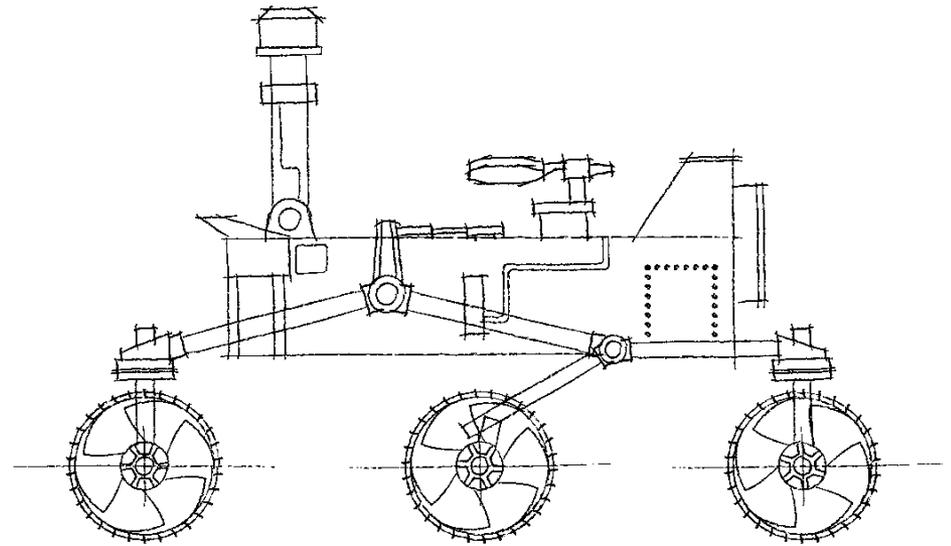




Mars 2020 Project

Matt Wallace
Deputy Project Manager

August 3, 2015



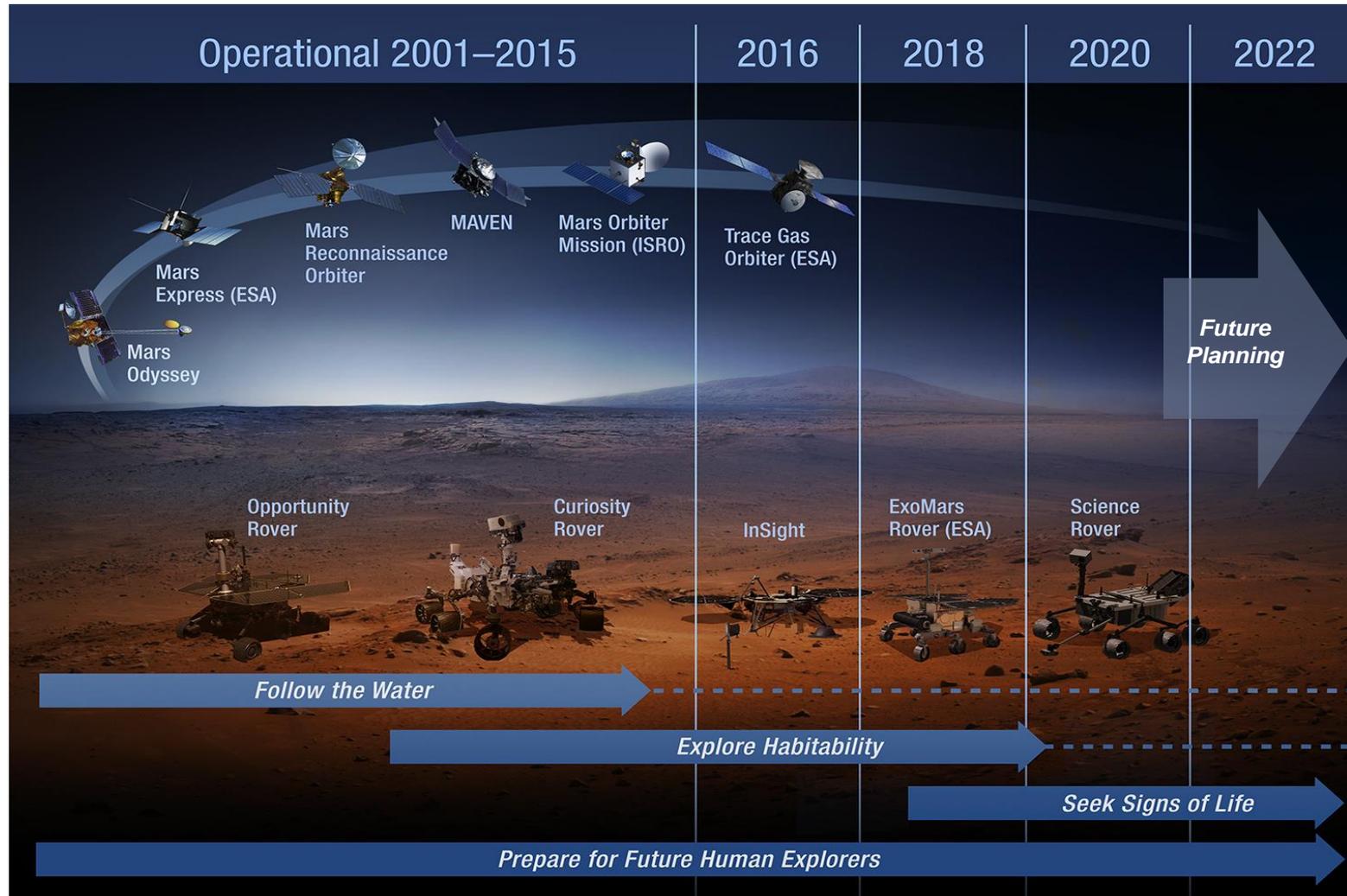
Mars 2020 Project

Mars Exploration in This Decade



Baseline Mars 2020 mission addresses the highest priority science

- Builds on Curiosity results by investigating a landing site for possible bio-signature preservation in full geologic context
- Provides HEOMD/STMD contributions to address key Strategic Knowledge Gaps
- Provides cached samples for possible return



Mission Overview



LAUNCH

- MSL Class/Capability LV
- Period: Jul/Aug 2020

CRUISE/APPROACH

- 7.5 month cruise
- Arrive Feb 2021

ENTRY, DESCENT & LANDING

- MSL EDL system (Range Trigger baselined, Terrain Relative Navigation funded thru PDR): guided entry and powered descent/Sky Crane
- 16 x 14 km landing ellipse (range trigger baselined)
- Access to landing sites $\pm 30^\circ$ latitude, ≤ -0.5 km elevation
- Curiosity-class Rover

SURFACE MISSION

- 20 km traverse distance capability
- Seeking signs of past life
- Returnable cache of samples
- Prepare for human exploration of Mars

Major Accomplishments in Phase A



- Evaluated 57 proposals in response to the competitive Announcement of Opportunity (AO) for science & exploration technology investigations; announced the 7 selected investigations for the rover payload on 31 July 2014
- Formalized agreement with HEOMD/STMD for contributions of MEDLI2 and exploration technology investigations
- Aggressive procurement of heritage hardware. Parts buys and procurements for items with low risk of change are proceeding at a fast pace.
- Completed Phase A trade studies and closed out decisions on augmented direct-to-Earth telecommunication, ringsail parachute, and other flight system modifications
- Sampling and caching architecture development laboratory and testbed established at JPL
- Issued Environmental Impact Statement Record of Decision on January 27, thus completing compliance with National Environmental Policy Act (NEPA)
- SRR/MDR (Life Cycle Review Step 1) completed 29 October 2014
- Completed instrument accommodation reviews on 3 March 2015
- Payload Systems Review (Life Cycle Review Step 2) completed 12 March 2015
- Approved for Phase B by Agency Program Management Council on 20 May 2015

Timeline to KDP-C



- Jul 2014 - Instrument Selection
- 27-29 Oct 2014 - System Requirements Review/Mission Definition Review
- Dec'14 - Mar'15 - Instrument Accommodation Reviews
- 17 Feb 2015 - Operations Productivity Update
- 3-4 Mar 2015 - Planetary Protection Approach Implementation Independent Assessment Review
- 11-12 Mar 2015 - Payload (+) Systems Review
- 25 March - KDP-B JPL Center Management Council completed
- 8 May - KDP-B SMD Program Management Council (DPMC) completed
- 20 May - KDP-B Agency Program Management Council (APMC) completed
- Jul/Aug 2015 - Pre-PDR Reviews (EDL, FS, SCS, Ops, Cost, etc.)
- 4-6 Aug 2015 - 2nd Landing Site Workshop
- Sept 2015 - Preliminary Design Review (PDR) Step 1
- Dec 2015 - PDR Step 2 (payload & related elements)
- 1st Qtr 2016 - KDP-C

Mars 2020 Summary



- ❑ Completed Phase A and formally entered Phase B of formulation
 - Completed instrument accommodation reviews, including implementing design modifications required at selection
 - SRB reported: *“Project is more mature than most in Phase A, ready for KDP-B decision milestone and Phase B start.”*
 - Approved for Phase B by Agency Program Management Council (APMC) on May 20

- ❑ High-heritage approach is providing stable foundation for Mars 2020. Heritage hardware (~90% of the flight system by mass) is essentially in Phase C/D. Parts buys and procurements for items with low risk of change are proceeding at a fast pace

- ❑ Published environmental impact statement and issued Record of Decision to baseline radioisotope power system, thus completing compliance with National Environmental Policy Act (NEPA)

- ❑ Working detailed engineering and design trades for cache system implementation

- ❑ Rover systems / Payload Update:
 - Agreement reached with Spain to provide high gain antenna
 - Upgraded engineering camera design with color and improved resolution compared to MSL navcam/hazcams
 - Added EDL / Parachute Uplook Cameras
 - Augmented SHERLOC with infinite focus fine-scale color imager (based on MSL MAHLI)
 - RIMFAX formally selected for flight based on accommodation

- ❑ Continuing to evaluate Terrain Relative Navigation (TRN) capability for potential inclusion on the mission

