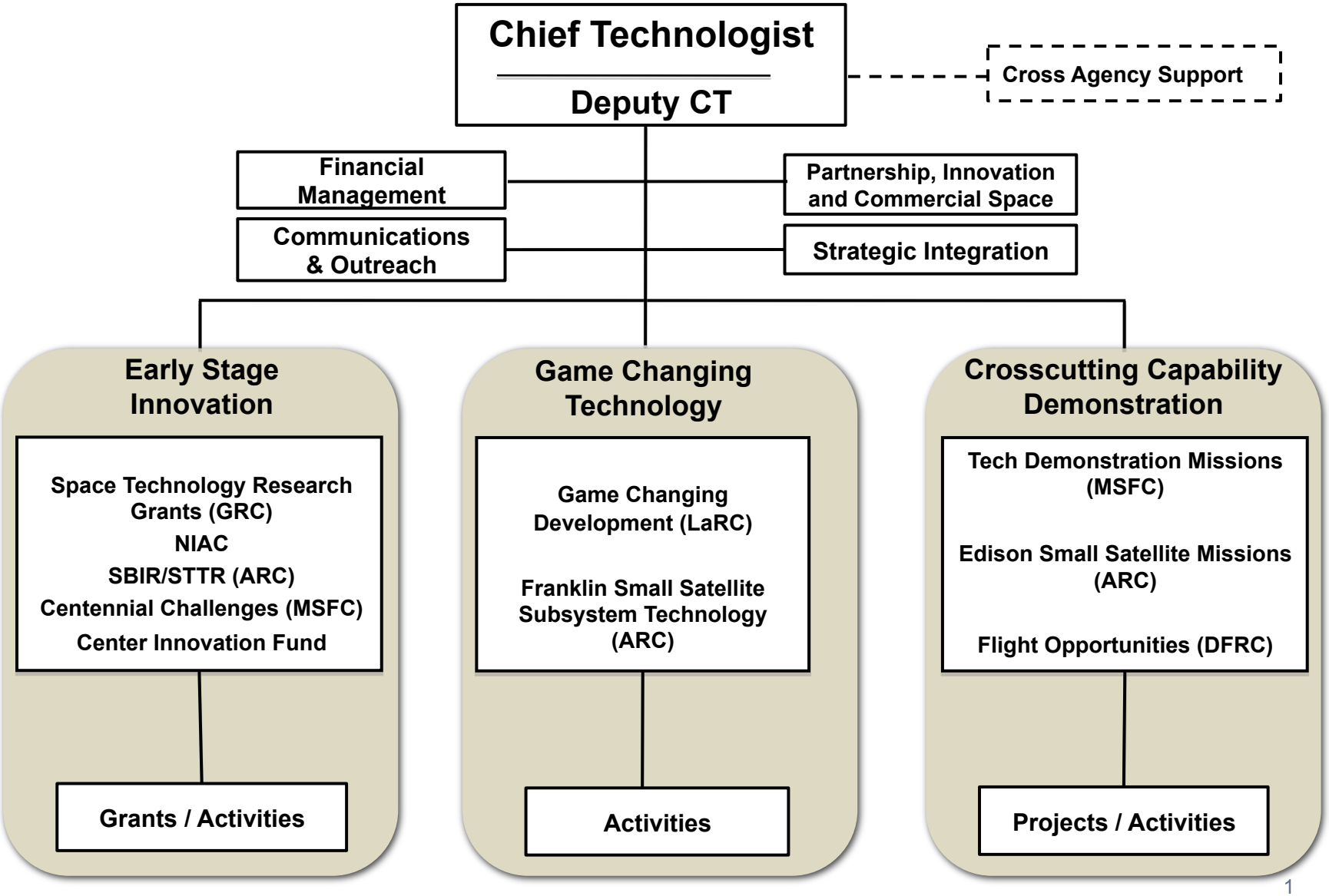
Office of the Chief Technologist Organization



Starting Strong

- **Building on the success of NASA's Innovative Partnerships Program (IPP)**
  - 4 of the 10 programs
    - Centennial Challenges
    - SBIR/STTR
    - IPP Seed Fund → Center Innovation Fund
    - FAST and CRuSR → Flight Opportunities
  - Management Structure and Center Leadership
    - IPP Partnerships, Technology Transfer, Commercialization and Commercial Space → Partnerships, Innovation and Commercial Space
    - IPP Center field offices → Center Chief Technologist offices

- **In FY11, 40% of Space Technology line is IPP-related content**

- **Over FY11-FY15, 25% of Space Technology line is IPP-related content**

- **Formulation of the Space Technology programs was initiated in February and has proceeded rapidly and effectively.**
  - Integrated approach
  - Center personnel involved from the start
  - Plan has been stable
  - Broad external support

Space Technology Engagement with External Community To Date

- **SBIR/STTR and Centennial Challenges and Flight Opportunities (FAST/CRuSR) are proceeding with standard cycle of external engagements as part of FY10 NASA IPP activities.**
  - Three new Centennial Challenges announced with $5M available.
  - July 19 release of SBIR/STTR call
  - September announcement of CRuSR RFQ awards
  - FAST flights in September 2010
- **In May, 2010, OCT released a NASA Technology Research Fellowship letter to NASA Field Centers and Federal Laboratories requesting research area topics.**
- **In May, 2010, three RFIs for the Technology Demonstration Missions Program, the Edison Small Satellite Missions Program, and the Small Satellite Subsystem Technology Program.**
  - Over 500 responses received
- **Space Technology Industry Forum on July 13-14, 2010.**
  - Over 300 external participants
- **In August, 2010 OCT released three RFIs for the NIAC, STRG and GCD programs.**
  - Over 900 responses received
- **NRC engaged in creation of Agency level technology roadmaps**.

NASA Technology Integration Governance

NASA Technology Executive Council

- The NASA Technology Executive Council (NTEC) is organized and chaired by the NASA Office of the Chief Technologist.
- Council membership includes the Mission Directorate AAs (or their designees), and the NASA Chief Engineer (or designee).
- The function of NTEC is to perform Agency-level technology integration, coordination and strategic planning
- 3 Meetings completed: June 10th, July 28th, and Sep 8th

Center Technology Council

- The Center Technology Council (CTC) is organized and chaired by the NASA Office of the Chief Technologist.
- Council membership includes the Center Chief Technologist (CCT) from each NASA Center, and a representative from OCE.
- The CTC will focus upon institutionally funded activities and development of OCT programs.
- 4 Meetings completed: June 22nd, July 29th, Sept 14th,and Oct 20th
- Center CTs:
  - **John Hines (ARC)**
  - **David Voracek (DFRC)**
  - **George Schmidt (GRC)**
  - **Peter Hughes (GSFC)**
  - **Thomas Twik (JPL)**
  - **John Saiz (JSC)**
  - **Karen Thompson (KSC)**
  - **Rich Antcliff (LaRC)**
  - **Andrew Keys (MSFC)**
  - **Ramona Travis (SSC)**

Governance model approved in May 2010

Technology Roadmap Status

Technology Roadmapping Background

- **OCT documented and received Agency-level concurrence on the "Process to Create and Maintain NASA's Aero-Space Technology Area Roadmap (A-STAR)" – *released version posted with OCT policy documents at www.nasa.gov/OCT***

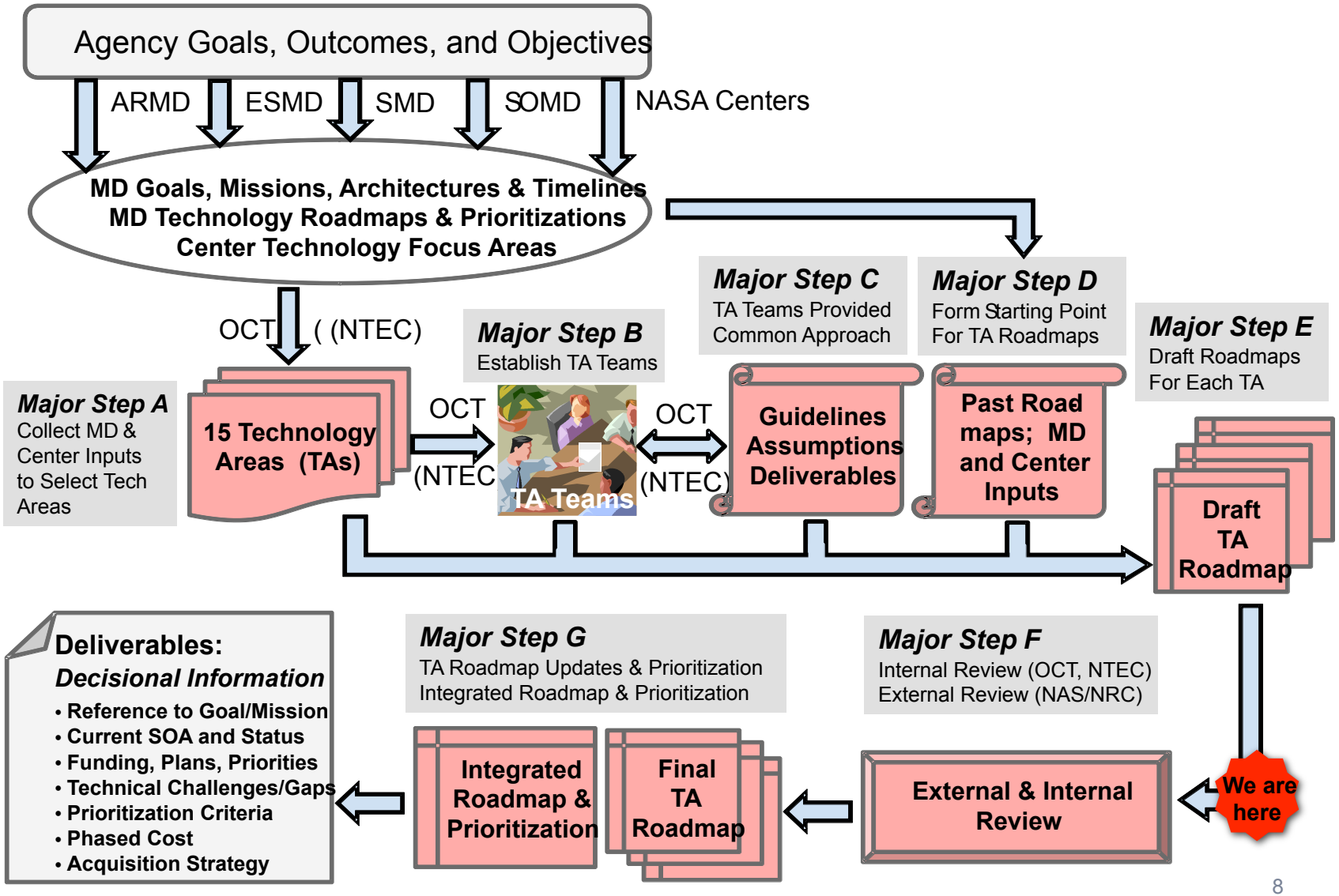
- **A-STAR performs a 'decadal' survey that:**
  - **Creates a set of 15 cross-cutting Technology Area (TA) roadmaps and links them to an integrated strategic roadmap**
  - **Calls for internal and external stakeholder participation in roadmap development and review**

- **OCT's Office of Strategic Integration (OCT/SI) was charged with developing, vetting, and executing the A-STAR process**

Technology Areas (TAs)

	A-STAR TAXONOMY
1	LAUNCH PROPULSION SYSTEMS
2	IN-SPACE PROPULSION SYSTEMS
3	SPACE POWER AND ENERGY STORAGE SYSTEMS
4	ROBOTICS, TELE-ROBOTICS, AND AUTONOMOUS SYSTEMS
5	COMMUNICATION AND NAVIGATION SYSTEMS
6	HUMAN HEALTH, LIFE SUPPORT AND HABITATION SYSTEMS
7	HUMAN EXPLORATION DESTINATION SYSTEMS
8	SCIENTIFIC INSTRUMENTS, OBSERVATORIES, AND SENSOR SYSTEMS
9	ENTRY, DESCENT, AND LANDING SYSTEMS
10	NANOTECHNOLOGY
11	MODELING, SIMULATION, INFORMATION TECHNOLOGY AND PROCESSING
12	MATERIALS, STRUCTURAL & MECHANICAL SYSTEMS, AND MANUFACTURING
13	GROUND AND LAUNCH SYSTEMS PROCESSING
14	THERMAL MANAGEMENT SYSTEMS
15	AERONAUTICS

A-STAR Process



External Review Process (NRC)

Using NASA-provided, draft TA roadmaps, the National Research Council (NRC) will:

- Hold focused workshops – primarily to ask externals to comment on drafts and to identify new and alternate ideas.
- Develop 1st report that integrates the draft roadmaps with the outputs of the workshops, and provides suggested changes and improvements to the NASA drafts
- After further development by NASA TA teams based on NRC 1st report, conduct a review of next iteration of TA roadmaps and provide a 2nd report.
- This activity is not affected by current Congressional debates (all bills call for NASA to build Agency technology roadmap/decadal survey)
- Current Status: NRC funding secured. Contract signed

A-STAR Schedule

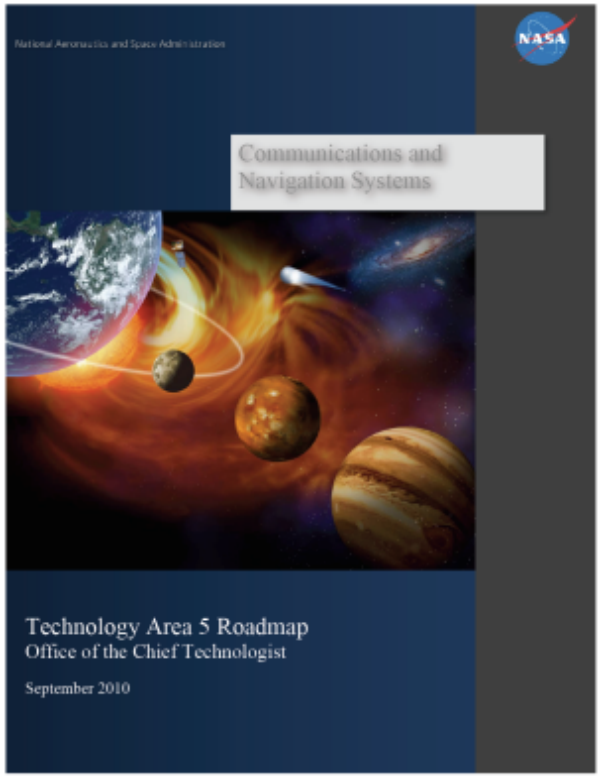
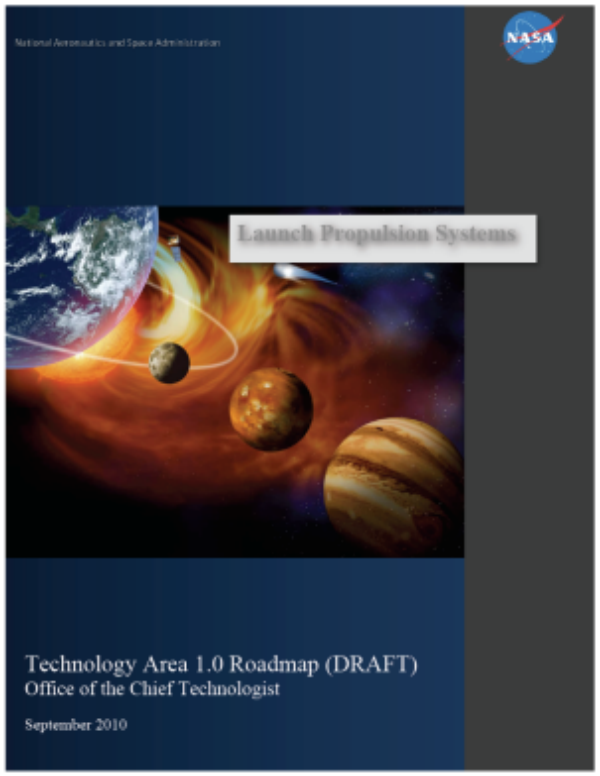
✓ Roadmapping Kickoff meeting with TA chairs	7/28/10
✓ First cut, 1-pg TABS and TASRs provided by each TA	8/13/10
✓ Presentation of Rev 1 Draft Roadmaps for NASA Review	9/15-16/10
✓ Draft Roadmap Review comments due to OCT	9/27/10
• TA team disposition of comments and report revisions	9/30-10/22/10
• OCT approval of final "draft" TA roadmap reports	10/25-29/10
• Draft NASA Roadmaps presented / sent to NRC and widely distributed	10/30/10 – 11/15/10
• NRC Workshops (TA team reps attend/present)	1/10-28/11
• NRC Interim Report based on workshops provided to NASA	2/28/11
• OCT & TA Team review NRC comments/update reports	3/1-4/15/11
• Presentation of Rev 2 Draft Roadmaps for NASA Review	4/18-19/11
• NASA Updated "Final" Draft Roadmap sent to NRC for review	5/27/11
• NRC Review Panel	6/30/11
• NRC Final Report	9/30/11

Final NRC Report date may slip.

Setting Expectations

- **The 15 TA Roadmaps were generated by the TA teams in 6 weeks**
- **The intent was to capture a comprehensive set of the phased technology needs to support future NASA missions & national needs**
  - **Mission Pull:** Mission Directorate strategic plans were used to identify specific future missions requiring technology development
  - **Mission Push:** TA teams were also asked to identify specific emerging innovations and technologies within their domains that would enable missions to meet NASA strategic goals in ways currently not considered within the Mission Directorate plans
- **However, view these DRAFT products in the proper context:**
  - The desire was to develop DRAFT products as a starting point for the NRC as quickly as practical
  - Focus was NOT placed on formatting or final narrative quality
  - Focus was placed on capturing known technical content by the Agency's technology subject matter experts
  - NRC would significantly augment the technical content by performing external reviews and soliciting external inputs through focused workshops
  - No attempt occurred to develop cost estimates or comprehensive prioritizations
- **The Bottom Line: These are DRAFT products that serve as a starting point for the NRC, and NOT final NASA positions regarding technology roadmaps**

Initial Draft Roadmaps Received & Completing Agency Internal Review

We now have draft 25 page reports in for each of the 15 roadmaps, and they are being reviewed by:

- MD POCs and whomever in NASA they ask to help
- Center Chief Technologists and up to 15 others they can ask
- OCT Division Leads and up to 3 others
- OCT SI members, especially the POCs to each roadmap team