What is the end goal?

A Manned outpost on the moon, five to seven years, $500 to $700 million.
Four mission classes:

- Scout class
- Sample return class
- Manned "Pathfinder" class
- Manned "Explorer" class

Develop two launch vehicles
## Scout Class Mission

One way mission to lunar surface  
Large payload (180 kg) on surface  
Early missions have engineering margins  
635 kg in GTO (if LV is capable)  
1500 kg in LEO (with Drop Tanks)  
Short local flights with leftover Propellant.

## Sample Return Class Mission

(needs a better name!)

Scout class payload returned to Earth  
Similar lander configuration, more propellant  
Large payload (180 kg) on surface and returned to Earth  
Requires reentry vehicle development  
1600 kg in GTO  
3800 kg in LEO
Pathfinder Class Mission

Crewed flights utilizing technologies developed from multiple lander missions.
scales roughly with size
11:1 mass from GTO
28:1 for LEO
Minimal manned vehicle ~225 kg

Mass Derivations
• Baseline Surveyor III mission
• 2200 lbs GTO. 600 landed, 60lbs payload
• We are utilizing newer technologies, especially electronics
• Vidicon camera 21lb -> CCD 1 oz
• Landing radars (600W) -> 200hz Lidar (5.4 W)
• Analog ground-based computers -> on-board microcontroller
• Star sensors, Sun sensors, IMU, radios, command decoders, actuator drivers, batteries, etc.
Uses of Outpost:

- Scientific interest
- Surface exploration
- Tourism
- Mining exploration base
Technology

- The needs of the 1960's with the materials of the 2010's
- Apollo
- Surveyor
- Microsats and commercial space
E/PO opportunities:

- Open Mission Training
- Opportunities for people to participate
- Educational television
- Many classroom and teacher's aids to be produced
- All data will be publicly available
PR opportunities:

- Contests
- Rovers
- Samples for students
- Fund-raising events
- Entertaining & educational television
- Movies/books/shorts/pop magazines

Pictures courtesy of Chantelle Baier, OL PR team, & University Rover Challenge.
Philosophy of the Open

Community openness and accountability

- No hiding or diverting funds from their intended purpose.
- Accurate paid member dues numbers
- Open distribution of charitable funds. People / Press.
- Individual's information is default private
- Software and hardware designs

International technology

ITAR – Open source and education should be exempt.
International contributions
- International participants
More Philosophy of the Open

Business connections

- Business spin-offs
- Building a base of experienced subcontractors
- Open source resellers equivalent: Skills
- Proprietary information
- Corporate sponsorship
- Personal income

Victory

- What I call 'Limited victory conditions'. A contribution that is open and relatively permanent
- If any of our hardware (or hardware we meaningfully helped develop) is used in a mission that returns man to the Moon – WE WIN!
- Helped to raise awareness and interest in Science & Engineering in youth.
- Fun
Time frame (5-7 years!?)

y0 = $5M USD fund-raising

y3 – Orbital testing of most flight hardware

y4 – Scout class (first spring at site)

y4+3mo – Sample return (under discussion)

y5 – Pathfinder class manned (first spring at site)

y5+2-3wks – Explorer class build

y5+6wks – Shakedown outpost

y5+3mo – Commission outpost!
Where do we go from here?

• Business development
• Fund-raising
• Science planning
• PR building
• (Oh yes, Engineering...)
Business & operations needs:

- Charitable business planning
- Funding
- Accounting
- Legal aid (starting with ITAR...)
- Marketing

Graphics arts needs:

- Web development
- 3D modeling
- Video production
- Artwork, 3D rendering, other illustration

How can you help?
How can you help?

PR needs:
• Media contacts (movie, television, print, electronic)
• Social networking development
• In-house documentaries, popular magazine articles, etc.

E/PO needs:
• Curriculum development, (K-Graduate level)
• Public & “amateur scientist” education
• Stock footage & 3D modeling for news & outside documentary use
How can you help?

Science needs:

- Contact the Science Team
- Lunar surface radiation
- Instrument makers

Engineering needs:

- Assistance in various design stages
- With immediate need in suits and Earth return development (Overall Lander mass is final goal)

How can you help?
How can we help you?

Science team:

- Contact the Science Team
- Will provide any data or research OL has developed

Engineering team:

- Assistance in various design stages
- All hardware is openly available

PR - E/PO - Marketing:

- Provide all resources available, including consulting, curricula, research, stock footage, artwork, etc.
- Will partner where it makes sense for both groups.
AMBITION

Shoot for the moon. Even if you miss, you'll land among the stars. Or the unimaginable hideous gaping void of space. One of the two.
ADVENTURE
Always bite off more than you can chew
## Payload required & Launch Vehicle Options

All landers deliver 180kg to lunar surface.

This means 1815 kg of lander in GTO x2 + 1T Nav/Com satellites

Roughly 8-10T GTO

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<thead>
<tr>
<th>Launch Vehicle</th>
<th>Cost</th>
<th>GTO</th>
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<tbody>
<tr>
<td>SpaceX Falcon9</td>
<td>$49.5M</td>
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In a Suit? For how long?
In a Suit? For how long?
OpenLuna.org
Your Moon... Your Mission... Get Involved.

"Because we've waited long enough!"