SPACE-BASED POSITIONING
NAVIGATION & TIMING

NATIONAL EXECUTIVE COMMITTEE

Economic Value Sub-Group

02 Jun 2014

Economic Task Statement

Approach:

The Advisory Board will form and convene a subgroup of members to:

- Review and assess existing economic studies
- Request Agency assessment of benefits and impact of reallocation of the MSS Band
- Request User and Manufacturer views on economic value and potential impact of MSS redesignation
- Consider timing of any Spectrum Reallocation
- To be performed with a series of subgroup meetings over the next six months

Products:

- A report summarizing range and credibility of economic benefits including impacts of Spectrum Redesignation

EXCOM Update

- New EXCOM co-chairs
  - Robert Work, Deputy Secretary of Defense
  - Victor Mendez, Acting Deputy Secretary of Transportation
- EXCOM meeting held March 14, 2014
  - Reviewed Advisory Board task results
  - Received briefing on CNAV implementation plan
  - Received updates on spectrum/interference topics
- New action item related to Advisory Board:
  - DOC to lead interagency team in consultation with National Space-Based PNT Advisory Board to develop a way forward for an updated, authoritative GPS economic benefits assessment

Economic Assessment Follow On Activities

- DOC can draw upon experience in evaluating economic benefits of “digital economy”
- Working to identify and acquire appropriate advisory services for next phase of economic assessment
- Next steps:
  - Prepare statement of work drawing from scoping contributions of Advisory Board
  - Form interagency team with NCO facilitation to provide inputs to study
- Will coordinate closely with Advisory Board subcommittee

PNTAB Topic 3. Economic Value of GPS

GPS has transformed our society in uncountable, positive ways

What is the Economic Value?

What would be the impact if Spectrum were compromised?

- Two studies are pertinent and appear credible:
  - European/Galileo and Australia assessments
- Have begun Reviews of these and other existing studies
  - Tend to be direct Cost based, not Value added – undervalues GPS contributions
  - Hard to quantify Societal Benefits (e.g. Search and rescue, driving instructions…)
  - Sum for sectors is at least many 10's of Billions of Dollars per year
  - Australian 2020 Impact of *augmentation* alone ~ 7 to 14 $B (Australian ~ 0.9 US$)
- Will continue effort in next year ***but …*** Caution on expectations –
  - best result is probably a range that is *understated, not value-added*
- Not a zero-sum game with Wide Band/Comm Spectrum – GPS is the timing signal of choice for most networks
  - GPS - very efficient spectrum user – over 150 signals now broadcast in the same "L1" band
  - GPS radio broadcasts serve over a billion users, with existing capacity to serve all mankind

Assumptions

- DOC is the lead on the economic study
- Include Public Safety and valuation of Loss of Life
- Interagency participation and cooperation will be a fact

- What do we assume about GPS Spectrum - Probability of Crowding, sharing, competition?

Long-Run vs. Short-Run Economic Impacts

- Long-run benefits measure impacts relative to what would have occurred if GPS never existed
  - They are useful in planning and budgeting or gauging effects of long-term signal interference that threatens PNT capabilities
- Loss from temporary disruption or denial of benefits is useful in examining security and risk issues, effects of space weather, and other degradation
  - Impacts may be large in the short-run because there isn't time to adjust production methods
    - Assuming the costs of temporary interruptions persist would result in an exaggerated estimate of long-run benefits of PNT
- Intermediate-term losses are relevant if systems can take many months or years to come back on line (such as destroyed power station transformers)

GPS Provides Substantial Civil Benefits

- GPS is critical to a great number of applications with huge economic benefits
- Benefits are growing rapidly with the expansion of GPS use and its deeper and wider infusion into applications
- The benefits of GPS will increase with new signals and other improvements in the system
- The benefits of GPS will increase with the availability of other GNSS systems

Expenditures vs. Benefits Or Value Added

- The size of *using* sectors provides an indication of the impact of GPS/GNSS together with other technologies and systems
  - Some of that impact may critically depend on PNT while some may have been possible with alternative technologies
- Expenditures on GPS/GNSS user equipment are benefits to the economy to the extent they are greater than what would have been spent in their absence. However, they are costs to users
- Expenditures on GPS/GNSS applications are costs, not benefits. Benefits are the incremental impacts of the use of GPS/GNSS.
  - Account needs to be taken of shifts in resources to GPS/GNSS from other uses that have benefits to the economy
- <u>The main focus of economic value is on productivity and cost savings</u>

The Bottom Line

- Aggregate benefit estimates will be "ball park," no matter how sophisticated the methodology, because the data doesn't exist to support more than that
- Nevertheless, it is possible to demonstrate the orders of magnitude and the widespread nature of the benefits and beneficiaries, and to effectively communicate that information
  - The information can be used to foster support for GPS if it is presented in interesting and understandable ways, repeated often, and used in specific as well as broad situations
  - Give them a story to tell

Beyond the Value of GPS

- What is the value of national sovereignty?
- What is the value of U.S. leadership in the world with GPS as the standard?
- The basis for the Internet depends entirely upon GPS the clock – distribution of timing
- The ONLY common clock worldwide is timing distributed by GPS