

Below is the analysis for determining the minimum number of points required to get the accuracy of UVA above 75% and accuracy of UVB above 95%.

I have used bootstrapping method to determine the minimum number of points where we start from 1 point and continue to increase the number of points till we get the desired accuracy. For the method to be less random, each iteration is repeated 10 times and the average accuracy across 10 iterations is taken into consideration.

I have chosen the bootstrapping method since the distribution is completely random and the readings along the segments that I am considering is not consistent. Bootstrapping is the best method in these cases.

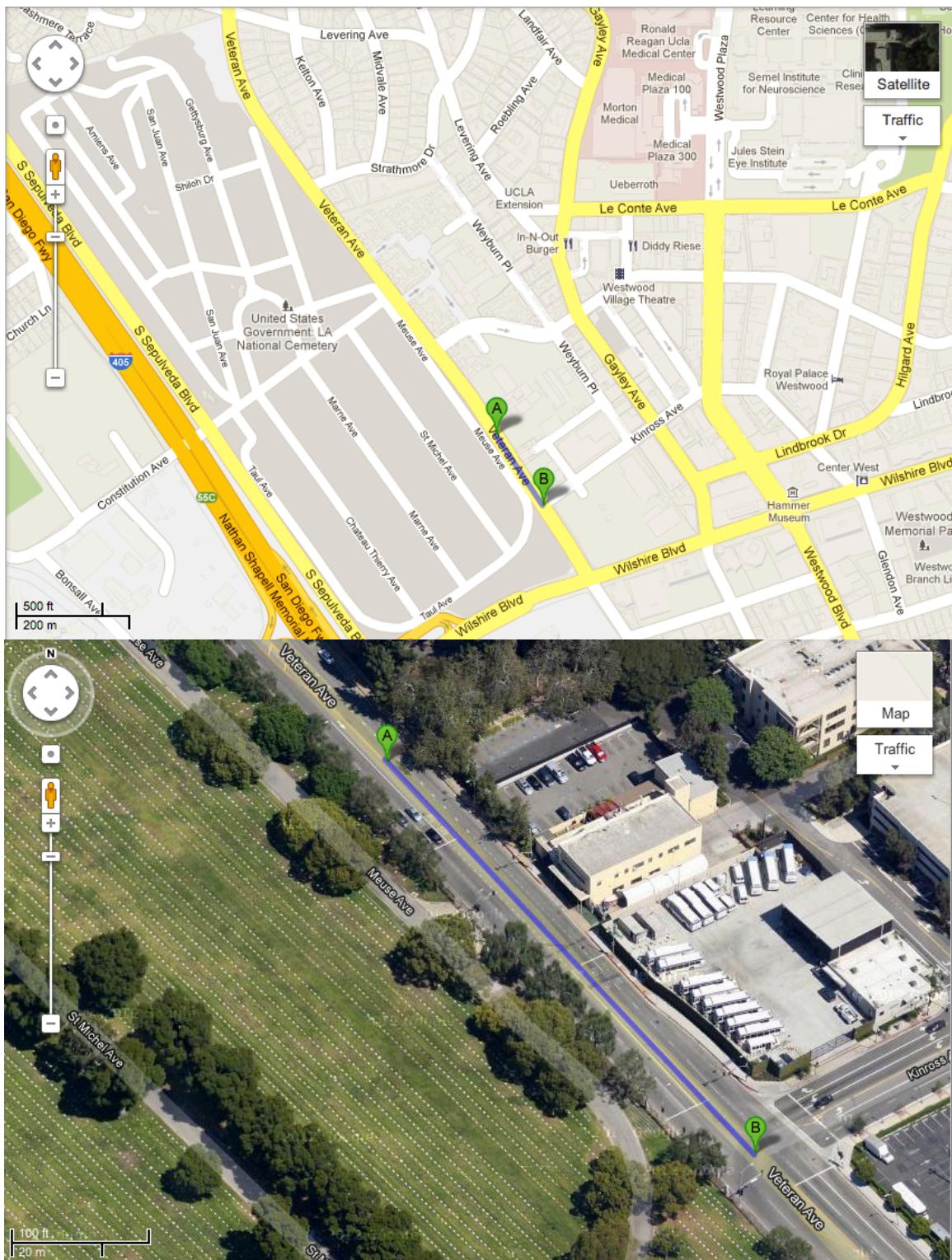
I have tried to cover variety of segments for my analysis by considering different road segments at different orientations and different length of segments.

After doing the analysis, I have come to following conclusion.

In the worst case, we need 6 points on a segment to get accuracy above 75% for UVA and we need 4 points on a segment to get accuracy above 95% for UVB.

In average case, we need 4 points on a segment to get accuracy above 75% for UVA and we need 3 points on a segment to get accuracy above 95% for UVB.

## Route 1



Start Point:  
34.060067,-118.449498

End Point:  
34.058945,-118.44864

Distance:  
480ft

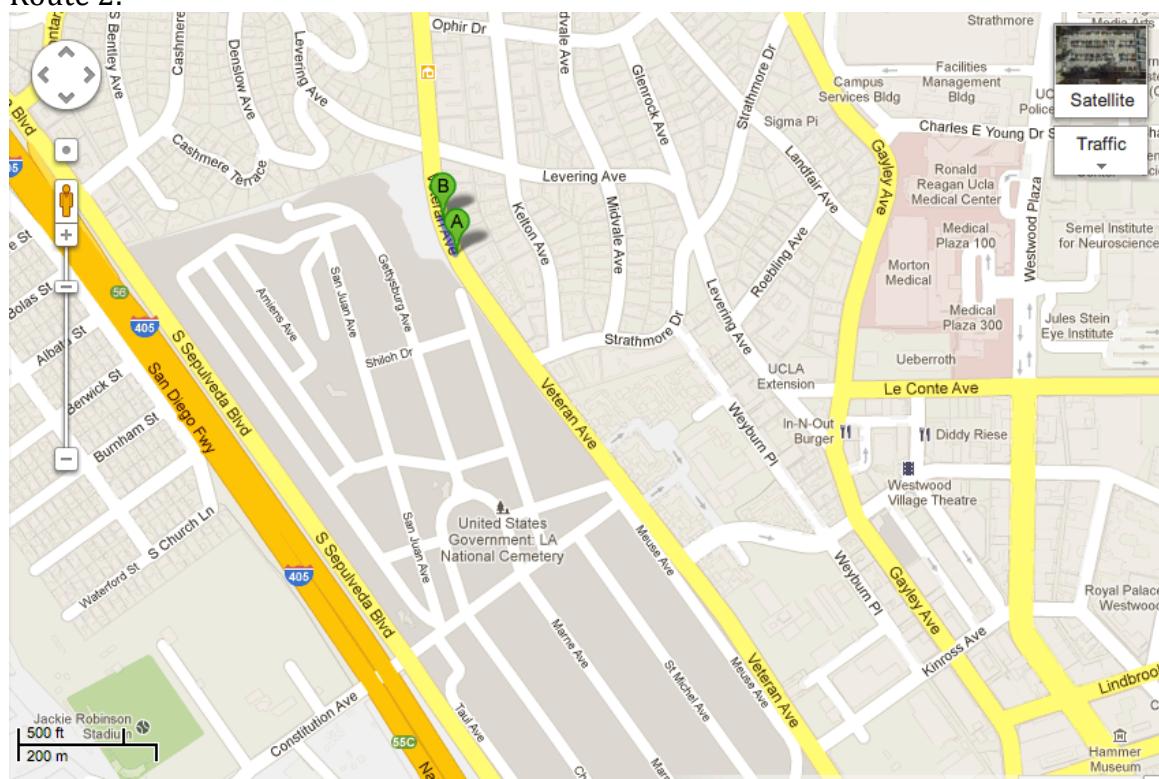
Output:

No of Readings	UVA Accuracy	UVB Accuracy
1	72.03039	93.37286
2	72.84915	93.7059
3	73.27921	94.36731
4	78.09173	94.94913
5	76.75012	95.06996
6	77.60953	97.47088
7	78.30137	97.91901

No of Readings to stabilize UVA Accuracy at 75% and UVB accuracy at 95%:

UVA: 4  
UVB: 4

## Route 2:



Start Point:  
34.065270,-118.454607

End Point:  
34.065948,-118.454169

Distance:  
180ft

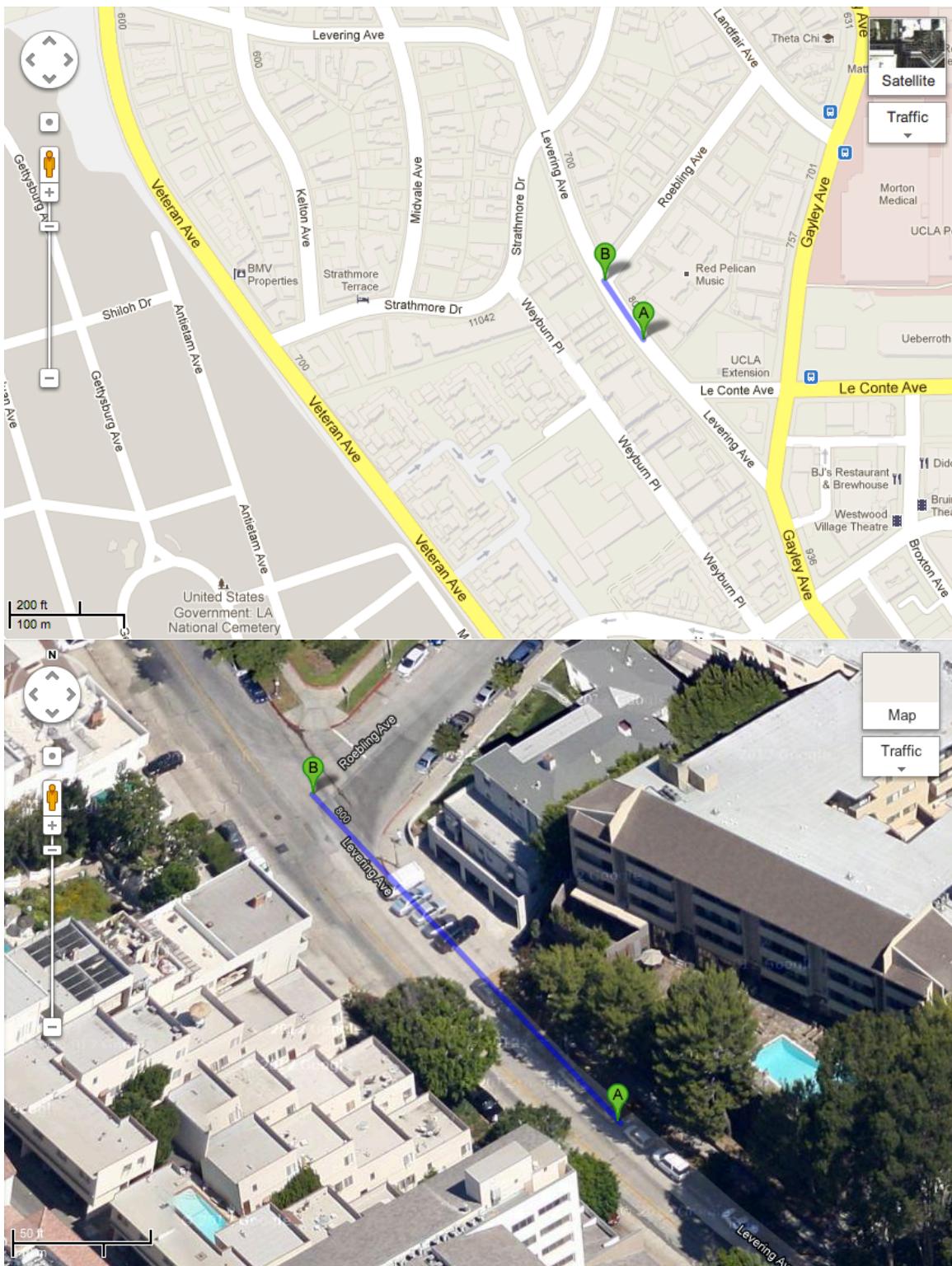
Output:

No of Readings	UVA Accuracy	UVB Accuracy
1	62.33563	90.8751
2	68.69139	95.34372
3	71.9053	96.88052
4	83.7723	96.1235
5	75.60744	95.95051
6	78.77724	97.39062
7	78.30137	97.96218

No of Readings to stabilize UVA Accuracy at 75% and UVB accuracy at 95%:

UVA: 4  
UVB: 2

### Route 3:



Start Point:  
34.064022,-118.449589

End Point:  
34.064489,-118.449965

Distance:  
200ft

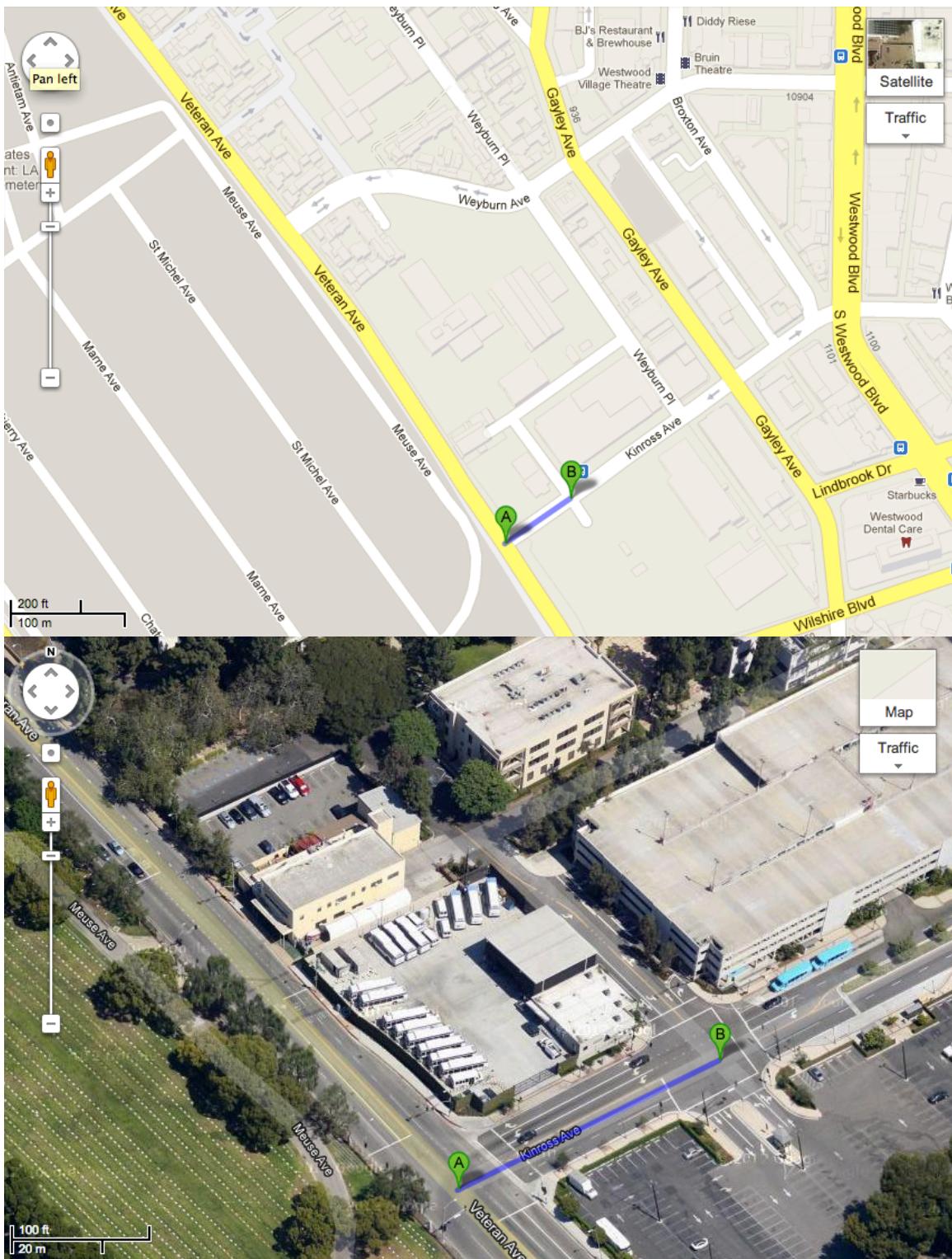
Output:

No of Readings	UVA Accuracy	UVB Accuracy
1	65.33298	90.0156
2	62.29749	88.62024
3	66.94044	95.30881
4	87.81089	95.66149
5	77.13757	97.265371
6	87.79633	96.34902
7	93.55506	97.49347

No of Readings to stabilize UVA Accuracy at 75% and UVB accuracy at 95%:

UVA: 6  
UVB: 3

## Route 4:



Start Point:  
34.059344,-118.448027

End Point:  
34.058979,-118.448648

Distance:  
233ft

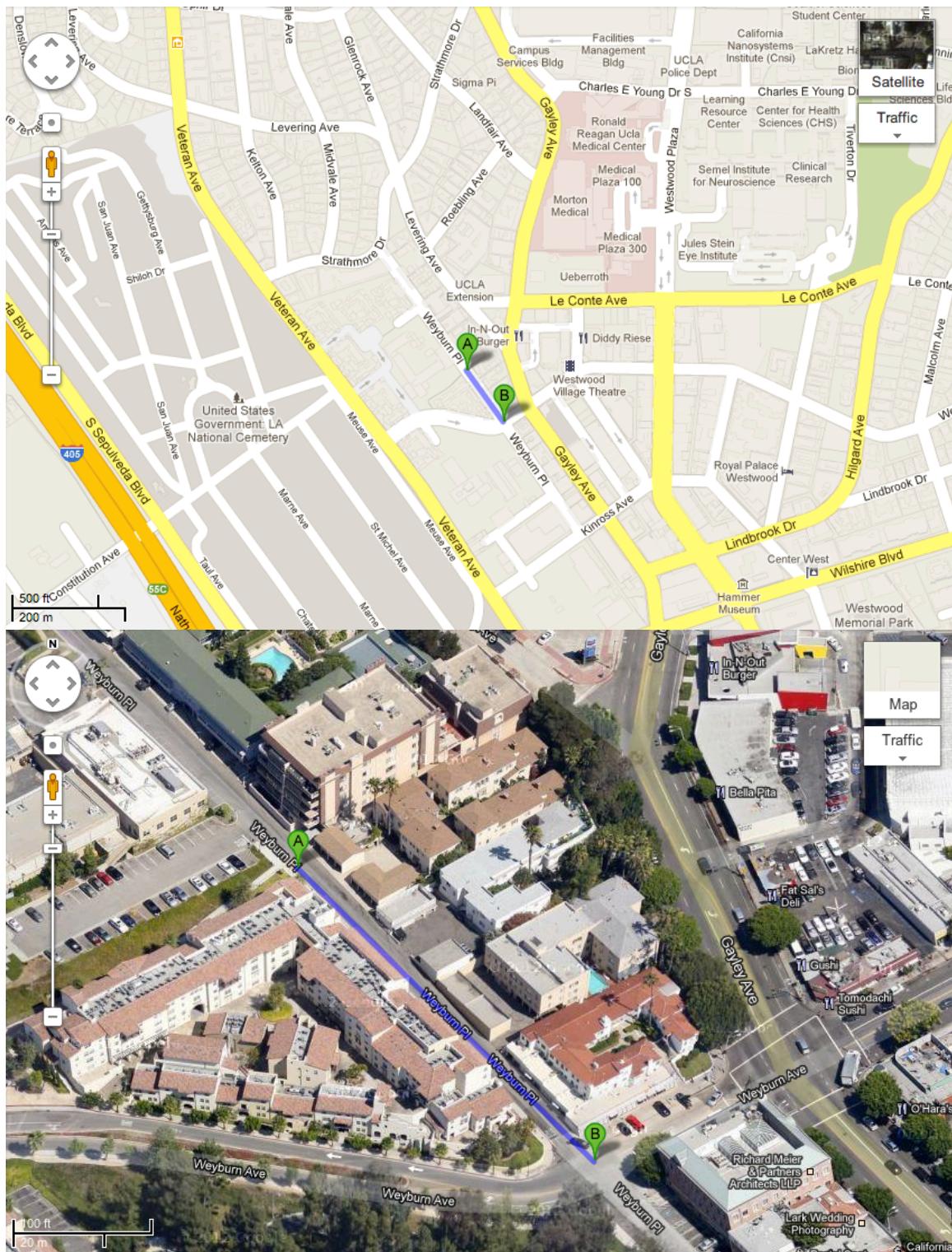
Output:

No of Readings	UVA Accuracy	UVB Accuracy
1	65.7383	91.02471
2	71.87201	91.05025
3	75.28261	93.0015
4	75.29943	94.89313
5	82.68207	95.38655
6	84.31634	96.13141
7	83.41866	96.61768

No of Readings to stabilize UVA Accuracy at 75% and UVB accuracy at 95%:

UVA: 3  
UVB: 4

## Route 5:



Start Location:  
34.061717,-118.448455

End Location:  
34.062535,-118.449184

Distance:  
371ft

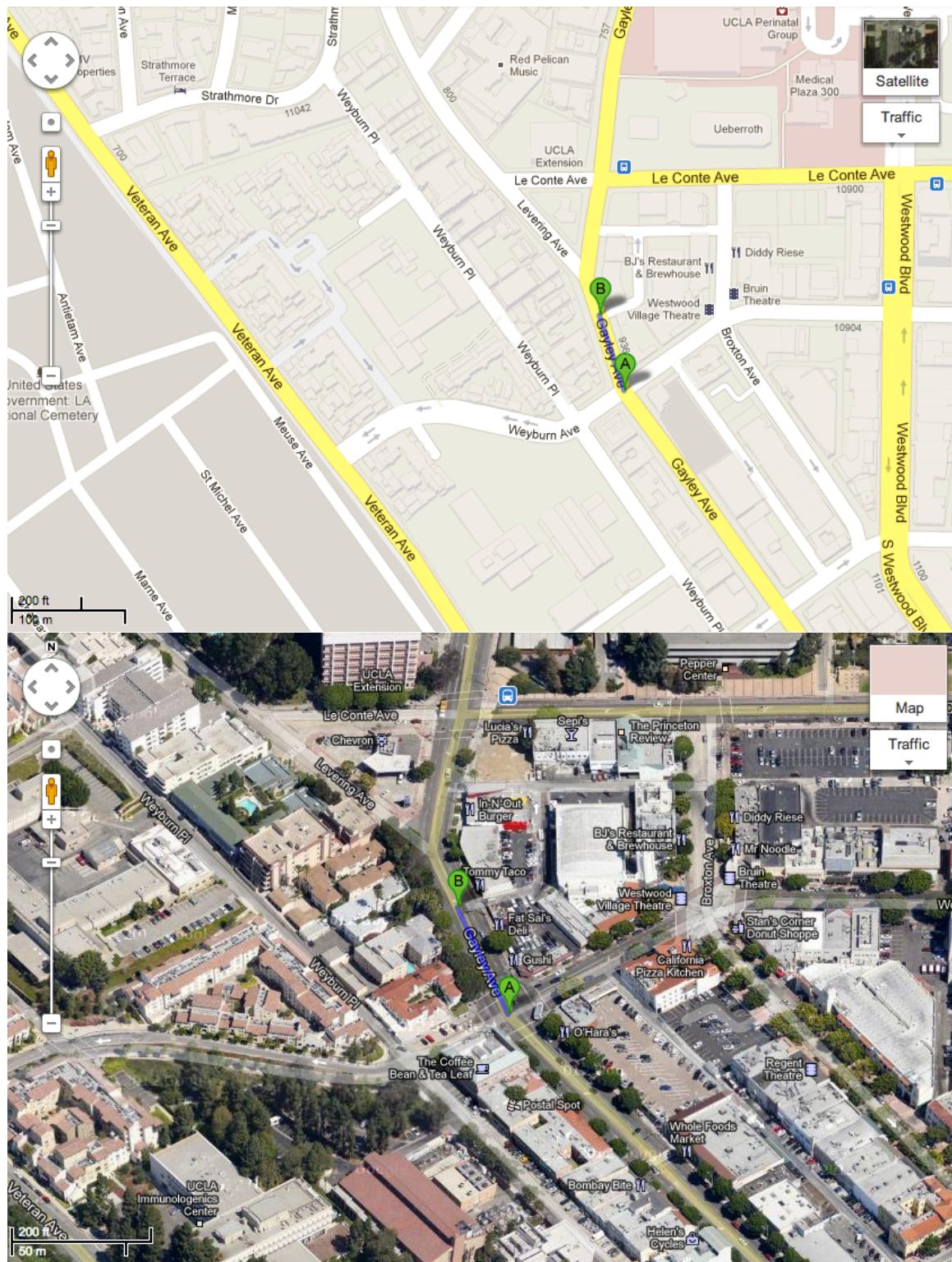
Output:

No of Readings	UVA Accuracy	UVB Accuracy
1	69.59812	95.60988
2	78.61146	98.00997
3	87.20315	97.4513
4	90.96039	97.66619
5	92.75761	98.88199
6	88.489	98.63385
7	88.63886	98.75971

No of Readings to stabilize UVA Accuracy at 75% and UVB accuracy at 95%:

UVA: 2  
UVB: 1

## Route 6:



Start Point:  
34.06197,-118.447984

End Point:  
34.062575,-118.448217

Distance:  
226ft

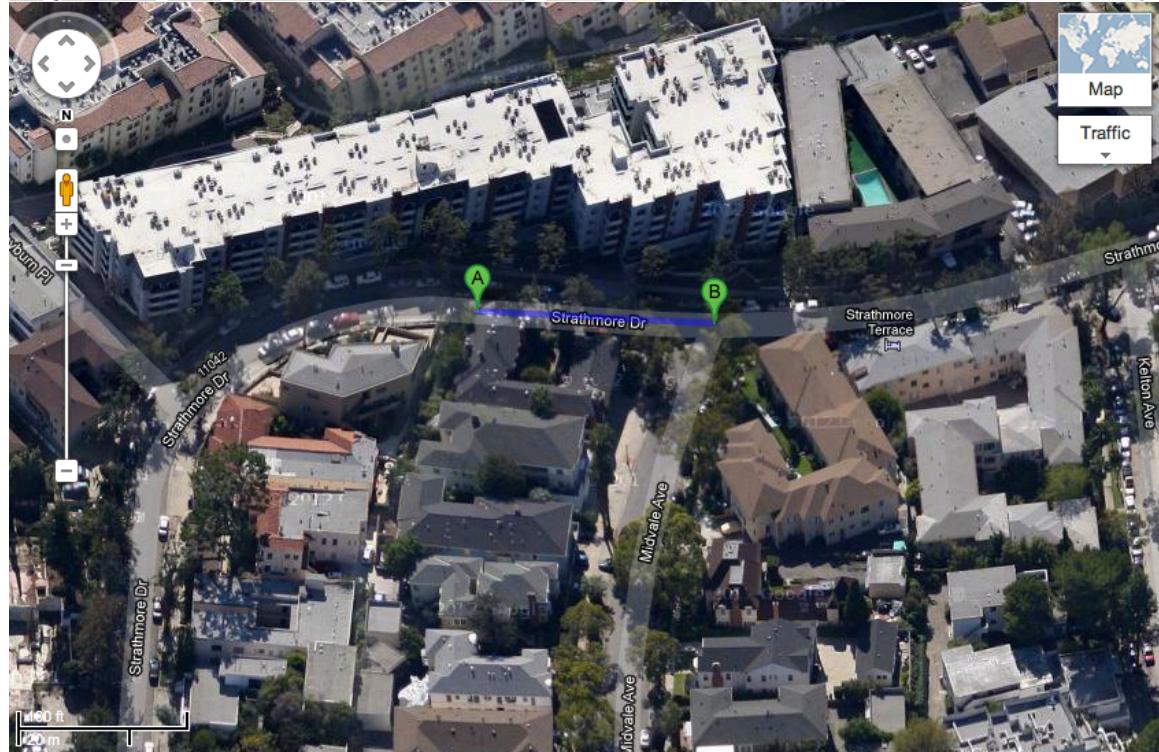
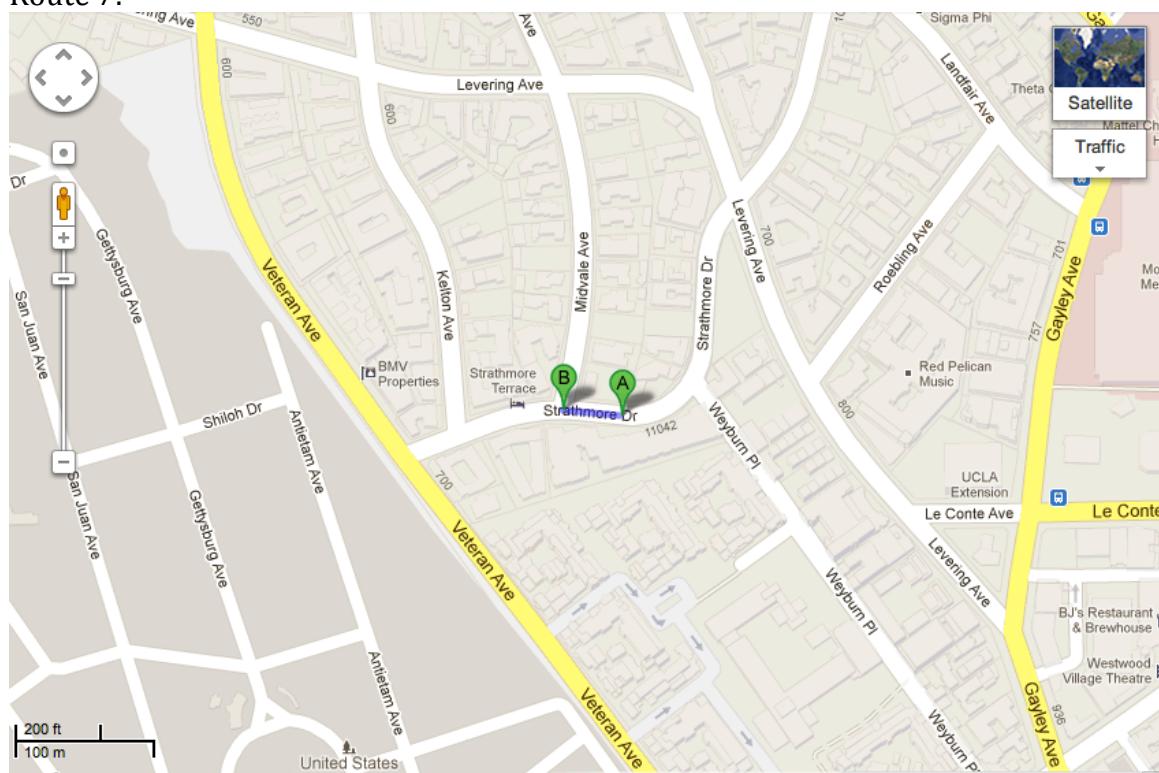
Output:

No of Readings	UVA Accuracy	UVB Accuracy
1	71.31901	92.55076
2	81.64635	94.07683
3	87.95883	97.4513
4	91.56362	96.77067
5	96.39601	98.60045
6	95.10367	97.80031
7	98.67633	98.67633

No of Readings to stabilize UVA Accuracy at 75% and UVB accuracy at 95%:

UVA: 2  
UVB: 3

Route 7:



Start Location:  
34.064308,-118.451878

End Location:  
34.064259,-118.451419

Output:

No of Readings	UVA Accuracy	UVB Accuracy
1	65.80804	94.09919
2	72.6942	92.74988
3	78.4838	94.06129
4	85.92444	95.666
5	89.87737	96.45172
6	92.88613	96.82911
7	91.17483	97.67854

No of Readings to stabilize UVA Accuracy at 75% and UVB accuracy at 95%:

UVA: 3  
UVB: 4