BOS 2018A Operational Requirements

For the R2018A design, the system must expand to accommodate 8 total cameras, which will bring an opportunity to purchase a cable specifically suited to these new needs.

```
clear; close all; LastRun = datetime
```

```
LastRun = datetime
   30-Nov-2017 10:23:59
```

Haul Rate Determinations

The function requirements relative to the daily operations encompass a day must perform 10-15 drops per area of interest, and 5-10 areas per day. Set A is more drops less sites and set b is more sites less drops.

```
clear;
DropsPerSite = [10 15 3 4];
SitesPerDay  = [5  4 10 10];
DropDepth = 150;
LiftAltitude = 30; %distance lifted between drops
DistanceBtDrops = 100; %meters
DistanceBtSites = 2000; %meters
DropTransitSpeed = 2; %knots
SiteTransitSpeed = 10; %knots
knotsTomm = 30.8667; %conversion for knots to meter/min
HaulRates =  30; %meters per minute
DropTimeOnBottom = 5; %min
TimeOnOffDeck = 10; %min
```

Determine the total time spent in hauling:

```
TimeFullDrop  = DropDepth./HaulRates + TimeOnOffDeck; % min
TimeLift  = LiftAltitude./HaulRates; % min
NumLift   = SitesPerDay.*(DropsPerSite*2-2);
NumDrops  = SitesPerDay*2;
TimeInHauling = NumLift.*TimeLift + NumDrops.*TimeFullDrop;
TimeInHaulingHours = TimeInHauling./60
```

```
TimeInHaulingHours =
    4.0000    3.8667    5.6667    6.0000
```

Determine the total time spent on bottom:

```
TimeOnBottom = SitesPerDay.*DropsPerSite.*DropTimeOnBottom;
TimeOnBottomHours = TimeOnBottom ./60
```

```
TimeOnBottomHours =
    4.1667    5.0000    2.5000    3.3333
```

Determine the total time spent in transit:

```
SingleTransitBtDropTime = DistanceBtDrops/(DropTransitSpeed.*knotsTomm);
TimeInTransitBtDrops = ((DropsPerSite-1).*SingleTransitBtDropTime).*SitesPerDay;

SingleTransitBtSite = DistanceBtSites/(SiteTransitSpeed.*knotsTomm);
TimeInTransitBtSites = (SitesPerDay-1).*SingleTransitBtSite;

TimeInTransit = TimeInTransitBtDrops + TimeInTransitBtSites;
TimeInTransitHours = TimeInTransit./60
```

```
TimeInTransitHours =
    1.6469    1.8359    1.5119    1.7819
```

Determine the total length of the operational day:

```
TotalTimeInOperation = TimeInHauling + TimeOnBottom + TimeInTransit;
TotalTimeInOperationHours = TotalTimeInOperation ./60
```

```
TotalTimeInOperationHours =
    9.8135   10.7025    9.6785   11.1152
```

What does that leave for transit to site in a typical day?

```
TotalDayHours = [12];
NonscienceTransitTime = TotalDayHours - TotalTimeInOperationHours
```

```
NonscienceTransitTime =
    2.1865    1.2975    2.3215    0.8848
```

```
StrikingDistance = floor(NonscienceTransitTime .* SiteTransitSpeed/2) %nautical miles
```

```
StrikingDistance =
    10     6    11     4
```

Plot the two scenarios

```
for (n = 1:length(DropsPerSite))
PlotData(n,:) = [
    TimeInHauling(n),...
    TimeOnBottom(n),...
    TimeInTransitBtDrops(n),...
    TimeInTransitBtSites(n)
    ]/(60);
lbl{n} = char(sprintf("%i drops, %i sites, %inm", DropsPerSite(n), SitesPerDay(n),StrikingDist

end
Labels = {'Hauling','On Bottom','Transit b/t Drops','Transit b/t Sites'};

figure();
```

```
c = categorical(lbl);
bar(c,PlotData,'stacked');
ylabel('Time (hours)');
legend(Labels,'Location','northwest');
title([num2str(DropDepth) '-m Depth, ' num2str(DistanceBtDrops) '-m Drop Spacing, ' num2str(Di
```