NSWC Crane Chief Technology Office

Presented by: Mr. Rob Walker

CAPT T.D. McKay, USN
Commanding Officer

Dr. Angie Lewis, SES
Technical Director

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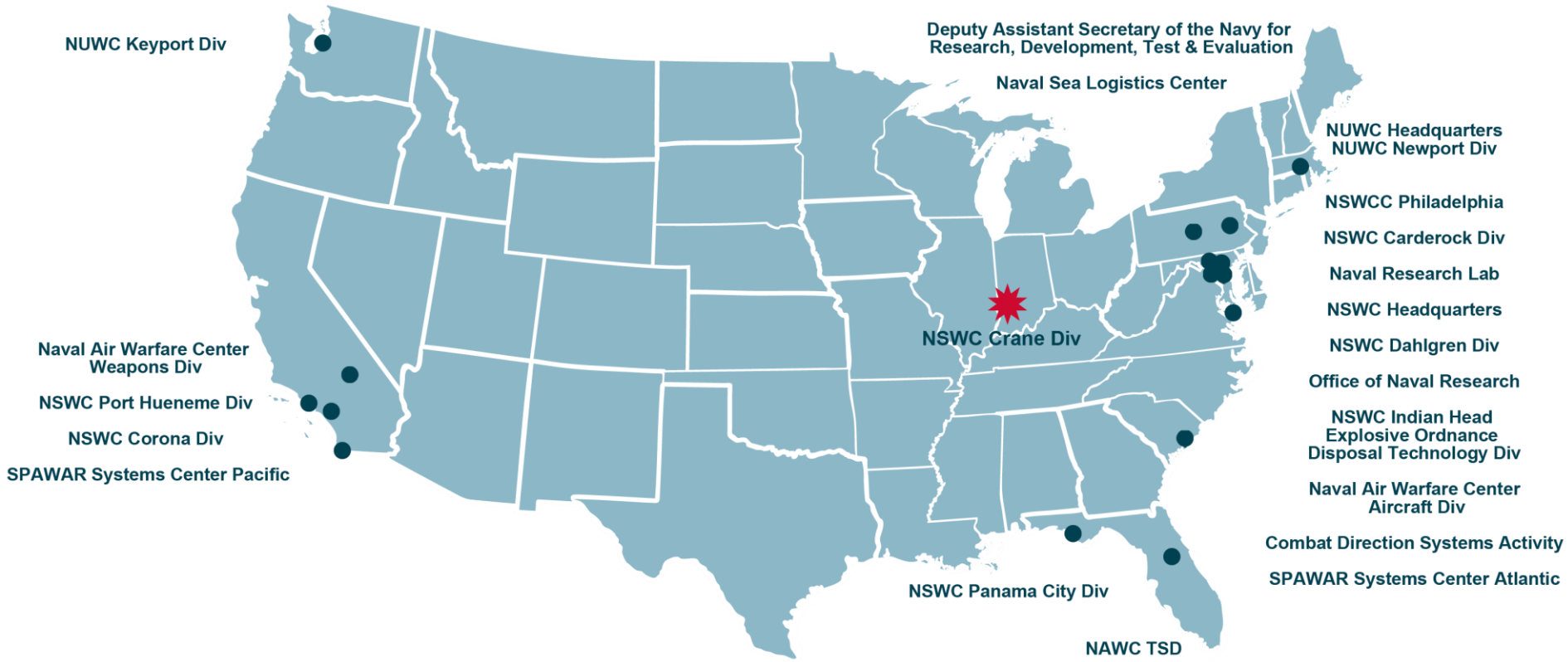
Naval Research & Development Establishment



Aggressive RESEARCH, DEVELOPMENT, TEST & EVALUATION for Reliable Real World Solutions.

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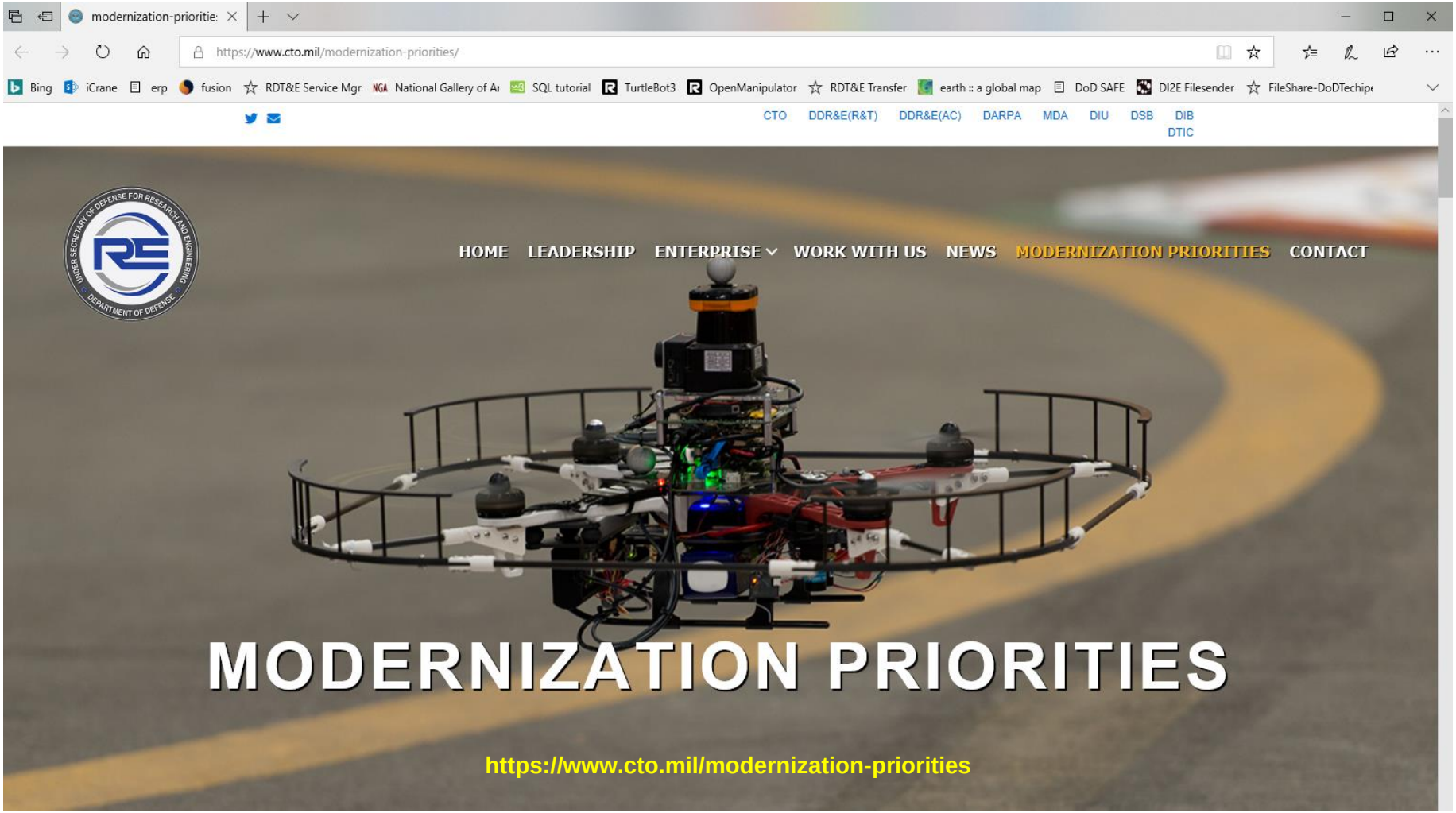
Modernization Priorities



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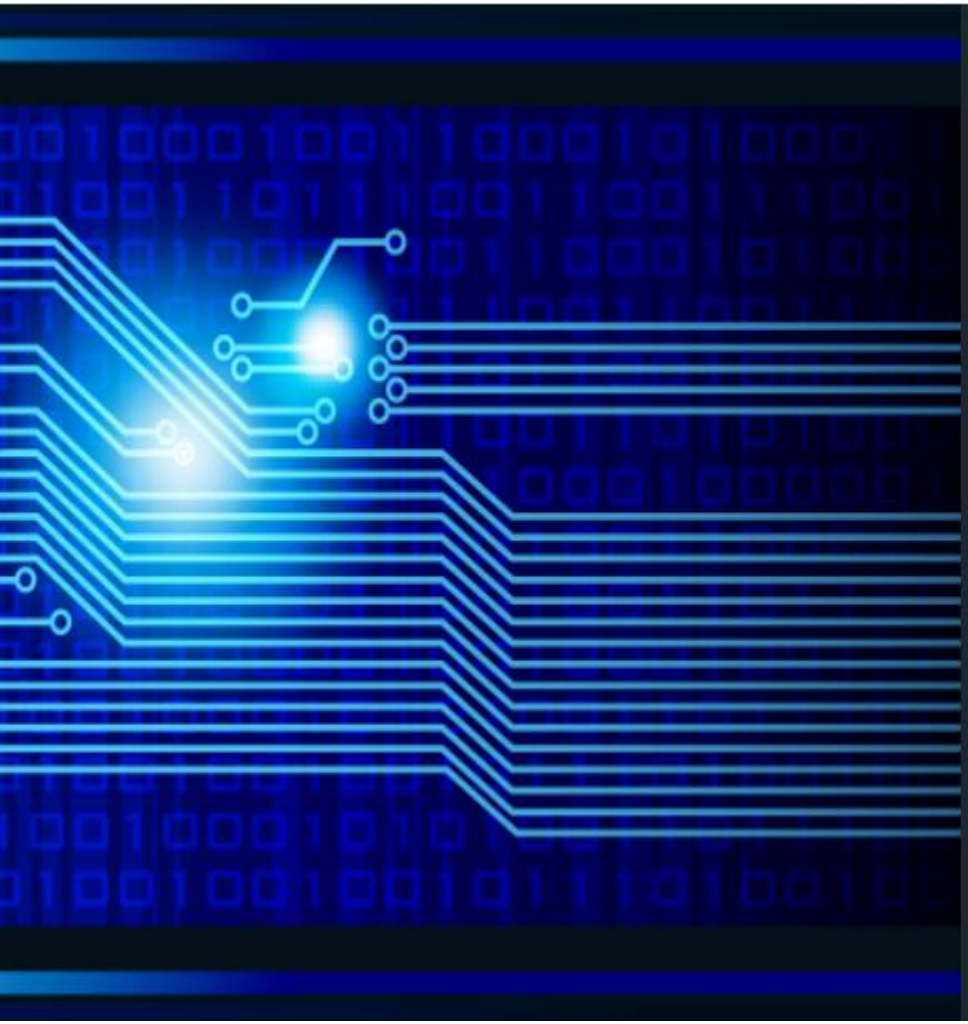
Modernization Priorities



AI/ML

Artificial Intelligence/ Machine Learning

The DoD will leverage AI to enable U.S. forces to operate more effectively and efficiently. As a Department, we are evaluating which of our processes and procedures can be enabled via adoption of AI technology to meet warfighter needs and Defense priorities.

Modernization Priorities

Biotechnology

Biotechnology is any technological application that harnesses cellular and biomolecular processes. Most current biotech research focuses on agent detection, vaccines, and treatment. Future advances in biotechnology will improve the protection of both the general public and military personnel from biological agents, among numerous other potential applications.

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Modernization Priorities

Autonomy

Autonomy extends and complements human capabilities. Advantages include persistence, size, speed, maneuverability, and reduced risk to human life. The DoD targets seamless integration of diverse unmanned/mixed team capabilities that provide flexible options for the Joint Force.

Modernization Priorities

Cyber

Cyber is a unique operational domain with significant security challenges and potential leap-ahead capabilities for military operations requiring enhanced command, control and situational awareness, and autonomous operations. Ability to gain and maintain the U.S. technological edge in cyberspace in the face of rapid evolution is essential to maintaining mission readiness.

Modernization Priorities

Directed Energy

When directed energy matures to a deployable capability, our armed forces will have the potential to defend against several types of threats with great precision and minimal collateral damage, at minimal cost per engagement. High Energy Laser (HEL) technology development and advancements in hardware are making laser weapon systems increasingly viable.

(Photo by John Hamilton)

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Modernization Priorities

FNC3

Fully Networked Command, Control, and Communications technology encompasses the capability to acquire, process, and disseminate information across force elements. DoD requires a clear path to robust C4I with multiply redundant fully-networked "Comms." Existing capabilities require sufficient protection against an increasing threat, in pervasiveness and effectiveness.

Microelectronics

Microelectronics have been rapidly evolving as the demand for inexpensive and lightweight equipment has increased, and have been incorporated into countless DoD systems. Our modernization ability is jeopardized by foreign microelectronics (ME) production, actions, and investments. We must develop and deliver next generation microelectronic technologies to enhance lethality, ensure critical infrastructure, and achieve economic competitiveness.

Quantum Science

Quantum computers pose an impending threat to secure communications. Continued US dominance in quantum information science will keep us ahead of these risks, and NSA crypto-modernization will protect our most sensitive communications against a quantum computer attack. Quantum sensing will deliver new and assured precision position, navigation, and timing capabilities, keeping our forces safe in GPS-denied theaters. Quantum networks will deliver drastically enhanced sensors for finding and fixing elusive targets, and will deliver resource multiplying effects for commercially developed quantum computers to solve DoD's hardest analytical problems.

Modernization Priorities

Hypersonics

Hypersonic weapons travel five or more times the speed of sound. There is a focus on the tactical capability that these sorts of weapons bring to theater conflicts or regional conflicts. Very quick response, high speed, highly maneuverable, difficult to find and track and kill. We are modernizing our offensive and defensive force structure to both utilize and deter this capability.

Modernization Priorities

Space

The U.S. way of war, across all domains, is dependent on timely and assured space effects. Adversary capabilities and advancements require us to move quickly to a more defendable and resilient space posture. Added protection and resiliency to our current spacecraft fleet is essential.

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Modernization Priorities

5G

5G will bring about wireless, ubiquitous connectivity across humans, machines, and the Internet of Things. DOD will adapt 5G and next generation technologies to "operate through" congested and contested spectrum and in spite of compromised networks to ensure maximum readiness, lethality, and partnering among allies. 5G prototyping and experimentation will be conducted in collaboration with the defense industry and commercial suppliers to accelerate U.S. prominence in the 5G global ecosystem.

NSWC Crane Technology Transfer Program

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Gateway for Collaboration Opportunities

T2 Provides Ecosystem Partners an Entry Point into the lab

T2 is the primary enabler that fosters external collaboration that fuels the Innovation Ecosystem

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Making Innovation Accessible

Leverage Federal Government's Investments in Innovation to:

- ❖ Encourage economic growth
- ❖ Promote dual use technologies

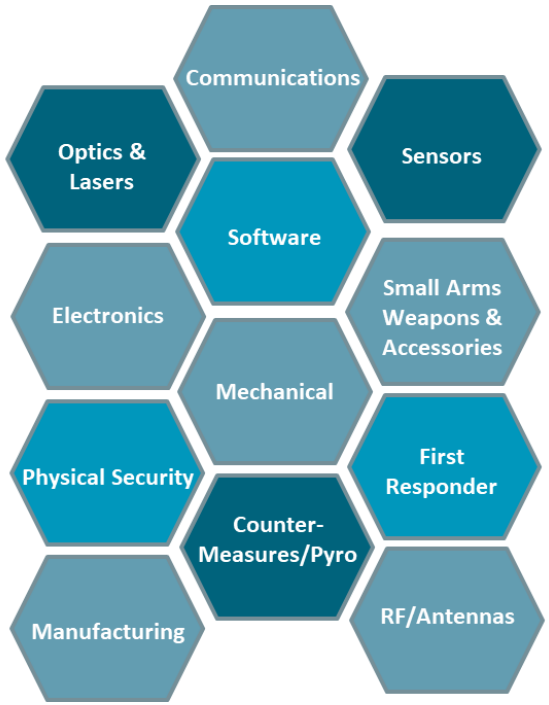
Accessible Innovation

Intellectual Property
- Majority of portfolio is prototyped and fielded
- >400 Inventions available

Subject Matter Experts
- 2000+ Scientists & Engineers

Specialized Equipment & Facilities
- State of the art laboratories

Testing Services
- Unique capabilities



Providing Access to the Valuable Resources of NSWC Crane

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Partnering Opportunities

PARTNERING OPPORTUNITIES

CRADA
- Collaborative Research & Development
- Technology Commercialization Support
- Access to expertise, equipment & facilities

Testing Services
- Fee for service arrangements
- Access to expertise, equipment & facilities

Patent License
- Right to make/use NSWC Crane technologies

Education Partnership
- Assist in enhancing STEM education

Tech Transfer Partnership Examples

- **ABC Inc. needs material tested using equipment unique to NSWC Crane**
  - Crane performs testing IAW defined scope and provides results
  - Requirement could be for government or commercial purposes
  - Fee for Service based arrangement
  - ***Work with Private Party Agreement***
- **Company B has a product that they believe would of interest to Crane**
  - Crane and Company B partner for Crane to evaluate and assess the technology
  - Crane reports results to Company B
  - ***Cooperative Research & Development Agreement***

Tech Transfer Partnership Examples

- **XYZ LLC is working on a high value technology, but would benefit from the expertise of Crane in its development**
  - Crane and XYZ LLC partner to conduct joint research & development
  - XYZ LLC receives exclusive commercial rights to any newly developed technology
  - ***Cooperative Research & Development Agreement***
- **JKL Inc. identifies a Crane developed technology that aligns to their business structure**
  - Crane licenses technology to JKL Inc.
  - JKL Inc. seeks assistance from Crane for commercialization efforts
  - JKL Inc. incorporates the technology into their product line and sells to their clients or customers
  - ***Patent License Agreement & Cooperative Research & Development Agreement***

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Why is T2 Important?

Two-fold objective:

(1) Economic Impact

- Supporting growth in the innovation ecosystem
- Opportunities for transitioning technology to the commercial marketplace
- High Tech, Small Business Focus

(2) Enhance Warfighting Capabilities

- Bringing the best solutions to bear on the technical challenges facing the warfighter
- Leveraging unique partnering mechanisms

Leveraging Partners in Support of a Strong Economy and a Strong National Defense

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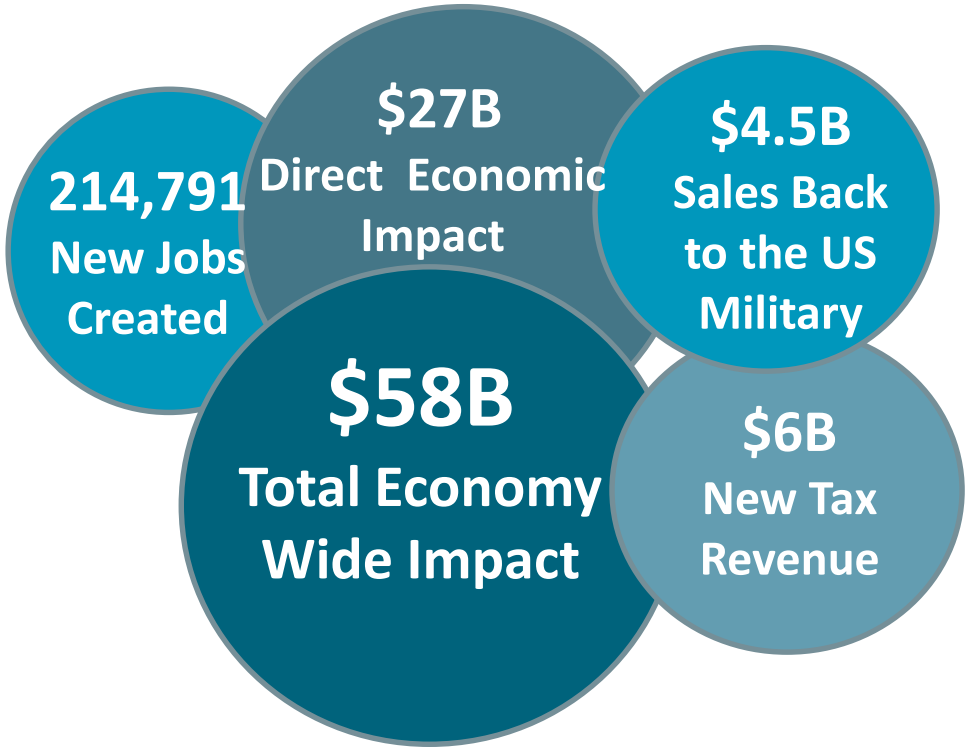
Why is T2 Important to Indiana/Region?

DoD License Agreements

- TechLink Economic Impact Analysis*
- DoD Licenses from 2000-2017
- 1,137 License Agreements
- 95% Response Rate



NSWC Crane License Agreements

- $62M Direct Economic Impact
- $162M Total Economy-Wide Impact
- $57M Total Labor Income

*https://techlinkcenter.org

Supporting the Nation's Defense through Economic Prosperity

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Federal Laboratory Consortium (FLC)

FLC
Federal Laboratory Consortium for Technology Transfer

NATIONWIDE NETWORK OF OVER
300+ FEDERAL LABORATORIES

The FLC's mission is to **promote, facilitate, and educate** T2 among federal labs, academia, industry and other government agencies to achieve commercialization goals, and create social and economic impacts with new innovative technologies.

PROMOTE

EDUCATE

FACILITATE

FLC Business

FLC Business Link

CONTACT US

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Fostering Innovation through Strategic Partnerships