

# WP Mission and Systems Engineering

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## 1 Mission

From the literature study, we know the problem at hand: for a long time, 140 meters was seen as the diameter to design asteroid surveys for. The result is that a lot of smaller sized asteroids are still unknown. Survey completeness for asteroids such as the one that impacted Chelyabinsk in 2013 is only around 10%. Several studies have been conducted on possible future space-based surveys, but the survey completeness they reach is not very impressive.

### 1.1 Determination of Mission

#### 1.1.1 Mission Objective

The main objective of the mission is to raise the completeness of Near-Earth Asteroid catalogues to the highest feasible level using technology that is currently available. A secondary objective of the system is to raise the warning time for asteroids that do end up impacting Earth.

1.1.2 Mission Constraints

1.1.3 Mission Statement

## 2 Systems Engineering Analysis

### 2.1 System Description

2.1.1 Interaction between Spacecraft

2.1.2 Duty Cycles and Lifespan

2.1.3 Requirements

### 2.2 Communication

2.2.1 Link Budget

2.2.2 Range

### 2.3 ADCS

2.3.1 Pointing Accuracy and Stability

2.3.2 Error Propagation among Multiple Satellites

### 2.4 Data Processing

2.4.1 Available Computing Power

2.4.2 Imposed Limitations