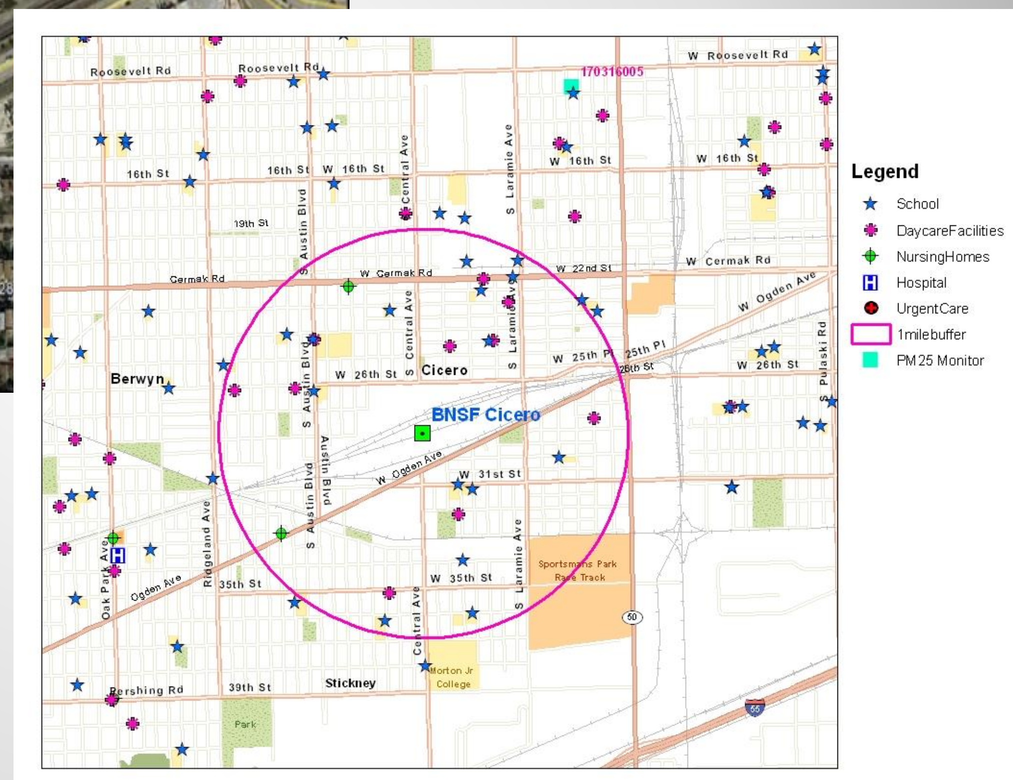
Cicero RARE Rail Study:

MSTRS Meeting
May 7, 2014
Chicago, IL

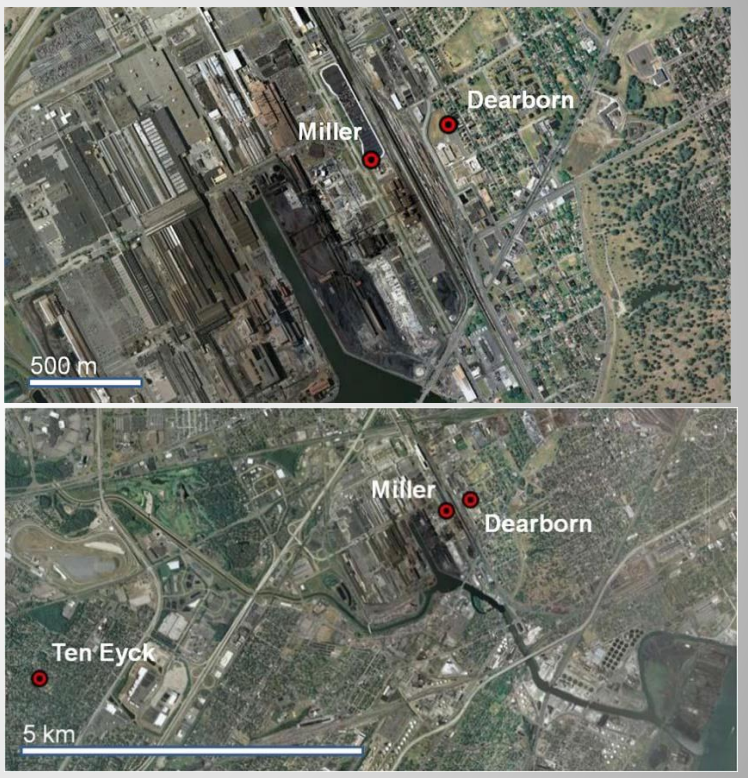
Background

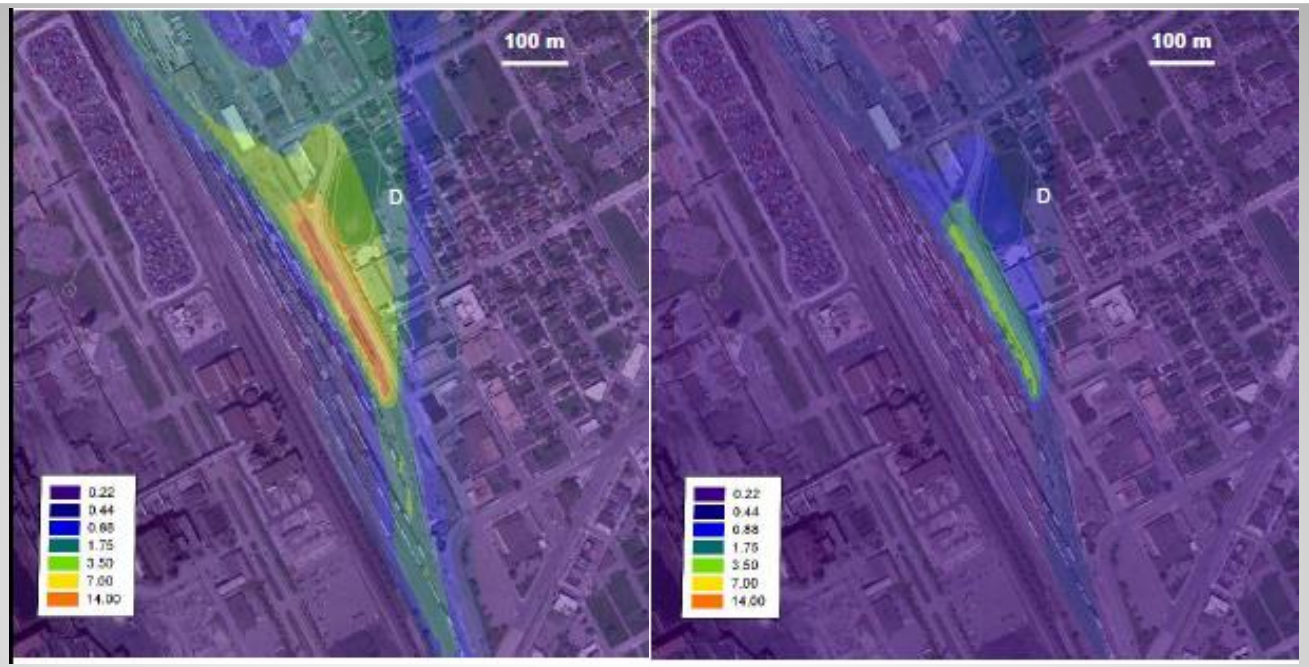

W 25th Pl
W 26th St
W Ogden Ave
S Laramie Ave
© 2012 Google
Imagery Date: 3/13/2012


170316005
BNSF Cicero
Cicero
Berwyn
Stickney
Roosevelt Rd
W Roosevelt Rd
16th St
W 16th St
19th St
Cermak Rd
W Cermak Rd
W 22nd St
W 25th Pl
W 26th St
W 31st St
35th St
W 35th St
39th St
Pershing Rd
W Ogden Ave
Ogden Ave
S Austin Blvd
Austin Blvd
S Central Ave
Central Ave
S Laramie Ave
Ridgeland Ave
Oak Park Ave
S Pulaski Rd
Sportsmans Park Race Track
Morton Jr College
Park
Legend
School
DaycareFacilities
NursingHomes
Hospital
UrgentCare
1milebuffer
PM25 Monitor

Phase 1

- 1) to develop an accurate inventory at rail yards;
- 2) to model PM concentrations from the inventory;
- 3) measure PM at three stationary monitoring sites.





Results from Phase 1

•Changes in fuel and replacement of locomotive engines to cleaner standards corresponded to reduced concentrations of PM reported by the stationary monitors

•Modeling suggests that yards can be a significant source of diesel PM to adjacent neighborhoods

•Modeling showed that implementation of cleaner locomotive engine standards on switcher engines resulted in significant reduction in concentrations impacting adjacent neighborhoods

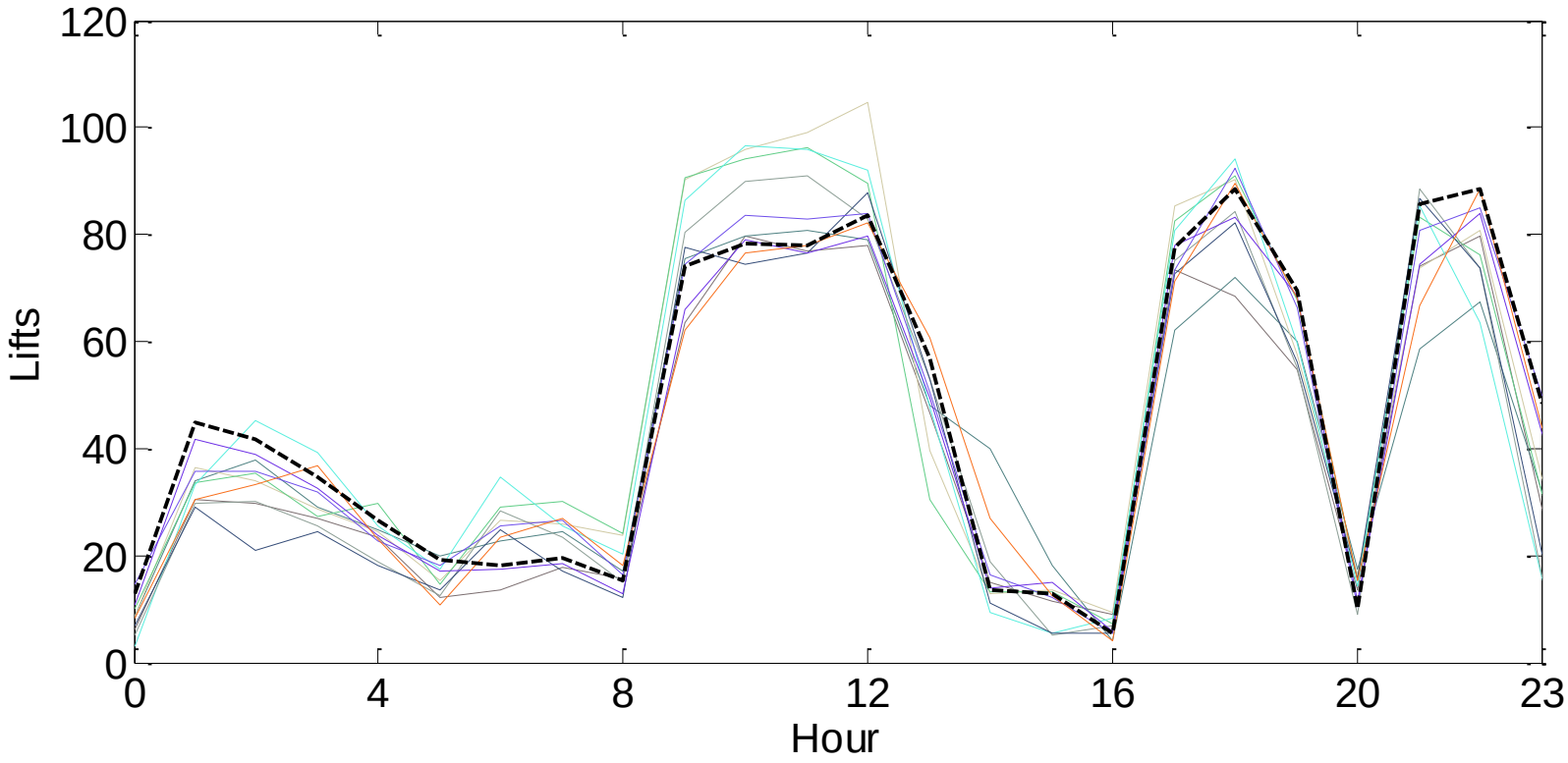
Phase 2

Phase 2 aims:

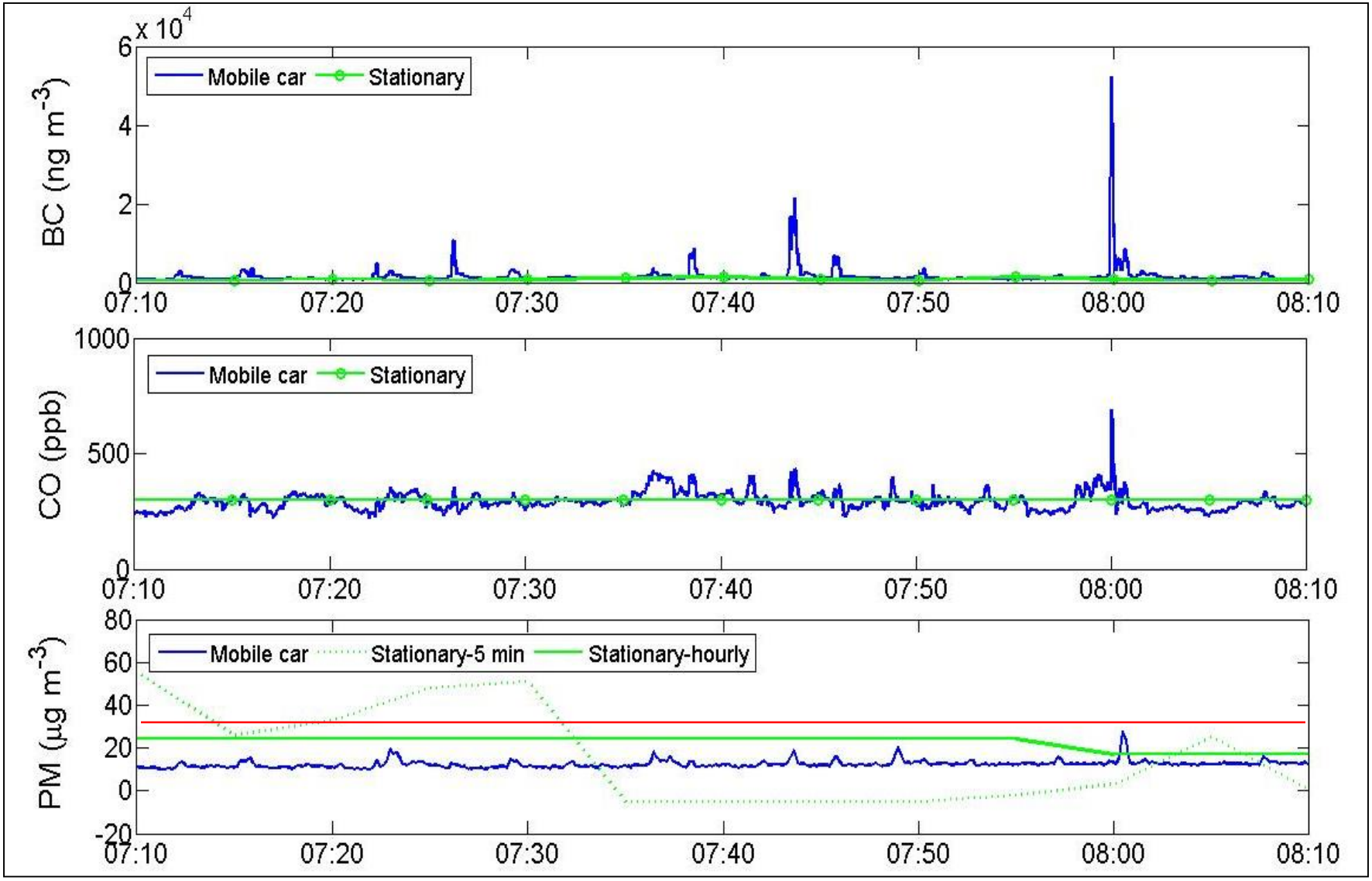
- 1) to compare mobile monitoring to stationary modeling of black carbon;
- 2) to characterize the rail yard contributions to local air quality impacts.

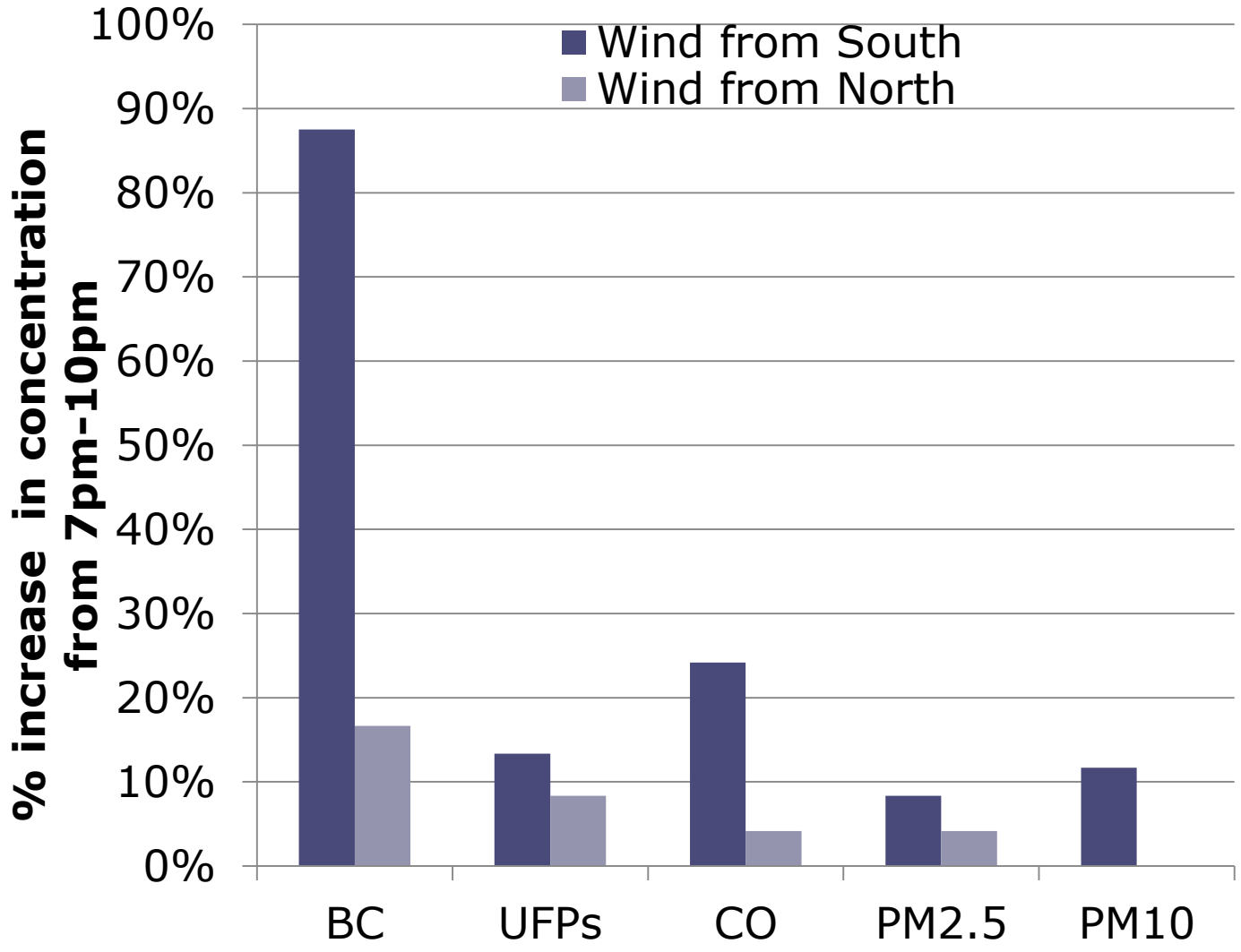
Mobile monitor solution

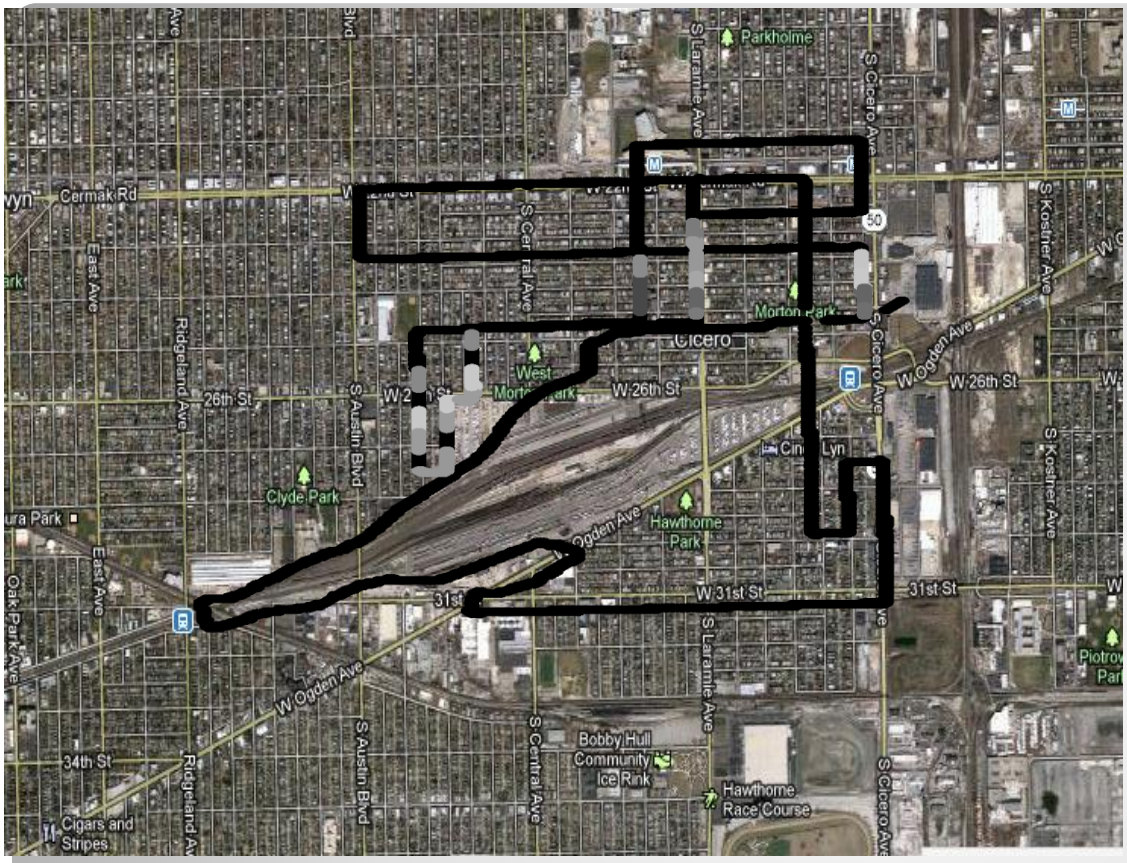
1. High temporal resolution to correlate to actives
2. Can move around spatially and collect upwind and downwind concentrations during a particular timed activity



Comparison of mean diurnal lift activity during the study (heavier dashed black line) with monthly average diurnal trends from October 2010 to July 2011 (10 months) shown in thin colored lines.


x 10^4
BC (ng m^-3)
Mobile car
Stationary
6
4
2
0
07:10
07:20
07:30
07:40
07:50
08:00
08:10
CO (ppb)
1000
500
0
PM (µg m^-3)
Stationary-5 min
Stationary-hourly
80
60
40
20
0
-20


% increase in concentration from 7pm-10pm
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Wind from South
Wind from North
BC
UFPs
CO
PM2.5
PM10



Phase 2 Results

- The stationary monitor was unable to attribute PM concentrations to specific sources.
- The mobile monitor, however, collected data showing high PM and black carbon concentrations emitted from the rail yard during hours of high yard activity.
- Downwind peak impacts appeared to be north of the yard.

EPA Region 5 Actions