

- Space launch activity panorama
 - Constant increase of the number of space actors detaining space assets
 - Almost 60 countries with at least one satellite
 - Existing UN conventions for space objects registration (started in 1962) but data not always provided by some party States and some States are not party to the convention
 - Slower progress in the number of launching countries
 - 11 individual countries + organisation (ESA)

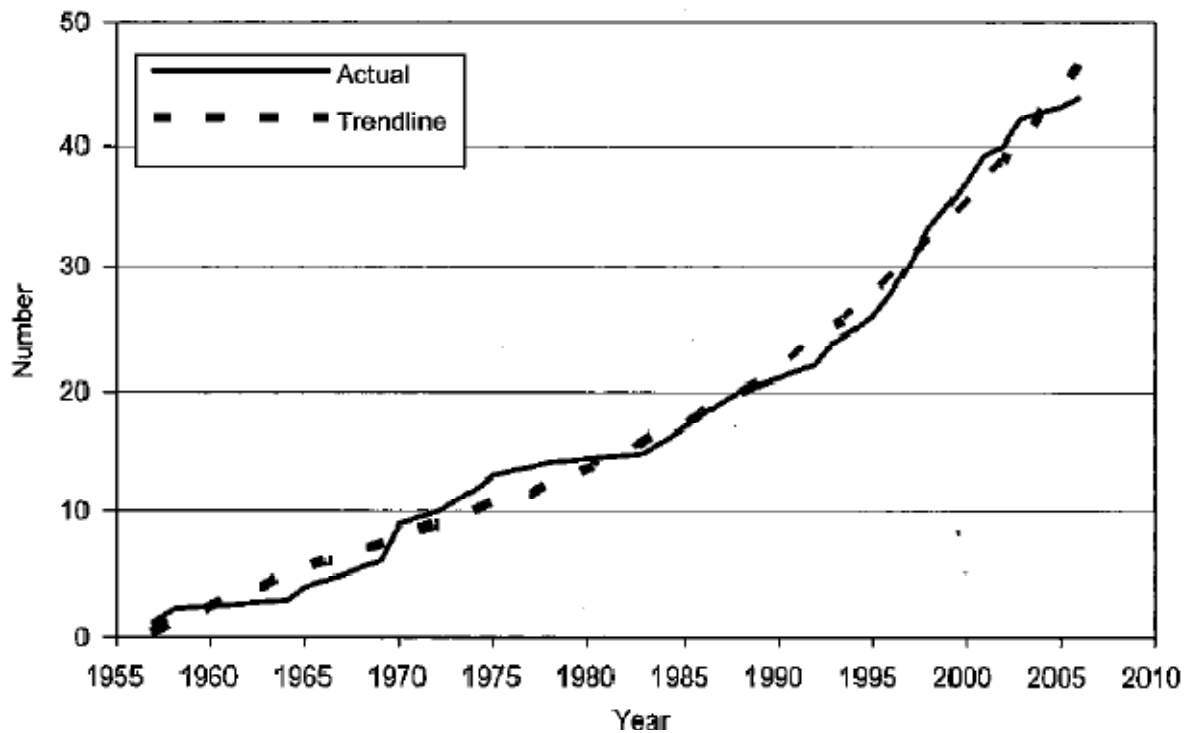


Fig. 1. Number of countries that own or operate satellites.

Source: Larrimore (Scott), *International Space Launch Notification and Data Exchange*, *Space Policy*, 23 (2007), p.173

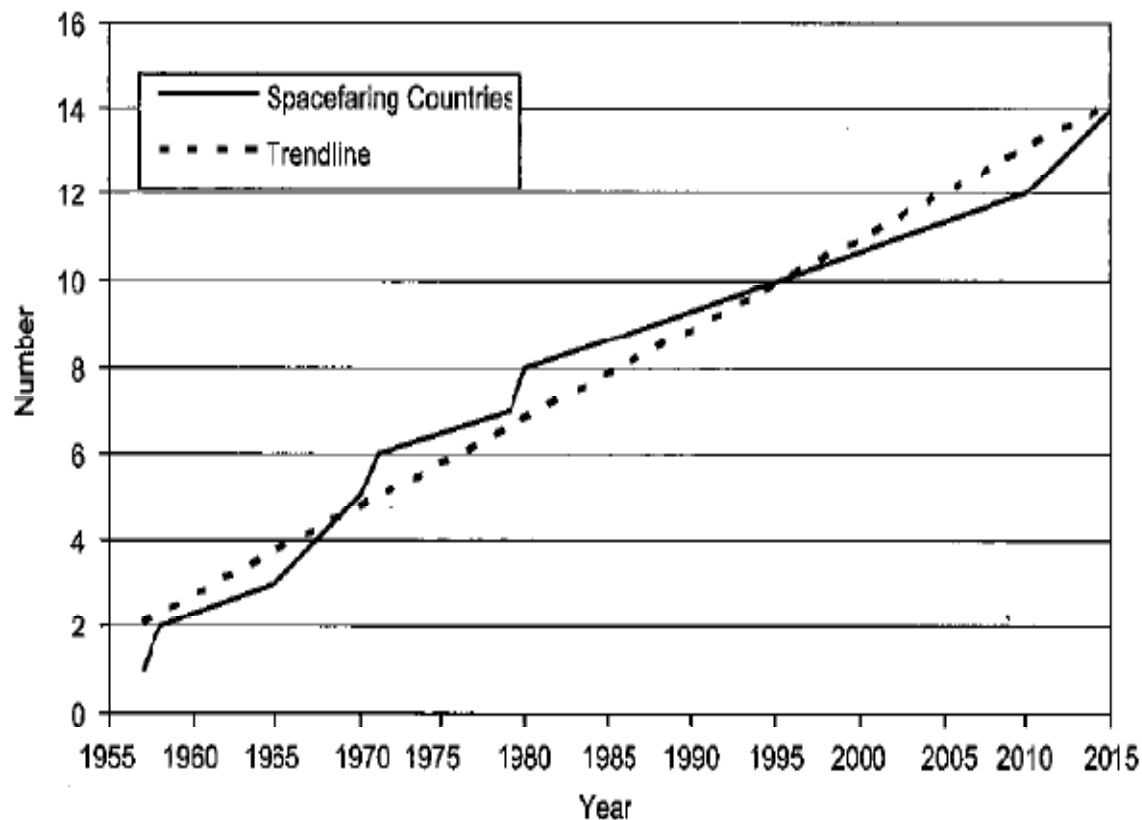


Fig. 2. Number of spacefaring countries.

Source: Larrimore (Scott), *International Space Launch Notification and Data Exchange, Space Policy*, 23 (2007), p.173

Recent Evolutions in the Field of Space Launch

State	Actor in
USSR/Russia	1957
USA	1958
<i>France</i>	<i>1965</i>
Japan	1970
China	1970
<i>UK</i>	<i>1971</i>
ESA	1979
India	1980
Israel	1988
Ukraine	1999
Iran	2008

- Remarks:
 - More countries are willing/able to possess space applications than to operate their own launch systems
 - However, it can be expected that the high number of States willing to use space may translate into a reasonable increase in national launch programmes
 - Out of the 9 (or 11) Launching States only one does not have parallel active missile programme

- Motivations for entering a national launch programme
 - National prestige/Independence in accessing space
 - Expanding nascent space applications programmes
 - Launch providers backlog/service uncertainties
 - Decreasing investment for accessing space (related to shrinking mass/performance ratio of new generations of satellites)

Trends towards an increased number
of national launch capabilities

Most recent example of SLV program

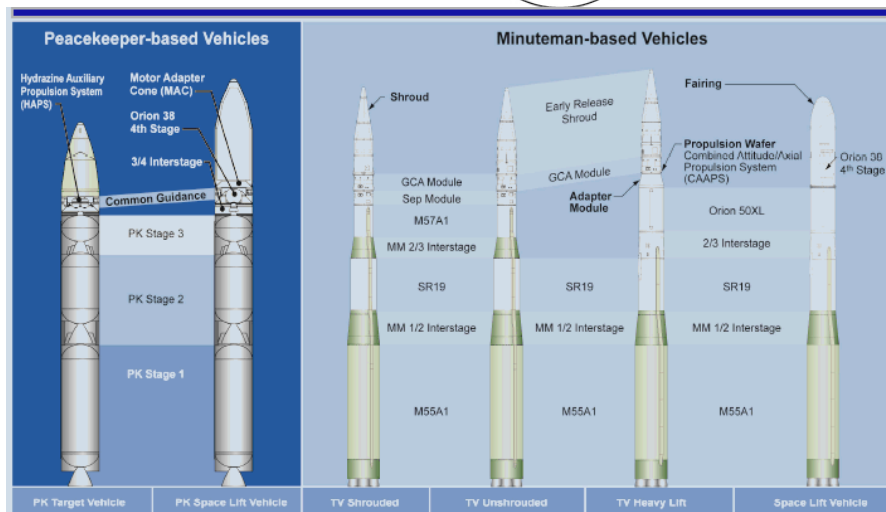
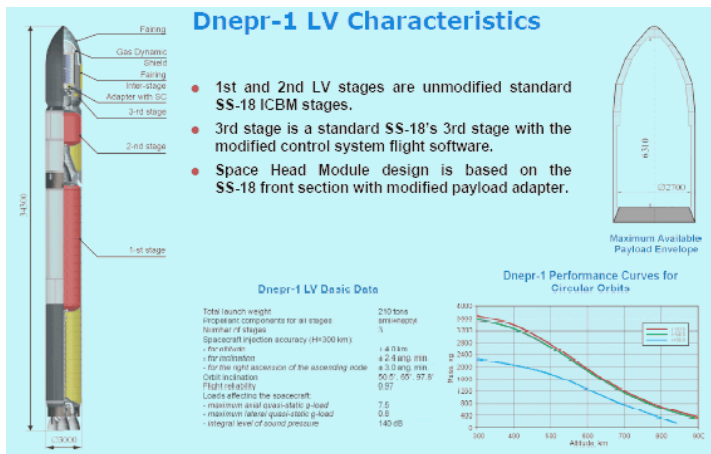
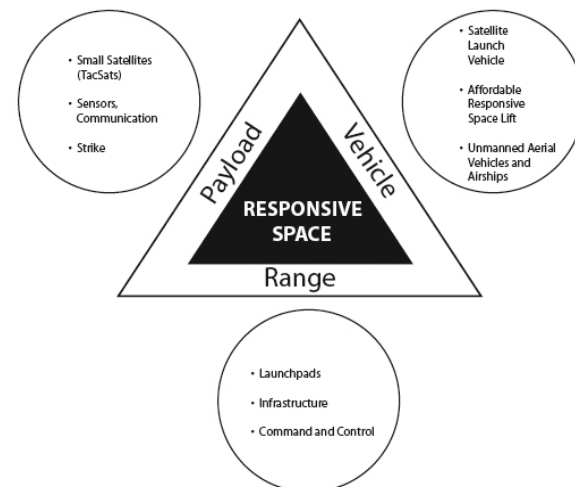
- South Korea will attempt to orbit a national satellite using a national launcher from the NARO Launch Pad (30 July 2009)
 - First stage: Russia Angara stage
 - Second Stage: South Korea (Solid)
 - 100 kg on LEO
 - Launch pad: 250 US\$ Million
 - Launcher : < 500 US\$ Million



- Trend towards small and medium launch vehicle
 - For emerging actors
 - = affordable access to space
 - For space faring countries
 - = Cost benefit and expected responsiveness
 - For new actors
 - = sub-orbital space flight ("space tourism")

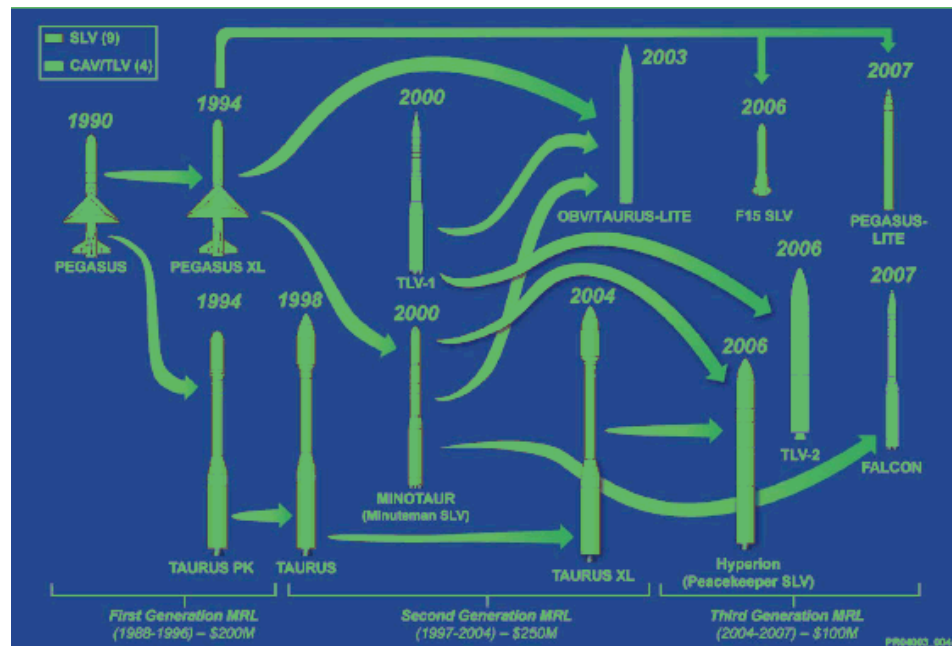
- Trend towards small and medium launch vehicle

- ORS "philosophy"



- Trend towards small and medium launch vehicle
 - Families of possibilities

- Possibly
"Air launched"...



- Trend towards small and medium launch vehicle
 - Possible increase in the number of “light launches” drawing benefit from new satellite technology ? An open question
 - Possible private actor surge ?
 - Possible support from public authorities (NASA)

Create new launch activities to be monitored ?

- Global trends to investigate ?
 - More actors:
 - States
 - Private (?)
 - More diversified orbital and sub-orbital launch techniques
 - Lighter SLVs getting closer to missile-related technologies

Confusions/misunderstandings more likely?
Need for HCOC to address new developments ?