



NORFOLK INTERNATIONAL AIRPORT

2019 State of the Airport

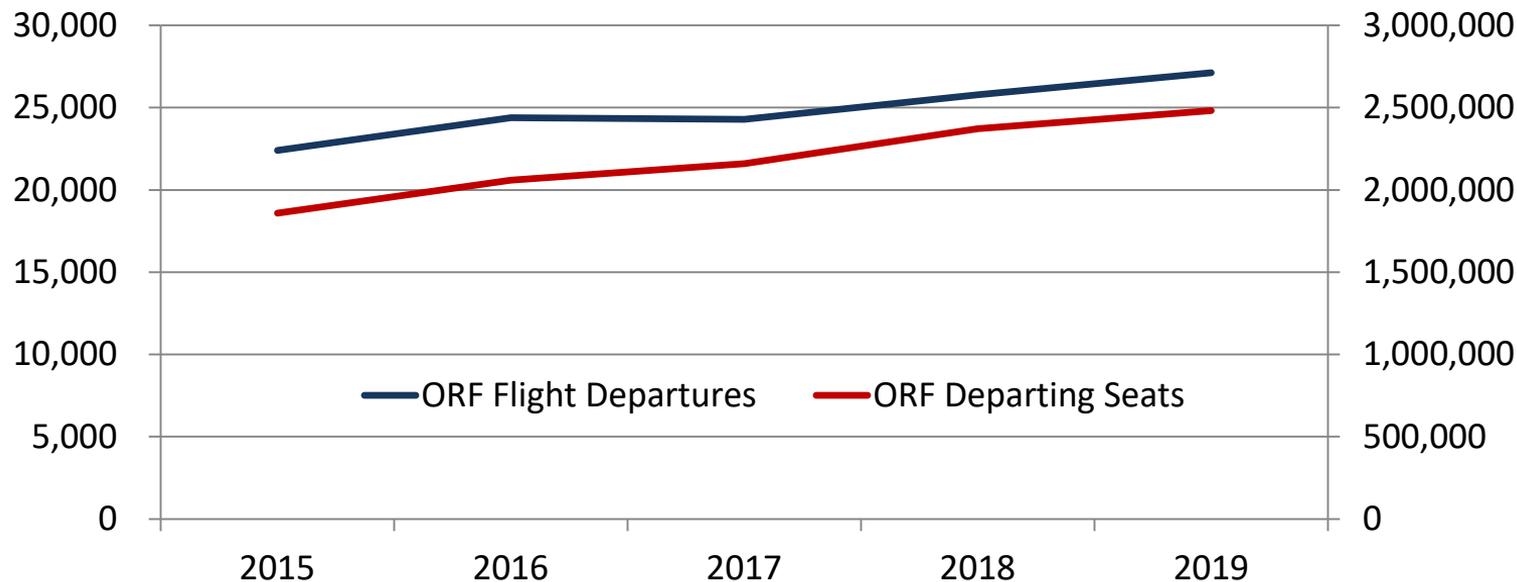
*Robert S. Bowen, Executive Director
Norfolk Airport Authority*





Air Service Review

Norfolk has been a beneficiary: Departures and Seats have increased



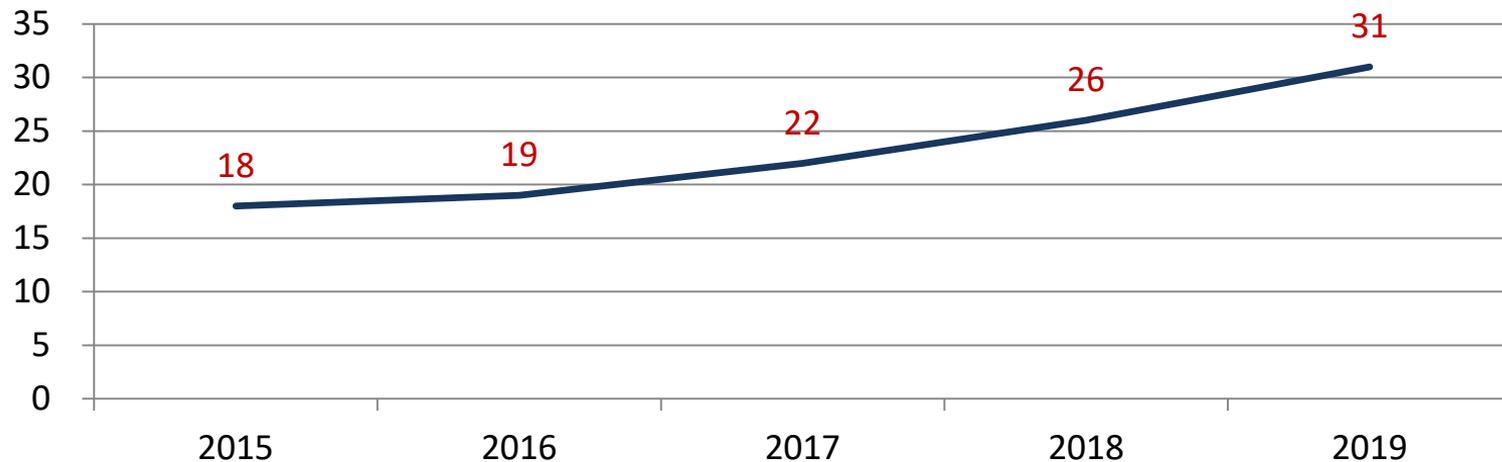
Note: Airlines include Allegiant, American, Delta, Frontier, Southwest, and United



Air Service Review

Norfolk has been a beneficiary: Airlines are expanding service

Non-Stop Markets



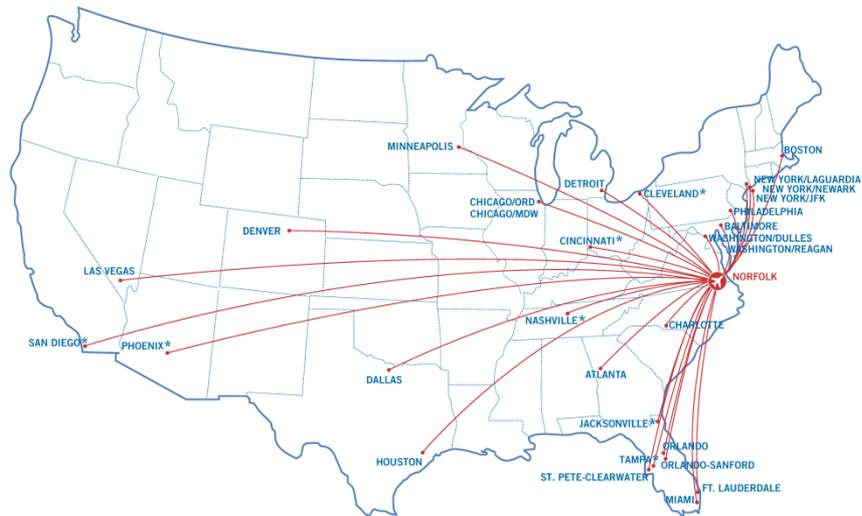
Note: Airlines include Allegiant, American, Delta, Frontier, Southwest, and United. Year-round and seasonal service.



NORFOLK INTERNATIONAL AIRPORT

31 Cities Served Nonstop in 2019

NORFOLK INTERNATIONAL AIRPORT NONSTOP CITIES SERVED



- ATLANTA
- BALTIMORE
- BOSTON
- CHARLOTTE
- CHICAGO-O'HARE
- CHICAGO-MIDWAY
- CINCINNATI*
- CLEVELAND*
- DALLAS
- DENVER
- DETROIT
- FT. LAUDERDALE
- HOUSTON
- JACKSONVILLE*
- LAS VEGAS
- MIAMI
- MINNEAPOLIS
- NASHVILLE*
- NEW YORK-LA GUARDIA
- NEW YORK-JFK
- NEWARK
- ORLANDO
- ORLANDO-SANFORD
- PHILADELPHIA
- PHOENIX*
- TAMPA*
- SAN DIEGO*
- ST. PETE-CLEARWATER
- WASHINGTON-DULLES
- WASHINGTON-REAGAN
- *Seasonal

GLOBAL ACCESS

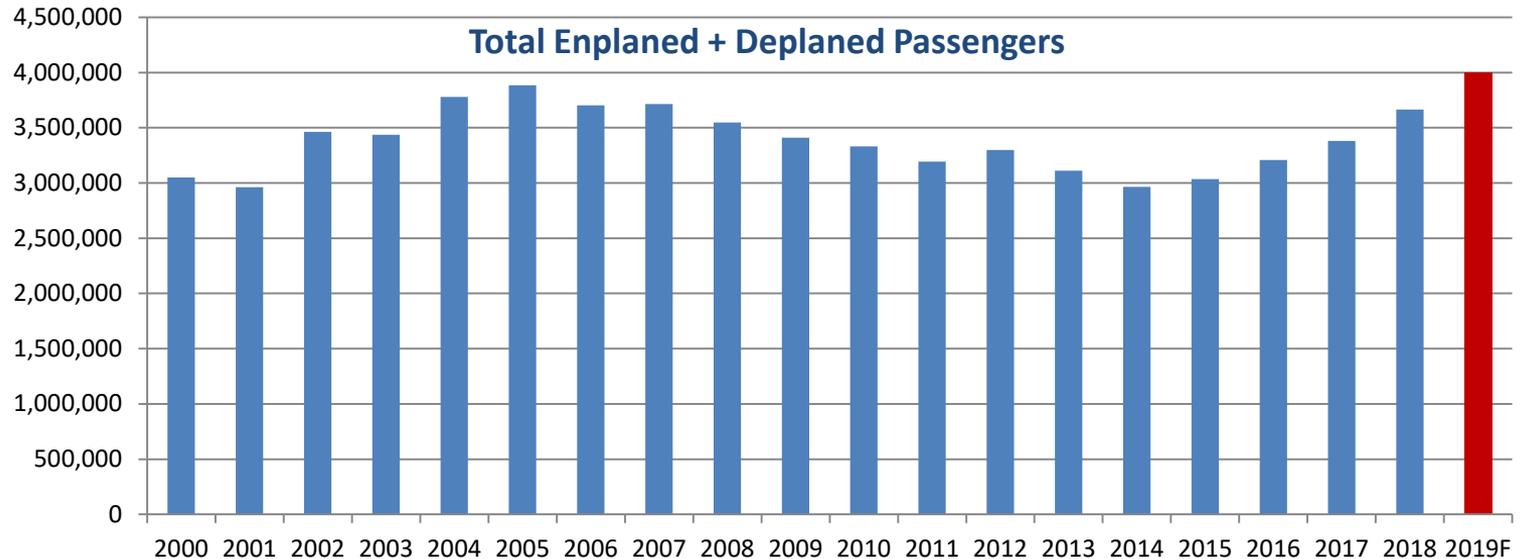
The high level of global access shown provides capability to reach major cities worldwide.





Air Service Review

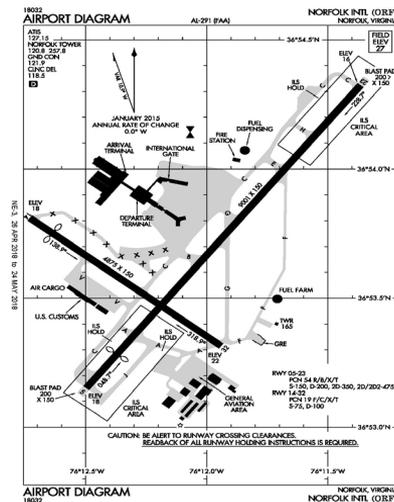
After five years of consistent passenger growth, 2019 is forecast to be the highest year in Norfolk International Airport history.





Capital Projects

- ➔ Master Plan Update
- ➔ Parking Revenue Control System Replacement
- ➔ Southwest Baggage Screening Equipment Relocation
- ➔ Airfield Guidance Signage Replacement Project
- ➔ Departures Elevators
- ➔ Concourse A Extension
- ➔ General Aviation Customs Facility
- ➔ Jet bridge Replacement
- ➔ Garage D





Capital Projects

Funding Summary

- 48 total projects in various stages of planning, design and construction
- Total open funding certificates of \$127,200,000
 - \$58,000,000: 2019 Bonds
 - \$20,000,000: Passenger Facility Charges
 - \$15,300,000: Parking Escrow Funds
 - \$14,100,000: Airport Improvement Program Entitlement Funds
 - \$8,800,000: State Entitlement Funds
 - \$2,200,000: Fixed Base Operator Reserve Funds
 - \$1,000,000: Capital Reserve Fund
 - \$7,800,000: Renewal and Extension Fund
- NO local taxes



Capital Projects

Funding Summary

- Runway 5/23 and Taxiway C Rehabilitation Projects
- Design and Construction Fiscal Years 2020 – 2023, Total Cost \$127,000,000
 - \$24,800,000: Airport Improvement Program Entitlement Funds
 - \$30,000,000: Airport Improvement Program Discretionary Funds
 - \$12,300,000: State Entitlement Funds
 - \$19,500,000: State Discretionary Funds
 - \$40,400,000: Passenger Facility Charges
- NO local taxes



NORFOLK INTERNATIONAL AIRPORT

On an Average Day at Norfolk International Airport:

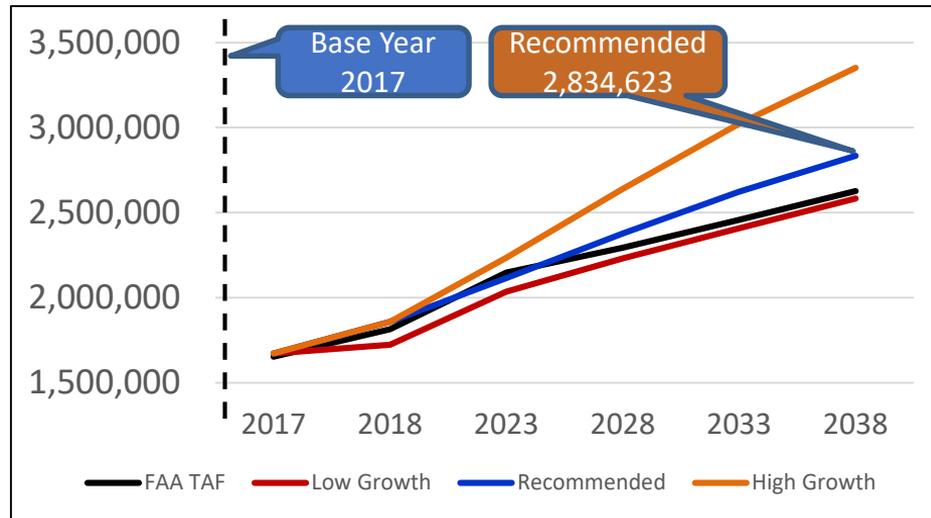
- The Economic Impact of Norfolk International Airport is felt far and wide, directly and indirectly.
 - 14,920 jobs
 - \$600 million in wages
 - \$1.8 billion in annual economic impact

**Norfolk International Airport contributes
\$5,000,000 to the daily economy
of the region**



Forecast of Passenger Enplanements

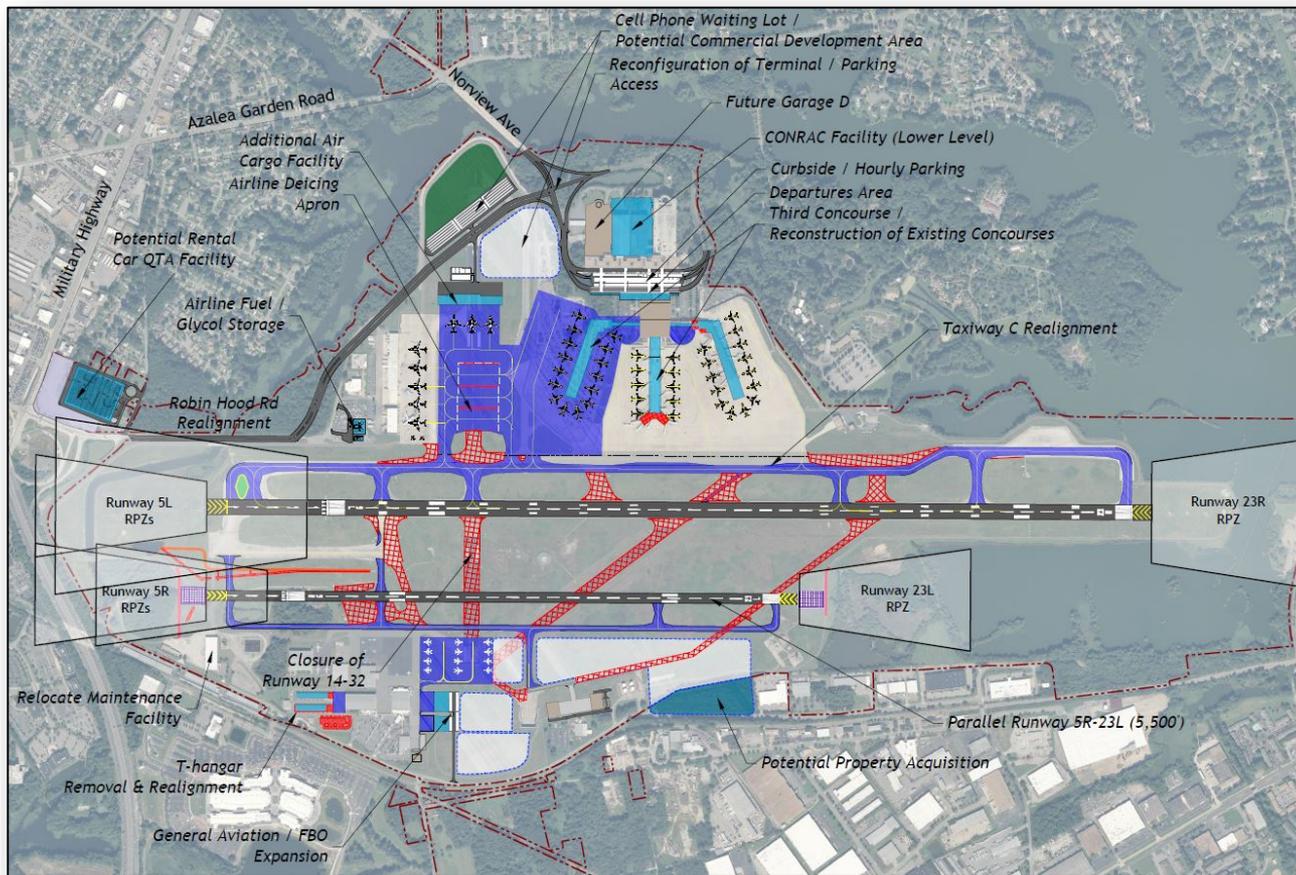
Year	TAF	Low Growth	Recommended	High Growth
2017	1,652,323	1,672,024	1,672,024	1,672,024
2018*	1,815,241	1,723,608	1,857,487	1,857,487
2023	2,147,644	2,035,945	2,115,424	2,234,279
2028	2,294,704	2,231,077	2,376,990	2,640,381
2033	2,458,050	2,407,453	2,622,848	3,022,093
2038	2,627,295	2,582,498	2,834,623	3,350,889
AAGR 2018-2038	1.9%	2.04%	2.1%	2.99%
Growth 2018-2038	44.7%	49.83%	52.6%	80.4%
% Above TAF	-	-1.7%	7.9%	27.5%



Low Growth: Static Regional Market Share
 Preferred: 5-Year Schedule Build-out and Regression
 High Growth: Historical Trend 3-Year Time Series



Recommended Plan





Airfield Concepts

- Runway System
 - 16 total concepts evaluated
 - 5 selected for further evaluation
 - 2 concepts for Runway 14-32
 - 3 concepts for Runway 5-23
 - Ongoing Coordination with Navy
- Taxiway System
 - 3 concepts evaluated





Airfield Alternatives

- Closure of Runway 14-32
 - Recaptures airport property to expand critical aviation facilities
 - Reduces crosswind coverage for light General Aviation aircraft

Note:

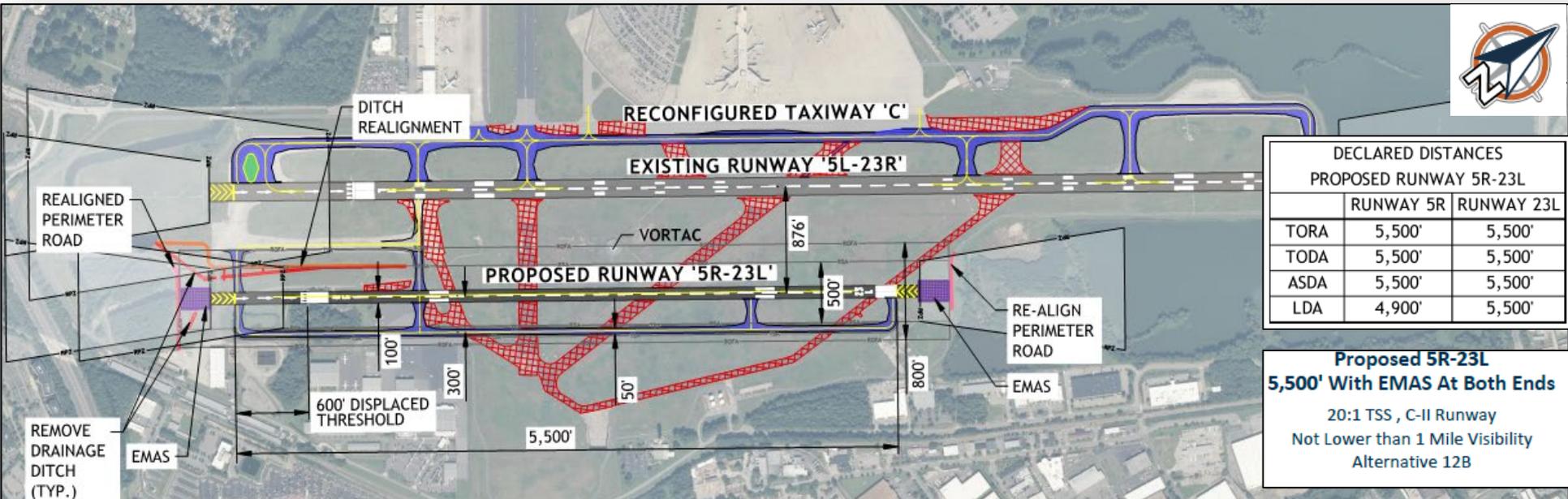
Runway 14-32 accommodates 1.4% of 2018 operations





Airfield Alternatives

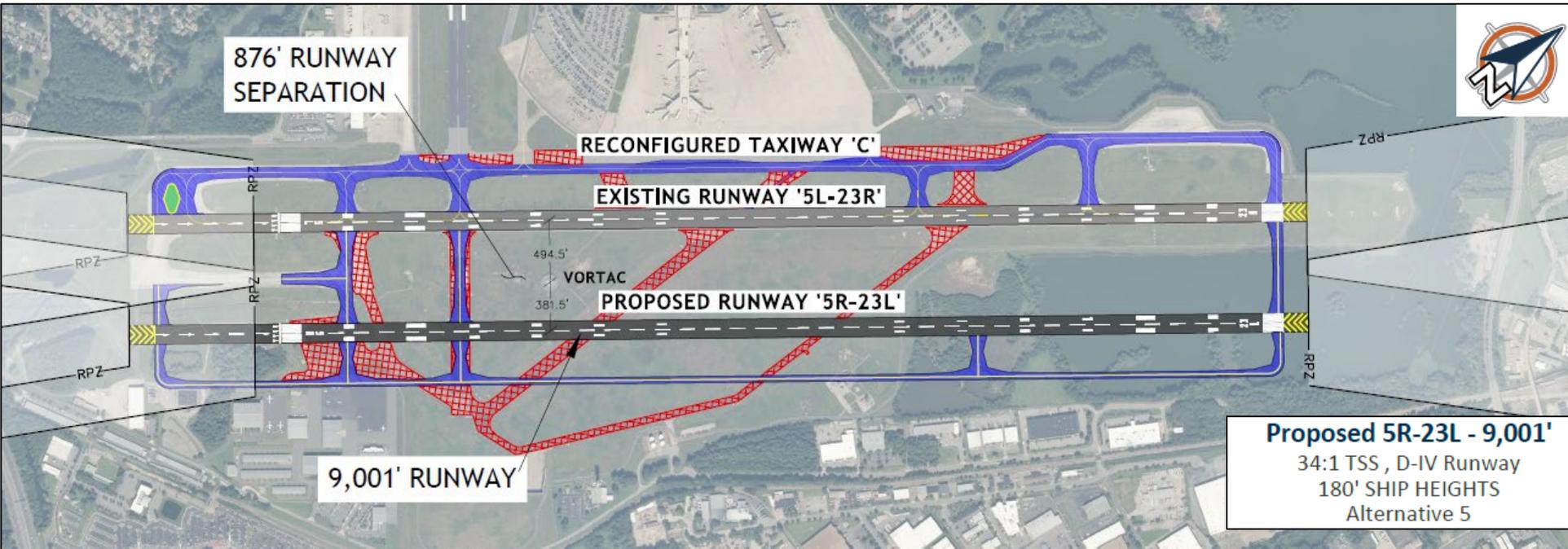
- Runway Alternative 12B
 - Proposed Parallel Runway 5R-23L – 5,500' C-II with EMAS
 - No impacts to Lake Whitehurst or wetlands





Airfield Alternatives

- Runway Alternative 12B – Ultimate
 - Extend Parallel Runway to 9,001' (increases to D-IV, no EMAS)





Airfield Projects Estimated Costs

Airfield Alternative	Projected Costs
Closure of Runway 14/32 (81,714 SY)	\$9,000,000
Parallel Runway 5R/23L 5,500'	\$56,000,000
EMAS	\$11,000,000
West Airfield Taxiway Improvements	\$41,000,000
East Airfield Taxiway Construction	\$25,000,000
Runway 5L/23R Standardization*	\$105,000,000
Total Airfield Program Costs	\$247,000,000

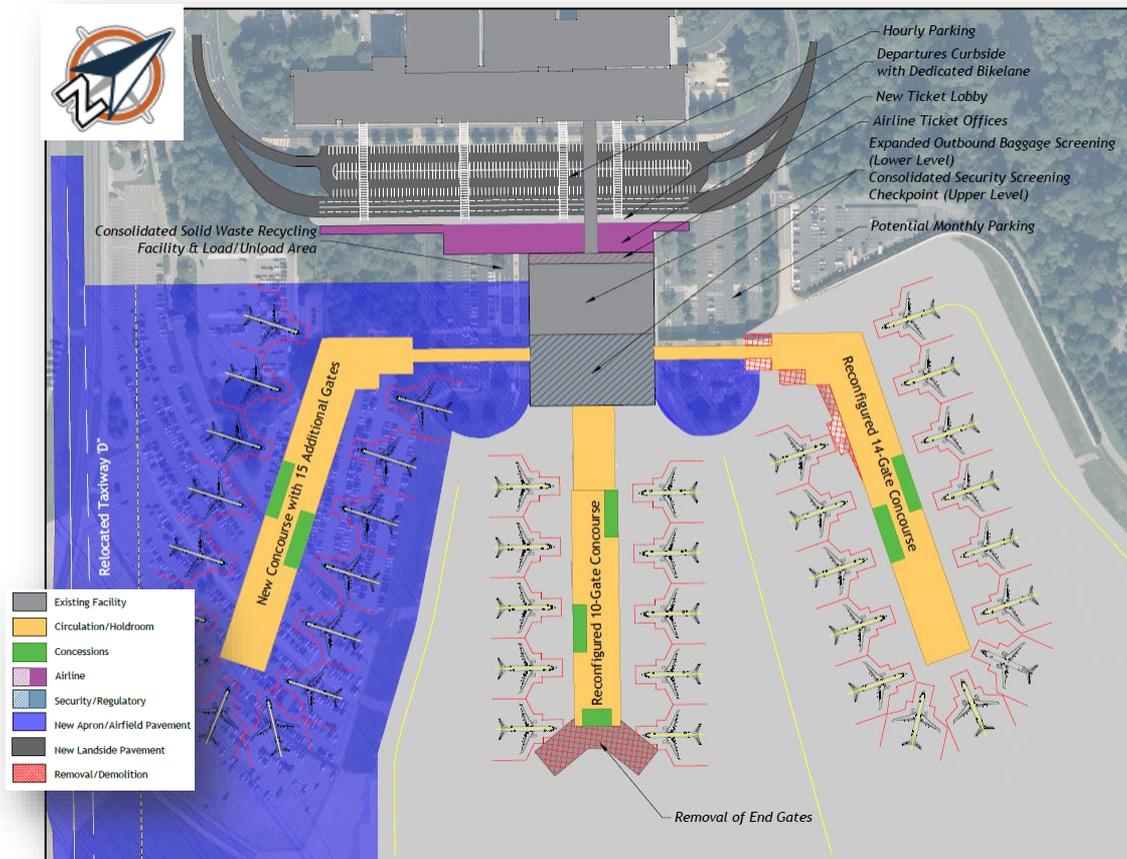


*Project identified prior to Master Plan Update - Will be retained as proposed airfield project in final Master Plan Update documents.



Terminal Expansion

- Terminal Alternative 1
 - Builds upon 2009 layout with 3rd Concourse
 - Consolidates
 - Departures curbside
 - Ticketing halls
 - Security Screening
 - Improves
 - Outbound baggage
 - Vehicle access





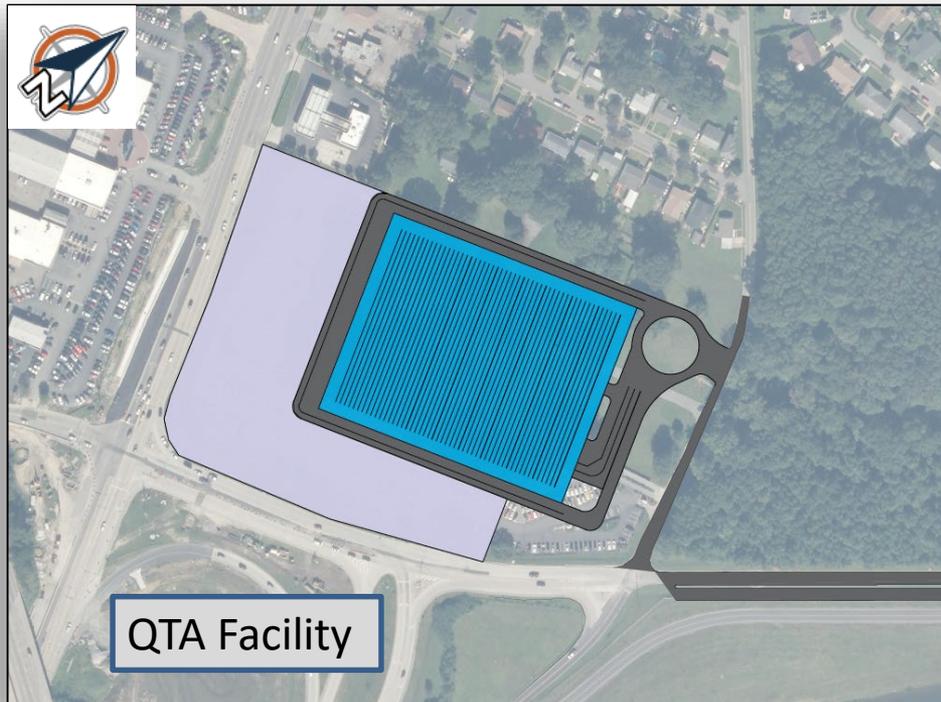
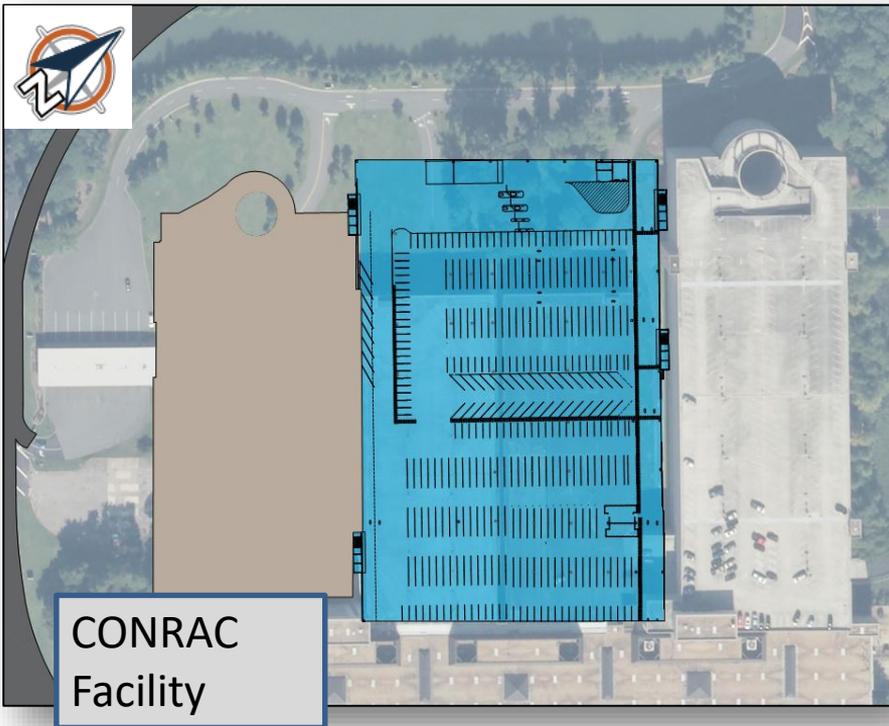
Terminal Projects Estimated Costs

Terminal Improvement Projects	Projected Costs
Ticketing/Check-In Lobby	\$39,500,000
Baggage Claim/Make-Up	\$44,500,000
Consolidated Security Checkpoint	\$27,000,000
Atrium Improvements	\$11,200,000
Concourse A	\$104,000,000
Concourse B	\$83,800,000
Concourse C	\$97,000,000
Terminal Apron Improvements	\$88,000,000
Total Design/Administration	\$7,500,000
Total Terminal Program Costs	\$502,500,000





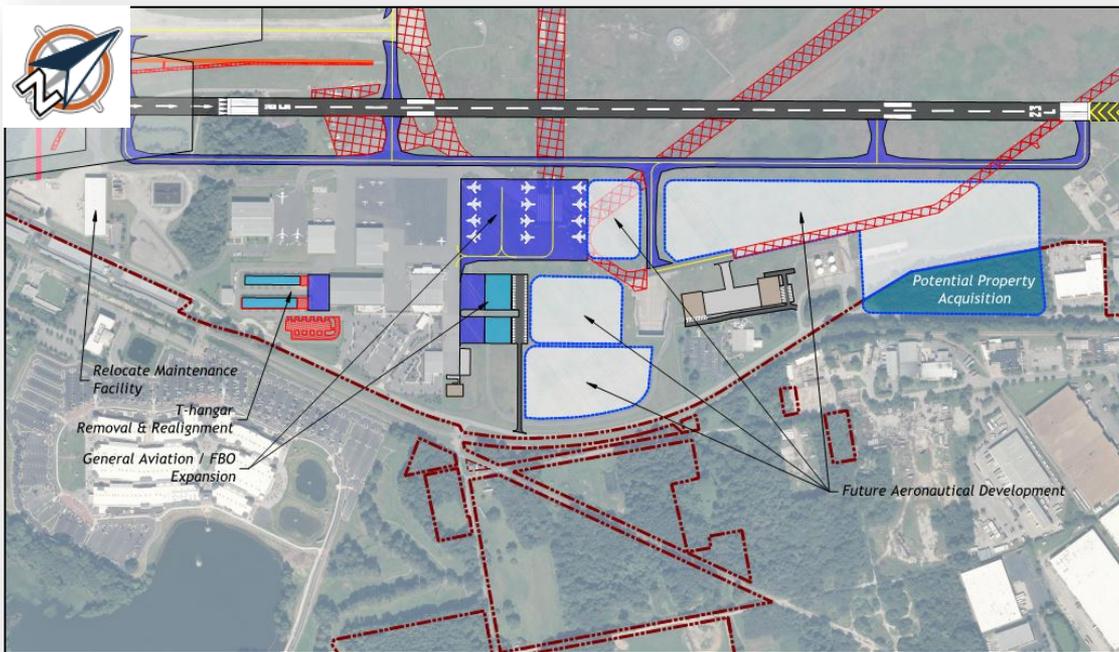
Rental Car Concepts





General Aviation Concepts

- 2 concepts evaluated
- Future expansion dependent upon demand
- Each concept identifies adjacent compatible development areas





Additional Development Areas

- Additional Air Cargo Facility
- New Terminal Deicing Apron
- New Commercial Fuel Facility
- Non-Aeronautical Development Areas





Additional Projects Estimated Costs

Support Facility & Landside Projects	Projected Costs
Relocated Fuel Facility	\$40,000,000
Cargo Apron Improvements	\$31,200,000
Cargo Facility Expansion	\$26,500,000
Deicing Apron*	\$39,000,000
New CONRAC Construction	\$75,000,000
General Aviation Apron Improvements	\$18,700,000
General Aviation Hangar Construction	\$22,000,000
Airport Roadway Improvements	\$13,700,000
Total Support & Landside Program Costs	\$266,100,000



*Includes optional complex glycol collection, storage, and treatment system



Next Steps...

- Complete Financial Plan
- Complete Airport Layout Plan (ALP) and Final Master Plan Report
- Submit for Approval
 - Norfolk Airport Authority
 - Virginia Department of Aviation
 - Federal Aviation Administration





America's Maritime Industry, Born in Hampton Roads: It's Our Past ... And More Importantly, Our Future

**Bringing together workforce, infrastructure and cutting-edge technologies
to lead the nation in the 21st century**

Hampton Roads Joint Military Economic Development Advisory Committees

VADM David Architzel (USN – Retired), Chairman

28 October 2019

Maritime Challenges and Opportunities: Looking Ahead

What Economic Challenges Confront This Maritime Economy?

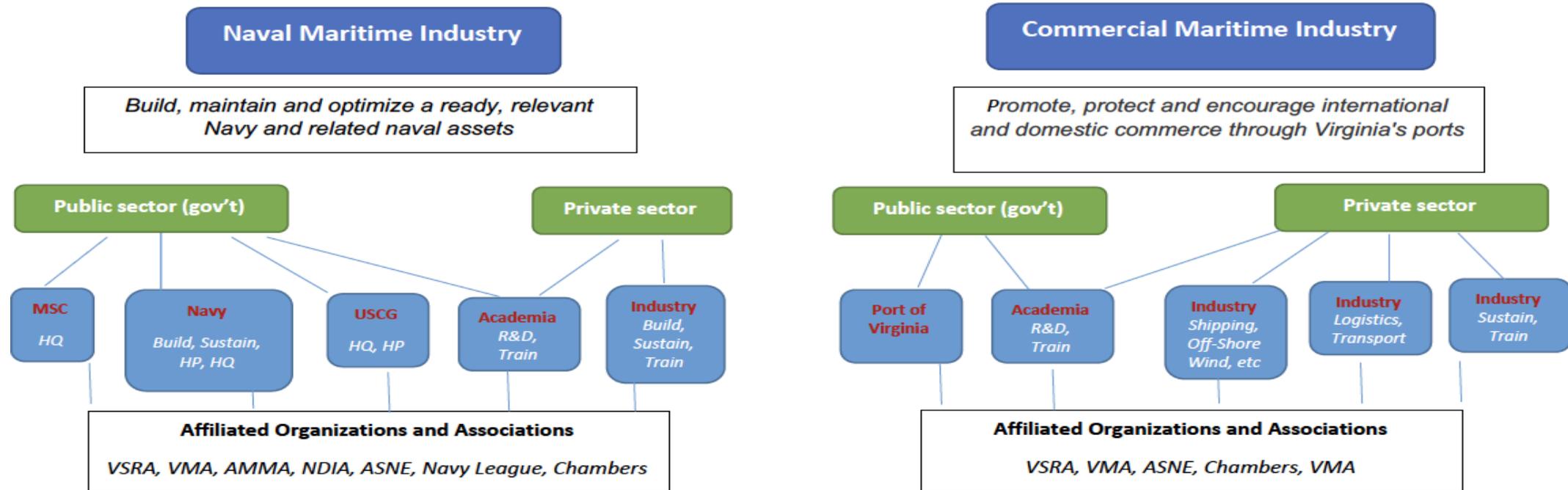
- **Government:** The naval mission – in accordance with the National Defense Strategy -- requires a tech-savvy workforce, plus robust supply chains of firms adept at data analytics, robotics, machine learning and other Industry 4.0/5.0 skills.
 - NAVSEA's maintenance forecast through 2024 cites this region as the likely recipient of significantly more work, ASAP
- **Private:** Commercial maritime/transport values Hampton Roads as a major Atlantic hub and foresees expansion via data analytics and advanced technology infusion.

What Can Our Economic Future Look Like?

We're proud to be the national center of maritime excellence! -- a magnet for talent via our Industry 4.0/5.0 training in maritime trades and management, to find a well-paying maritime job or build a business in our maritime ecosystem.

If it touches the water in Hampton Roads, it's maritime

What's the Maritime Ecosystem in Hampton Roads?



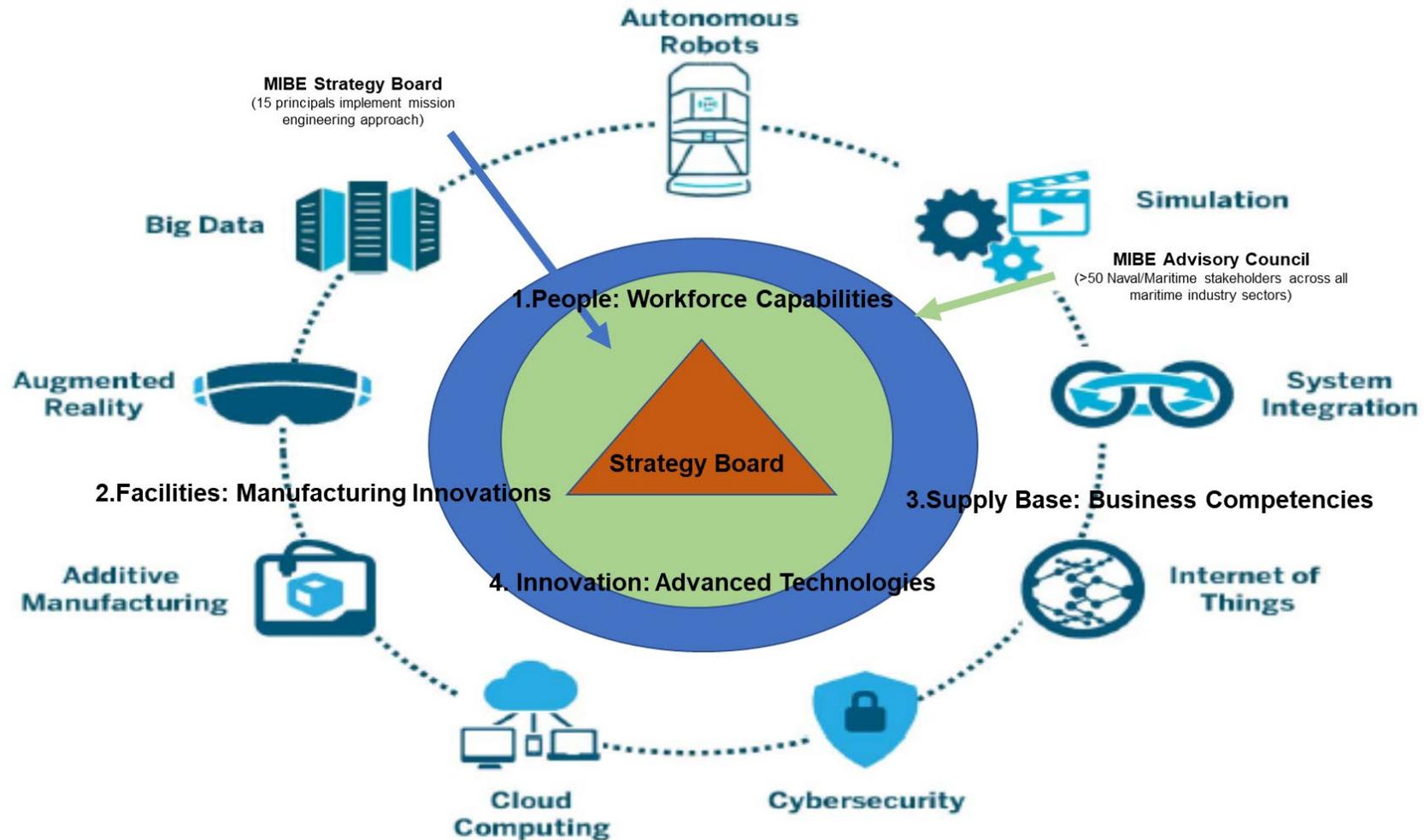
What Needs Do the Naval and Commercial Maritime Sectors Have in Common?

Increased Competencies and Capabilities in Workforce, Supplier Base, Infrastructure and Industry 4.0/5.0 Infusion

What Sectors of the Hampton Roads Economy are Supported by the Maritime Industry?

Health, Real Estate, Retail, Education, Transportation, Recreation, Legal/Accounting, Cyber Security, IT, Energy

Hampton Roads Maritime Industrial Base Ecosystem (MIBE): Delivering Industry 4.0+ Innovation



Technology innovations are competency multipliers, with supportive public policy and industrial base funding.

MIBE's Trajectory, Looking Forward

- MIBE functions as a Virginia association of naval and commercial maritime stakeholders, with an (executive) **Strategy Board** and **Investment Committee**, operating under formal **Bylaws** to optimize the region's keystone industry, sustain the Navy fleet that the nation needs, and grow promising commercial maritime – inclusive of the emerging mid-Atlantic wind power industry. *If it touches the water, it's maritime.*
- With our **Workforce** and **Supply Base Teams** in the lead, MIBE components are applying Mission Engineering precepts to determine, prioritize and close performance gaps:
 - The Strategy Board has approved four high-value **Workforce Team** gap closure projects.
 - The **Supply Base Team** has recommended five high-value gap closure projects for approval.
 - The **Facilities/Advanced Manufacturing Team** is applying a SWOT analysis to determine critical performance gaps.
- MIBE anticipates closing regional maritime performance gaps in 2019-2020 through formal projects seed-funded by DoD's Office of Economic Adjustment.
- MIBE is leveraging GO Virginia projects that transform key industries, build true 21st Century workforces, and promote sustainable regional economies.

MIBE supports a unified Hampton Roads naval/commercial maritime industry -- a true economic pillar

Maritime Challenges and Opportunities: Offshore Wind

- **Background:** Dominion Energy has announced the nation's largest offshore wind farm, planning a 200 turbine project 27 miles east of Virginia Beach, starting in 2020. An Offshore Wind Task Force (OWTF) Executive Committee with many public/private partners supports planning. The Virginia project (CVOW) will leverage decades of wind energy success globally.
- **Opportunity:** CVOW advanced manufacturing and installation opportunities are diverse and numerous – as are R&D opportunities for new cyber security protections, for example.
- **Opportunity:** Moreover, many skilled trades and supplier competencies required for offshore wind projects overlap Hampton Roads' maritime industry competencies.
- **Challenge:** With 3% unemployment and maritime maintenance/modernization suppliers flush with work in Hampton Roads, we need an innovative strategy to meet CVOW needs.
- **Challenge:** If CVOW work goes elsewhere due to lack of regional maritime industry bandwidth, regional maritime may face a deep-pocketed industrial competitor, instead of the industrial collaborator that we want.
- **Next Step:** OWTF, working with MIBE's Strategy Board and the VA Economic Development Partnership, should call for an urgent assessment discussion.



HAMPTON ROADS MARITIME INDUSTRIAL BASE ECOSYSTEM

Delivering a Ready, Relevant, & Sustainable Fleet

For more information, email r1baker@odu.edu or call 757.375.5273

BACKUP SLIDES

How Is MIBE Ensuring This Future?

- Mobilizing government and private maritime talent across the board, regionally.
- Creating a lean, agile management structure, locally, aimed at performance gaps

- Building an inventory of resources – including academic resources-- state-wide.
- Applying a novel approach to prioritizing maritime performance gaps.

- Emphasizing Industry 4.0/5.0 technologies as performance multipliers.
- Focusing on available gap closure solutions.

- Marshalling fiscal resources to support gap closures.
- Encouraging the right mix of local/state/federal public policy support vehicles.

Workforce Committee Priorities

End State: Hampton Roads is a national maritime leader - especially for shipbuilding, maintenance, repair and modernization - with the ability to recruit and develop a technologically adept, well-trained workforce in both maritime industry trades and management. Stretch goal: by 2024, Hampton Roads' maritime workforce has acquired high skill levels in applying Industry 4.0 technologies to each of the maritime trades.

- **Regional Maritime Future Skills Framework and Workforce Gap Analysis**
- **Marine Trades Training Level 1 aka. "Pre-Hire" Program Optimization**
- **Hampton Roads Maritime Web Portal (Cloud)**
- **Military (Navy) Transition Program Optimization**

Supply Base Committee Priorities

- **Conduct Supply Base Assessment**
 - Economic Profile, Economic Impact, GIS Mapping
 - Feedback on “End State” Barriers
 - Technology Utilization & Gaps
 - Small business, veteran-owned, women-owned, minority-owned and HUBZone business contracting compliance
 - US Department of Defense’s (DOD) Cyber Security DFARS/NIST 800-171 compliance and USDOL Section 503 compliance
 - Infrastructure Needs
- **Standardize a Supplier Technical Assessment and Validation System**
- **Identify Process Engineering Software and Training Solutions – Pilot**
- **Assess Process Improvement Culture and Capabilities – Pilot**
- **Host Value-Chain Conference, Workshop Series and Cloud-based Supplier Matching Resource(s)**
- **Host Quarterly Executive Roundtable on Contracting Challenges**
- **Evaluate Regional Professional Employment Organization/Private “Labor Hall”**
- **Leverage Existing Resources & Collaborate - Do Not Reinvent the Wheel**

Glossary of Terms

- **AMMA** – American Maritime Modernization Association *~ 70 members*
- **ASNE** – American Society of Naval Engineers *local chapter of national society*
- **Chambers** – Chambers of Commerce *Tidewater and Peninsula branches*
- **DoD** – Department of Defense
- **HQ** – Headquarters
- **HP** – Home Port
- **MIBE** – Maritime Industrial Base Ecosystem
- **NAVSEA** – Naval Sea Systems Command
- **NDIA** – National Defense Industry Association *local chapter of national society*
- **VMA*** – Virginia Manufacturers Association *>5,000 state manufacturers*
- **VMA** – Virginia Maritime Association *~600 members*
- **VSRA** – Virginia Ship Repair Association *~300 members*