



# U.S. Department of Homeland Security: Commercialization Office

## Product Realization Chart

DHS S&T Portfolio	N/A			Basic Research			Innovation and Transition				
Technology Phase	Needs Assessment			Science			Technology Development		Product Development		
Technology Readiness Level (TRL)	N/A			TRL 1 – TRL 3			TRL 4 – TRL 6		TRL 7 – TRL 9		
Key Objectives	<ul style="list-style-type: none"> <li>Identify S&amp;T capability gaps (mission needs) requiring material solutions.</li> <li>Preliminary operational requirements are developed.</li> <li>Market survey.</li> <li>Technology scan.</li> <li>Assess technology-based solutions to address gaps.</li> <li>Develop rough order-of-magnitude (ROM) estimates of project cost and schedule.</li> <li>Investigate the value proposition of a product idea.</li> <li>Establish technical objectives and milestones.</li> <li>Conduct preliminary IP review.</li> <li>Ensure the qualification of tools, materials, processes, and suppliers as required.</li> <li>Provide a preliminary production plan.</li> <li>Develop preliminary marketing objectives and milestones.</li> <li>Initiation of Congressional Appropriations Memo, Technology Transition Agreements (TTA), Program Descriptions (Research and Innovation), and Feasibility Studies lead to Program and Budget Execution.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>A program sponsor and end-users / requirements have been identified.</li> <li>Mission Needs Statement has been developed.</li> <li>Communication with end-users and customers has been initiated.</li> <li>Preliminary operational requirements have been developed.</li> <li>A Feasibility Study White Paper has been developed and accepted. (TRL1 and 2)</li> <li>A threat, vulnerability, or gap has been identified.</li> <li>Develop and update the preliminary product plan.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>End-user is involved in concept and requirements development.</li> <li>An empirical or theoretical design solution has been proven in laboratory experiments.</li> <li>Analytical studies to confirm the basic principles of the technology have been developed.</li> <li>Operational requirements analysis has been conducted; Operational requirements are applied to Functional Requirements. (TRL 2 and 3)</li> <li>System concept(s) / architecture have been assessed.</li> <li>Program Risk Assessment has been completed; Risk Management Plan has been developed. (TRL 2 and 3)</li> <li>Program Cost Analysis has been completed and updated. (TRL 2 and 3)</li> <li>Preliminary Security Assessment has been conducted.</li> <li>Develop a Technology Roadmap.</li> <li>Refine the market assessment and technology scan.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Supplemental and alternate technologies throughout DHS S&amp;T have been surveyed.</li> <li>Technology's physical validity has been proven in laboratory experiments.</li> <li>Program Management Plan (PMP) has been developed.</li> <li>Proof of Concept Plan has been developed.</li> <li>Manufacturing / production strategy has been developed.</li> <li>Develop Quality Control Plan to include standards conformance, reliability testing, etc.</li> <li>Develop Marketing Plan to include market size and research.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>All required technology components are integrated for Proof of Concept.</li> <li>Proof of Concept is conducted.</li> <li>IPPT has been briefed on progress of the technology's development.</li> <li>The customer has been briefed on the Proof of Concept results.</li> <li>Functional Requirements Document has been finalized.</li> <li>SEMP has been finalized and updated. (TRL 4, 5, &amp; 6)</li> <li>TEMP has been completed and updated. (TRL 4, 5, &amp; 6)</li> <li>Configuration Management Plan exists.</li> <li>PMP has been updated. (TRL 4, 5, and 6)</li> <li>Risk Management Plan is updated. (TRL 4, 5, and 6)</li> <li>Program Cost Analysis is updated. (TRL 4, 5, and 6)</li> <li>Quality Assurance Plan exists.</li> <li>Program Transition Manager is engaged in transition planning.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>ORD and CONOPS are developed.</li> <li>Security Assessment is updated.</li> <li>OMB 300 and Acquisition Plan have been completed (if required).</li> <li>IPPT has certified readiness for the transition of the Technology.</li> <li>Program Transition Manager has assisted in transition documentation development.</li> <li>Technology scan and market survey. (ongoing)</li> <li>Analysis of Alternatives is developed and updated. (TRL 5 &amp; 6)</li> <li>Entry Criteria Checklist is completed and delivered to the TM.</li> <li>POD has been created, approved, and signed. (TRL 5 &amp; 6)</li> <li>Director has approved the transition.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>Execute a preliminary Technology Transition Agreement (TTA), or Technology Commercialization Agreement (TCA) as applicable</li> <li>Program Manager has been identified</li> <li>Successful T&amp;E in a simulated operational environment has been conducted.</li> <li>End user / customer has been briefed on the results of T&amp;E.</li> <li>Initial Security Guidelines have been developed.</li> <li>Draft Program Assessment Rating Tool (PART) plan exists, if required.</li> <li>National Environmental Policy Act (NEPA) plan / assessment, if required.</li> <li>Interoperability Assessment.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>S&amp;T and the end-user / customer have begun to develop final transition planning document; Transition Plan has been developed. (TRL 7 and 8)</li> <li>Technology has been successfully demonstrated in an operational environment. (TRL 7 and 8)</li> <li>Updates (if required) have been made to the Operational and / or Functional Requirements Document.</li> <li>Risk Management Plan, Program Cost Analysis and PMP have been updated (as needed).</li> <li>Strategic Program Planning (e.g., Balanced Scorecard) has been conducted.</li> <li>Operations and Maintenance Manual has been completed / updated.</li> <li>Security Manual has been developed.</li> <li>Interoperability has been demonstrated.</li> <li>Management Directives (MD) have been reviewed to assure compliance.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>Technology components are form, fit, and function compatible with an operational system.</li> <li>Technology production has been addressed and planned by DHS and the end-user / customer.</li> <li>Training Plan has been developed and implemented. (TRL 8 and 9)</li> <li>Operational Test Report has been completed.</li> <li>Limited User Test (LUT) Plan has been developed.</li> <li>List other objectives when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>All critical program documentation has been completed.</li> <li>Planning is underway for the integration of the next generation technology into the existing program components.</li> <li>End-user fully demonstrates the technology in CONOPS.</li> <li>Lessons Learned completed.</li> <li>After Action Review completed.</li> <li>Sustainment Plan is completed.</li> <li>List other objectives when defined.</li> </ul>	
Key Deliverables	<ul style="list-style-type: none"> <li>Preliminary market assessment and technology scan.</li> <li>Congressional Appropriations Memo, Technology Transition Agreements, Program Descriptions (Research and Innovation), and Feasibility Studies lead to Program and Budget Execution.</li> <li>Preliminary product plan that assesses features, benefits, and risk.</li> <li>Initial plan for marketing, production, and sales control.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Mission Needs Statement.</li> <li>Feasibility Study.</li> <li>Congressional Management Vision, or Description of Leap-ahead Capability.</li> <li>Program Risk Assessment (technology, schedule, etc.). Risk Management Plan (TRL 2 and 3)</li> <li>Preliminary Security Assessment.</li> <li>Functional Requirements (draft). (TRL 3)</li> <li>Preliminary product plans (approved and ongoing).</li> <li>New Technology roadmaps (approved for further development and implementation).</li> <li>Updated market assessment and technology scan.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Preliminary Operational Requirements Document (end-user / customer validation).</li> <li>Program Cost Analysis (updated). (TRL 2 and 3)</li> <li>Program Risk Assessment (technology, schedule, etc.). Risk Management Plan (TRL 2 and 3)</li> <li>Preliminary Security Assessment.</li> <li>Functional Requirements (draft). (TRL 3)</li> <li>Preliminary product plans (approved and ongoing).</li> <li>New Technology roadmaps (approved for further development and implementation).</li> <li>Updated market assessment and technology scan.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Systems Engineering Management Plan (SEMP) draft.</li> <li>Proof of Concept Plan.</li> <li>Program Management Plan (PMP) draft.</li> <li>End-user / Customer Status Review.</li> <li>Detailed product and marketing plan.</li> <li>Quality control plan.</li> <li>Optimization Review meeting.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Proof of Concept Report.</li> <li>Functional Requirements Document.</li> <li>SEMP (TRL 4, 5, and 6)</li> <li>TEMP (TRL 4, 5, and 6)</li> <li>Quality Assurance Plan.</li> <li>Configuration Plan Management.</li> <li>PMP (updated). (TRL 4, 5, &amp; 6)</li> <li>Risk Management Plan (updated). (TRL 4, 5, and 6)</li> <li>Program Cost Analysis (updated). (TRL 4, 5, and 6)</li> <li>End-user / Customer Status Review.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>ORD and CONOPS.</li> <li>Security Assessment (updated).</li> <li>Program Definition Document (PDD).</li> <li>OMB 300 Capital Asset Plan.</li> <li>Acquisition Plan.</li> <li>Entry Criteria Checklist.</li> <li>Analysis of Alternatives. (TRL 5 &amp; 6)</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>Technology Transition Agreement (TTA), or Technology Commercialization Agreement (TCA) as applicable</li> <li>Risk Management Plan (updated).</li> <li>Program Cost Analysis (updated).</li> <li>PMP (updated).</li> <li>National Environmental Policy Act (NEPA) initial assessment, if required.</li> <li>Interoperability Assessment.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>Transition Plan (draft)</li> <li>Operational and Functional Requirements Documentation (updated).</li> <li>Risk Management Plan (updated).</li> <li>Program Cost Analysis (updated).</li> <li>PMP (updated).</li> <li>Strategic Program Planning (NEPA) if conducted.</li> <li>Operations and Maintenance Manual.</li> <li>Security Manual.</li> <li>Finalized Interoperability Assurance Report. (TRL 7 and 8)</li> <li>Applicable Management Directives (MD), if required. (TRL 7)</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>Limited User Test (LUT) Plan.</li> <li>Deployment or Transition Plan.</li> <li>Training Plan.</li> <li>Operational Test Report.</li> <li>Customer Acceptance Document.</li> <li>Initial Systems-level Metrics Assessment.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Germane to both Acquisition and Commercialization</li> <li>Customer Feedback.</li> <li>Lessons Learned.</li> <li>After-action Review.</li> <li>Sustainment Plan is completed (a. Spiral Development Assessment, b. Predefined Product Improvement, c. Emerging Threats) Assessment.</li> <li>Quality Assurance / Metrics Report, i. Risk Management Reassessment.</li> <li>List other deliverables when defined.</li> </ul>	
			<b>FutureTECH Program</b>								
							<ul style="list-style-type: none"> <li>Engineering documentation package release and manufacturing plan.</li> <li>Updated marketing plan.</li> <li>Test plan for quality control.</li> <li>Development Phase Review meeting.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>IP Protection and Licensing.</li> <li>Manufacturing and sales plan release package is to be distributed.</li> <li>Sales Release Phase Review meeting.</li> <li>Pilot Phase Review meeting.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate that a defect-free product can be manufactured on schedule and at a cost consistent with the target price points.</li> <li>List other deliverables when defined.</li> </ul>	<ul style="list-style-type: none"> <li>Finalized product plan sales release package is to be distributed.</li> <li>Execution of the acceptance, shipment, and after-sales support of the new product.</li> <li>List other deliverables when defined.</li> </ul>	
Management Review	<ul style="list-style-type: none"> <li>Corporate review meeting of value proposition and product overview.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Corporate review meeting of the preliminary product plan.</li> <li>Feasibility Review meeting.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Corporate review meeting to approve preliminary product plan and technology roadmap.</li> <li>Results and follow up actions</li> </ul>	<ul style="list-style-type: none"> <li>Optimization Review meeting.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Analysis of the engineering and manufacturing plan.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Analysis of the engineering and manufacturing plan.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Development Phase Review meeting.</li> <li>Comprehensive analysis of the engineering and manufacturing plan.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Corporate review of the manufacturing release package.</li> <li>Pilot Phase Review meeting.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Analysis and review of the manufacturing plan.</li> <li>Results and follow up actions.</li> </ul>	<ul style="list-style-type: none"> <li>Corporate review of the finalized product plan and sales release package.</li> <li>Sales Release Phase Review meeting.</li> </ul>	
							<b>SECURE Program</b>				
							<b>DT&amp;E Designation (SAFETY Act)</b>				
							<b>Designation (SAFETY Act)</b>				
							<b>Certification (SAFETY Act)</b>				