

Global High Speed Point-to-Point (PTP) Cargo/Passenger Travel



“Getting Faster”: A White Paper by the FastForward Study Group

Version A | 21 October 2009

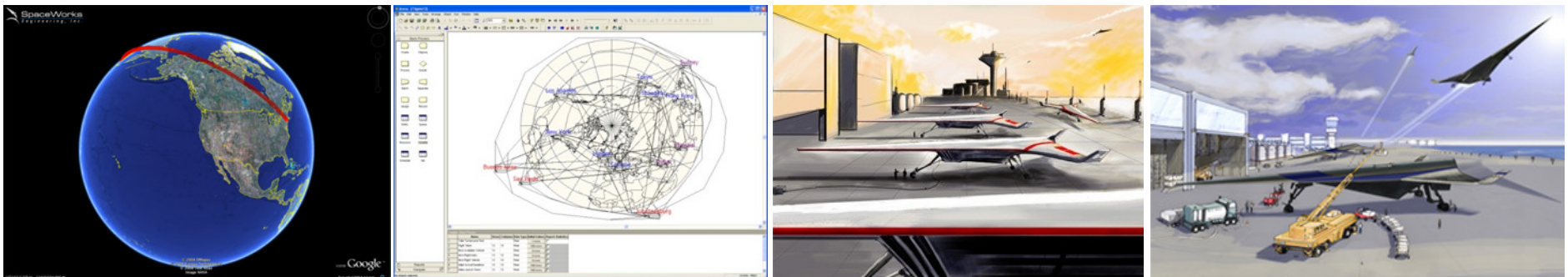
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www.spaceworkscommercial.com/projects/fastforward

- **FastForward is an ad-hoc study group** consisting of major aerospace contractors, emerging new space companies, spaceports, key federal government agencies, and academic representatives
 - All-volunteer effort formed in October 2008
 - 20 organizations represented (by invitation)
 - Hosted by SpaceWorks Commercial (Washington, DC, USA)
- Our focus is on pre-competitive analysis and assessment of **future global high speed point-to-point passenger and cargo services**
- Our group produces technical papers, white papers, and software tools related to global PTP transportation for use by our members and the community at-large



What is the FastForward Study Group?

Our focus is on pre-competitive analysis and assessment of future global high-speed point-to-point passenger and cargo services

- 1. Market assessment and characterization of future high speed point-to-point service for passengers and cargo, including economic drivers**
- 2. Identification of key regulatory and policy issues**
- 3. Evaluation of candidate flight vehicle options and technology needs**
- 4. Identification of challenges for emerging Aerospaceports in the U.S. and abroad**
- 5. Identification of synergies with ongoing government encouragement of advanced flight programs**

Primary FastForward Study Group Focus Areas



Spaceport
Associates

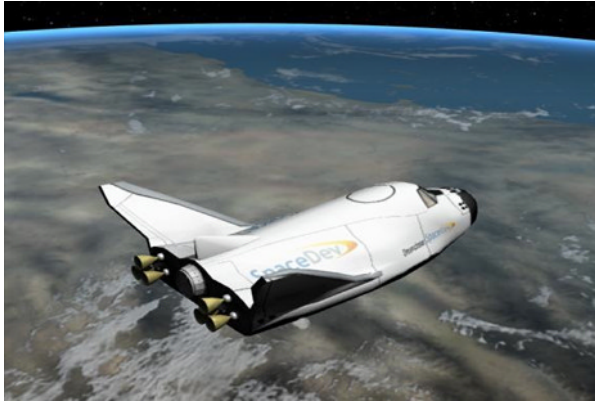


FastForward Study Group Members Come from a Variety of Organizations



The High Speed PTP Trade Space

Evolved Versions of Single-Site Suborbital Personal Spaceflight Vehicles



Sierra Nevada Corp. Dreamchaser



RocketPlane Global XP

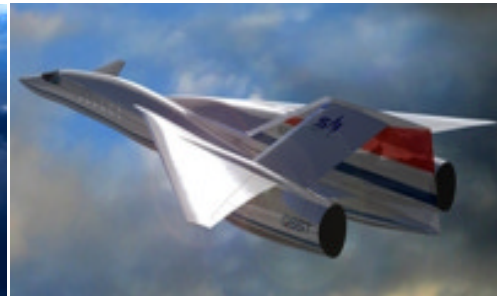


XCOR Lynx

New Vehicles with Longer Range (Reusable or Expendable, Subsonic, Hypersonic)



Aerion SBJ (Supersonic Business Jet)



Supersonic Aerospace International,
LLC (SAI) Quiet Supersonic Transport
(QSST)



Gulfstream
Supersonic Business Jet



Notional Hypersonic
Vehicle (SEI)

Sample Candidate PTP Vehicles and Flight Concepts

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Future Aerospaceports That Might Serve 1st Gen PTP Markets

1. Four Technical Papers Related to PTP Markets and Business Cases

- IAC 2008, SPACE 2009 (2), IAC 200

2. Four Panel Sessions Discussing the Potential of PTP Markets

- SPACE 2009, Google Tech Talks, DragonCon, NewSpace 2009

3. Two Software Simulation Tools for PTP

- GHOST calculator for fast package delivery times for candidate cities given range, pickup/distribution times, and vehicle average flight speed
- PTP Discrete Event network operations model for optimum fleet sizing

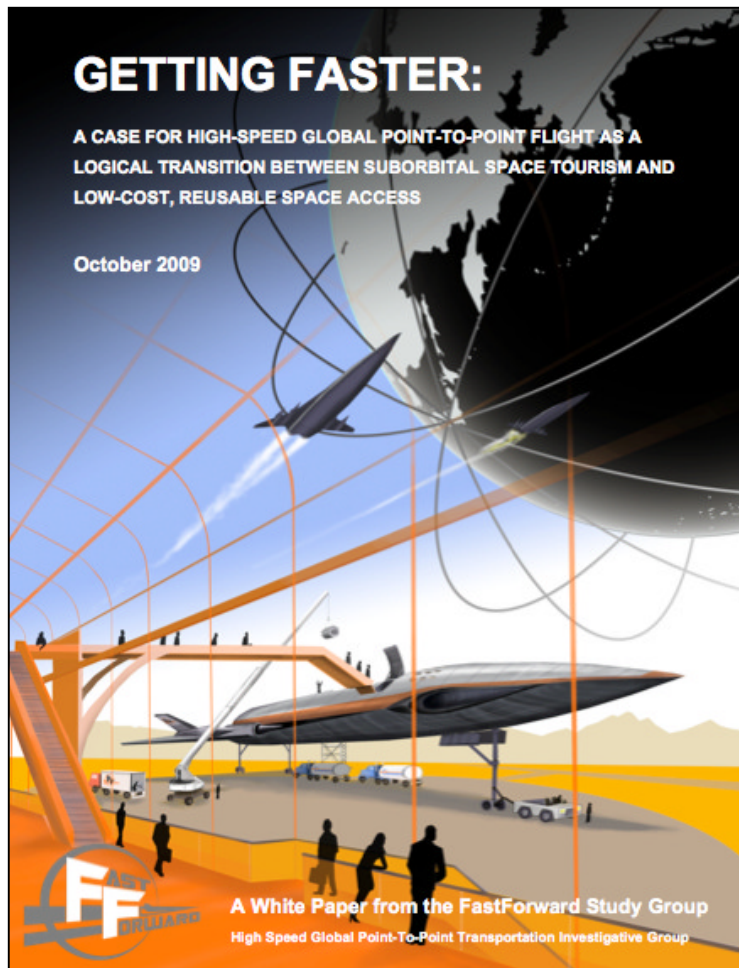
4. List of Top 7 Challenges Facing Spaceports for Future PTP

- Collaborative effort of FastForward spaceport members

5. New White Paper (released today)

- Getting Faster: A Case for High-Speed Global Point-to-Point Flight as a Logical Transition Between Suborbital Space Tourism and Low-Cost, Reusable Space Access

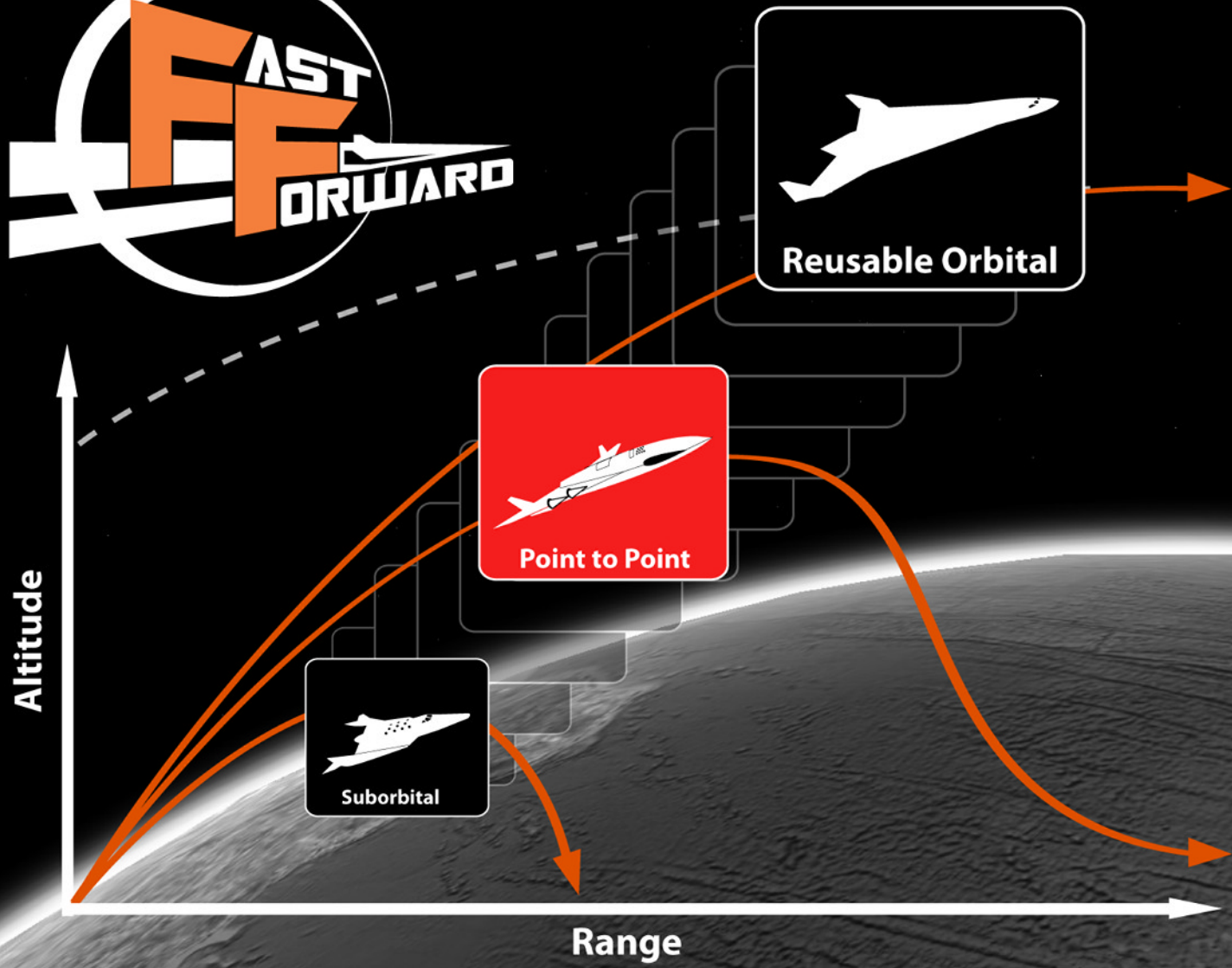
FastForward Study Products (2008 - 2009)



- Product of the FastForward Study Group
- Recognizes the national goal for affordable, safe, and reliable access to space as well as the aviation industry's goal of "getting faster"
- Outlines a case for establishing future high-speed PTP as a critical incremental step to achieve these goals using commercial RLVs
- White paper **released today** and available now for public download

www.spaceworkcommercial.com/projects/fastforward

Today's Announcement: "Getting Faster" White Paper



PTP Serves as an Incremental Stepping Stone to Low Cost Space Access

The white paper posits that there are several advantages related to incremental plan to leverage PTP to lead to low cost space access

- **Evolves from world-class industries within the U.S.**, notably: commercial and business aviation, and reusable single-site suborbital transport, with their inherent emphases on reliability, safety, and affordability
- **Derives from an immediate market-driven need** for faster global transportation services that will help sustain the critical transitional step of the plan
- **Represents a true public / private partnership**, with each entity bringing its own unique capabilities to the effort to reduce overall risk
- **Is incremental by nature**, with ample opportunities for commercial competition, synergies with other endeavors, and market development that help reduce peak annual expenses along the stepping stones of its evolution
- **Sustains a strong and flexible domestic aerospace workforce** to support synergistic commercial, civil, and military needs for both rapid global travel and space transportation

Advantages of the Proposed Incremental Approach

The white paper calls for a modest study, to be completed over the next year, to conduct the critical preliminary work necessary to support a new incremental national strategy that will ultimately meet U.S. space transportation needs through the encouragement of synergistic and transitional high speed, global point-to-point flight

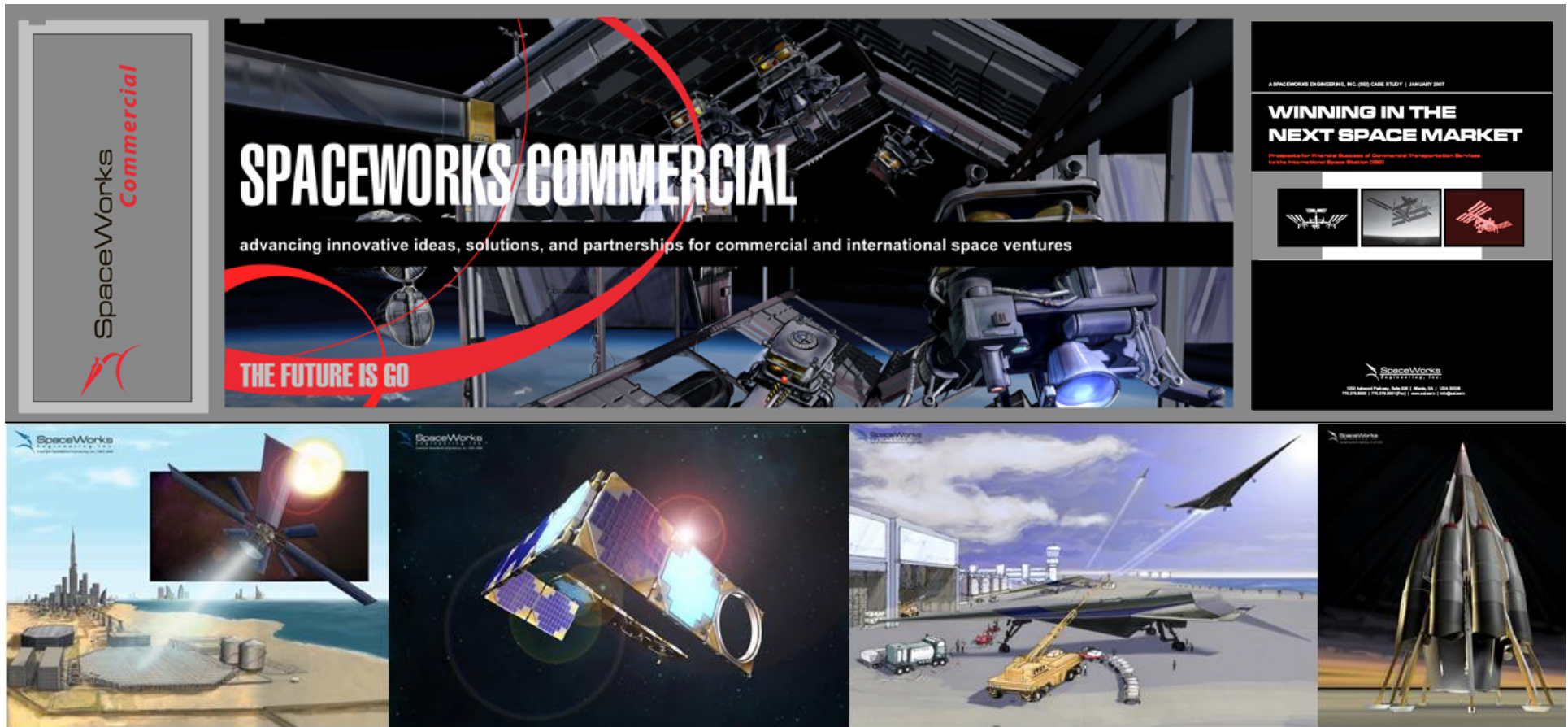
- **FastForward has conducted early research in this area, as have other, and we believe it to be promising. However, **additional focus research is needed to produce an actionable set of study products:****
- **PTP markets for passengers and priority packages must be better understood and supported with statistically valid analysis**
- **Critical missing and enabling technologies must be identified**
- **Aerospaceport needs must be prioritized**
- **Key government roles must be established for various federal and state agencies**
- **We urge the government to act quickly to commission this critical and necessary step toward meeting the country's future space access needs**

Call for Near Term Action



Questions and Discussion





SpaceWorks Commercial is a division of SpaceWorks Engineering, Inc. (SEI) of Atlanta, GA. **SpaceWorks Commercial** seeks to create value-added partnerships with the emerging entrepreneurial space community as well as international space industry leaders. Key goals of this division include advancing innovative solutions to challenges in space development, space-based energy, and high-speed flight. **SpaceWorks Commercial** also participates in popular space prizes.

For more information on the FastForward Study Group, contact Dr. John Olds, CEO of SEI (john.olds@sei.aero) or Mr. A.C. Charania, President of SpaceWorks Commercial (ac@sei.aero).

Study Host Organization: SpaceWorks Commercial