Global Tracking System

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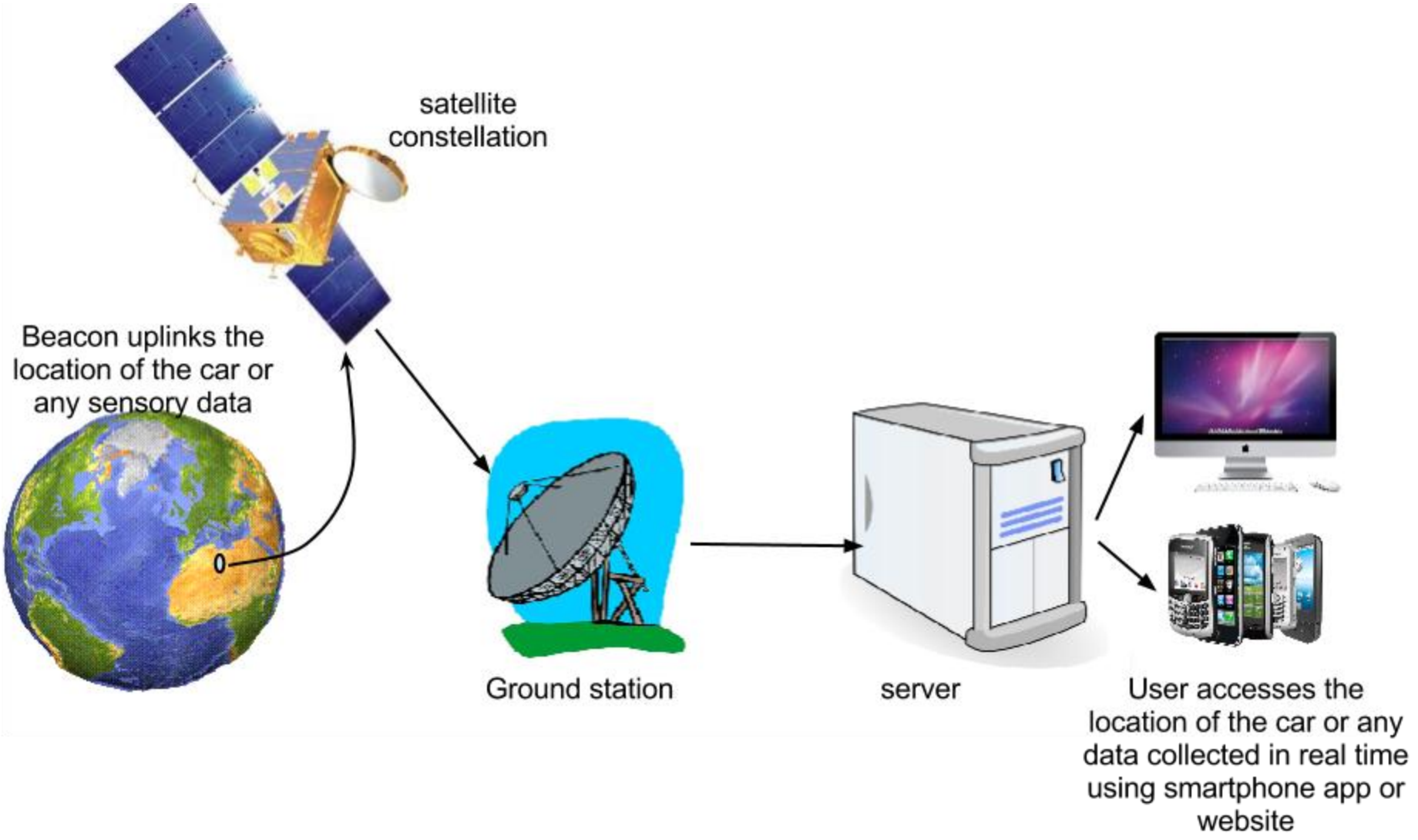
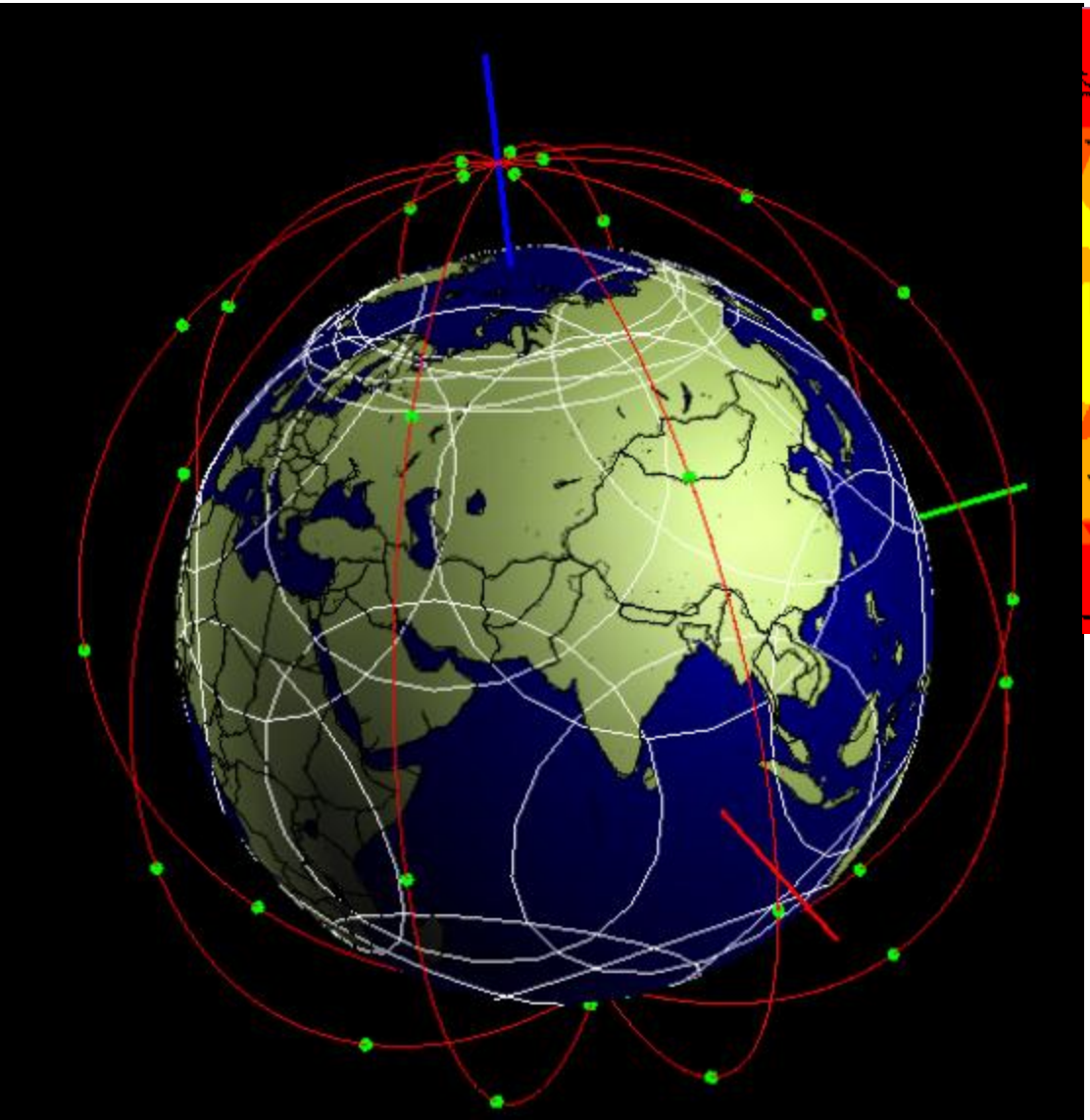
Problem Definition

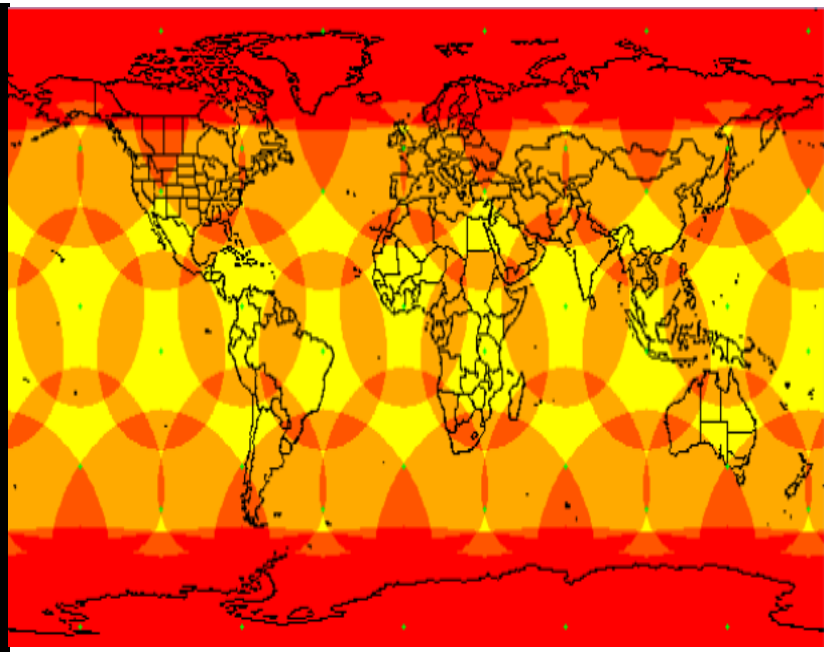
- Car theft is a major problem in both developed and developing countries.
- Statistics show that a car is stolen every 26 seconds in the United States.
- According to the British Crime Survey, a vehicle is stolen every 4 minutes in the United Kingdom.
- And, in Australia, a vehicle is stolen every 10 minutes with nearly over 3.5 million cars stolen annually worldwide.

Global Tracking System



How the constellation looks like?





40 satellites

5 orbits

Altitude: 1600Km LEO

Business feasibility

- **One-time cost**
- **Satellites and ground stations cost:**

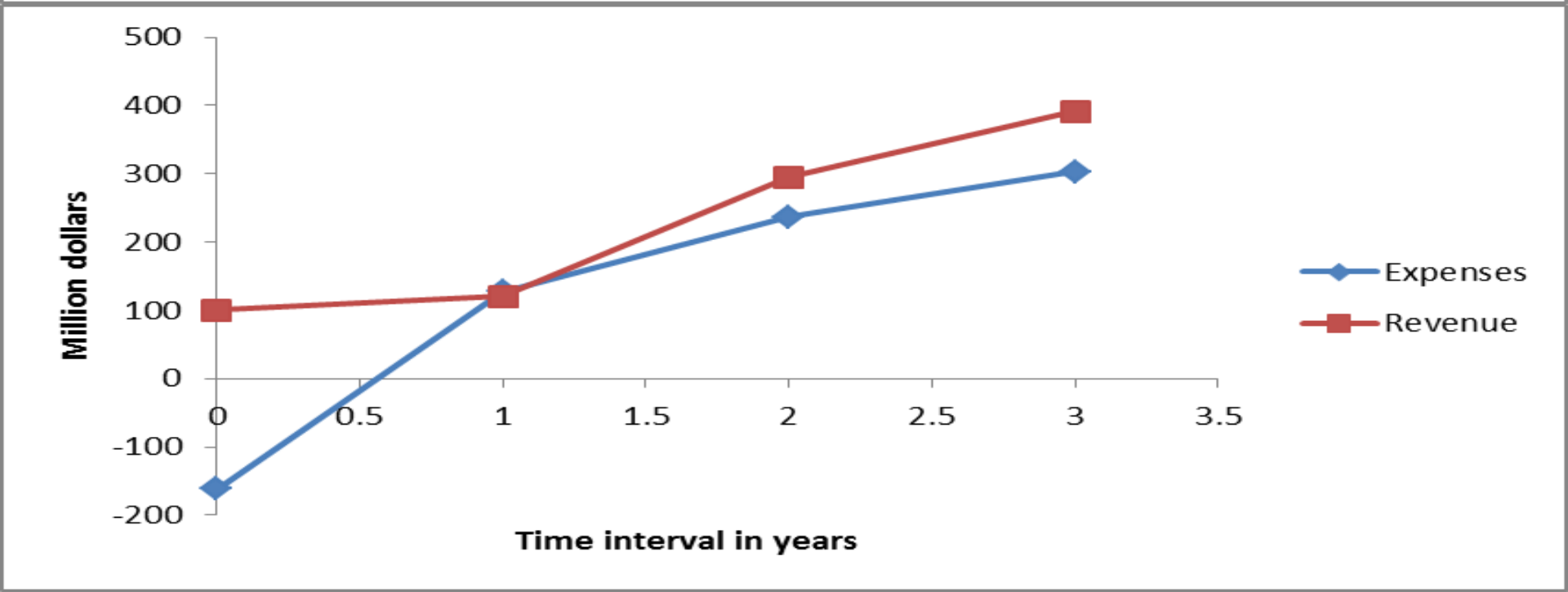
Satellites components	Cost
Bus cost "low level bus (9.6 Kbps)"	$0.5M
Communication payload "uplink 1200 bps "	$0.4 M
Cost of one satellite	$0.9M
Total cost of all 40 satellites	**$36M**
Ground station specifications	**Cost**
9.6 Kbps	$0.05M
Total cost of four ground stations	**$0.2M**

Launch cost

- Launch cost = rocket cost * 5 rockets - free slots * rockets * 4M = (25 * 5) – (7 * 5 * 4) = -15 M$
- Which means a gained profit with $15M however, it's expected that not all slots are occupied. As an average, 5 slots of 7 available would be free leading to launch cost = $25M
  Initial costs =Satellites cost + Ground stations cost + Launch cost
  = 36 + (0.05*4) +25= $61.2 M
- Unadjusted total costs: Initial costs + software development + Distribution + Advertising and Marketing = 61.2+0.05+2 + 4 = $67.25M
  Unexpected one-time operations : 10% of total onetime costs = $6.725M
- **Total one-time cost:**

  total one-time cost = 67.25M +6.725M= $73.975M
- Suggested selling price to the beacon: $400 in first year, $350 in second year and $320 in the last year.

100
80
60
40
20
0
-20
-40
-60
-80
0
200
400
600
800
1000
1200
Total profit in million dollars
No. of beacons sold in thousands


500
400
300
200
100
0
-100
-200
0
0.5
1
1.5
2
2.5
3
3.5
Million dollars
Time interval in years
Expenses
Revenue

RISK ANALYSIS

1) System failure in one of the satellites.
2) Failure in one of the ground stations.
3) Downlink overloading on one of the ground stations.
4) Lag of service due to server failure.
5) Launching delay.

Thank you