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APPENDIX A

Kernel Bandwidth Selection Experiment - Road Section-wise Results

Road Section 1

Total number of road segments randomly selected for evaluation : 6

| Bandwidth Calculation Method | No. of segments whose number of lanes accurately calculated | | | |
|--|---|-------|-------|-------|
| | N=1019 | N=150 | N=144 | N=120 |
| Rule of Thumb for Gaussian | 3 | 1 | 0 | 0 |
| Unbiased Cross Validation | 6 | 6 | 6 | 5 |
| Biased Cross Validation | 6 | 2 | 0 | 0 |
| Sheather & Jones Plug-in Method | 6 | 6 | 6 | 5 |
| Diffusion based method by Botev et. al | 6 | 6 | 6 | 5 |


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 Total number of road segments randomly selected for evaluation : 20
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| Bandwidth Calculation Method | No. of segments whose number of lanes accurately calculated | | | |
|--|---|-------|-------|-------|
| | N=1019 | N=150 | N=144 | N=120 |
| Rule of Thumb for Gaussian | 17 | 4 | 1 | 0 |
| Unbiased Cross Validation | 20 | 20 | 20 | 19 |
| Biased Cross Validation | 20 | 7 | 1 | 0 |
| Sheather & Jones Plug-in Method | 20 | 20 | 20 | 19 |
| Diffusion based method by Botev et. al | 20 | 20 | 20 | 19 |

Road Section 3

Total number of road segments randomly selected for evaluation : 10

| Bandwidth Calculation Method | No. of segments whose number of lanes accurately calculated | | | |
|--|---|-------|-------|-------|
| | N=1019 | N=150 | N=144 | N=120 |
| Rule of Thumb for Gaussian | 8 | 1 | 0 | 0 |
| Unbiased Cross Validation | 10 | 10 | 10 | 9 |
| Biased Cross Validation | 10 | 4 | 0 | 0 |
| Sheather & Jones Plug-in Method | 10 | 10 | 10 | 8 |
| Diffusion based method by Botev et. al | 10 | 10 | 10 | 8 |



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APPENDIX- B: CODE SNIPPETS

B.1: Matlab Code Snippet for converting geographic coordinates (in WGS 84) to State Plane Coordinates

```
mstruct=gcm(axesm('lambertstd'));
mstruct.zone='california 3';
mstruct.falsenorthing=500000;
mstruct.falseeastng=2000000;
mstruct.geoid=[6378137 0.081819191042815];
mstruct.mapparallels=[38.433333 37.066667];
mstruct.nparallels=2;
mstruct.origin=[36.500000 -120.500000 0];
mstruct.scalefactor=1;
```

```
[x1, y1] = projfwd(mstruct, lat1, lon1);
[x2, y2] = projfwd(mstruct, lat2, lon2);
```



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