Table 3.1 – Percentage Mode Share by Car and Car Person Trips for NWC Stores

Scenario	Beehive Asda	Cambourne Morrisons	Coldham's Lane Sainsbury's	Bar Hill Tesco Extra	Milton Tesco	Newmarket Road (Cheddars Lane) Tesco
Planned Development Only	85%	95%	85%	94%	92%	83%
Test 1	85%	95%	84%	94%	91%	83%
Test 2	85%	94%	84%	94%	91%	82%
Test 3	85%	94%	84%	94%	92%	82%
Test 4	85%	95%	84%	94%	91%	83%
Test 5	85%	95%	85%	94%	92%	83%
Test 6	85%	95%	84%	94%	92%	83%

Scenario	Cherry Hinton (Yarrow Road) Tesco	Trumpington Waitrose	Northstowe Supermarket	New Store A (University Site)	New Store B (NIAB Site)	New Store C2 (Orchard Park)
Planned Development Only	88%	86%	94%	-	-	-
Test 1	87%	85%	94%	77% (2,460)	-	-
Test 2	87%	85%	94%	-	82% (3,170)	-
Test 3	87%	85%	94%	-	-	85% (4,050)
Test 4	87%	86%	94%	74% (380)	81% (1,060)	-
Test 5	88%	86%	94%	74% (370)	-	84% (1,950)
Test 6	87%	85%	94%	-	81% (1,020)	85% (1,920)

Note: The actual number of car person trips to each of the new stores is provided in addition to the percentage car mode shares in this table, to provide additional context (see paragraph 3.7).These numbers specifically relate to the number of car person trips generated over a 12 hour day by the additional food store provision above that contained in the Planned Development Only scenario.

Shopping Trip Costs

3.12 As described in paragraph 2.21, Generalised Cost is the DfT's preferred measure of trip cost: rather than pure time or pure distance, it is a combination of the two and represents the monetary cost of a trip to an individual person. For this reason, the Gravity Model has been built using Generalised Cost in pence and its results are also presented in this way. Reductions in average travel costs across the whole Gravity Model (relative to the Planned Development Only scenario with no new store provided) indicate that the average travel distance and time have reduced, and as a consequence there would be a beneficial impact on emissions when viewing the model catchment area as a whole.

3.13 Table 3.2 shows the average cost of trips to the new store(s) in each test location labelled A, B and C2 in Figure 3.1 above, and the total average trip cost across the whole Gravity Model catchment area. This table indicates that the average shopping trip cost across the whole catchment area decreases when a new major food store is included, and the costs associated with visiting the new stores themselves are lower still.

3.14 In the Planned Development Only situation, when there are no major food stores in NWC, the average generalised cost of travel to all modelled major food stores is 214p. Whenever a new store is added, this average cost decreases (for example, in Test 1, it decreases to 211p), indicating that shopping trips in general are shorter in distance and/or time. In all Test scenarios, those trips to the new stores themselves have a lower average trip cost than the whole (for example, in Test 1, the average cost of travel to New Store A is 194p). The trips to the existing stores still account for the majority of the trips in the model, and hence these much lower average costs to the new stores have a relatively small impact on the overall average cost to all stores. These trends are true, to a greater or lesser extent, across all the Tests.

3.15 This indicates that stores situated in NWC are well located to draw most of their custom from a more local area than the existing modelled major food stores, and that the overall effect on the whole Gravity Model catchment area is also beneficial. The store location that performs best in terms of lowest trip costs is store B (NIAB site), especially when this is taken in combination with store A (University site) in Test 4. This, again, partly relates back to the density of dwellings on the development sites: a greater number of dwellings nearby leads to a greater number of low-cost trips, which in turn reduces the average trip cost.

Table 3.2 – Daily Average Trip Costs (pence), All Modes

Trip Destination	Planned Development Only	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
New Store A only	-	194	-	-	183	182	-
New Store B only	-	-	182	-	177	-	180
New Store C2 only	-	-	-	190	-	185	187
All Stores	214	211	211	211	212	212	212

Abstraction from Existing Major Stores

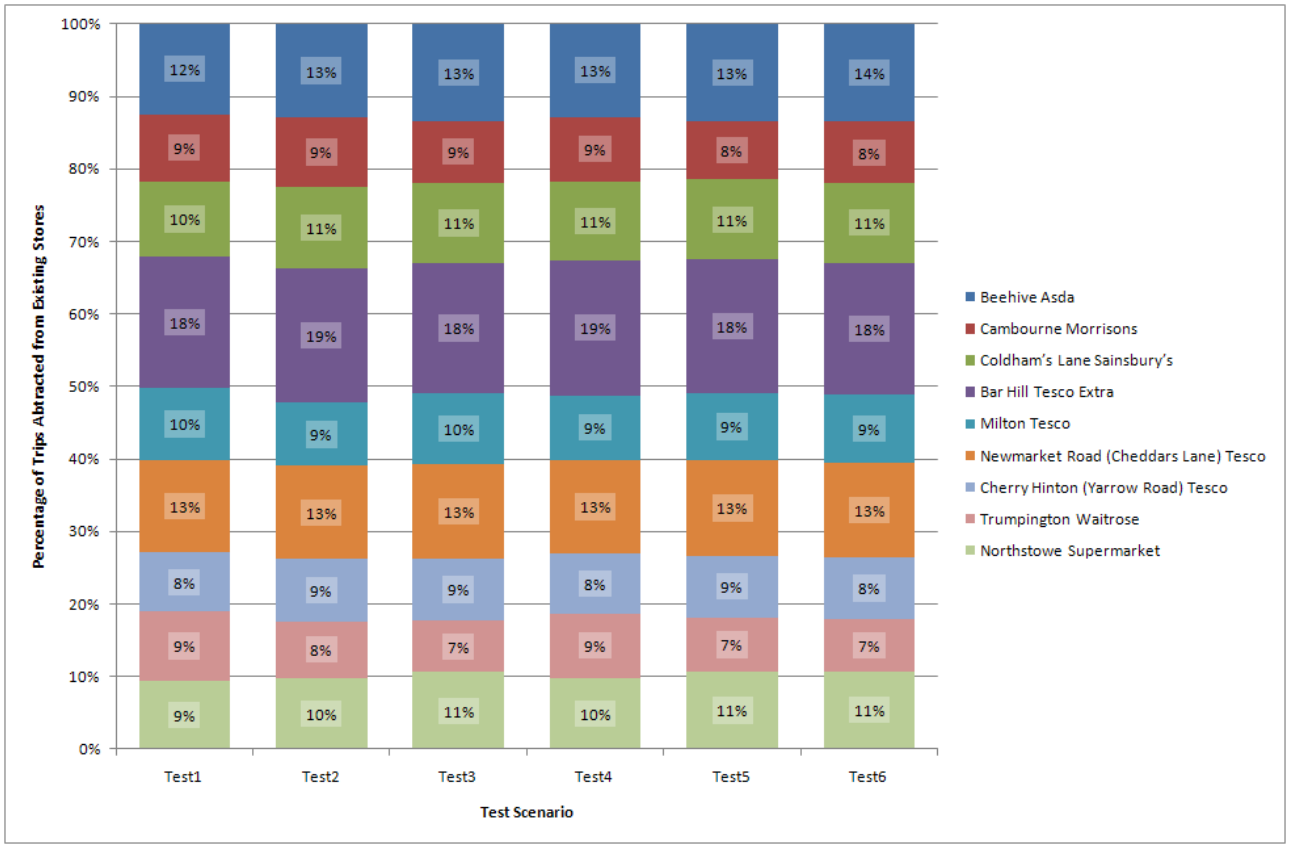
3.16 The bar chart in Figure 3.4 shows, for each Test scenario, the proportion of trips to the new major store in NWC which previously patronised existing stores elsewhere in the Planned Development Only scenario. The labels on the bar chart show the percentage of trips that are abstracted from each existing store: for example, 12% of custom to the new store in Test 1 previously patronised Beehive Asda, while 18% previously used Bar Hill Tesco Extra.

3.17 The variations between each test are very small, suggesting that the exact location of the new store(s) as tested in the Gravity Model has only a marginal effect on the levels of abstraction from other existing major stores across the catchment area.

3.18 For NWC, the Gravity Model predicts that abstraction of shoppers from Bar Hill Tesco Extra will make up proportionally the largest share of abstracted shopping trips. This is intuitively correct given that it is the closest store in competition with the proposed new store(s). The model predicts that Asda at the Beehive Centre and Tesco on Newmarket Road (Cheddars Lane) are the next most affected stores in terms of abstraction.

3.19 The SRS predicted that Milton Tesco would have been affected more than the Gravity Model outputs suggest, due to its proximity to NWC. As discussed in paragraph 2.18, this store is on the borderline between the minor and major classifications and therefore has only a relatively small 'gravitational pull'. Other factors that may make it more popular than its size suggests (such as its visibility from the A14 and a petrol station facility) cannot be readily incorporated in the Gravity Model. Whilst the Milton store is relatively close to NWC, the Gravity Model does incorporate the costs of travelling through the Cambridge road network to each of the major store locations in its calculations meaning that accessibility by road is part of the calculations. Nonetheless, the levels of abstraction from Milton Tesco may be underrepresented in the Gravity Model outputs.

Figure 3.4 – Abstraction from Existing Stores



Level of Internalisation

3.20 Table 3.3 shows, for each Test, the percentage of trips to the new store(s) that originate within the SRS Primary Catchment Area. A higher percentage indicates that more trips are being sourced locally and therefore that fewer trips originate from outside the SRS Primary Catchment Area.

Table 3.3 – Percentage of Trips to New Stores from within SRS Primary Catchment Area

Test Scenario	Store Location A	Store Location B	Store Location C2
Test 1	52%	-	-
Test 2	-	51%	-
Test 3	-	-	46%
Test 4	55%	53%	-
Test 5	55%	-	48%
Test 6	-	52%	47%

3.21 The store at location C2 (Orchard Park) always draws the lowest proportion of its custom from the SRS Primary Catchment Area, since its location is relatively near the catchment boundary and existing stores (such as Milton Tesco) are closer and therefore in greater competition. Store location B is the most centrally located in the SRS Primary Catchment Area, but store location A performs slightly better due to the higher density of dwellings on the University site.

3.22 This same analysis has also been performed for trips originating within the new developments in NWC to give a further indication of the level of trip containment within NWC. These results are presented in Table 3.4. Again, store location A (University site) gives the highest levels of trip internalisation and location C2 (Orchard Park) the lowest.

Table 3.4 – Percentage of Trips to New Stores from within NWC

Test Scenario	Store Location A	Store Location B	Store Location C2
Test 1	30%	-	-
Test 2	-	20%	-
Test 3	-	-	13%
Test 4	34%	21%	-
Test 5	34%	-	13%
Test 6	-	21%	13%

Shopping Destinations across the Wider Catchment Area

3.23 Figure 3.5 to Figure 3.16 on the following pages show for each Test scenario the proportion of main (weekly) shopping trips that are predicted to visit a major new food store in NWC as compared to the other existing stores. These cover the whole of the Gravity Model catchment area. The size of each pie chart is directly related to the actual number of shopping trips from the relevant ward, with smaller pie charts indicating fewer trips to any of the major food stores (new or existing) in the study area – either due to smaller population levels in that ward, or due to other (not modelled) shopping opportunities outside the SRS Secondary Catchment Area.

3.24 Note that this analysis looks at the shopping *destinations* from each ward, whereas Table 3.3 in the section above looks at the *origins* of the shopping trips that use the new store(s).

3.25 These results show, as expected, that those Wards closer to NWC have a greater share of trips going to the new store(s) than those Wards further away. The pie charts in the NWC area show that residents of Wards near NWC still do a large proportion of their shopping at existing external stores. This is supported by the long-distance nature of the observed data that has been replicated by the Gravity Model (see paragraph 2.27). This is also partly due to the size of the Wards covering a greater area than NWC itself; some parts of the Wards are closer to existing stores than to the new NWC stores.

3.26 Tests with two smaller stores (Tests 4, 5 and 6) draw a smaller number of trips from wards further away than tests with a single larger store (Tests 1, 2 and 3), because the smaller individual store size has a smaller 'gravitational pull'. Illustrating this (using existing stores as an example), shoppers travel further to Bar Hill Tesco Extra because it is larger and has a wider range of goods than their more local alternatives. This effect can be seen in the following figures because the total share of each pie chart for NWC stores in Tests 4, 5 and 6 is smaller than the NWC share in Tests 1, 2 and 3.

3.27 These figures also give an indication of the sphere of influence of the stores in each test. For example, Figure 3.6 shows very few trips to NWC stores originating from the eastern side of Cambridge in Test 1, while Figure 3.8 shows more in Test 2 and Figure 3.10 shows the most in Test 3. Similarly, store location C2 in Test 3 draws a much greater number of trips from the Histon and Impington ward than store location A in Test 1, because the Orchard Park location is more attractive to shoppers from that ward than the University location is.

3.28 As indicated in paragraph 3.26, the tests with two smaller stores have a smaller sphere of influence than the tests with one larger store. Again, the tests with stores located further east draw more custom from the eastern part of Cambridge, although this relates to a smaller number of trips than the tests with a single larger store.

Figure 3.5 – Test 1 Shopping Destinations, Wide Area

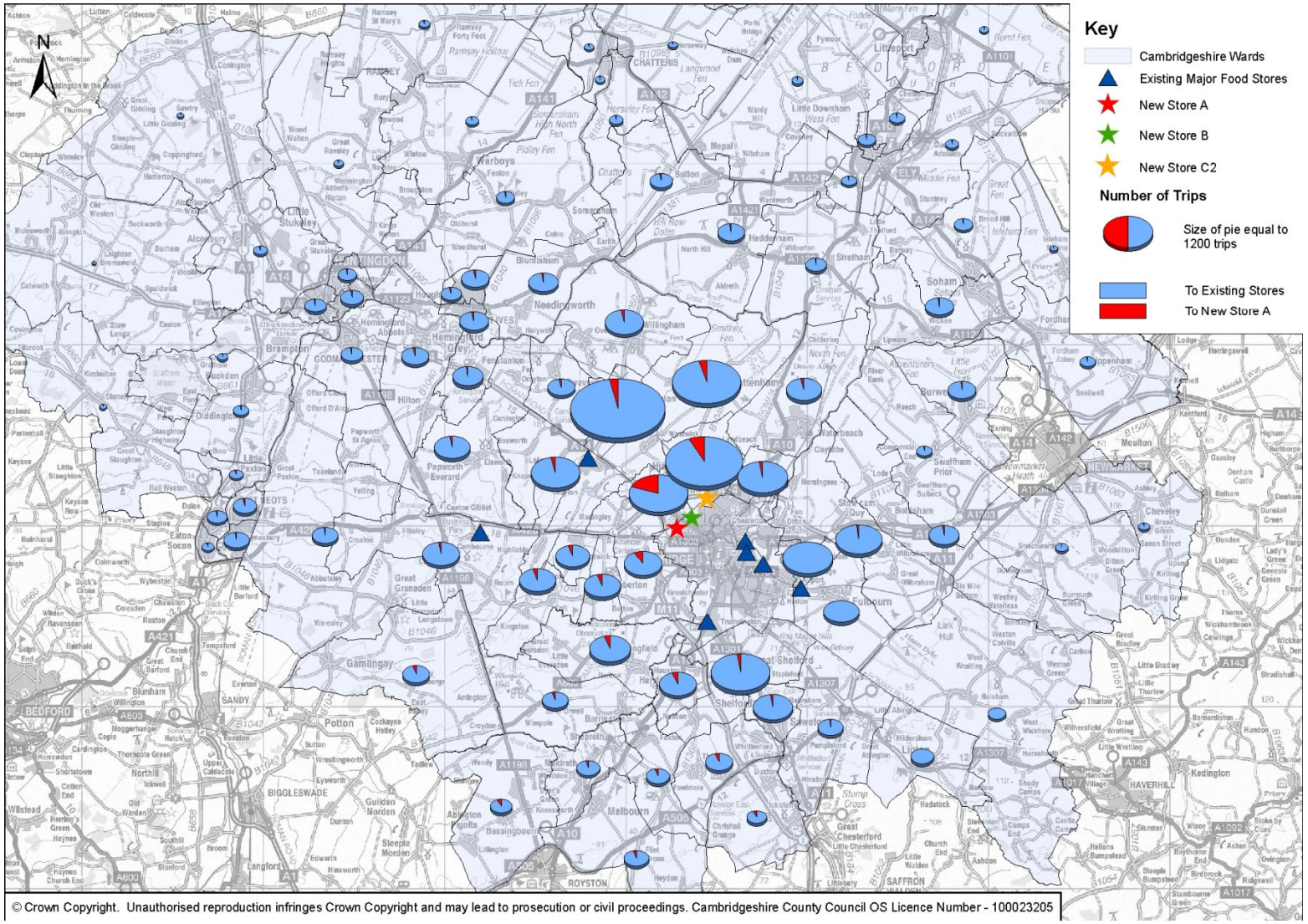


Figure 3.6 – Test 1 Shopping Destinations, Local Area

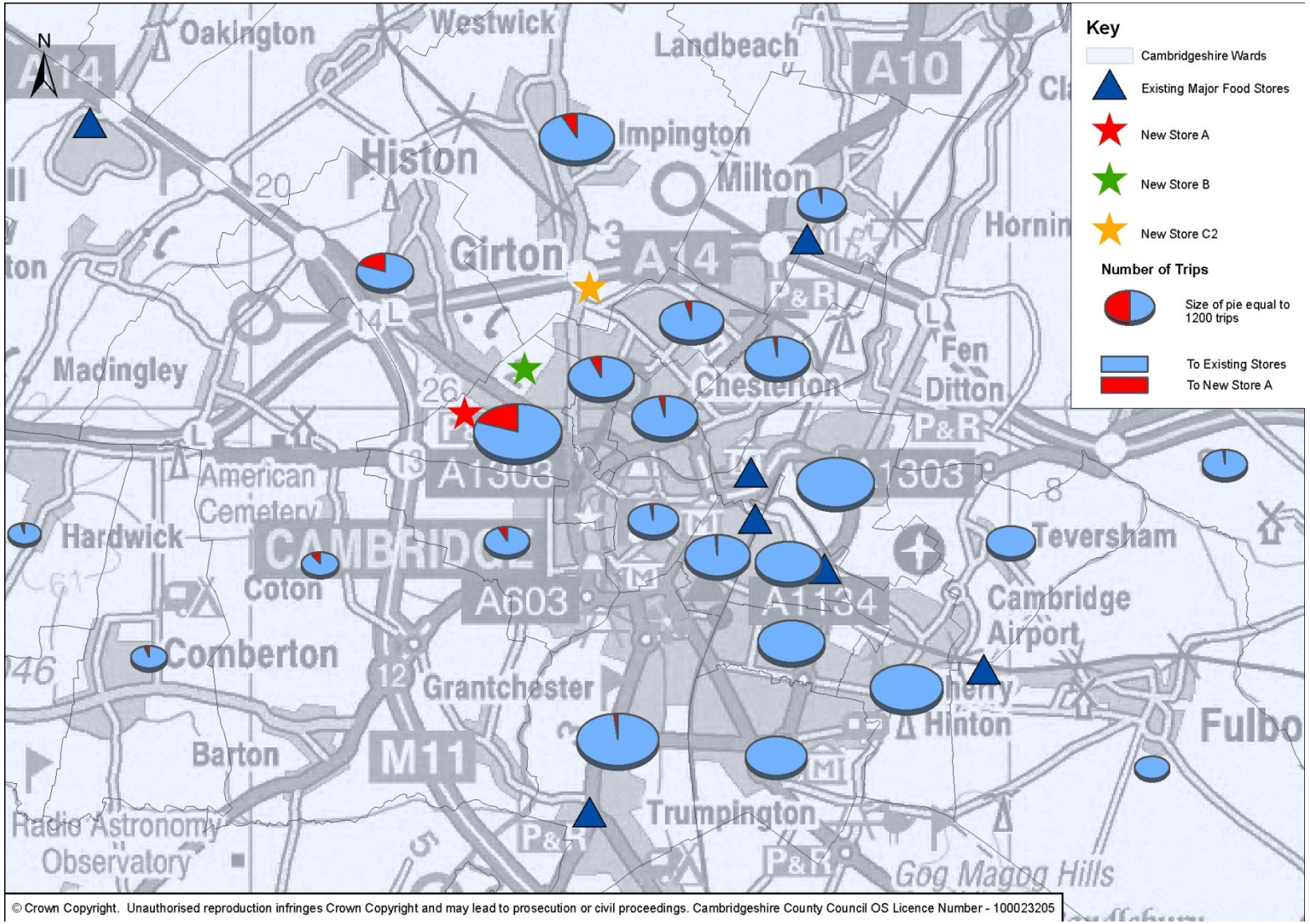


Figure 3.7 – Test 2 Shopping Destinations, Wide Area