The goal of this subtopic is to develop new tools to ensure that advanced technology investments are guided by appropriate analyses. These analyses are needed in areas involving all of the various element programs within ESR&T. The analyses will support the definition of technology road maps for ESR&T.

The scope of Technology Systems Analysis Tools includes the development of advanced tools to support technology systems analyses, such as: portfolio analysis; campaign analysis; system technology architecture impact analysis; advanced concept analysis; sensitivity analysis; verification and validation analysis; development cost analysis; and the population of advanced technology databases and information systems. The ASCT analyses planned will be performed using low-fidelity/high-level techniques. They will focus on entry level technologies and notional architectures. Higher fidelity assessments will be performed using ESMD (Exploration Systems Mission Directorate) Simulation Based Acquisition (SBA) resources.

This Technology Systems Analysis Tools subtopic is currently focusing on developing advanced tools which enable the following:

- Conducting exploratory research and development of emerging technologies and advanced concepts with high potential payoff;
- Performing architecture, campaign, and technology analyses to identify and inform portfolio development for relevant exploration applications;
- Technology analysis to identify and prioritize mission enabling technologies;
- Architecture, mission, advanced concept, and technology risk analysis;
- Technology databases, roadmaps, and portfolio development;
- Exploration and implementation of different advanced concepts development methodologies and techniques to enable more effective and efficient study development;
- Development of advanced concepts analyses and sensitivity analyses that can incorporate the full range of technical fields related to space exploration;
- Analysis of advanced concepts, advanced technologies, and portfolio analysis;
• Campaign analysis including the synthesis and analysis of many missions, architectures and competing capabilities and technologies against FOMs;

• Technology analysis that identifies SOA and levels of performance metrics associated with cost- and risk-dependent chronologies (technology datasheets);

• Advanced concept and system technology verification and validation;

• Effective techniques for presenting tradeoffs and recommendations to decision-makers.