

CycleRAP in Drenthe



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Drenthe Province – The Netherlands

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1. Introduction

1.1 Background

Around 10,000 bicyclists are seriously injured on Dutch roads each year and road design plays a role in half of those accidents. The module provides insights into the roads (including road surfaces and intersections where there is a higher risk of accidents) to enable municipalities and provinces to make roads safer.

1.2 About CycleRAP

CycleRAP is part of the International Road Assessment Programme (iRAP), a method and certification system developed to systematically estimate how the form and design of a road protect road users.

The CycleRAP method can be used to survey all types of cycling infrastructure. The method classifies cycle paths and roads according to safety. Roads are analysed in 25-metre sections based on 34 road characteristics.

In the Netherlands the ANWB and SWOV are affiliated with EuroRAP/iRAP. The ANWB is the founder of EuroRAP and is the principal for the development of the CycleRAP methodology. SWOV carried out the scientific research on which the CycleRAP methodology is based. Moreover, SWOV is an iRAP centre of excellence. It plays a permanent role in the development of the methodology and the quality control of road inspections.

1.3 Objectives of the program

The objective of the Program is to assess the safety of about 80 km of bicycle routes in Drenthe province.

The objective includes the following tasks:

- Survey about 80 km of bicycle routes that are managed by the Drenthe Province and code the video survey data according to CycleRAP Coding specification
- Collect traffic flow and speed data for the 80 km according to iRAP Data Analysis and Reporting specification.
- Produce an CycleRAP input file which includes all road attributes and collected data. Produce Star Rating Score results to identify areas of high risk.

1.4 Project Deliverables

The deliverables of the project include the following:

- CycleRAP upload file in Excel format
- CycleRAP Star Rating Scores file in Excel format (linked with images)
- Access to web based on-line viewer by which user can easily access road location data (geo-referenced online images) and existing inventory of road infrastructure.
<http://89.216.97.24/RoadSurvey.UI.WebNew>
- Summary Report

2. Road network

The bicycle routes inspected were managed by Drenthe province. There are 7 bicycle routes inspected, which are shown in following figures. The survey network is 80 km long, but as some divided bicycle paths are surveyed in both directions, the survey length is 91 km carriageway kilometres.

Figure 1. Route 1 Zuidwolde - Hoogeveen

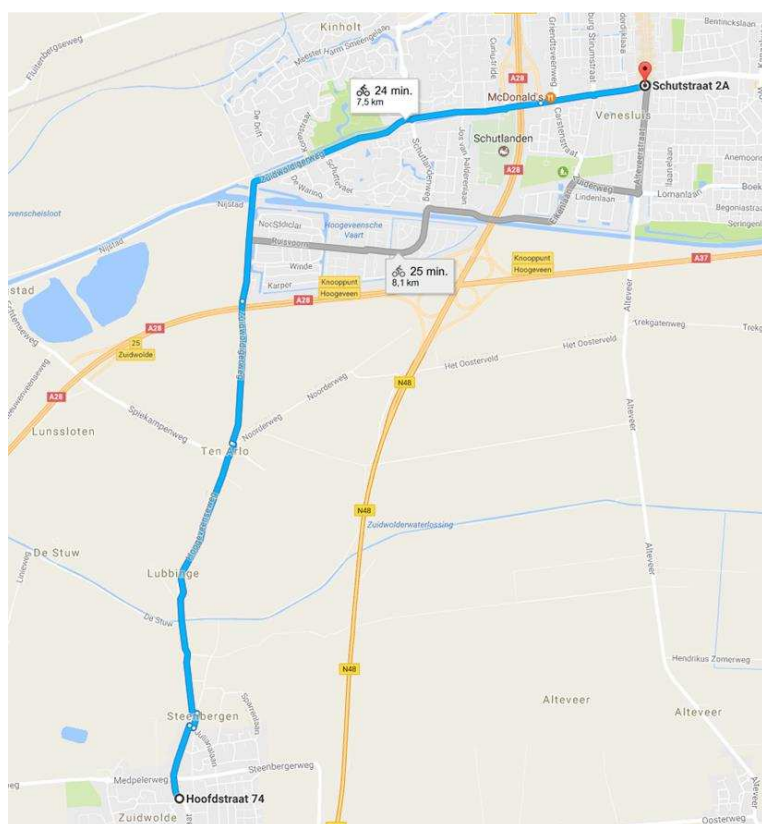


Figure 2. Route 2 Roden – Groningen

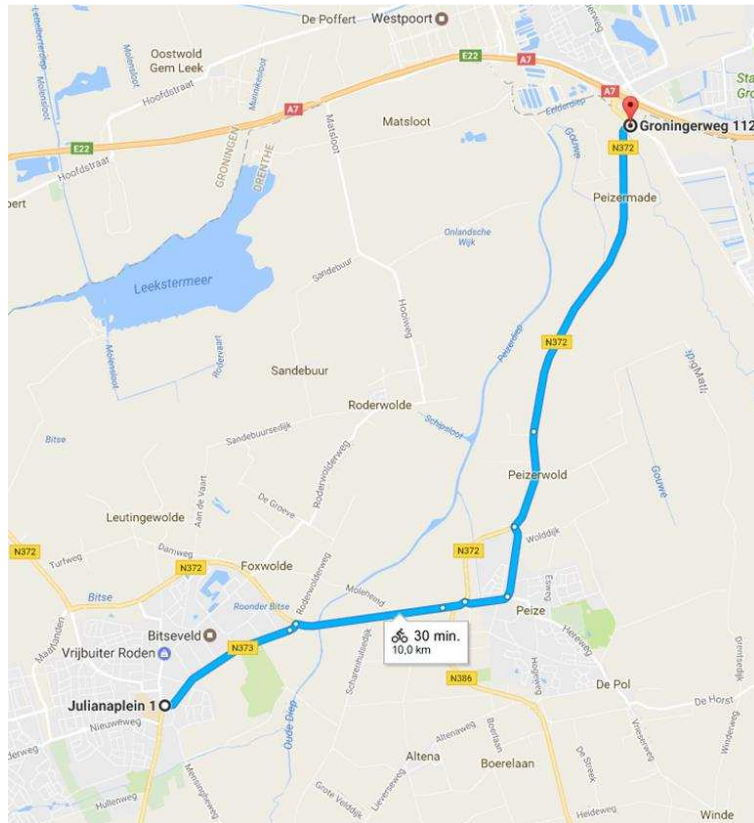


Figure 3. Route 3 Roden – Assen

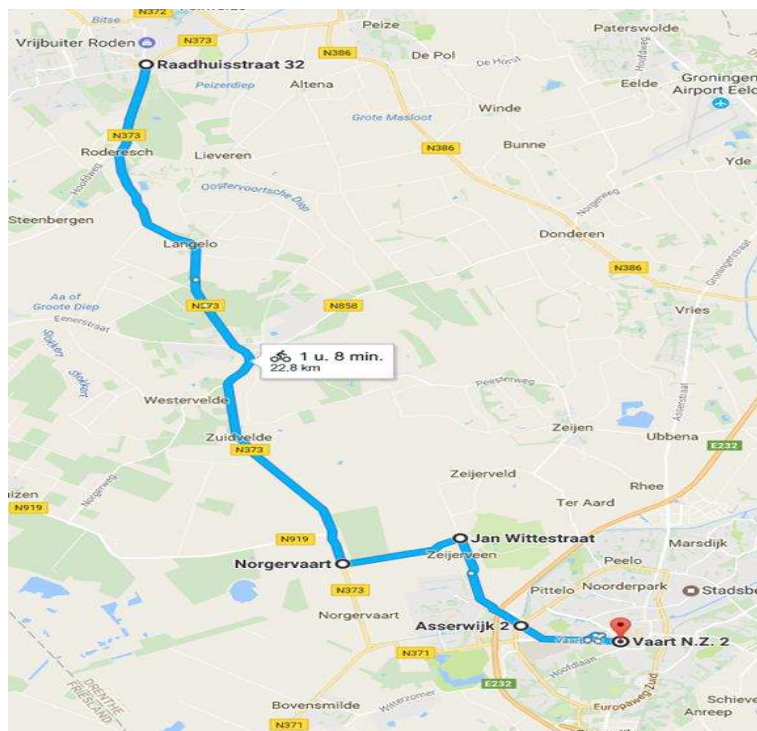
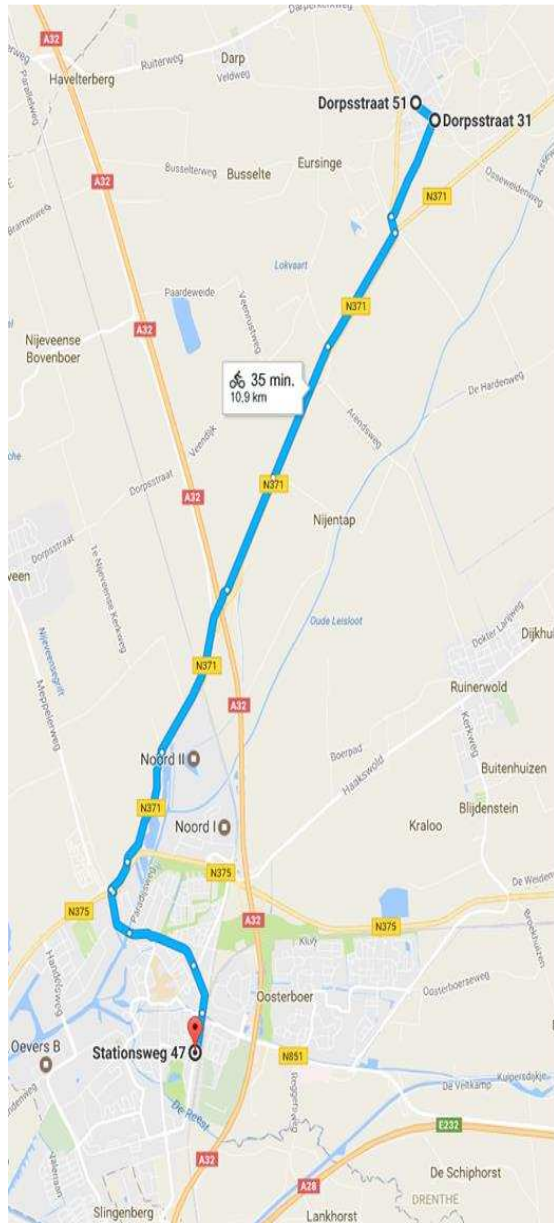


Figure 4. Route 4.1 Havelte – Meppel



Route 4.2 Meppel - Havelte

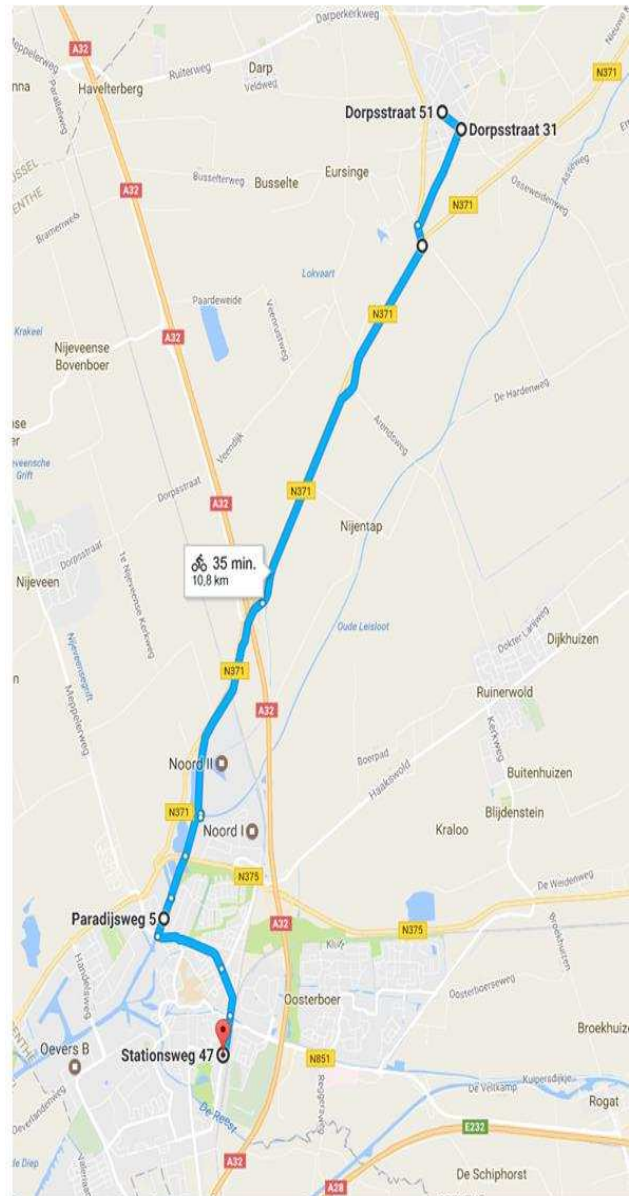


Figure 5. Route 5 Odoorn - Emmen

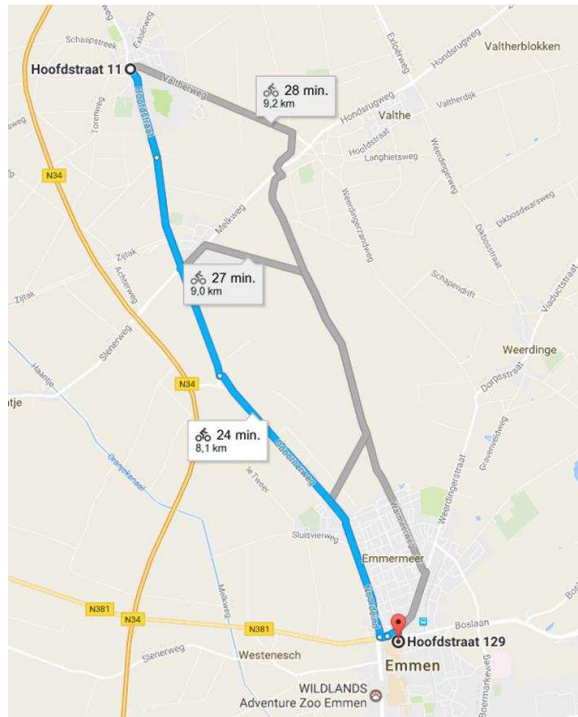
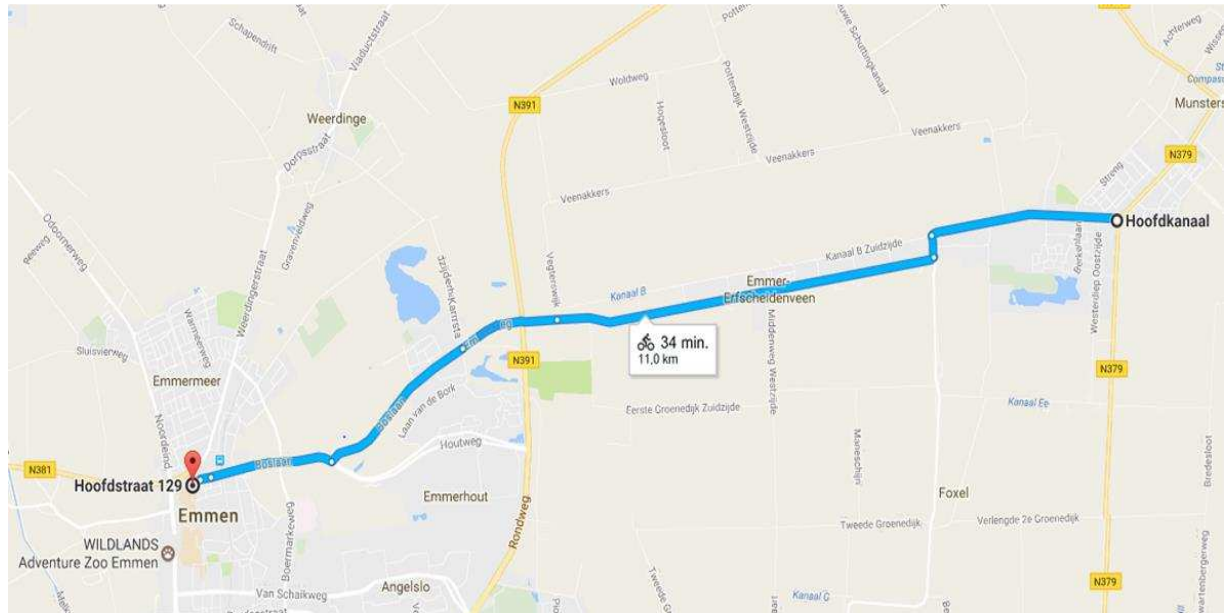


Figure 6. Route 6 Emmer-Compascuum - Emmen





3. Data Collecting

3.1 Road Survey

The CycleRAP road survey commenced in March 2017 using a CAMSS digital imaging system fitted onto bicycle. The cameras recorded a view of the bicycle path and roadside verges in front of the inspection vehicle. The image was sufficiently wide to identify intersections, roadside usage and also roadside

hazards. These images were collected every 5 metres of travel. A specialised mounting bracket for distance measuring device was also attached to the inspection vehicle, at the front wheel.

Figure 7. Inspection vehicles



3.2 Coding the data

After the completion of the road inspection phase, the process of coding of video images material took place. The coding of the recorded video material was carried out on the basis of the CycleRAP Star Rating

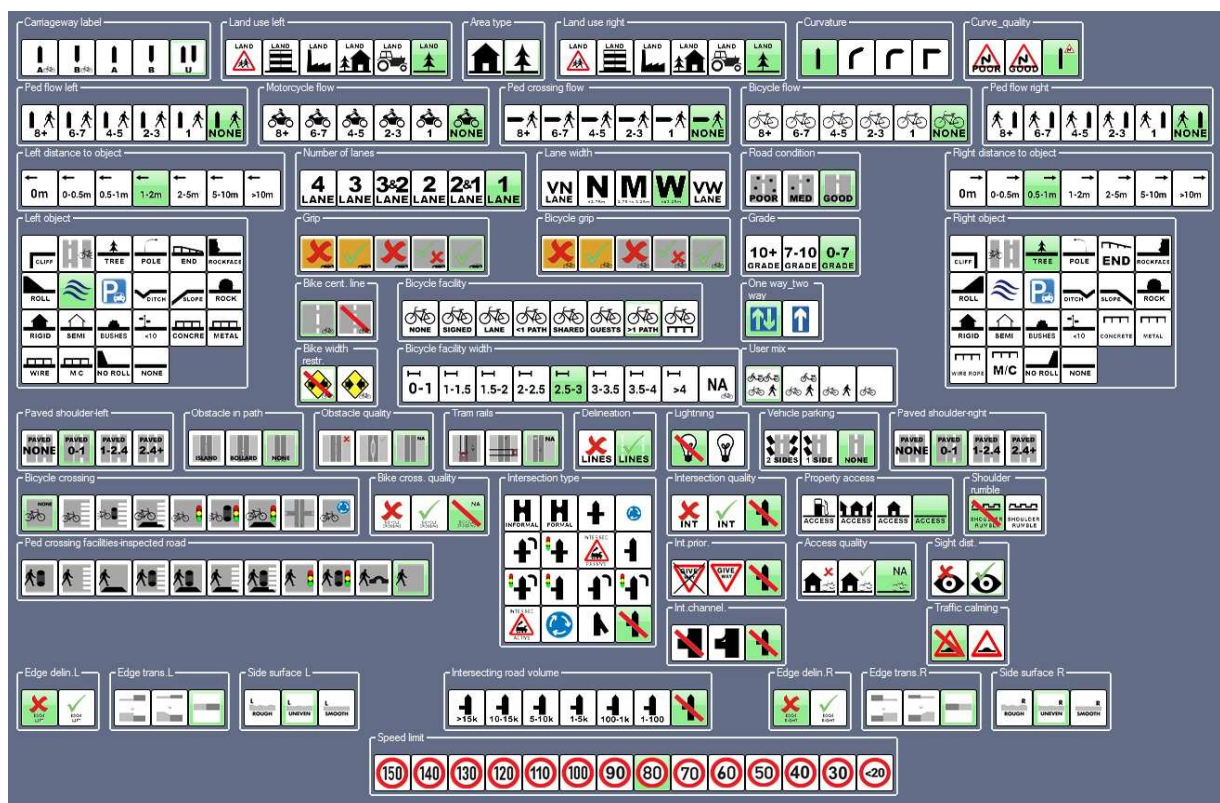
Coding Manual. The coding stuff used the CAMSS coding software specially adopted for CycleRAP to code some 50 road infrastructure features at 25 metre intervals along the bicycle route. More details on the features coded are available in the CycleRAP Coding Manual.

After the coding, the results of the coders are checked at random. References of the important attributes are checked on the Google Earth satellite image.

The Quality Assurance process was the next important phase of the coding process and assessed whether the road attributes captured in the road inspection had been coded correctly.

The Quality Assurance of the specific dataset was performed by the iRAP team.

Figure 8. CycleRAP coding form



4. Road safety assessment

Based on the analysis of the coded survey data and safety indicators, the bicycle routes are rated for safety using CycleRAP methodology.

The standard iRAP methodology produces Star Rating Scores of four groups of road users; vehicle occupants, motorcyclist, bicyclist and pedestrians. The CycleRAP model is an extension of the iRAP risk model for bicyclists. The Star Rating Score gives a more comprehensive picture of the risk for cyclists using the road or a cycle facility. The model uses more crash types to estimate the risk. Compared to the iRAP V3 model, CycleRAP uses more road attributes and flow data.

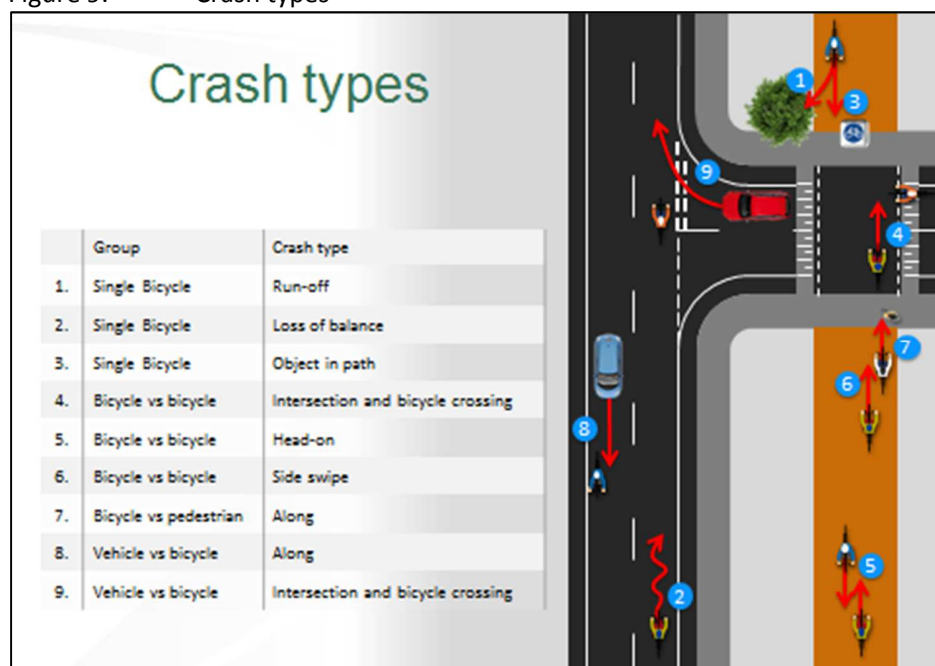
4.1 Crash types

The standard iRAP model is based on three crash types attributing to the bicyclist risk. It provides two crash types for crashes between vehicles and bicyclist: vehicles and bicyclist travelling along the road; and crashes on intersections and property access points. The third crash type represents the risk of the bicyclist running off the road.

The CycleRAP model is an extension of the iRAP bicyclist model. It is based on nine types of crashes to better reflect the risk. This model gives an enhanced image to account for a large proportion of road deaths and serious injuries.

The crash types include vehicle vs bicycle crashes; single bicycle crashes; bicycle vs bicycle crashes; and bicycle vs pedestrian crashes.

Figure 9. Crash types



Single bicycle crashes

These crashes occur without crashing into another road user. Due to various reasons a cyclist may crash. For example: trying to avoid other road users, avoiding obstacles or potholes, slippery road surface. The

road design contributes to the likelihood of a crash and to the severity of the outcome. SWOV research has shown that in half of all single bicycle crashes¹ infrastructure influences the likelihood.

Examples of the crash types

See below examples of the crash types on segregated facilities or on the road. Similar crash scenario's are put in the model for different bicycle facility types. In the examples, some (not all) of the road attributes that attribute to crash are noted on the figures.

Figure 10. Single bicycle, Run-off on facility

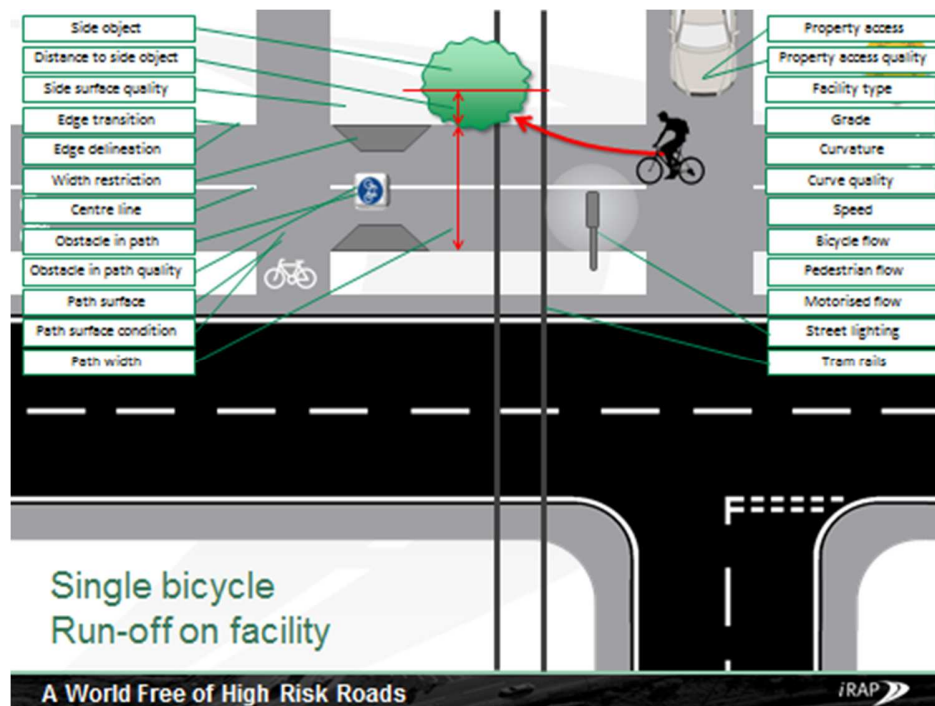


Figure 11. Single bicycle, Run-off on road

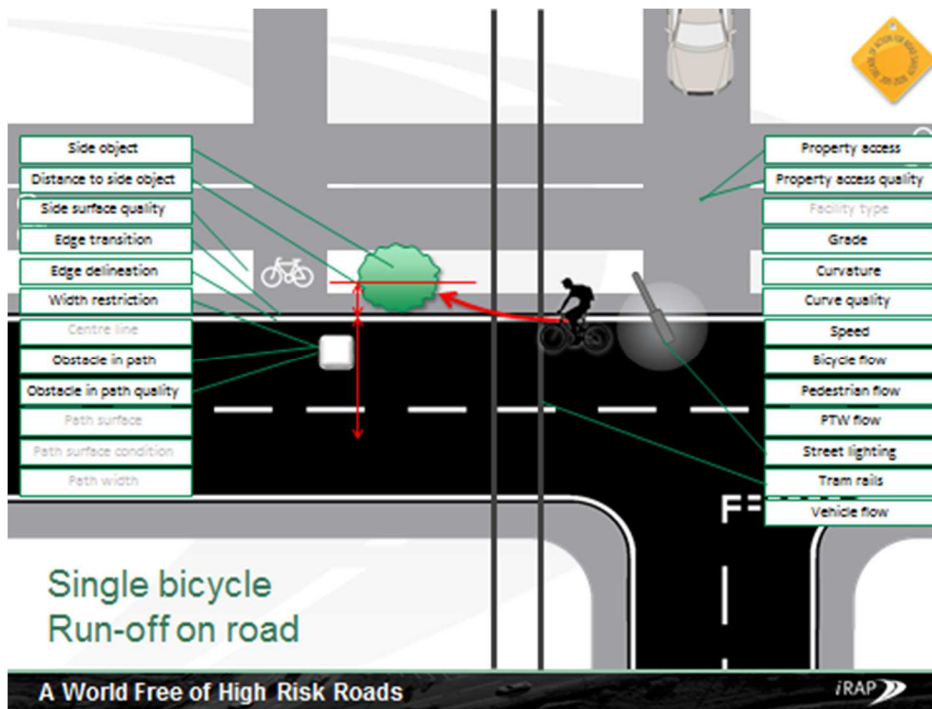


Figure 12. Single bicycle, Loss of balance on facility

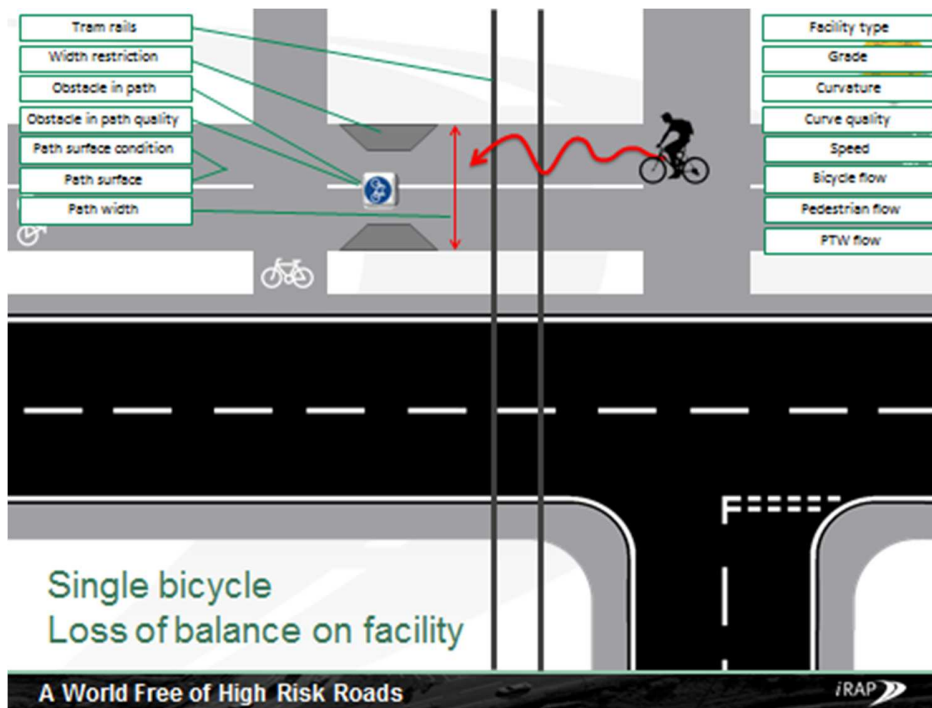


Figure 13. Single bicycle, Loss of balance on road

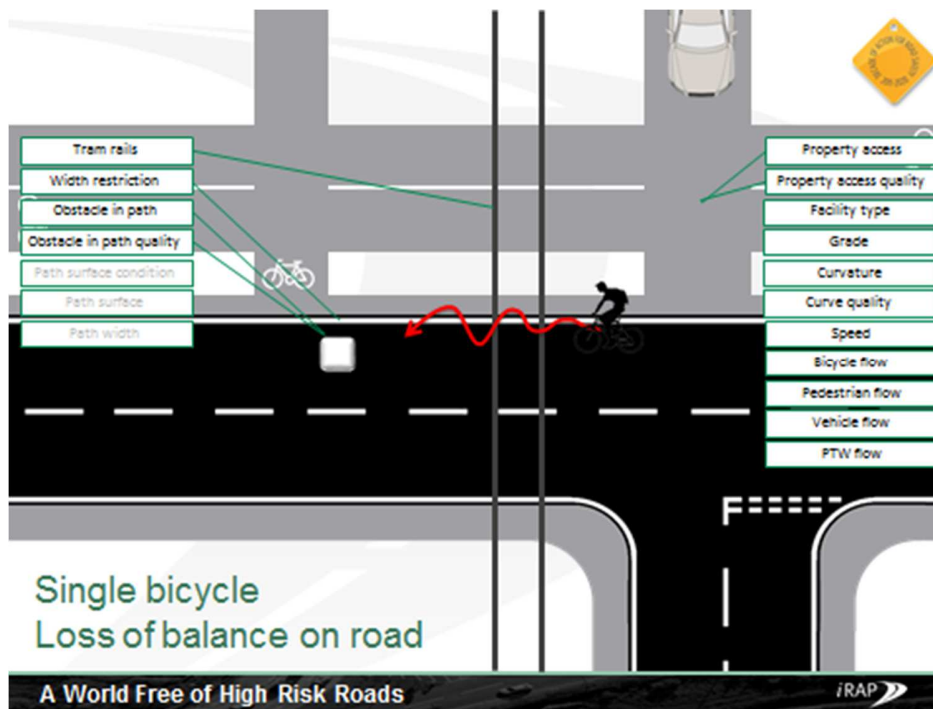


Figure 14. Single bicycle, Object in path on facility

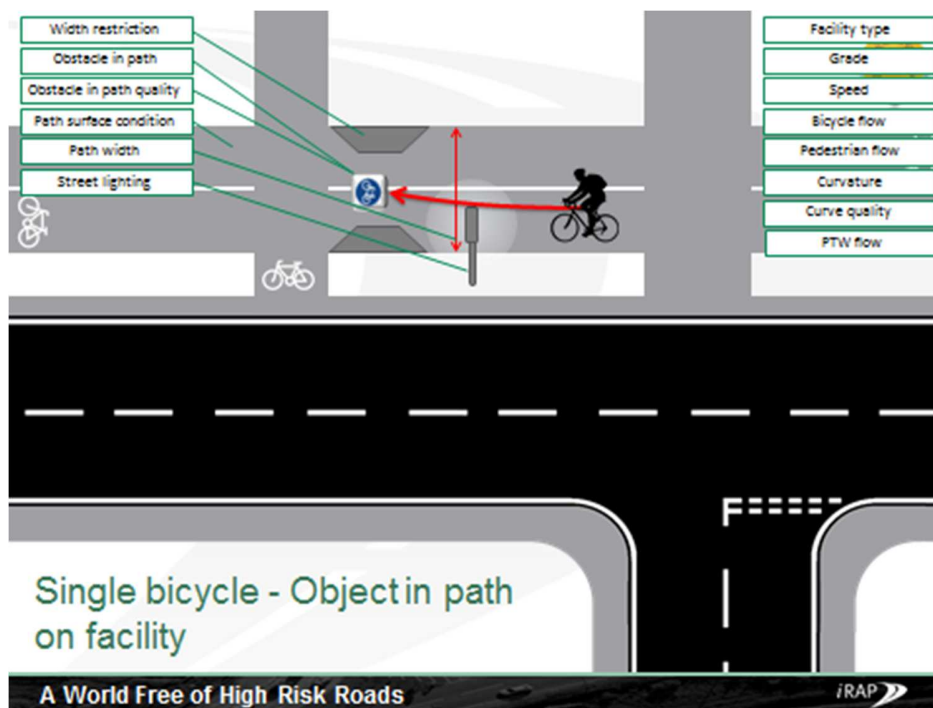


Figure 15. Single bicycle, Object in path on road

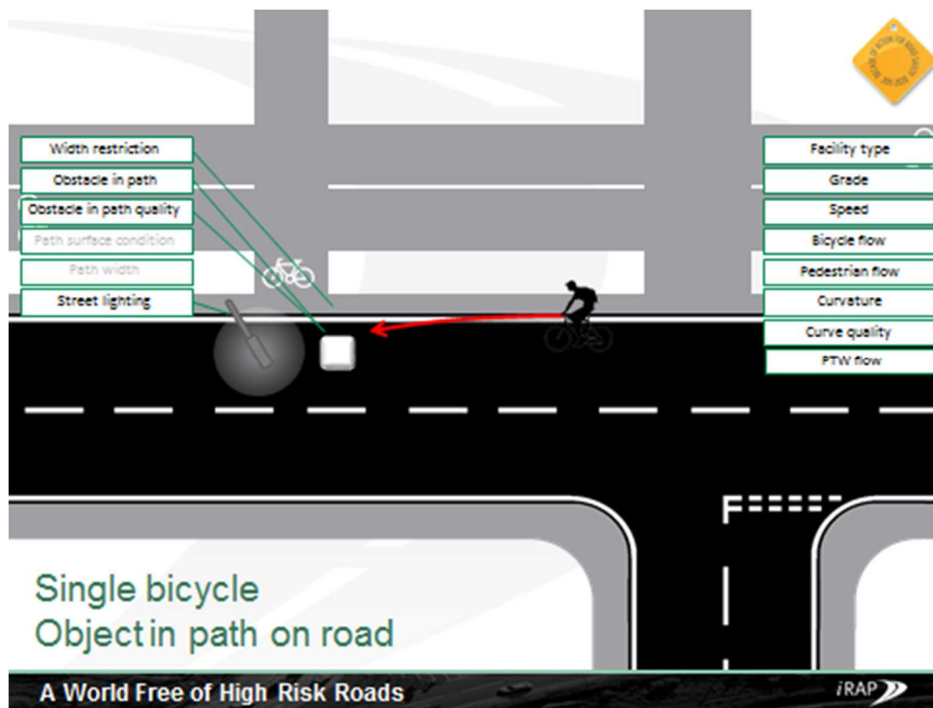


Figure 16. Bicycle vs bicycle, Bicycle crossing

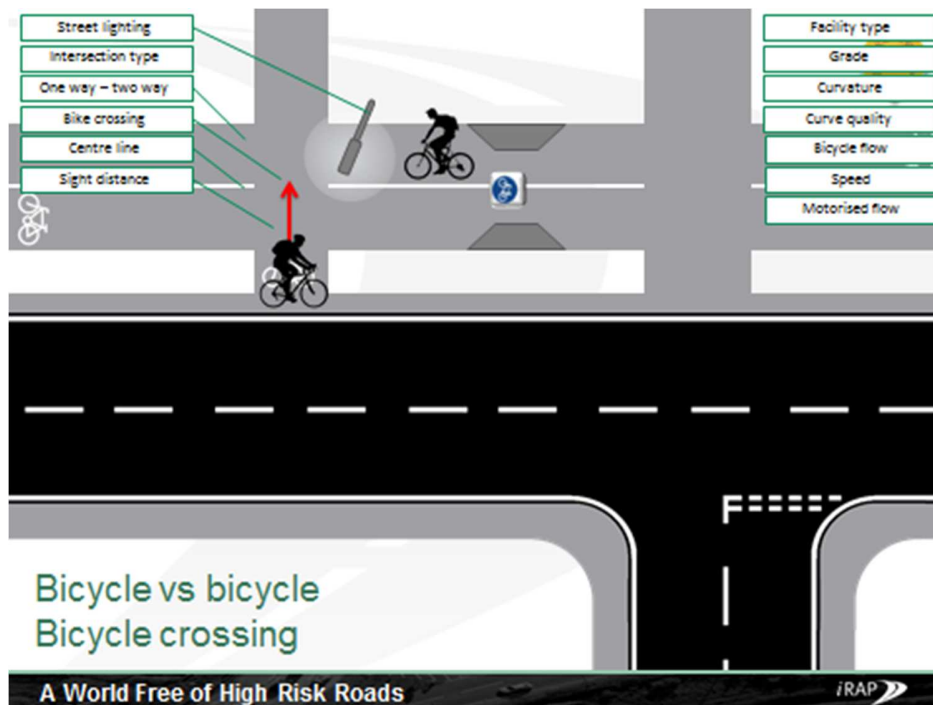


Figure 17. Bicycle vs bicycle, Head-on

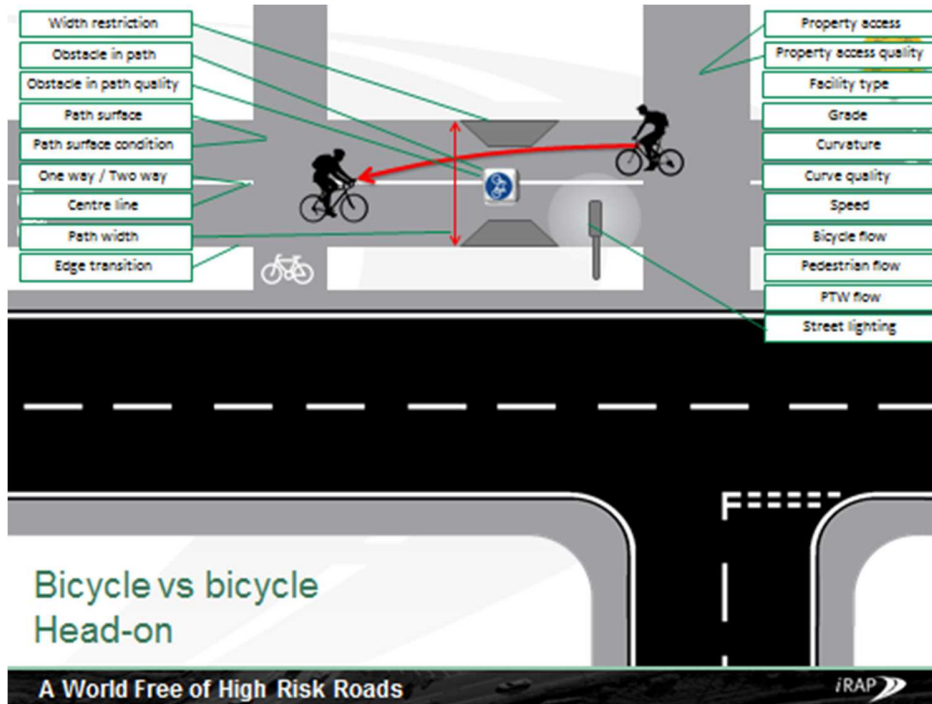


Figure 18. Bicycle vs bicycle, Side swipe

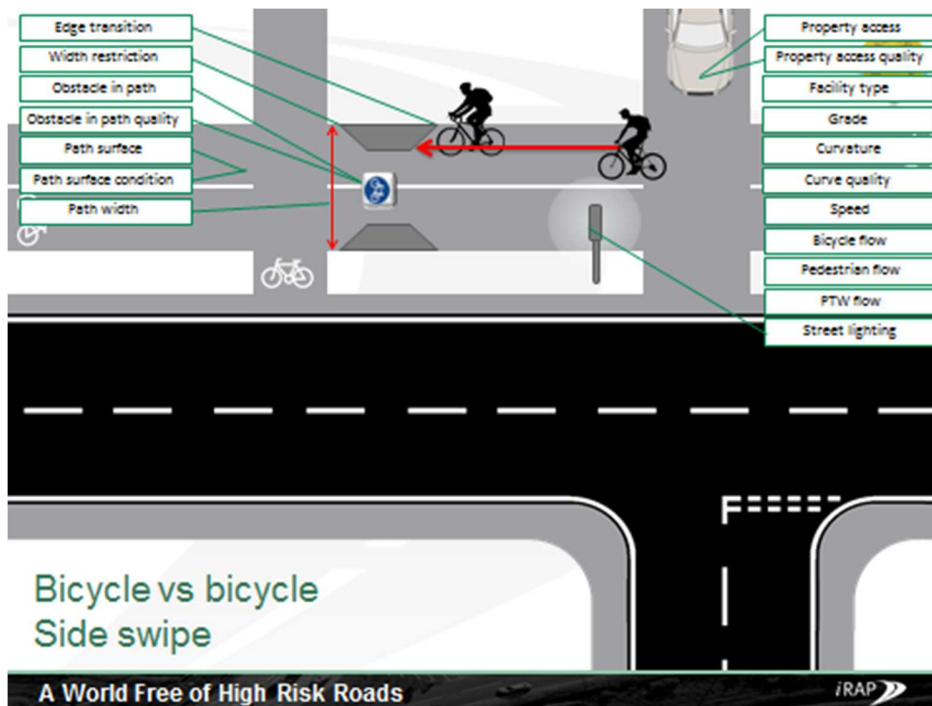


Figure 19. Vehicle vs bicycle, Along

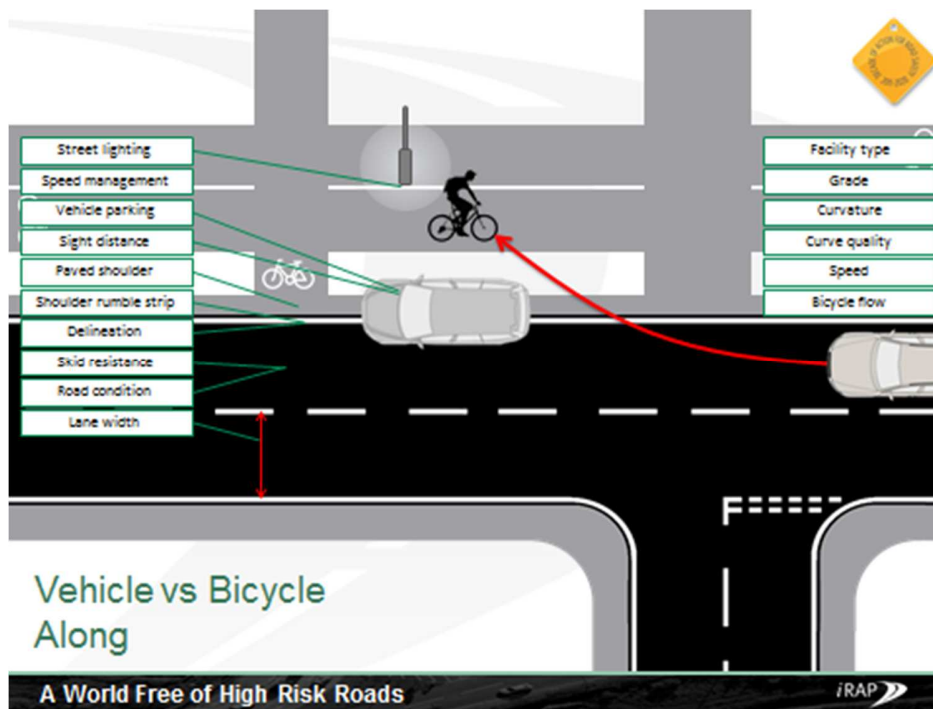
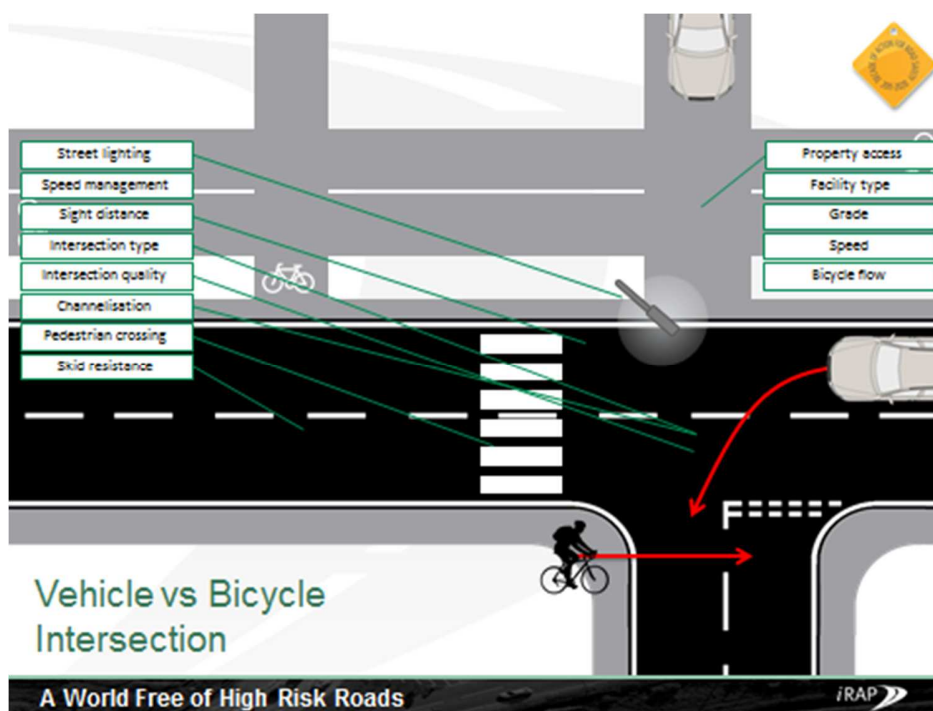


Figure 20. Vehicle vs bicycle, Intersection



4.2 Crash initiation modes

For the purposes of developing the risk assessment models, a series of ‘crash initiation modes’ were considered for each crash type. These describe ways in which a crash can begin. Described in the table below:

Table 1. Crash initiation modes

Initiation mode	Contributing factor	Crash type
A cyclist departs from the lane, towards the side of the road.		Cycle run-off.
A cyclist loses control over the bicycle.		Cycle loss of balance.
A cyclist hits an object on the road or on the cycle facility.		Cycle object in path.
A cyclist is moving along a bicycle crossing or is performing a turning manoeuvre at a bicycle crossing.	A cyclist is moving along a bicycle crossing or is performing a turning manoeuvre at a bicycle crossing.	Bicycle crossing.
A cyclist is departs from the lane, towards the middle of the road or opposing lane.	A cyclist is moving along the road, coming from the opposite direction.	Cycle head-on.
A cyclist is moving along the road (overtaking).	A cyclist is moving along the road.	Cycle side swipe.
A cyclist is moving along the road (overtaking).	A pedestrian is moving along the road.	Pedestrian along.
A pedestrian is crossing the road.	A cyclist is moving along the road.	Pedestrian along.
A vehicle or motorcycle departs from the lane (loss of control).	There is no oncoming vehicle present and a cyclist is at the side of road or travelling along the road.	Vehicle vs bicycle along.
A cyclist departs from the lane, towards the middle of the road or vehicle lane.	A vehicle or motorcycle is moving along the road.	Vehicle vs bicycle along.
A vehicle or motorcycle performs a turning manoeuvre at an intersection*.	A cyclist is moving across the intersection or making a turning manoeuvre.	Vehicle vs bicycle intersection.
A cyclist performs a turning manoeuvre at an intersection*.	A vehicle or motorcycle is moving across the intersection or making a turning manoeuvre.	Vehicle vs bicycle intersection.
A vehicle or motorcycle is travelling across an intersection* (without making a turning manoeuvre).	A bicyclist is crossing an intersection.	Vehicle vs bicycle intersection.
A cyclist is coming from a cycle facility that crosses the road (or merges with the road).	A vehicle or motorcycle is moving along the road.	Vehicle vs bicycle intersection.

*Intersections includes junctions at which a property access is adjected to the road.

4.3 CycleRAP Star Rating Scores

The overall Star Rating Scores for the bicycle routes assessed are shown below in charts presented for different crash types as well as total Star Rating Score for each Route.

Route 1

Chart 1. Route 1, Single bicycle score

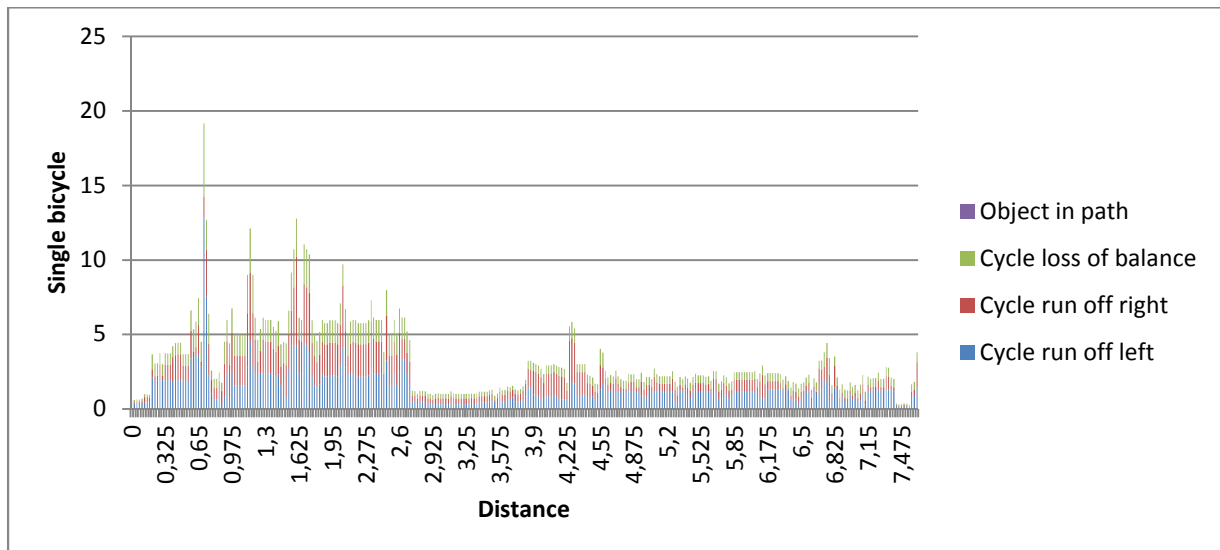
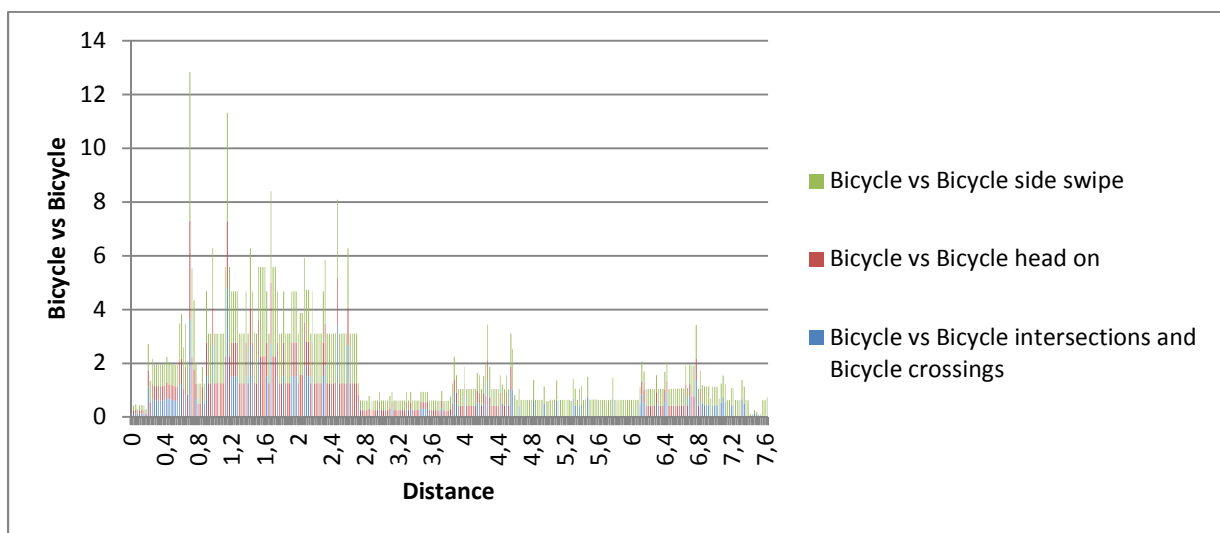


Chart 2. Route 1, Bicycle vs Bicycle score



The highest Star Rating score for both crash types is on 700m, the image of the locatin is shown below.

Figure 21.

Route 1, 0.7 km

Single bicycle score 19.150529 , Bicycle vs Bicycle score 12.842238



Chart 3. Route1, Vehicle vs Bicycle score

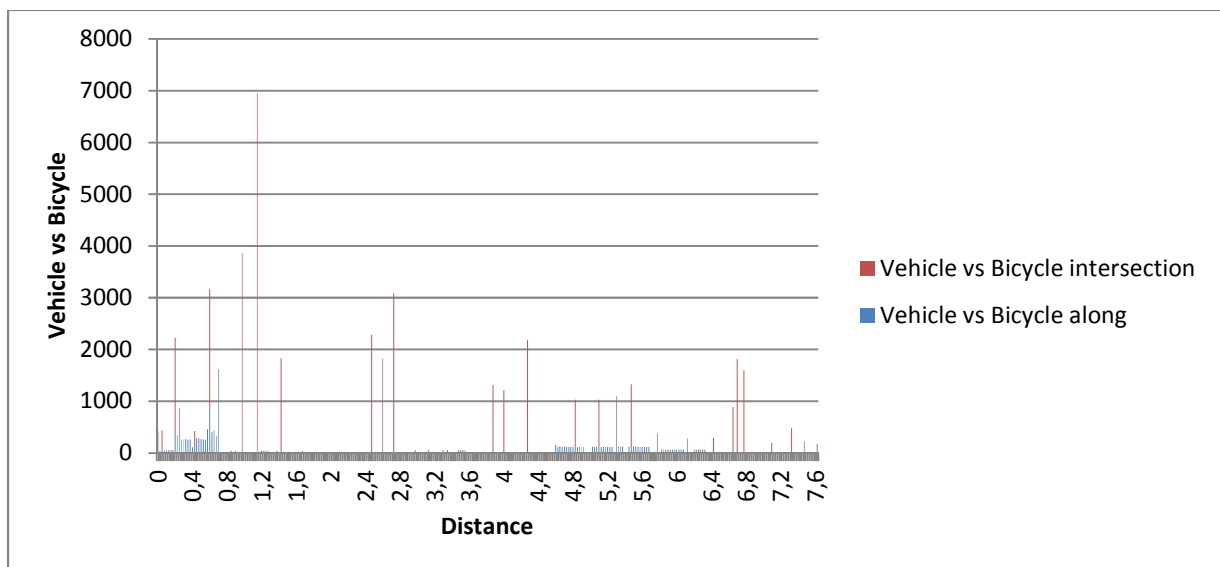
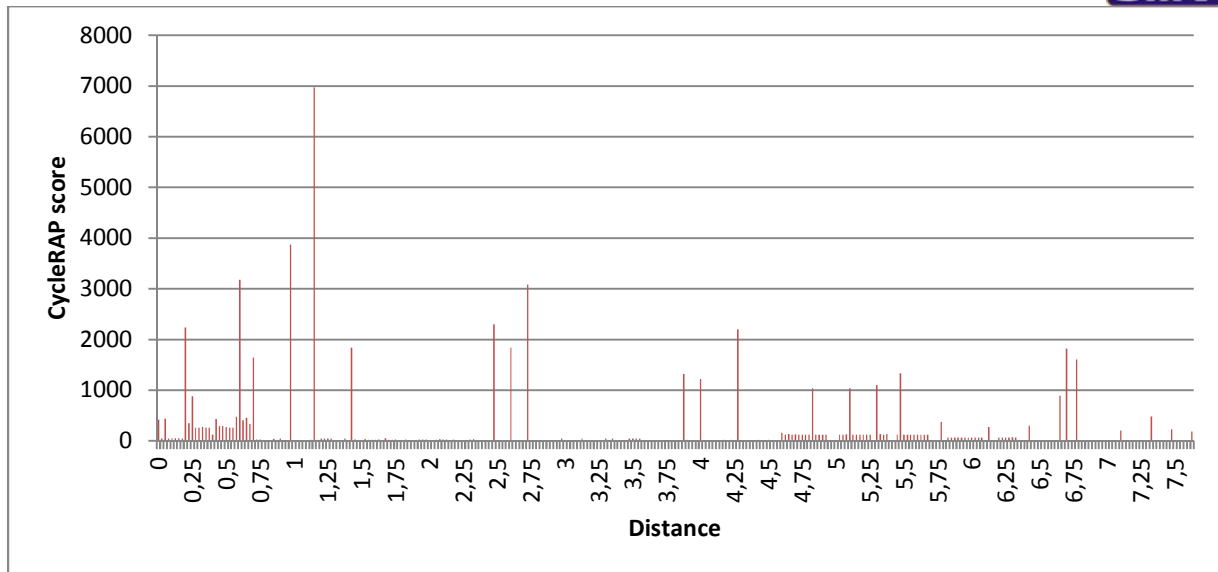


Chart 4. Route 1 , total CycleRAP score



Following figures represent locations with highest Star Rating Score (over 2000)

Figure 22.

Route 1- 0.2 km, CycleRAP score 2234.896



Figure 23.

Route 1- 0.6 km, CycleRAP score 3173.86



Figure 24.

Route 1- 0.975 km, CycleRAP score 3872.794



Figure 25.

Route 1- 1.15 km, Vehicle vs Bicycle score 6947.592, CycleRAP score 6971.029



Figure 26.

Route 1- 2.475 km, CycleRAP score 2298.02



Figure 27.

Route 1- 2.725 km, CycleRAP score 3085.556



Figure 28.

Route 1- 4.275 km, CycleRAP score 2200.135



Route 1-B1

Chart 5. Route 1-B1, Single bicycle score

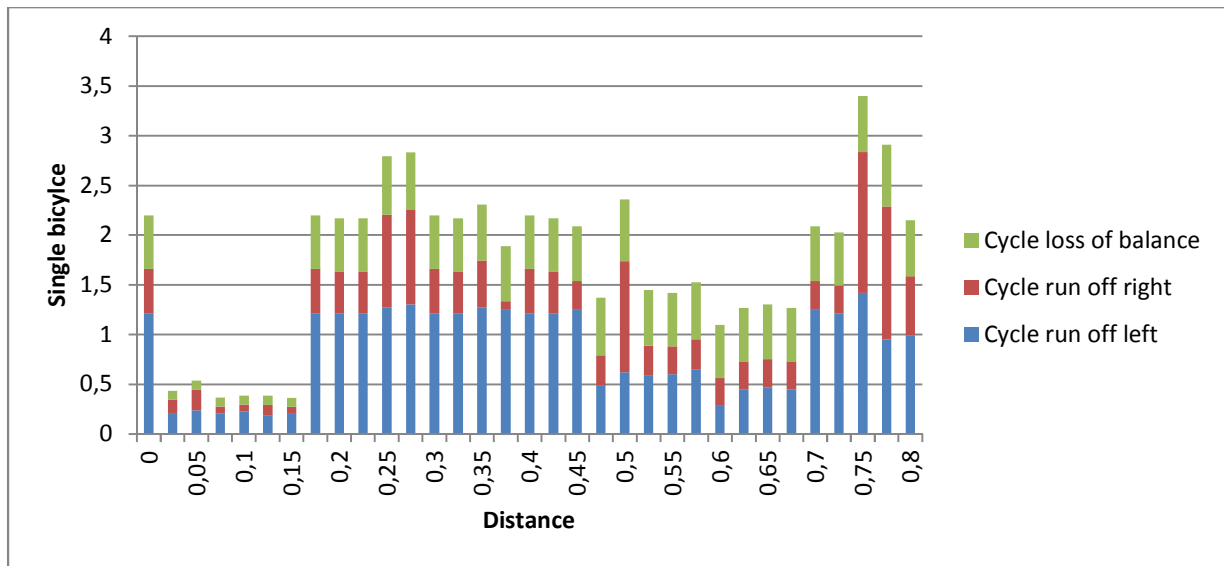


Figure 29.

Route 1-B1 – 0.75 km, Single bicycle score 3.399216



Chart 6. Route 1-B1, Bicycle vs Bicycle score

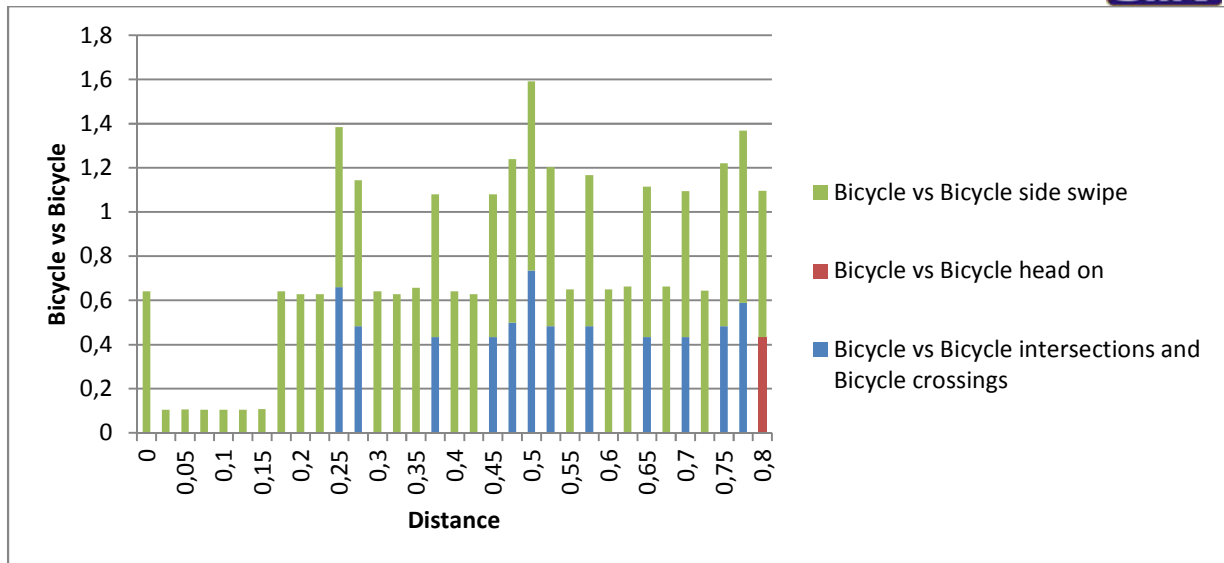


Figure 30.

Route 1-B1 – 0.5 km, Bicycle vs Bicycle score 1.591702



Chart 7. Route 1-B1, Vehicle vs Bicycle score

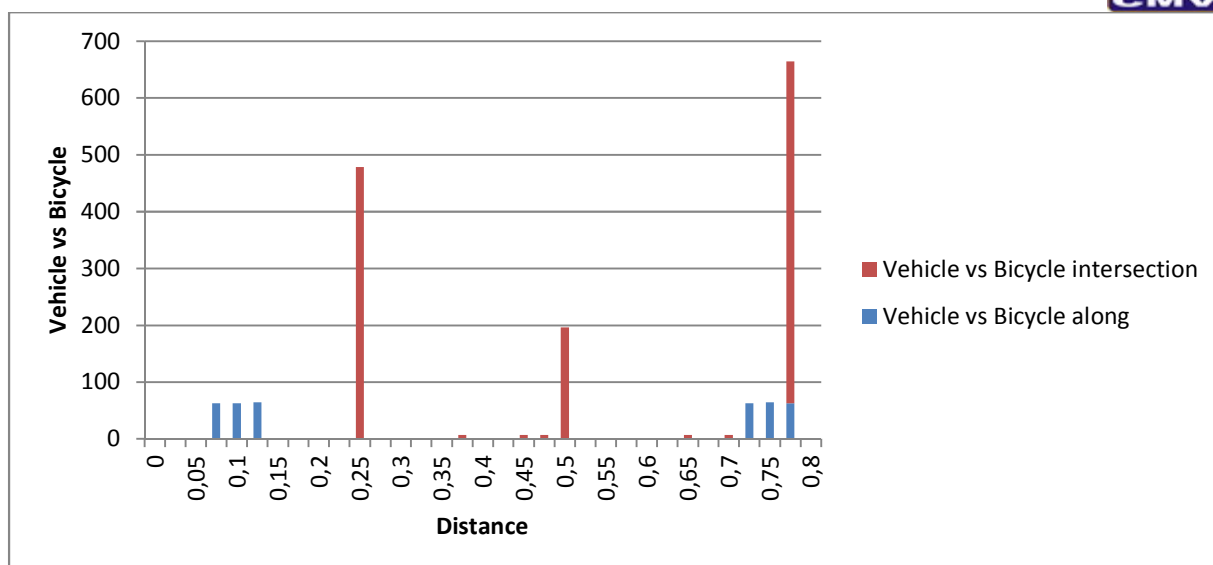
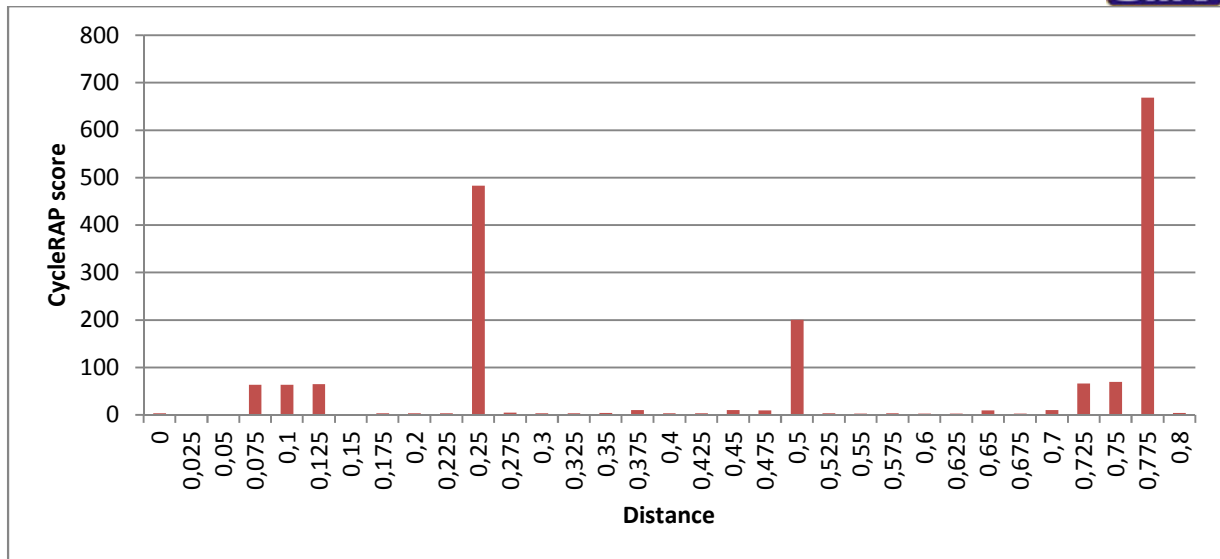


Figure 31.

Route 1-B1 – 0.775 km, Vehicle vs Bicycle score 664.32429



Chart 8. Route 1-B1, CycleRAP score



Route 1-B2

Chart 9. Route 1-B2, Single bicycle score

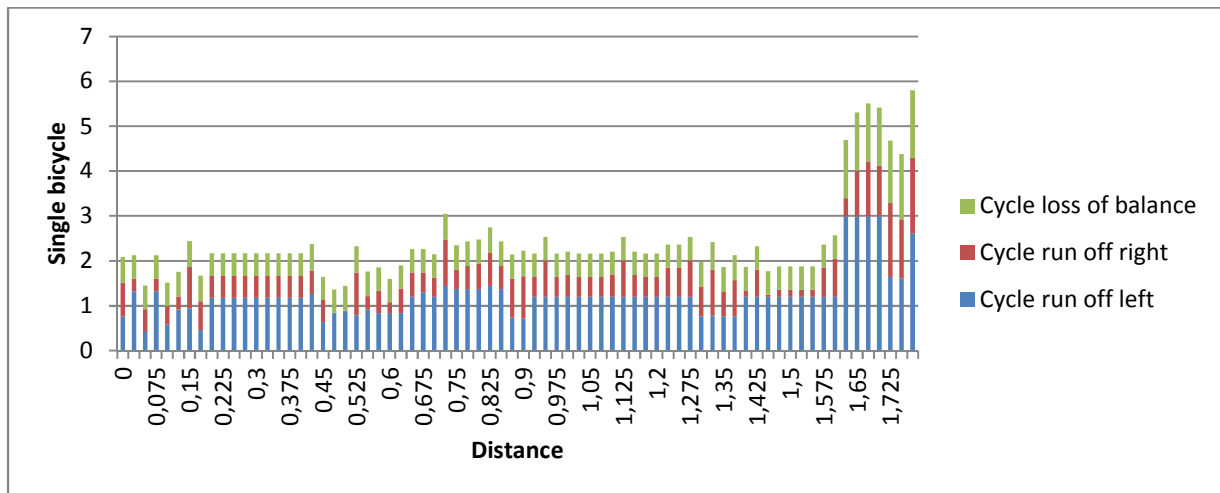
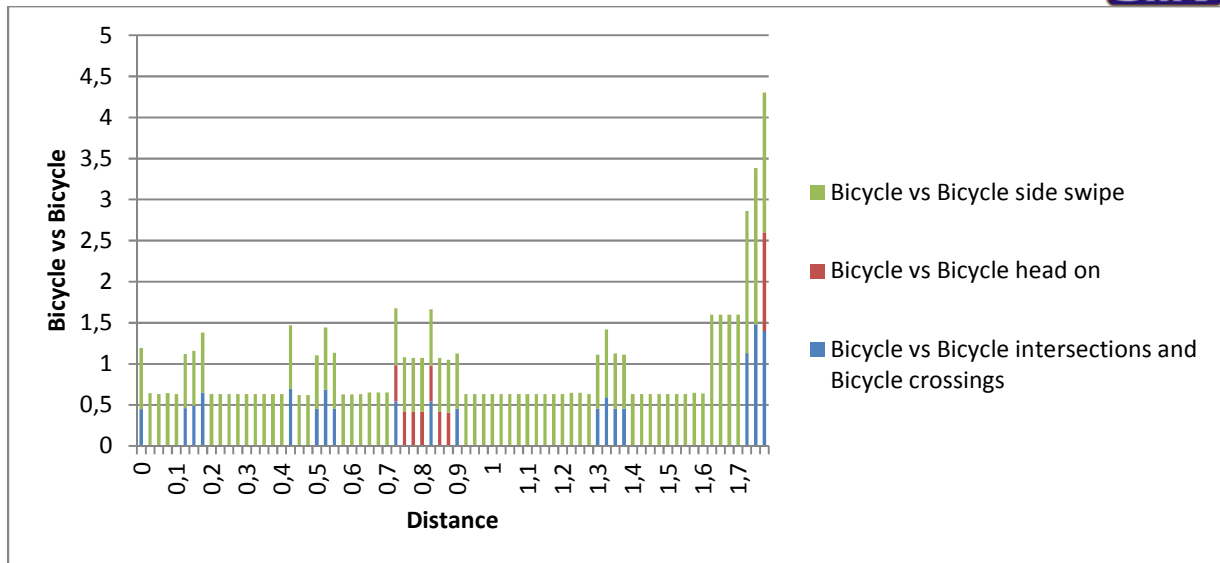


Chart 10. Route 1-B2, Bicycle vs Bicycle score



The highest Star Rating score for Single Bicycle and Bicycle vs Bicycle crash type is on 1.775 km shown below on Figure 32.

Figure 32.

Route 1-B2- 1.775 km, Single Bicycle score 5.802354, Bicycle vs Bicycle score 4.300665



Chart 11. Route 1-B2, Vehicle vs Bicycle score

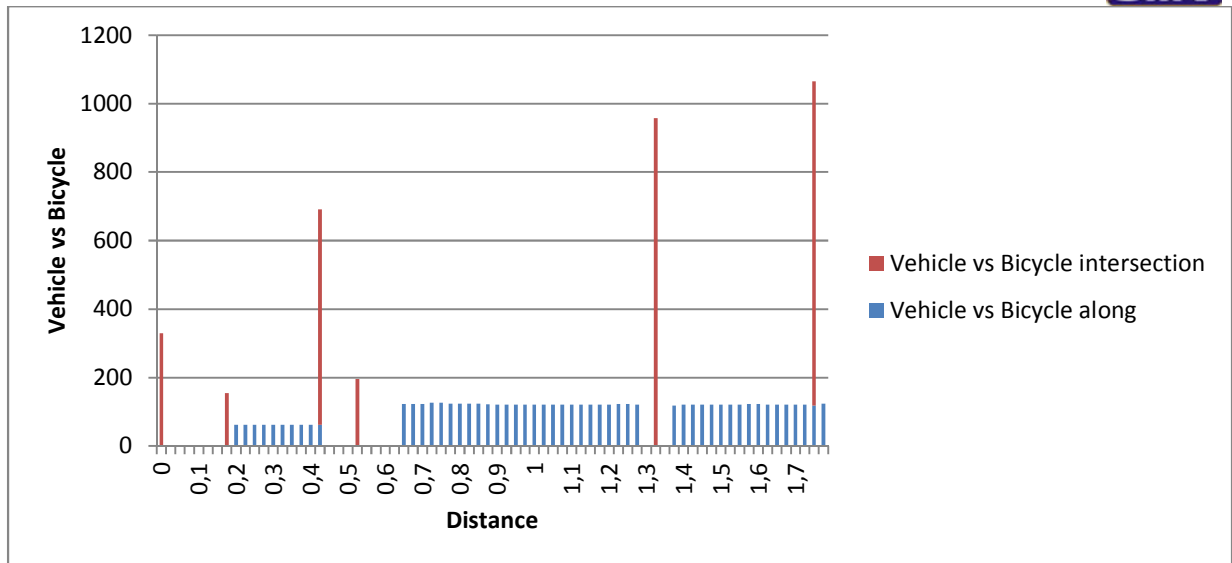
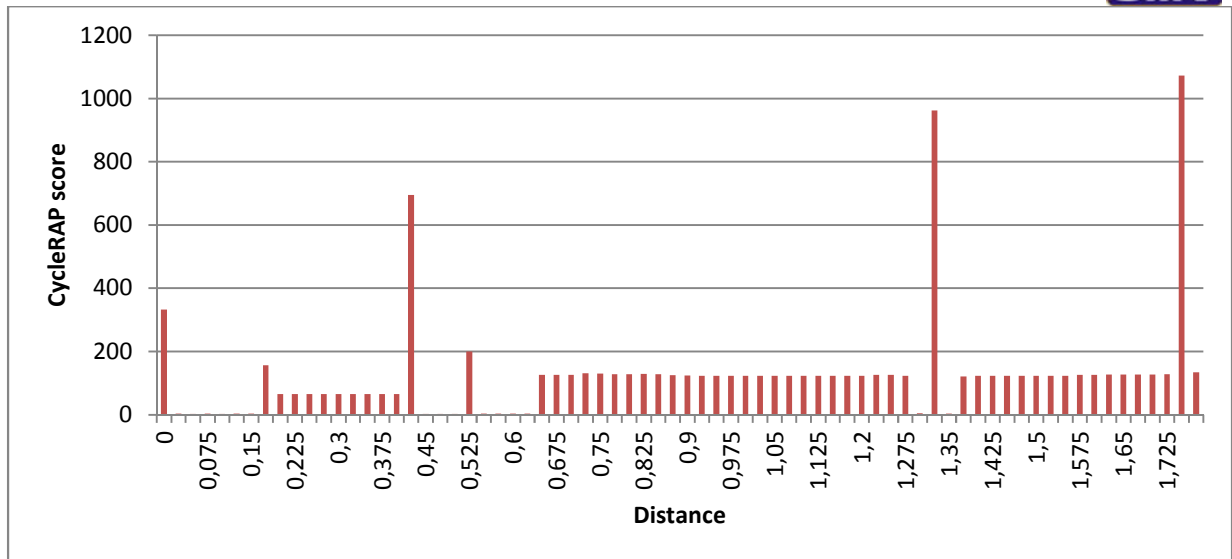


Figure 33.

Route 1-B2 – 1.75 km, Vehicle vs Bicycle score 1065.5606



Chart 12. Route 1-B2, CycleRAP score



Route 2

Chart 13. Route 2, Single bicycle score

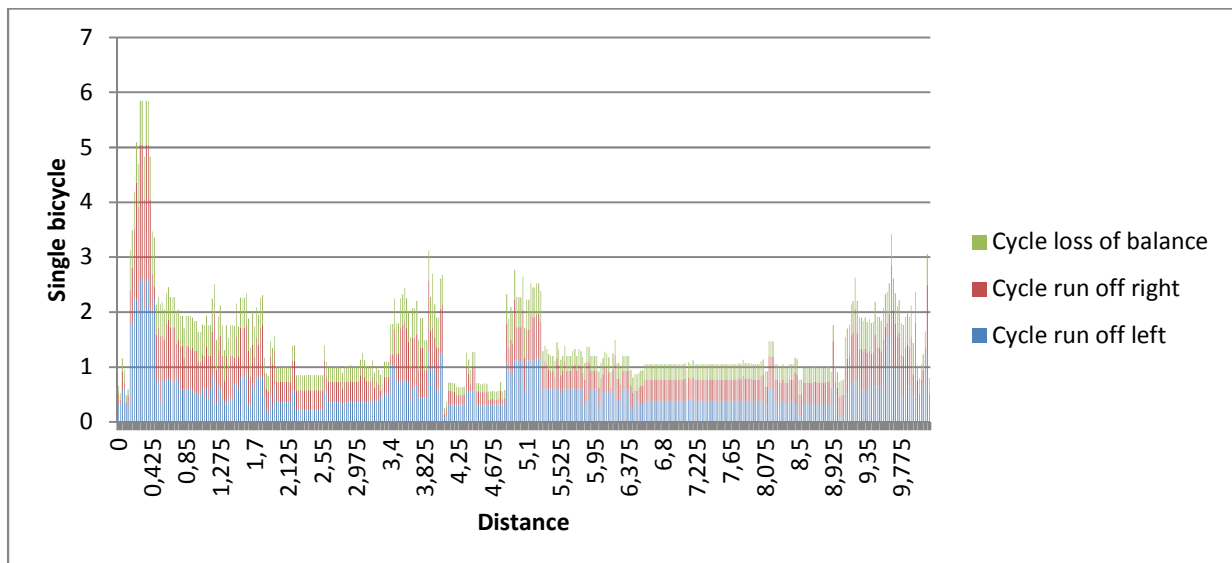
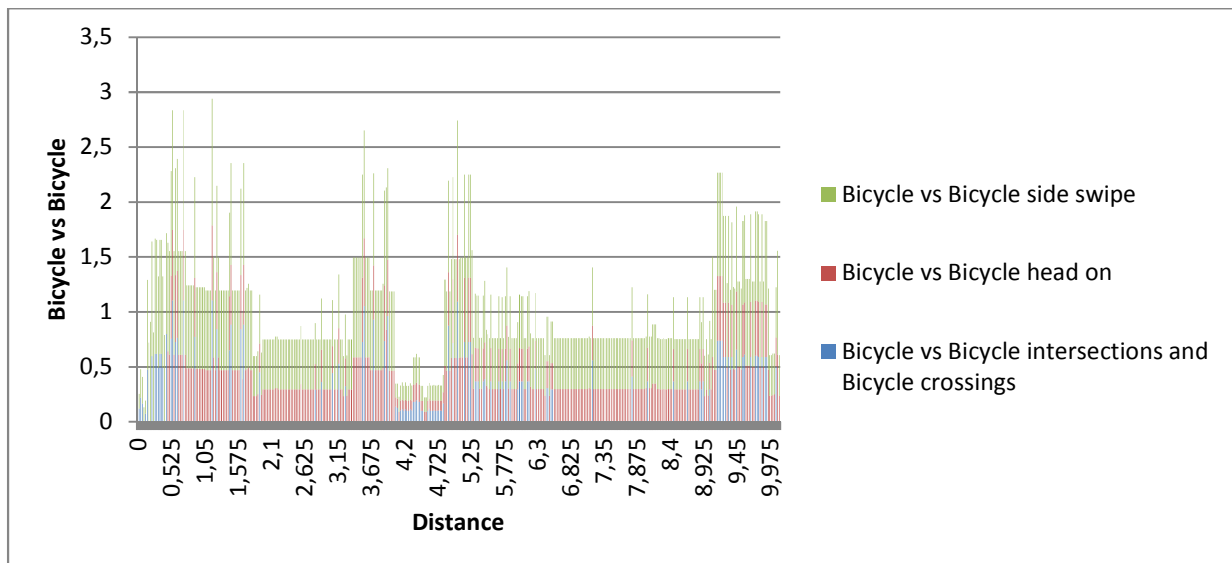


Figure 34.

Route 2 – 03 km, Single bicycle score 5.842681

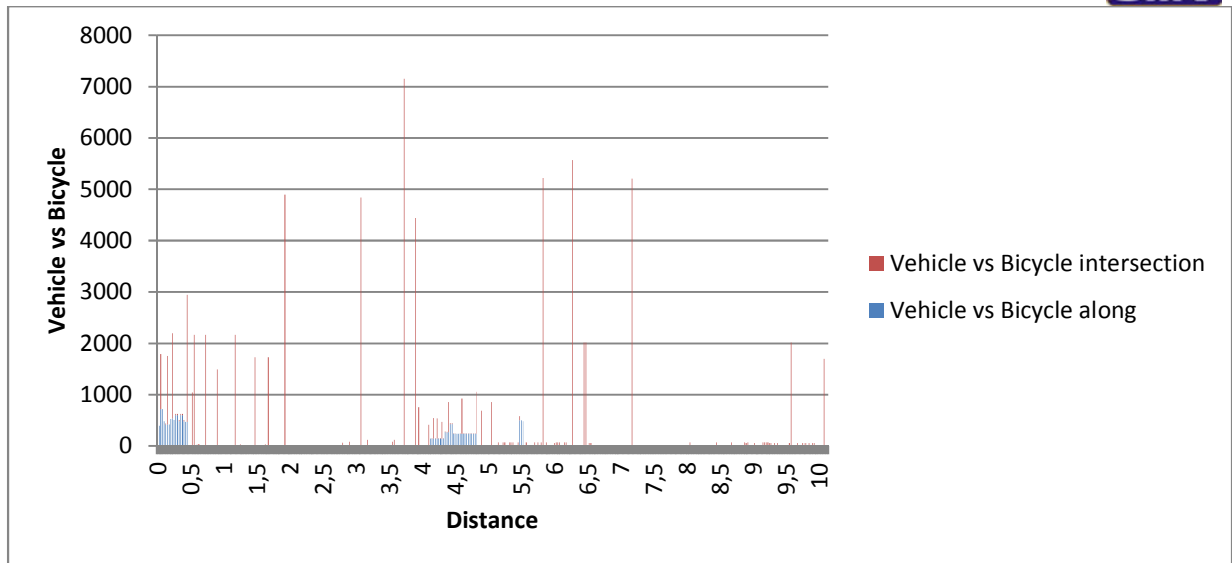


Chart 14. Route 2, Bicycle vs Bicycle score



The highest Star Rating Score for Bicycle vs Bicycle crash type is on 1.175 km shown on Figure 40.

Chart 15. Route 2, Vehicle vs Bicycle score



The highest Star Rating Score for Vehicle vs Bicycle crash type is on 3.725 km shown on Figure 43.

Chart 16. Route 2, CycleRAP score

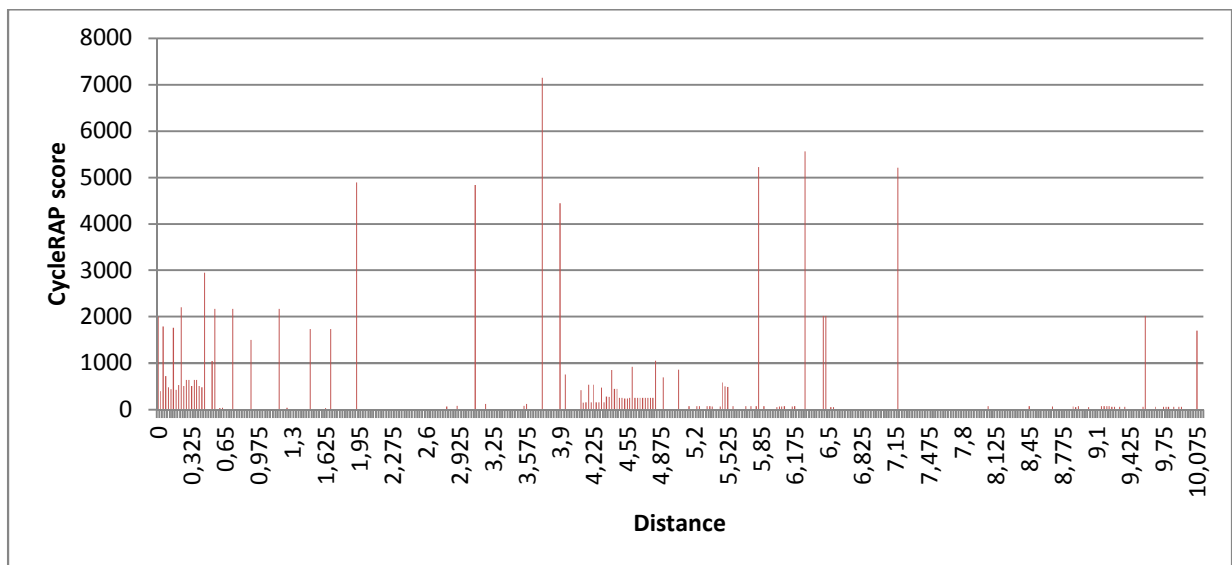


Figure 35.

Route 2- 0 km, CycleRAP score 2003.454



Figure 36.

Route 2- 0.225 km, CycleRAP score 2203.165



Figure 37.

Route 2- 0.45 km, CycleRAP score 2948.886



Figure 38.

Route 2- 0.55 km, CycleRAP score 2168.152



Figure 39.

Route 2- 0.725 km, CycleRAP score 2167.995



Figure 40.

Route 2- 1.175km, Bicycle vs Bicycle score 2.941807, CycleRAP score 2168.325



Figure 41.

Route 2- 1.925 km, CycleRAP score 4895.75



Figure 42.

Route 2- 3.075 km, CycleRAP score 4840.249



Figure 43.

Route 2- 3.725 km, Vehicle vs Bicycle score 7150.5511 CycleRAP score 7155.016



Figure 44.

Route 2- 3.9 km, CycleRAP score 4444.677



Figure 45.

Route 2- 5.825 km, CycleRAP score 5222.308



Figure 46.

Route 2- 6.275 km, CycleRAP score 5568.365



Figure 47.

Route 2- 6.450 km, CycleRAP score 2016.541



Figure 48.

Route 2- 6.475 km, CycleRAP score 2016.541



Figure 49.

Route 2- 7.175 km, CycleRAP score 5212.722



Figure 50.

Route 2- 9.575 km, CycleRAP score 2019.019



Route 2-B2

Chart 17. Route 2-B2, Single bicycle score

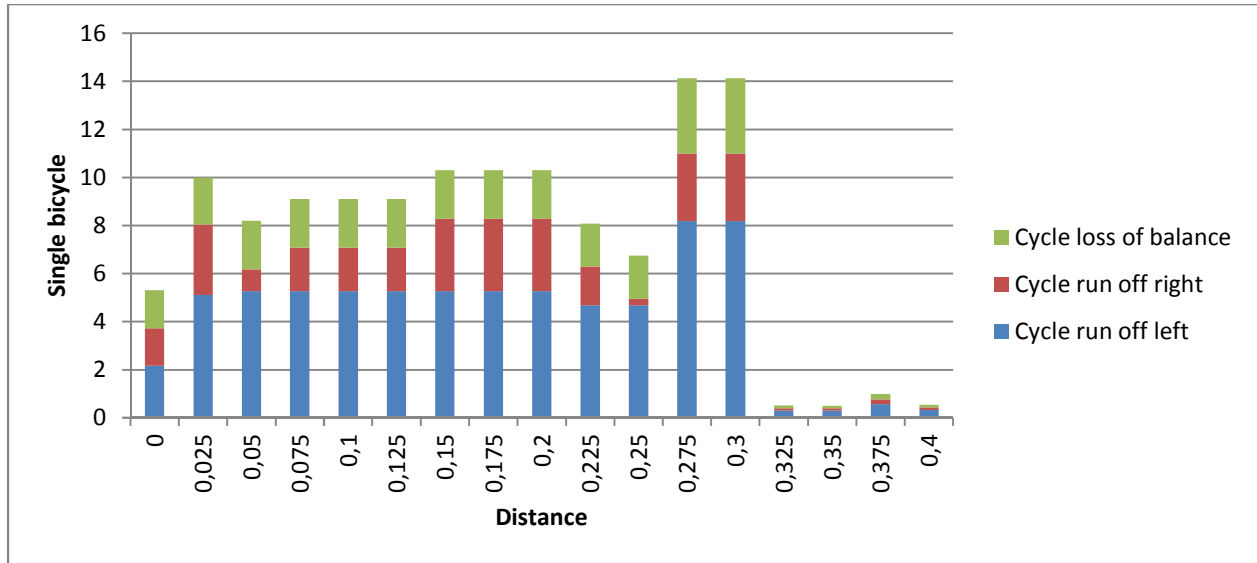


Figure 51.

Route 2-B2 – 0.275 km, Single bicycle score 14.12842



Chart 18. Route 2-B2, Bicycle vs Bicycle score

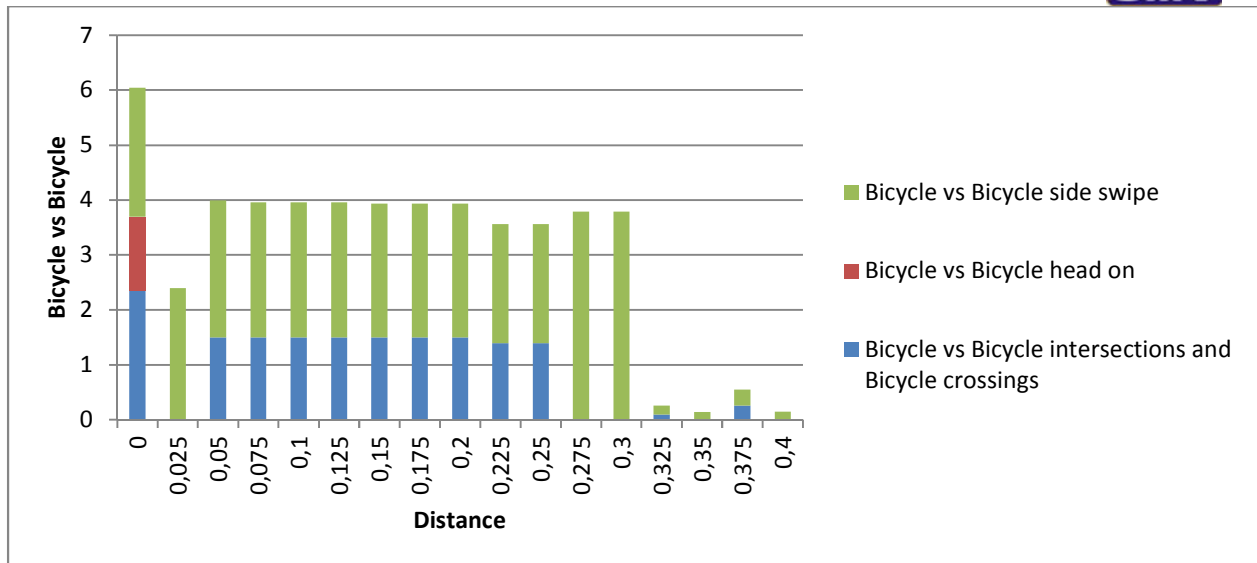
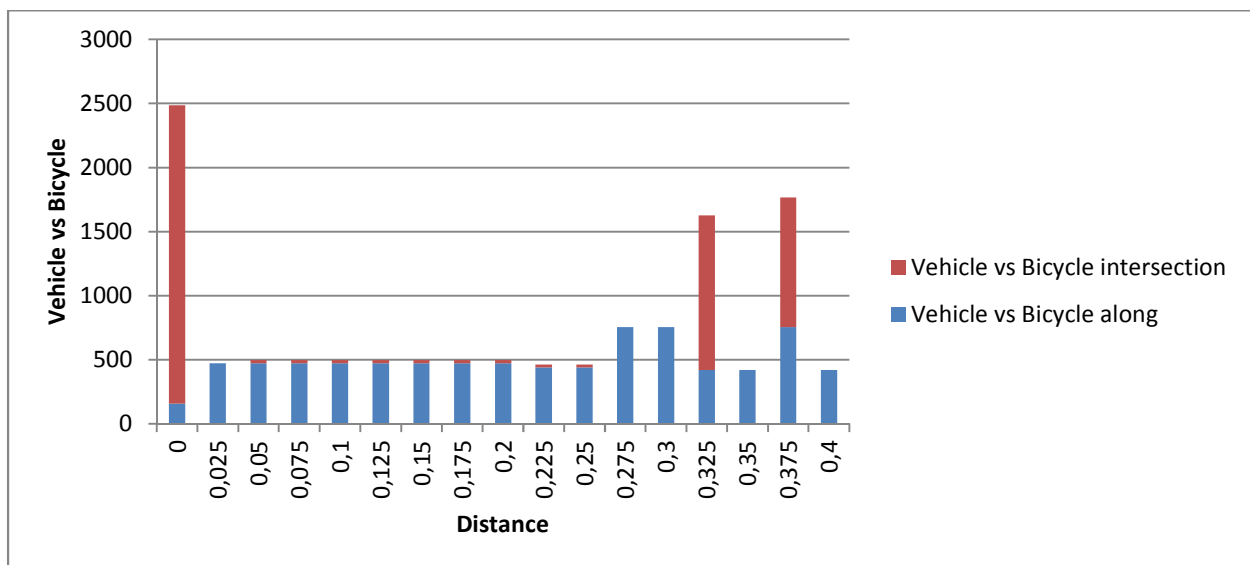


Chart 19. Route 2-B2, Vehicle vs Bicycle score



The highest Star Rating Score for Bicycle vs Bicycle and Vehicle vs Bicycle crash types is on 0 km swown on Figure 52.

Chart 20. Route 2-B2, CycleRAP score

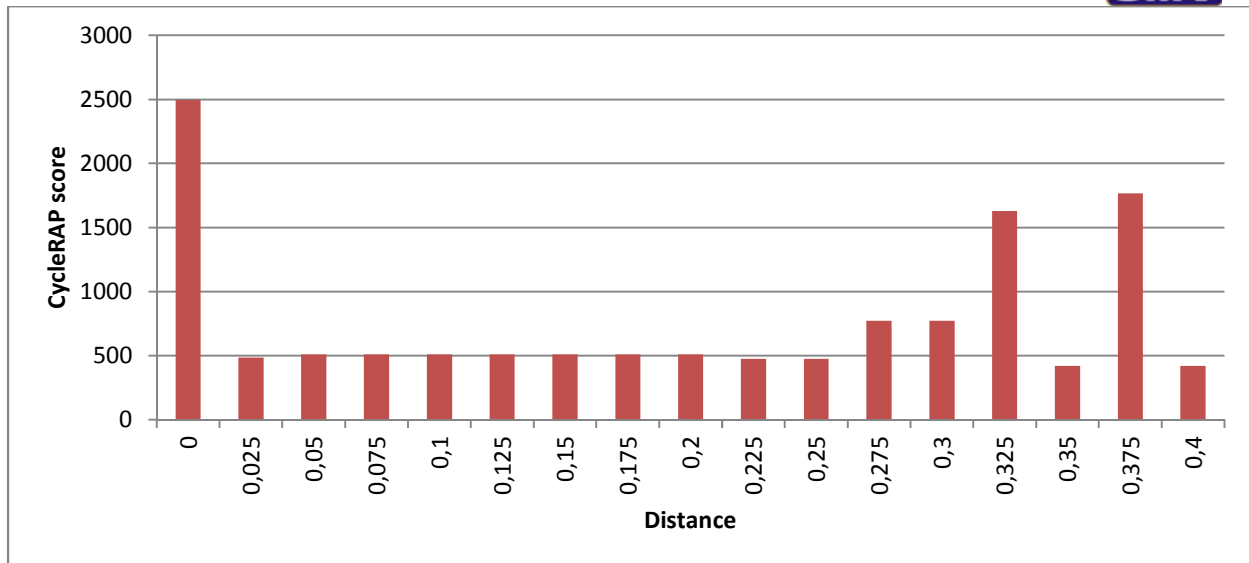


Figure 52.

Route 2-B2- 0 km, Bicycle vs Bicycle score 6.045465, Vehicle vs bicycle score 2485.5824,

CycleRAP score 2496.937



Route 3

Chart 21. Route 3, Single bicycle score

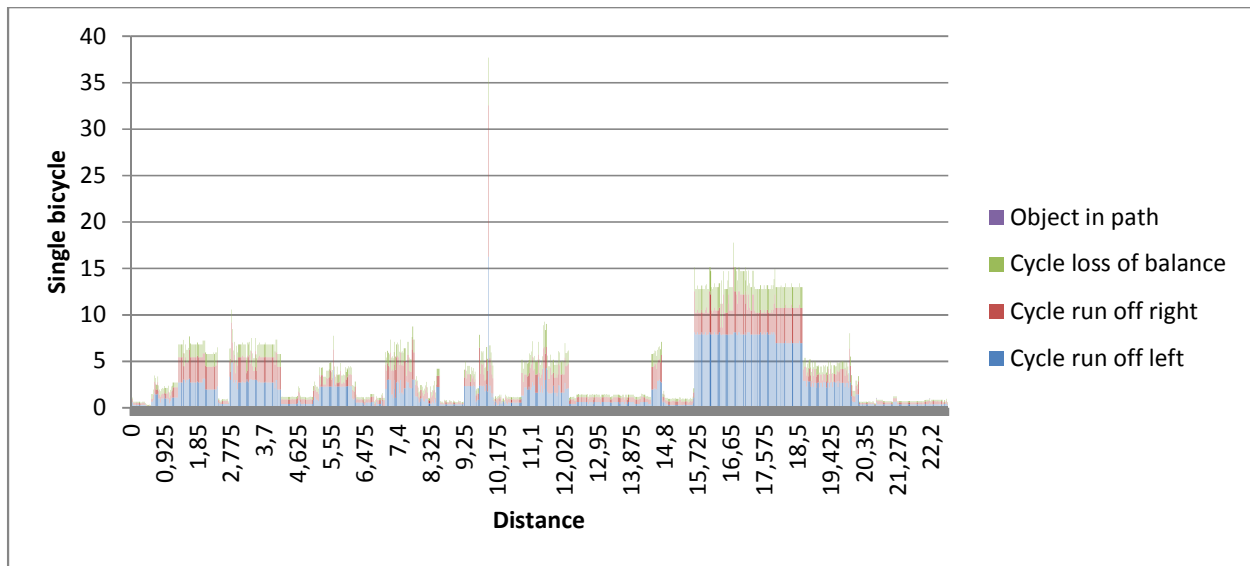
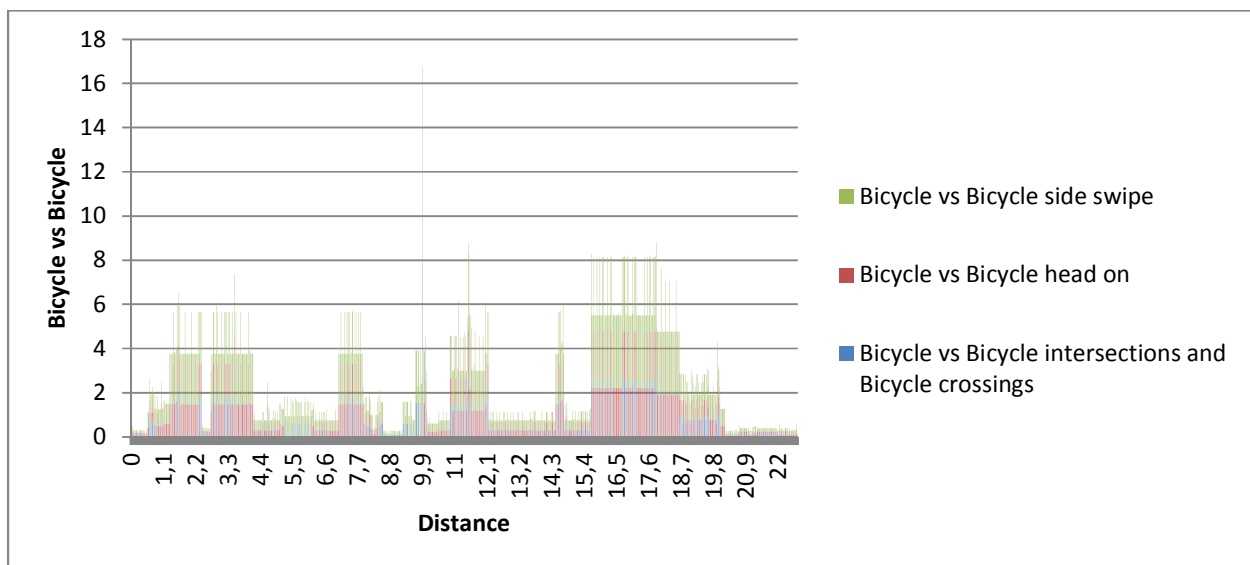


Chart 22. Route 3, Bicycle vs Bicycle score



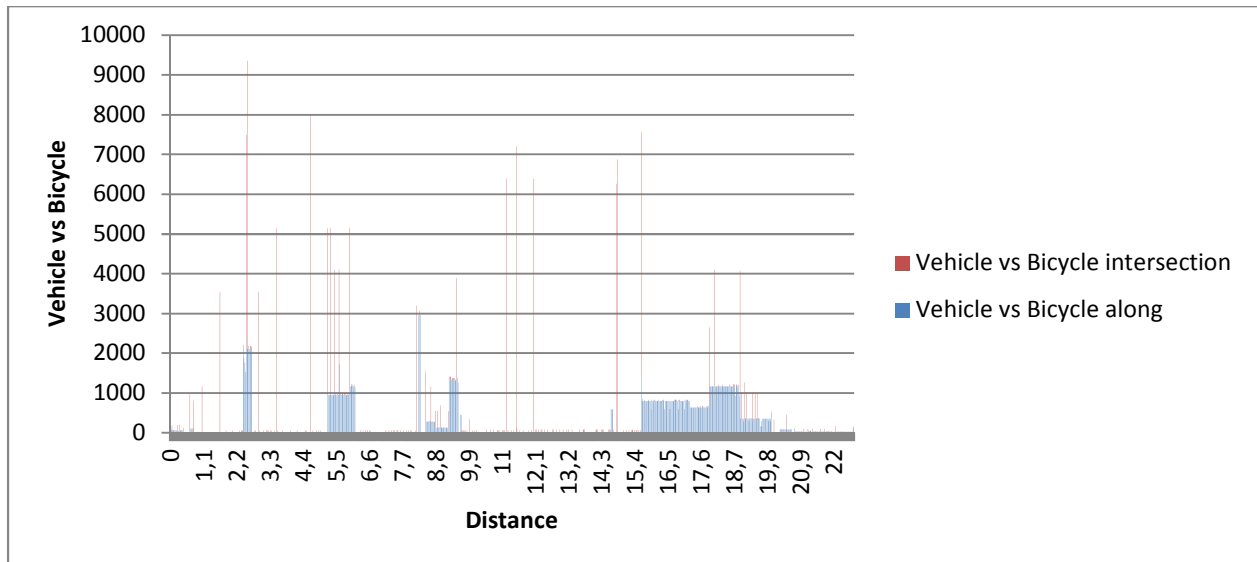
The highest Star Rating Score for Single Bicycle and Bicycle vs Bicycle crash type is on 9.925 km shown on Figure 53.

Figure 53.

Route 3 – 9.925 km, Single bicycle score 37.731104, Bicycle vs Bicycle score 16.707



Chart 23. Route 3, Vehicle vs Bicycle score



The highest Star Rating Score for Vehicle vs Bicycle crash type is on 2.575 km shown on Figure 58.

Chart 24. Route 3, CycleRAP score

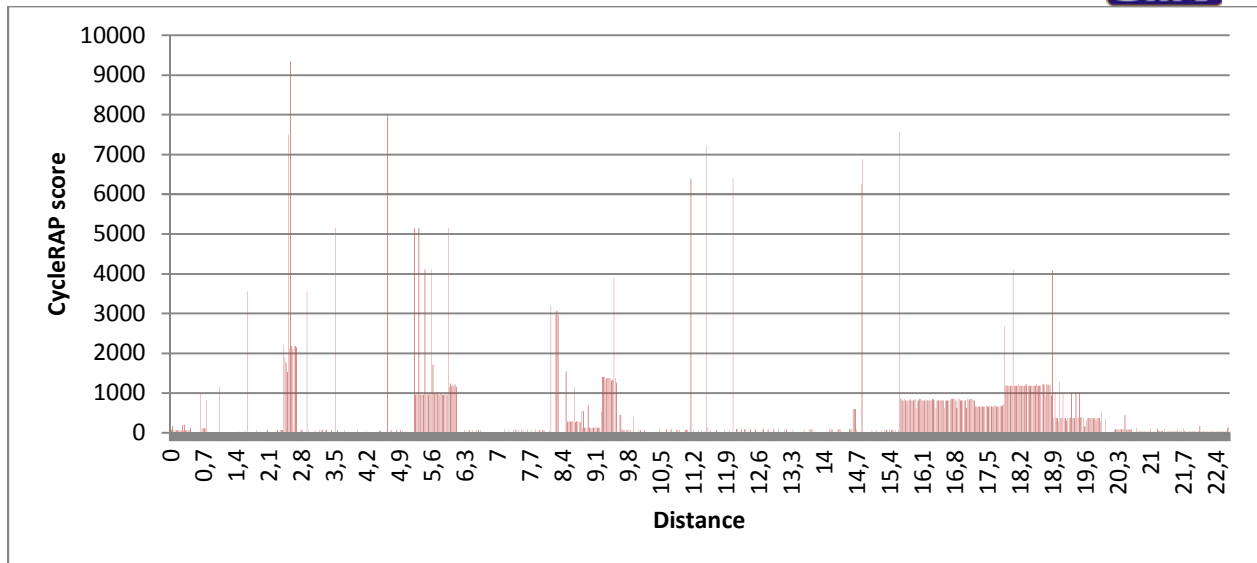


Figure 54.

Route 3- 1.65 km, CycleRAP score 3558.547



Figure 55.

Route 3- 2.425 km, CycleRAP score 2210.365



Figure 56.

Route 3- 2.525 km, CycleRAP score 7499.795



Figure 57.

Route 3- 2.55 km, CycleRAP score 2109.964



Figure 58.

Route 3- 2.575 km, Vehicle vs Bicycle score 9350.272, CycleRAP score 9351.579



Figure 59.

Route 3- 2.6 km, CycleRAP score 2187.461



Figure 60.

Route 3- 2.625 km, CycleRAP score 2109.916



Figure 61.

Route 3- 2.65 km, CycleRAP score 2187.461



Figure 62.

Route 3- 2.675 km, CycleRAP score 2187.51



Figure 63.

Route 3- 2.7 km, CycleRAP score 2145.877



Figure 64.

Route 3- 2.925 km, CycleRAP score 3558.3



Figure 65.

Route 3- 3.525 km, CycleRAP score 5162.413



Figure 66.

Route 3- 4.65 km, CycleRAP score 7994.78



Figure 67.

Route 3- 5.225 km, CycleRAP score 5154.114



Figure 68.

Route 3- 5.325 km, CycleRAP score 5154.114



Figure 69.

Route 3- 5.45 km, CycleRAP score 4104.369



Figure 70.

Route 3- 5.6 km, CycleRAP score 4110.06



Figure 71.

Route 3- 5.95 km, CycleRAP score 5161.682



Figure 72.

Route 3- 8.15 km, CycleRAP score 3198.997



Figure 73.

Route 3- 8.25 km, CycleRAP score 2961.168



Figure 74.

Route 3- 8.275 km, CycleRAP score 3069.972



Figure 75.

Route 3- 8.3 km, CycleRAP score 2961.081



Figure 76.

Route 3- 9.5 km, CycleRAP score 3906.284



Figure 77.

Route 3- 11.15 km, CycleRAP score 6393.592



Figure 78.

Route 3- 11.475 km, CycleRAP score 7221.981



Figure 79.

Route 3- 12.05 km, CycleRAP score 6393.24



Figure 80.

Route 3- 14.8 km, CycleRAP score 6266.144



Figure 81.

Route 3- 14.825 km, CycleRAP score 6878.594



Figure 82.

Route 3- 15.625 km, CycleRAP score 7573.187



Figure 83.

Route 3- 17.875 km, CycleRAP score 2677.835



Figure 84.

Route 3- 18.05 km, CycleRAP score 4126.454



Figure 85.

Route 3- 18.9 km, CycleRAP score 4074.409



Route 3-B1

Chart 25. Route 3-B1, Single Bicycle score

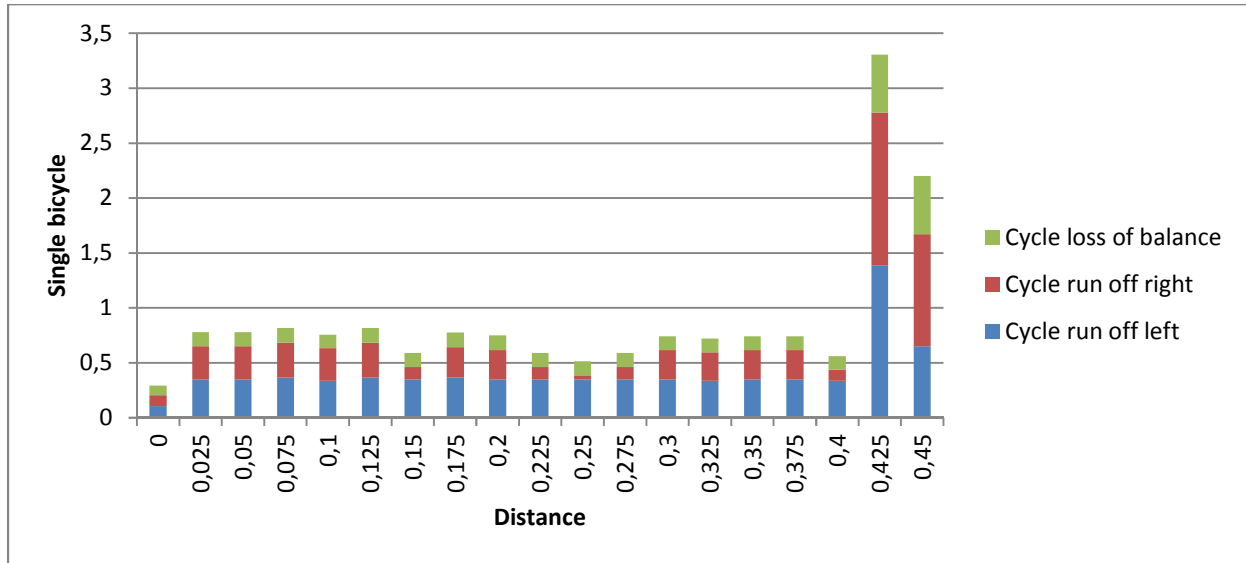
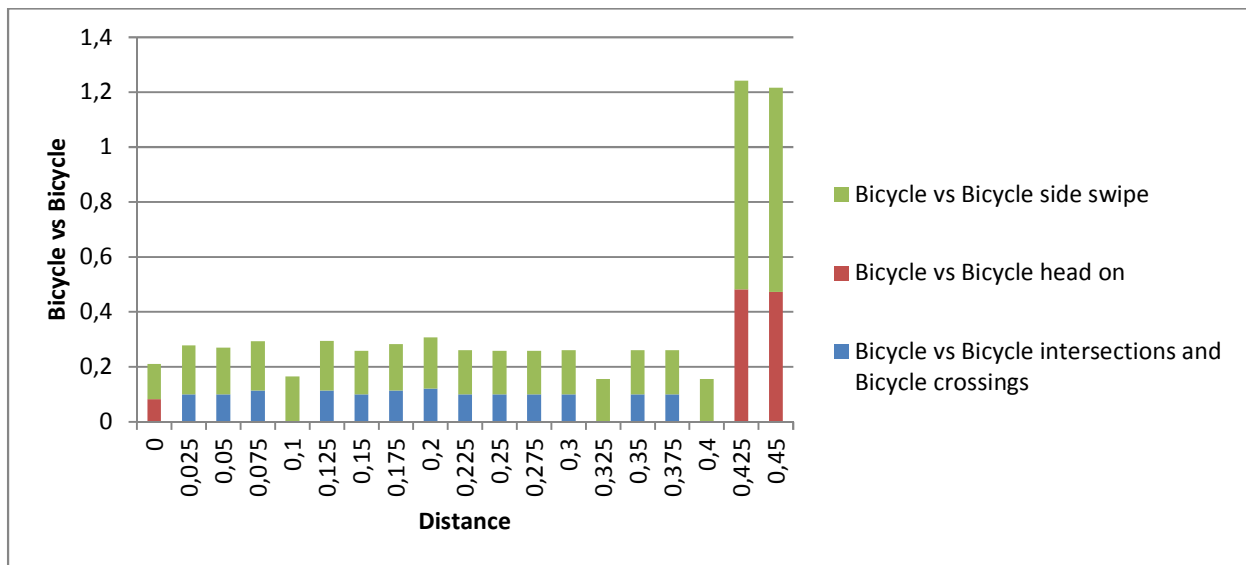


Chart 26. Route 3-B1, Bicycle vs Bicycle score



The highest Star Rating Score for Single Bicycle and Bicycle vs Bicycle carsh type is on 0.425 km shown on Figure 86.

Figure 86.

Route 3-B1 – 0.425 km, Single bicycle score 3.307961, Bicycle vs Bicycle score 1.241871



Chart 27.

Route 3-B1, Vehicle vs Bicycle score

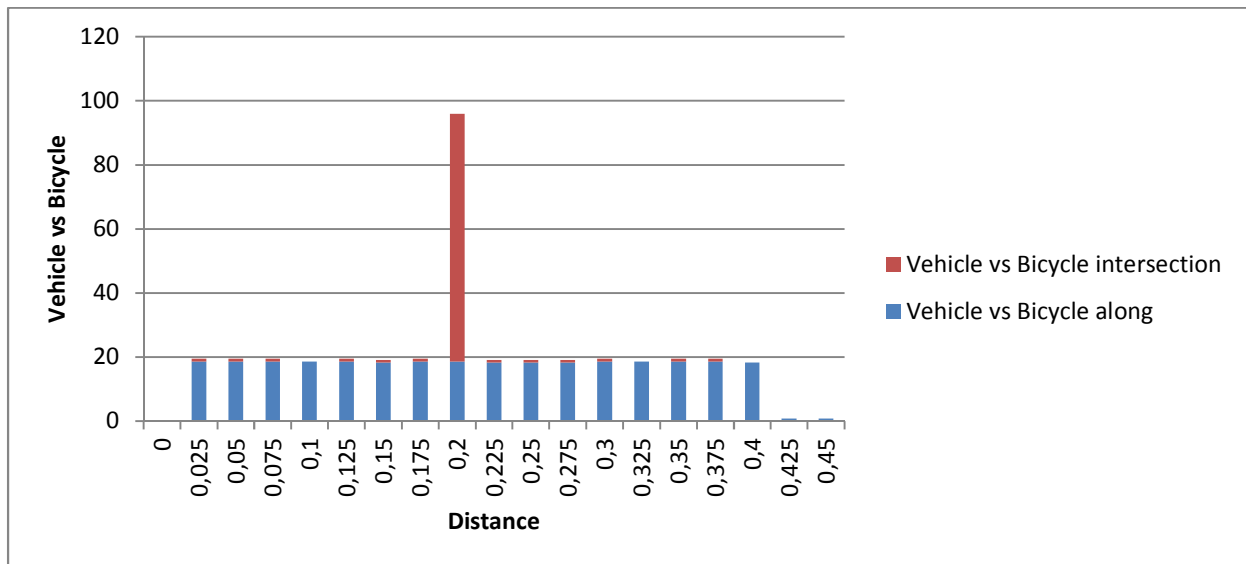


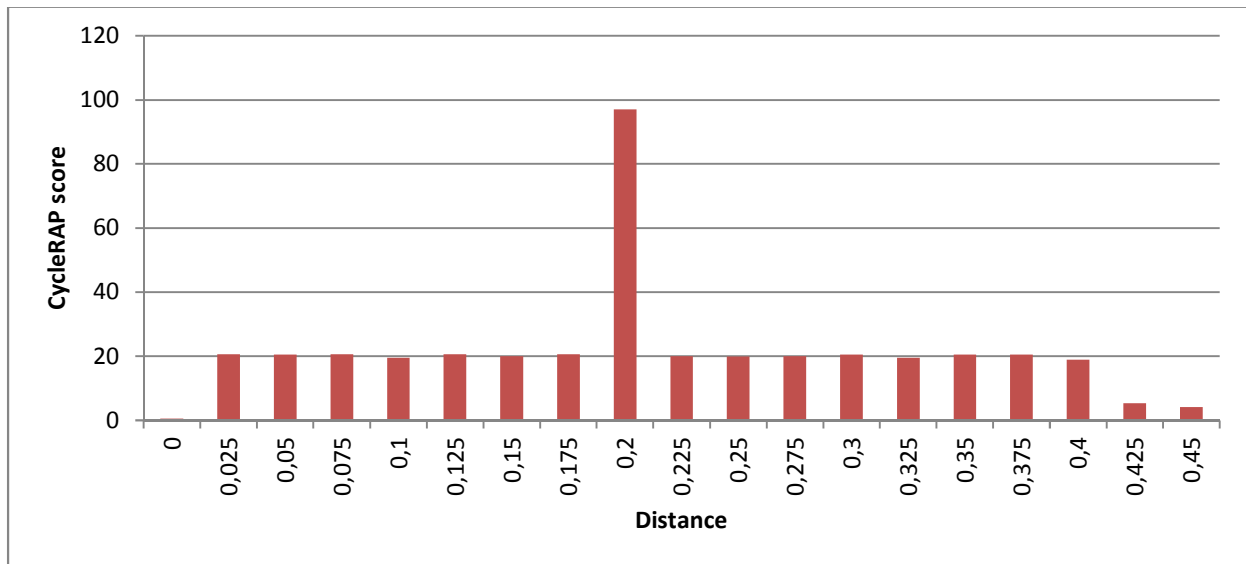
Figure 87.

Route 3-B1 – 0.2 km, Vehicle vs Bicycle score 95.9727



Chart 28,

Route 3-B1, CycleRAP score



Route 3-B3

Chart 29. Route 3-B3, Single Bicycle score

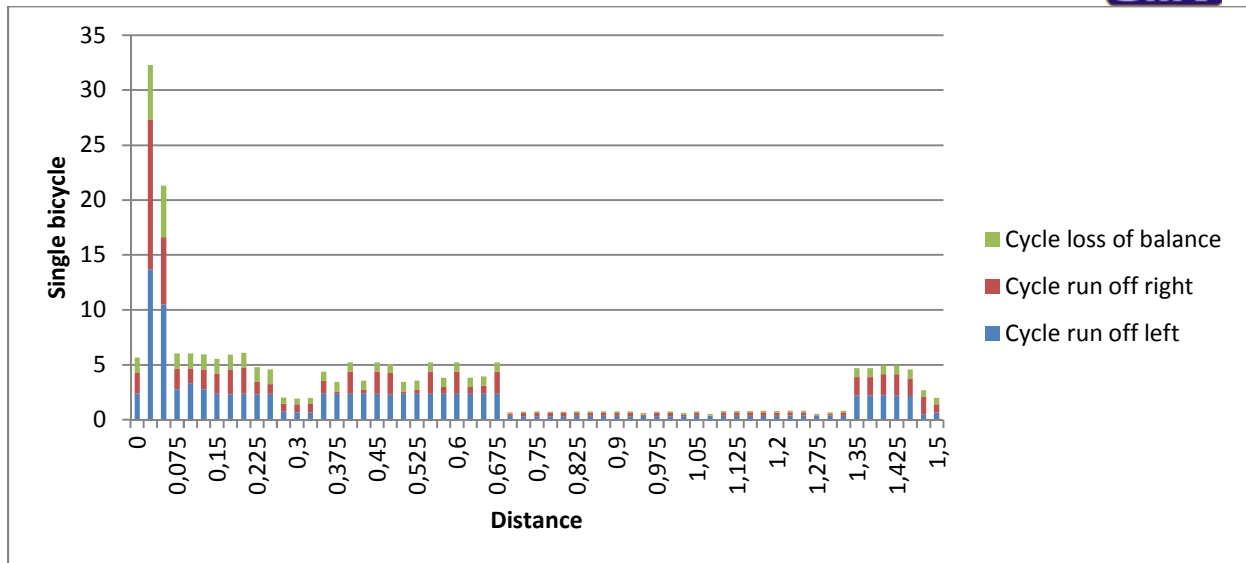
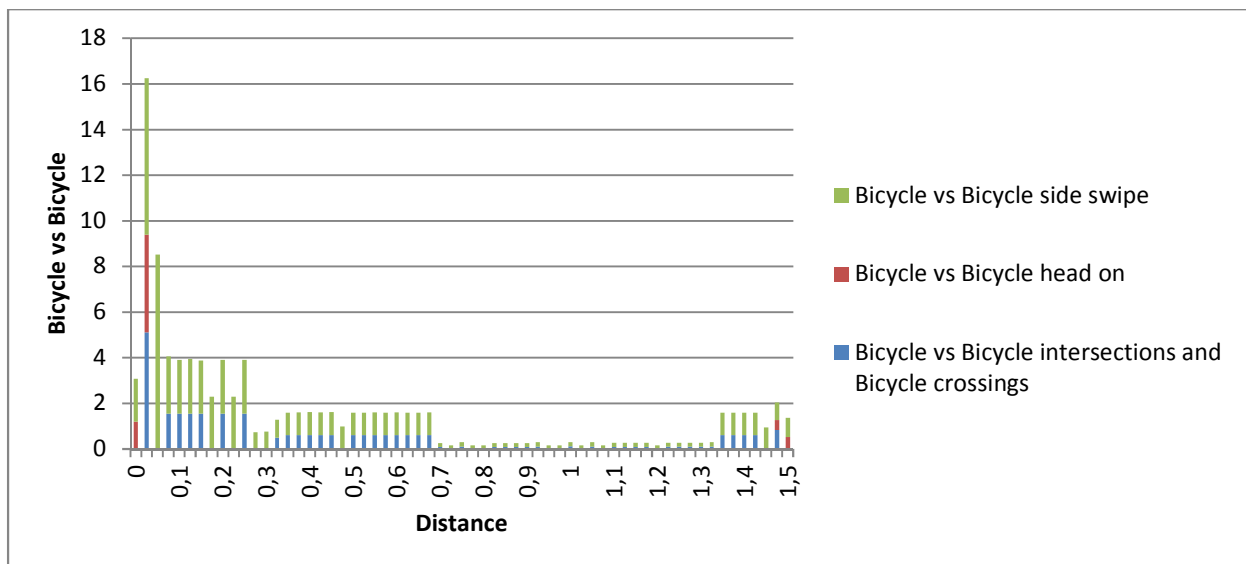


Chart 30. Route 3-B3, Bicycle vs Bicycle score



The highest Star Rating Score for Single Bicycle and Bicycle vs Bicycle carsh type is on 0.025 km shown on Figure 88.

Figure 88.

Route 3-B3 – 0.025 km, Single bicycle score 32.318798, Bicycle vs Bicycle score 16.251644



Chart 31. Route 3-B3, Vehicle vs Bicycle score

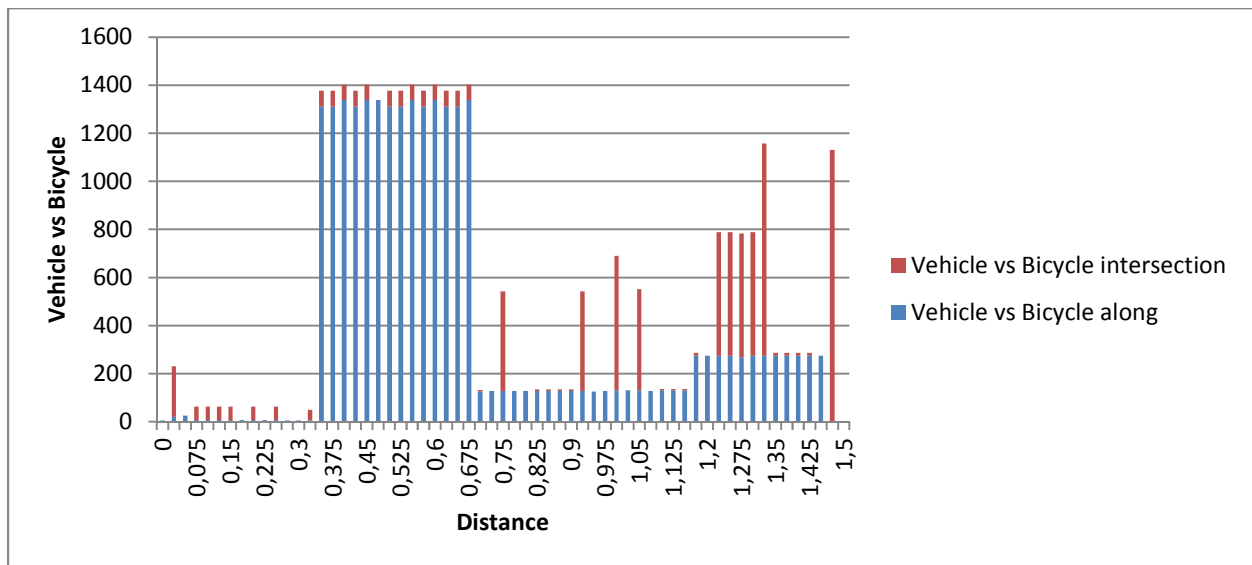
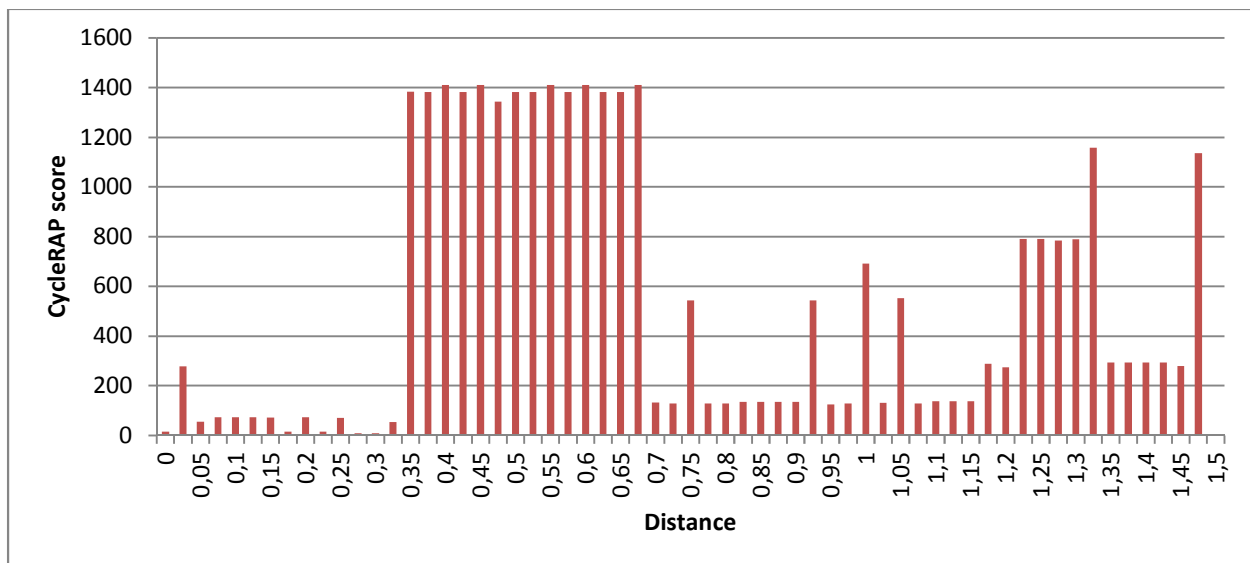


Figure 89.

Route 3-B3 – 0.55 km, Vehicle vs Bicycle score 1403.58033



Chart 32. Route 3-B3, CycleRAP score



Route 3-B4

Chart 33. Route 3-B4, Single Bicycle score

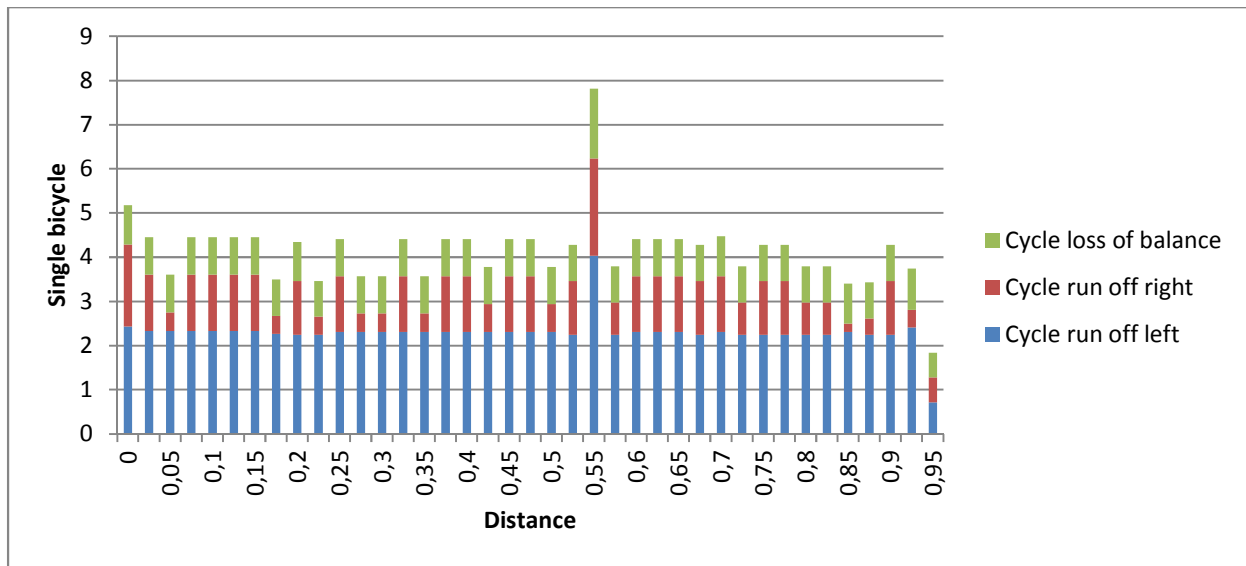
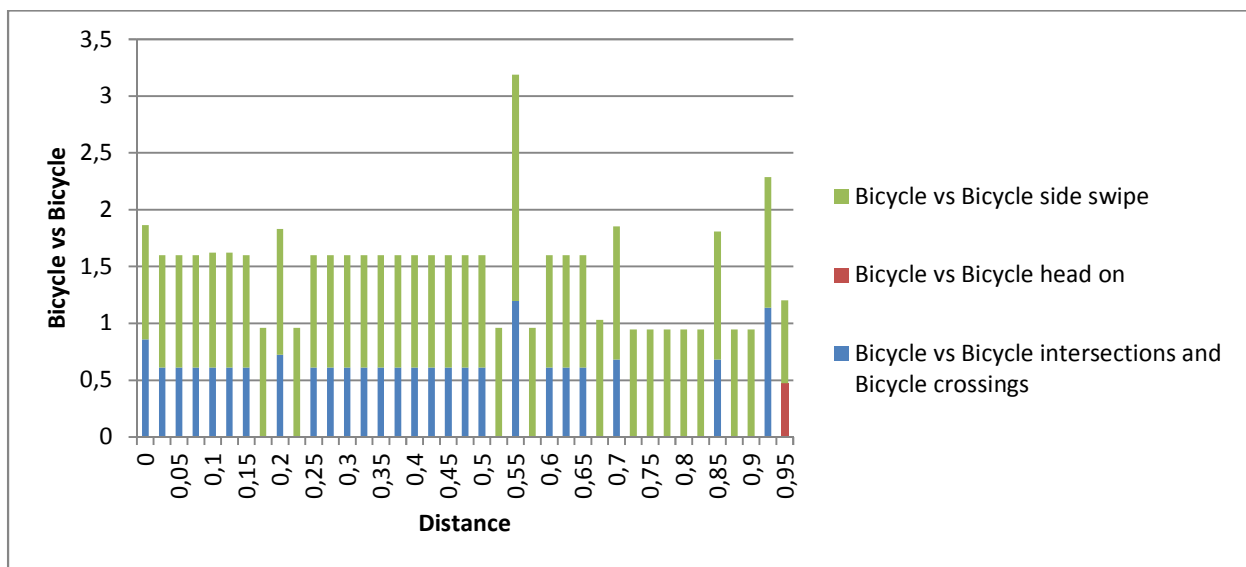


Chart 34. Route 3-B4, Bicycle vs Bicycle score



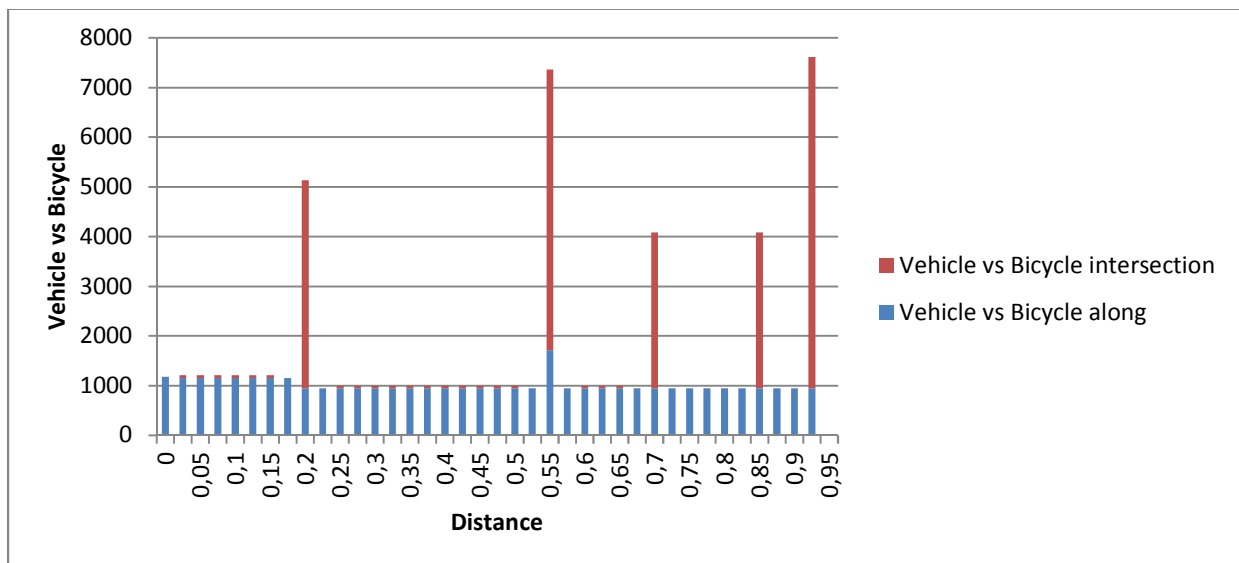
The highest Star Rating Score for Single bicycle and Bicycle vs bicycle carsh type is on 0.55 km shown on Figure 88.

Figure 90.

Route 3-B3 – 0.55 km, Single bicycle score 7.818362, Bicycle vs Bicycle score 3.42170437



Chart 35. Route 3-B4, Vehicle vs Bicycle score



The highest Star Rating Score for Vehicle vs bicycle crash type is on 0.925 km shown on Figure 95.

Chart 36. Route 3-B4, CycleRAP score

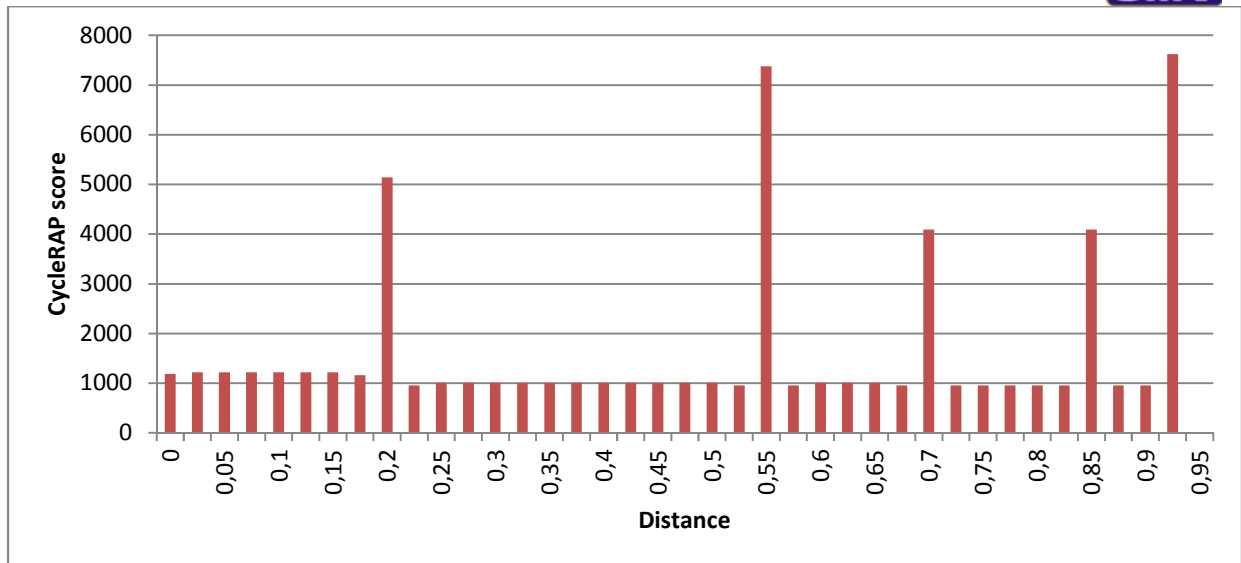


Figure 91.

Route 3-B4- 0.2 km, CycleRAP score 5140.59



Figure 92.

Route 3-B4- 0.55 km, CycleRAP score 7370.19



Figure 93.

Route 3-B4- 0.7 km, CycleRAP score 4089.08



Figure 94.

Route 3-B4- 0.85 km, CycleRAP score 4087.97



Figure 95.

Route 3-B4- 0.925 km, Vehicle vs Bicycle score 7.611.7785, CycleRAP score 7617.81



Route4.1

Chart 37. Route 4.1, Single bicycle score

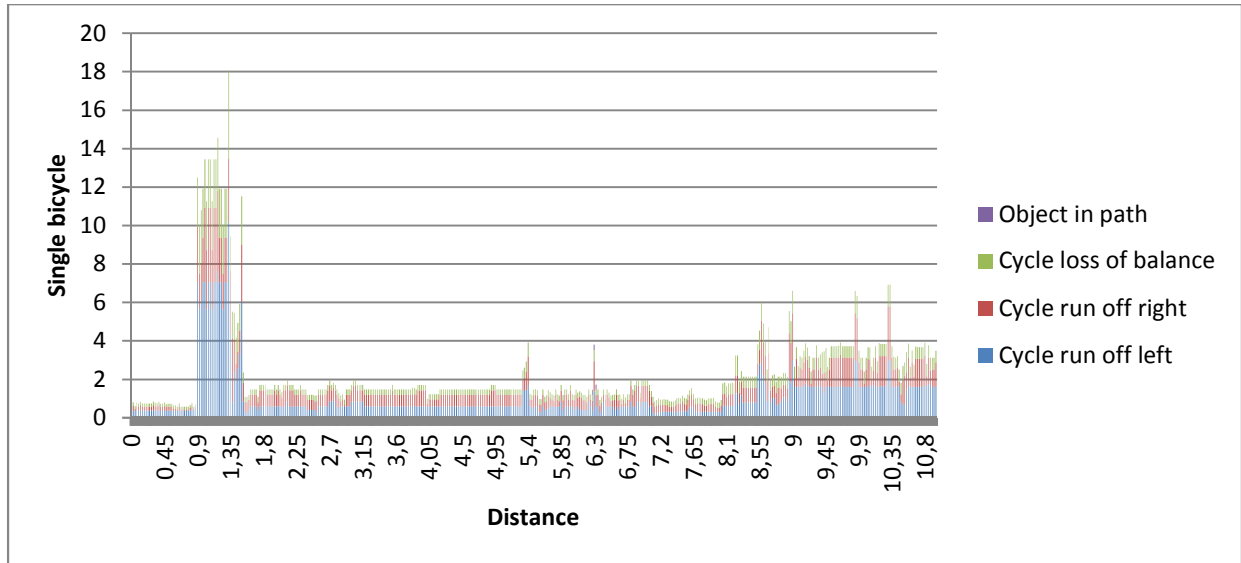


Figure 96.

Route 4.1 – 1.325 km, Single bicycle score 18.07002



Chart 38. Route 4.1, Bicycle vs Bicycle score

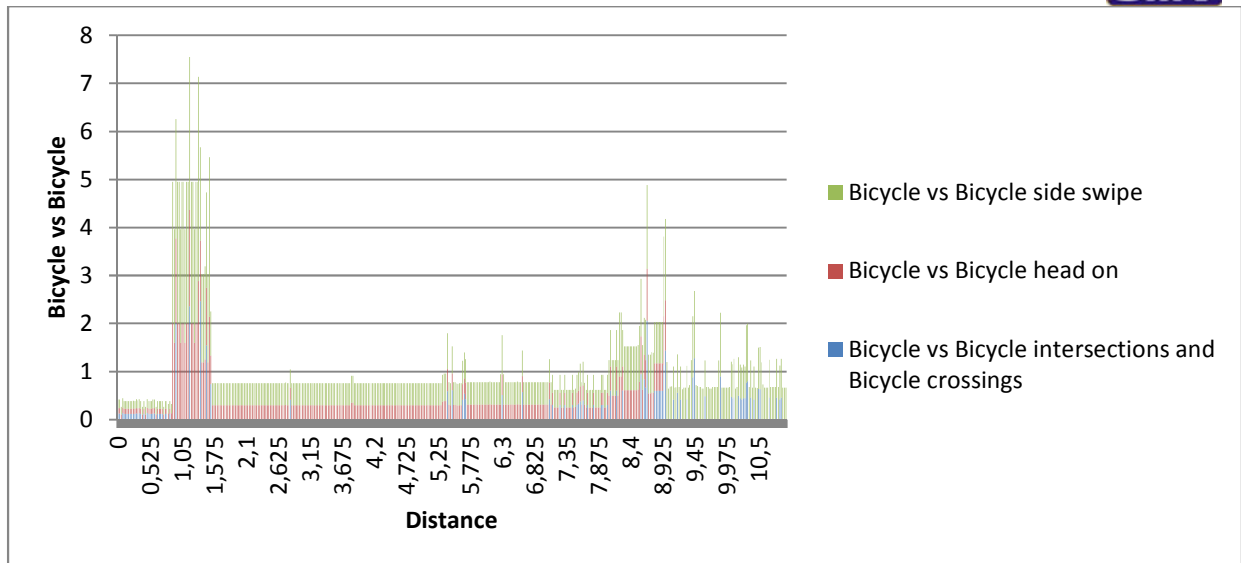


Figure 97.

Route 4.1 – 1.175 km Bicycle vs Bicycle score 7.548672



Chart 39. Route 4.1, Vehicle vs Bicycle score

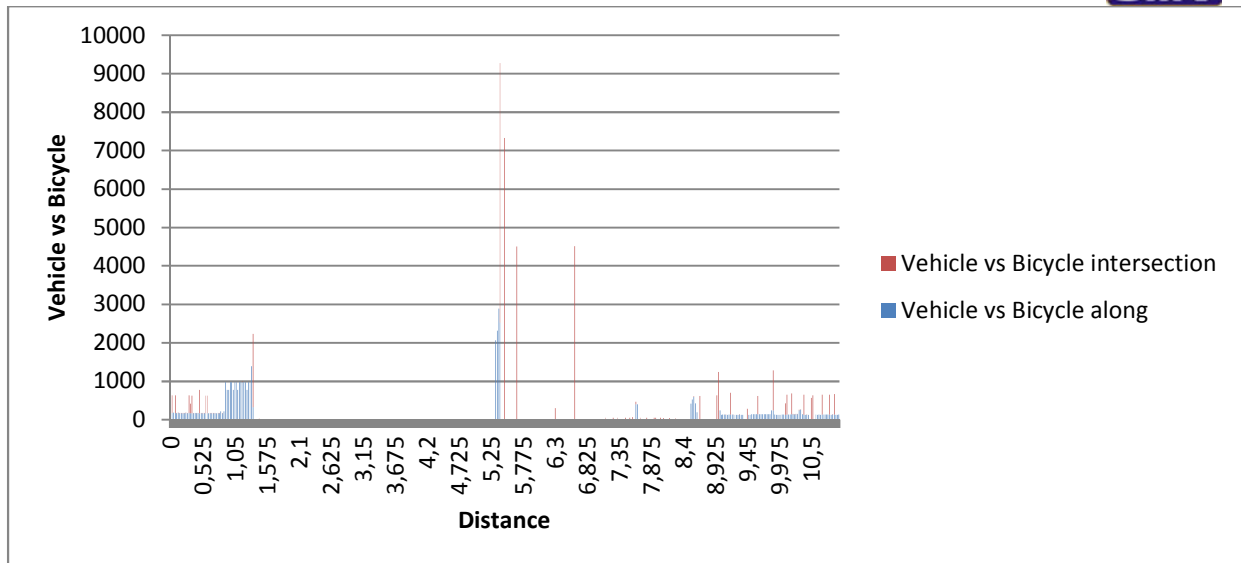
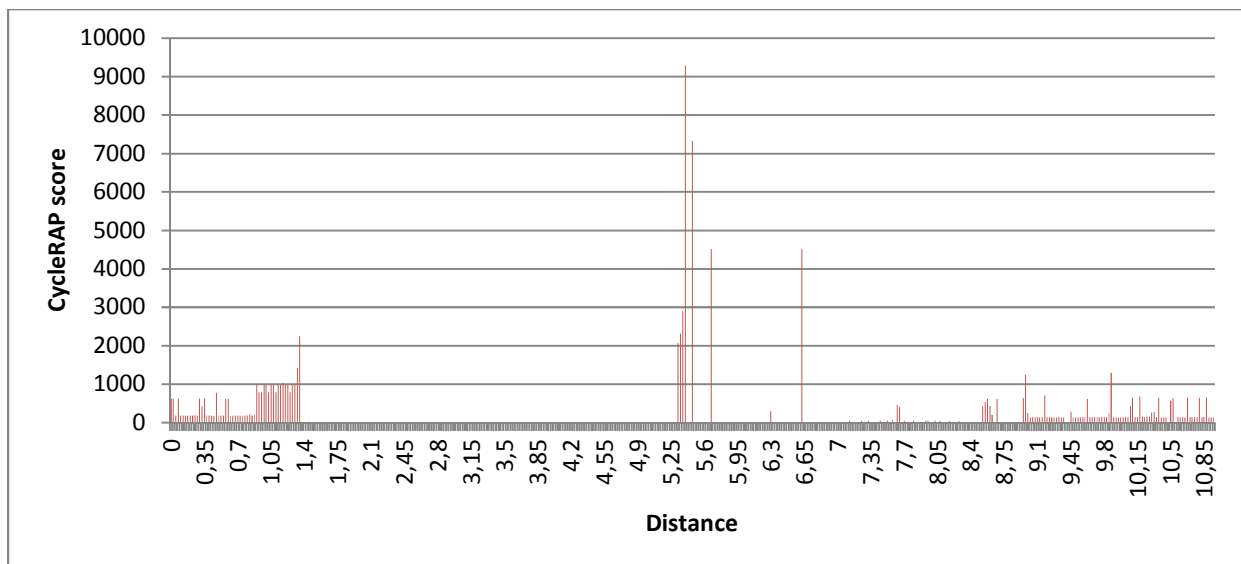


Chart 40. Route 4.1, CycleRAP score



The highest Star Rating Score for Vehicle vs bicycle crash type is on 5.4 km shown on Figure 102.

Figure 98.

Route 4.1- 1.35 km, CycleRAP score 2249.066



Figure 99.

Route 4.1- 5.325 km, CycleRAP score 2069.56



Figure 100.

Route 4.1- 5.35 km, CycleRAP score 2317.664



Figure 101.

Route 4.1- 5.375 km, CycleRAP score 2896.499



Figure 102.

Route 4.1- 5.4 km, Vehicle vs Bicycle score 11793.163, CycleRAP score 9281.438



Figure 103.

Route 4.1-5.475 km, CycleRAP score 7327.481



Figure 104.

Route 4.1- 5.675 km, CycleRAP score 4509.629



Figure 105.

Route 4.1- 6.625 km, CycleRAP score 4514.331



Route 4.2

Chart 41. Route 4.2, Single bicycle score

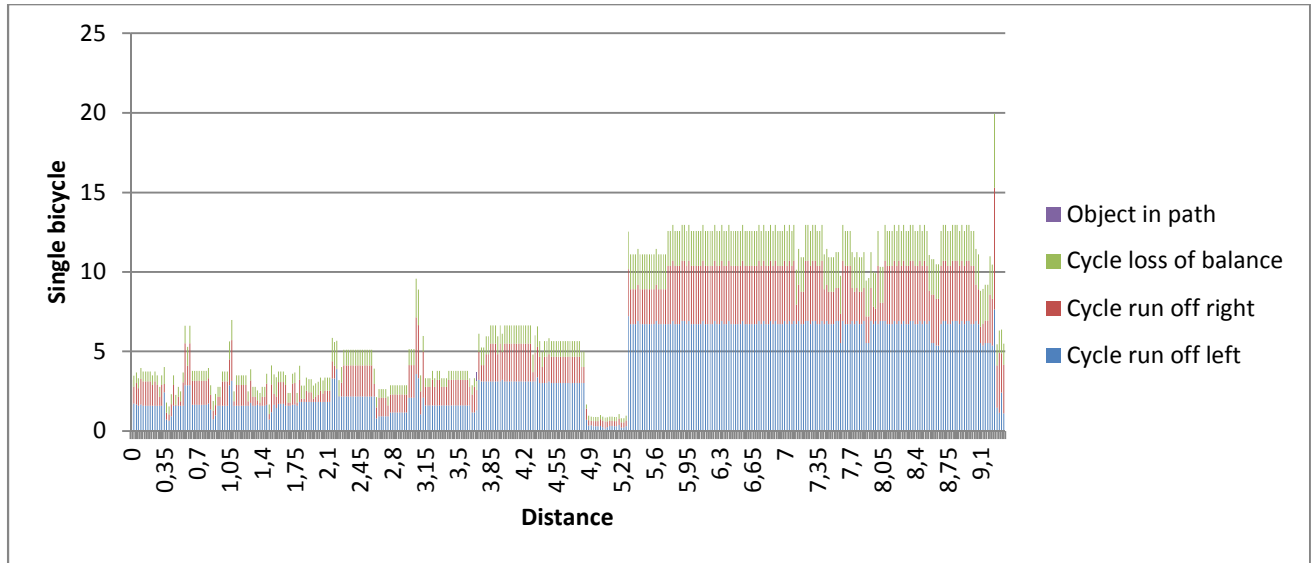


Figure 106.

Route 4.2 – 9.25 km, Single bicycle score 19.951612



Chart 42. Route 4.2, Bicycle vs Bicycle score

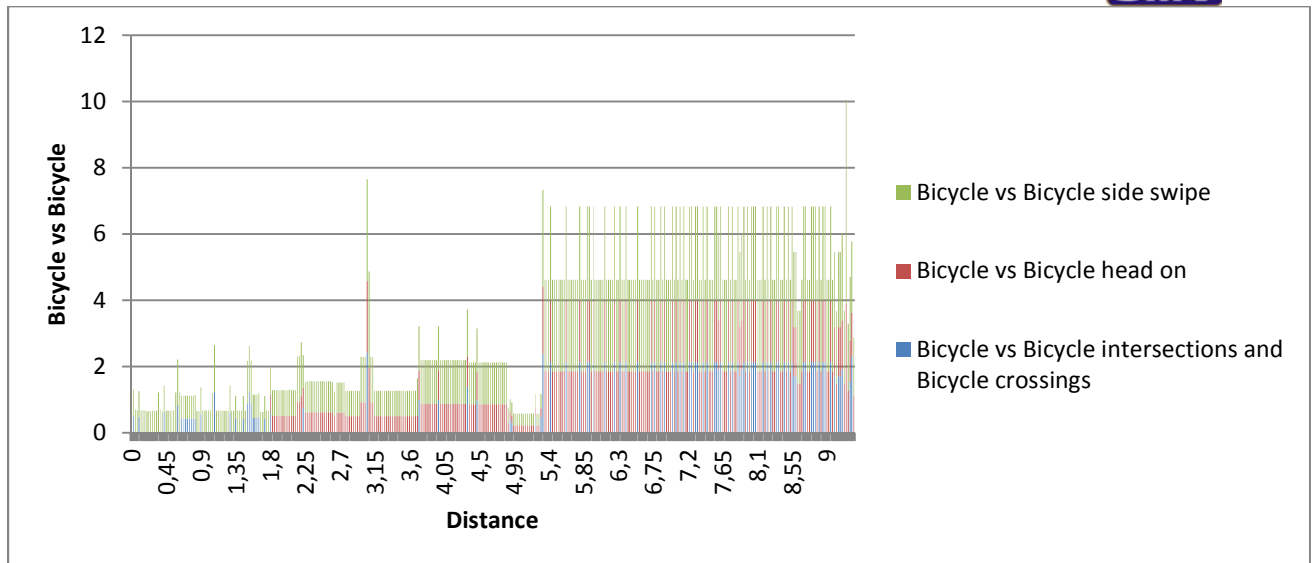


Figure 107.

Route 4.2 – 3.05 km, Bicycle vs Bicycle score 7.651798



Chart 43. Route 4.2, Vehicle vs Bicycle score

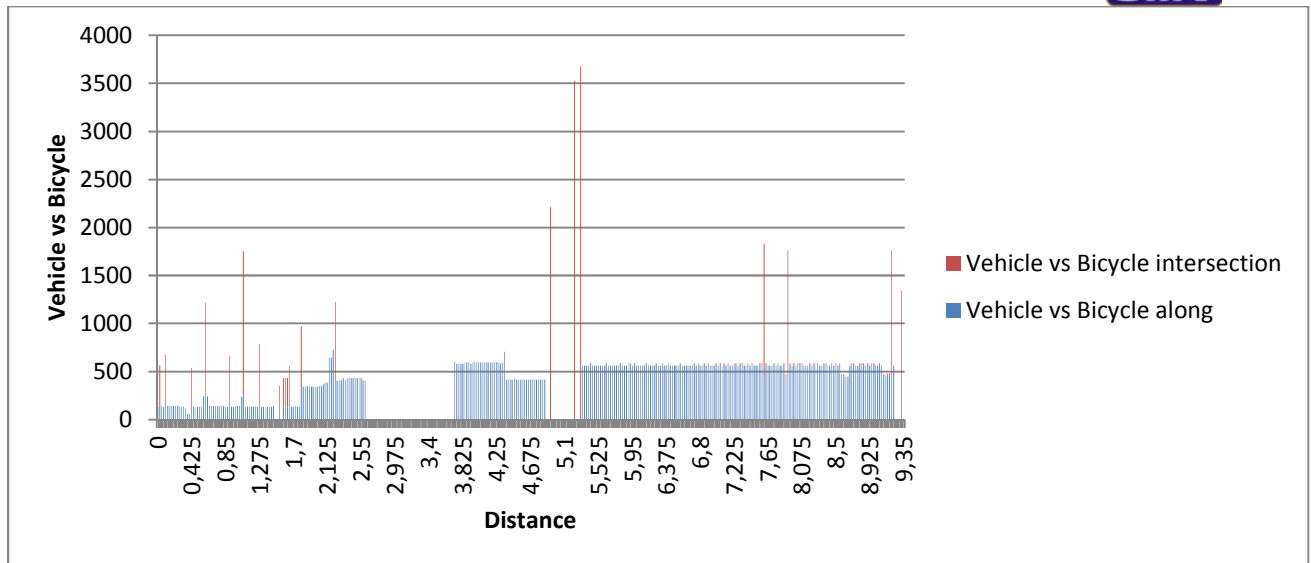
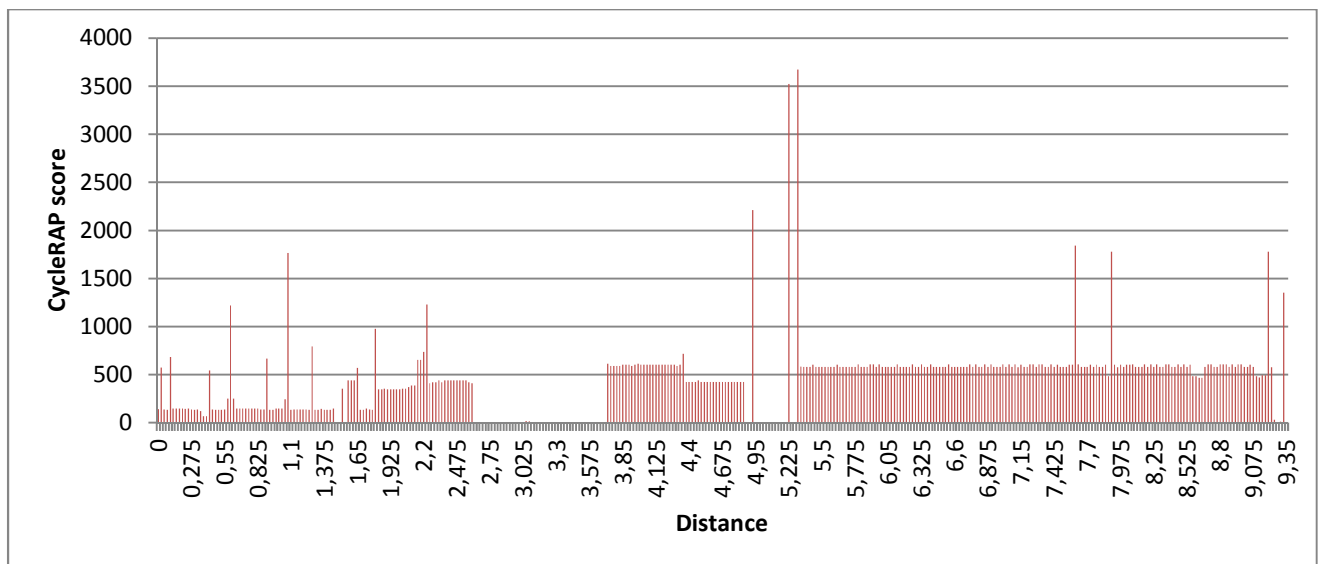


Chart 44. Route 4.2, CycleRAP score



The highest Star rating Score for Vehicle vs bicycle carsh type is on 5.3 km shown on Figure 110.

Figure 108.

Route 4.2- 4.925 km, CycleRAP score 2212.18



Figure 109.

Route 4.2- 5.225 km, CycleRAP score 3525.36



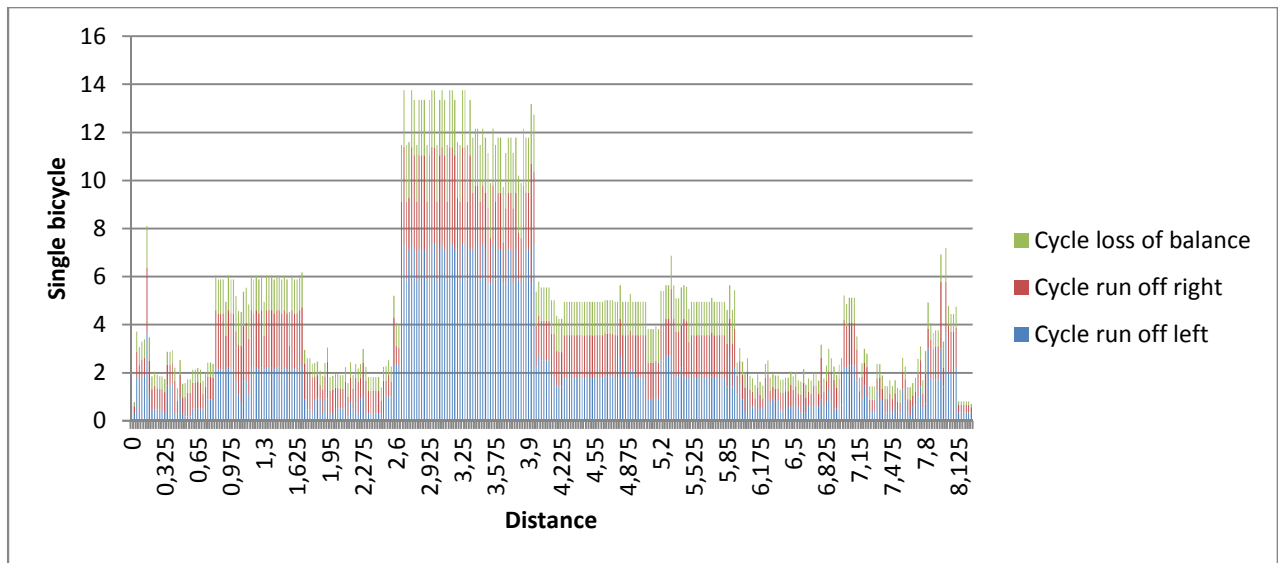
Figure 110.

Route 4.2- 5.3 km, Vehicle vs Bicycle score 3671.65485, CycleRAP score 3673.79



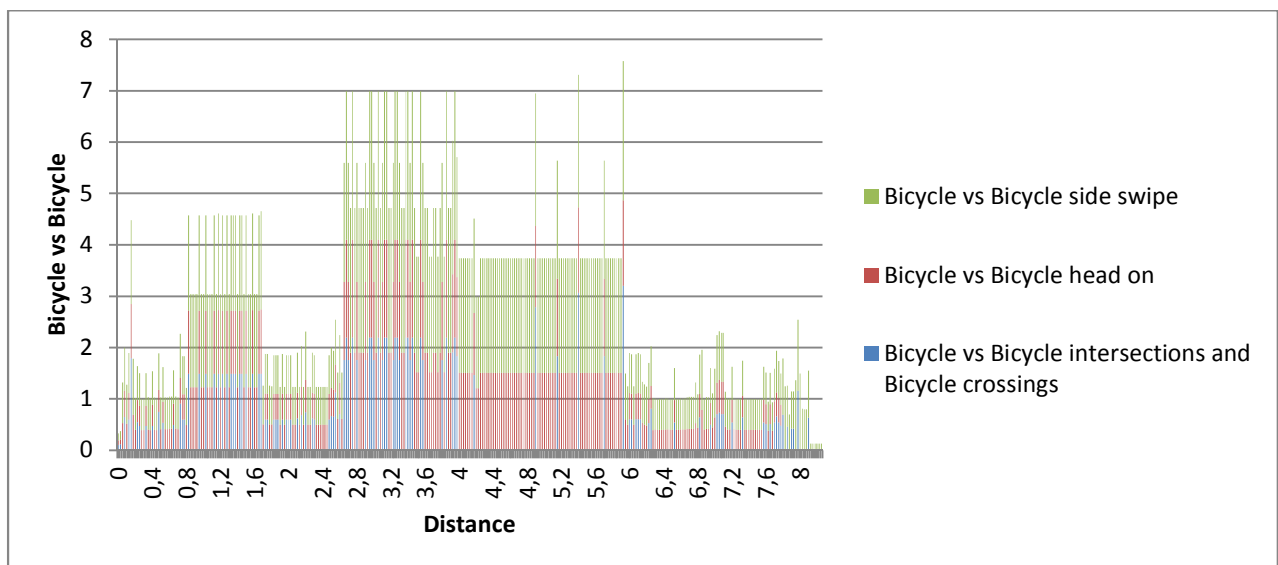
Route 5

Chart 45. Route 5, Single bicycle score



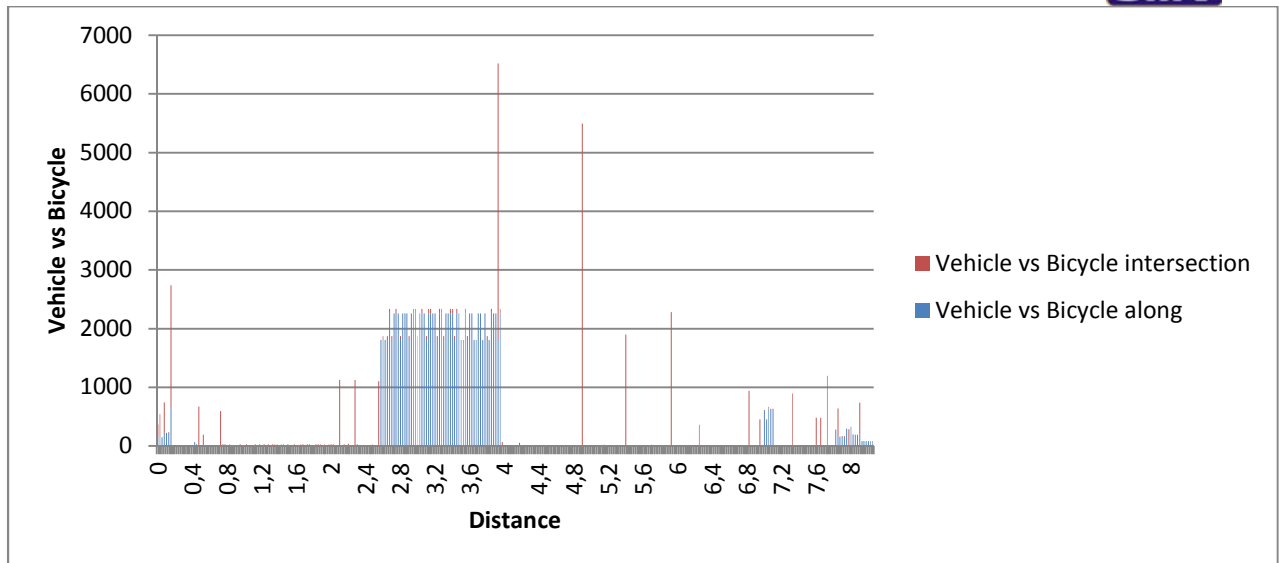
The highest Star Rating score for Single bicycle crash type is on 3.275 km shown on Figure 130.

Chart 46. Route 5, Bicycle vs Bicycle score



The highest Star Rating score for Bicycle vs bicycle crash type is on 5.925km shown on Figure 149.

Chart 47. Route 5, Vehicle vs Bicycle score



The highest Star Rating score for Vehicle vs bicycle crash type is on 3.925km shown on Figure 146.

Chart 48. Route 5, CycleRAP score

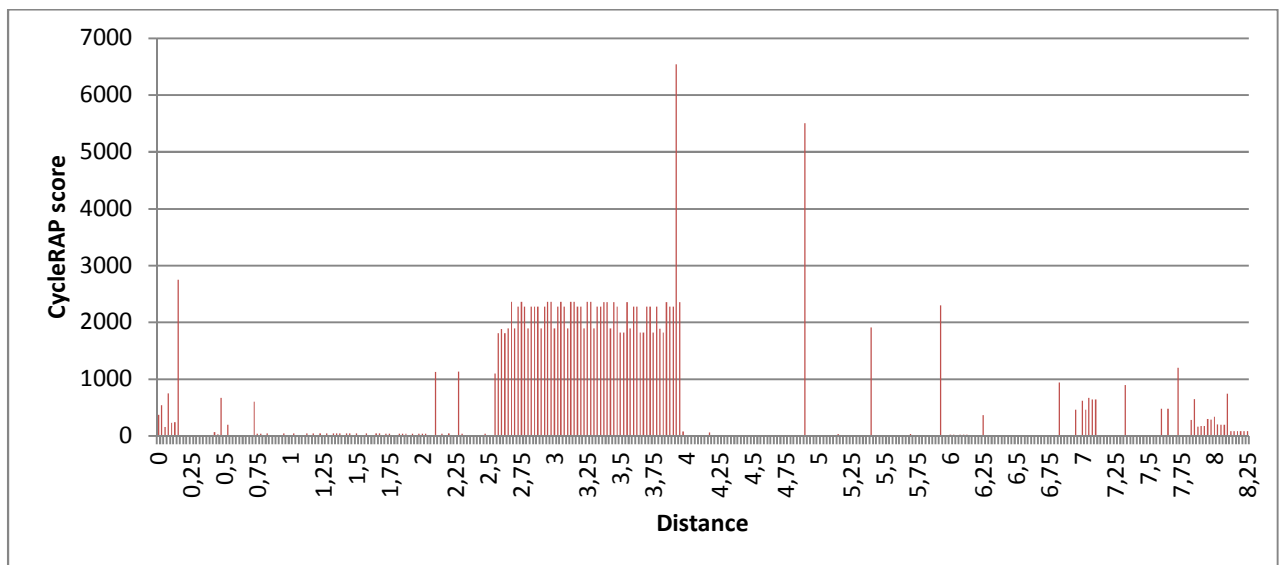


Figure 111.

Route 5- 0.15 km, CycleRAP score 2752.404



Figure 112.

Route 5- 2.675 km, CycleRAP score 2361.43



Figure 113.

Route 5- 2.725 km, CycleRAP score 2272.937



Figure 114.

Route 5- 2.75 km, CycleRAP score 2361.43



Figure 115.

Route 5- 2.775 km, CycleRAP score 2274.692



Figure 116.

Route 5- 2.825 km, CycleRAP score 2274.692



Figure 117.

Route 5- 2.85 km, CycleRAP score 2274.692



Figure 118.

Route 5- 2.875 km, CycleRAP score 2274.692



Figure 119.

Route 5- 2.925 km, CycleRAP score 2274.692



Figure 120.

Route 5- 2.95 km, CycleRAP score 2361.43



Figure 121.

Route 5- 2.975 km, CycleRAP score 2361.43



Figure 122.

Route 5- 3.025 km, CycleRAP score 2274.692



Figure 123.

Route 5- 3.05 km, CycleRAP score 2361.43



Figure 124.

Route 5- 3.075 km, CycleRAP score 2274.692



Figure 125.

Route 5- 3.125 km, CycleRAP score 2361.43



Figure 126.

Route 5- 3.15 km, CycleRAP score 2361.43



Figure 127.

Route 5- 3.175 km, CycleRAP score 2274.692



Figure 128.

Route 5- 3.2 km, CycleRAP score 2272.937



Figure 129.

Route 5- 3.25 km, CycleRAP score 2361.43



Figure 130.

Route 5- 3.275 km, Single bicycle score 13.75127, CycleRAP score 2361.43



Figure 131.

Route 5- 3.325 km, CycleRAP score 2274.692



Figure 132.

Route 5- 3.35 km, CycleRAP score 2273.132



Figure 133.

Route 5- 3.375 km, CycleRAP score 2359.823



Figure 134.

Route 5- 3.4 km, CycleRAP score 2359.823



Figure 135.

Route 5- 3.45 km, CycleRAP score 2359.823



Figure 136.

Route 5- 3.475 km, CycleRAP score 2273.132



Figure 137.

Route 5- 3.55 km, CycleRAP score 2359.823



Figure 138.

Route 5-3.6 km, CycleRAP score 2273.132



Figure 139.

Route 5- 3.625 km, CycleRAP score 2273.132



Figure 140.

Route 5-3.7 km, CycleRAP score 2273.132



Figure 141.

Route 5- 3.725 km, CycleRAP score 2273.132



Figure 142.

Route 5-3.775 km, CycleRAP score 2273.132



Figure 143.

Route 5- 3.85 km, CycleRAP score 2359.823



Figure 144.

Route 5- 3.875 km, CycleRAP score 2273.132



Figure 145.

Route 5- 3.9 km, CycleRAP score 2273.132



Figure 146.

Route 5- 3.925 km, Vehicle vs Bicycle score 6524.312, CycleRAP score 6543.526



Figure 147.

Route 5- 3.95 km, CycleRAP score 2360.426



Figure 148.

Route 5- 4.9 km, CycleRAP score 5506.367



Figure 149.

Route 5- 5.925 km, Bicycle vs Bicycle score 7.580079, CycleRAP score 2294.949



Route 5-B1

Chart 49. Route 5-B1, Single bicycle score

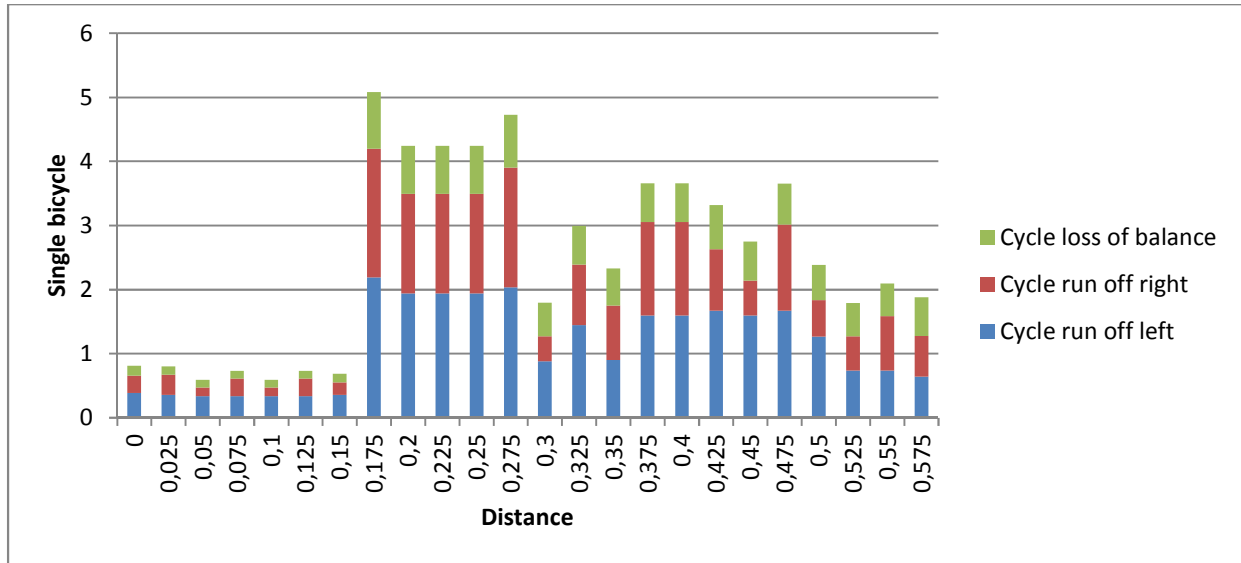


Chart 50. Route 5-B1, Bicycle vs Bicycle score

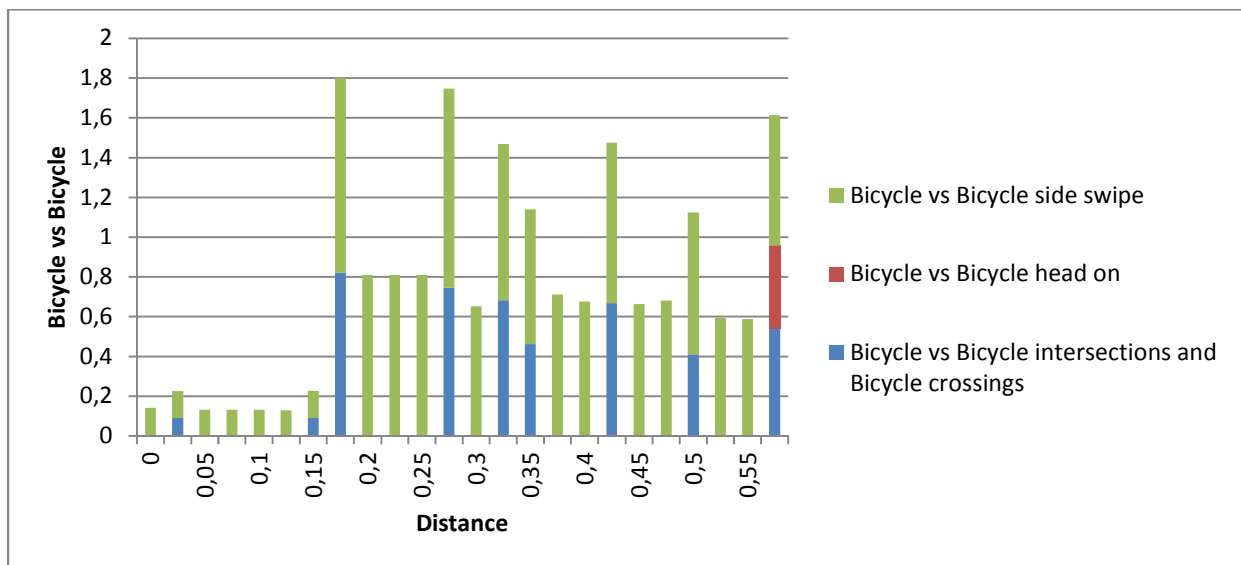
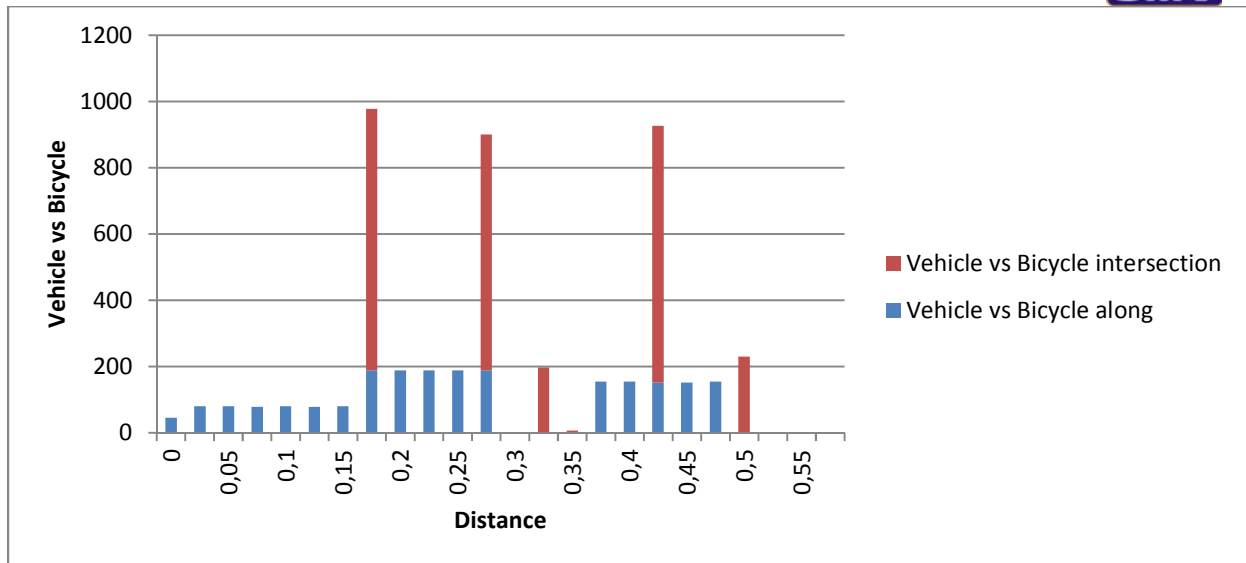


Chart 51. Route 5-B1, Vehicle vs Bicycle score



The highest Star Rating score for all three crash types is on 0.175 km shown on Figure 150.

Chart 52. Route 5-B1, CycleRAP score

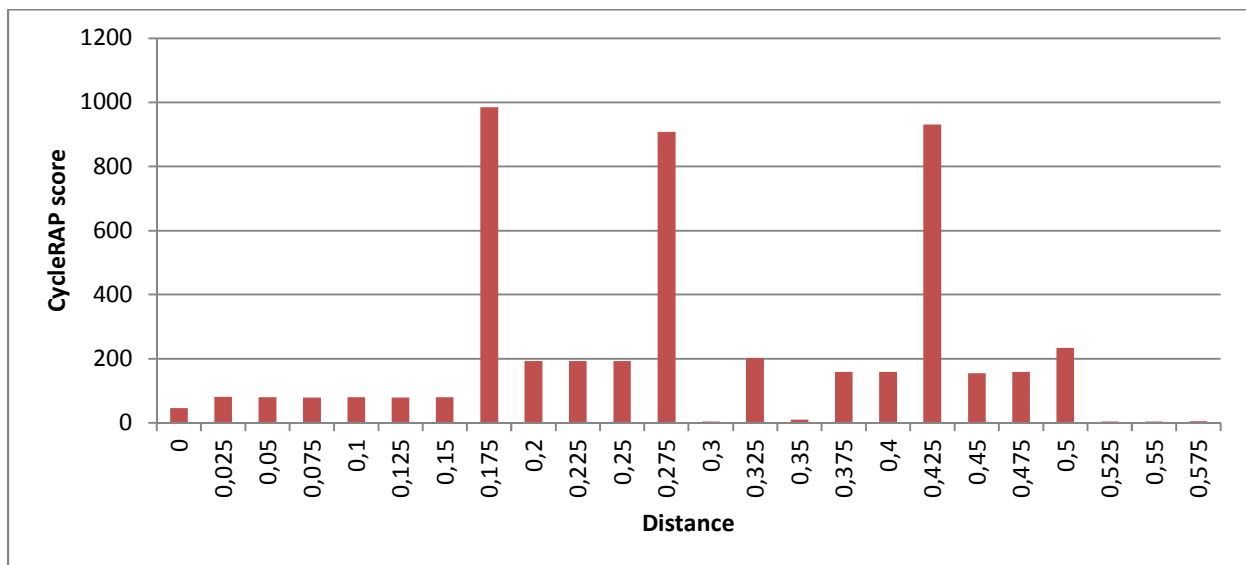


Figure 150.

Route 5-B1- 0.175 km, Single bicycle score 5.082215, Bicycle vs Bicycle score 1.800626,
Vehicle vs Bicycle score 978.0298, CycleRAP score 984.9127



Route 6

Chart 53. Route 6, Single bicycle score

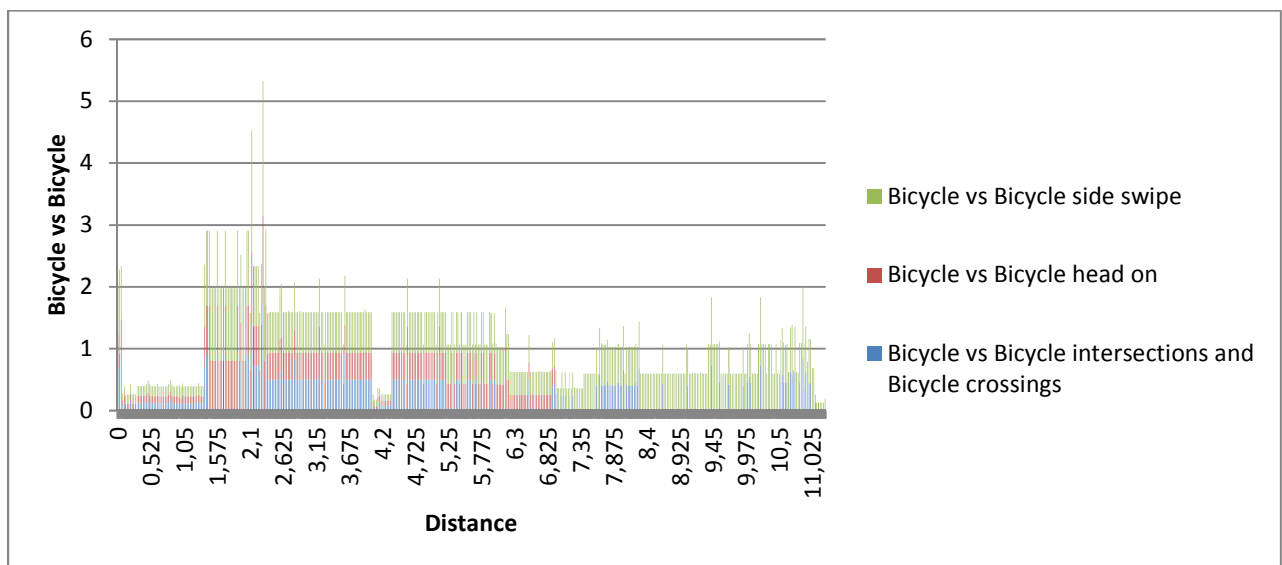
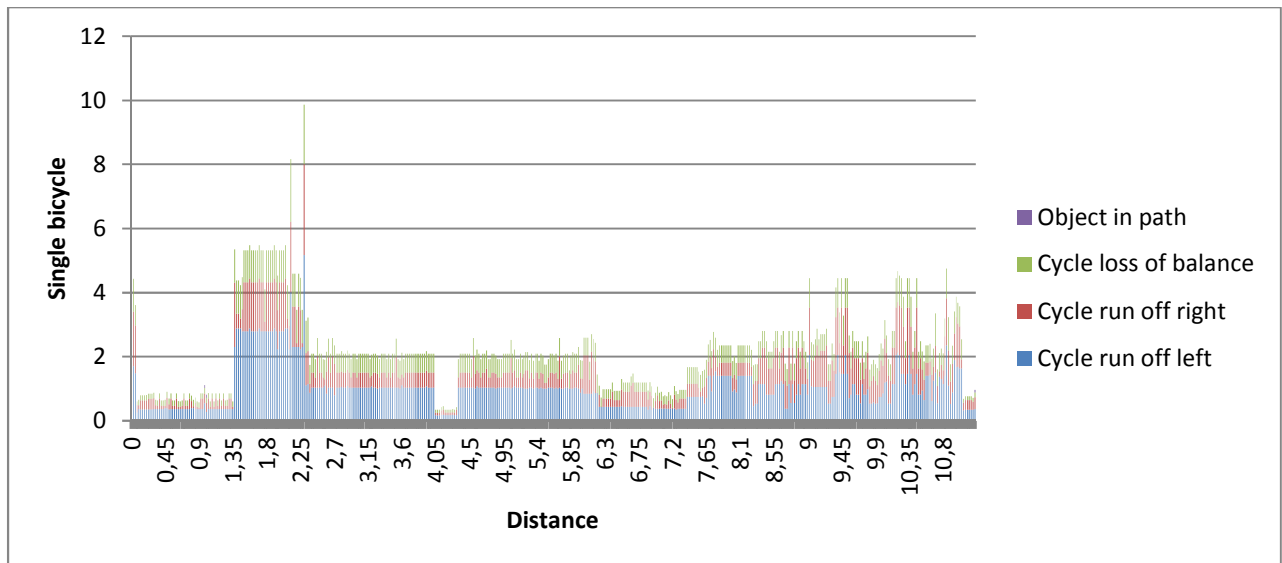


Chart 54. Route 6, Bicycle vs Bicycle score

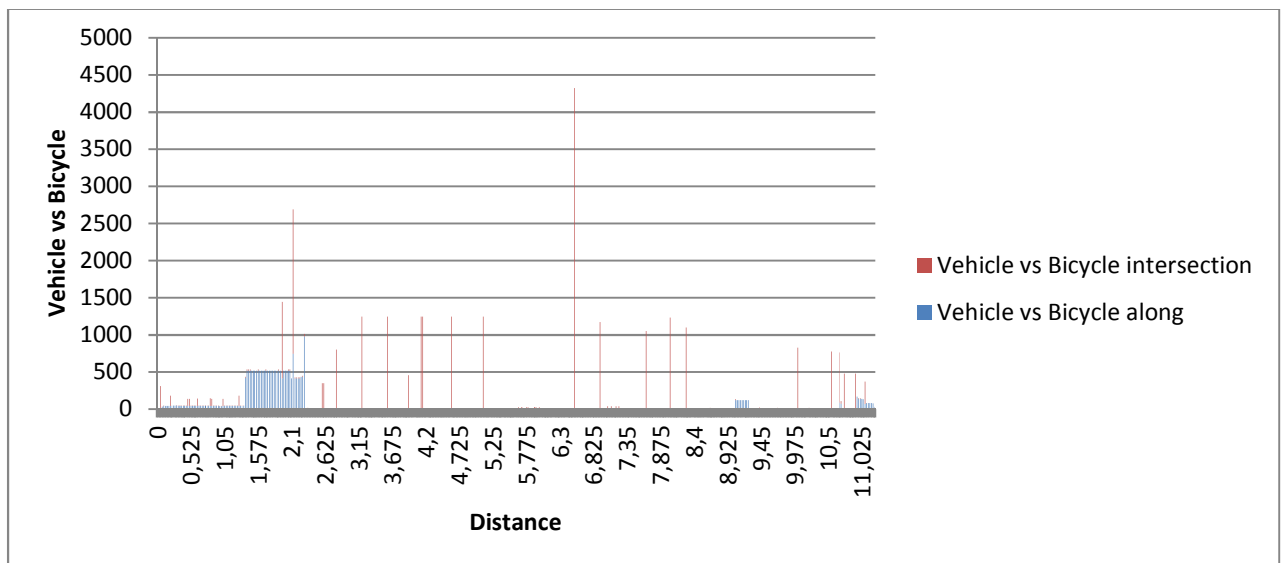
The highest Star Rating score for Single bicycle and Bicycle vs bicycle carsh type is on 2.3 km shown on Figure 151.

Figure 151.

Route 6- 2.3 km, Single bicycle score 9.868645, Bicycle vs Bicycle score 5.325818



Chart 55. Route 6, Vehicle vs Bicycle score



The highest Star Rating score for Vehicle vs bicycle carsh type is on 6.525 km shown on Figure 152.

Chart 56. Route 6, CycleRAP score

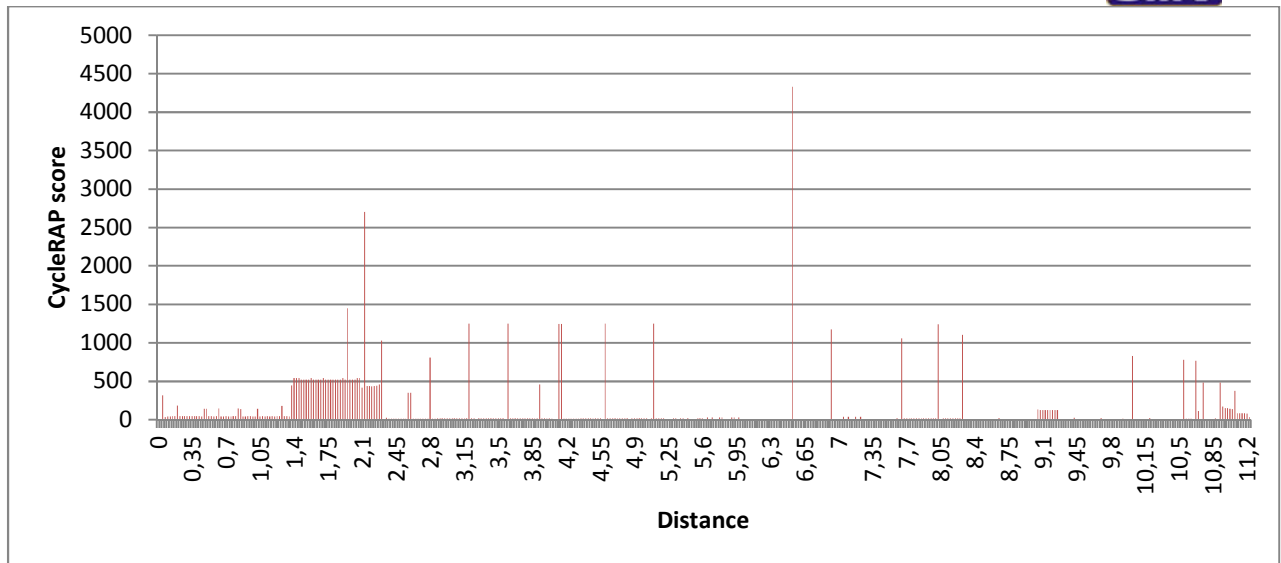


Figure 152.

Route 6- 2.125 km, Vehicle vs Bicycle score 4327.27535, CycleRAP score 2702.336



Figure 153.

Route 6-6.525 km, Vehicle vs Bicycle score 4327.27535, CycleRAP score 4329.794



Route 6-B1

Chart 57. Route 6-B1, Single bicycle score

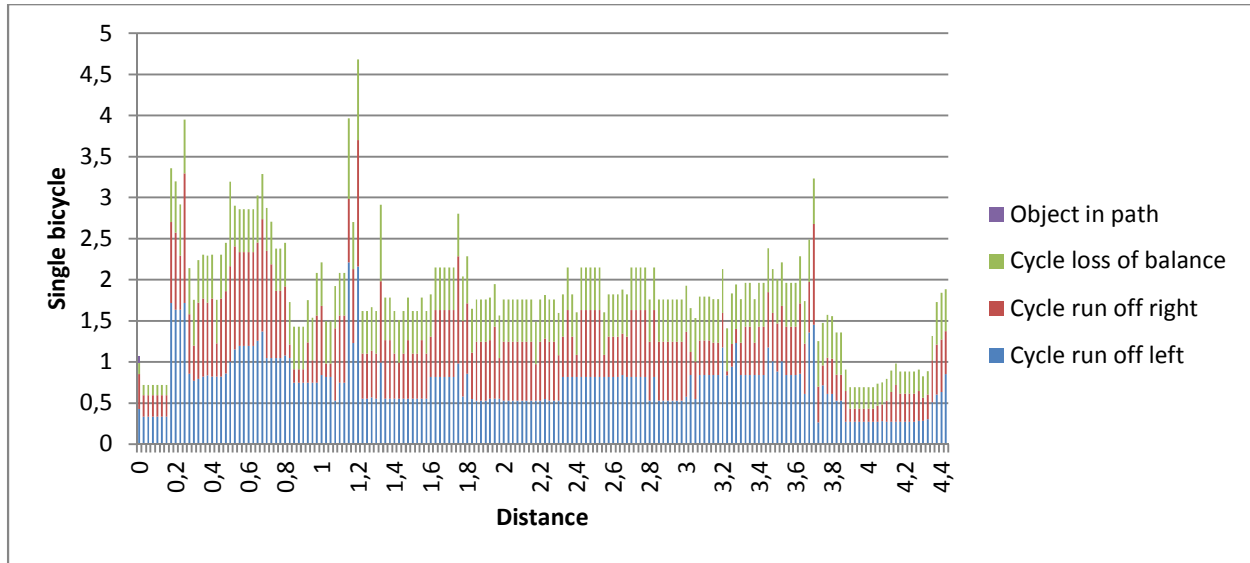


Figure 154.

Route 6-B1-1.2 km, Single bicycle score 4.680403



Chart 58. Route 6-B1, Bicycle vs Bicycle score

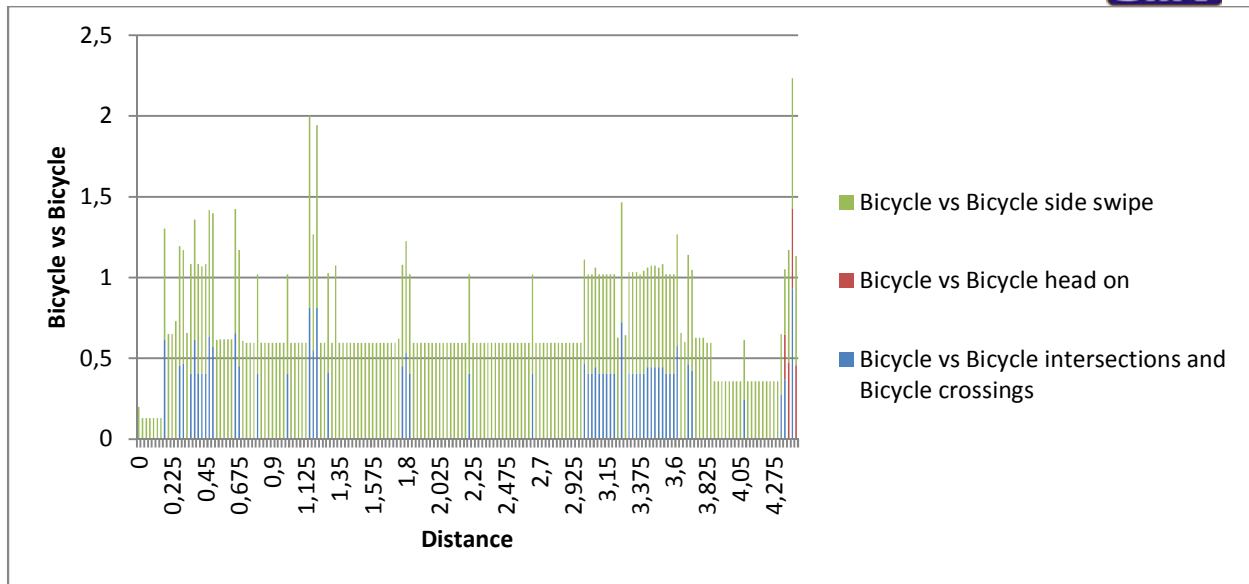
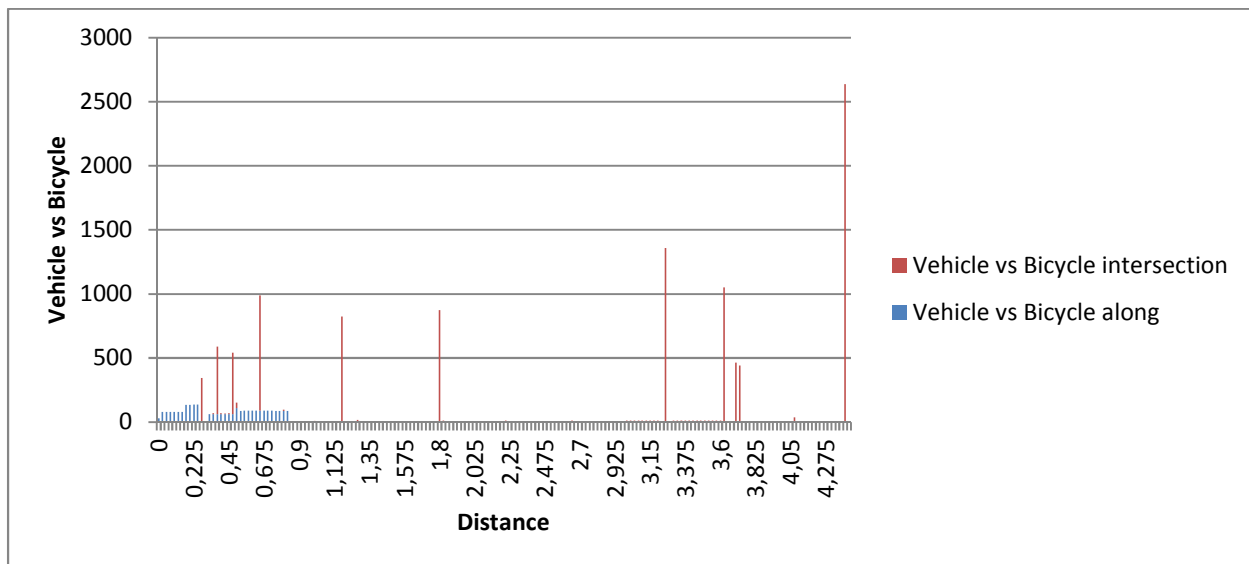


Chart 59. Route 6-B1, Vehicle vs Bicycle score



The highest Star Rating score for Bicycle vs bicycle and Vehicle vs bicycle crash type is on 4.4km shown on Figure 155.

Chart 60. Route 6-B1, CycleRAP score

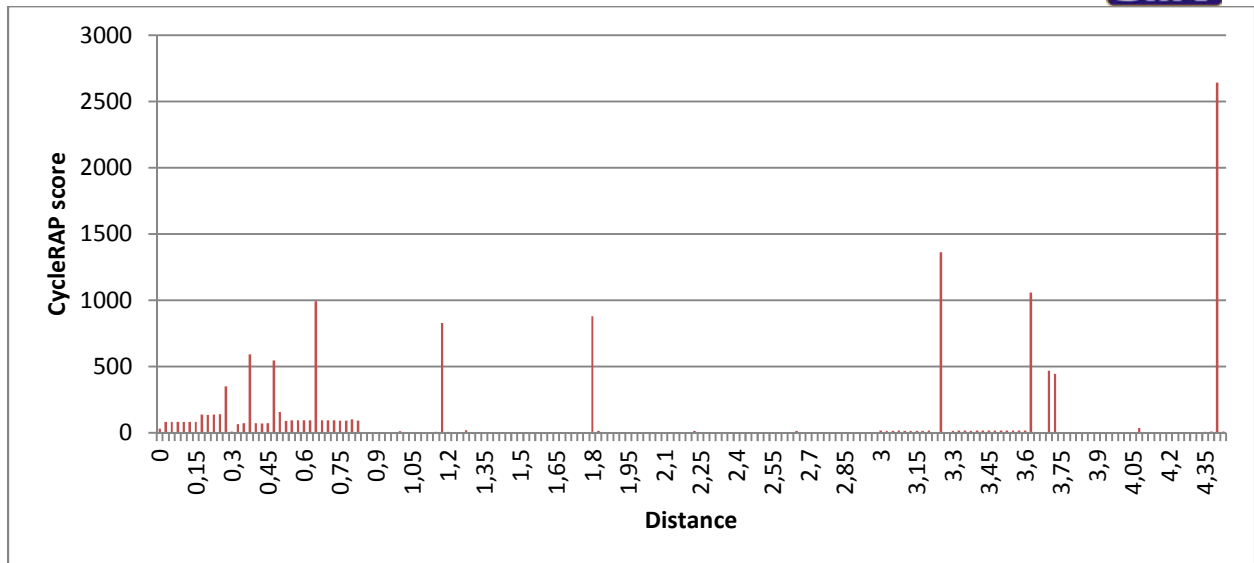


Figure 155.

Route 6-B1- 4.4 km, Bicycle vs Bicycle score 2.2338, Vehicle vs Bicycle score 2638.93273,

CycleRAP score 2643.01



Chart 61. Avarege CycleRAP score per route

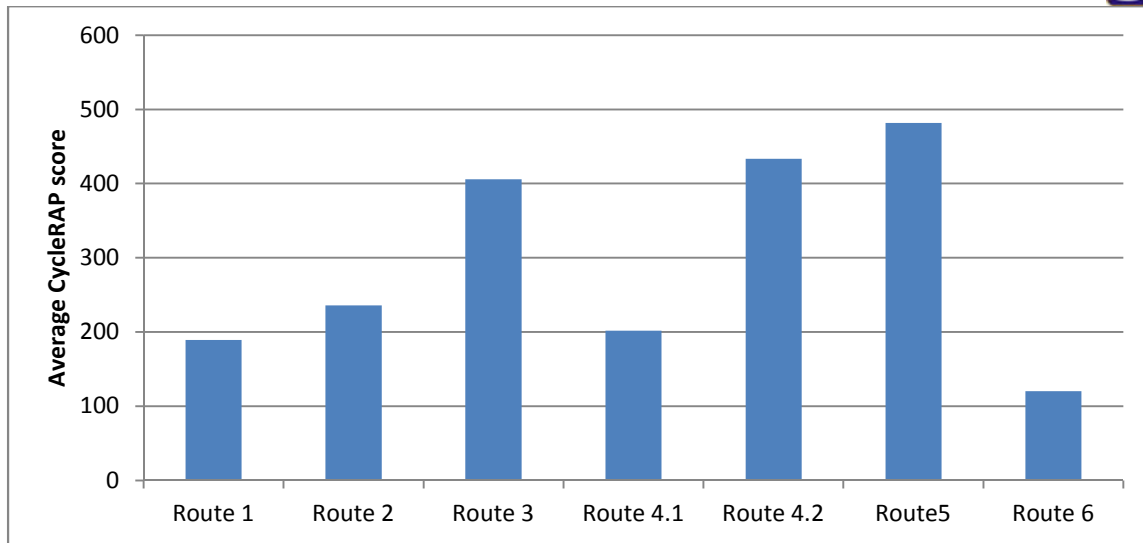


Chart 62. CycleRAP score per bicycle facility type

