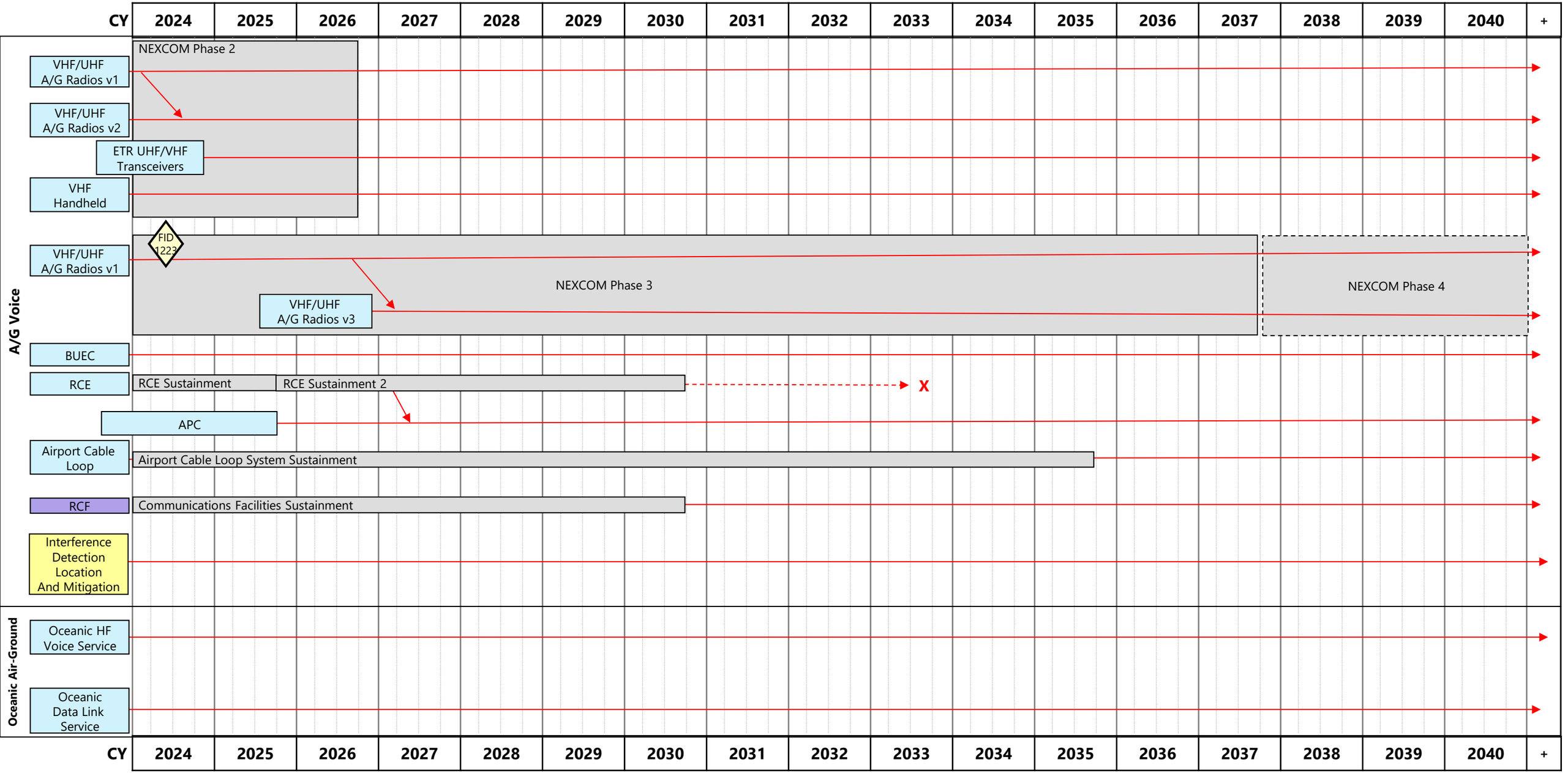
Communication Roadmap (3 of 5)



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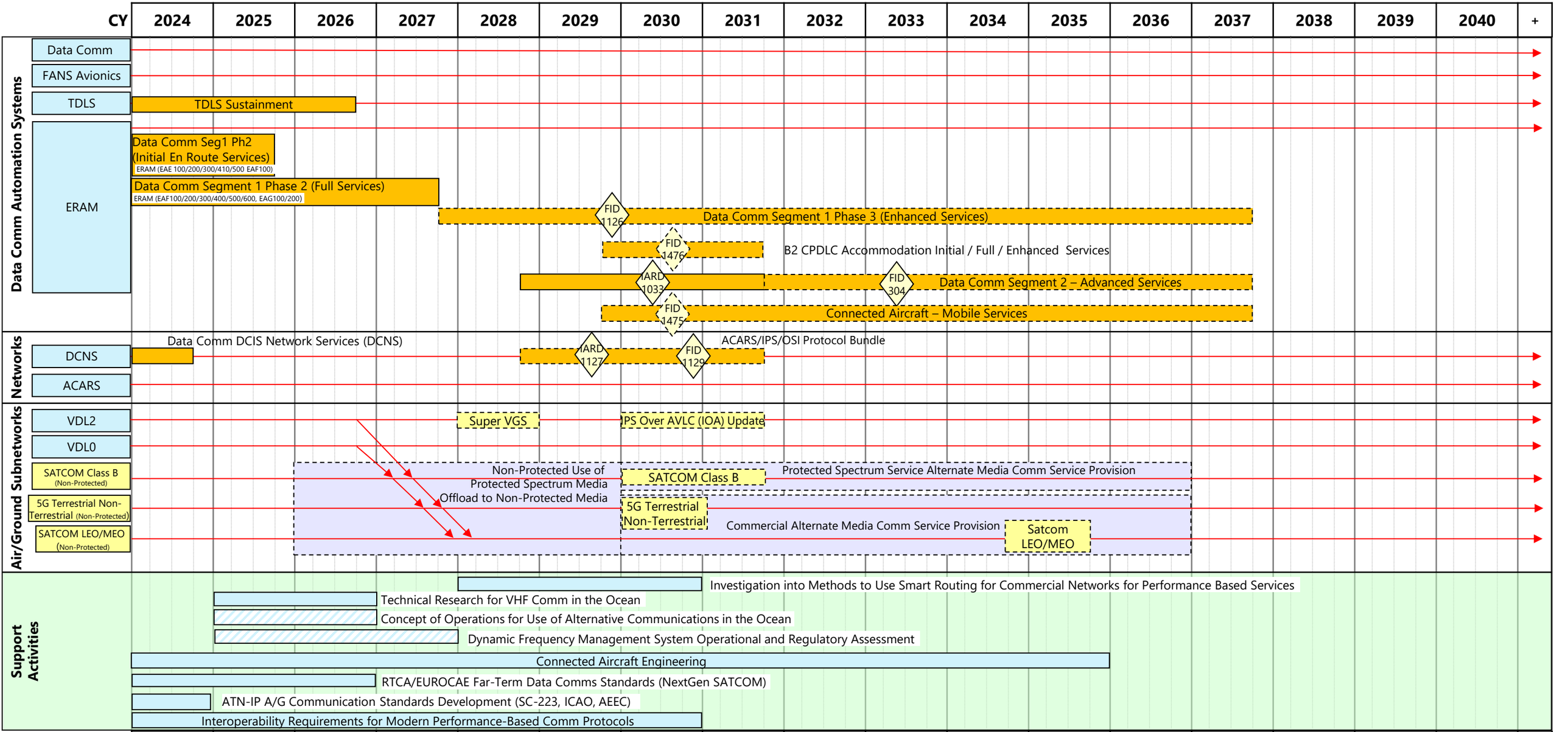
Communication Roadmap (4 of 5)



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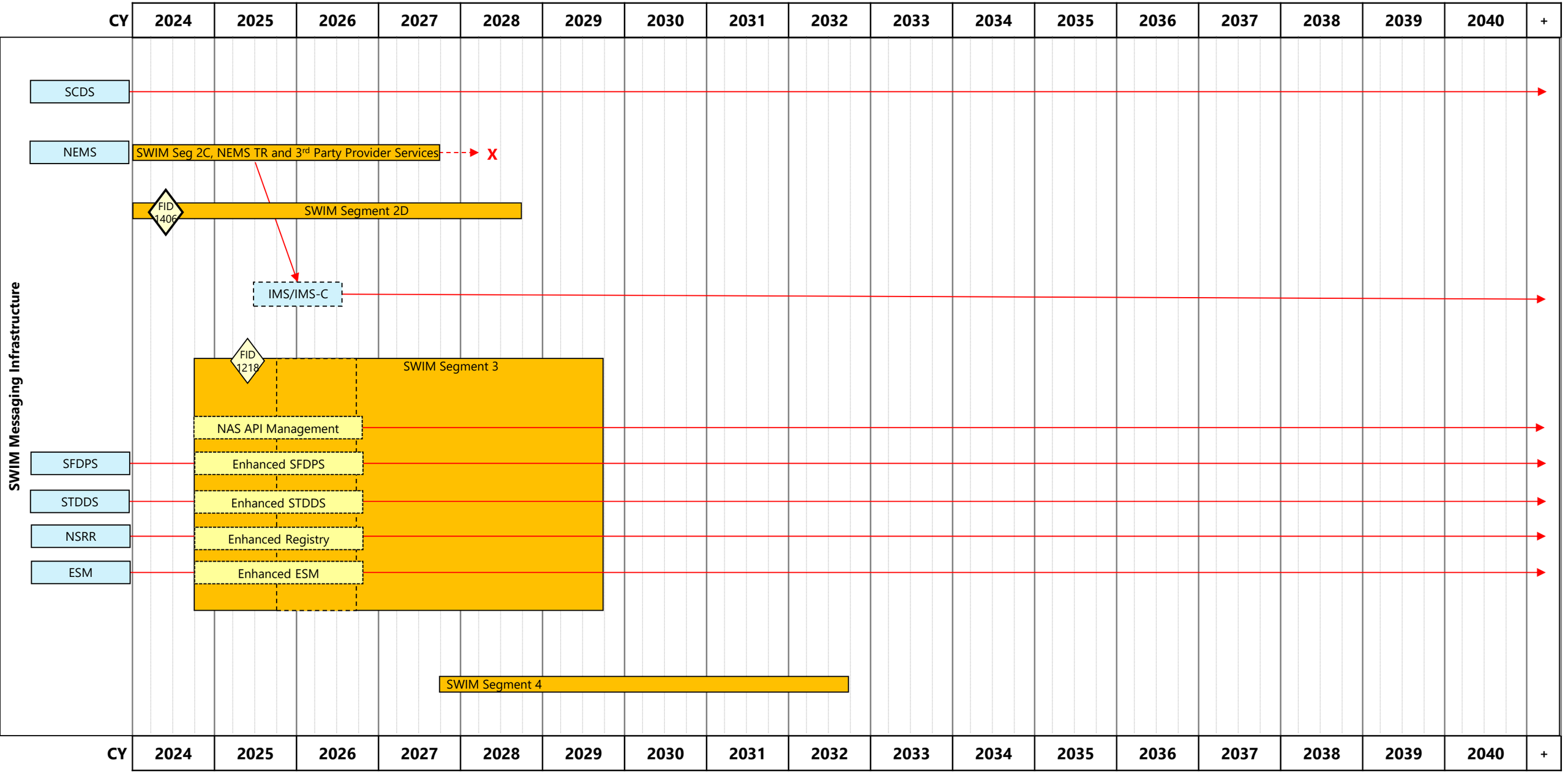
Communication Roadmap (5 of 5)



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Communication Roadmap: Assumptions

Identifier	Description
COMM-01	FENS will become the primary ground-based Voice/Data transport system.
COMM-02	All domestic flight safety critical A/G communications are over VHF based systems. Advisory communications (e.g. Weather, NAS Status, NOTAMS) can be supported by VHF A/G Communication or by commercial communications services through airborne access to SWIM services.
COMM-04	Relationship between SWIM and Communications: SWIM Dataflows all leverage NAS OPS IP service and initial SWIM Segment 2 infrastructure is being implemented with FTI & FENS.
COMM-06	ASTI (ANICS) will not be integrated into FAA Telecommunications Infrastructure contract.
COMM-07	FIDI TR will develop IP communication protocols between automation systems (e.g. ERAM, terminal clients) which end systems will provide the investment necessary to implement required changes.
COMM-08	JRC approved a joint IID for Data Comm Segment 1 and 2 in 2008; therefore, it is projected that IID for Segment 2 will be waived.

Communication Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
304	2033 Q2	Communication	FID	Final Investment Decision (FID) for Data Comm Segment 2
1033	2030 Q2	Communication	IARD	Investment Analysis Readiness Decision (IARD) for DataComm Segment 2
1126	2029 Q4	Communication	FID	Final Investment Decision (FID) for Data Comm Segment 1 Phase 2 Enhanced Services
1127	2029 Q3	Communication	IARD	Investment Analysis Readiness Decision (IARD) for Data Comm IP Gateway
1129	2030 Q4	Communication	FID	Final Investment Decision (FID) for Data Comm IP Gateway
1218	2025 Q2	Communication	FID	Final Investment Decision (FID) for SWIM Segment 3
1223	2024 Q2	Communication	FID	Final Investment Decision (FID) for NEXCOM Phase 3
1335	2026 Q3	Communication	FID	Final Investment Decision (FID) for VCS Ph1 - GPC
1354	2024 Q3	Communication	FID	Final Investment Decision (FID) for NAS Recovery Communications (RCOM) Sustainment 2
1406	2024 Q2	Communication	FID	Final Investment Decision (FID) for SWIM Segment 2D
1407	2027 Q3	Communication	FID	Final Investment Decision (FID) for VoICE Communication Systems (VCS) Phase 2 IP #1
1408	2028 Q2	Communication	FID	Final Investment Decision (FID) for VoICE Communication Systems (VCS) Phase 2 IP #2
1409	2024 Q2	Communication	FID	Final Investment Decision (FID) for FAA Enterprise Network Services (FENS) #2
1419	2025 Q2	Communication	FID	Final Investment Decision (FID) for VoICE Communications System (VCS) Air to Ground Protocol Converter (APC) #2
1440	2025 Q2	Communication	Strategy	JRC Strategy Decision for Time-Division Multiplexing to Internet Protocol (TDM-to-IP) Migration
1475	2030 Q3	Communication	FID	Final Investment Decision (FID) for Connected Aircraft – Mobile Services
1476	2030 Q3	Communication	FID	Final Investment Decision (FID) for B2 CPDLC Accommodation Initial / Full / Enhanced Services
1484	2025 Q1	Communication	Strategy	JRC Strategy Decision for FENS
1485	2026 Q4	Communication	Strategy	JRC Strategy Decision for FTI S2
1486	2030 Q3	Communication	Strategy	JRC Strategy Decision for FTI S3
1487	2029 Q1	Communication	Strategy	JRC Strategy Decision for TDM-IP Phase 2

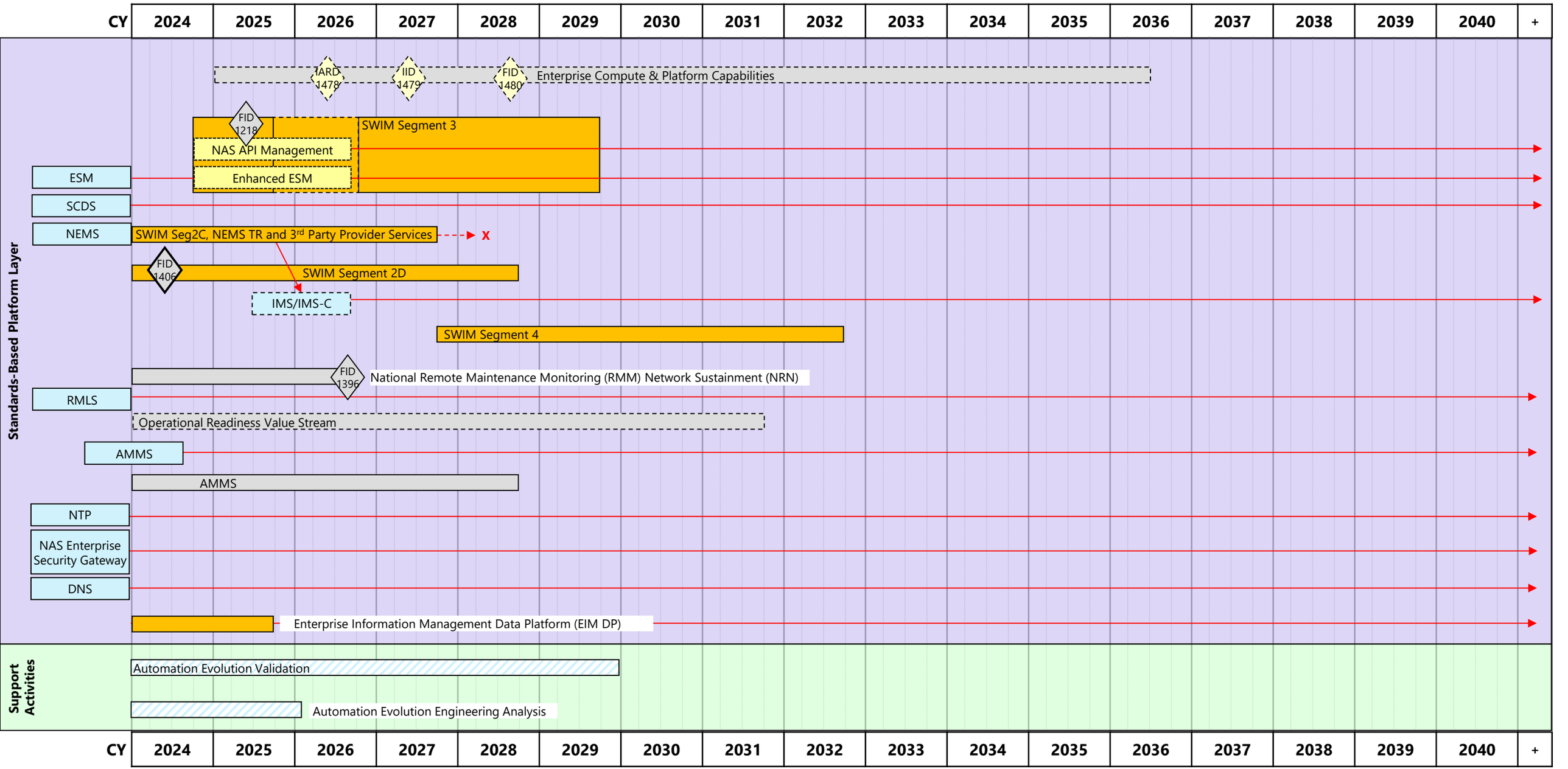
Enterprise Services & Capabilities

The Enterprise Services and Capabilities Roadmap presents an Executive View (EV) of the evolution of existing and planned enterprise services provided by NAS systems and programs and provides an outline of the major activities, decisions, and milestones. By definition, services are capabilities that exist as processes, applications, infrastructure, or any combination. They are implemented using design principles that support and promote enterprise-wide interoperability, sharing, standardization, federation, awareness, loose coupling, granularity, modularity, abstraction, reuse, and flexibility. Enterprise Services in the Automation Evolution Strategy (AES) architecture is defined as a service created for standardized use across the FAA. It includes services that provide common functionality where there is a significant benefit to the organization for all to adopt.

The Enterprise Services & Capabilities Roadmap is organized around the following Automation Evolution Strategy (AES) layers: Standards-Based Platform and Computing Resources. Additional layers may be considered during the next update cycle.

- The Standards-Based Platform Layer include services that deliver specific software or middleware component that are made available for use in creating, deploying, and operating mission software. It provides Frameworks & Environments and Enterprise Infrastructure Services (e.g. security event information management, cyber, monitoring/logging, identity access management, data encryption, and back-up & restore).
- The Computing Resources Layer includes services that provide components of the computing infrastructure needed to run platform and/or mission software. It provides End User equipment (e.g. workstations and monitors), Computing Infrastructure Components (e.g. cloud & on-prem, routers, switches, servers, disk storage).

Enterprise Services & Capabilities Roadmap (1 of 2)



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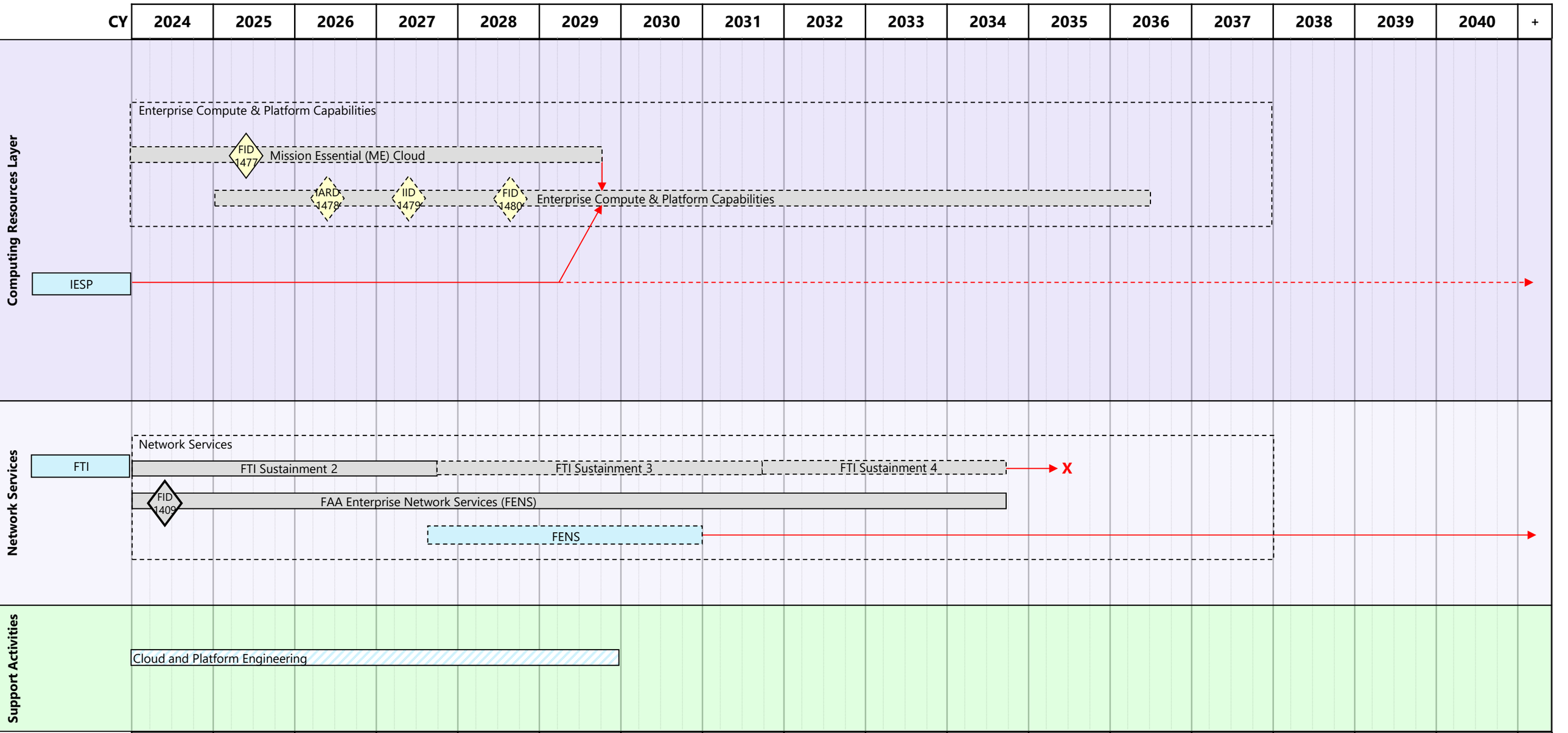
Enterprise Services & Capabilities Roadmap (2 of 2)



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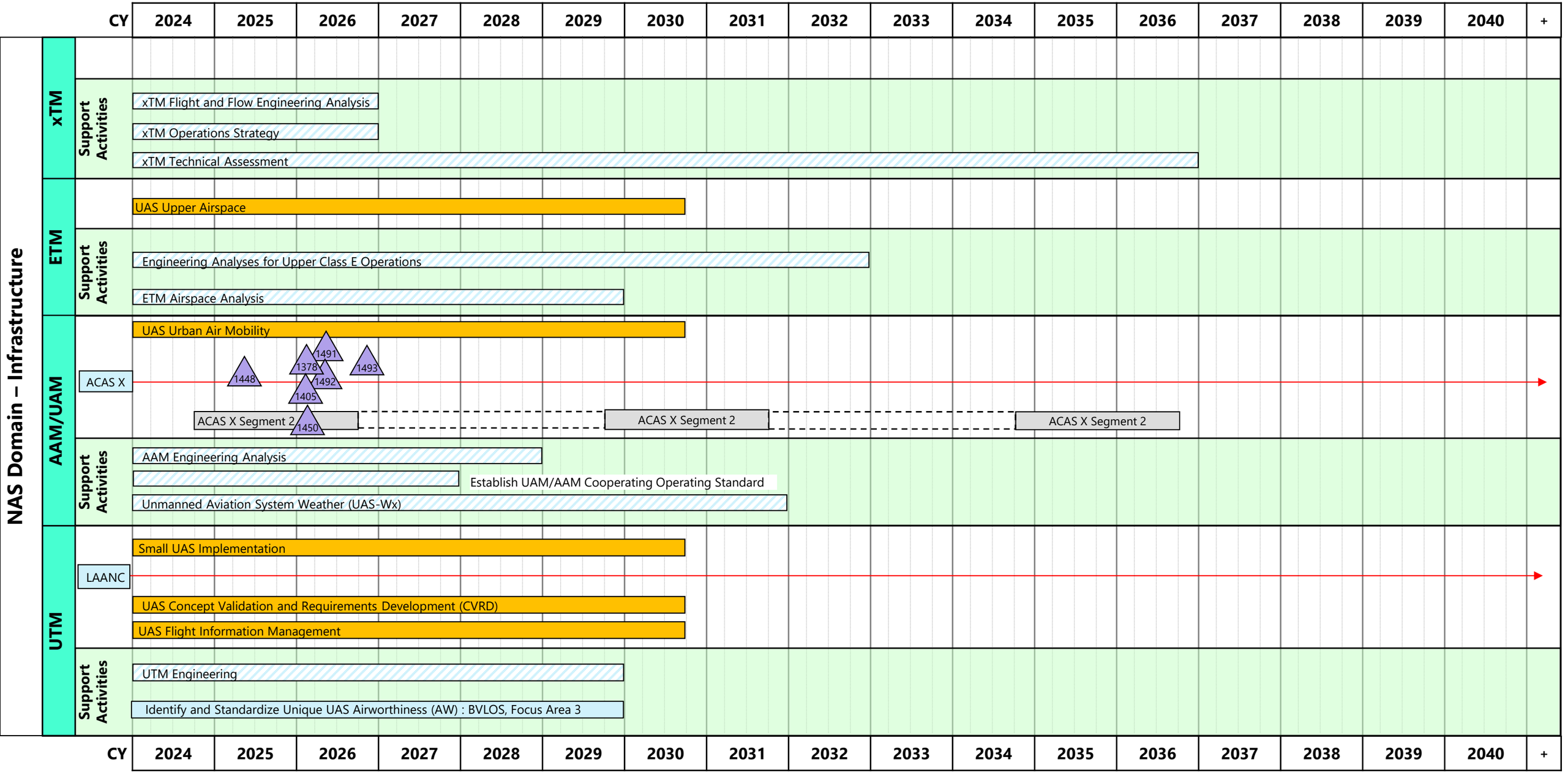
Enterprise Services & Capabilities Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
1396	2026 Q3	Automation	FID	Final Invesment Decision (FID) for National RMLS Network Sustainment
1406	2024 Q2	Communication	FID	Final Investment Decision (FID) for SWIM Segment 2D
1477	2025 Q2	Enterprise Services & Capabilities	FID	Final Investment Decision (FID) for Mission Essential (ME) Cloud
1478	2026 Q2	Enterprise Services & Capabilities	IARD	Investment Analysis Readiness Decision (IARD) for Enterprise Compute & Platform Capabilities
1479	2027 Q2	Enterprise Services & Capabilities	IID	Initial Investment Decision (IID) for Enterprise Compute & Platform Capabilities
1480	2028 Q3	Enterprise Services & Capabilities	FID	Final Investment Decision (FID) for Enterprise Compute & Platform Capabilities

Extensible Traffic Management (xTM)

The Extensible Traffic Management (xTM) Roadmaps provide a consolidated timeline of activities and investments, both active and planned, required to integrate diverse operations into the NAS. The current iteration of the roadmaps reflect initial pre-implementation efforts and AMS acquisitions.

Extensible Traffic Management (xTM) Roadmap (1 of 2)



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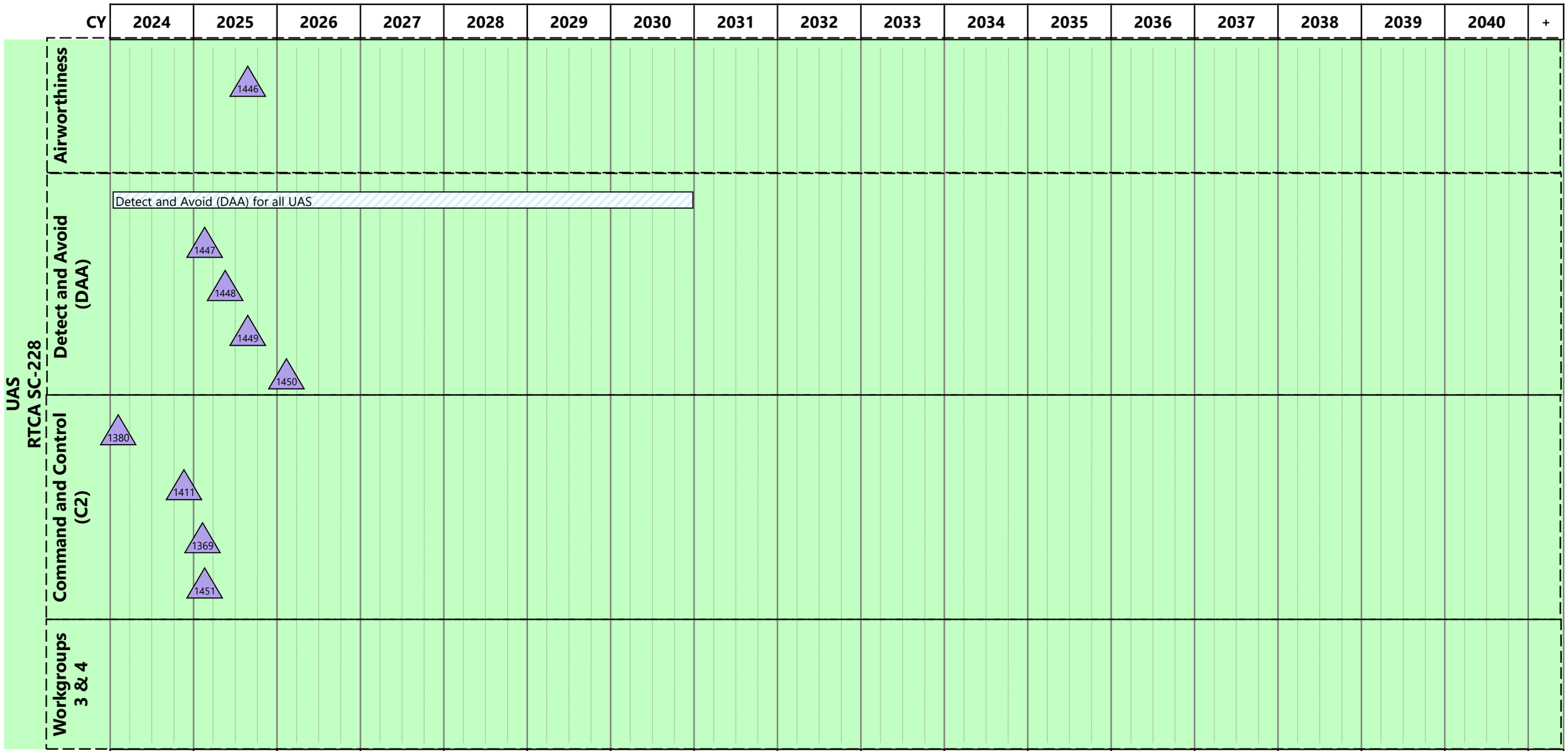
Extensible Traffic Management (xTM) Roadmap (2 of 2)



BASELINE

Extensible Traffic Management (xTM): Assumptions

Identifier	Description
NE-01	NSIC Implementation is dependent on TFMS/ ERAM/ STARS development bandwidth
NE-02	The Authoritative references used to populate the CY2019 UAS roadmaps are: 1) "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap" (July 2018) 2) CIP data provided by AFN and Draft CIP FY 2020 – FY2024 3) UAS Integration Research Plan (2017 – 2022) 4) Other NAS Infrastructure Roadmaps 5) UAS Stakeholder inputs
NE-03	Although impacted NAS systems are identified and documented in "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap" (July 2018), requirements allocations have not been discussed and accepted by the organizations that manage the impacted systems. Upon coordination and decisions made about UAS requirements allocation, ANG-B intends to update this roadmap to depict acquisitions that will deliver UAS-related requirements in the future.
NE-04	Research and Development: The full scope of research and development activities are too numerous and complex to depict on this format of the roadmaps. Roadmap stakeholders are encouraged to reference pages 10, 35 and 38 of "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap" (July 2018) to understand the full scope of FAA UAS R&D efforts.

Extensible Traffic Management (xTM) Roadmap: Decision Points (1 of 1)

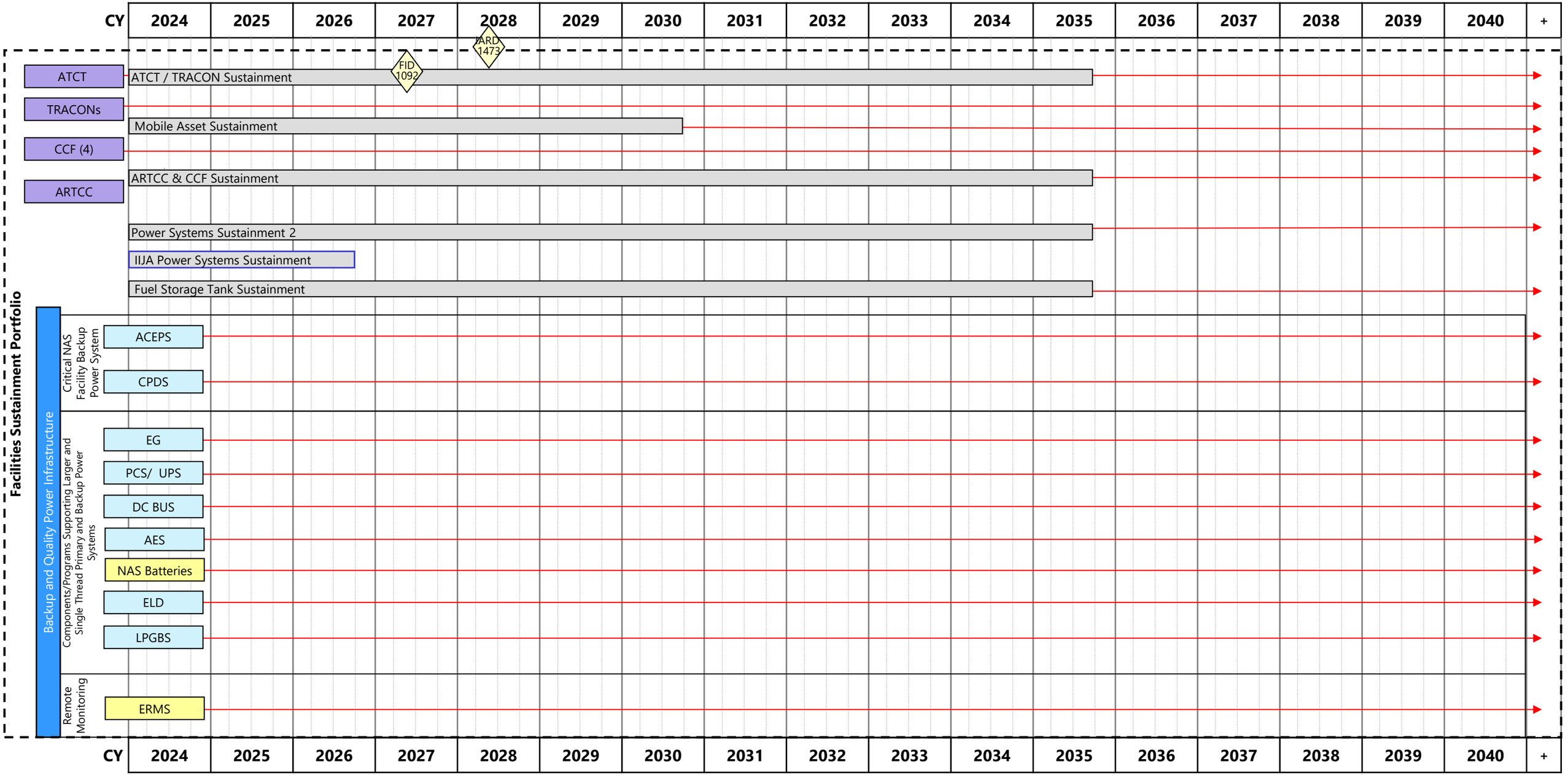
DP #	Target Date CY	Primary Domain	Type	Name
1369	2025 Q1	Aircraft	Other Milestone	C2 Link MOPS for Cellular Networks
1380	2024 Q3	Aircraft	Other Milestone	DO-406 - Minimum Operational Performance Standards for Ultra High Frequency Airborne Radio Systems Supporting UAS C2 Link Systems
1405	2026 Q1	Aircraft	Other Milestone	Minimal Operational Performance Standards (MOPS) for ACAS Xr
1411	2024 Q4	Aircraft	Other Milestone	C2 Link MOPS (Terrestrial) (DO-362B)
1446	2025 Q3	Aircraft	Other Milestone	MASPS: Navigation for Automatic Taxi (DO-VVV)
1447	2025 Q1	Aircraft	Other Milestone	DAA MOPS (DO-365C Change 1)
1448	2025 Q2	Aircraft	Other Milestone	DAA Radar MOPS Update (DO-366B)
1449	2025 Q3	Aircraft	Other Milestone	MASPS for DAA Supporting Taxi Operations (DO-WWW)
1450	2026 Q1	Aircraft	Other Milestone	DAA MOPS (DO-365D)
1451	2025 Q2	Aircraft	Other Milestone	RTCA Report (RR) for Users of DO- 377B for Deriving C2 Link System Requirements
1491	2026 Q2	Aircraft	Other Milestone	Minimum Operational Performance Standards (MOPS) for Cooperative Surveillance Systems
1492	2026 Q2	Aircraft	Other Milestone	Minimum Operational Performance Standards (MOPS) for ACAS Xu Revision A DO386(A)/ED275(A)
1493	2026 Q4	Aircraft	Other Milestone	Guidance for Validation of Collision Avoidance Systems

Facilities

The Facilities Roadmap presents an Executive View (EV) of the current National Airspace System (NAS) facilities environment and their sustainment, modernization, or replacement through major development programs.

Items with a blue outline are lines of funding from the Infrastructure Investment & Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL).

Facilities Roadmap (1 of 5)



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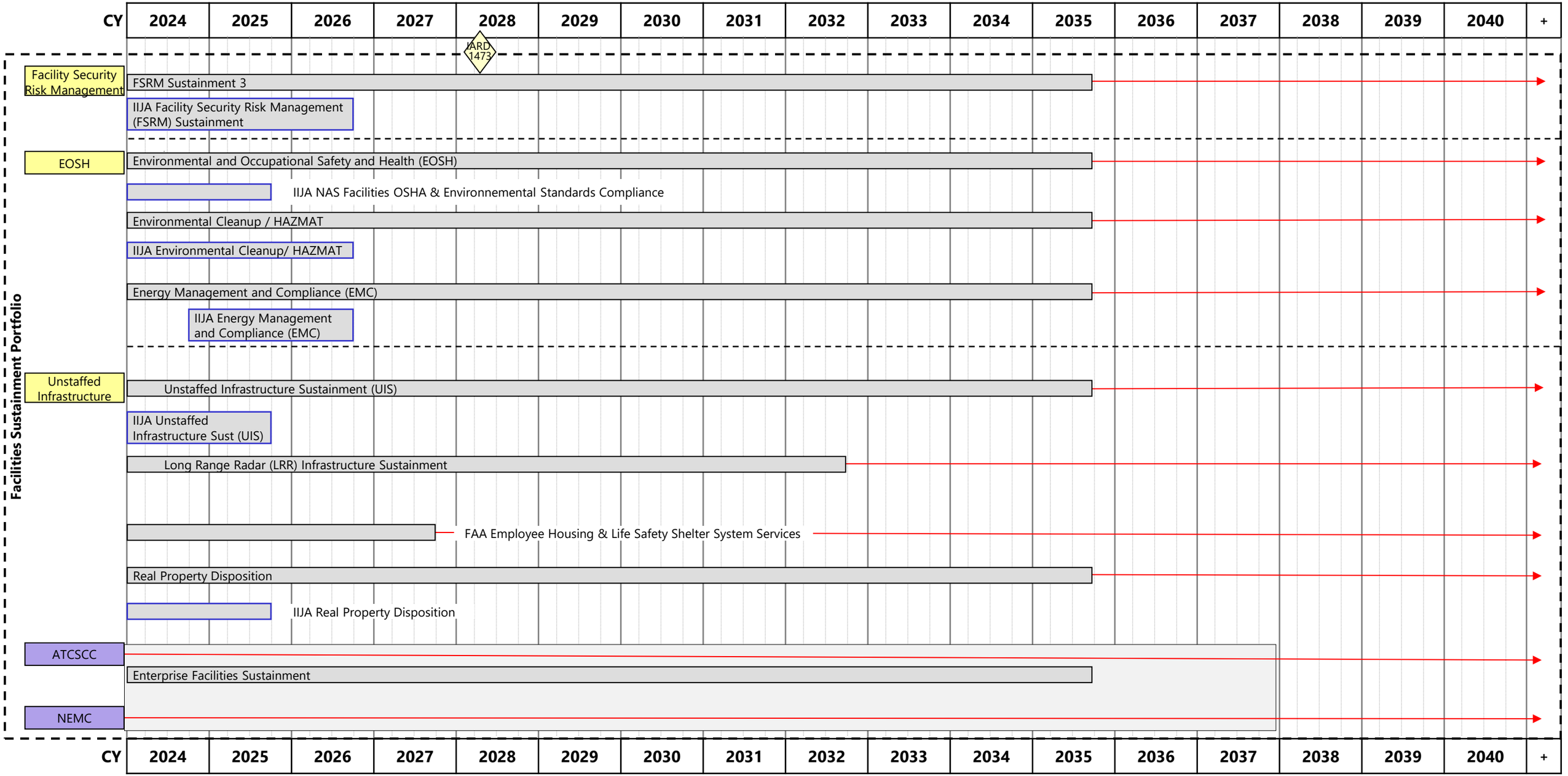
Facilities Roadmap (2 of 5)



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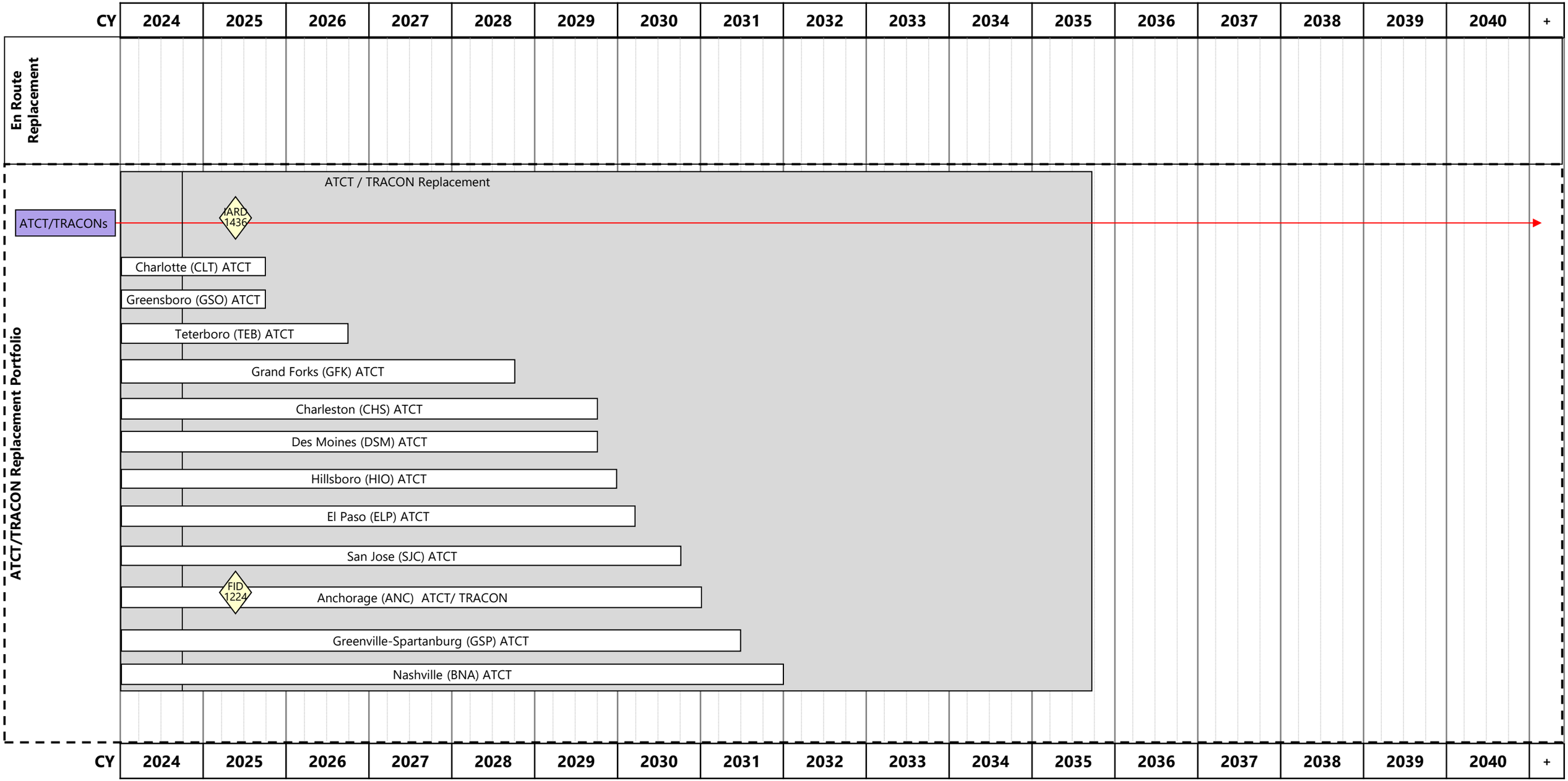
Items with a blue outline are lines of funding from the Infrastructure Investment & Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL).

Facilities Roadmap (3 of 5)



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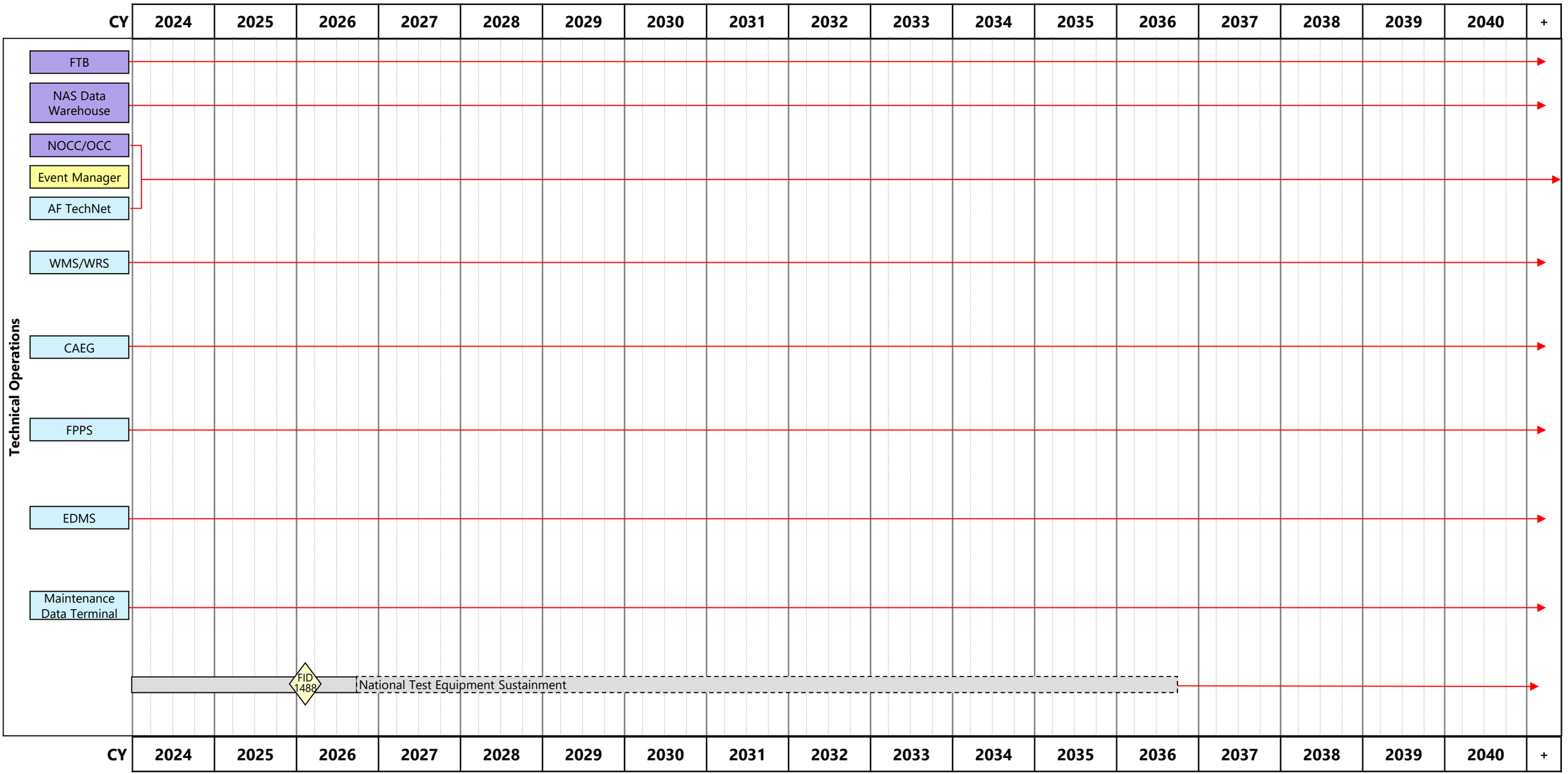
Facilities Roadmap (4 of 5)



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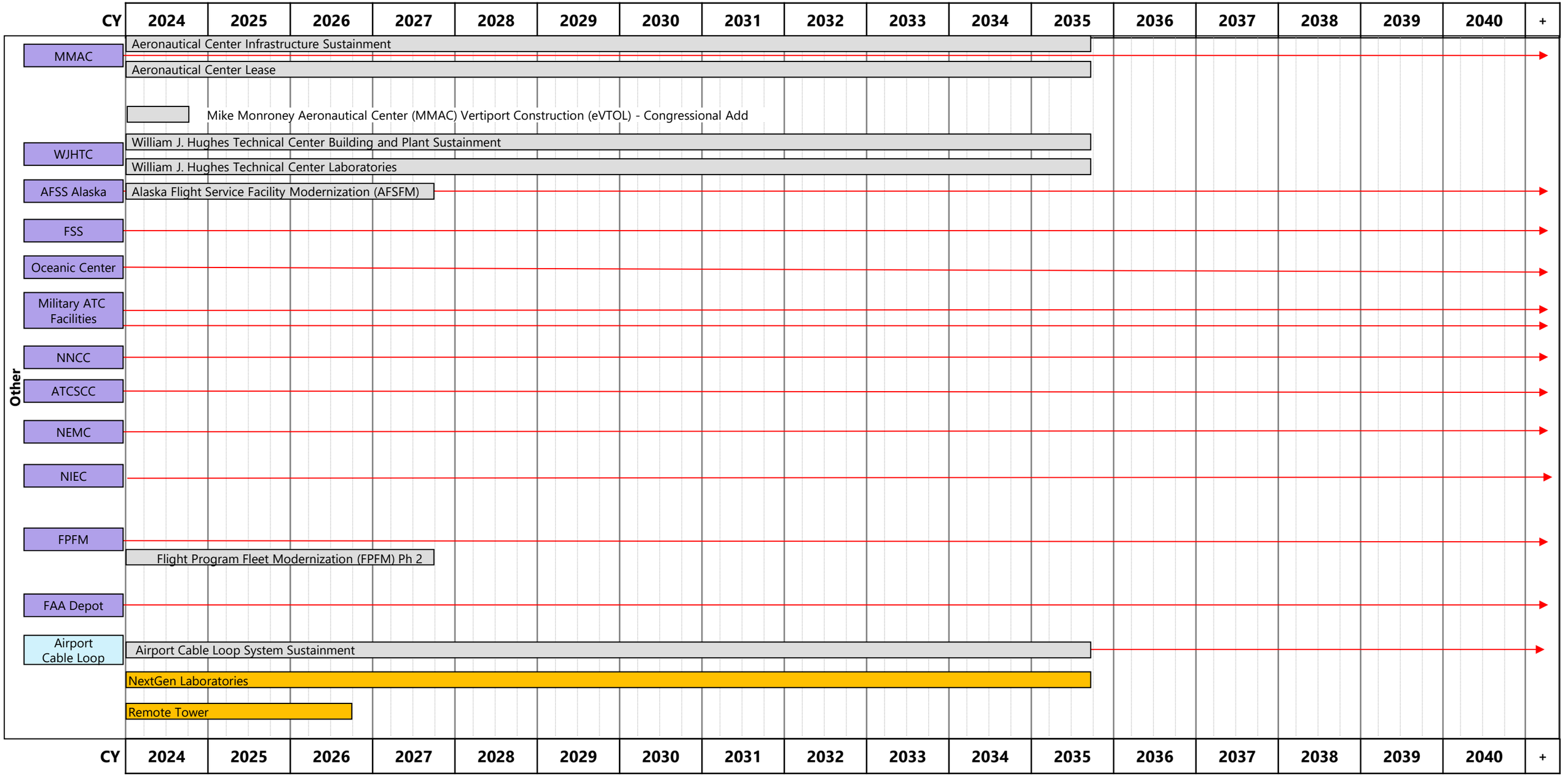
Facilities Roadmap (5 of 5)



BASELINE

Facilities Roadmap: Assumptions

Identifier	Description
FAC-01	AJW-2 will need funding for any facilities or infrastructure projects to expand or improve a facility in preparation for a PMO program installation. Refurbish requirements at Large TRACONs and new facilities may be needed to support BA positions. AJW-2 should receive funding and requirements documentation at least 3 years in advance, preferably 4 years, to integrate the project into the Sustainment or New Investment portfolio workplan.
FAC-02	Projects within the Facilities Sustainment Portfolio that are estimated to cost over $50 million are assigned their own FID decision point.
FAC-03	Projects within the ATCT/ TRACON Replacement Portfolio that are estimated to cost over $160 million are assigned their own FID decision point.

Facilities Roadmap: Decision Points (1 of 1)

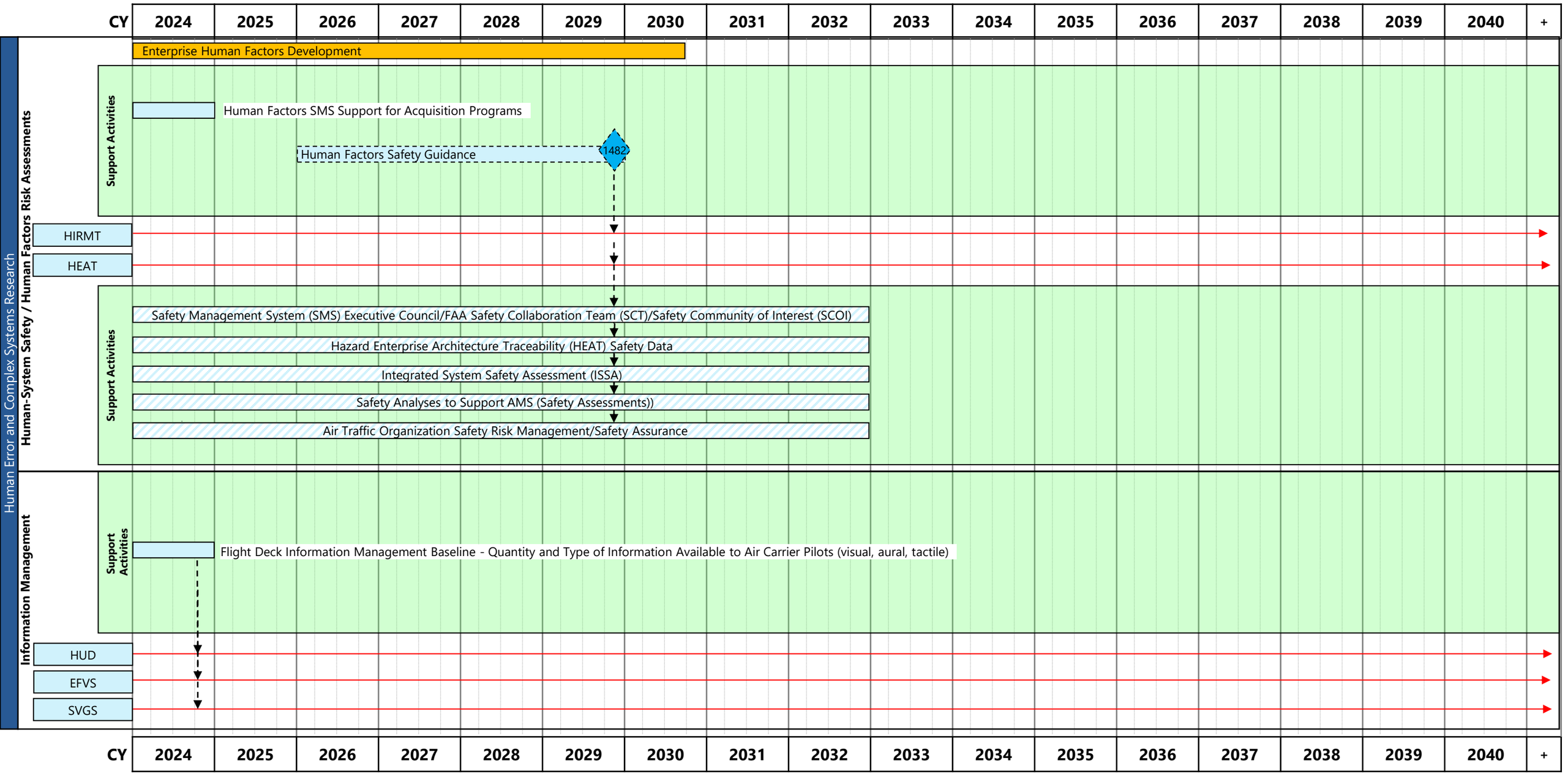
DP #	Target Date CY	Primary Domain	Type	Name
1092	2027 Q2	Facilities	FID	Final Investment Decision (FID) for New York TRACON (N90) Sustainment
1224	2025 Q2	Facilities	FID	Final Investment Decision (FID) for Anchorage ATCT/TRACON Replacement
1436	2025 Q2	Facilities	IARD	Investment Analysis Readiness Decision (IARD) ATCT/TRACON Replacement Portfolio Phase 1
1473	2028 Q2	Facilities	IARD	Investment Analysis Readiness Decision (IARD) for the Facilities Sustainment Portfolio
1488	2026 Q1	Facilities	FID	Final Investment Decision (FID) for National Test Equipment Sustainment

Human Systems Integration

The Human Systems Integration (HSI) Roadmap provides an Executive View (EV) of investments in human factors activities and their direct contribution to technology concepts, developments, evaluations, and evolution of National Airspace System (NAS) infrastructure. The HSI Roadmap shows the progression of human factors research and engineering activities alongside NAS infrastructure to document human factors product transition points. The HSI Roadmap drives the execution of critical path activities by providing timely human factors inputs to NAS infrastructure investments and related programs.

For more information, please contact the Office of NextGen, Human Factors Division.

Human Systems Integration Roadmap (1 of 4)



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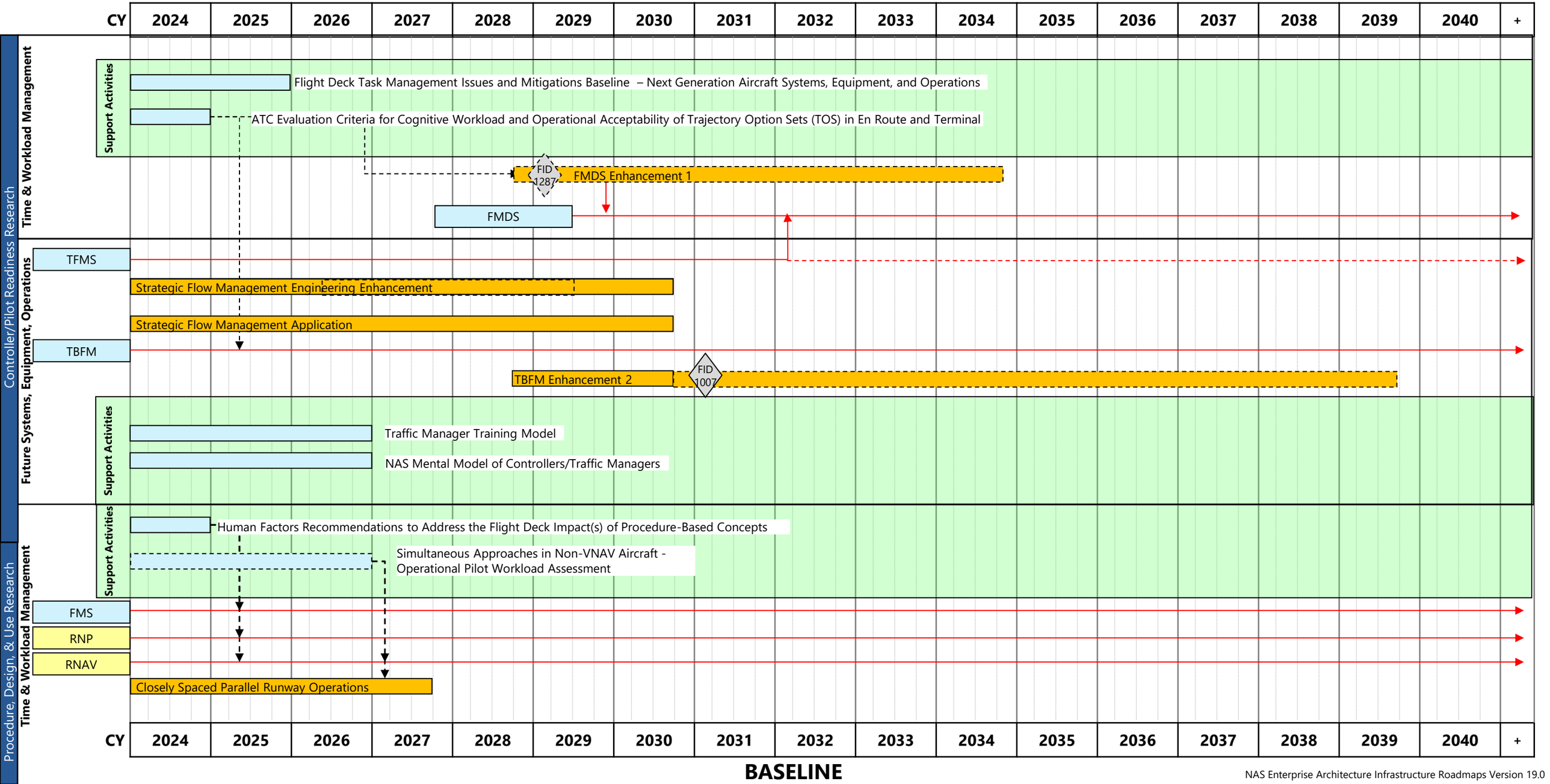
Human Systems Integration Roadmap (2 of 4)



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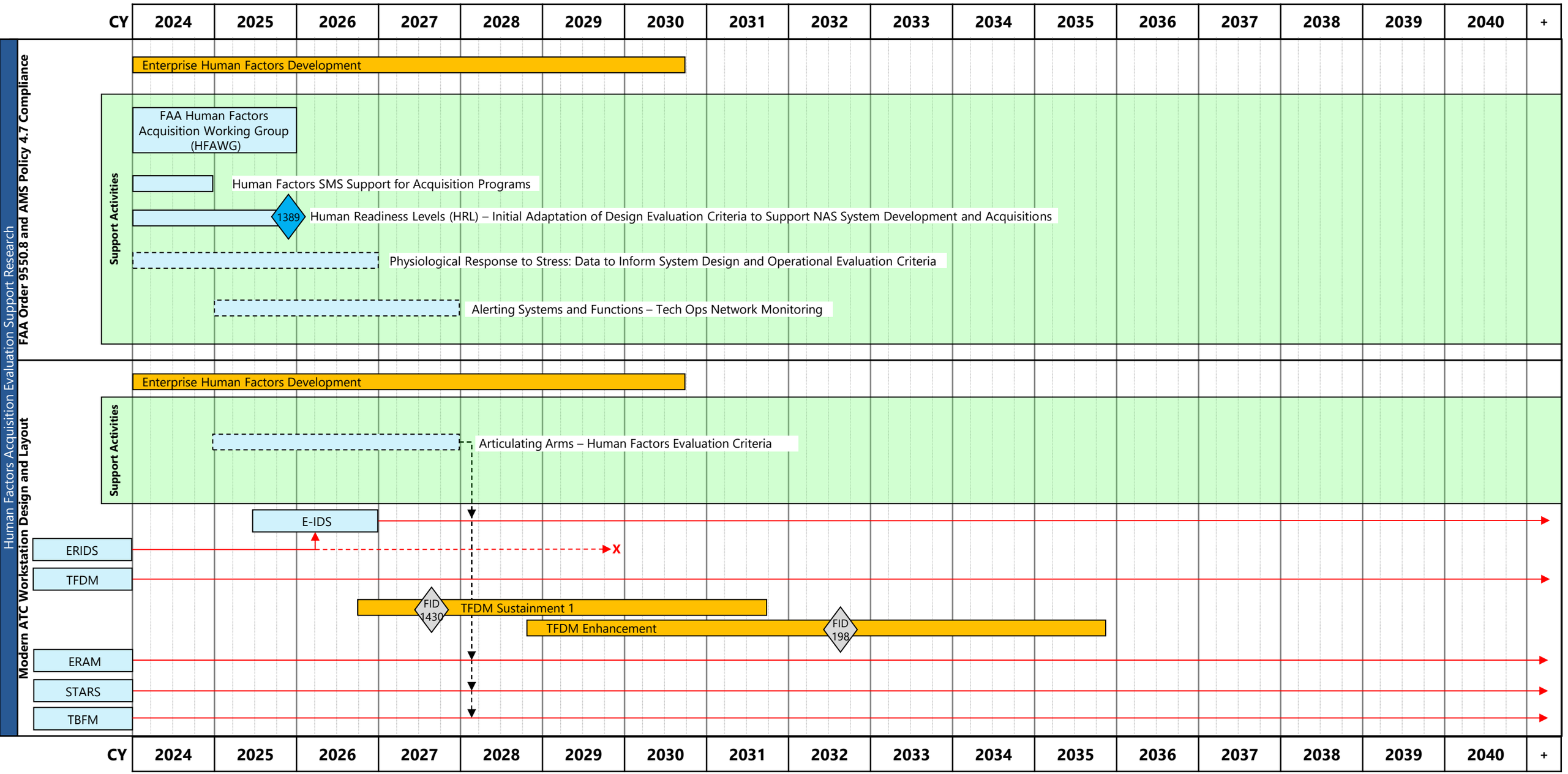
Human Systems Integration Roadmap (3 of 4)



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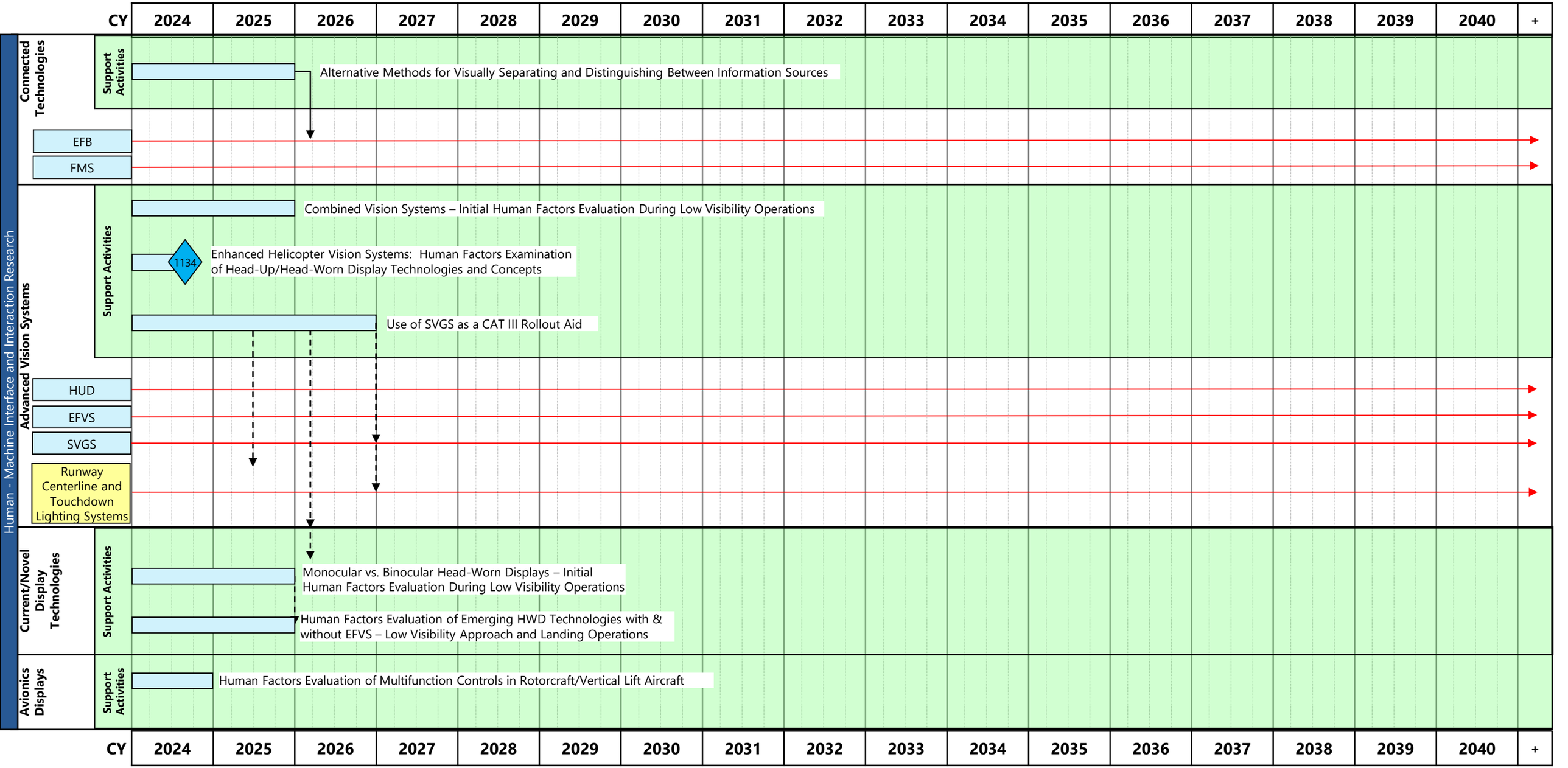
Human Systems Integration Roadmap (4 of 4)



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Human Systems Integration Roadmap: Assumptions

Identifier	Description
HSI-01	The execution of program- and project-specific human factors activities are not represented in the HSI Roadmap.
HSI-02	Human factors integration points represent an identified opportunity for acquisition and procedure development programs to apply specific human factors products.
HSI-03	Human factors integration points represent the final opportunity for acquisition and procedure development programs to apply specific human factors products.
HSI-04	Acquisition and procedure development programs will coordinate with ANG-C1 throughout AMS and other processes to identify and address human factors opportunities.
HSI-05	ANG-C1 will coordinate across programs to identify and address NAS-wide human factors opportunities.

Human Systems Integration Roadmap Summary

Human Factors Functions	Example Infrastructure Development Influences
Human Error and Complex Systems Research *User Centered Design* 1131	•FAA methods to factor human behavior in system-safety/risk assessments •Data to evaluate effectiveness of mitigations for human factors risks •Verification of human factors assumptions – e.g., system design, intended function, end-user experience •FAA methods to evaluate system design and minimize occurrence of design related errors •Criteria to evaluate information display, accessibility, and management based on task urgency/criticality
User Readiness Research *Systems, Equipment, Operations*	•Criteria to determine effect of new systems, operations, and procedures to user tasks, skills, and proficiency needs •Data to evaluate effectiveness of electronic/distance learning technology and methods for systems and procedures training •Change management criteria to support user acceptance of air/ground capabilities and target utilization rate achievement •Criteria for management of unfamiliar situations with highly automated systems and operations
Human Factors Acquisition Evaluation Support Research *FAA Order 9550.8 and AMS Policy 4.7 Compliance* HF-01	•Apply evidence-based criteria to support the implementation of human factors tools, processes, and requirements into AMS •Evaluate acquisition program requirements and SMS products for human factors •Facilitate the integration of human factors with emerging NAS programs: Independent HF assessment of NextGen concepts •Verify the integration of human factors with NAS programs: Independent HF ISR checklist sign-off •Criteria to evaluate system design for maintainability
Procedure Design and Use Research *Complexity, Operational Acceptability, Usability*	•Criteria to evaluate procedure design alternatives and potential impacts to usability, complexity, operational acceptability, and human performance •Develop human factors methods to evaluate the documentation of procedures •Verify the operational acceptability of new procedures and develop mitigations as appropriate
Human-Machine Interface and Interaction Research *Systems, Displays, Controls* 1134	•Provide data on the contribution of technology to human performance and safety •Inform evidence-based human factors standards, guidelines, requirements, and other documentation for systems, displays, and controls •Support technology design reviews, down-selection of alternatives, and response to emerging user interface and interaction issues •Data on user interactions with advanced technologies – e.g., understanding of system behavior, logic, limitations, minimum system transparency needs

BASELINE

Human Systems Integration Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
1007	2031 Q1	Automation	FID	Final Investment Decision (FID) for TBFM Enhancement 2
1134	2024 Q3	Human Systems Integration	Strategy (Other)	Decision on the Approval and Implementation Strategy of Human Factors Guidance for Helicopter Advanced Vision Systems
1281	2025 Q3	Automation	FID	Final Investment Decision (FID) for Flow Management Data and Services
1287	2029 Q1	Automation	FID	Final Investment Decision (FID) for Flow Management Data and Service (FMDS) Enhancement 1
1389	2025 Q4	Human Systems Integration	Strategy (Other)	Decision to Adapt and Implement Human Readiness Levels in System Development and Acquisition Guidance
1482	2029 Q4	Human Systems Integration	Strategy (Other)	Other Strategy for Human Factors Safety Guidance

Information Systems Security

The Information Systems Security roadmap represents the evolution of existing or planned information security services and capabilities to protect NAS systems and data from the continuous cyber threat. The roadmap depicts the information security-related services from the Enterprise Services Roadmap and the supporting policy development activities, feasibility studies, and prototypes to enable the ISS capabilities.

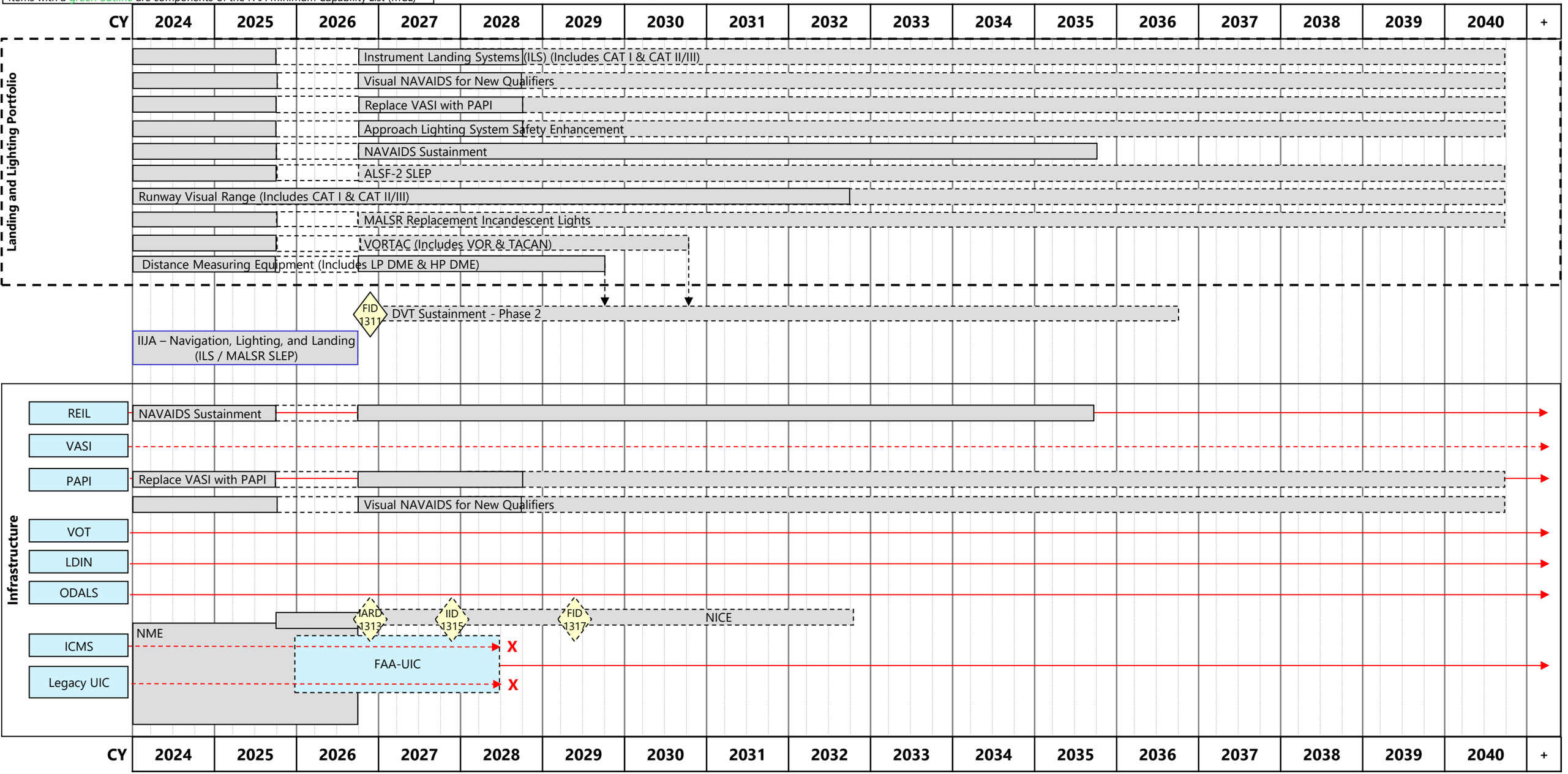
Navigation

The Navigation roadmap depicts the establishment, sustainment and evolution of ground-based, satellite-based, and visual navigation systems which enable aircraft to determine and report their position, navigate in accordance with clearances, and efficiently transit the NAS. These systems support conventional and Performance-Based Navigation (PBN) for the NAS and will ensure safe, efficient, and resilient services.

Items with a blue outline are lines of funding from the Infrastructure Investment & Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL).

Items with a green outline are components of the FAA Minimum Capability List (MCL)

Navigation Roadmap (1 of 3)



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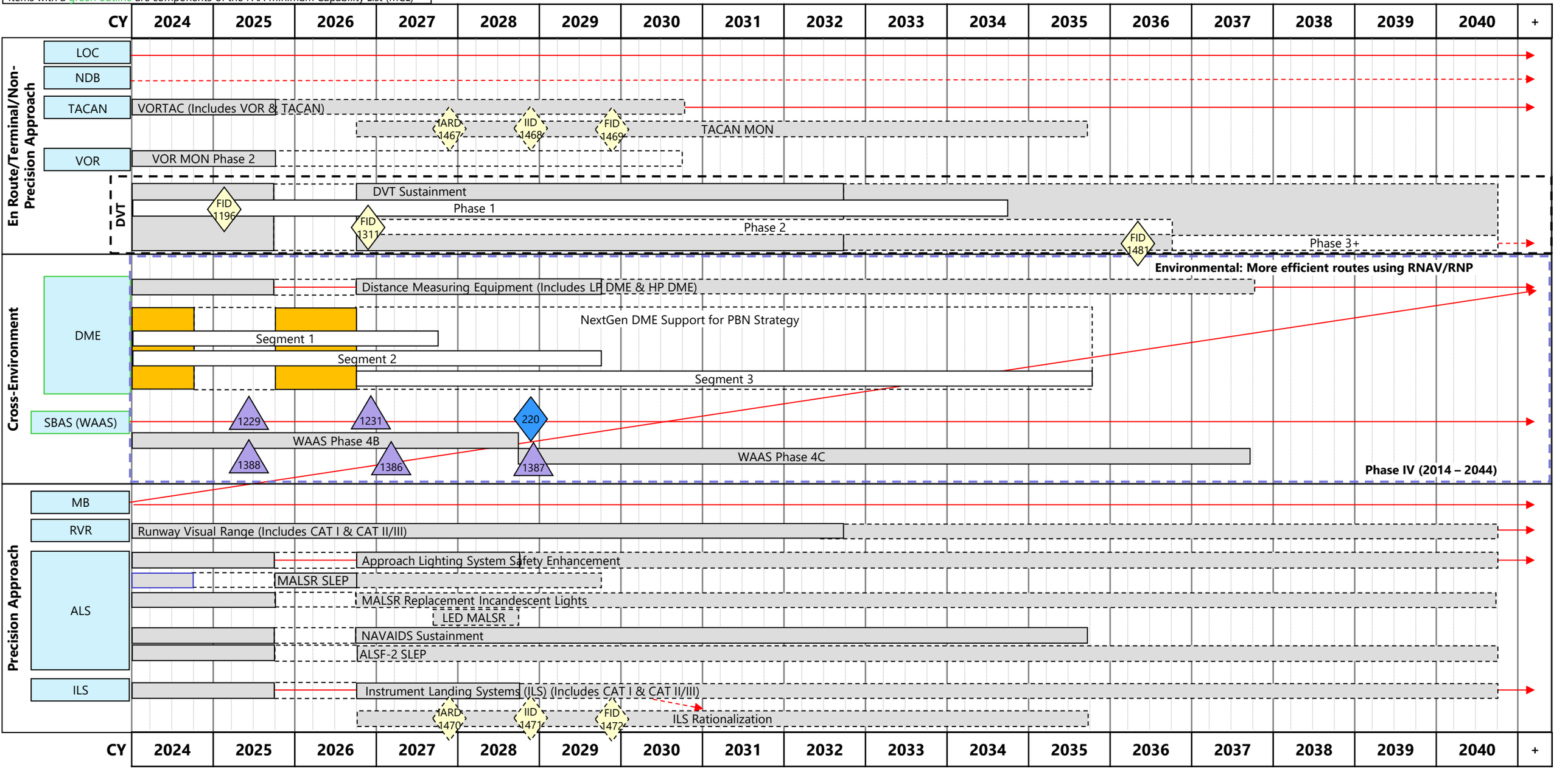
Items with a blue outline are lines of funding from the Infrastructure Investment & Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL).

Items with a green outline are components of the FAA Minimum Capability List (MCL)

Navigation Roadmap (2 of 3)



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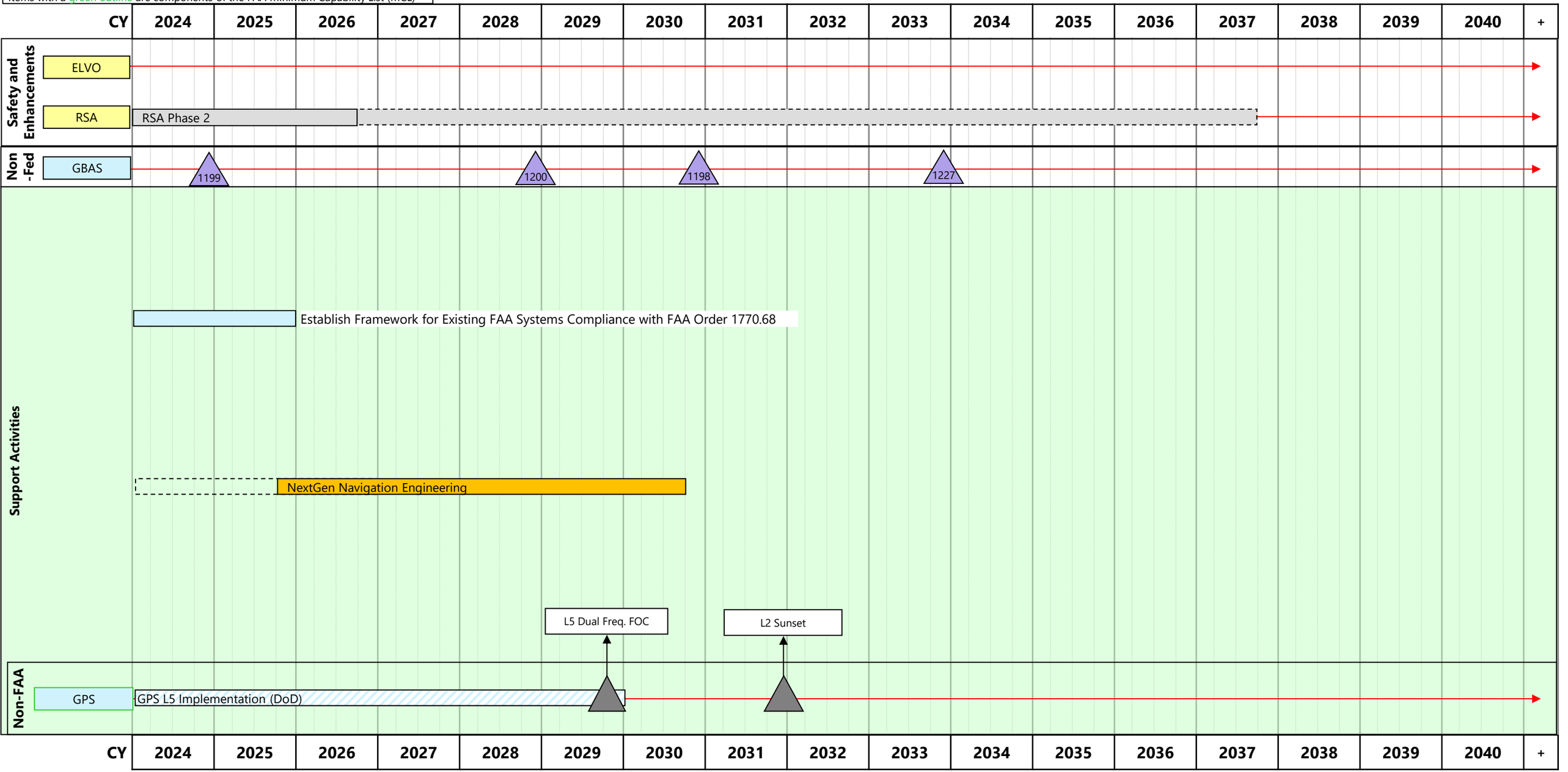
Items with a green outline are components of the FAA Minimum Capability List (MCL)

Navigation Roadmap (3 of 3)



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Navigation Roadmap: Assumptions (1 of 2)

Identifier	Description
NAV-01	FAA is transitioning to PBN operations as the primary capability for daily aircraft operations. PBN is comprised of RNAV and RNP routes and procedures for en route, terminal, and approach & landing operations. This will include: a) Transition from conventional routes and procedures defined by VOR to RNAV and RNP approaches enabled by GNSS and DME RNAV navigation as a GNSS outage backup. b) Expansion of Localizer Performance Vertical (LPV) approach procedures enabled by GNSS to provide vertical guidance to all qualifying airports. c) Enhance the DME network to expand DME RNAV coverage for en route and terminal operations as part of a resilient navigation infrastructure
NAV-02	NextGen implementation requires an aggressive transition to services that support Performance-Based Navigation (PBN). This requires: a) Navigation Strategy to be fully aligned with the FAA's PBN NAS Navigation Strategy, which provides: 1. Clearly defined operational needs and establishment of PBN services for airports and airspace. 2. Close collaboration with the aviation stakeholders
NAV-03	Need to continue working closely with users and the avionics industry to support additional aircraft equipage to facilitate the transition to PBN operations throughout the NAS a) The PBN Strategy provides operational benefits that encourage voluntary equipage. b) Equipage must be in place to support transition to PBN
NAV-04	PBN strategy includes the need for a resilient navigation infrastructure to maintain safety, security, and capacity and preclude significant economic impact during GNSS outages. This includes: a) Establishing a VOR MON to ensure continued en route and approach operations during GNSS disruptions for aircraft that are not equipped for DME RNAV. b) Providing infrastructure to enable DME RNAV aircraft to continue to their destination served by an ILS approach during GNSS disruptions. c) Sustain ILSs to support approach and landing operations during GNSS disruptions. d) Investigate complementary PNT capabilities to provide resiliency for evolving operational needs.

Navigation Roadmap: Assumptions (2 of 2)

Identifier	Description
NAV-05	FAA has no current plan to acquire Federal GBAS systems. GBAS installations will depend on individual airports' interest and investment.
NAV-06	Department of Defense will maintain a GPS constellation consistent with the Standard Positioning Service. Continue close coordination with DOD to ensure GPS continues to meet the PNT needs for aviation.
NAV-07	The Navigation Roadmap provides an infrastructure strategy to support all phases of flight.
NAV-08	In the future, the DME and VORTAC CIP will no longer be managed in the Landing and Lighting Portfolio and will be transitioned into the DVT Sustainment Program Phase 2.

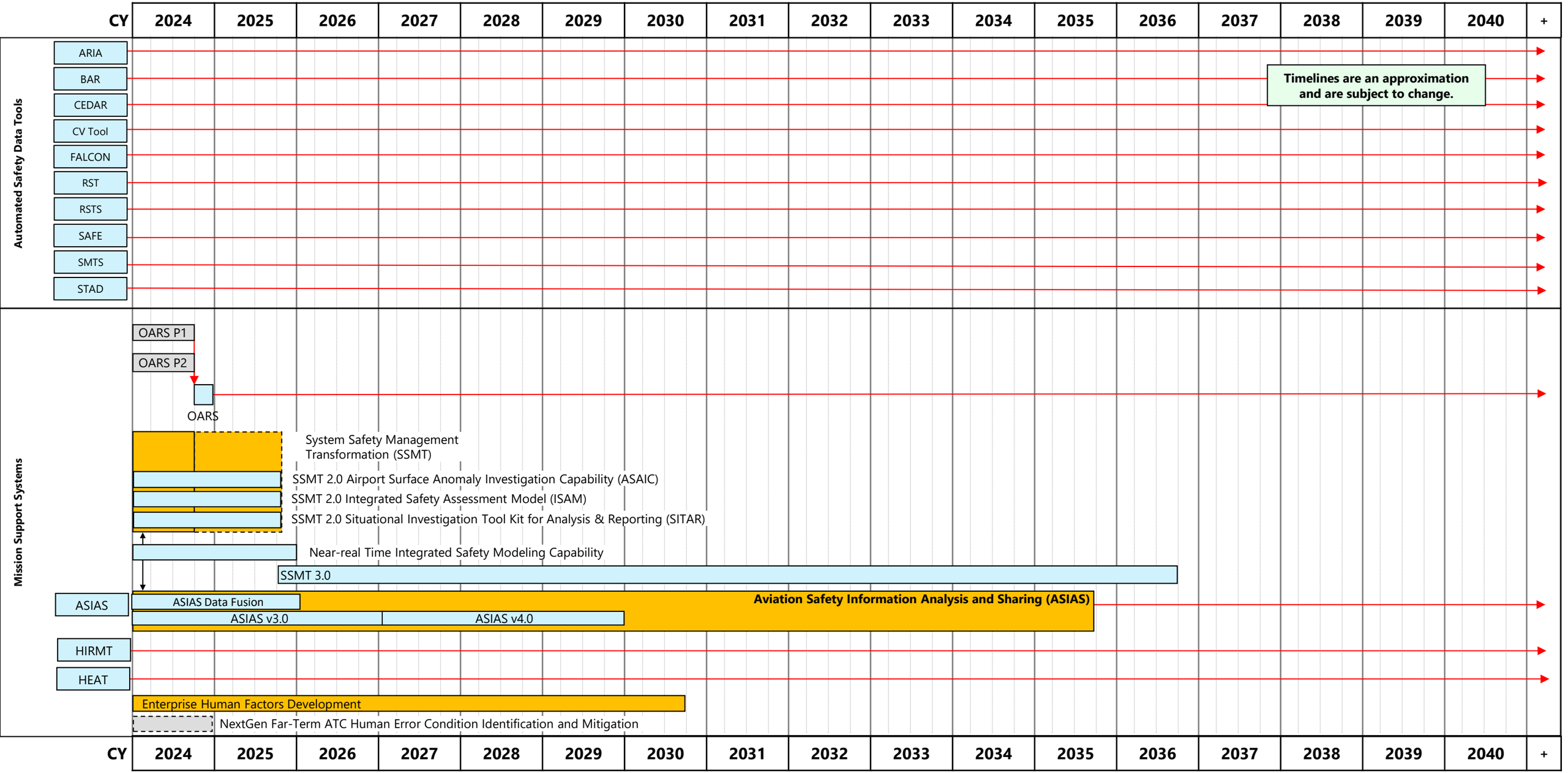
Navigation Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
220	2028 Q4	Navigation	Strategy (Other)	Decision to cut over to Dual Frequency IOC Operations
1196	2025 Q1	Navigation	FID	Final Investment Decision (FID) for DVT Sustainment Program Phase 1
1198	2030 Q4	Navigation	Other Milestone	GBAS DFMC ICAO SARPS - Initial Draft
1199	2024 Q4	Navigation	Other Milestone	GBAS DFMC RTCA MOPS - Initial Draft
1200	2028 Q4	Navigation	Other Milestone	GBAS DFMC RTCA MOPS - Final Draft
1227	2033 Q4	Navigation	Other Milestone	GBAS Dual-Frequency Multi-Constellation Standards for Applicability
1229	2025 Q2	Navigation	Other Milestone	SBAS L1/L5 MOPS Part 2
1231	2026 Q4	Navigation	Other Milestone	SBAS L1/L5 SARPS Part 2
1311	2026 Q4	Navigation	FID	Final Investment Decision (FID) for DVT Sustainment Program Phase 2
1313	2026 Q4	Navigation	IARD	Investment Analysis Readiness Decision (IARD) for Navaids Interface-Connect Equipment (NICE)
1315	2027 Q4	Navigation	IID	Initial Investment Decision (IID) for Navaids Interface-Connect Equipment (NICE)
1317	2029 Q2	Navigation	FID	Final Investment Decision (FID) for Navaids Interface-Connect Equipment (NICE)
1386	2027 Q1	Navigation	Other Milestone	H-ARAIM IOC
1387	2028 Q4	Navigation	Other Milestone	H-ARAIM FOC
1388	2025 Q2	Navigation	Other Milestone	DFMC H-ARAIM MOPS
1467	2027 Q4	Navigation	IARD	Investment Analysis Readiness Decision (IARD) for TACAN MON/Resilient Operational (RON)
1468	2028 Q4	Navigation	IID	Initial Investment Decision (IID) for TACAN MON/Resilient Operational (RON)
1469	2029 Q4	Navigation	FID	Final Investment Decision (FID) for TACAN MON/Resilient Operational (RON)
1470	2027 Q4	Navigation	IARD	Investment Analysis Readiness Decision (IARD) for ILS Rationalization
1471	2028 Q4	Navigation	IID	Initial Investment Decision (IID) for ILS Rationalization
1472	2029 Q4	Navigation	FID	Final Investment Decision (FID) for ILS Rationalization
1481	2036 Q3	Navigation	FID	Final Investment Decision (FID) for DVT Sustainment Phase 3+

Safety

The Safety Roadmap reflects various aspects of the Safety Risk Management (SRM) process that support enterprise level, concept/capability level, and system level safety. It supports the execution of safety assessments on potential safety issues that span multiple FAA organizations, through cross-cutting stakeholder collaboration, and provides FAA decision-makers with pertinent information to make risk-based decisions. The Safety Roadmap integrates SRM elements with NAS operations and system acquisition milestones through the development of key safety assessments, procedures, guidance, policy and requirements that support the NextGen Enterprise System.

Safety Roadmap (1 of 2)



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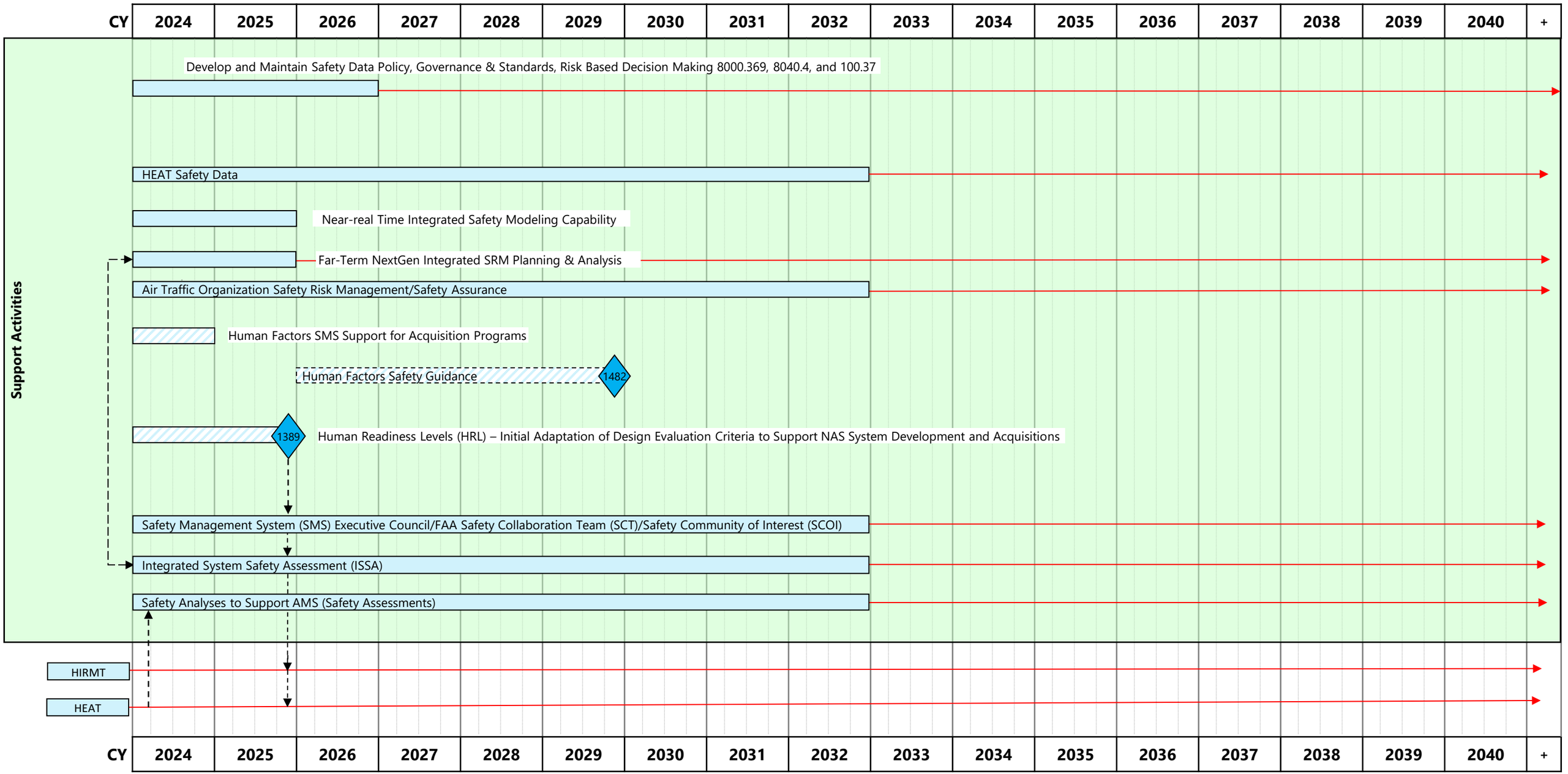
Safety Roadmap (2 of 2)



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Safety Roadmap: Assumptions

Identifier	Description
SAFE-01	ASIAS is part of the FAA Mission Support EA. It is depicted on the Safety Infrastructure Roadmap for coordination purposes since: a) It will require NAS data. b) It will provide safety data and tools for the NAS
SAFE-02	SMS Implementations for other LOBs are part of the FAA Mission Support EA. These activities are depicted on the Safety Infrastructure Roadmap for coordination purposes.

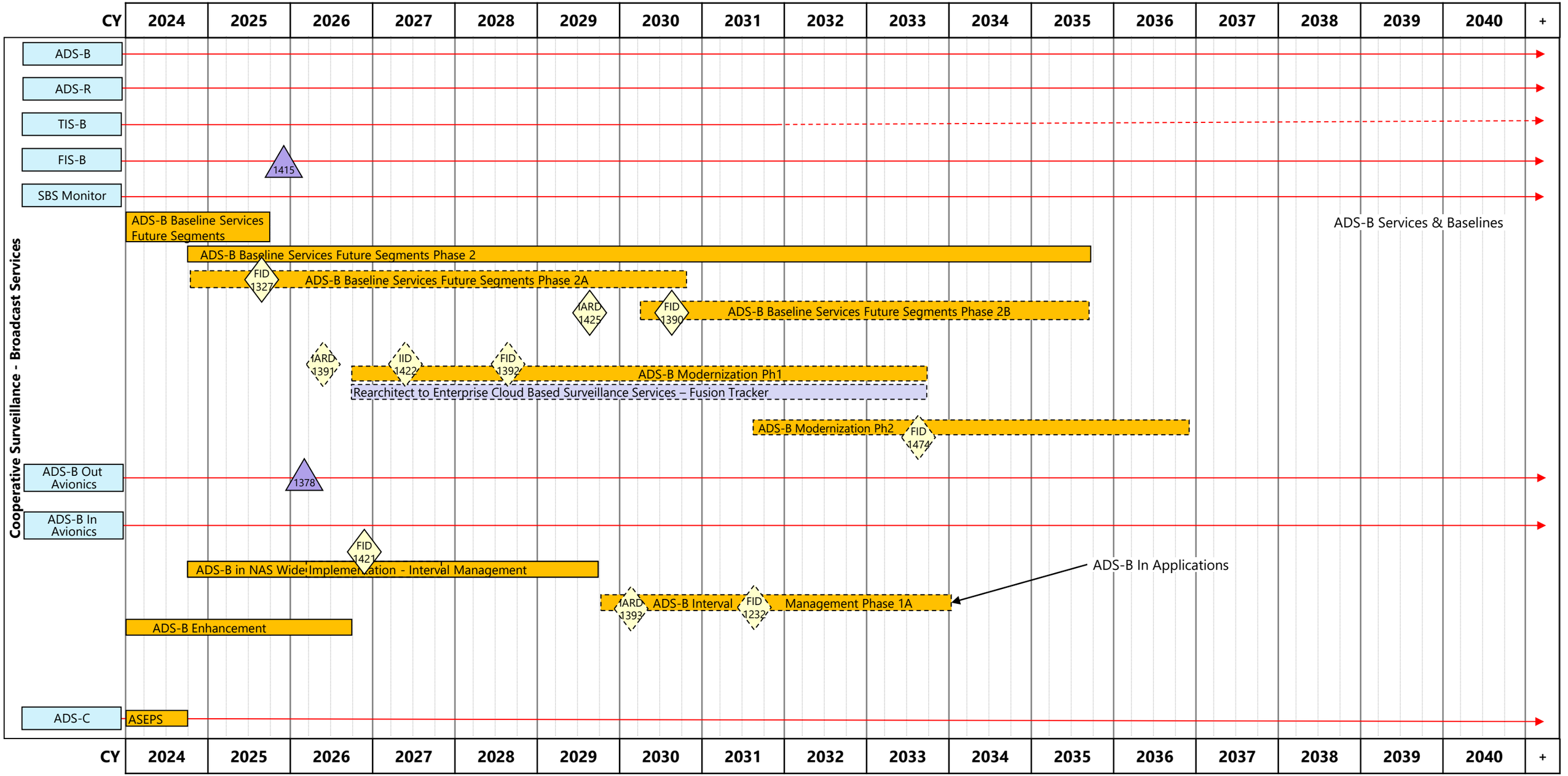
Safety Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
1389	2025 Q4	Human Systems Integration	Strategy (Other)	Decision to Adapt and Implement Human Readiness Levels in System Development and Acquisition Guidance
1482	2029 Q4	Human Systems Integration	Strategy (Other)	Other Strategy for Human Factors Safety Guidance

Surveillance

The Surveillance roadmap depicts the sustainment of legacy surveillance systems and the evolution towards the NextGen environment.

Surveillance Roadmap (1 of 4)



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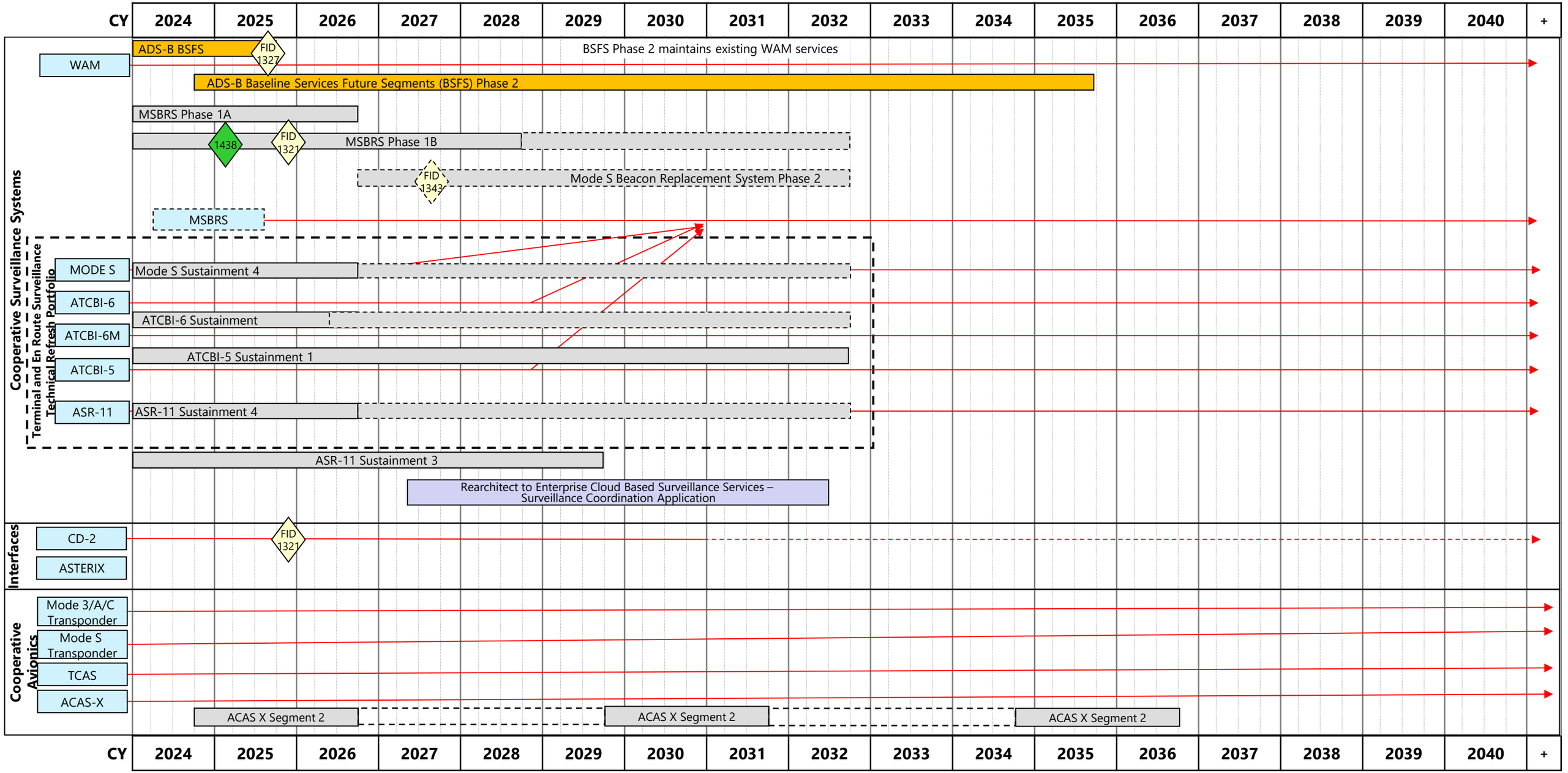
Surveillance Roadmap (2 of 4)



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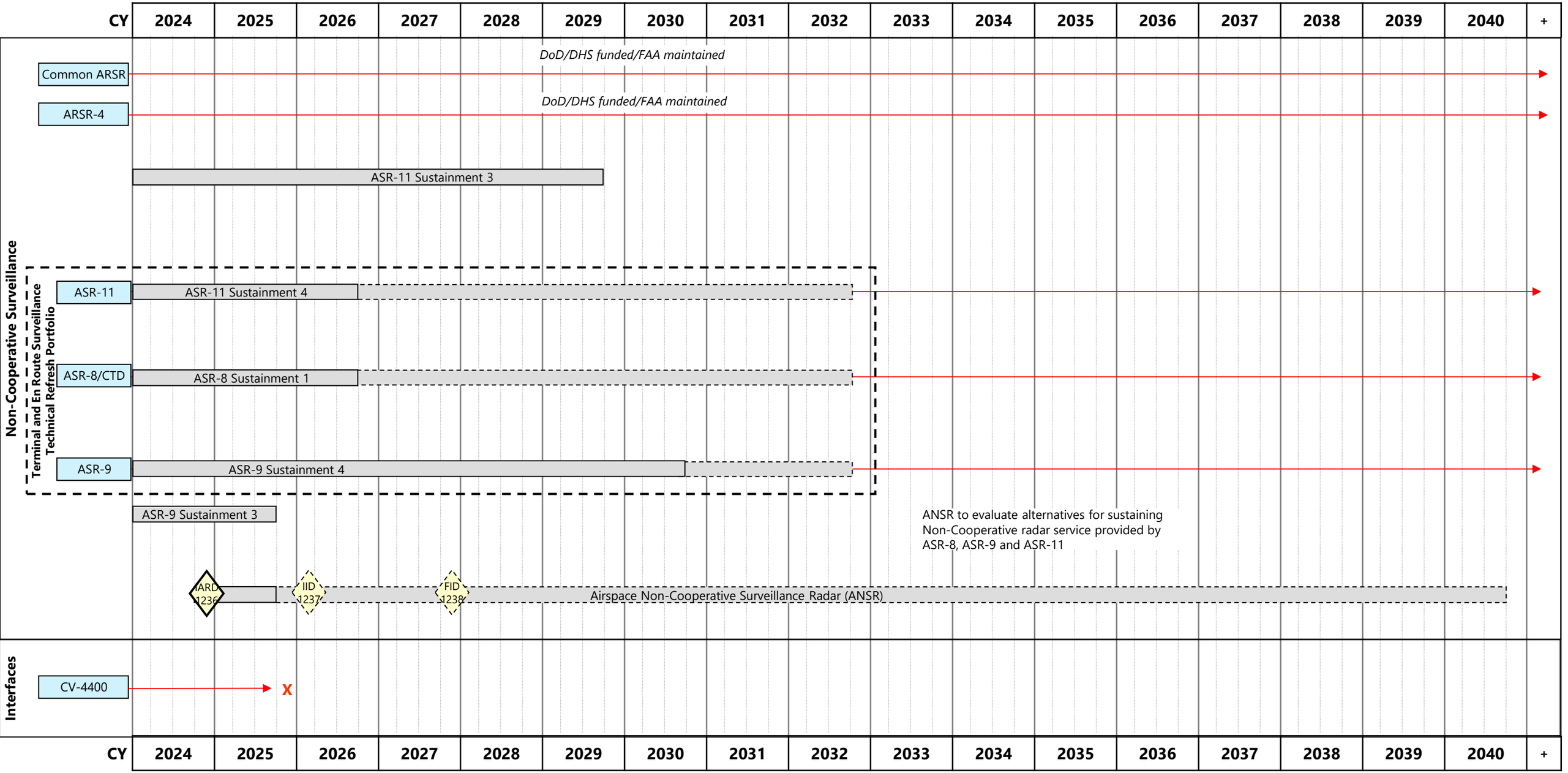
Surveillance Roadmap (3 of 4)



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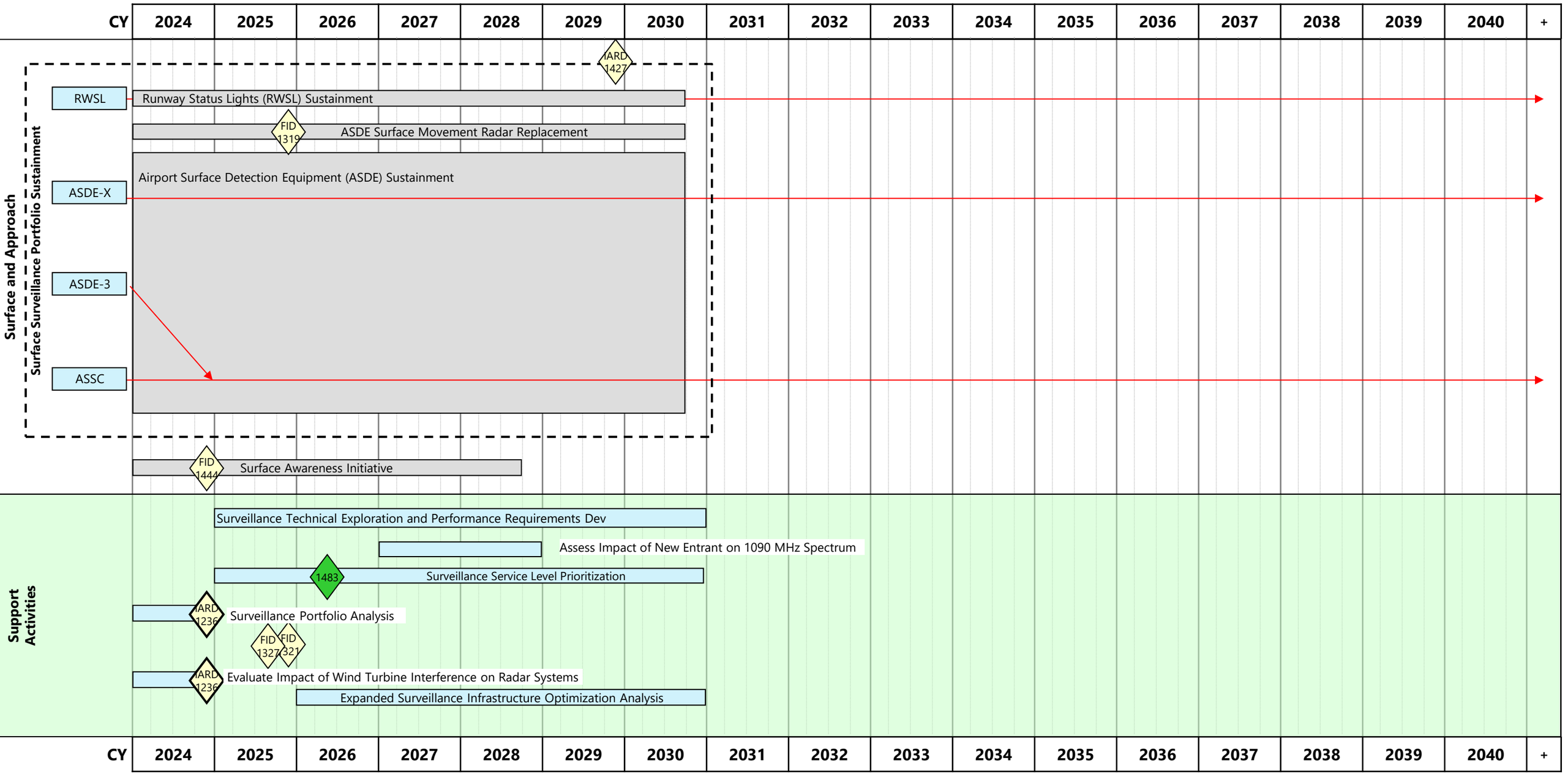
Surveillance Roadmap (4 of 4)



Surveillance Roadmap: Assumptions

Identifier	Description
SURV-01	Backup to mitigate loss of on-board GPS positioning source for ADS-B is required: a) Retain all en route beacons (~150 monopulse systems) b) Retain limited set of terminal beacons (or WAM) based on need (Core 30 airports for resiliency, other airports based on economic analysis and ADS-B equipage rates) c) All terminal non-cooperative surveillance coverage areas are retained for safety purposes d) Selected terminal surveillance systems that will no longer be required will be divested starting in CY2020
SURV-02	The Mode-S Beacon Replacement System (MSBRS) will replace all remaining beacon systems that are not replaced by WAM
SURV-03	The ANSR program will determine the long-term upgrade strategy of the ASR-8, ASR-9, and ASR-11 (PSR portion) systems

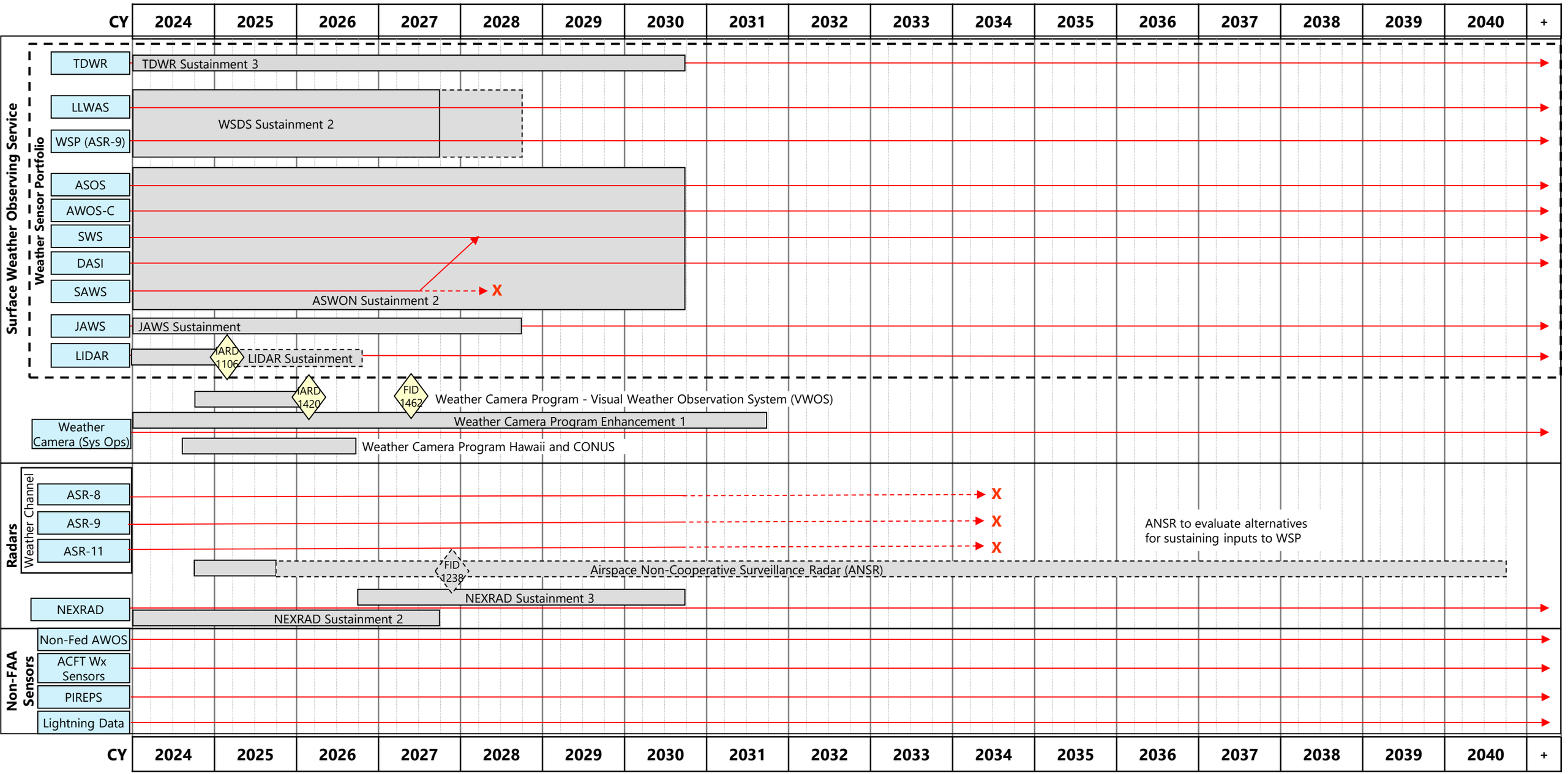
Surveillance Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
1224	2025 Q2	Facilities	FID	Final Investment Decision (FID) for Anchorage ATCT/TRACON Replacement
1232	2031 Q3	Surveillance	FID	Final Investment Decision (FID) for ADS-B In Applications: IM Phase 1A
1236	2024 Q4	Surveillance	IARD	Investment Analysis Readiness Decision (IARD) for Airspace Non-cooperative Surveillance Radar (ANSR)
1237	2026 Q1	Surveillance	IID	Investment Initial Decision (IID) for Airspace Non-cooperative Surveillance Radar (ANSR)
1238	2027 Q4	Surveillance	FID	Final Investment Decision (FID) for Airspace Non-cooperative Surveillance Radar (ANSR)
1269	2024 Q3	Automation	FID	Final Investment Decision (FID) for STARS Sustainment 4
1319	2025 Q4	Surveillance	FID	Final Investment Decision (FID) for ASDE-3 Surface Movement Radar (SMR) Replacement
1321	2025 Q4	Surveillance	FID	Final Investment Decision (FID) for MSBRS Phase 1B
1327	2025 Q3	Surveillance	FID	Final Investment Decision (FID) for ADS-B Baseline Services Future Segments Phase 2A
1343	2027 Q3	Surveillance	FID	Final Investment Decision (FID) for Mode S Beacon Replacement System Phase 2
1390	2030 Q3	Surveillance	FID	Final Investment Decision (FID) for Automatic Dependent Surveillance-Broadcast (ADS-B) Baseline Services Future Segments (BSFS) P2B
1391	2026 Q2	Surveillance	IARD	Investment Analysis Readiness Decision (IARD) for Automatic Dependent Surveillance-Broadcast (ADS-B) Modernization
1392	2028 Q3	Surveillance	FID	Final Investment Decision (FID) for Automatic Dependent Surveillance-Broadcast (ADS-B) Modernization
1393	2030 Q1	Surveillance	IARD	Investment Analysis Readiness Decision (IARD) for ADS-B In Applications: IM Phase 1A
1421	2026 Q4	Surveillance	FID	Final Investment Decision (FID) for ADS-B Interval Management
1422	2027 Q2	Surveillance	IID	Initial Investment Decision (IID) for ADS-B Modernization
1425	2029 Q3	Surveillance	IARD	Investment Analysis Readiness Decision (IARD) for ADS-B BSFS Phase 2B
1427	2029 Q4	Surveillance	IARD	Investment Analysis Readiness Decision (IARD) for Surface Portfolio Sustainment
1438	2025 Q1	Surveillance	Strategy	JRC Strategy Decision for Mode S Beacon Replacement System Phase 1B
1444	2024 Q4	Surveillance	FID	Final Investment Decision (FID) for Surface Awareness Initiative
1474	2033 Q3	Surveillance	FID	Final Investment Decision (FID) for ADS-B Modernization Phase 2
1483	2026 Q2	Surveillance	Strategy	JRC Strategy Decision for Surveillance Portfolio Analysis

Weather

The Weather Roadmap presents an Executive View (EV) of weather-related acquisition activities and the changes to these activities that exist within the Weather enterprise architecture (EA) domain (projects and programs) of the Federal Aviation Administration (FAA). The Weather Roadmap provides the evolution of the weather architecture via AMS milestones and related activities (e.g., aviation weather research, demonstrations, and other agency activities) necessary to achieve the performance objectives and capabilities to support NextGen. As a perspective of the changes in the NAS operational environment, the Weather Roadmap reflects major Weather interdependencies to support (or be supported by) other domains in the NAS enterprise architecture as depicted in NAS Roadmaps.

Weather Roadmap (1 of 4)



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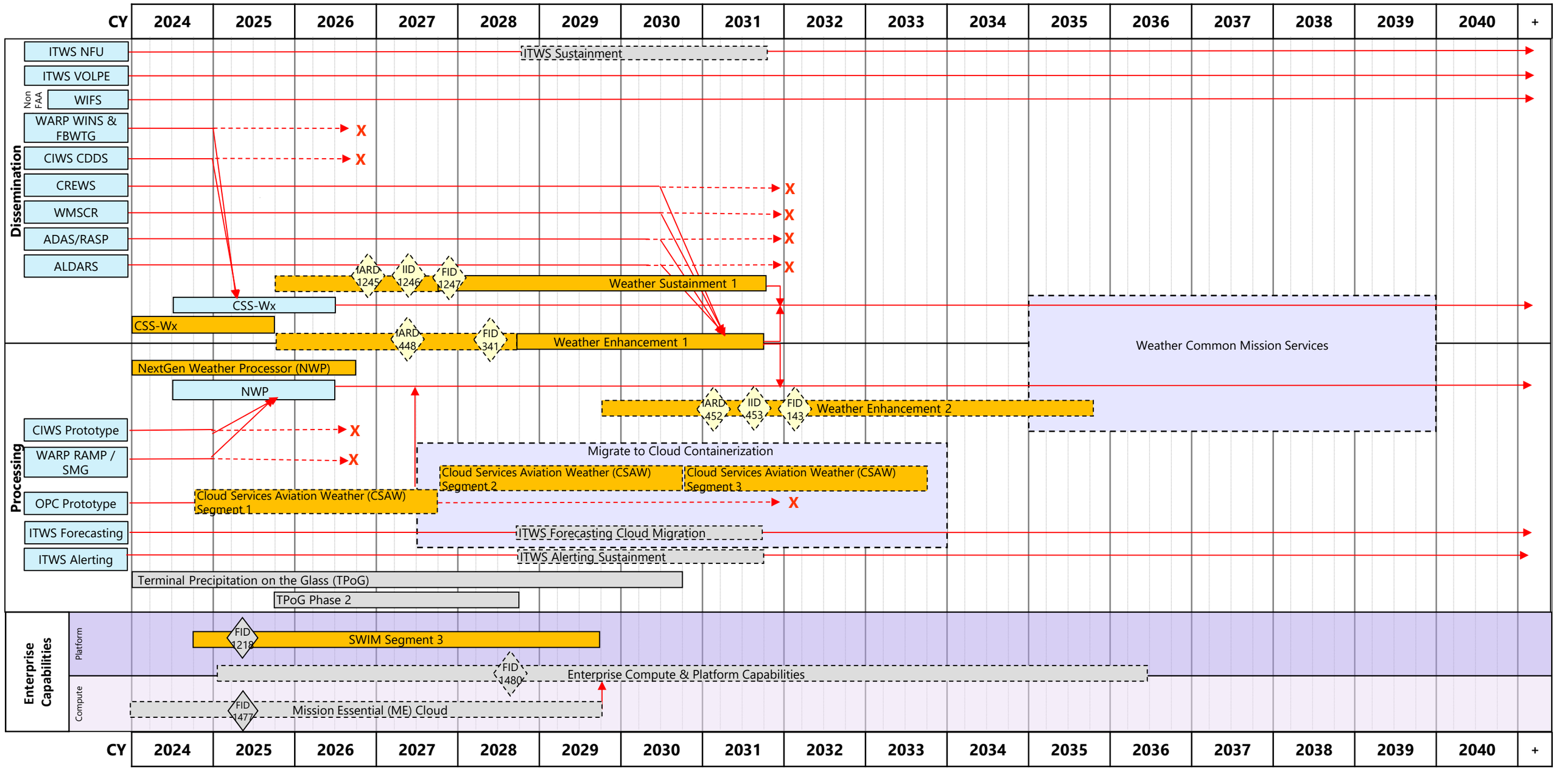
Weather Roadmap (2 of 4)



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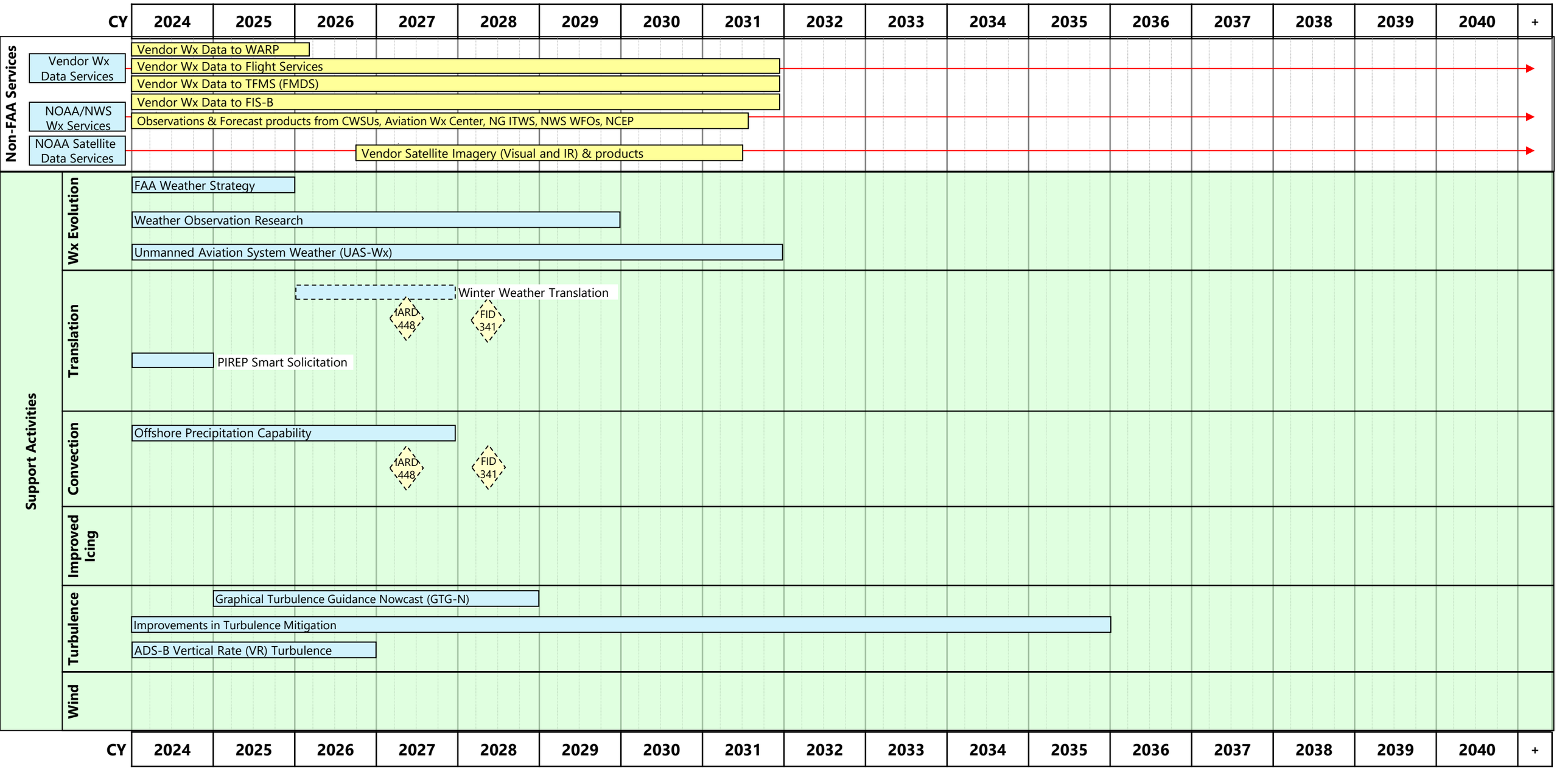
Weather Roadmap (3 of 4)



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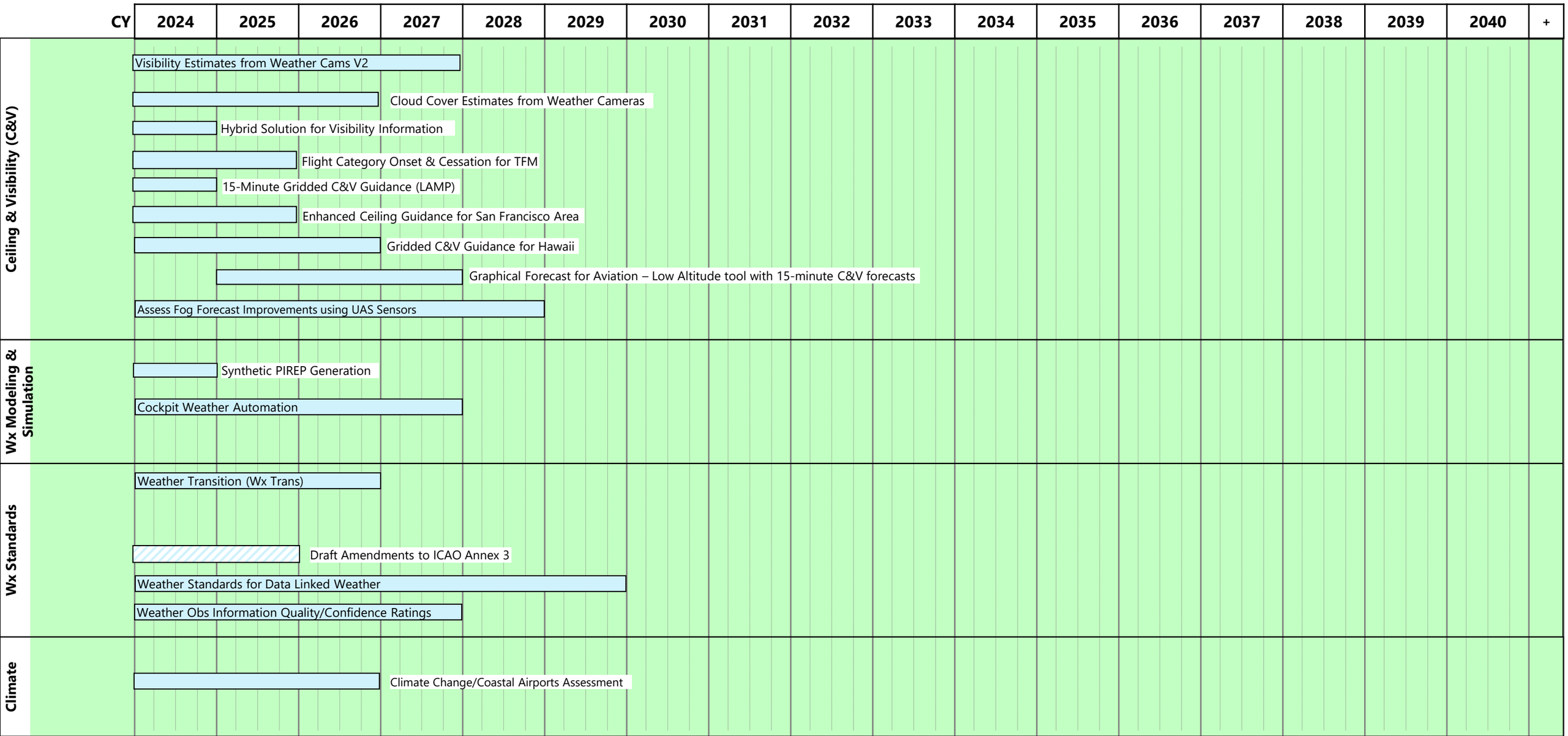
Weather Roadmap (4 of 4)



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Weather Roadmap: Assumptions (1 of 2)

Identifier	Description
WX-01	Ongoing NextGen Weather functional & performance requirements validation may result in new/emerging requirements in NextGen Weather Architecture.
WX-02	The Weather Sensor Technology Portfolio (WSTRP) was created to more effectively manage ASWON S2, TDWR S3, WSDS S2, and JAWS projects, and to allow for a systematic replacement and sustainment of Weather Sensor systems. WSTRP is currently comprised of TDWR, LLWAS, WSP(ASR-9), ASOS, AWOS-C, SWS, DASI, SAWS, and JAWS systems. The Light Detection and Ranging (LIDAR) will be added to the WSTRP at LIDAR IARD.
WX-05	The NAS Weather Infrastructure Portfolio incorporates R&D Research to Ops (RTO) with new weather products/information with increased forecast accuracy/frequency to NAS Users with minimal architectural/infrastructure change. Moreover, RTO Support Activities will further augment support to NAS operational decision-making by including weather “translation” as well as “uncertainty” capabilities.
WX-06	Weather processing functions converge into NextGen Weather Processor (NWP) that will be implemented in several phases. Initial NWP implementation (formerly called NWP WP1) provides NWP-Central services replacing prototype separate CIWS and CoSPA convective weather forecast capabilities with a 0-8 hour merged forecast capability. The Weather and Radar Processor (WARP) Radar Acquisition and Mosaic Processor (RAMP) function is subsumed in initial NWP implementation. Once funded, Weather Enhancement 1 will host Wx R&D algorithms matured since initial implementation baseline freeze including improved Convective and Translation algorithms. Weather Enhancement 2 will implement NextGen weather Far-term capabilities. ITWS (including ITWS VOLPE and ITWS NFU) will continue providing terminal weather information for pacing airports. ITWS forecasting functionality is planned to be transitioned to the cloud in a future timeframe.
WX-08	NAS Infrastructure Portfolio will supply weather information at user-specified resolution, both spatially and temporally. NWP will host the first NextGen mid-term "weather translation" product, e.g., Weather Avoidance Fields (WAF) to TFM of convective weather constraints to aircraft movement in NAS airspace (delivered by CSS-Wx). Weather Enhancement 1 will add additional weather Translation products e.g. Turbulence, Wind, Ceiling, Visibility and Precipitation. Weather Enhancement 1 continues necessary system components updates out to 2032.
WX-09	Products developed from requirements allocated to NWS, will likely be delivered to FAA via NWS’ NextGen IT Web Services (NGITWS). Many, but not all, of these products will be accessible via CSS-Wx initial implementation.

Weather Roadmap: Assumptions (2 of 2)

Identifier	Description
WX-10	To address emerging anti-icing regulations and to mitigate automated surface observing shortfalls at Level A/B airports, FAA will continue to evaluate R&D opportunities in sensor and algorithm development to improve precipitation discrimination (freezing/frozen/liquid including ice pellets and drizzle). Once mature and tested to meet all FAA automated sensor requirements, in conjunction with NWS this capability will be integrated into ASOS/AWOS-C to support aircraft and airport ground anti/de-icing operations.
WX-11	Weather observation/forecast R&D will continue to be periodically evaluated for maturity to determine whether new/improved functionality should be implemented.
WX-12	The FAA will continue to transmit validated Weather Performance requirements as they are identified to the NWS. These requirements will be associated with validated operational needs together with supported weather modeling and simulation. They will be consistent with the overall Enterprise Weather Strategy in meeting the needs of a future NAS. If the requirements cannot be met by the NWS, funding will be provided to develop algorithms to fulfill those requirements for subsequent NWS implementation.
WX-14	Satellite Data Services Requirements need to be identified, and research needs to be conducted on integrating new weather satellite sensor data into FAA systems.
WX-17	FAA installed twenty-one (21) new Weather Camera (WCAM) sites in Hawaii in 2020-2024 to improve aviation safety and efficiency by providing pilots and other aviation stakeholders with near-real time images of weather conditions along their flight routes and at their destinations. WCAM Enhancement E1 will add an additional 160 new camera systems within Alaska and CONUS. Two new functionalities using current weather camera images, Visibility Estimation through Image Analytics (VEIA) and Cloud Estimation through Image Analytics (CEIA), are currently being developed and are projected to be available on the website in FY25.

Weather Roadmap: Decision Points (1 of 1)

DP #	Target Date CY	Primary Domain	Type	Name
143	2032 Q1	Weather	FID	Final Investment Decision (FID) for Weather Enhancement 2
341	2028 Q2	Weather	FID	Final Investment Decision (FID) for Weather Enhancement 1
448	2027 Q2	Weather	IARD	Investment Analysis Readiness Decision (IARD) for Weather Enhancement 1
452	2031 Q1	Weather	IARD	Investment Analysis Readiness Decision (IARD) for Weather Enhancement 2
453	2031 Q3	Weather	IID	Initial Investment Decision (IID) for Weather Enhancement 2
1106	2025 Q1	Weather	IARD	Investment Analysis Readiness Decision (IARD) for Weather Sensors Tech Refresh Portfolio - LIDAR
1218	2025 Q2	Communication	FID	Final Investment Decision (FID) for SWIM Segment 3
1238	2027 Q4	Surveillance	FID	Final Investment Decision (FID) for Airspace Non-cooperative Surveillance Radar (ANSR)
1245	2026 Q4	Weather	IARD	Investment Analysis Readiness Decision (IARD) for Weather Sustainment 1
1246	2027 Q2	Weather	IID	Initial Investment Decision (IID) for Weather Sustainment 1
1247	2027 Q4	Weather	FID	Final Investment Decision (FID) from Weather Sustainment 1
1420	2026 Q1	Weather	IARD	Investment Analysis Readiness Decision (IARD) for Visual Weather Observation System (VWOS)
1462	2027 Q2	Weather	FID	Final Investment Decision (FID) for VWOS
1477	2025 Q2	Enterprise Services & Capabilities	FID	Final Investment Decision (FID) for Mission Essential (ME) Cloud
1480	2028 Q3	Enterprise Services & Capabilities	FID	Final Investment Decision (FID) for Enterprise Compute & Platform Capabilities