# TECHNICAL NOTE – ADDENDUM

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| **DATE:** | 01 July 2024 | **CONFIDENTIALITY:** | Confidential |
| **SUBJECT:** | COMET 2014 Base Year Model Review | | |
| **PROJECT:** | Strategic Road Network – St Albans and Dacorum District | **AUTHOR:** | Bipin Muley |
| **CHECKED:** | Shaista Farooq | **APPROVED:** | Christine Elphicke |

## 1 INTRODUCTION

WSP has been commissioned to undertake a Strategic Road Network (SRN) review for National Highways (NH) for St Albans District Council (SADC) and Dacorum District. Hertfordshire County Council's (HCC) transport model COMET was used for this work, which has a 2014 base year model.

WSP undertook a review of the 2014 base year model in the St Albans District (SAD) and Dacorum District to understand the performance of the COMET model on the SRN (M1, M25, A1(M)), roads approaching the SRN (such as A414 Breakspear Way) and major road network (such as A41, A414, A405 and A1081) within these two districts and presented their findings in a technical note[1] .

Based on the findings from the Base year SRN review, WSP undertook network and matrix improvements and this note is an addendum to the SRN note, presenting the results of the improvements made to the 2014 Base year in St Albans and Dacorum district on the SRN network.

In addition to that, on the request of National Highways, the performance of the model flows against the WebTRIS sites on M25 which lie just outside the St Albans and Dacorum District boundary is also included in this addendum.

## 2 MODEL IMPROVEMENTS

Following the Strategic Road Network (SRN) review for National Highways (NH) for SADC and Dacorum District, preliminary network investigations and checks were carried out where the GEH is over 10 near the SADC Regulation 18 development site allocations. Based on those checks, changes to the network coding were identified to improve the network. These changes were applied to the model in all time periods and the results showed very minor improvements. As the improvements were very small, matrix estimation was re-run in an attempt to further improve the network, prioritising the counts in SADC in the matrix estimation process. It should be noted that the network changes were made to local roads and not to any SRN links or any other links assessed in the SRN review e.g. roads approaching SRN.

Table 1 presents the summary of the network changes identified as part of the network investigations. It is to be noted that these changes have been carried out in all three peak time periods (AM, IP and PM).

[1] 240409 COMET 2014 Base Year Model Review-SRN_FINAL

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**Table 1: Network Coding Improvements**

| Link | Road Name | Time Period | Observed Flow | Modelled Flow | GEH | Action |
|---|---|---|---|---|---|---|
| 6263-6288 | Punchbowl Lane | AM | 5 | 190 | 18.75 | Reduce speed to 10/20mph. Keep the SFC as same. |
| 6319-6101 | B652 Bower Heath Lane | | 63 | 306 | 17.92 | Reduce the speed to 10/20mph |
| 6101-6319 | B652 Bower Heath Lane | | 106 | 249 | 10.79 | Reduce the speed to 10/20mph |
| 6082-6350 | A1081 Harpenden Road | | 433 | 701 | 11.27 | The road currently modelled as 72kph should be 64kph/ 40mph road and Capacity Index should be 36. |
| 6231-6414 | B5378 Shenley Lane | | 571 | 896 | 12.02 | The road currently modelled as 72kph should be 64kph/ 40mph road and Capacity Index should be 36. |
| 6101-6319 | B652 Bower Heath Lane | IP | 26 | 149 | 13.18 | Reduce speed to 10/20mph. Keep the SFC as same. |
| 6414-6231 | B5378 Shenley Lane | | 254 | 481 | 11.79 | The road currently modelled as 72kph should be 64kph/ 40mph road and Capacity Index should be 36. |
| 6231-6414 | B5378 Shenley Lane | | 244 | 487 | 12.74 | The road currently modelled as 72kph should be 64kph/ 40mph road and Capacity Index should be 36. |
| 6229-6252 | Barnet Road | | 304 | 148 | 10.39 | The road currently modelled as 40kph should be 48kph/ 30mph road. |
| 6231-6414 | B5378 Shenley Lane | PM | 398 | 737 | 14.21 | The road currently modelled as 72kph should be 64kph/ 40mph road and Capacity Index should be 36. |
| 6319-6101 | B652 Bower Heath Lane | | 85 | 265 | 13.65 | Reduce speed to 10/20mph. Keep the SFC as same. |
| 6101-6319 | B652 Bower Heath Lane | | 21 | 229 | 18.55 | Reduce speed to 10/20mph. Keep the SFC as same. |

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| Link | Road Name | Time Period | Observed Flow | Modelled Flow | GEH | Action |
|---|---|---|---|---|---|---|
| 6101-5397 | B652 Kimpton Btm | | 82 | 214 | 10.83 | Reduce speed to 10/20mph. Keep the SFC as same. |
| 5397-6101 | B652 Kimpton Btm | | 36 | 159 | 12.41 | Reduce speed to 10/20mph. Keep the SFC as same. |

## RESULTS

As per the TAG unit M3.1 (Section 3.3.11), the validation criteria and guidelines for link flows are defined in Table 2.

**Table 2: Link Flow Validation Criteria and Acceptability Guideline**

| Criteria | Description of Criteria | Acceptability Guideline |
|---|---|---|
| 1 | Individual flows within 100 veh/h of counts for flows less than 700 veh/h | > 85% of cases |
| | Individual flows within 15% of counts for flows from 700 to 2,700 veh/h | |
| | Individual flows within 400 veh/h of counts for flows more than 2,700 veh/h | |
| 2 | GEH < 5 for individual flows | > 85% of cases |

The network coding and matrix improvement were carried out in the 2014 base year COMET 7 model. To test the impact of the changes three scenarios were compared:

1. COMET 7 – Original model
2. COMET 7 (Revised) – original model revised with the network coding improvements
3. COMET 7 (Revised 2) – original model with network coding and matrix improvements

Table 3 presents the summary of the link performance for all the counts as per TAG criteria, noting that “All Roads” in the table are SRN (M1, M25, A1(M)), roads approaching the SRN (such as A414 Breakspear Way) and major road network (such as A41, A414, A405 and A1081). The values color-coded with green are close to/meeting the TAG criteria while the amber and red color-coded indicate values not meeting/far away from TAG criteria respectively.

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**Table 3: Link Performance of St Albans and Dacorum District – All Counts (TAG Criteria)**

| Road Type | Period | COMET 7 | | | | COMET 7 (Revised) | | | | COMET 7 (Revised 2) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Cars | LGV | HGV | Total | Cars | LGV | HGV | Total | Cars | LGV | HGV |
| All Roads | AM | 64% | 63% | 95% | 98% | 66% | 64% | 95% | 98% | 69% | 63% | 95% | 97% |
| | IP | 77% | 77% | 98% | 91% | 78% | 78% | 98% | 98% | 80% | 78% | 98% | 97% |
| | PM | 70% | 70% | 97% | 98% | 72% | 70% | 97% | 98% | 72% | 70% | 97% | 98% |
| SRN Roads only | AM | 88% | 88% | 100% | 88% | 88% | 88% | 100% | 88% | 88% | 88% | 100% | 88% |
| | IP | 100% | 100 % | 100% | 88% | 100% | 100 % | 100% | 88% | 100% | 100% | 100% | 100% |
| | PM | 88% | 100 % | 88% | 88% | 88% | 100 % | 88% | 88% | 88% | 100% | 88% | 88% |

It is observed that there is a slight improvement in the calibration and validation of the counts with network coding and matrix improvements. However, as expected, the SRN roads only show the same overall results for each time period (AM, IP and PM).

A comparison of the GEH values for each of the above 3 scenarios was also carried out for the SADC and Dacorum Districts in each time period**.** Figure 1 to Figure 9 presents these.

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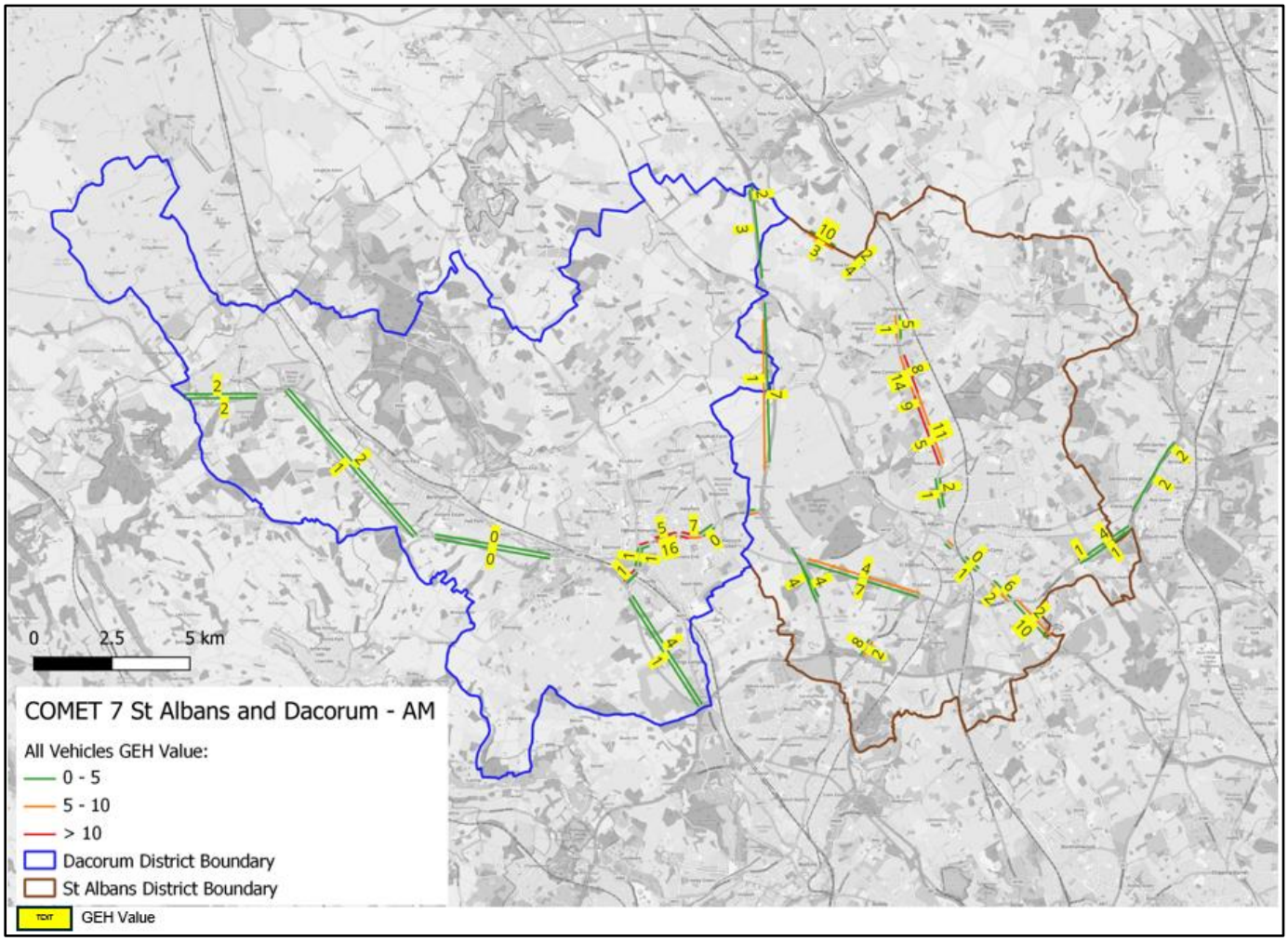


**Figure 1: AM Peak Base Year Count Performance within SAD and Dacorum District – Original Model**

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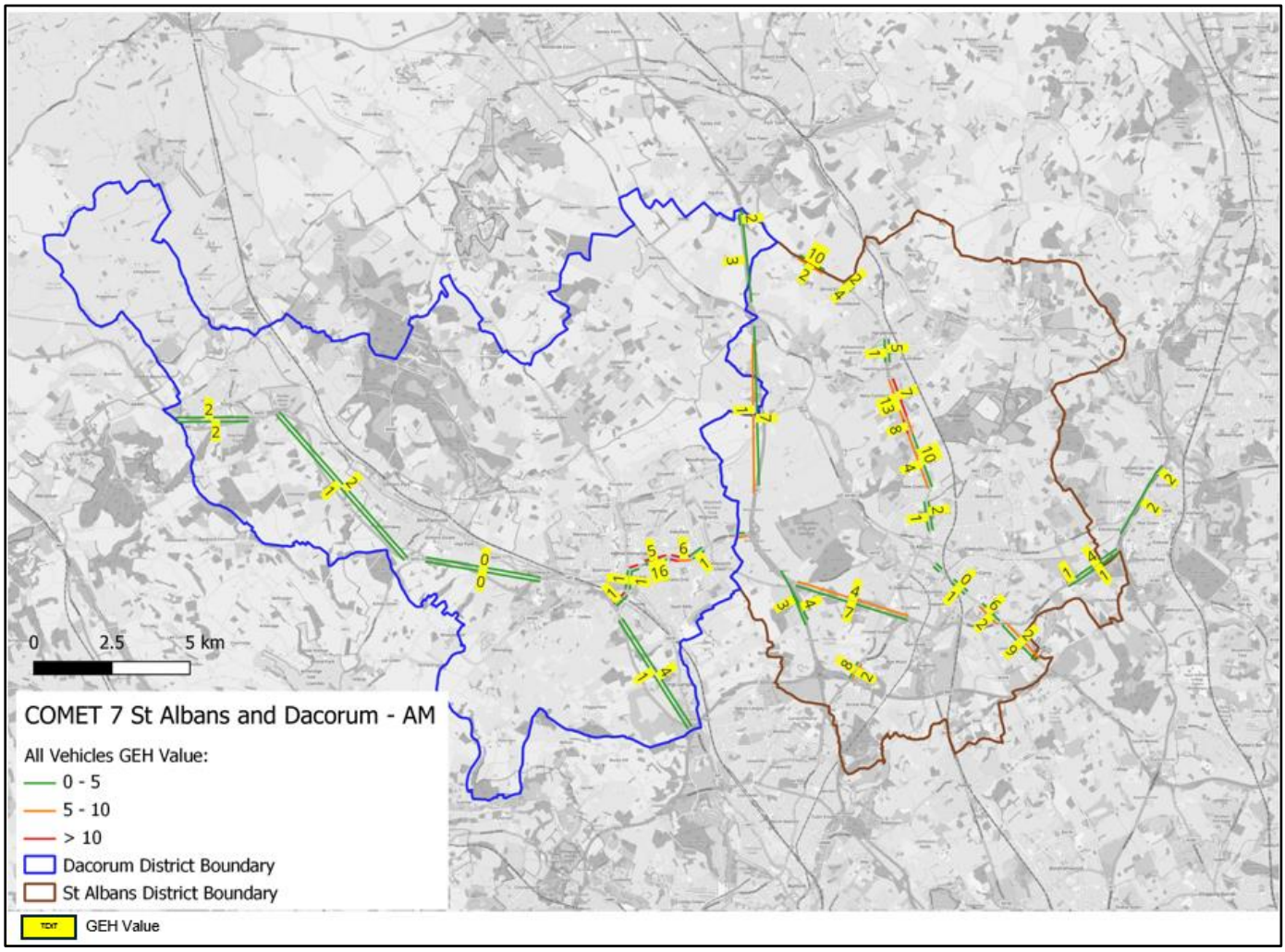


**Figure 2: AM Peak Base Year Count Performance within SAD and Dacorum District – With Network Improvements**

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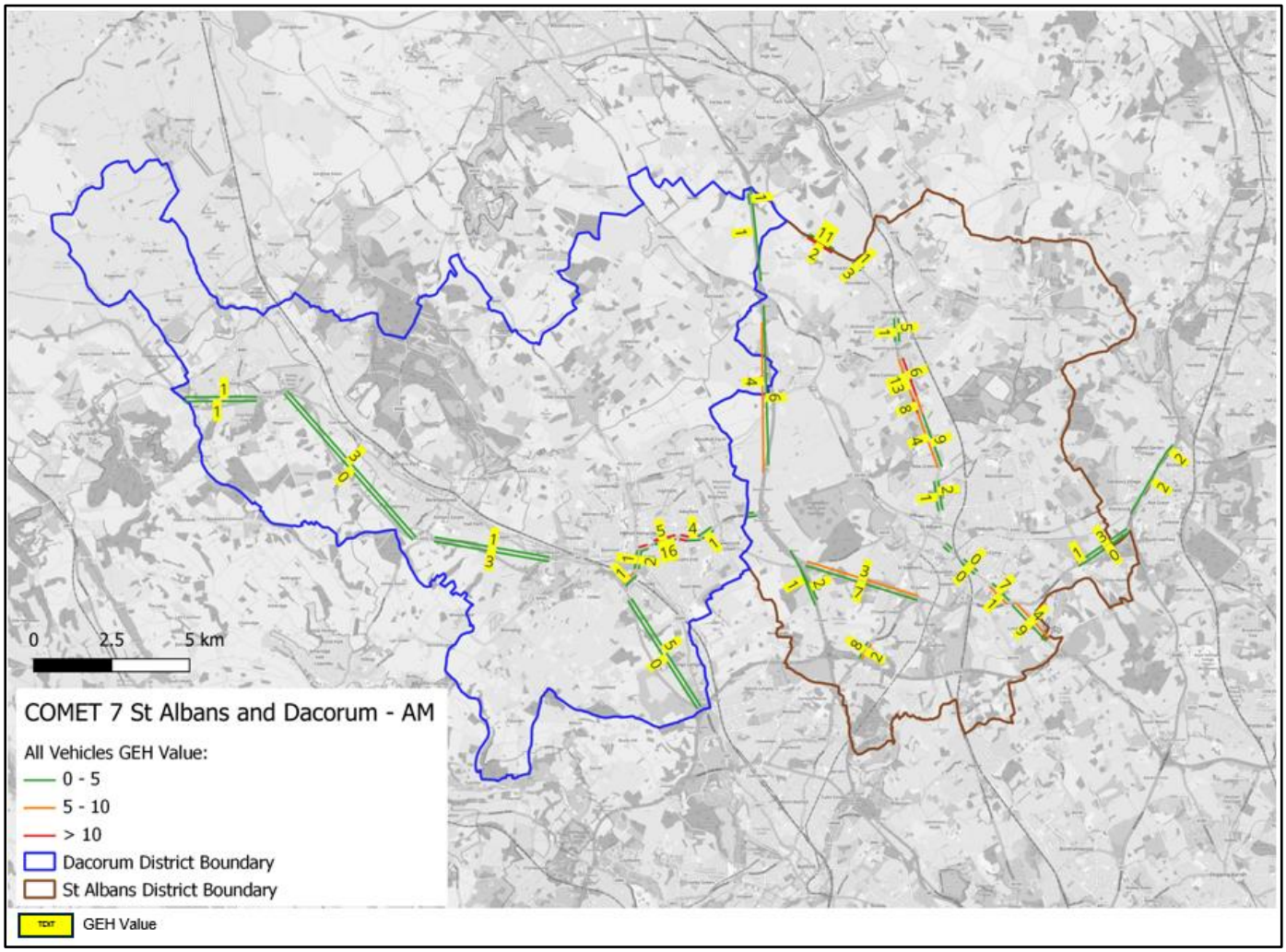


**Figure 3: AM Peak Base Year Count Performance within SAD and Dacorum District – With Network and Matrix Improvements**

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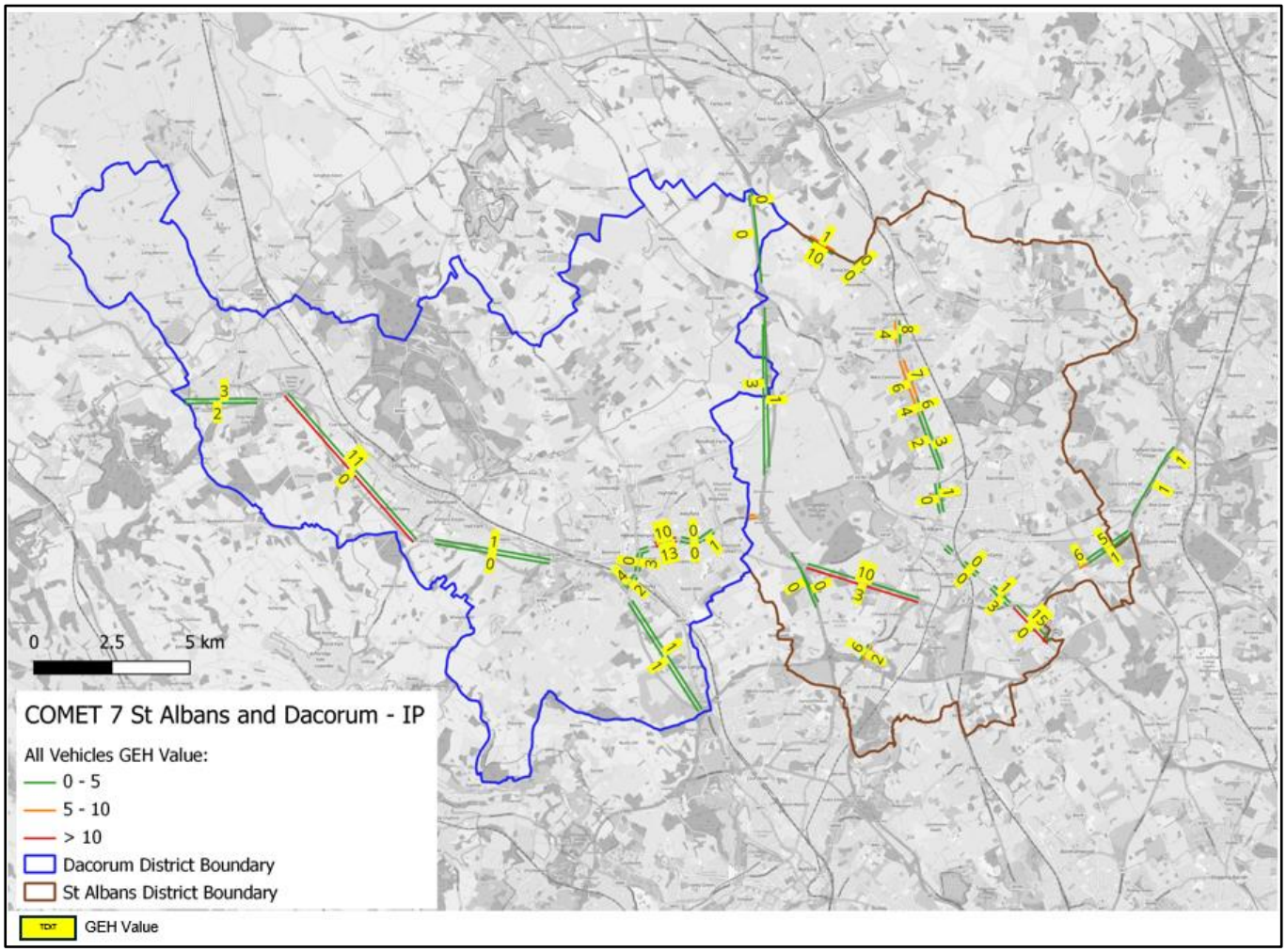


**Figure 4: Inter-Peak Base Year Count Performance within SAD and Dacorum District – Original Model**

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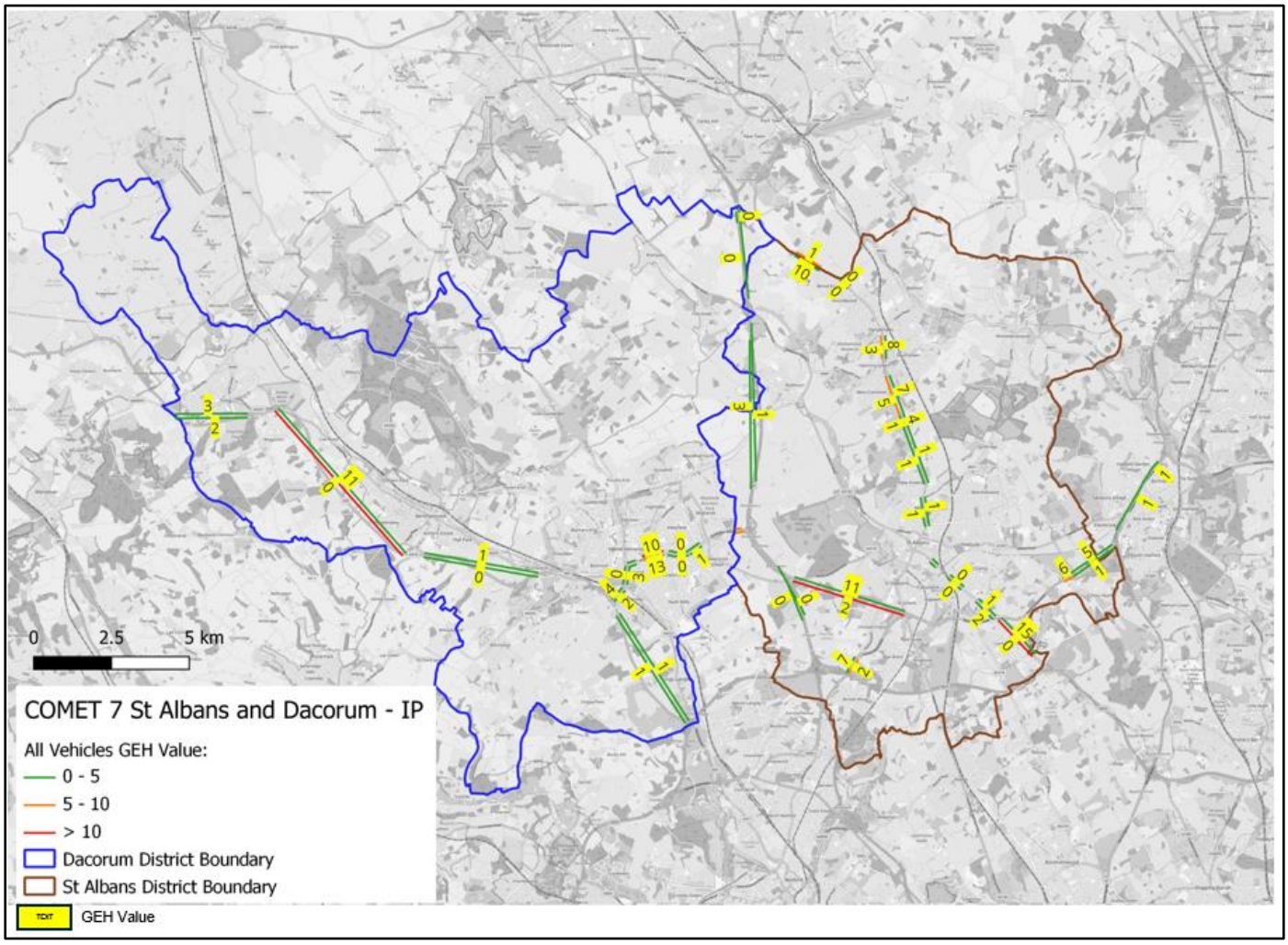


**Figure 5: Inter-Peak Base Year Count Performance within SAD and Dacorum District – With Network Improvements**

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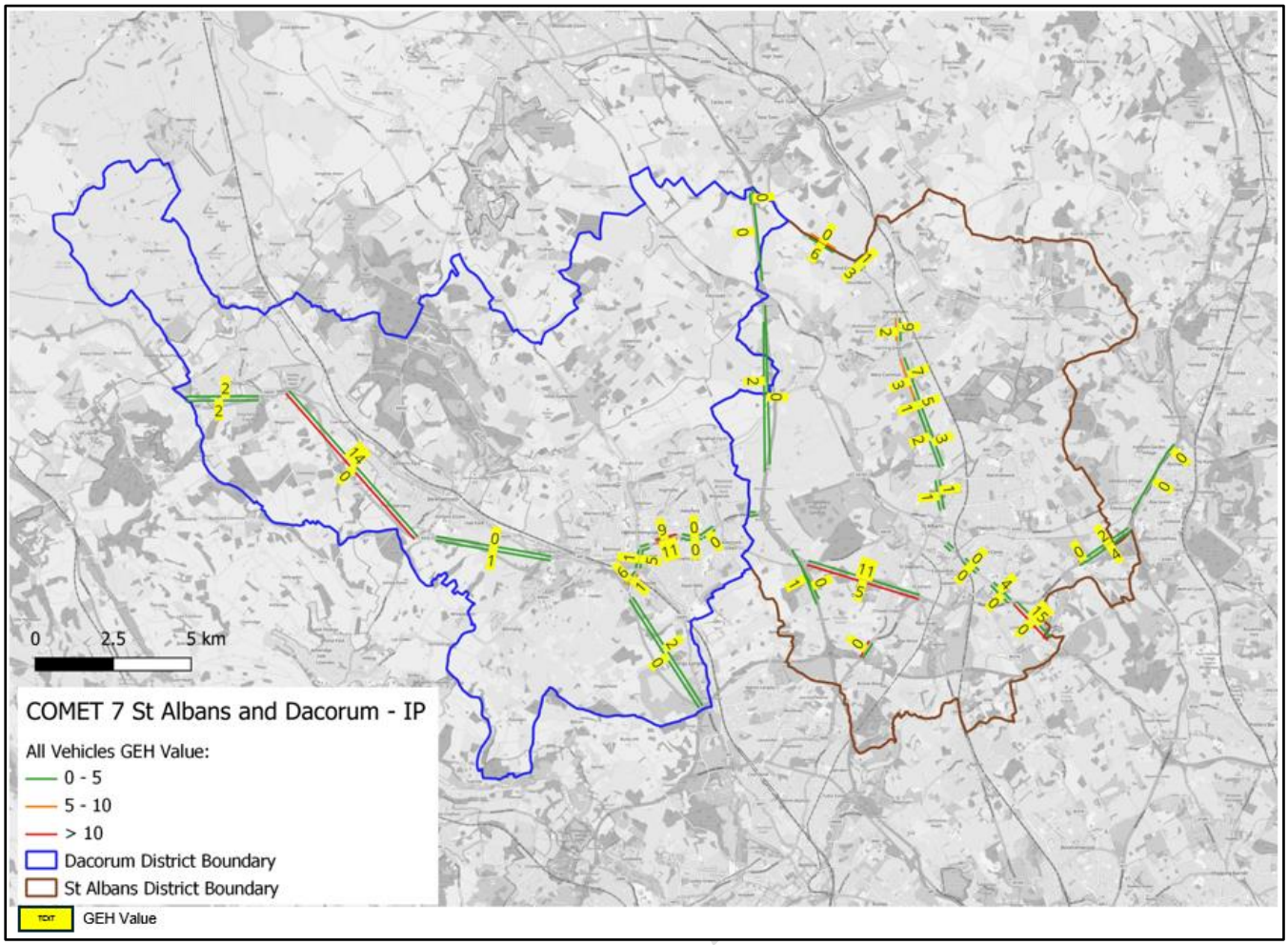


**Figure 6: Inter-Peak Base Year Count Performance within SAD and Dacorum District – With Network and Matrix Improvements**

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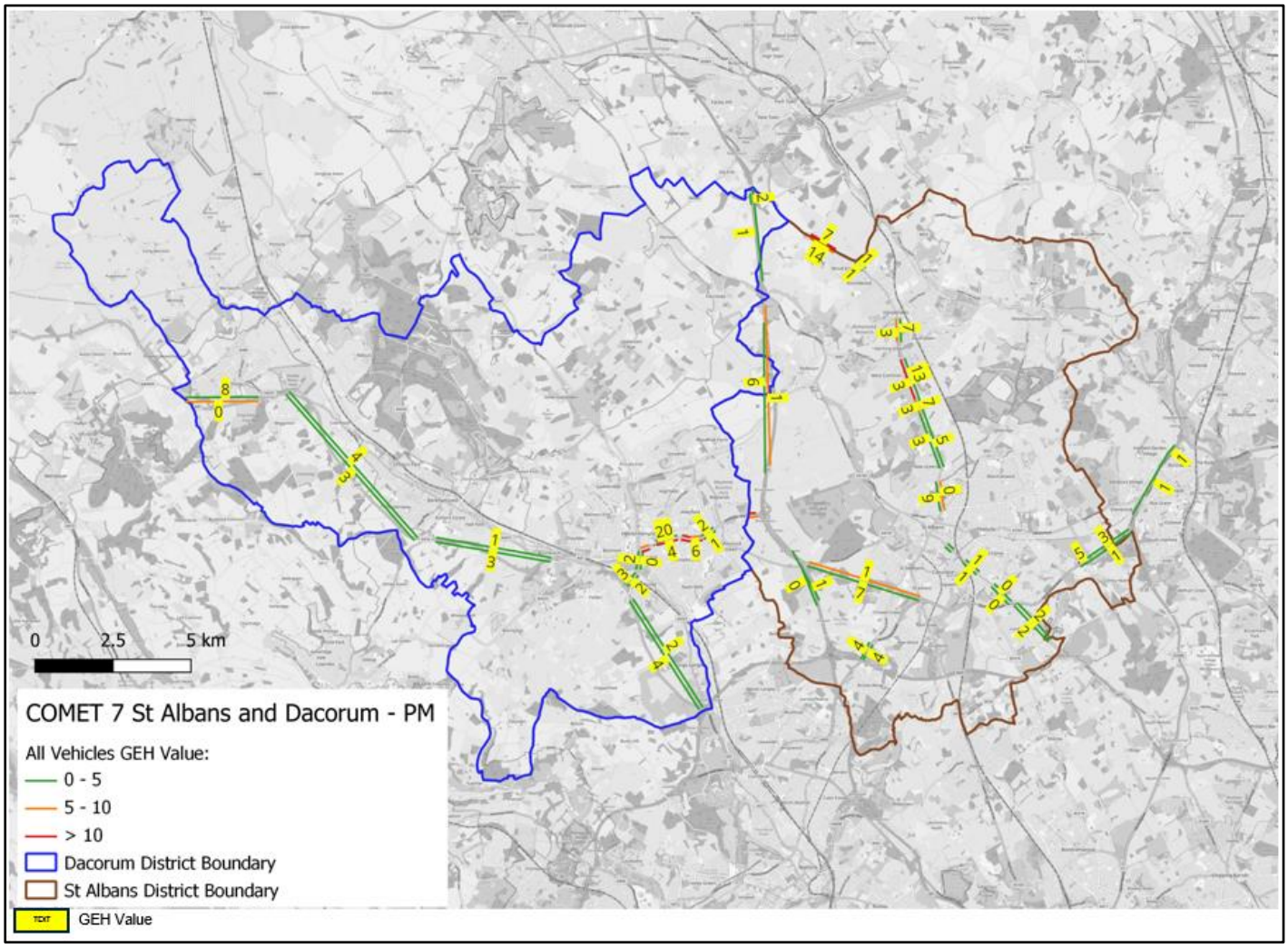


**Figure 7: PM Peak Base Year Count Performance within SAD and Dacorum District – Original Model**

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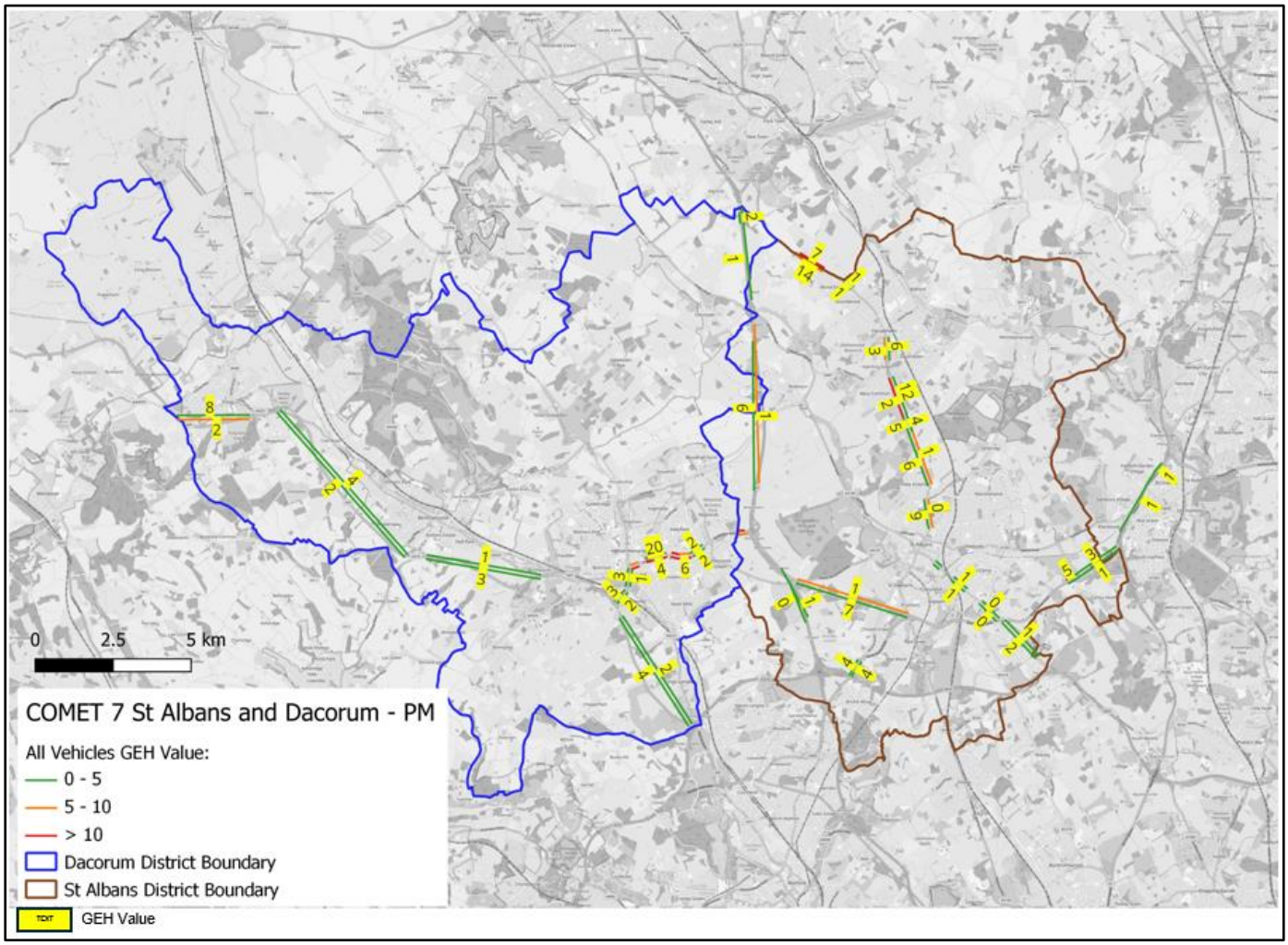


**Figure 8: PM Peak Base Year Count Performance within SAD and Dacorum District – With Network Improvements**

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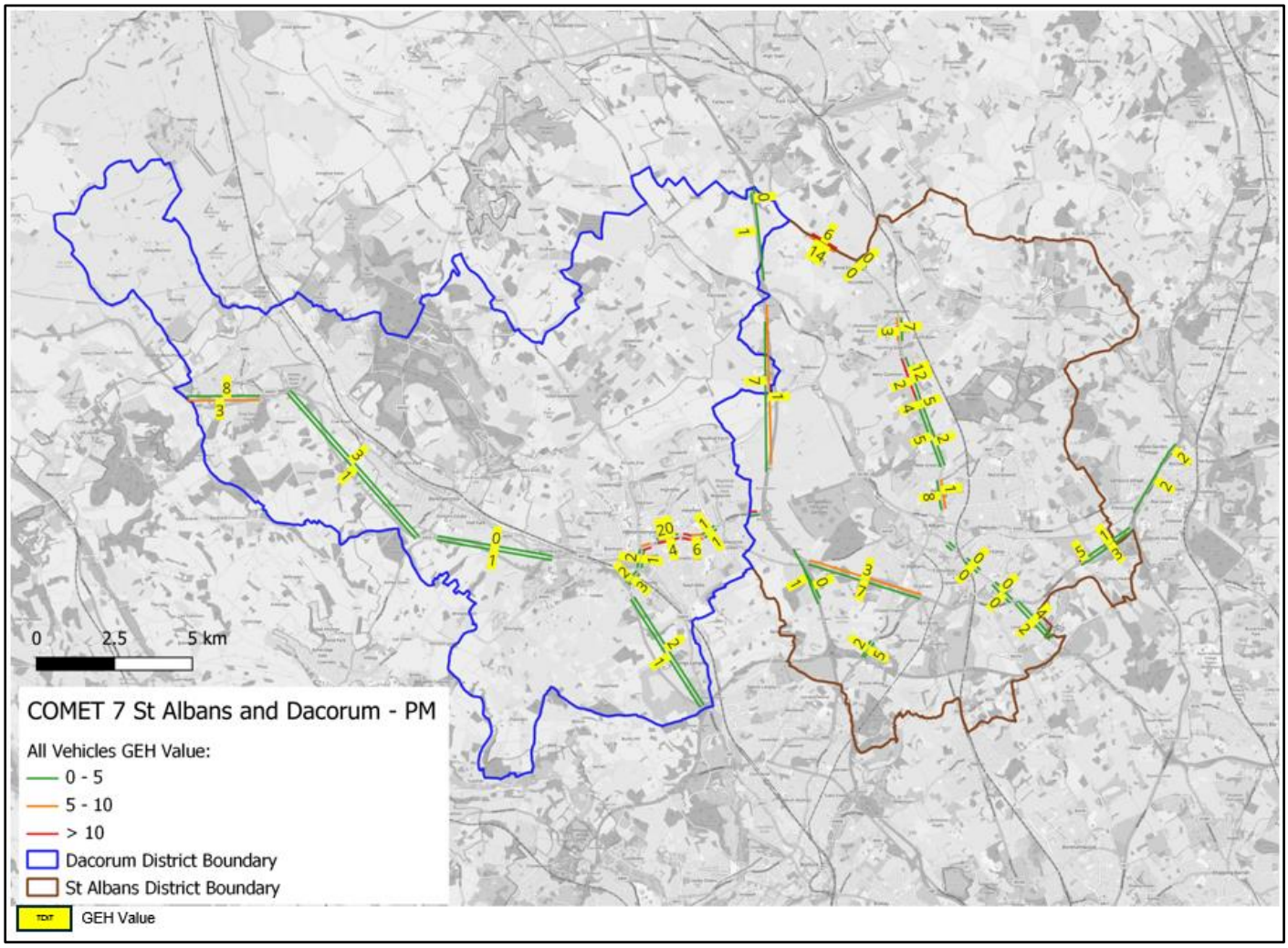


**Figure 9: PM Peak Base Year Count Performance within SAD and Dacorum District – With Network and Matrix Improvements**

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## M25 COUNT PERFORMANCE

In addition to the above analysis, the WebTRIS sites on M25 which lie just outside the SADC and Dacorum District boundary were checked for their performance. A total of 8 counts were identified and 2014 counts were extracted. Figure 10 presents the location of the sites on M25.


**Figure 10: Location of M25 WebTRIS sites near SADC**

Table 4 presents the traffic count performance of the M25 near the SADC boundary.

**Table 4 Link Performance of M25 counts near SADC boundary – All Counts (TAG Criteria)**

| Road Type | Period | COMET 7 | COMET 7 (Network improvements) | COMET 7 (network & matrix improvements) |
|---|---|---|---|---|
| | | Total | Total | Total |
| M25 near SADC | AM | 38% | 38% | 75% |
| | IP | 75% | 75% | 75% |
| | PM | 50% | 50% | 63% |

It is observed that the performance of M25 links in the original COMET 7 model near SADC is not very satisfactory, especially in the AM and PM peaks. The performance of M25 links near SADC in the COMET 7 with network coding improvements also does not have any changes as the network changes carried out were

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on minor roads near the Regulation 18 allocation sites. However, the performance of the M25 links improved when matrix estimation was run (prioritising counts in SADC) with the network improvements (from 38% to 75%), especially in the AM peak, in comparison to the original COMET 7 base year model.

The individual link count performance of the original COMET 7 model and COMET 7 model with network and matrix improvements for the counts on the M25 near the SADC boundary is presented in Table 5 to Table 7 for AM, IP and PM peaks respectively. The values color-coded with green are close to/meeting the TAG criteria while the amber and red color-coded indicate values not meeting/far away from TAG criteria respectively.

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**Table 5: Link Performance of counts on M25 near SADC boundary – AM**

| Location | Description | Direction | Total Observed | COMET 7 | | | | | COMET 7 with network and matrix improvements | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Modelled | Difference (Modelled – Observed) | % Difference | GEH | Meet TAG Criteria | Total Modelled | Difference (Modelled - Observed) | % Difference | GEH | Meet TAG Criteria |
| **5312A** | Junction 22-23 | Clockwise | 5239 | 4850 | 390 | 7% | 5.5 | Yes | 5123 | 116 | 2% | 1.6 | Yes |
| **5312B** | Junction 23-22 | Anti-Clockwise | 4316 | 3874 | 442 | 10% | 6.9 | No | 4263 | 53 | 1% | 0.8 | Yes |
| **5271A** | Junction 21A-22 | Clockwise | 5485 | 4472 | 1013 | 18% | 14.4 | No | 4645 | 840 | 15% | 11.8 | No |
| **5271B** | Junction 22-21A | Anti-clockwise | 4381 | 3592 | 789 | 18% | 12.5 | No | 4007 | 374 | 9% | 5.8 | Yes |
| **5232A** | Junction 21-21A | Clockwise | 3095 | 2944 | 152 | 5% | 2.8 | Yes | 3108 | -13 | 0% | 0.2 | Yes |
| **5231B** | Junction 21A-21 | Anti-Clockwise | 2336 | 2061 | 274 | 12% | 5.9 | Yes | 2297 | 39 | 2% | 0.8 | Yes |
| **5207A** | Junction 20-21 | Clockwise | 5772 | 5103 | 669 | 12% | 9.1 | No | 5528 | 244 | 4% | 3.3 | Yes |
| **5206B** | Junction 21-20 | Anti-Clockwise | 4427 | 3555 | 872 | 20% | 13.8 | No | 3722 | 705 | 16% | 11.0 | No |

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**Table 6: Link Performance of counts on M25 near SADC boundary – IP**

| Location | Description | Direction | Total Observed | COMET 7 | | | | | COMET 7 with network and matrix improvements | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Modelled | Difference (Modelled – Observed) | % Difference | GEH | Meet TAG Criteria | Total Modelled | Difference (Modelled - Observed) | % Difference | GEH | Meet TAG Criteria |
| **5312A** | Junction 22-23 | Clockwise | 4155 | 4078 | 77 | 2% | 1.2 | Yes | 3977 | 178 | 4% | 2.8 | Yes |
| **5312B** | Junction 23-22 | Anti-Clockwise | 4024 | 3965 | 59 | 1% | 0.9 | Yes | 3903 | 121 | 3% | 1.9 | Yes |
| **5271A** | Junction 21A-22 | Clockwise | 4104 | 3098 | 1006 | 25% | 16.8 | No | 3596 | 508 | 12% | 8.2 | No |
| **5271B** | Junction 22-21A | Anti-clockwise | 3902 | 3328 | 574 | 15% | 9.6 | No | 3594 | 308 | 8% | 5.0 | Yes |
| **5232A** | Junction 21-21A | Clockwise | 2427 | 2542 | -115 | -5% | 2.3 | Yes | 2876 | -449 | -18% | 8.7 | No |
| **5231B** | Junction 21A-21 | Anti-Clockwise | 2174 | 1909 | 265 | 12% | 5.9 | Yes | 2144 | 30 | 1% | 0.6 | Yes |
| **5207A** | Junction 20-21 | Clockwise | 5033 | 4954 | 79 | 2% | 1.1 | Yes | 5029 | 4 | 0% | 0.1 | Yes |
| **5206B** | Junction 21-20 | Anti-Clockwise | 4567 | 4240 | 328 | 7% | 4.9 | Yes | 4167 | 400 | 9% | 6.1 | Yes |

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**Table 7: Link Performance of counts on M25 near SADC boundary – PM**

| Location | Description | Direction | Total Observed | COMET 7 | | | | | COMET 7 with network and matrix improvements | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Modelled | Difference (Modelled – Observed) | % Difference | GEH | Meet TAG Criteria | Total Modelled | Difference (Modelled - Observed) | % Difference | GEH | Meet TAG Criteria |
| **5312A** | Junction 22-23 | Clockwise | 5040 | 4736 | 304 | 6% | 4.4 | Yes | 5083 | -43 | -1% | 0.6 | Yes |
| **5312B** | Junction 23-22 | Anti-Clockwise | 4838 | 4610 | 228 | 5% | 3.3 | Yes | 4818 | 20 | 0% | 0.3 | Yes |
| **5271A** | Junction 21A-22 | Clockwise | 5193 | 4159 | 1034 | 20% | 15.1 | No | 4426 | 766 | 15% | 11.1 | No |
| **5271B** | Junction 22-21A | Anti-clockwise | 5036 | 3762 | 1274 | 25% | 19.2 | No | 3980 | 1056 | 21% | 15.7 | No |
| **5232A** | Junction 21-21A | Clockwise | 3170 | 3528 | -357 | -11% | 6.2 | Yes | 3508 | -338 | -11% | 5.9 | Yes |
| **5231B** | Junction 21A-21 | Anti-Clockwise | 2900 | 2528 | 372 | 13% | 7.1 | Yes | 2770 | 129 | 4% | 2.4 | Yes |
| **5207A** | Junction 20-21 | Clockwise | 6080 | 5636 | 444 | 7% | 5.8 | No | 5756 | 325 | 5% | 4.2 | Yes |
| **5206B** | Junction 21-20 | Anti-Clockwise | 5721 | 4949 | 773 | 14% | 10.6 | No | 5229 | 493 | 9% | 6.7 | No |