



Center for the Commercial Deployment
of Transportation Technologies

*A Partnership of
Government, Industry and Academia*

Strategic Plan

March 16, 1999

The Center for the Commercial Deployment of Transportation Technologies (CCDoTT) matches innovative technology to “end-to-end” military and commercial transportation requirements, improving military deployment effectiveness and the nation’s productivity, competitiveness and balance of trade. CCDoTT’s fundamental principles are captured in the Center’s Vision, Mission, Values, Strategic Goal, and Strategic Objective statements:

Center for Commercial Deployment of Transportation Technologies

Vision: *CCDoTT is recognized as the world leader in the application of technology to improve global logistics operations and management.*

Mission: *Develop and deploy advanced transportation technologies to enhance commercial and national defense rapid deployment and logistics capabilities and the growth in national and international trade.*

Values: ***Competency*** – *qualified and experienced professionals effectively managing and executing CCDoTT programs using the best practices and technical resources available.*

Commitment – *giving our best effort to deliver the products and services our clients expect on schedule and with resources provided.* ***Quality*** – *delivering and standing behind “best of class” products and services that reflect our competency and commitment.* ***Integrity*** – *adhering to the highest possible standards of principled conduct and openness with our clients, sponsors, and co-workers.*

Strategic Goal: *Improve military deployment effectiveness and the nation’s productivity, competitiveness and balance of trade.*

Strategic Objective: *Reduce the time and cost of military deployments and commercial goods transport.*

CCDoTT’s ability to accomplish its mission is built on activities in two strategic areas -- one related to the organization and management, one related to technology programs:

CCDoTT Priorities:

1. Organization and Management

- a) *Guidance* – Establishing and Maintaining the Center’s Focus and Direction
- b) *Management* – Planning and Executing the Center’s Programs to Successful Completion
- c) *Partners* – Establishing and Maintaining the Center’s Relationships with Partners, Customers and Providers

2. Technology Programs

- a) *Physical infrastructure* and process improvements at origin, destination, storage and transfer points (MHE, instrumentation, pre-positioning, storage and retrieval methods, etc.)
 - b) Improvements in *transportation assets* (containers, vehicles, vessels, aircraft, rolling stock, and on-board systems, etc.)
 - c) *Information infrastructure* and process improvements throughout the end-to-end movement for better command and control (collection, processing, decision support tools, communications, retrieval, presentation, etc.)
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1. What is CCDoTT?

The Center for the Commercial Deployment of Transportation Technologies (CCDoTT) is a partnership of academic institutions, government, and commercial corporations. It was formed to enable the Department of Defense (DOD), the Department of Transportation (DoT), and other government and commercial sponsors to: (1) leverage commercial technologies in solving defense transportation infrastructure problems; (2) conduct research and development for defense transportation infrastructure initiatives; and (3) provide a technology transfer/dual use bridge between the DOD and commercial industry. The consortium was organized to provide a broad range of defense and commercial technologies, to analyze transportation problems and environmental impacts, and to develop procedural, computer, or equipment solutions. It is well-versed in defense command, control, communications, computers and intelligence (C4I); electronic commerce; transportation technologies; computer simulation and modeling; economic and cost modeling; state-of-the-art training and educational solutions; and advanced manufacturing technologies. CCDoTT is a California State University, Long Beach (CSULB) chartered Center within the College of Engineering that operates as a virtual organization, partnering with government organizations, academic institutions, and high technology providers throughout the nation where solutions to pressing military and commercial transportation problems can be found.

As the flagship campus of the California State University system and home of one of the largest engineering colleges in the west, CSULB is well-positioned to serve as the base of operations for CCDoTT. CSULB's focus on applied technology is evidenced in its outstanding Research Park facilities located near the nation's two largest intermodal seaport facilities, the Ports of Long Beach and Los Angeles and the transportation corridor that serves these major seaports. Additionally, CSULB is a co-partner with the University of Southern California as one of the nation's 17 University Transportation Centers funded under the Transportation Equity Act for the 21st Century ("TEA-21").

CCDoTT's projects through FY98 with the Department of Defense's United States Transportation Command (USTRANSCOM) and the Department of Transportation's Maritime Administration (MARAD) have involved technology partnerships with:

- August Design
- Boeing
- BTG, Incorporated
- Concurrent Technologies Corporation (CTC)
- Louisiana State University
- Parsons Brinckerhoff, Inc. (PB)
- Automated Terminal Systems (ATS)
- Science Applications International Corporation (SAIC)
- Stanley and Associates
- The Logistics Management Institute (LMI)
- The University of Alabama
- The University of South Alabama
- The University of Southern California (USC)
- VZM, Inc.

As CCDoTT's programs grow in number and variety, its technology partnerships expand and evolve to ensure that it brings the best technology possible to address the needs of its sponsors and customers.

2. CCDoTT Priorities

For CCDoTT to be successful, it must address transportation issues that are important to national security interests and to commercial enterprises, and it must execute programs effectively. CCDoTT's Strategic Plan reflects these critical success factors. The following pages identify strategic objectives and strategies and actions for the two strategic areas. The goals serve to focus activities in each strategic area and provide the basis for assessing progress and recognizing accomplishments. The strategies and actions are the operational means for unifying and coordinating CCDoTT activities. Successful implementation of CCDoTT's Strategic Plan depends upon clear understanding of CCDoTT's mission, focus on identifiable products and deliverables in the technology programs, dedicated leadership, and strong partnerships.

Figure 1 illustrates the relationships between the strategic priorities for the High Speed Sealift/Agile Port Program. Effective organization and management is key to engaging partners, identifying R&D priorities, and executing programs; a clear focus on strategic technology programs differentiates CCDoTT from other organizations with transportation technology transfer missions; and strategic partnerships align CCDoTT with military and commercial customers who will benefit from its programs and technology providers who can develop the best

solutions. The strategic technology programs are interactive in that improvements in transportation assets may be necessary to take advantage of improvements in the physical infrastructure and vice versa. Improvements in the information infrastructure may be required to manage rapidly moving assets so that decision makers know the current status at any time in the end-to-end movement process and that they reach their intended destination at the right time.

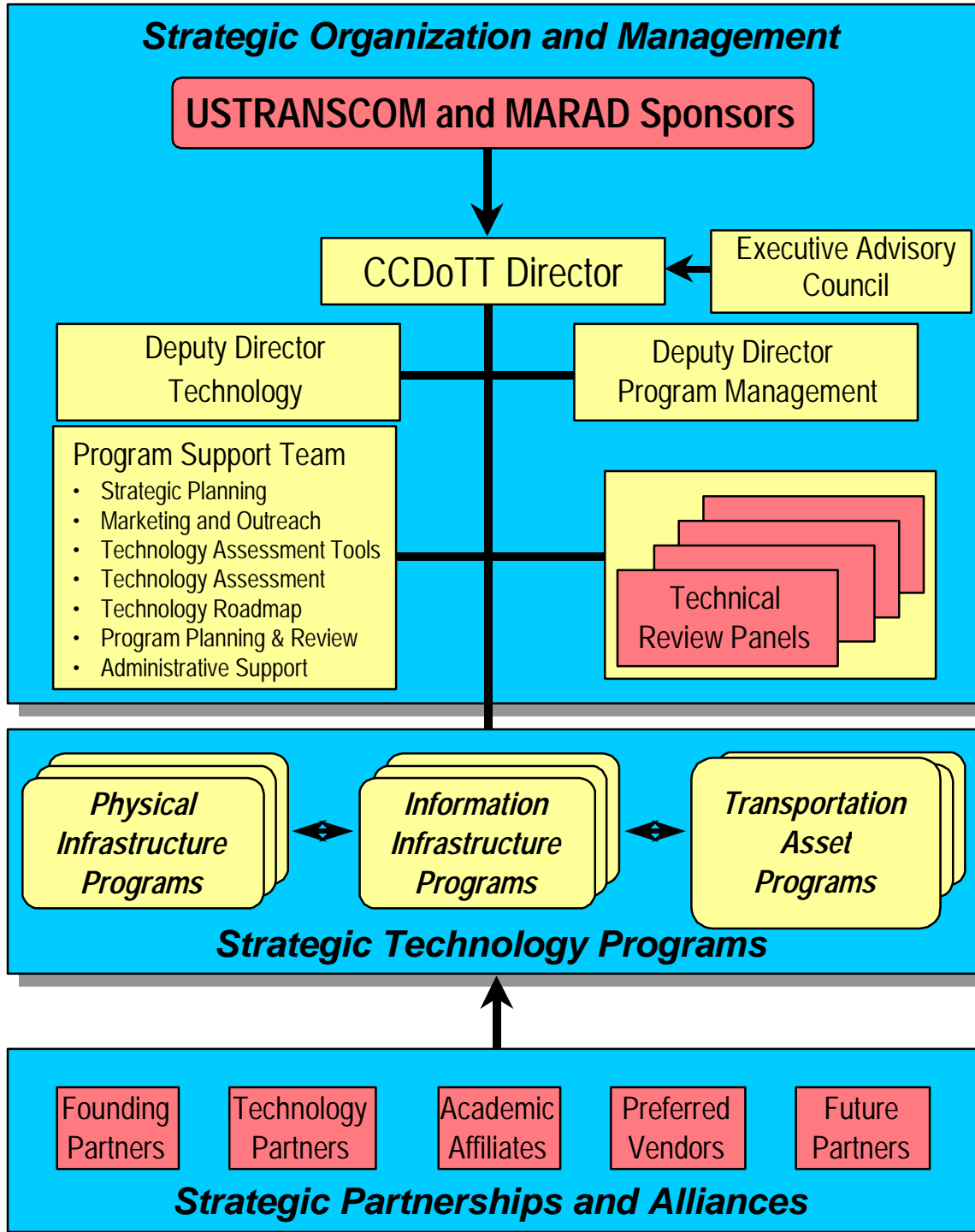


Figure 1. CCDoTT's success depends on effective organization and management, significant technical programs, and strong partnerships and alliances.

3. Organization and Management

3.1 **Guidance Goal – Establish and Maintain the Center’s Focus and Direction**

CCDoTT’s success depends on two major factors: (1) identify and pursuing programs within its mission that meet the needs of its sponsors and customers, and (2) executing those programs effectively to meet technical, schedule, and cost objectives. As a national center, CCDoTT offers its sponsors and customers access to world class technology solutions through its partnerships with outstanding academic institutions, successful high technology companies, premier national laboratories and research centers, and experienced domain experts who understand both military and commercial requirements.

To take full advantage of CCDoTT’s capabilities and to ensure that its resources are applied effectively, CCDoTT must take deliberate steps to focus on high payoff programs that directly address the needs of current and potential sponsors and customers. This requires close coordination with government (military and civilian) and commercial stakeholders whose needs must be addressed and with key technology providers who will produce solutions that meet these needs. The objectives in this area are designed to ensure that this coordination occurs.

3.1.1 Guidance Objective 1: Maintain a CCDoTT Executive Advisory Council.

The CCDoTT Executive Advisory Council* is comprised of senior government (military and civilian), industry (commercial technology users and technology providers), academic, and state and local officials who are knowledgeable of military and civilian needs and technology opportunities but do not influence funding decisions involving CCDoTT. The Council serves CCDoTT across all of its current and potential program areas by providing assistance in four important areas:

- Assist CCDoTT leadership (Director and Executive Steering Group) in *identifying and targeting specific technology programs* that address military and commercial end-to-end transportation needs;
- Assist CCDoTT in *establishing and maintaining a network of contacts* among potential program sponsors and technology providers;
- Serve as an extension of CCDoTT in *informing others about CCDoTT’s capabilities and accomplishments*; and
- Review and offer advice concerning CCDoTT’s current and proposed technical programs and its organization and management practices for executing technical programs successfully.

The composition of the Council reflects the knowledge and expertise needed to assist Center policy making, in setting strategic priorities, in making intelligent investment decisions, and in developing and maintaining a constituency among potential program sponsors and technology providers. The size of the Council and its composition changes with the nature of CCDoTT’s technology programs and direction. In general, the categories of membership include the following:

- Representative(s) from certain DOD unified commands and individual Services
- Representative(s) from commercial transportation providers including maritime, rail, highway, and air transportation and intermodal facilities (seaports, intermodal terminals) that support these providers
- Representative(s) from state and local jurisdictions (agencies and other organizations) where major CCDoTT programs exist
- Representative(s) from transportation industries, science and technology firms, and universities that understand emerging technology trends.
- Representative from the CSULB College of Engineering (permanent member)
- CCDoTT Director (*ex officio*)

* The CCDoTT Executive Advisory Council should be distinguished from Program or Project Senior Strategic Steering Groups that oversee and direct specific technology programs. The Council’s responsibilities go beyond any single program and are directed toward establishing and maintaining CCDoTT as a viable national center in the long term.

The Executive Advisory Council is chaired by an outstanding, highly respected individual who understands both CCDoTT's mission and capabilities and the requirements and needs of military and commercial interests. The Chairperson may come from different organizations at different times, depending on CCDoTT's current and anticipated technology programs.

The term of service for Council members is three years with one-third of the membership rotating off each year. The Chairperson may change annually or bi-annually. The Council will identify and invite new members to join the Council in accordance with the CCDoTT Charter as members rotate off each year.

The Council is supported by the CCDoTT center support staff which assist the Chair by planning, organizing, facilitating, and documenting Council meetings, preparing and executing communications between the Chairperson and Council members, and providing other assistance to the Council as required.

The Council meets at least semi-annually or more often as deemed necessary by the Chairperson and CCDoTT Director. Other Council activities (teleconferences, videoconferences, meetings coordinated with other events) may occur from time to time as appropriate.

At the discretion of the CCDoTT management and in coordination with the Council members, meeting expenses for Council members are reimbursed by CCDoTT. However, Council participation is on a voluntary basis and, as such, is uncompensated unless unusual circumstances require otherwise.

The initial CCDoTT Executive Advisory Council includes senior executives from the following organizations:

- CSULB College of Engineering
- A major US-based marine shipping company (e.g., Sealand, APL)
- A major US-based rail company (e.g., CSX, Norfolk Southern, UP, BNSF)
- A major port authority (e.g., Port of LA/LB, Port of Philadelphia)
- Elected or senior agency officials from jurisdictions or quasi-governmental entities where major programs are or will be executed (e.g., CALTRANS, Alameda Corridor Transportation Authority)
- Academic institutions with relevant research and education programs (e.g., University of Southern California, University of Alabama)
- A major science and technology provider involved in programs related to CCDoTT's current and/or anticipated efforts.
- Appropriate Government Officials from USTRANSCOM, MARAD, etc.

3.1.2 Guidance Objective 2: Collect and assimilate strategic plans from organizations whose requirements and needs directly influence CCDoTT's current and potential technology programs.

CCDoTT's current technology programs are in direct response to identified military mobilization requirements for major regional contingencies and limited regional contingencies. They are driven by *Joint Vision 2010* and *United States Transportation Command: Strategic Plan FY 1998 – FY 2017*. They also address specific commercial transportation needs outlined in USDOT's Maritime Administration Strategic Plan that overlap or complement military mobilization requirements.

For CCDoTT to maintain its relevance in addressing military and commercial requirements, it must stay abreast of the strategic plans of current and potential sponsor and customer organizations. This is accomplished in part through the CCDoTT Executive Advisory Council described under Strategic Guidance Objective 1. However, all military and commercial needs are not represented on the Council and other mechanisms are needed to identify and respond to these needs.

Most government and industry organizations prepare strategic plans periodically and update them on an annual basis. CCDoTT currently uses strategic plans from USTRANSCOM and MARAD to guide its program efforts. As CCDoTT's capabilities and partnerships expand, it must broaden its view to understand the strategic intent of other relevant stakeholders. These stakeholders include transportation firms, technology developers, government agencies, and military organizations. To the extent that these plans are available and can be acquired, CCDoTT must identify technologies and initiatives that address strategic needs and formulate multi-year programs that

address these needs. These programs, once reviewed by the Senior Strategic Steering Group, become the foundation for funding requests, partnering strategies, competitive procurements, and outreach activities.

3.1.3 Guidance Objective 3: Establish the analytical and procedural foundation for identifying areas of greatest need and highest payoff for potential Center programs.

The CCDoTT Executive Advisory Council and strategic plans from other organizations are essential inputs to CCDoTT's program development activity. However, these inputs must be used in a logically structured process that produces credible, defensible, responsive technology programs. CCDoTT's program development process is the mechanism for identifying and selecting promising technology programs. The process employs logical processes, analytical tools, objective criteria, critical review, and potential funding to develop the Center's technology programs. This process is illustrated in Figure 2.

Program development begins with the strategic guidance garnered from Senior Strategic Steering Group review and endorsement of current programs, input from the strategic plans of other organizations, and a realistic assessment of end-to-end military and commercial transportation needs along with feedback from completed and on-going CCDoTT programs and projects. The advice and guidance drawn from these sources, combined with an awareness and understanding of available funding and potential procurements, supports preparation or updating of CCDoTT's strategic plan. The strategic plan enables CCDoTT managers to formulate the technology roadmap (i.e., the critical technologies that must be available to meet functional requirements and identify when they must be available) and specific technology thrusts (i.e., areas where focused attention is needed to ensure that required technologies are available when needed and areas where technology investment produce high payoffs across multiple functional requirements).

Based on the technology roadmap and identified technology thrusts, CCDoTT solicits input from technology providers in government, industry, and academia for ideas and proposals to address these technology needs. Responses may come from current technology partners from industry and academia or from other technology providers with relevant technical capabilities. The solicitation process may involve formal Requests for Proposals (RFP) based on known program funding and technical requirements. Alternatively, the process may take the form of a multi-phased solicitation where ideas are sought in a general area and reviewed against specific selection criteria. Organizations that submit the most promising ideas are asked to submit more detailed proposals for further consideration.

In the case of RFPs, the CCDoTT review process uses evaluation criteria provided in the RFP and reviews submissions accordingly. Typically, the RFP process will be used when program funds have already been identified, technology requirements are well understood and documented, and CCDoTT's desire is to identify the most cost-effective provider of the needed technologies and services.

The multi-phased solicitation process can be used when program funding is yet to be allocated to specific projects or when technical requirements lack sufficient specificity to prepare a formal RFP. In this case, CCDoTT uses a technology prioritization process that maps proposed technologies against functional requirements and identified technology thrusts. The prioritization process uses a variety of assessment tools to identify the most promising technologies, including Quality Functional Deployment (QFD), simulation modeling and analysis, and economic analysis to determine which technologies offer greatest promise for meeting the functional requirements of potential military and commercial sponsors and customers. Figure 3 illustrates an example of how this process works.

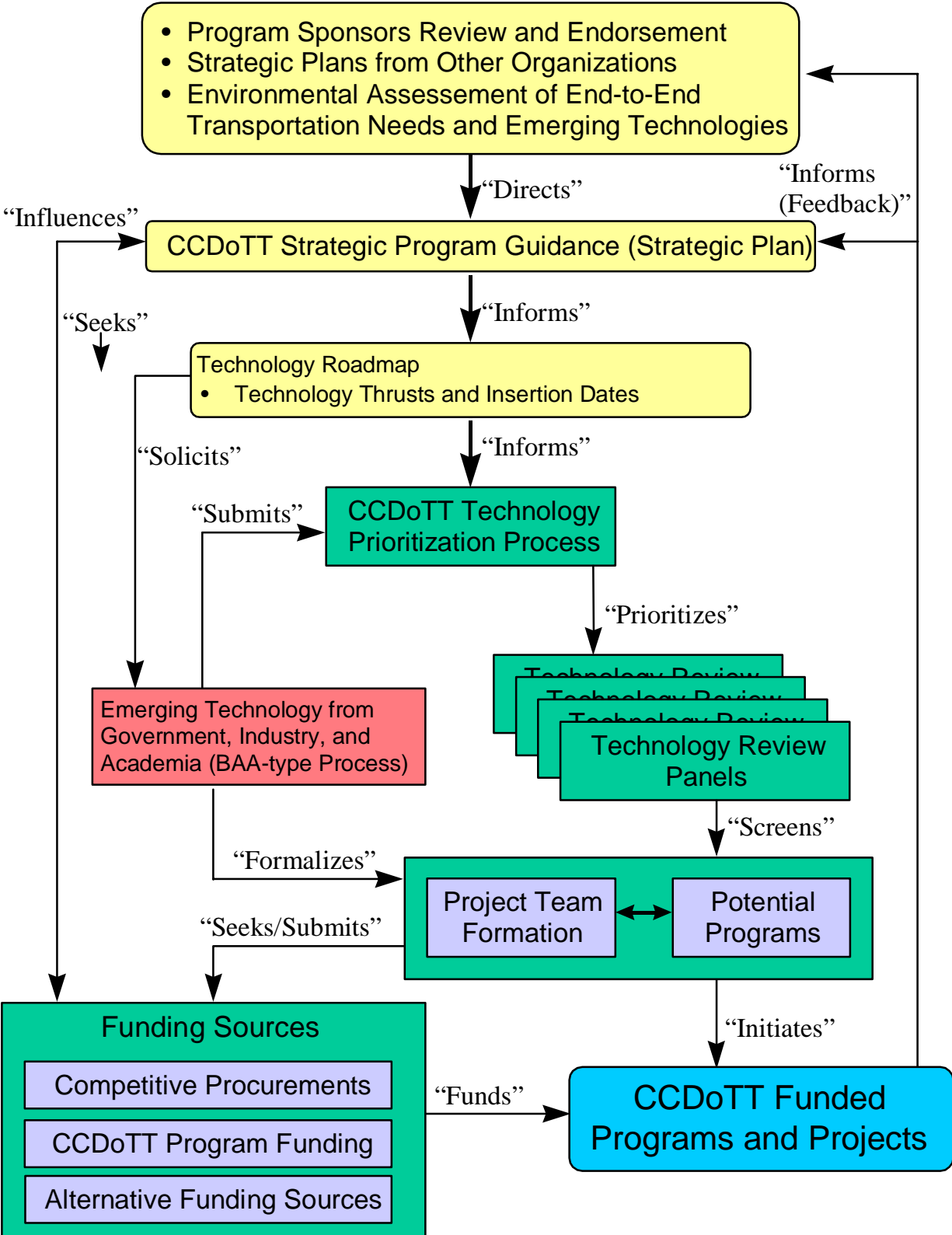


Figure 2. CCDoTT's program development process aligns customer needs with technology solutions and available resources.

Technology Thrusts (Areas where technology is needed to meet functional requirements)						
	A	B	C	D	E	
Relative Importance→	5	7	3	7	9	
↓ Candidate Technologies (rated against technology thrusts)						Score
Technology 1	0	1	9	3	3	82 (71)
Technology 2	9	3	3	1	3	109 (94)
Technology 3	1	9	0	3	3	116 (100)

Figure 3. CCDoTT uses formal evaluation processes to identify the most promising high payoff technology solutions.

The technology thrusts shown in Figure 3 relate to specific customer needs. For example, high speed sealift may require improvements in propulsion, hull design, and on-board cargo storage and handling. It may also require advancements in simulation and modeling to evaluate alternative ship designs. Each of these is a separate technology thrust and each technology thrust may differ in relative importance to program success. The “relative importance” row reflects these differences. Candidate technologies address one or more of the technology thrusts. The values in the cells in each candidate technology row indicate how well each technology addresses the need within the technology thrusts. In many cases, these values must be determined subjectively based on the knowledge and understanding of subject matter and domain experts; in other cases, relative values can be determined through analytical tools such as computer simulation models. Subjective scoring uses a 0 (no impact), 1 (low impact), 3 (medium impact), and 9 (high impact) rating scale. The “Score” column shows the weighted technology scores obtained by summing the product of the relative importance of the thrusts and the relative impact of the candidate technology across all thrusts for each technology.

This evaluation process allows CCDoTT to prioritize technologies for further consideration based on the technical feasibility of the proposed technology. Because these technologies are likely to be drawn from a number of scientific fields, CCDoTT calls on technical experts in appropriate fields to serve on Technology Review Panels that assess the likelihood of success of the proposed project. Scientists and engineers who serve on Technology Review Panels come from government, industry, and academia and may represent customer or stakeholder groups who sponsor CCDoTT projects. Organizations represented on the CCDoTT Senior Strategic Steering Group contribute to Technology Review Panels as appropriate to ensure that the programs meet success probability thresholds.

Once screened by Technology Review Panels, high priority projects (as determined previously) are formulated as potential programs and projects. Program and project teams are formalized by submitting organizations, accommodating review guidance provided by CCDoTT management. Programs for which funding is already identified are initiated as CCDoTT funded programs and projects. For unfunded programs with merit relative to the CCDoTT mission, CCDoTT assists in identifying appropriate funding sources, including preparing proposals to potential funding sources in response to RFPs or as unsolicited proposals.

The final element of the program development process is the feedback from current CCDoTT programs and projects to the initial stages of the planning process so that future plans and guidance reflects the lessons learned from past efforts.

3.2 Management – Plan and Execute the Center’s Programs to Successful Completion

Strategic management involves alignment of technical, human, and fiscal resources with program needs to produce high quality products and services on time and within cost. CCDoTT’s approach to strategic management ensures that the Center pursues and selects the projects that best meet customer needs, that it forms the most qualified teams available to execute the projects, and that it manages and monitors these efforts to successful completion or timely termination when technical hurdles prove insurmountable or performance is unacceptable. The strategic management objectives described below are designed to ensure that these management practices are observed.

3.2.1 Management Objective 1: Establish technical review panels and a CCDoTT program support team.

The Technology Review Panels are not part of the permanent CCDoTT staff but convene from time to time to provide services described in part under Guidance Objective 3.1.3. However, their role goes beyond program development activities to include program review responsibilities discussed below. Membership on Technical Review Panels varies depending on the nature of technologies under consideration and the areas of application. The Panels include technical and domain experts drawn from key sponsor and customer organizations and high technology partners (government, industry, and academia). Panel members are generally uncompensated except, in some cases, the expertise needed to provide adequate review mandates retention of paid technical consultants.

The program support team is employed by or under contract to the Center to provide the wide-ranging administrative and technical support needed to make the Center run smoothly and plan and execute its programs successfully. The program support team consists of administrative and technical staff who understand the goals and processes of the Center and can manage these processes in support of the Center Director. While the program support team is part of the CCDoTT organizational structure, the individuals on the team may be CSULB employees, outside contract employees, or employees of CCDoTT partners assigned to support CCDoTT. Team members may be assigned full-time to CCDoTT or on an on-call status to support specific Center needs. The Program Support Team is supported through CCDoTT funding derived from CCDoTT projects and funding made available by partner organizations.

Specific responsibilities of the Program Support Team include:

- *Strategic Planning:* Developing, updating, and disseminating mid- to long-term plans and actions that enable CCDoTT to achieve its technical objectives.
- *Marketing and Outreach:* Planning and executing general and targeted efforts that create greater visibility for CCDoTT among potential partners and sponsors, including identification of appropriate audiences and offices for CCDoTT outreach efforts.
- *Technology Assessment Tools:* Identifying, acquiring, and, as necessary, developing tools to assess the technical merits, cost, and operational effectiveness of technology proposals and products.
- *Technology Assessment:* Applying technology assessment tools to proposed or in-progress efforts so that alternative or competing technologies can be equitably evaluated and compared.
- *Technology Roadmap:* Developing the technical pathway to the desired end state by identifying available technology, technology opportunities, and technology challenges to be addressed in the multi-year programs. The technology roadmap provides the basis for soliciting and evaluating proposals and judging progress toward program objectives.
- *Program Planning & Review:* Assisting the Center Director by supporting program planning activities (e.g., preparing solicitations and statements of work and facilitating the proposal review process), and arranging, coordinating, facilitating, and documenting periodic program reviews of efforts currently underway.
- *Administrative Support:* Providing routine administrative support including correspondence with partners, vendors, sponsors, and other stakeholders, managing electronic communication media (e.g., CCDoTT's web site at www.ccdott.org), and other tasks as necessary.

3.2.2 Management Objective 2: At least annually, update CCDoTT's technology roadmap and technology thrusts based on guidance from the Senior Strategic Steering Group, the strategic plans of partner organizations, the end-to-end transportation environmental assessment, and the status of current CCDoTT programs.

To accomplish this objective, CCDoTT implements the initial steps in the program development process described under Strategic Guidance Objective 3.1.3 on an annual or more frequent basis. Under the leadership of the Center Director, the CCDoTT program support team develops the information base needed to support program development and planning; identifies, collects, and assimilates strategic plans of other organizations; and prepares the CCDoTT Annual Program Report used by the Senior Strategic Steering Group and others to determine CCDoTT strengths and capabilities.

The CCDoTT support team plans and facilitates the program development process by assisting with planning and organizing Senior Strategic Steering Group meetings where program development issues are discussed, updating CCDoTT's strategic plan to reflect advice offered by the Senior Strategic Steering Group, updating the technology roadmap consistent with strategic priorities, and assisting CCDoTT managers and partners in identifying specific technology thrusts that will anchor CCDoTT program development effort.

3.2.3 Management Objective 3: Employ a disciplined process for identifying and soliciting the best technology solutions available to meet program needs and for selecting the best partners and vendors to pursue these solutions.

As directed by the CCDoTT Director, the program support team facilitates CCDoTT's solicitations for technology proposals in response to technology thrusts and other identified program opportunities. This support ranges from working directly with CCDoTT partners to develop responsive work statements to drafting RFPs, developing bidder lists, establishing evaluation criteria, and managing the distribution, collection, cataloguing, and related correspondence with prospective bidders and partners. In the case of multi-phased solicitations, the program support team posts technology thrusts to the CCDoTT World Wide Web site. This site is designed to allow responses to be submitted through the web site in a structured format so that the announcement and submission cycle is as efficient as possible. Initial responses are screened to identify the most promising technology ideas and these submissions are selected for more detailed proposals.

Proposed work statements and solution proposals are evaluated using the technology prioritization process described under Strategic Guidance Objective 3.1.3 so that a ranked list of proposed programs and projects results. The program support team assists the Center Director in identifying the most promising solutions by forming and convening appropriate Technology Review Panels as described previously.

Projects that pass the test of technical feasibility are listed in the order assigned through the technology prioritization process and, as funding permits, form the basis for CCDoTT's program and project selection process.

3.2.4 Management Objective 4: Identify and institutionalize methods for measuring and reporting program performance to customers, partners, sponsors, and other stakeholders.

CCDoTT's primary distinction is its emphasis on the end-to-end transportation process for both military and commercial interests. With this distinction in mind, CCDoTT's ultimate measure of effectiveness is *the reduction in the overall time required to move cargo or people from a point of origin through multiple transfer points to a final destination*. For many military customers, this movement is from a continental United States (CONUS) installation to an other than continental United States (OCONUS) Theater Assembly Area (TAA) or other point of use. For many commercial customers, this movement is from multiple suppliers located throughout the world to factories or warehouses in the United States to distribution outlets around the world. In both cases, the transportation required is often multistage, multimodal, and may involve consolidation or deconsolidation activities at staging locations en route to final destinations.

CCDoTT's programs and projects are developed to make this end-to-end process more productive in terms of both the handling and movement of cargo and people and the information available to help decision makers know exactly where things and people are, their current condition, their expected arrival times at intermediate and final destinations, and the status of the transportation network (e.g., other transportation assets available, alternative routing available) in which movements occur. CCDoTT must report its programs and projects to customers, partners, sponsors, and other stakeholders in terms that relate to this overall emphasis. Because the effect of individual programs and projects on end-to-end transportation times is often difficult or impossible to measure, indirect measures are often used as surrogates for ultimate measures. For example, one measure of program or project success is the extent to which resulting technologies and products are accepted and adopted by military and commercial organizations. Other metrics may be established through the use of simulation models and other tools that provide insight into how transportation systems will be affected by improvements in individual components of the system.

Specifically, CCDoTT will establish primary measures of effectiveness (MOE) that serve to guide program development (e.g., help to guide the technology roadmap and technology thrusts) and to measure success in achieving program objectives. CCDoTT will use these measures to report to customers, partners, sponsors, and

other stakeholders on a regular basis (e.g., semi-annually), the progress made with respect to these MOE. Two specific reporting opportunities where such information will be reported are in the CCDoTT Annual Report and at the semi-annual CCDoTT Senior Strategic Steering Group meetings.

Each CCDoTT program will have its unique program management structure and plan based on the stakeholders needs and organizations involved. For example, as shown in Figure 4, the program structure and plan for the current High Speed Sealift/Agile Port Program involves multiple federal agencies who are collectively CCDoTT’s clients and work through various agreements to fund specific programs through CCDoTT. The technical effort is distributed among a number of academic, government, and commercial organizations with expertise in specific areas relevant to the scope of work.

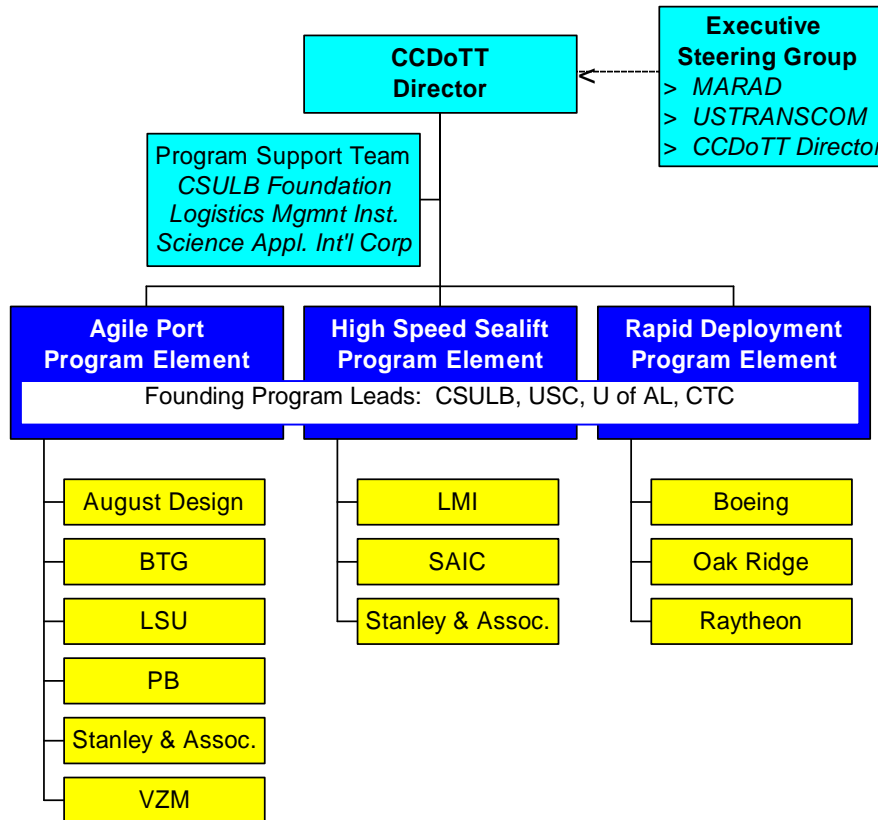


Figure 4. Program Management Structure for CCDoTT's Current Agile Ports/High Speed Sealift Program

3.2.5 Management Objective 5: Conduct regular (e.g., quarterly) technical reviews to ensure that technical programs are on course and to assess and mitigate program risks.

By their nature, CCDoTT’s programs and projects are far reaching in terms of potential payoff and the risks associated with successful technical performance. Because of this, CCDoTT must maintain close oversight to ensure that technical programs make satisfactory progress toward their objectives and that program risks are identified as early as possible and appropriate risk mitigation strategies are taken.

The key to this approach is a disciplined program review process as illustrated in Figure 5. The review process varies depending on project status but considers both technical and programmatic issues. Programmatic issues include cost and schedule performance, funding issues, and other organizational concerns. The type of technical performance review depends on the stage of the project. Early in the project, technical review consists primarily of evaluating technical plans in terms of feasibility and risks. As technology moves from concept to prototype to demonstration, the review transitions from “paper” to “product”. At each stage in the review, Technical Review Panels may be used to obtain objective, qualified opinions about proposed technology and technology demonstrations. Program review may result in changes in the way technical program objectives are accomplished or may, in some cases, result in changes to the program’s technical objectives themselves.

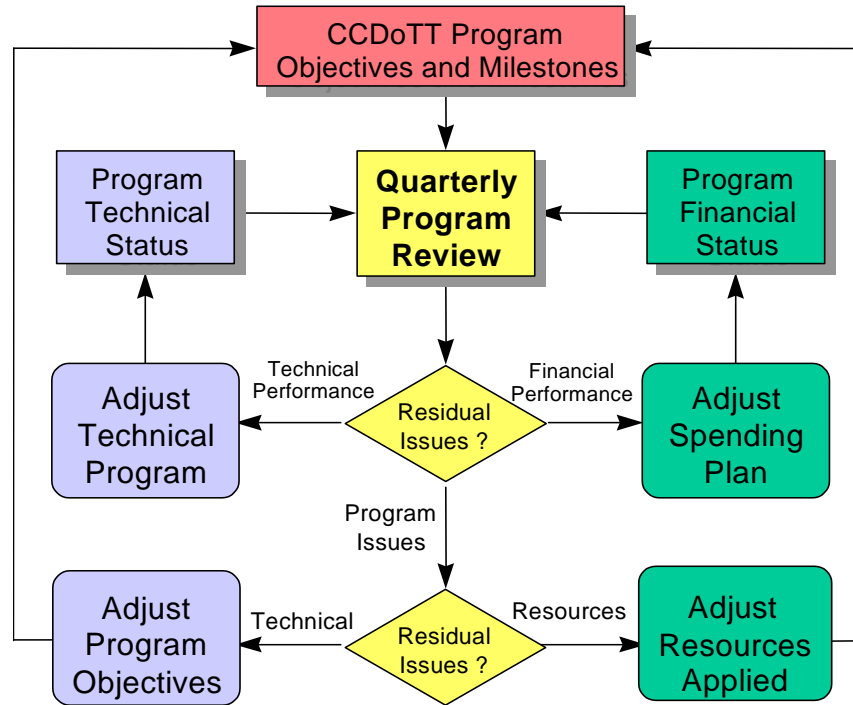


Figure 5. CCDoTT Quarterly Program Review Process Overview

Program reviews are planned and facilitated by the CCDoTT Program Support Team and led by the Center Director. Key stakeholders (customers, sponsors, and technology providers) attend the reviews at the invitation of the Director. Multiple related programs are reviewed at the same review meeting to minimize the number of individual review sessions and to coordinate program activities.

3.3 Partners – Establish and Maintain the Center’s Relationships with Customers, Sponsors, and Providers

As a virtual organization, CCDoTT depends on its partnerships with sponsors, customers, and technology providers to ensure that its technical programs address military and commercial needs, its resource base is solid, and its transportation technology products and services are exceptional. Identifying, establishing, and maintaining these partnerships is a major responsibility of the CCDoTT leadership. The Center develops and maintains partnerships through active involvement in organizations and activities that bring CCDoTT capabilities to the attention of specific customers and sponsors and by publicizing its accomplishments to a broad spectrum of potential customers, sponsors, and technology providers. The three strategic objectives that follow show how CCDoTT establishes and maintains these partnerships.

3.3.1 Partners Objective 1: Establish criteria for CCDoTT partnerships that define relationships with sponsors, customers, jurisdictions, and technology providers in government, industry, and academia.

In a partnership, multiple partners contribute to and benefit from a relationship that produces something of greater value than any partner could produce independently. CCDoTT serves as the organizing catalyst that brings together sponsors, customers, and technology providers to solve critical military and commercial transportation problems that none of the partners can solve alone. Each partner comes to the partnership with specific expectations regarding its individual contribution and the benefit it expects to receive. Customers and sponsors contribute

financial resources in return for solutions to specific transportation problems. Technology providers contribute the expertise needed to develop transportation technology products and services in return for access to potential markets for these products and services. Additionally, technology providers generally receive direct compensation for services provided, often retaining some proprietary interest in the resulting products.

CCDoTT's initial partnerships were built around programs funded through special appropriations acquired through Base Realignment and Closure (BRAC) economic assistance programs administered by the DOD Office of Economic Adjustment. These funds along with later funding were and are being applied to programs in direct response to Service interest in High Speed Sealift and Agile ports. Current funds are administered through the USDOT's Maritime Administration and the technical work is performed by a number of technology providers.

The CCDoTT Charter, the available funding sources and the initial technical program defined the CCDoTT partnerships when CCDoTT was formed. The partnership will change as the Center seeks additional customers and sponsors and adds other programs that require different technical capabilities. Additionally, the partnerships will change based on the performance of current and future technology providers.

CCDoTT must establish criteria and ground rules for establishing new partnerships and for maintaining the current ones. These criteria and ground rules must reflect CCDoTT's mission, the needs of CCDoTT's current and potential sponsors and customers, and the extent to which partners can contribute to the success of CCDoTT's programs. CCDoTT must set the ground rules for technology providers from academia and industry so that proprietary rights are understood, agreements for in-kind and financial contributions are established, and technical performance expectations are known. CCDoTT assumes responsibility for the overall quality of the programs it delivers and must also have the authority to shape its partnerships to ensure that quality expectations are achieved.

3.3.2 Partners Objective 2: Prepare and distribute a CCDoTT Annual Report that describes Center capabilities, current programs, key partners, and recent accomplishments.

As a Center that receives public and private funding for its technology services and products, CCDoTT reports its capabilities and accomplishments to all interested parties. This report is in the form of the CCDoTT Annual Report which describes technical program areas, current programs and projects, relationships with sponsors and technology providers, and CCDoTT technical capabilities. The Annual Report is an attractive multi-color bound document with photographs, graphics, and text and is distributed to current and prospective sponsors, customers, and technology partners.

3.3.3 Partners Objective 3: Develop and execute an outreach program to increase CCDoTT's visibility among current and potential sponsors and customers and CCDoTT's technical partners in government, industry, and academia.

CCDoTT is known primarily among its current partners (USTRANSCOM, MARAD, and technology partners). For CCDoTT to be successful, it must achieve higher visibility among potential sponsors and customers. CCDoTT's outreach program uses multiple approaches to achieve higher visibility, including its web site (www.ccdott.org), its Annual Report, periodic newsletters, occasional press releases (as justified by program accomplishments), participation in national meetings (e.g., technical society meetings, trade group meetings, government-sponsored meetings), publications in appropriate professional and trade journals, and targeted outreach materials (brochures, technical reports, demonstrations).

CCDoTT's program support team assist the Center Director by planning and producing outreach materials and, as appropriate, representing CCDoTT in forums where CCDoTT visibility is important.

4. Technology Programs

CCDoTT's current technical programs focus primarily on prototyping agile port facilities operating in combination with high speed sealift and related rapid deployment technologies and on enhancement of capabilities for cargo and personnel movement tracking and total asset visibility. CCDoTT has partnered with the United States Transportation Command (USTRANSCOM) and the Maritime Administration (MARAD) in the short term, and expects to broaden its interaction to include all partners that can materially impact on CCDoTT's goals and objectives. The partnership has a high level goal to improve the overall U.S. commercial transportation system

which, in turn, will insure that the Department of Defense's (DOD's) global rapid response capability is adequate to meet all requirements. This effort must leverage existing and planned Federal programs and commercial resources, develop additional options to support rapid deployment, and increase port and terminal throughput. The objective is to reduce the cost and delivery times for commercial intermodal goods transport (especially high-value time-sensitive goods) by fostering and promoting the deployment of advanced transportation technologies. Throughout, the intent is to assure a stable intermodal infrastructure that supports manufacturers and customers, with time certain, efficient, and competitive distribution capabilities that can be used by the DOD during times of crisis.

4.1 The Program

This 5-Year project plan provides a strategy for demonstrating an agile port facility operating in combination with new or improved mobility platforms. The goal is to greatly improve the nation's transportation systems and leverage those systems to support the rapid delivery of DOD unit and non-unit material from origin (normally within the continental United States) and a destination theater. To accomplish this, the DOD expects to leverage the commercial distribution system to provide major support. Consequently, CCDoTT will investigate and demonstrate technologies and concepts that meld facilities, transportation infrastructure, resources, environmental considerations, physical constraints, and mobility platforms together to provide commercially viable and militarily useful capabilities. This effort is intended to improve commercial goods transport by integrating air and sea Agile Ports (AP) with new mobility platforms including High Speed Sealift (HSS) vessels and advanced air vehicles. These in turn will rely on agile intermodal transfer (AIT) and overland transportation technologies to achieve end-to-end improvement in delivery performance. These physical concepts require the integration of rapid deployment technologies with advanced information management technologies to achieve revolutionary change. Consequently, CCDoTT will prototype and demonstrate the following: infrastructure improvements at DOD force projection platforms; HSS for commercial and military applications; agile ports operating in conjunction with HSS; supporting technologies for air, sea and intermodal transfer points that facilitate rapid delivery of cargo; and electronic commerce, sensor and information management technologies at commercial and strategic ports.

4.2 The Guide

The CCDoTT Operational Concept Document (OCD) summarizes how the DOD could incorporate the High Speed Sealift/Agile Port (HSS/AP) concept to increase throughput for surge deployment and enhance DOD mobility. The OCD is the basis for the initial roadmap summary contained in Section 4.4 of this document. The goal is that this effort will identify the requirements for more effective use of High Speed Sealift/Agile Port technologies in the commercial market. The result will be the identification of opportunities to eliminate or mitigate weaknesses in the current end-to-end distribution system; an assessment of high leverage technologies that can eliminate or mitigate these weaknesses; and a prioritized ordering of development work needed to achieve the potential associated with HSS/AP.

4.3 The Program Plan

The CCDoTT Program plan has been divided into three broad categories or program objectives: Physical Infrastructure Programs (e.g., Agile Ports), Transportation Asset Programs (e.g., High Speed Sealift), and Information Infrastructure Programs (e.g., information technology and decision support to enable cargo tracking and rapid deployment). Each of these program areas is addressed in detail in subsequent sections of this plan. The overall theme is to bring the necessary technologies, concepts, business practices, and governmental efforts together. This will be accomplished by a stream of small-scale projects within each program area that lead into coordinated demonstrations of technologies. As the technologies are proven, the opportunity will be created to have a full-scale demonstration of improved cargo flow within the economic sphere of the United States. Figure 6 reflects this process.

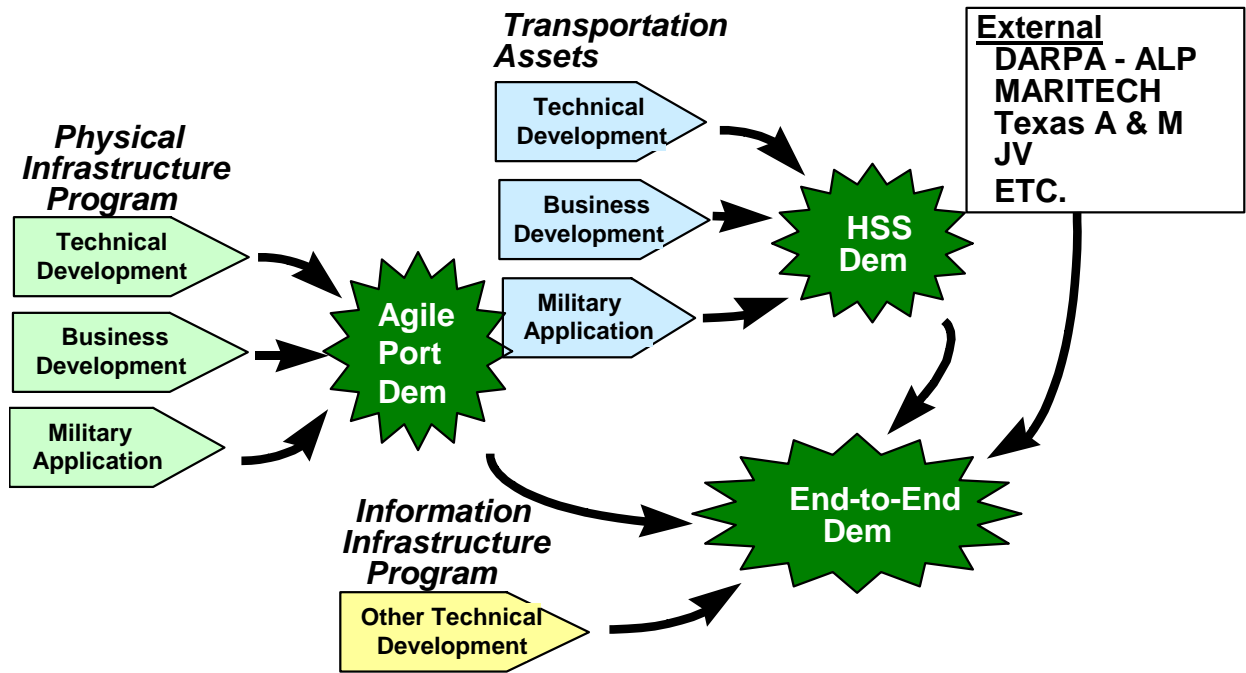


Figure 6. CCDoTT's major program areas are designed to demonstrate technically feasible and economically viable solutions to end-to-end transportation needs.

4.4 Technical Program Objectives

CCDoTT intends to demonstrate the technologies that would facilitate the improvement of the total end-to-end intermodal movement of cargo in the commercial sector and subsequently improve the end-to-end flow of cargo in any DOD sponsored movement. Initial CCDoTT efforts will focus on improving origin to destination elapsed time by 25 percent by 2004 and by 50 percent by 2008. CCDoTT also intends to demonstrate technologies that would allow a surface platform to carry 2000 STONs metric tons of cargo for 4,000 nautical miles (trans Atlantic) at up to 60 knots by 2004. These goals are intended to focus efforts to achieve capabilities and improvements far beyond what can be expected through normal evolution. CCDoTT believes that innovation and technology application can achieve these goals. The program elements described below are designed to achieve these goals. In subsequent years additional goals will be identified to expand the application of technologies to the national intermodal system across all modes and nodal interchange points.

Accomplishing these goals requires an investment in technologies and their development at levels estimated as shown in Figure 7. Investment requirements are based on previous research done by CCDoTT and the results of technology conferences sponsored by CCDoTT. They represent a program that balances technology development and risk mitigation as of the time of this plan. Future developments will result in a dynamic program funding level that reflects the results of continuing research.

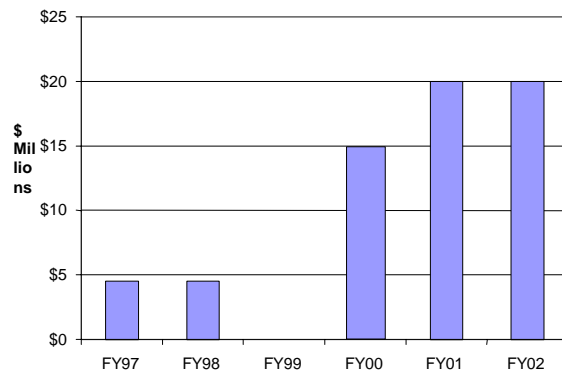


Figure 7. Estimated funding requirements (in millions) for CCDoTT programs (FY97 and FY98 based on actual funding levels, FY00 is an estimate based on proposals submitted.)

4.4.1 Program Objective 1 - Improve physical infrastructure and processes at origination, destination, storage and transfer points.

Projects in this program area address facility, technology, and process needs at fixed locations where multiple transportation modes interact and/or where significant cargo handling occurs. Examples include assembly/disassembly points, shipment transfer points, consolidation/deconsolidation facilities, and mode transfer points. CCDoTT initial physical infrastructure projects focus primarily on seaports and related facilities; airports, rail facilities, and commercial motor vehicle transfer points also fall within this area of applied technology. CCDoTT's Agile Port project plan is describe briefly below.

4.4.1.1 Current Effort: Agile Port

This project is designed to explore the environment necessary to create an Agile Port capable of expediting the flow of cargo through the port and facilitating any sealift or airlift platforms that may develop. Initial efforts have been focused on surface modes. Future efforts will naturally expand to include the interface between surface and air. There is a need to improve the overall efficiency of the flow of cargo through the ocean ports and intermodal interchange points. While higher speed craft will require maximum efficiencies, any port can benefit from improvements without the introduction of high speed ships. The challenge before the community is to anticipate the bow wave of change and provide the tools and designs to improve the efficiency of any interchange complex. Surface cargo movement and the demands of the end user for efficient and effective movement of cargo have been growing. The container revolution which began in the late 1960's has matured and future improvements in throughput will come from improved management techniques, improved facilities, and operational optimization at any point that a piece of cargo is touched by man or machine.

The design of this program, portrayed in Figure 8, permits a thorough, phased analysis that allows investigation of important areas that can affect flow of cargo through intermodal interchanges. It will, also, define the potential military uses of any available commercial techniques or unique military requirements. It will explore the various business models for the intermodal operation, review global commercial best practices and define the characteristics of an Agile Port. It will seek out and demonstrate agile port technologies to achieve desired efficiencies. It will investigate and mitigate the impact of high volume, bulk commodities that can affect agile port operations. It will explore operational issues, through demonstrations and prototypes that will affect the basic operation of these new intermodal facilities. Finally it will lead to an Agile Port design that integrates the best technologies and processes and that will be the basis for a fully integrated Agile Port demonstration.

In the end, this comprehensive, multi-year approach should support a decision by more than one port operator, equipment manufacturer, or intermodal operator to improve their ability to flow cargo through the intermodal transportation system. It will also support the development of the facilities that will be required for the next generation of cargo ships.

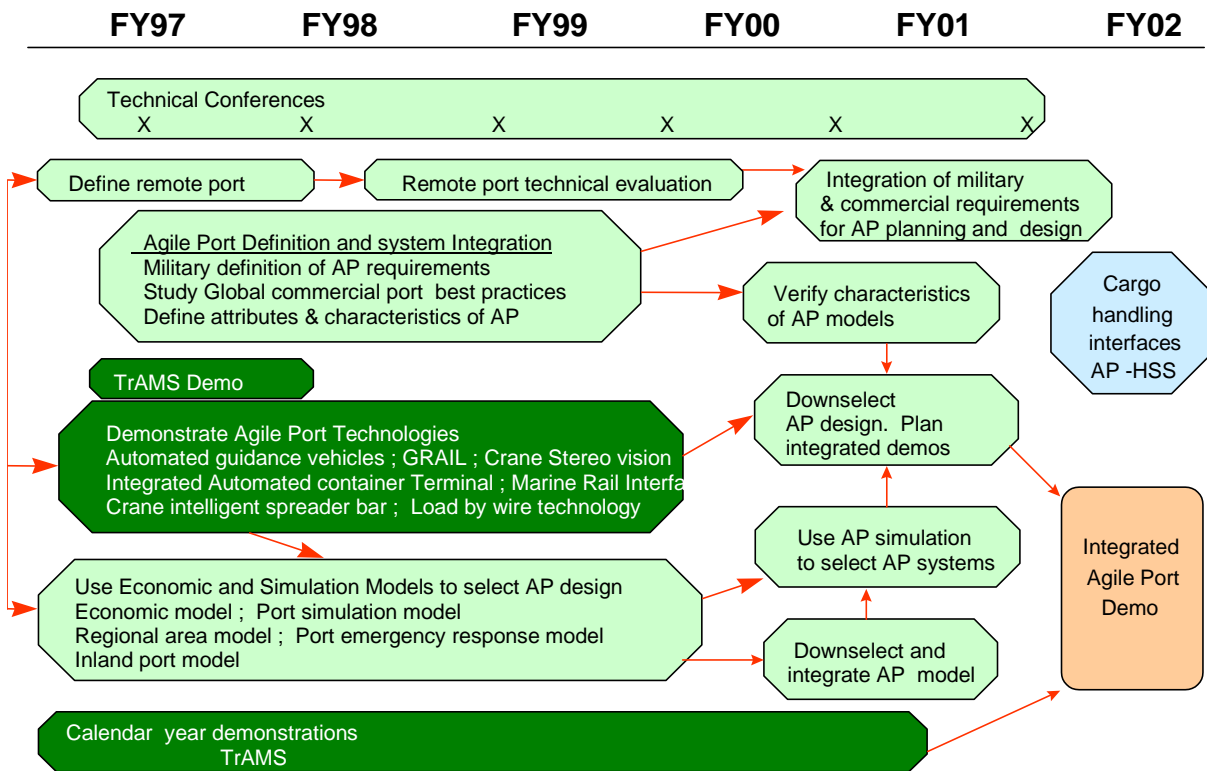


Figure 8. Program Element 1, Agile Ports (AP): Research, facilitate, develop, demonstrate, integrate AP technologies.

4.4.1.2 Future Projects

[This section to be added and updated based in results of workshops and conferences with potential sponsors and clients in the public and private sector].

4.4.2 Program Objective 2: Improve transportation assets

Transportation assets include all aspects of the machines and processes that move cargo, including conveyances and power units and the technologies related to their design, production and operation (e.g., propulsion, materials, structures, designs, electronics, manufacturing processes). These assets may be airborne, sea vessels, amphibious platforms, rail-guided, tracked vehicles, rubber-tired vehicles, or sleds and the boxes, containers, pallets, specialized fixtures and other hardware related to cargo movement. Applied technology projects in this area are designed to improve the performance and economic benefits of transportation assets.

CCDoTT’s initial focus in this area is on improvement in waterborne cargo delivery systems. The project plan for this activity is presented below.

4.4.2.1 Current Project: Improved Waterborne Cargo Delivery Systems (IWCDS)/High Speed Sealift (HSS)

This project is designed to explore the environment necessary to encourage and/or facilitate a High Speed Sealift (HSS) industry. The current commercial market for HSS is in the area of high speed ferries designed to move passengers and cargo over limited distances. There is some evidence that a commercial market for larger, transoceanic high speed ships is developing. The challenge before the U.S. transportation community is to develop the technologies and processes needed to gain significant market shares in the HSS operational and ship manufacturing market.

This program includes exploration of the steps necessary to encourage this market from an economic and technology approach. Further, it is designed to explore the ability of the HSS industry to support potential U.S.

military utilization. It is not designed to create a “purpose unique” or DOD owned HSS platform. Rather, it assumes that any HSS market and associated industry must be commercially viable.

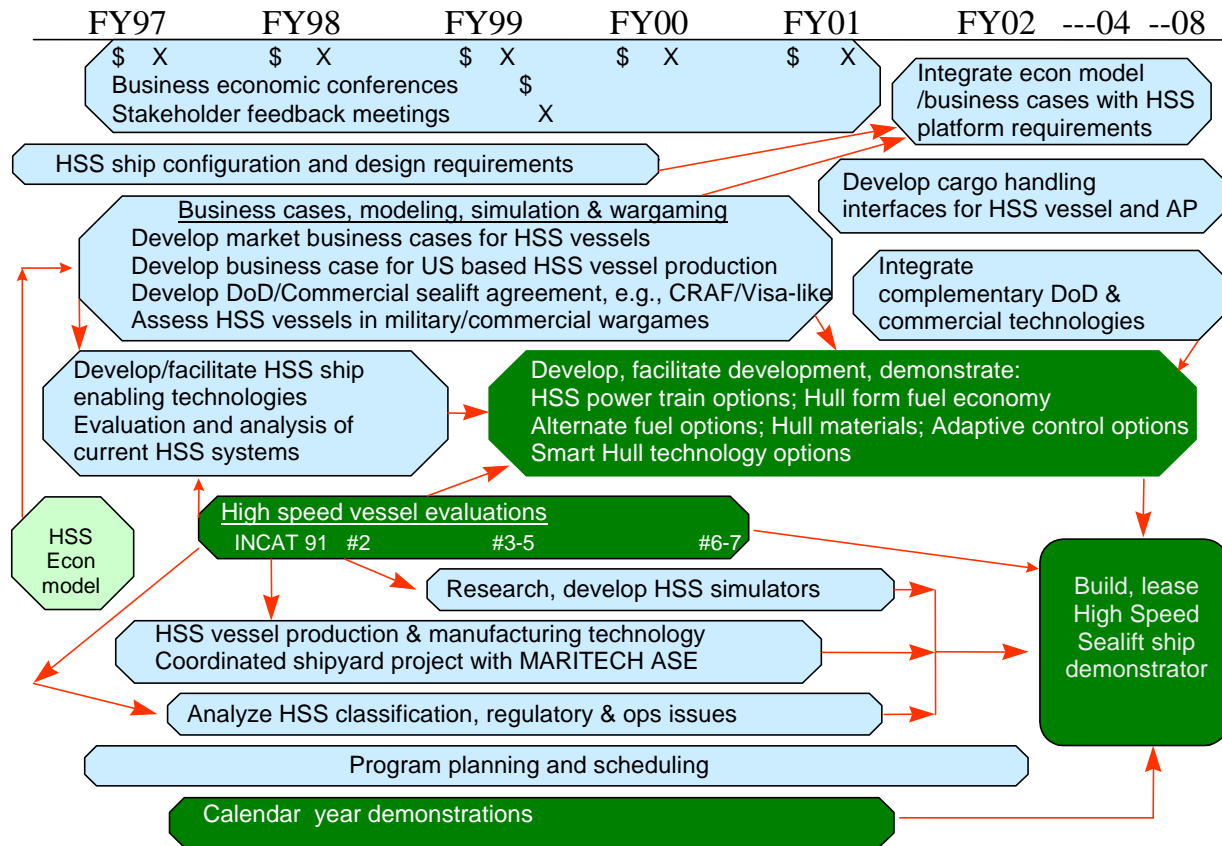


Figure 9. Program Element 2, High Speed Sealift (HSS) Vessels: Design, facilitate, develop, demonstrate, integrate HSS technologies.

This program, shown in Figure 9, is designed to move through the analysis in a phased approach that allows investigation of all areas that can affect the creation of this industry. It will help identify the potential military use of any available HSS platforms. It will explore the various business models for HSS ship operation and the manufacturing process. It will explore the manufacturing process to include materials and design issues. It will provide a method to capture data from any commercial designs that are built and bring that data into a public database. Finally, it allows for the exploration of operational issues that will affect the basic operation of this type craft in open ocean trade routes. It is intended to lead to HSS vessel demonstrations that advance the individual and collective technologies required for a commercially viable vessel within an end-to-end system.

In the end, this multi-year approach should support a decision by more than one manufacturer and ship operator to enter the market with a reasonable expectation of success.

4.4.2.2 Future Projects

[This section to be added and updated based in results of workshops and conferences with potential sponsors and clients in the pubic and private sector].

4.4.3 Program Objective 3: Improve the information infrastructure and processes throughout the end-to-end movement for better command and control.

The information infrastructure enables decision makers to select the best combination of transportation assets, the best routes, the best mixture of commodities, and the best schedules relative to the most relevant criteria (e.g., speed, economy, volume, weight, asset utilization); to track the progress of cargo movement throughout its move from origin to destination; and to make and implement real-time decisions that may result in rerouting or otherwise

changing the initial movement plan. This program area is tightly coupled with the other two areas because it is the information infrastructure that will enable decision makers to employ both the physical infrastructure and the transportation assets effectively. This program area includes information exchange (e.g., using electronic data interchange (EDI)); financial transactions (e.g., using EFT); data collection, analysis, storage, access, and dissemination; and decision support tools that help managers make the best use of transportation facilities and assets in achieving military and commercial objectives.

CCDoTT's current program focus in this area is on rapid deployment technologies that can expedite the flow of cargo through ports and intermodal facilities. This project is described below.

4.4.3.1 Current Project - Rapid Deployment

This project is designed to explore the environment necessary to create Rapid Deployment technologies capable of expediting the flow of cargo through ports and intermodal facilities in austere operational locations. This technology will capitalize on any modal platforms (ships, air vehicles, trucks, trains, etc.) that may develop and will extend the technologies associated with Agile Ports to austere operational locations. This effort is intended to improve the end-to-end flow of unit equipment and cargo through ocean ports, aerial ports and intermodal interchange points. This program element also focuses on the physical characteristics needed to support worldwide power projection. It will accommodate higher speed sealift and advanced air vehicle designs to maximize efficiencies. The design of this program, shown in Figure 10, permits a thorough, phased analysis that allows investigation of all areas that can affect flow of cargo from origin to destination. This program investigates all potential military uses of any available commercial techniques or unique military requirements and applies the techniques to various process models. The intent is to identify, through use of demonstrations and prototypes, operational and electronic data interchange (EDI) issues that will affect the deployment and sustainment of military forces when using commercially compatible processes. Where these issues exist, proposals for their elimination or mitigation will be recommended.

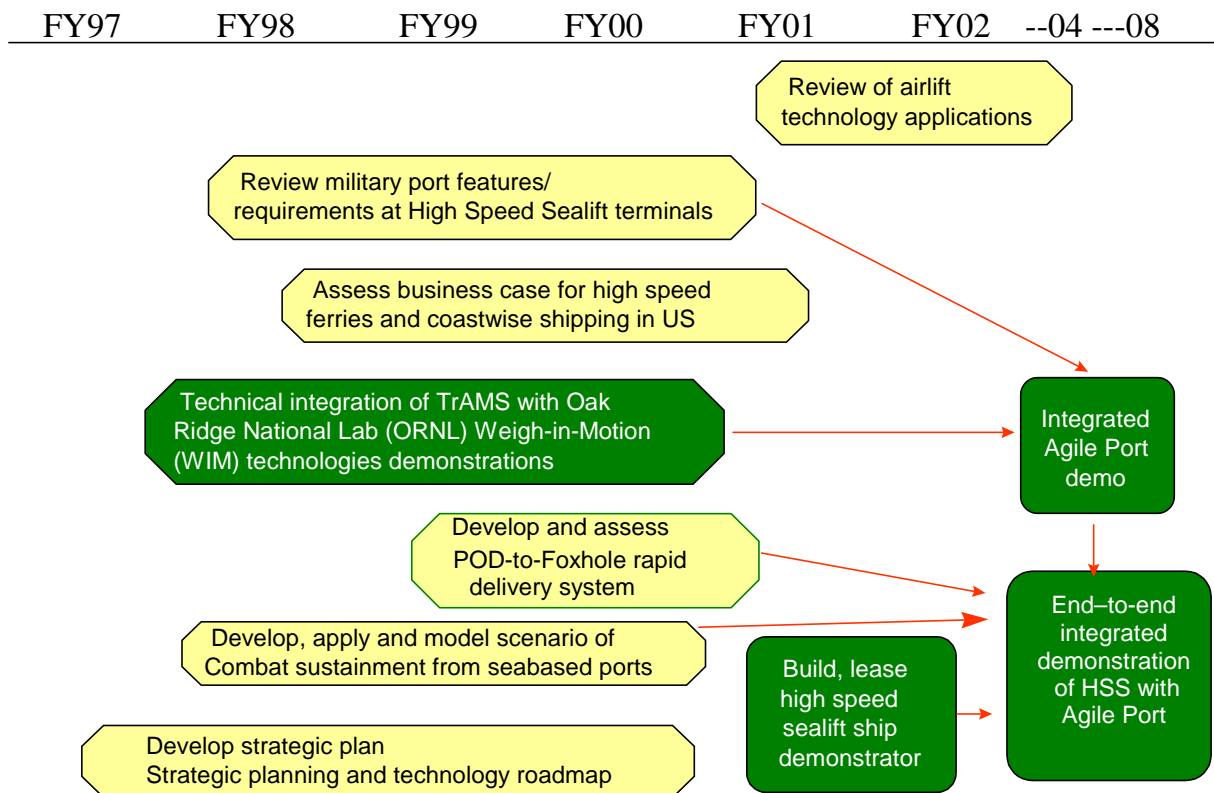


Figure 10. Program Element 3, Rapid Deployment (RP) Technologies: Research, facilitate, develop, demonstrate, integrate, RP technologies.

In the end, this comprehensive, multi-year approach should provide the basis for the development of tactics, concepts, and doctrine that can capitalize on the expected quantum improvement in operational and logical support.

The result will be an integrated system capable of flowing cargo from origin to destination with minimal disruption on commercial systems and time sensitive, efficient use of resources.

4.4.3.2 Future Projects

[This section to be added and updated based in results of workshops and conferences with potential sponsors and clients in the public and private sector].

5. Summary

This plan presents a comprehensive program to increase the application of technologies to the flow of commerce through the national intermodal system. It is designed to foster the development of a robust national capability that can compete in the international market. It presents an opportunity to establish a market niche in the international trade lanes. This opportunity can also directly affect the nation's ability to support force projection in times of national crisis.

The plan is predicated on institutional and resource commitments and organizational discipline needed to ensure that the best investment decisions are made and programs are executed with the diligence and sense of purpose needed to realize the Center's vision and accomplish its mission. The University, the Center leadership, and its key academic, government, and private sector partners have made this commitment.