



HARNESSING THE POWER OF TECHNOLOGY for the **WARFIGHTER**

NSWC Crane Technologies

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HARNESSING THE POWER OF TECHNOLOGY FOR THE WARFIGHTER

Technology Transfer (T2) Big Picture

T2 is Mandated

- Presidential Memo Oct 28, 2011
- Law - Title 15 USC 3701- 3715
- DOD and SECNAV Directives & Instructions

Legislative Purpose of T2:

- Improve the economic, environmental and social well being of the US, by
- Leveraging innovation developed with tax payer \$ in the Federal Labs



Lab's "Shareable Assets"

- Knowledge (IP, Tech Data)
- Technical Experts (SMEs)
- Specialized Equipment
- State of the Art Facilities

T2 is the "Intentional communication of *knowledge, expertise, facilities, and equipment, and other resources* for application to military and non-military systems."

Why is T2 Important to Indiana/Region?

TechLink Economic Impact Analysis – DOD Licenses

National Economic Impacts from DoD License Agreements With U.S. Industry 2000-2014

Total Economy-Wide Impact

Command	Output \$ Millions	Value Added \$ Millions	Employment (Number of Jobs Created or Retained)	Labor Income \$ Millions	Average Wage (US = \$46,482)
Navy	\$ 2,686	\$ 1,341	13,018	\$ 894	\$ 68,653
Naval Sea Systems Command	\$ 493	\$ 238	2,420	\$ 156	\$ 64,549
NSWC Crane	\$ 34	\$ 6	138	\$ 9	\$ 64,696
NSWC Carderock	\$ 40	\$ 19	191	\$ 12	\$ 63,115
NUWC Newport	\$ 393	\$ 191	1,968	\$ 127	\$ 64,678
SPAWAR San Diego	\$ 88	\$ 43	384	\$ 27	\$ 70,588

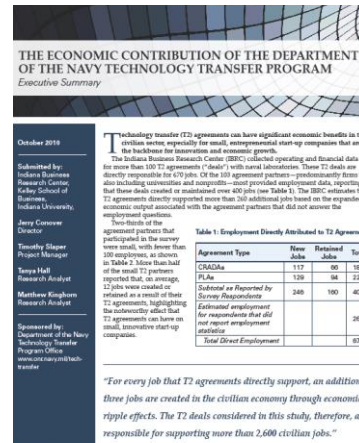
- Crane was one of four NAVSEA WFCs with national economic impact
- Crane's T2 License program is only 7 years
- NSWC Crane's investment in patent license agreements has resulted in

- \$9 million in labor income
- Economic Output of \$34 million
- 138 Jobs Created

- **Indiana University study: 103 Navy T2 “deals”**

Results

- Economic Activity \$545M
- Tax revenue \$60M
- Jobs 2,630
- Avg. Salary \$79.3k



THE ECONOMIC CONTRIBUTION OF THE DEPARTMENT OF THE NAVY TECHNOLOGY TRANSFER PROGRAM
Executive Summary

October 2010

Submitted by:
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navsea.mil/tech-transfer

Technology transfer (T2) agreements can have significant economic benefits in the civilian sector, especially for small, entrepreneurial start-up companies that are the backbone for innovation and economic growth. The Indiana Business Research Center (IBRC) collected operating and financial data for more than 100 T2 agreements (“deals”) with naval laboratories. These T2 deals are directly responsible for 470 jobs. Of the 100 agreement partners—predominantly from high-tech industries including aerospace and computer—most provided employment data, reporting that these deals created or maintained over 400 jobs (see Table 1). The IBRC estimates that T2 agreements directly supported more than 260 additional jobs based on the reported economic output associated with the agreement partners that did not receive the employment questionnaires.

Two-thirds of the agreement partners that participated in the survey were small, with fewer than 100 employees, as shown in Table 2. More than half of the small T2 partners reported that, on average, 12 jobs were created or retained as a result of their T2 agreements, highlighting the substantial impact that T2 agreements can have on small, innovative start-up companies.

Table 1: Employment Directly Attributed to T2 Agreements

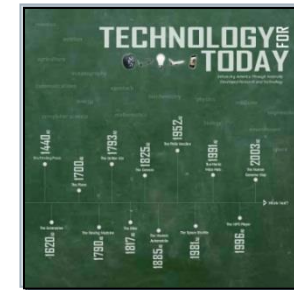
Agreement Type	New Jobs	Retained Jobs	Total
CRADA	117	86	193
PLAs	129	94	223
Subtotal as Reported by Survey Respondents	246	180	426
Estimated employment for respondents that did not report employment statistics			264
Total Direct Employment			690

“For every job that T2 agreements directly support, an additional three jobs are created in the civilian economy through economic ripple effects. The T2 deals considered in this study, therefore, are responsible for supporting more than 2,600 civilian jobs.”

It improves the **economic, environmental, and social well being** of Indiana!!!!

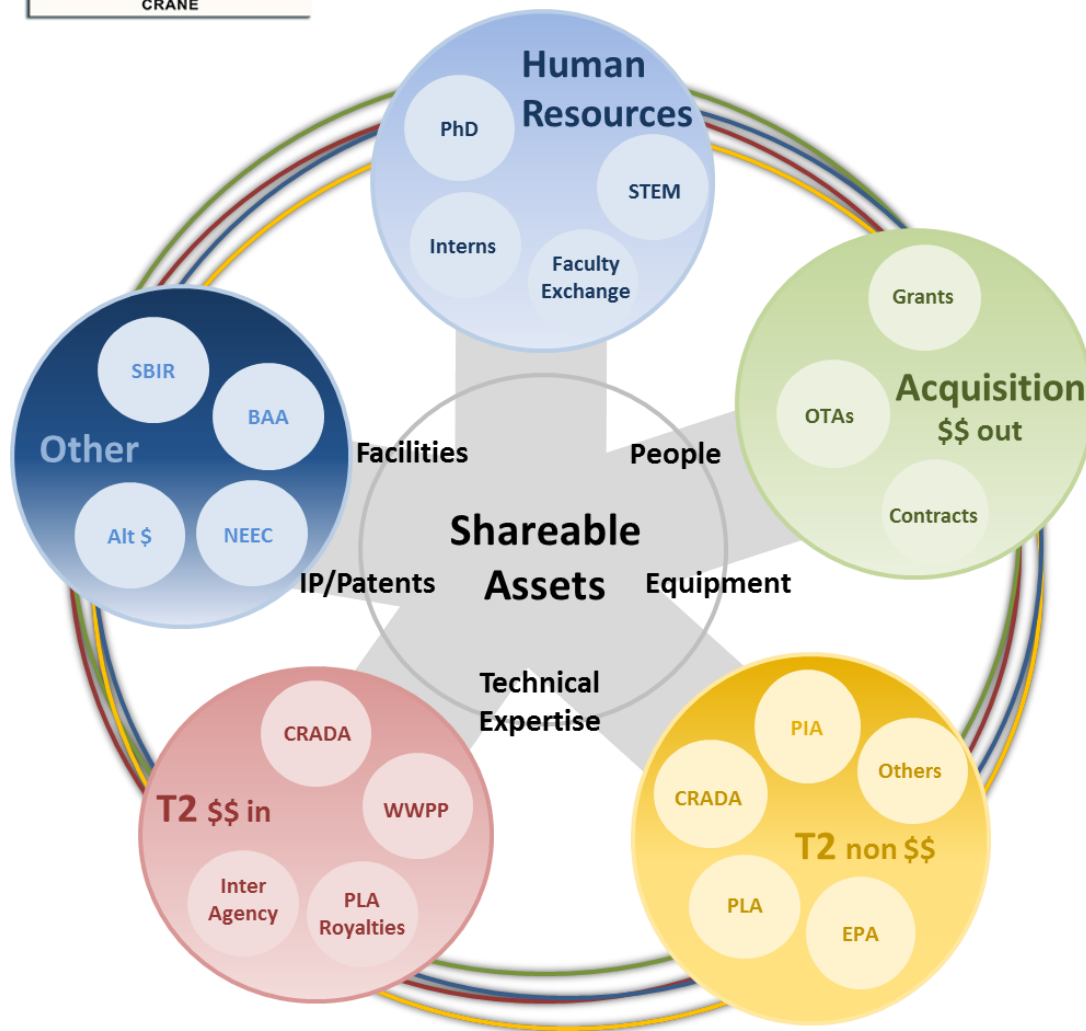
What makes our program work?

- **Partnership Network*** – leveraging funded and tasked entities
- **Innovation Discovery*** – uncovering and protecting innovation
- **University Involvement*** – highlights:
Military 2 Market / Tech Commercialization Academy / Law Student interns



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NSWC Crane Partnership Wheel



Partnership Process

1. Identify desired outcome
2. Determine appropriate partnership type from T2 Toolbox
3. Weigh risks & benefits
4. Negotiate tasking, terms & conditions
5. Execute

NSWC Crane Leveraging Partnering Opportunities

Snap Shot of Crane IP

282 issued

137 filed at USPTO

91 disclosed

- Most prototyped & often fielded – “time to market”
- Inventor/Experts available
- Initial marketing info available on many

Main Technology Areas:

- Testing / Manf Methods
- First Responder Oriented
- Physical Security
- Mechanical
- Weapons
- Optics / Lasers
- Countermeasures (pyro)
- Antennas / RF
- Sensors
- Communications
- Electronics
- Software



INNOVATION ECONOMY: “Seed Corn”

Infrastructure: Partnership Intermediary (PIA)

An Not For Profit entity or agency which is owned, chartered, funded, operated in whole or in part by a *State or local government....*

“that assists, counsels, advises, evaluates, or otherwise cooperates with small business firms” or educational institutions....

“that need or can make *demonstrably productive use of technology related assistance* from a Federal laboratory”

Ref 15 USC 3715(c)



Content

- **University Collaboration**
 - **Business & Entrepreneurship programs** (market studies, business plans, etc.: USI, Ball State, Purdue, CSUSB, SDSU, NC St Marquette,
 - **Law schools (patent prosecution):** IU (2), Valparaiso, Pepperdine, Utah, USC more

Channels

- **Partnership Intermediary Agreements**
 - **Regional:** know the local players
 - **National:** closes the deal

Win / Win: partners are chartered, funded, motivated, and looking for good technical “content”...leveraging functional expertise

By the Numbers (*since Jan 10*)

- 7 start up companies
- 6 signed CRADAs
- 4 exclusive licenses signed
- 11 national bus. plan competitions

Great National & Local PR!

- US News & World Report #1 ranking for classroom impact, Apr 11
- NDIA's National Defense Magazine article (Aug 11)
- 3 FLC Awards for BSU and M2M
- BSU business college flyer (mailed to 34,000)
- Multi Inside Indiana Business: TV and radio interviews



<http://www.usnews.com/education/best-colleges/articles/2011/04/18/10-college-classes-that-impact-the-outside-world>

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Engineers & Business undergrads

- Private Funding
- 5 years in...just \$ for 1 more
- 12 Technologies / 25 patents
- 2,000+ commercialization ideas
- To date:
 - 1 startup w/ license
 - 1 T2 award
 - Attracting partners

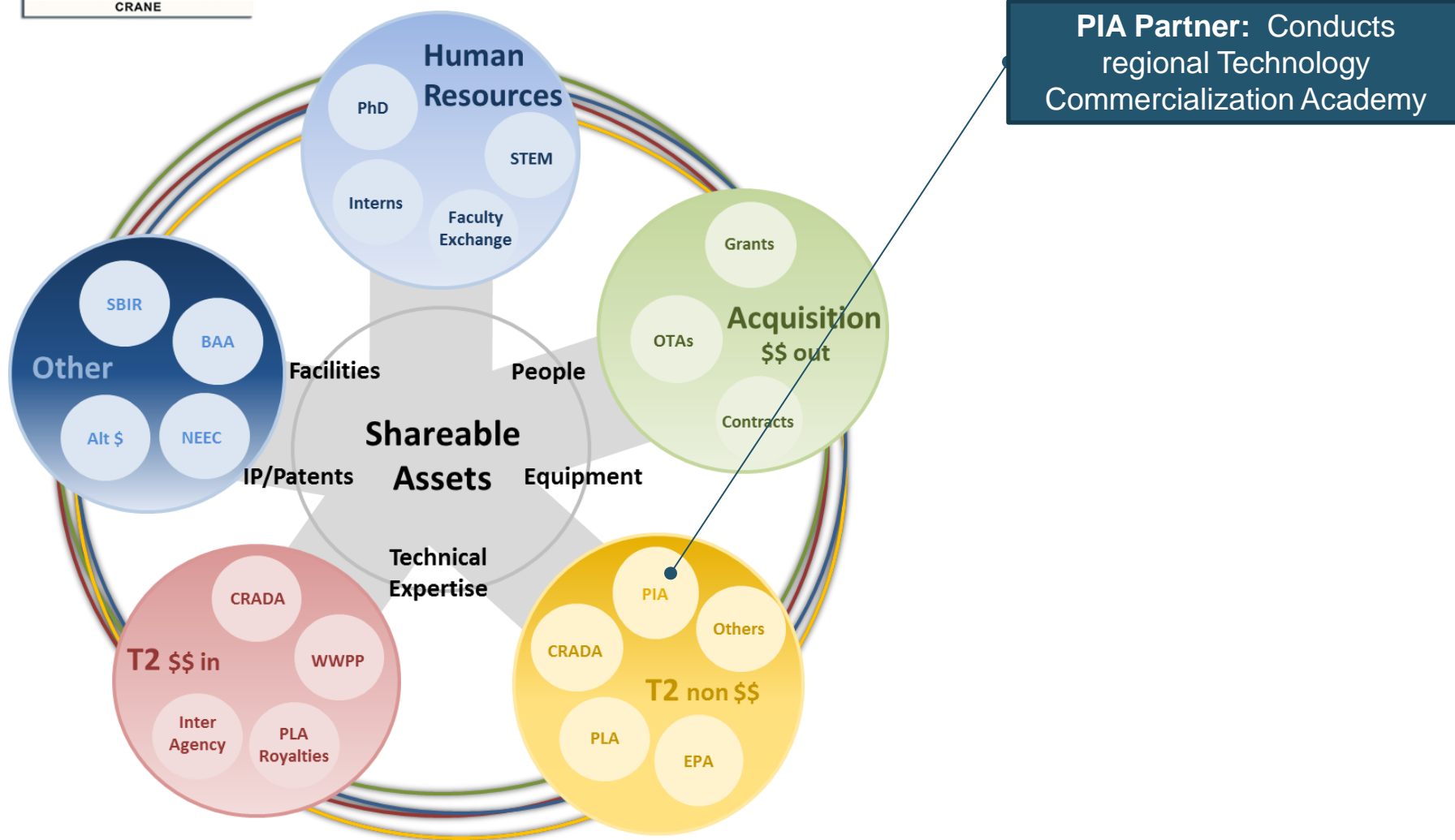


Prototypes

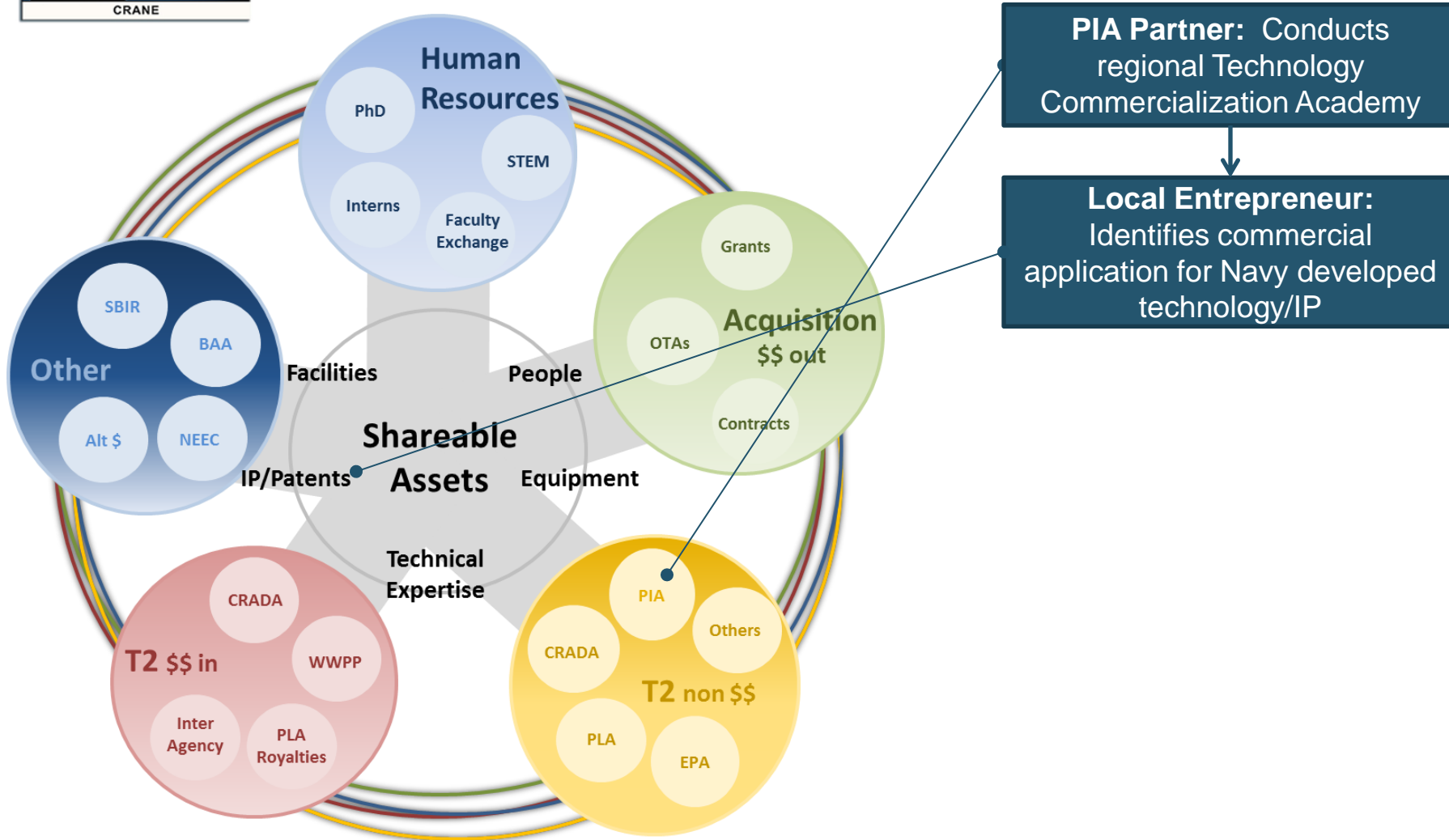


Presenting to biz & investor community

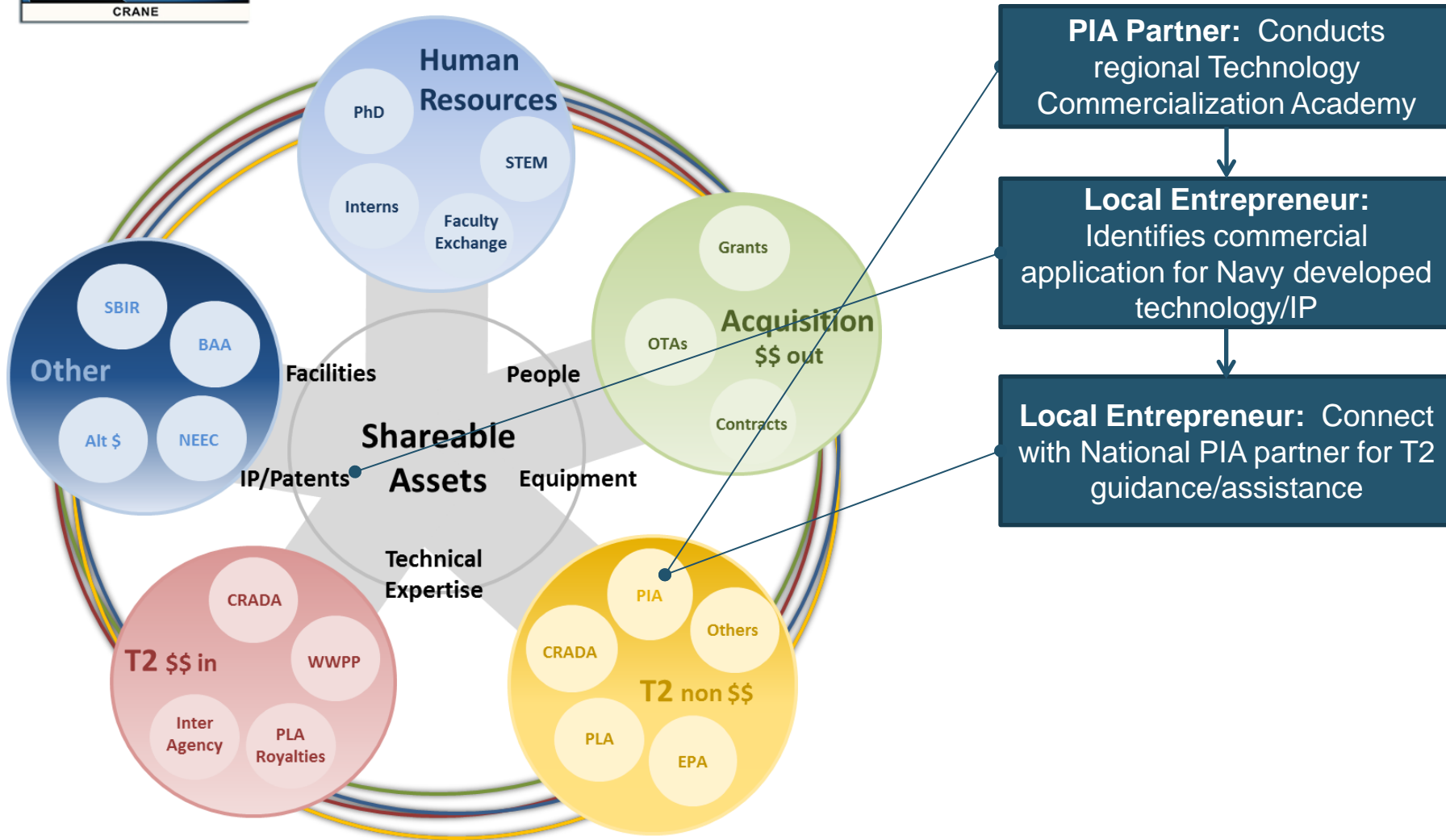
NSWC Crane Partnership Example 1



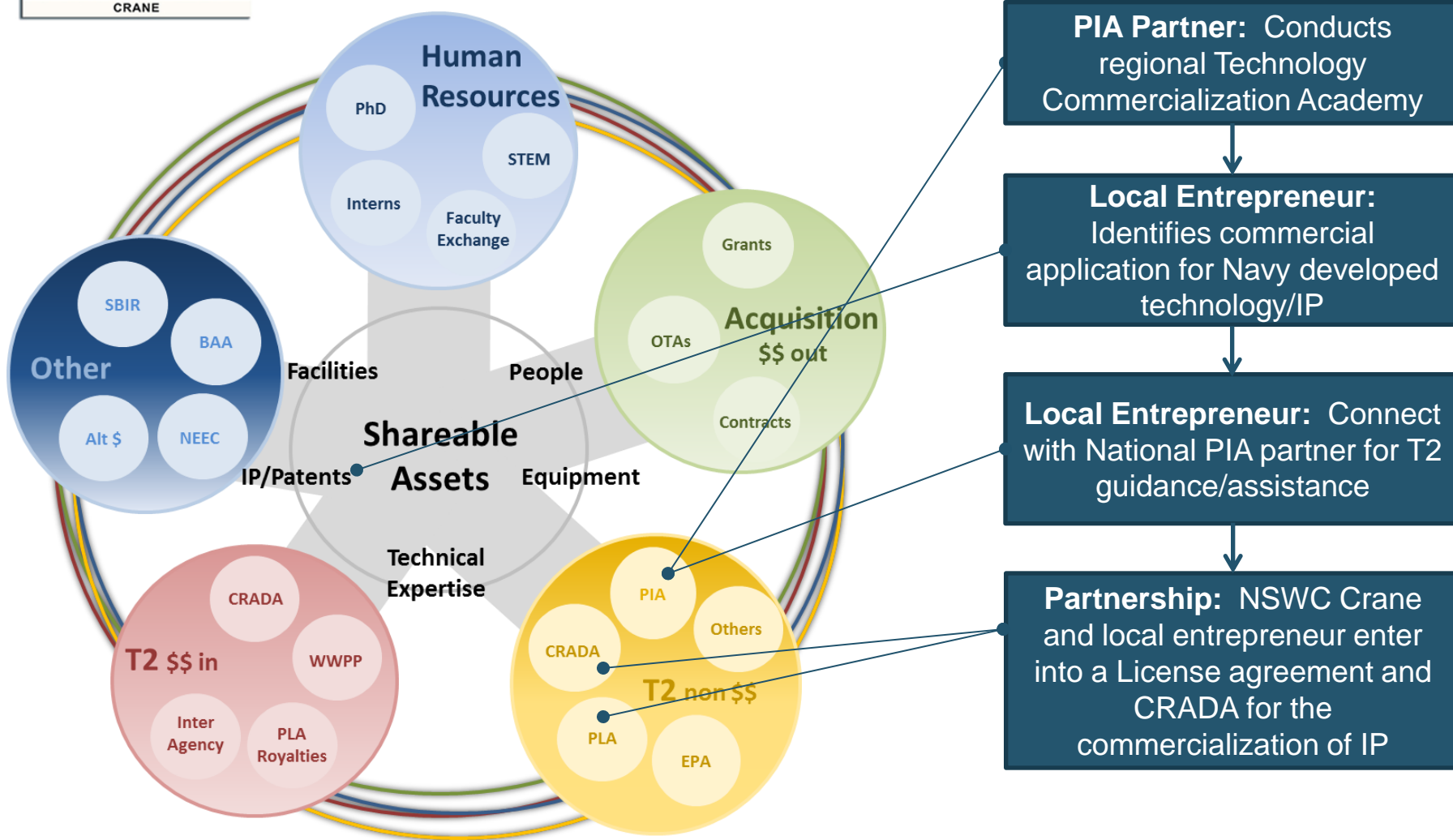
NSWC Crane Partnership Example 1



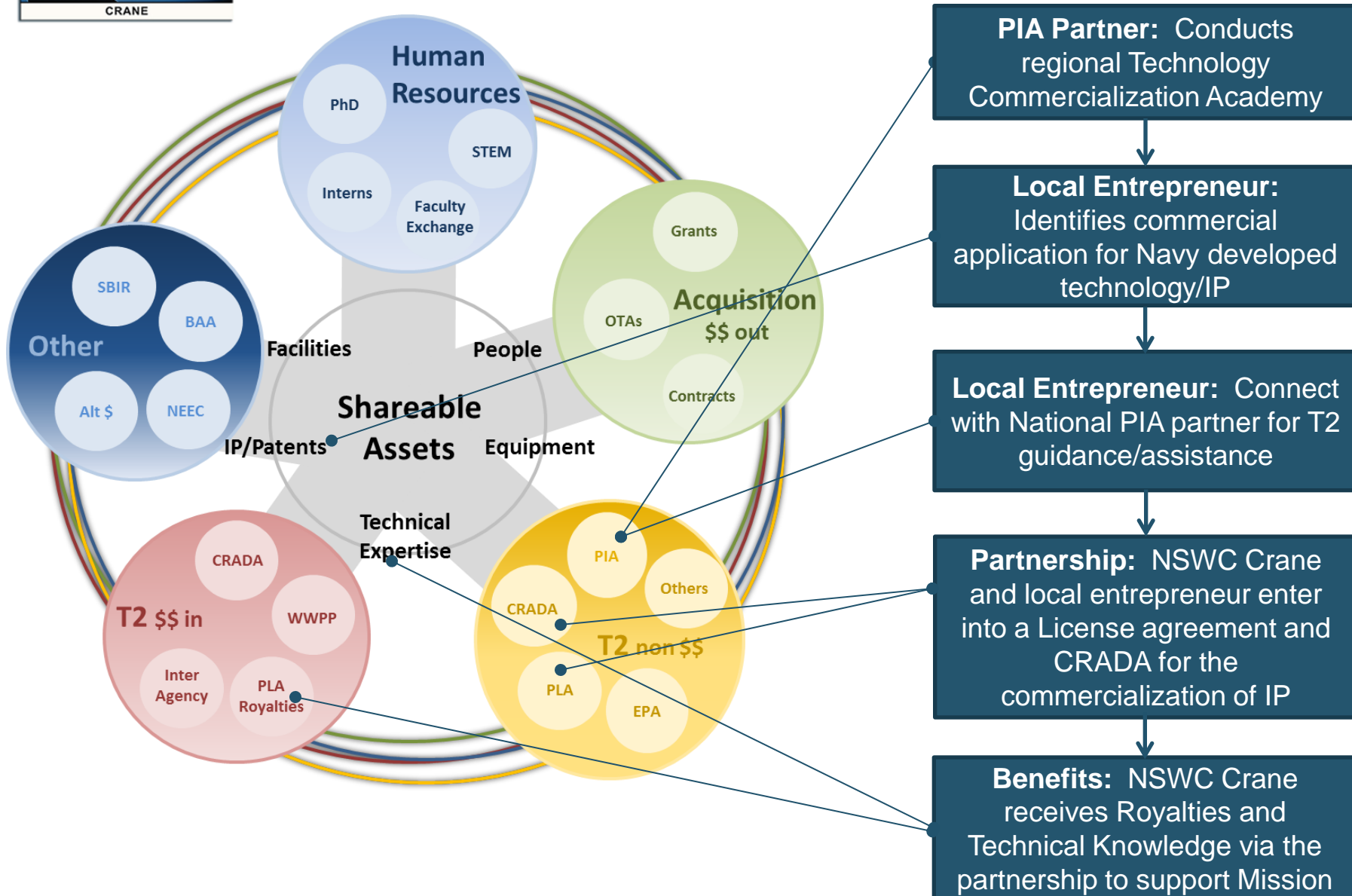
NSWC Crane Partnership Example 1



NSWC Crane Partnership Example 1



NSWC Crane Partnership Example 1





T2 Partnering Mechanisms

Vehicle	Authority	Who is Eligible	Purpose & Advantage	Description
Cooperative Research and Development Agreement (CRADA)	15 U.S.C. 3710a	Any non-federal government entity	Joint development and sharing of facilities, knowledge, experience and/or intellectual property. Provides data and intellectual property protection from Freedom of Information Act for an established period of time.	An agreement that provides for joint research and development; however, NAVSEA Division personnel and facilities costs may be paid for by the non-government partner. Approval by Division Commander. Not subject to Federal Acquisition Regulations.
Educational Partnership Agreement (EPA)	10 U.S.C. 2194	Any educational institution	Allows Division scientists and engineers to work with educational institutions to enhance STEM education.	Allows for equipment loans, help with STEM course development, guest lectures and demonstrations, workshops for teacher and student science and technology education.
Partnership Intermediary Agreement (PIA)	15 U.S.C. 3715	Any semi-private entity set up by state or local governments	Allows the Division to partner with semi-private institutions to develop potential interactions with State and local business entities.	Allows for the development of interactions that would increase the utilization of Division facilities and expertise.
Patent License Agreement (PLA)	35 U.S.C. 207	Any entity	Joint development and sharing of facilities, knowledge, experience and/or intellectual property. Provides data and intellectual property protection from the Freedom of Information Act for an established period of time.	Assigns the right to make, use or sell government intellectual property. License fees and/or royalties may be involved. Approved by the Division Commander.
Memorandum of Understanding or Agreement (MOU/MOA)	DoDI 4000.19	Any entity	Allows for the defining of understanding and areas of responsibility between two or more parties.	Defines general and detailed areas of responsibility and understanding between two or more entities.
Work For Private Parties Agreement (WFPP)	10 U.S.C. 2539b 10 U.S.C. 2563 22 U.S.C. 2770	Any business, university or private entity	Provides a working alliance with the Divisions' unique technical personnel and use of the facility for an appropriate fee through the authorization testing services, sales or articles or services outside of the Department of Defense under specific conditions as well as the sale of articles and services to U.S. companies for incorporation into end items that may be sold to friendly foreign countries or international organizations.	Perform work efforts within the Divisions' technical capabilities under authorized statutes 22 USC 2770, 10 USC 2539b(a)(3), 2539b(a)(4), and 10 USC 2563. Approval at the Division and/or Headquarters' level.
Centers for Industrial and Technical Excellence (CITE)	10 U.S.C. 2474	Any private, non-Government entity	CITE designation as an arsenal- and/or depot-level activity allows the Navy to more efficiently maintain an in-house, energetics capability by enabling designated activities to effectively address and manage under-utilized capacity. This has a positive impact on operations due to increased direct investments in equipment and facilities, combined with cost sharing of a larger revenue base, resulting in higher levels of readiness with lower stabilized rates.	A statutory authority (10 USC 2474) that permits CITE-designated depot maintenance and military arsenal facilities to (1) enter into public-private partnerships with private, non-Government entities to perform work related to core competencies; (2) received reimbursement for use of under-utilized Government resources where capacities exist; and (3) be excluded from requirements limiting the amount of Government work contracted out to private industry within a fiscal year.

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T2 Summary

- T2 at Crane:
 - *Positioned to lead and shape the discussion*
- Nationally, T2 is in growth/high interest period
 - *Stars are aligned*
- Goal: Effective, scalable and sharable model

Leveraging T2/IP for enhanced lab mission effectiveness through technology based economic development is ensuring we're using ALL our assets and not "leaving money on the table"



Technology Transfer (T2) Metrics

152

T2 Agreements

Agreement
Breakdown:

32 CRADAs

60 EPAs

17 PIAs

19 PLAs

24 WFPPs

NSWC CRANE TECHNOLOGY TRANSFER

FY16 QUICK STATS

92

IP Disclosed

Intellectual
Property Portfolio

510

282

Patents
Issued

Agreements
Initiated

FY16

40

136

Patents Filed

1000* by 2020
NSWC Crane T2 Goal

* Pieces of IP

Last updated: July 13, 2016