QUALITY MANAGEMENT

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<th>REVISION 3</th>
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<td>Date</td>
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<tr>
<td>Prepared by</td>
<td>Daniel Cornelius</td>
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<tr>
<td>Checked by</td>
<td>Andrew Potter</td>
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Friday, 22 July 2016

2016 Project Code 62101624
# TABLE OF CONTENTS

1 PROJECT BACKGROUND ..........................................................1
2 DATA COLLECTION ....................................................................2
3 BASE ASSUMPTIONS .................................................................3
4 BASE MODEL ..............................................................................8
5 FORECAST ASSUMPTIONS .....................................................15
6 FORECAST OBSERVATIONS ...................................................22
7 CAPACITY TESTS .....................................................................29
8 CONCLUSIONS ..........................................................................32

BIBLIOGRAPHY .......................................................................................35

## APPENDICES

APPENDIX A – FORECAST OCCUPANCY RESULTS – WEEKDAY
APPENDIX B – FORECAST OCCUPANCY RESULTS – SATURDAY
APPENDIX C – FORECAST OCCUPANCY RESULTS – PEAK
APPENDIX D - DEVELOPMENT MAP
APPENDIX E – DEVELOPMENT DETAIL
1

PROJECT BACKGROUND

1.1 CONTEXT

North East Lincolnshire Council (NELC) has ambitious plans for regeneration in the Grimsby and Cleethorpes area, with a set of large developments intended over the next 15 years. Through the introduction of new businesses, retail, leisure and shopping facilities, the Council forecast that an additional 8,800 jobs will be created by 2030. The proposals will be included in the “Grimsby and Cleethorpes Town Centres Investment Plan” that will be published for consultation in February.

The proposed developments are expected to attract additional demand and increase the dwell time of those visiting the town. Additional demand will have an impact on the local highway and parking facilities.

WSP|Parsons Brinckerhoff (WSP|PB) were commissioned by NELC to undertake a study of the impact of the proposed developments on parking within Grimsby town centre to:

1) Determine the car parking capacity that will be provided as the plan is executed, at five yearly intervals over the next twenty years

2) Assess the capacity of the town’s car parking provision taking account of demand generated by the planned and committed developments

The answers to these questions would inform more immediate questions. Is there sufficient parking capacity for the town now and in the plan future such that

- Duchess Street can be brought forward for residential use?
- the Council are comfortable creating the right conditions to encourage the redevelopment of the private parking facility on Victoria Street South?
- the Council should make it a requirement that a redevelopment of the multi-storey car park site at Abbey Walk includes provision of public parking.

1.2 OVERVIEW

Objectives 1 and 2 and guidance on the subsequent questions have been addressed through the creation of a parking allocation model. This report demonstrates the methodology used for calibrating and validating the model. It also sets out answers to the objectives and the immediate questions.
DATA COLLECTION

2.1 BASE PARKING DATA

NELC have provided WSP|PB with the following parking data:

- Revenue data for public parking facilities: Weekly totals separated by duration for 2014
- Parking inventory and tariff data

Site observations were undertaken by WSP|PB with the objective of:

- Collecting number plate data to understand the arrivals and length of stay within key car parks, including on street
- Understanding the proportion of on-street parking permanently occupied by residents.
- Undertaking interviews to generate samples of the origins, destinations, and trip purpose of visitors to the Grimsby town centre
- Assess and understand the attractiveness of each car park
- Observing parking behaviour
- Identifying the frequency/use of permits
- Verifying the tariff structure at public and private car parks
- Verifying the parking supply

WSP|PB also collected data from the following sources:

- WebTAG guidance to inform the modelling assumptions, Department for Transport
- TRICS for trip generation within ASDA, B&Q, Tesco and Sainsbury’s.
- Count data from the Management Team at Freshney Place including hourly entry and exit data for the full year of 2014.

2.2 FORECAST DATA

NELC have provided WSP|PB with the following source documents or information:

- Initial expectations for each development site and the impact upon capacity and demand included in the “Invest North East Lincolnshire – Investment Plan” (March 2015)
- The NELC Parking Strategy

We have used a combination of sources including the TRICS land use trip rate database, Transport Assessments and other demand assumptions to forecast site trip generation.
3
BASE ASSUMPTIONS

3.1 PARAMETERS

VALUES OF TIME

The model allocates users to car parks based on generalised costs. These costs take account of a combination of the monetary cost of parking for the stay required and the time taken by the user walking from that car park location to their destination. In this way the model reflects the choice of parking close to the town centre and paying more or parking at a peripheral location that may be less expensive. Other factors, including the restrictions, the availability of an empty parking spot as well as the attractiveness of the car park are considered by the choice mechanism within the model.

To create a generalised cost, the model uses a value of time. This enables time to be converted to monetary values. Different users are considered to have different values based on the activity that they are engaged in.

<table>
<thead>
<tr>
<th>User Class</th>
<th>Value of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commute</td>
<td>£5.68</td>
</tr>
<tr>
<td>Employers</td>
<td>£31.02</td>
</tr>
<tr>
<td>Business</td>
<td>£7.84</td>
</tr>
</tbody>
</table>

*Table 3-1: Model Values of Time*

The values of time shown in Table 3-1 have been derived based upon WebTAG (Transport Analysis Guidance) provided by the Department of Transport for the UK. These values are used in the model to calculate the cost of time for walking and driving.

WALK TIME COEFFICIENT

The Grimsby parking model uses crow fly distances between car park location and final destination. Department for Transport (2014b) states that walking time is usually considered by people to be up to twice as inconvenient as driving (they will pay double to reduce a minute of walking time compared to what they will pay to reduce a minute in a vehicle). These factors combined increase the standard values of time by a factor of 3 for those walking between car park and destination. This factor was corroborated by an improved model calibration.

VEHICLE OPERATING COSTS

Within the model drivers do not consider the differential between parking options for fuel and other vehicle operating costs. Considerable evidence indicates that vehicle operating costs and fuel costs are generally ignored by drivers at the point of use. Furthermore in uncongested conditions it is unlikely that the marginal costs of travelling to one car park over another feature in the decision of which car park to use.

3.2 PARKING SUPPLY

Total capacity within each car park was based upon a combination of information received from NELC and on site observations. These capacities are demonstrated in Figure 3-1 below. The Town Hall car park is only open to the public on Saturdays. The car parks associated with the larger supermarkets and stores are included within the model.
Parking rules, such as tariffs, maximum stay, charging times and opening times were based upon site observations and other base data provided by NELC.

3.3 PARKING DEMAND

DEMAND RECORDS

A process of demand synthesis was undertaken to create a demand distribution for each car park. For the larger and more significant car parks, a set of interview data was used to inform origins, destinations, purpose and dwell time. After a process of cleaning and patching, these interviews were extrapolated to match count data for each of these facilities.

In some locations interview and/or count data was not available or was of insufficient size to prove reliable to create specific listings of parking demand. For these locations a combination of on-site observations, revenue data and proxy car parks were used to build the demand profiles. The data which informed the base demand for each car park is listed in Table 3-2.
Table 3-2: Basis for demand creation at each car park

<table>
<thead>
<tr>
<th>Facility</th>
<th>Interview Data</th>
<th>Count Data</th>
<th>Revenue Demand</th>
<th>TRICS Data</th>
<th>Proxy Car Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartergate</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duchess Street</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Hall Roof</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somerfield/Poundland</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshney Place East</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshney Place West</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victoria Street South</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Street North</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Street South</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abbey Walk</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hannover Street</td>
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<td></td>
</tr>
<tr>
<td>Heritage Centre North</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritage Centre South</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritage Square</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Town Hall</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abbey Gate</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cartergate Private</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garston Street (E)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off Upton Lane</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal Box (Garden Street S)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Station Approach</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Westwick</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASDA</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sainsbury’s</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tesco</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data Sources
- Facility
- Interview Data
  - Arrivals, Dwell time, Purpose
  - Origin, Destination
- Count Data
  - Arrivals, Dwell time
- Revenue Data
  - Duration
  - Profile
- Survey Demand
  - Obs
  - Occupancy snapshot, parking behaviour
- TRICS Data
  - Arrivals, Exits
- Proxy Car Park
  - For missing data

Table 3-2: Basis for demand creation at each car park

PARKING TRENDS

Data from the car park counters at Freshney Place has been used to inform some trends. The volumes of those parked at the end of the hour period 12:00-12:59 (13:00) has been used as a suitable time to obtain a maximum occupancy.

![Freshney Place Daily Accumulation at 13:00 for 2014](image)

Figure 3-2: Annual Daily Occupancy Profile at 13:00 for Freshney Place

The chart shows:

- The dips of Easter Sunday, Christmas Day and New Year’s Day
That other than the Christmas period, visitor volumes to Freshney Place are generally consistent across the year (there is no particular weather or attraction-based seasonality)

There is a general increase towards Christmas from the beginning of November

The peak days are just before and immediately after Christmas Day

The frequent peaks of the Saturdays in each week period (total maximum occupancy sits at around 750 for most of the year)

a mid-week mini-peak, usually on Tuesdays

The capacity of all Freshney Place car parks combined is 1,002 spots, indicating that it is on six or seven days a year that maximum occupancy breached 80%.

WEEKDAY AND SATURDAY

Where possible, data from neutral days has been amalgamated and averaged to inform a normal Weekday and Saturday. Neutral weekdays have been considered as Tuesday, Wednesday, and Thursday. Neutral months have been considered as March, June, September, October and November.

The figures below show the sub set of days used (dark blue) as neutral days representing the full set (pale blue) based on the accumulation on those days at 13:00 at the Freshney Place car parks. With all Weekdays ranked, the average of the neutral day based on the maximum occupancy at Freshney Place at 13:00 is the 55th percentile. For Saturdays it is the 58th percentile.

Both neutral days present a credible level of demand commensurate with the day type being represented. Both days show limited fluctuation across the year and support the use of a single day to represent demand.
PEAK DAY ANALYSIS

An annual profile of daily arrivals was created based upon the daily count data received for Freshney Place and corroborated by the weekly revenue data received for all public car parks.

Using relative all day arrival volumes from the Freshney Place car parks, we have created a peak day. It has a 47% increase in arrivals compared to the neutral Saturday. Furthermore, in order to match the occupancy profile for this day, a 31% increase in dwell time was included. Thus the peak day, representative of the 22nd December (a Monday) is characterised by not only an uplift in the total number of visitor trips into the town, but those visitors are staying longer.

The peak day model is based upon the Saturday model, but with the above mentioned factors applied to all trips with an actual destination (not car park) of Freshney Place, the Market Hall and Grimsby town centre.
4 BASE MODEL

4.1 OVERVIEW

A process of calibration was undertaken for the neutral weekday and Saturday models. This included adjusting model and demand parameters so that occupancy, demand and revenue profiles were modelled as expected.

4.2 ATTRACTIVENESS

As part of the process of calibrating the modelled demand profile, some car parks required an attractiveness penalty. The actual value selected is determined through a process of trial and error around an expected value considered during site visits. These values reflect the ease of access, safety, and aesthetics of each car park. Approximately half the car parks required penalties. These are listed and justified in Table 4-1 below.

<table>
<thead>
<tr>
<th>Parking Facility</th>
<th>Sector</th>
<th>Penalty Minutes</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbey Gate</td>
<td>Private</td>
<td>1.8</td>
<td>Unattractive parking facility</td>
</tr>
<tr>
<td>B&amp;Q</td>
<td>Private</td>
<td>5.0</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Burgess Street</td>
<td>Public</td>
<td>15.0</td>
<td>Poor facility which feels unsafe and an indirect walking route into town</td>
</tr>
<tr>
<td>Cartergate Private</td>
<td>Private</td>
<td>2.2</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Duchess Street</td>
<td>Public</td>
<td>0.2</td>
<td>Mildly less convenient access compared to neighbouring car parks</td>
</tr>
<tr>
<td>Garden Street (E)-Private</td>
<td>Private</td>
<td>1.6</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Heritage Centre North</td>
<td>Public</td>
<td>1.5</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Heritage Centre South</td>
<td>Public</td>
<td>1.5</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Heritage Square</td>
<td>Public</td>
<td>2.5</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Iceland</td>
<td>Private</td>
<td>9.0</td>
<td>Potential requirement to purchase from store and limited space</td>
</tr>
<tr>
<td>On Street North</td>
<td>Public</td>
<td>15.0</td>
<td>Time to search and find a space, which may be further out of town than expected</td>
</tr>
<tr>
<td>On Street South</td>
<td>Public</td>
<td>7.0</td>
<td>Time to search and find a space, which may be further out of town than expected</td>
</tr>
<tr>
<td>Sainsbury’s</td>
<td>Private</td>
<td>1.0</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Signal Box</td>
<td>Private</td>
<td>2.0</td>
<td>Unattractive parking facility</td>
</tr>
<tr>
<td>Town Hall</td>
<td>Public</td>
<td>2.7</td>
<td>Uncertainty around parking availability</td>
</tr>
<tr>
<td>Victoria Street South</td>
<td>Private</td>
<td>0.5</td>
<td>Indirect walking route from town centre</td>
</tr>
<tr>
<td>Westwick</td>
<td>Private</td>
<td>0.2</td>
<td>Mildly less convenient access compared to neighbouring car parks</td>
</tr>
</tbody>
</table>

Table 4-1: Attractiveness penalties

4.3 OCCUPANCY CALIBRATION

The daily occupancy profile was calibrated for each car park so that the modelled demand closely follows the input desired demand. Figure 4-1 and Figure 4-2 show the success of this calibration for the weekday and Saturday models respectively. In each case, the thin line represents the desired profile and the thicker line represents the modelled profile. In most instances the modelled profile follows the desired profile, indicating an appropriate volume of trips in the model and a successful calibration of the allocation process.
Figure 4-1: Weekday Occupancy Calibration

Figure 4-2: Saturday Occupancy Calibration
4.4 VALIDATION STATISTICS

A process of model verification was undertaken to ensure that the modelled arrivals are suitably close to the total input (calibrated) arrivals.

\[ GEH = \sqrt{\frac{(M-C)^2}{(M+C)/2}} \]

where:
- \( GEH \) is the GEH statistic;
- \( M \) is the modelled flow; and
- \( C \) is the observed flow.

**Equation 4-1: GEH Statistic (DfT 2014)**

The GEH statistic (Equation 4-1) has been used to compare daily arrivals. DfT (2014) guidance refers to GEH as a suitable method for validating modelled link flows. It is a formula to identify significant percentage differences on the main values while suppressing the importance of any large percentage discrepancies when the absolute value is small. In this respect there is similarity between highway and parking demand modelling and therefore we have applied the GEH statistic to demonstrate the goodness of fit of the Grimsby parking model.

For assignments of traffic flows, the DfT (2014) recommends that 85% of the validated flows should have a GEH of less than 5, and no flows should have a GEH greater than 10. Table 4-2 and Table 4-3 present the GEH values achieved for the parking model. Most GEH values are under 5. These results indicate a good fit.

<table>
<thead>
<tr>
<th>Car Park Name</th>
<th>Car Park Sector</th>
<th>Observed Arrivals</th>
<th>Modelled Arrivals</th>
<th>GEH Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbey Gate</td>
<td>Private</td>
<td>184</td>
<td>253</td>
<td>4.7</td>
</tr>
<tr>
<td>Abbey Walk</td>
<td>Public</td>
<td>280</td>
<td>238</td>
<td>2.6</td>
</tr>
<tr>
<td>ASDA</td>
<td>Private</td>
<td>4973</td>
<td>4967</td>
<td>0.1</td>
</tr>
<tr>
<td>B&amp;Q</td>
<td>Private</td>
<td>857</td>
<td>934</td>
<td>2.6</td>
</tr>
<tr>
<td>Burgess Street</td>
<td>Public</td>
<td>7</td>
<td>11</td>
<td>1.3</td>
</tr>
<tr>
<td>Cartergate</td>
<td>Public</td>
<td>130</td>
<td>113</td>
<td>1.5</td>
</tr>
<tr>
<td>Cartergate Private</td>
<td>Private</td>
<td>71</td>
<td>90</td>
<td>2.1</td>
</tr>
<tr>
<td>Duchess Street</td>
<td>Public</td>
<td>115</td>
<td>119</td>
<td>0.4</td>
</tr>
<tr>
<td>Freshney Place East</td>
<td>Private</td>
<td>916</td>
<td>823</td>
<td>3.2</td>
</tr>
<tr>
<td>Freshney Place West</td>
<td>Private</td>
<td>931</td>
<td>912</td>
<td>0.6</td>
</tr>
<tr>
<td>Garden Street (E)-Private</td>
<td>Private</td>
<td>79</td>
<td>118</td>
<td>3.9</td>
</tr>
<tr>
<td>Heritage Centre North</td>
<td>Public</td>
<td>17</td>
<td>5</td>
<td>3.6</td>
</tr>
<tr>
<td>Heritage Centre South</td>
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<td>4</td>
<td>3</td>
<td>0.5</td>
</tr>
<tr>
<td>Heritage Square</td>
<td>Public</td>
<td>6</td>
<td>5</td>
<td>0.4</td>
</tr>
<tr>
<td>Iceland</td>
<td>Private</td>
<td>90</td>
<td>61</td>
<td>3.3</td>
</tr>
<tr>
<td>Market Hall Roof</td>
<td>Public</td>
<td>257</td>
<td>232</td>
<td>1.6</td>
</tr>
<tr>
<td>Sainsbury's</td>
<td>Private</td>
<td>3311</td>
<td>3496</td>
<td>3.2</td>
</tr>
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<td>Private</td>
<td>70</td>
<td>43</td>
<td>3.6</td>
</tr>
<tr>
<td>Somerfield / Poundland</td>
<td>Public</td>
<td>176</td>
<td>193</td>
<td>1.3</td>
</tr>
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<td>Station Approach</td>
<td>Private</td>
<td>62</td>
<td>62</td>
<td>0.0</td>
</tr>
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<td>Tesco</td>
<td>Private</td>
<td>2137</td>
<td>2195</td>
<td>1.2</td>
</tr>
<tr>
<td>Town Hall</td>
<td>Public</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Victoria Street South</td>
<td>Private</td>
<td>89</td>
<td>135</td>
<td>4.3</td>
</tr>
<tr>
<td>Westwick</td>
<td>Private</td>
<td>120</td>
<td>133</td>
<td>1.2</td>
</tr>
<tr>
<td>On-Street</td>
<td>Public</td>
<td>767</td>
<td>528</td>
<td>9.4</td>
</tr>
</tbody>
</table>

**Table 4-2: Calibration of weekday modelled arrivals**
4.5 REVENUE COMPARISON

The revenue data provided by NELC included weekly parking revenue for each public sector car park throughout 2014. Of these car parks, the following included in the study are:

- Abbey Walk
- Burgess Street
- Cartergate
- Duchess Street
- Heritage Centre
- Market Hall Roof
- Somerfield
- Town Hall

This weekly NELC demand was disaggregated into a neutral weekday and Saturday using annual daily demand profiles calculated using the Freshney Place daily demand data supplied for 2014. The resultant week total demand to daily total demand factors were 0.13 for a weekday and 0.21 for a Saturday. On occasion, these factors were adjusted to achieve model calibration.
The graphs in Figure 4-3 compare the NELC revenue data to that modelled. Each plot point marker represents one public car park in the study area. For a perfect calibration, all the markers would be exactly on the diagonal line.

The models match as would be expected given the variance expected in a model and that the daily NELC revenue was estimated from factored weekly revenue data.

In 2014, the total annual revenue recorded by NELC car parks in the study area was £637,000. Annualising the three model days to cover the entire year, the models estimate revenue of £570,000. These are in the same order of magnitude, giving further confidence in the model set.

CAVEATS

The Grimsby parking allocation model has been produced to meet the requirements discussed in section 1 of this report. Caution should be taken if using the model for any other purpose.

The model has been calibrated to revenue data where possible. It should be noted that revenue data was only available on a weekly basis for public car parks. Therefore the daily revenue indications are provided with no warranty. The model should not be used to inform investment decisions in terms of revenue or precise vehicle numbers.

Queueing on entry to car parks is not considered within the model. If a car park is full then demand will redistribute to available capacity in alternative car parks.
4.6 CURRENT PARKING UTILISATION MODELLED

The following figures and charts show the modelled output for the base models in 2015 for the weekday, Saturday and Peak Day model.

**Weekday**

The weekday parking volumes are high in the on-street locations and these account for just under 400 vehicles that have been observed to make long stay parking in the streets surrounding the town centre. The superstore parking is also busy at lunchtime and well used throughout most of the day. Private and public off street capacity in the town centre is less well used, and while some smaller individual locations have high maximum occupancy public off street capacity overall reaches a maximum occupancy of only 32% on a neutral weekday. The Heritage car parks with capacity at 181 spots attract only a handful of vehicles.

**Saturday**

Abbey Walk has low utilisation. Therefore while some short stay car parks remain popular (Market Hall Roof and Somerfield) the overall capacity available remains generous for demand. Both private off street and public off street provision are more than sufficient for the demand. Public off street maximum occupancy is 23% overall, with no individual location being higher than 63%. Freshney Place sees maximum occupancy of 56%.

**Peak Day**

On these days, the overall public sector off street parking reaches a maximum occupancy of 59% with some specific locations reaching levels that would start to make parking less convenient. Cartergate is at 85% and Market Hall Roof at 70%. Within the private sector, most of the locations reach a peak occupancy greater than 80%, including the two large car parks at Freshney Place. It would be expected that even in 2015, even though there is sufficient capacity within the town centre overall for the demand, this day type is characterised with a number of people not being able to park at their car park of first choice.
Figure 4-4: System Occupancy Profile – Weekday 2015

**BASE STATISTICS**

<table>
<thead>
<tr>
<th>Car Park Name</th>
<th>Sector</th>
<th>Arrivals</th>
<th>Revenue</th>
<th>Max Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbey Walk</td>
<td>Public</td>
<td>238</td>
<td>£44</td>
<td>55%</td>
</tr>
<tr>
<td>Burgess Street</td>
<td>Public</td>
<td>11</td>
<td>£33</td>
<td>18%</td>
</tr>
<tr>
<td>Cartergate</td>
<td>Public</td>
<td>113</td>
<td>£236</td>
<td>25%</td>
</tr>
<tr>
<td>Duchess Street</td>
<td>Public</td>
<td>119</td>
<td>£239</td>
<td>15%</td>
</tr>
<tr>
<td>Heritage Centre North</td>
<td>Public</td>
<td>5</td>
<td>£9</td>
<td>3%</td>
</tr>
<tr>
<td>Heritage Centre South</td>
<td>Public</td>
<td>3</td>
<td>£8</td>
<td>10%</td>
</tr>
<tr>
<td>Heritage Square</td>
<td>Public</td>
<td>5</td>
<td>£9</td>
<td>10%</td>
</tr>
<tr>
<td>Market Hall Roof</td>
<td>Public</td>
<td>232</td>
<td>£455</td>
<td>39%</td>
</tr>
<tr>
<td>Somerfield / Poundland</td>
<td>Public</td>
<td>193</td>
<td>£468</td>
<td>60%</td>
</tr>
<tr>
<td>Town Hall</td>
<td>Public</td>
<td>0</td>
<td>£0</td>
<td>-</td>
</tr>
<tr>
<td><strong>Public Off Street</strong></td>
<td></td>
<td>919</td>
<td></td>
<td>34%</td>
</tr>
</tbody>
</table>
Figure 4-5: System Occupancy Profile – Saturday 2015

<table>
<thead>
<tr>
<th>Car Park Name</th>
<th>Sector</th>
<th>Arrivals</th>
<th>Revenue</th>
<th>Max Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbey Walk</td>
<td>Public</td>
<td>10</td>
<td>£49</td>
<td>2%</td>
</tr>
<tr>
<td>Burgess Street</td>
<td>Public</td>
<td>14</td>
<td>£42</td>
<td>23%</td>
</tr>
<tr>
<td>Cartergate</td>
<td>Public</td>
<td>185</td>
<td>£383</td>
<td>43%</td>
</tr>
<tr>
<td>Duchess Street</td>
<td>Public</td>
<td>113</td>
<td>£232</td>
<td>18%</td>
</tr>
<tr>
<td>Heritage Centre North</td>
<td>Public</td>
<td>7</td>
<td>£7</td>
<td>3%</td>
</tr>
<tr>
<td>Heritage Centre South</td>
<td>Public</td>
<td>4</td>
<td>£11</td>
<td>13%</td>
</tr>
<tr>
<td>Heritage Square</td>
<td>Public</td>
<td>26</td>
<td>£36</td>
<td>24%</td>
</tr>
<tr>
<td>Market Hall Roof</td>
<td>Public</td>
<td>446</td>
<td>£887</td>
<td>60%</td>
</tr>
<tr>
<td>Somerfield / Poundland</td>
<td>Public</td>
<td>207</td>
<td>£486</td>
<td>58%</td>
</tr>
<tr>
<td>Town Hall</td>
<td>Public</td>
<td>4</td>
<td>£14</td>
<td>8%</td>
</tr>
<tr>
<td>Public Off Street</td>
<td></td>
<td>1016</td>
<td></td>
<td>20%</td>
</tr>
</tbody>
</table>
### Figure 4-6: System Occupancy Profile – Peak 2015

#### BASE STATISTICS

<table>
<thead>
<tr>
<th>Car Park Name</th>
<th>Sector</th>
<th>Arrivals</th>
<th>Revenue</th>
<th>Max Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbey Walk</td>
<td>Public</td>
<td>218</td>
<td>£872</td>
<td>42%</td>
</tr>
<tr>
<td>Burgess Street</td>
<td>Public</td>
<td>41</td>
<td>£123</td>
<td>68%</td>
</tr>
<tr>
<td>Cartergate</td>
<td>Public</td>
<td>332</td>
<td>£920</td>
<td>85%</td>
</tr>
<tr>
<td>Duchess Street</td>
<td>Public</td>
<td>521</td>
<td>£1,159</td>
<td>65%</td>
</tr>
<tr>
<td>Heritage Centre North</td>
<td>Public</td>
<td>274</td>
<td>£289</td>
<td>60%</td>
</tr>
<tr>
<td>Heritage Centre South</td>
<td>Public</td>
<td>43</td>
<td>£130</td>
<td>73%</td>
</tr>
<tr>
<td>Heritage Square</td>
<td>Public</td>
<td>130</td>
<td>£180</td>
<td>60%</td>
</tr>
<tr>
<td>Market Hall Roof</td>
<td>Public</td>
<td>344</td>
<td>£1,012</td>
<td>78%</td>
</tr>
<tr>
<td>Somerfield / Poundland</td>
<td>Public</td>
<td>179</td>
<td>£571</td>
<td>65%</td>
</tr>
<tr>
<td>Town Hall</td>
<td>Public</td>
<td>18</td>
<td>£81</td>
<td>37%</td>
</tr>
<tr>
<td>Public Off Street</td>
<td></td>
<td>2100</td>
<td></td>
<td>59%</td>
</tr>
</tbody>
</table>
5

FORECAST ASSUMPTIONS

5.1 OVERVIEW

An overview of the forecast process is illustrated in Figure 5-1.

![Flow chart of forecast demand methodology](image)

Figure 5-1: Flow chart of forecast demand methodology

Population growth, employment growth, economic growth, and car ownership are all estimated and included within the TEMPRO trip end growth rates. These factors determine the scale of expected growth in trip generation. Car traffic and parking demand will increase as the area contains more households and the people within those households own and make more use of private cars. An alternative approach to estimating future trip making is to consider the demand at the attractions or developments, based on a summation of retail floorspace and office floorspace. Trip generation and attraction could be expected to be equivalent, but as they are derived in different ways, are not necessarily so.

5.2 COMPARISONS WITH TEMPRO GROWTH

TEMPRO is a trend-based database model, based upon observations within the National Travel Survey (NTS) and historic census data. It forecasts trends in housing, employment, population and car ownership.

The forecast increase in trips from TEMPRO has been compared to the modelled trip generation, as demonstrated in Figure 5-2. In absolute terms the increase in trips in the model is lower than the TEMPRO destination trip ends. This is because TEMPRO trip ends include all journeys in the wider Grimsby urban zone defined in the Trip End Model used by TEMPRO. The graphs in Figure 5-2 demonstrate that the model shows less absolute growth than TEMPRO in the town centre on a weekday (only 2,500 trips compared to 6,000). Some of the growth in work trip ends will occur in areas outside the town centre and are included within the TEMPRO zone but not the town centre modelled area. What is not known from this analysis is whether the 3,500 trips within the model is appropriate, and whether to be consistent with TEMPRO, more or less should be arising in the town centre. In contrast, on Saturday, the number of trip ends in the parking model...
are above those in the whole TEMPRO area, suggesting that all the new trip ends within TEMPRO are accounted for in the town centre modelled area and indeed the model either has more trips than forecast by TEMPRO or that the town centre will increase its trip ends at the expense of lost trip ends in other parts of Grimsby.

Figure 5-2: Comparison between TEMPRO Growth and Modelled Growth in Vehicles

Figure 5-3 illustrates the trip end increases as a percentage of demand. It can be seen that whilst the model has less growth in absolute trips, it has significantly greater growth rates than those from TEMPRO. Proportionally, this reflects a step change in large development in Grimsby town centre and indicates that within the model Grimsby town centre is indicated to be either taking a greater share of the growth predicted for the TEMPRO area and/or the TEMPRO modelled growth rate is forecast at a rate lower than that now expected for the area.

Figure 5-3: Comparison between TEMPRO Growth and Modelled Growth as a percentage

What this indicates is that the Grimsby allocation model will be more congested and there will be more parking demand in the town centre than if the trip growth was controlled to TEMPRO. This
means that we are testing a demand scenario that is higher than that would be expected based on the trend data in the national trip end model. This higher trip level and application to the model is suitable for the purposes of this study. However if it were required that this model should be used for a business case to central government then an additional model run may be required, controlled to TEMPRO growth assumptions. This would effectively reduce the level of parking demand based on an implication that not all the developments planned would come forward to the scale or level expected.

5.3 PROPOSED DEVELOPMENT GROWTH

For the purposes of model forecasting it is the proposed developments that have been used to inform the volume of trips and parking demand in future years. These are not controlled to TEMPRO. These development assumptions are outlined in this section of the report and set out in more detail in Appendix E.

No changes to parking space design standards (how large a parking bay is marked) have been included (though this could reduce the number or available parking bays in future years).

Some adjustments to development duration of stay has been included to reflect the impact of longer dwell times arising from the entertainment and greater food and beverage offer arising from the eastern extension of Freshney Place.

In 2030, no proposed development is included in the model. To account for unknown development, a trend based growth has been applied. This equates to an increase of 2.8% on a weekday and 3.8% on a Saturday, to match the development-led growth expected between 2020 and 2025.

5.4 DEVELOPMENT ASSUMPTIONS

The amount of modelled development was initially based upon plans in the ‘Invest North East Lincolnshire’ masterplan (2015). These assumptions were then amended based upon discussions between WSP|PB and NELC. Our final modelling assumptions are listed in Table 5-1.
Grimsby Parking Strategy
North East Lincolnshire Council

20

Grimsby Parking Strategy WSP | Parsons Brinckerhoff
North East Lincolnshire Council Project No 3514373A-PTY

Table 5-1: Development Assumptions

<table>
<thead>
<tr>
<th>Development</th>
<th>Development Assumptions</th>
<th>Year Modelled</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Victoria Street car park 5250 sq ft Non-Food Retail (A1), 5250 sq ft Food &amp; Drink (A3)</td>
<td>2025</td>
</tr>
<tr>
<td></td>
<td>21000 sq ft Business (B1) - assume that 50% of demand will be provided staff parking or change mode. Other 50% will park in existing facilities.</td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Upper Burgess Street 4400 sq ft Non-Food Retail (A1), 4200 sq ft Food &amp; Drink (A3)</td>
<td>2025</td>
</tr>
<tr>
<td></td>
<td>16800 sq ft Business (B1) - assume that 50% of demand will be provided staff parking or change mode. Other 50% will park in existing facilities.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Grimsby Entertainment Hub</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Mixed-use development 50000 sq ft non-food retail (A1)</td>
<td>2020</td>
</tr>
<tr>
<td>C</td>
<td>Grimsby Waterside</td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>Residential led development 50000 sq ft non-food retail (A1)</td>
<td>2020</td>
</tr>
<tr>
<td>D</td>
<td>Grimsby Station Quarter</td>
<td></td>
</tr>
<tr>
<td>D1 - D4</td>
<td>Sites north of railway 45000 sq ft non-food retail (A1)</td>
<td>2025</td>
</tr>
<tr>
<td>D5</td>
<td>Duchess Street car park 68000 sq ft affordable residential development (land-use type C3) - Assume no additional demand into town centre.</td>
<td>2025</td>
</tr>
<tr>
<td>E</td>
<td>Grimsby Minder Quarter</td>
<td></td>
</tr>
<tr>
<td>E2</td>
<td>Cartergate north Context Parking permission appears to have been granted for office-based development. See Ref: DM/0203/15/FUL</td>
<td>2020</td>
</tr>
<tr>
<td>E3</td>
<td>Cartergate south Context 100 Bed Hotel</td>
<td>2020</td>
</tr>
<tr>
<td>E4</td>
<td>2500 sq ft B1 (office) 2500 sq ft A3 (restaurant)</td>
<td>2020</td>
</tr>
<tr>
<td>E5</td>
<td>Primark 40000 sq ft non-food retail</td>
<td>2020</td>
</tr>
</tbody>
</table>

NELC anticipate an increase in non-food retail in the entire Grimsby area by 250,000 sq ft between 2015 and 2030. The modelled development directly accounts for approximately 145,000 sq ft of non-food retail under the assumption that the other 95,000 sq ft will be provided elsewhere or as part of the general growth factor applied between 2025 and 2030.

A map showing each development location is included within Appendix D.

5.5 TRIP GENERATION

Trip generation for each development was primarily achieved using the TRICS database. This database contains hourly trip rate data from national surveys undertaken over a wide sample of developments. In each case, the trip rates from TRICS for the specified land use were scaled to the proposed size of each modelled site in Grimsby.

For office trip generation and the Entertainment hub alternative methods were used to forecast trip generation and parking demand.

Average dwell times were determined based upon the land use type and a distribution produced to create within the model a spread of trip durations.

Appendix E details the assumptions used for trip generation for each development site.

5.6 CAPACITY ASSUMPTIONS

Parking capacity changes have been adopted in association with the proposed developments. Where additional customer parking is assumed to be provided on site by a development, the quantum is set to match the normal Saturday demand in 2030. The spaces which will have been considered available for all Grimsby demand are listed in Table 5-2. Parking in these areas is modelled as free for users of the proposed development. Whilst anybody else can park in these spaces, they pay a tariff similar to neighbouring car parks.
Table 5-2: Additional Public Parking

Some of the proposed developments will be constructed on land which is currently used as parking. This will result in a reduction in capacity. These losses are listed in Table 5-3.

Table 5-3: Reductions to Public Parking

Some commercial sites (office buildings) have been assumed to provide a proportion of parking for their staff. This provision is private non residential (PNR) parking and is generally not included within the allocation model. To account for this, the amount of PNR estimated to be provided for each development is modelled by reducing development car trip demand by an equivalent amount. Full details of parking assumptions for each development are listed in Appendix E.

The resultant overall parking capacity modelled in Grimsby is shown in Table 5-4 below.

Table 5-4: Total Modelled Capacity
6

FORECAST OBSERVATIONS

6.1 IS THERE SUFFICIENT CAPACITY OVERALL?

The total vehicles allocated in the model in each year for each type of day is set out in Figure 6-1 below. For the Weekday and Saturday day types the total demand is successfully allocated to a car parking location across all time horizons. This means that all demand is able to park within the modelled area. For the Peak Day this is not the case. Beyond 2020 there is a difference between the Peak Total and the parking allocated within the Peak Day model. This difference is an indication of the trips which could not park due to there being insufficient space in the system at the time required.

Figure 6-1: Total Arrivals by Year

Public parking capacity in the model is approximately 5,000 spaces. This reduces by 250 spaces between 2015 and 2025. Yet the model is forecasting that parking demand can increase from 15,700 to over 18,000 on a weekday and from 20,800 to 25,000 on a Saturday. In both cases the modelling concludes that this demand can be parked within the capacity provided. To apply a sense check to the modelled results, the following exercise examines parking capacity and demand in more aggregate terms.

Aggregate Approach to Forecasting Capacity

A significant element of that total supply, just under 1800 spots, is provided by the private stores (the group “private stores” includes Asda, Tesco, Sainsbury’s and B&Q). A further 400 are on-street. These elements are well used. The off street public parking in the town centre provided by the Council and private sector constitutes around 2,700 spots. These as demonstrated in the base model are not so well utilised. On a weekday the public sector capacity takes 920 parking events in facilities with a capacity of 1220. However the maximum occupancy is only 34%. The spread of arrivals over the day and large proportion of stays that are short in duration means that for a weekday the town could comfortably operate in toto public car parks with only 500 spots (achieving 85% maximum occupancy).

Examination of data from Freshney Place confirms that for neutral weekdays the centre saw a turnover of 3.9 in 2014 and 4.0 on Saturdays. Turnover is calculated as the total number of cars
parked in the day divided by the maximum occupancy of that day. Within these aggregated values, the smaller West Lower Car Park achieved turnover rates of 4.7 on a weekday and 5.5 on a Saturday.

If a turnover of 4 was maintained into the future and applied in addition to the parking spots that are currently unused in the public and private sector, the town could support a further \((4 \times [1220-500] \times 0.85)\) 2448 parking events with existing capacity reaching a maximum occupancy of 85%.

There is also spare capacity in the private sector in the base year. Of the 1400 spot capacity the maximum occupancy is 600. Allowing an 85% maximum occupancy sets the current year requirement at 706, almost half total capacity. Thus the private sector car parks could accept a doubling, or further 2630 parking events using existing capacity.

Combined, the additional 2448 and 2630 additional parking events that could be accommodated within the existing public and private sector’s spare weekday capacity, is around 5,100. Thus using only surplus capacity within the public and private sector off street parking, demand could increase from the 15,669 current estimate of demand to over 20,750 at existing turnover rates and time of use distribution.

**Saturday**
For the Saturday the combined public and private sector town centre off street maximum occupancy achieved is 1150 cars. The turnover is 4.2. Based on the combined capacity on the Saturday currently being 2755, this indicates that those car parks could accommodate an overall parking demand of \((2755 \times 0.85 \times 4.2)\) 9,835. In the current Saturday model they are taking just under 4,800. Thus there is scope for more than another 5,000 trips to park in town using the existing capacity at the public and private town centre car parks. On this basis the demand on a Saturday could reach 25,825 with an 85% maximum occupancy and based on current Saturday dwell times and stay durations, using the public and private sector off street capacity.

**Peak Day**
Within the current Peak Day model the combined public and private sector off street parking in the town accommodates over 7,000 parking events. The maximum occupancy reaches 2000 cars within the combined capacity of 2755 (73% occupancy). To reach 85% at maximum occupancy would take a further 340 cars at the busiest time. Based on a turnover of 3.5 derived from the modelling for the peak day, this equates to a further 1200 cars within the private and public town centre off street parking facilities. This would take the current peak day total from the 23,200 total to 24,400. The dwell time of peak day trips is longer than that for Saturday.

Thus this approach demonstrates that while existing total capacity is around 5000 spots, much of this capacity is currently unused and surplus. This surplus allows the growth in demand to rise some way before capacity is reached.

**Empirical Turnover Rates**
The method above relies on the basis that there is significant turnover within Grimsby car parks and in particular with those associated with shopping or visitor trips to the centre. On the peak day, 22\(^{nd}\) December 2014, at Freshney Place overall turnover was 4.4 with that in the West Lower Car Park reaching 6.2.

<table>
<thead>
<tr>
<th></th>
<th>Total In</th>
<th>Total Out</th>
<th>Max</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Car Park</td>
<td>1443</td>
<td>1443</td>
<td>334</td>
<td>4.3</td>
</tr>
<tr>
<td>West Lower Car Park</td>
<td>461</td>
<td>458</td>
<td>74</td>
<td>6.2</td>
</tr>
<tr>
<td>East Car Park</td>
<td>2169</td>
<td>2036</td>
<td>508</td>
<td>4.3</td>
</tr>
<tr>
<td>Freshney Place Overall</td>
<td>4073</td>
<td>3937</td>
<td>916</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Thus turnover values of 4 do not appear to be unreasonable or uncommon.

**Conclusion on Overall Capacity**
The model is forecasting that with the proposed changes the capacity within the town centre will be sufficient overall for a neutral Weekday and Saturday through to 2030. Overall weekday
volumes remain lower than Saturdays by some margin, and there is comfort that even those
weekdays at the higher end of the range represented by the neutral weekday model will be
accommodated in the town centre up to 2030.

The Peak Day model has provided some indication as to the overall capacity of the town centre in
terms of parking events. At around 26,500 daily arrivals, the town is unable to accommodate
demand at the busiest time of the day.

A secondary method of forecasting likely capacity using turnover, existing demand and capacity
has ratified the order of magnitude at which capacity is reached within the model. The secondary
method is based solely on the public and private town centre off street car parks and does not
include additional use of other car parks designated for superstore shopping (that do allow paid
for parking for non-customers) or increased use of on-street parking.

The Saturday model is approaching the apparent point of saturation with the current capacity
(26,500 trips per day) by 2030. For this reason we can forecast that there will be sufficient parking
capacity overall for Saturday in 2030 but little scope for increased demand beyond that.

A key point is that this summary conclusion and the figures in the table are based on overall
capacity and demand in the town. At this aggregate level there is sufficient parking for everyone in
legitimate locations. This does not necessarily mean that there will be availability in the car parks
that users may wish to use, and for this reason despite there being an overall capacity surplus,
there may be a perception and concern that there is insufficient parking capacity at a more
localised level. This is explored in the next section.

6.2 OCCUPANCY

Occupancy is a measure of how many vehicles are parked in a car park at any particular point in
time. The main figures that follow show the occupancy profile for each parking sector in 2030. The
charts below those show how maximum occupancy changes by year for each car park up to
2030. These second charts are important for assessing whether the distribution of the parking
capacity is appropriate for the local demand, and inform whether despite the overall
capacity being sufficient, there are likely to be localised issues.

A rule of thumb is that car parks begin to appear full at 85% occupancy. To some extent this value
is impacted by the layout. More sophisticated facilities are using sensor technology to provide
guidance to available parking bays creating a convenient experience and high utilisation close to
100%. The model will fill all locations up to 100% occupancy, though it applies time penalties as a
car park approaches capacity to reflect the inconvenience and time taken to locate available
parking.

Weekday

Figure 6-2 shows the overall utilisation across the sectors in 2030. Even at the peak period over
lunchtime, these charts demonstrate the conclusions above that town overall town will have
sufficient capacity for the expected demand.

The analysis of occupancy on the weekdays across the time horizons shows progressive increase
in utilisation in most locations. On street parking is already, and continues to be completely
saturated. By 2030, the model indicates that most parking locations will be operating at capacities
below 90% (Figure 6-3). There will be pressure at the car parks serving ASDA, Tesco and Station
Approach but the town retains many car parking locations with maximum occupancy levels below
80%, including the larger facilities of Freshney Place and Abbey Walk.

Saturday

The Saturday model shows some constriction between 11:00 and 16:00 within the private car
parks (supermarkets) in 2030 (Figure 6-4) but the town centre car parks (private and public) still
have capacity.

At a local level, the development trips create an impact on the north-western car parks, including
Cartergate and Market Hall Roof, but these still retain spare capacity during the period of
maximum occupancy (Figure 6-5). Abbey Walk and the Town Hall, currently largely unused on Saturdays, see increased demand. What is key about these occupancy charts is that they are indicating that there will be a balanced use of the car parks, and there isn't evidence to suggest that a particular area of the town will come under exceptional localised pressure due to demand in that locality overwhelming the available parking capacity.

Peak Day
The largest impact is shown in the Peak Day model. Noting that the Peak Day is based on the Saturday with an 47% increase in arrivals and 31% increase in dwell time for those with key town centre destinations, it is an unusual day and intentionally defined to stress test parking capacity. Figure 6-6 demonstrates that in 2030, by 11:00 there will be no available parking capacity in the Grimsby town centre study area.

Figure 6-7 shows that by 2020 the town will be under pressure on a peak day. The supermarket car parks within will be effectively full. Within the town centre the larger car parks, Freshney Place and Abbey Walk, will also be saturated. There is some residual capacity within these and most car parks within the 2020 model but users will be inconvenienced. Finding a parking spot will likely be problematic. The model is showing the characteristics of “overspill” parking as the more remote or less popular sites such as the Town Hall, Abbey Walk, Westwick and Heritage Centre all see a jump in occupancy from 2015 to 2020.

By 2025 all the car parks experience close to maximum occupancy of 100%.

Detailed occupancy profiles for every day type, time period and car park are included within Appendix A.
Appendix B and Appendix C of this report.

Figure 6-2: System Occupancy Profile – Weekday 2030

Figure 6-3: Maximum Occupancy by Car Park - Weekday
Figure 6-4: System Occupancy Profile – Saturday 2030

Figure 6-5: Maximum Occupancy by Car Park - Saturday
Figure 6-6: System Occupancy Profile – Peak 2030

Figure 6-7: Maximum Occupancy by Car Park - Peak
CAPACITY TESTS

7.1 ABBEY WALK CLOSURE

OVERVIEW

As part of option testing we have modelled the demolition of Abbey Walk to provide additional space for the development at Grimsby Station Quarter. Abbey Walk currently provides a capacity of 428 vehicles.

A test has been undertaken in the 2030 model to assess the impact of this demolition in the year of greatest demand. When option testing in this way the model uses a suppression module that forecasts those travellers that will switch away from parking as a result of the option where it increases cost or reduces convenience. This switch represents those that will not travel, will change model to get to town or potentially satisfy their trip in another way (for example buying online or travelling to a different destination).

RESULTS

Reducing modelled capacity within the Grimsby area resulted in reallocation of parking demand and some additional suppression. Table 7-1 shows that in the model, 4 trips were suppressed during the week, and 8 on a Saturday. These suppressions were due to a change in generalised cost, representing a shift to other travel modes. In the peak day model however, the large increase in suppressed trips was due to insufficient parking capacity.

<table>
<thead>
<tr>
<th>Day Type</th>
<th>Base</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekday</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Saturday</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Peak</td>
<td>2,488</td>
<td>4,144</td>
</tr>
</tbody>
</table>

Table 7-1: Suppression in 2030 Due To Abbey Walk Closure

The suppressed trips during the week and on a weekday are predominantly permit parkers currently using Abbey Walk. The model forecasts that some of these will not be prepared to change location and will probably change mode. All others reallocate and move to alternative parking. In particular Westwick is seen to increase occupancy.

Figure 7-1: Change in Maximum Occupancy Change due to Abbey Walk Closure – Weekday
The maximum occupancy graph in Figure 7-1 demonstrates how parking demand re-allocates following the reduced capacity. Whilst some car parks are significantly affected, unutilised capacity across the town centre during a neutral weekday remains.

In 2030 on a Saturday, without the loss of Abbey Walk, the town has a good distribution of parking demand and most town centre car parks retain some capacity during the maximum occupancy period. Without Abbey Walk a number of locations are affected, shown in Figure 7-2. There is clear evidence of overspill – Burgess Street and the Heritage Centre see a significant increase in use. Both Freshney Place East and West breach 90% and a number of car parks move over the maximum occupancy mark of 85%. It is likely that finding parking in the more popular locations could prove problematic. Furthermore the modelled Saturday represents a mid-point. There will be days when demand is higher. Notwithstanding, the indications are that the town could cope, and while some car parks are exceeding 85%, they are not at 100% capacity.

Figure 7-2: Change in Maximum Occupancy Change due to Abbey Walk Closure - Saturday

The Peak Day was shown to be struggling in 2020. The removal of Abbey Walk will exacerbate the maximum occupancy on these days.

SUMMARY

Demolition of Abbey Walk is likely to result in risk of insufficient capacity on a Saturday by 2030, but is not expected to create insurmountable problems for the neutral weekday.

7.2 ADDITIONAL STRATEGIC PARKING AT STATION QUARTER

OVERVIEW

Proposals for Station Quarter also include a requirement for up to 1200 spaces as part of the development. In this case, it would be assumed that this capacity would be provided as a replacement for the Abbey Walk facility. Therefore, there would be a net gain of 772 spaces.

A test has been undertaken in the 2030 model to assess the impact of these additional spaces, and by how much they improve peak day parking.

RESULTS

Provision of a total of 1200 spaces at Abbey Walk (an additional 772 spaces) significantly reduces modelled suppression on the peak day. In 2030, this allows for an additional 2,216 daily parking events, which is nearly sufficient to accommodate all the demand on the peak day in 2030. 272 trips remain suppressed or unable to find parking at the time required.
In 2025, the numbers suppressed are under 25, indicating that there would be almost enough parking spaces for all assumed demand. These results are shown in Table 7-2.

<table>
<thead>
<tr>
<th>Year</th>
<th>Base</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030</td>
<td>2,488</td>
<td>272</td>
</tr>
<tr>
<td>2025</td>
<td>1,708</td>
<td>23</td>
</tr>
<tr>
<td>2020</td>
<td>27</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 7-2: Improvement in Peak Model Suppression due to Additional 772 spaces

Retaining Abbey Walk and adding 1200 spots in Station Quarter

Table 7-3 demonstrates the improvement if an additional 1200 spaces were added as well as maintaining the existing Abbey Walk car park (resulting in a total of 1628 spaces). This would be sufficient to provide capacity for almost all the currently suppressed demand in 2030.

<table>
<thead>
<tr>
<th>Year</th>
<th>Base</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030</td>
<td>2,488</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 7-3: Improvement in Peak Model Suppression due to Additional 1200 spaces

SUMMARY

The proposed additional capacity at the Station Quarter development has the potential to provide enough capacity in the town such that there would be sufficient parking for the demand created during the maximum occupancy period on the peak day:

- in 2025 if 773 additional spots are provided (Abbey Walk is replaced with 1200 spots) and
- in 2030 if 1200 additional spots are provided (Abbey Walk is retained in addition to the new parking capacity of 1200 spots).
CONCLUSIONS

8.1 MODELLING OVERVIEW

DETERMINING TOTAL ADDITIONAL DEMAND & CAPACITY (OBJECTIVE 1)

12 developments have been modelled. This has resulted in approximately 4000 additional trips by 2030 on a Saturday, and 2500 additional trips on a weekday.

An additional 410 spaces have been assumed to be created for all parkers in Grimsby within Grimsby Gateway and Grimsby Waterside. However, a reduction of 650 spaces has been assumed across Grimsby due to construction on existing car parks. This is a net loss of 230 spaces on a weekday.

The model is based on the observations of current arrangements and provision calculations that include:

- An expectation and inclusion within the assumptions that on-site parking associated with most of the office developments will be provided of sufficient size to accommodate approximately half the total car demand for the site.
- Continued uncontrolled on-street parking within the inner residential areas
- Parking charges remaining consistent with current and visitors to many of the private stores will continue to enjoy time-restricted but uncharged parking.

As parking pressures increase in the future it is likely that the greater use of residential streets will generate a response and requirement for the re-introduction of controlled parking zones and the extension of such areas beyond the immediate town centre. The creation of on-street controls could remove 400 parking spots currently in use by predominantly long stay parkers.

The provision of on-site parking for employees will be dictated largely by developers in conjunction with the prevailing parking standards operated by the Council. Consistent under-provision of PNR parking, while not itself to be discouraged as part of plans to reduce car dependence, will increase the requirements for other parking provision.

A significant change to the parking tariff and times of restrictions could have a notable effect on the amount of car parking demand. This is especially the case given that some current car users live sufficiently close to the town centre that they are in-scope to switch to other modes of travel with limited inconvenience.

All of these conditions will impact on which time horizon the day types experience parking constraints and will need to be considered and kept under review as the development plan progresses.

ABILITY FOR SYSTEM TO ACCOMMODATE ADDITIONAL DEMAND (OBJECTIVE 2)

The town centre and most car parks are expected to have sufficient capacity for the modelled development during a weekday over the time horizons modelled. There will be pressure at the car parks serving the supermarkets and Station Approach but many car parking locations within the town will retain maximum occupancy levels below 80%, including the larger facilities of Freshney Place and Abbey Walk.

Similarly on a Saturday, the modelling indicates that up to 2030 the current demand for parking will be accommodated within the capacity planned for the town centre. The supermarkets are
likely to experience capacity issues in the near future and Abbey Walk and the Town Hall, currently largely unused on Saturdays, see increased demand. However in the town centre, the indications are that the capacity planned is appropriately distributed and most car parks while approaching capacity during the period of maximum occupancy, do still retain some capacity.

For the peak day however, indications are that some of the main private sector car parks are already close to capacity (specifically Freshney Place) and it is unlikely that the system as described will be able to accommodate expected demand. Significant difficulties with parking will arise as early as 2020.

Providing for the peak

Provision of sufficient parking capacity to accommodate the demand arising at the busiest period on a peak day is unlikely to offer the most commercially sound position. Options to provide temporary capacity for such peak periods is adopted by many town and cities in the UK, including the provision of temporary park and ride operating from the grounds of education establishments closed on those days or an acceptance that peak demands cannot be met with permanent facilities that are otherwise unused on other days of the year. With the development of significant areas of office and commercial buildings the option to incorporate use of on-site parking on peak days and Saturdays may similarly offer peak capacity solutions.

ASSESSMENT

Thus we would conclude that

- There is no indication that Duchess Street cannot be brought forward at an early opportunity for residential use
- Ambitions to see the redevelopment of the private parking facility on Victoria Street South should not be delayed on grounds of parking capacity
- A strategy and action plan to provide additional temporary capacity for the limited number of peak days each year is required and more appropriate than attempting to provide permanent capacity all year round. Based on the assessment undertaken this additional capacity should look to provide 800 temporary parking spots by 2025 and 1200 spots by 2030.

Station Quarter

The model forecasts that the multi-storey car park site at Abbey Walk could be redeveloped and this need not require replacement public parking. Indications are that the lost capacity could be absorbed on a weekday. There is probably sufficient capacity still within the town on a Saturday in 2030 without Abbey Walk but other locations will be pushed towards 95-100% occupancy. Visitors to the town are likely to be inconvenienced and not able necessarily to park where they would wish to, but nonetheless still be able to park.

There is an expectation that the efficiency with which existing capacity can be used and the improvements to users’ awareness of where spare capacity exists in the town will improve over the next ten years. With a modern count system and greater adoption by the public of personal and in-car information systems, the effective utilisation levels of parking are likely to increase more towards 100%. On this basis the threshold of 85% as an operational maximum may be reset at a higher level.

Notwithstanding, the model indicates that Abbey Walk will be used far more from 2025 on a Saturday, and provision of parking capacity for the town that is geared to operate for a number of hours on a typical Saturday at over 90% will not provide the level of service that may be expected by shoppers. Abbey Walk is expected to be full on peak days as early as 2020. For these reasons continued availability of Abbey Walk or an equivalent would be advisable.
Plans for significant additional capacity however seem unnecessary, and provision of a further 1200 spots on the site would create within the town parking spots that may never be needed before 2030, even on peak days.

Over the longer term there are a number of potential changes that will change the premise upon which the forecasts are based, including the extent to which on-street parking remains unrestricted in the inner residential area. It would thus be prudent that where possible a final decision on any additional capacity provision on this site is held pending clarity as to the extent and nature of town centre development over the next 5 years.
BIBLIOGRAPHY


Appendix B – Forecast Occupancy Results – Saturday

2015

2020
Appendix C – Forecast Occupancy Results – Peak

2015

2020
Appendix D - Development Map
Appendix E – Development Detail

A1 - VICTORIA STREET CAR PARK

DEVELOPMENT TYPE
5,250 sq. ft developed for non-food retail (land use type A1) and 5,250 sq. ft developed for food & drink (land use type A3). 21,000 sq. ft developed for Business (land use type B1).

POLICY CONTEXT
Invest North East Lincolnshire (March 2015) identifies a development opportunity for a mixed use, retail, food & drink, business/commercial or leisure development.

TIMESCALE OF DELIVERY
The development is anticipated to be delivered within five to ten years. Therefore, it will be included in the 2025 model.

DEMAND FROM DEVELOPMENT
The demand on parking provision generated by the development has been considered in combination with survey data available in TRICS, an industry-standard database containing survey trip rates.

For non-food retail (land use type A1), the demand is based on survey data from TRICS relating to non-food retail developments.

For food & drink retail (land use type A3), the demand is based on survey data from TRICS relating to restaurant-based developments.

To obtain the demand for all office-based developments (land use type B1), TRICS has not been used, as it relies on observed trip generation at the site. Office sites with constraints on parking capacity will by definition return lower car generation than may in fact be the case, and those working at the office that have parked elsewhere are not recorded. For the purposes of these forecasts it has been assumed that:

- There will be one employee per 100 sq. ft;
- 65% of employees wish to drive on any given day;
- 30% of employees arrive between 07:00-07:59, 60% arrive between 08:00-08:59 and 10% arrive between 09:00-10:00;
- Demand has been reduced by 50% on the basis that half of the parking provision will be provided on site as private non-residential.

Due to the nature of office-based developments, for simplicity, no demand is generated by land use type B1 on Saturdays.

DEMAND PROFILE
Demand on parking provision induced by the development is expected to vary between weekdays and Saturdays. The chart below shows the number of arrivals expected to be induced by the development on weekdays and Saturdays.
The duration of stay for each type of visitor to each development (worker, commuter or other) has been determined based on the expected development type. In the case of this mixed-use development:

- For non-food retail and food & drink land use types, the average duration has been set to 86 minutes.
- For office-based land use an average stay of 8-8.5 hours has been applied;

The duration of stay applied to trips is based on a profile around the average, presented below.
PURPOSE SPLIT

For modelling, purpose split is determined over the day. For development A1, the earlier trips are commuters to the office space and then principally others later in the day, representing visitors to the retail area.

On Saturdays, no demand has been associated with the office-based development (B1). A purpose split of 1% has been applied to commuters on Saturdays throughout the day to represent those employed in retail. An average 8-hour stay is assumed to reflect a spread of work shift patterns.

PARKING PROVISION

Other than the Private Non-Residential element assumed and resulting in reduced demand for the offices, no additional parking capacity will be provided for the demand included in the model. The development is to be built upon the site of Victoria Street car park and it is expected that 80 parking spots will be lost.
A4 - UPPER BURGESS STREET

DEVELOPMENT TYPE
4,200 sq. ft developed for non-food retail (land use type A1), 4,200 sq. ft developed for food & drink (land use type A3) and 16,800 sq. ft developed for business/commercial (land use type B1).

POLICY CONTEXT
Invest North East Lincolnshire (March 2015) identifies a development opportunity for a mixed use, retail, food & drink, business/commercial or leisure development.

TIMESCALE OF DELIVERY
The development is anticipated to be delivered within the next five to ten years. Therefore, it will be included in the 2025 model.

DEMAND FROM DEVELOPMENT
For non-food retail (land use type A1) and food & drink retail (land use type A3), the demand is based on survey data from TRICS relating to non-food retail developments and restaurant-based developments respectively.

The demand for office-based developments (land use type B1), has been derived from the assumptions that: there will be one employee per 100 sq. ft; 65% of employees wish to drive; and 50% of demand will be accommodated for in private non-residential parking provided by the development.

DEMAND PROFILE
Demand on parking provision induced by the development is expected to vary between weekdays and Saturdays. A higher number of trips are expected on Saturdays due to the retail-based development.

Expected number of arrivals

The expected accumulated demand on the development is indicated below.
**DURATION OF STAY**

It is assumed that duration of stay on weekdays will be longest for commuters, between 8-8.5 hours, and shortest for workers and others, approximately one hour. The average durations have been applied for both weekdays and Saturdays.

**PURPOSE SPLIT**

A time-specific purpose split has been used to represent the large amount of commuters in the early morning hours with a transition to predominantly other users for the main daytime hours.

**PARKING PROVISION**

Some Private Non-Residential parking is assumed on site associated with the offices. Additionally, it is expected that parking will be provided for retail visitors. An increase in capacity of 60 parking spots is expected to cater for future demand. These are assumed free for customers of this development, and available to other parkers at a standard local parking rate.
B1 - GRIMSBY ENTERTAINMENT HUB

DEVELOPMENT TYPE
A nine-screen cinema (land use type D2), alongside six restaurants each of 3,500 sq. ft in floor space (land use type A3).

POLICY CONTEXT
*Invest North East Lincolnshire* (March 2015) identifies a development opportunity for a mixed use leisure development, comprising of retail, food & drink and leisure. The investment plan identifies the area as the town’s main entertainment destination.

TIMESCALE OF DELIVERY
The development is anticipated to be delivered within the next five years. Therefore, it will be included in the 2020 model.

DEMAND FROM DEVELOPMENT
The restaurant demand is based on TRICS data. For the cinema-based land use (D2), demand has been derived based on screen numbers and attendance profile data provided by the operator. The model demand is based on:

- A 9-screen cinema comprising of typically 100 seats per screen;
- Weekdays demand being primarily after 18:00 on weekdays with a typical demand of 20 cars per screen;
- Saturday demand being higher and consistent throughout the day from lunchtime with 10 cars per screen attracted every hour.

The demand of the overall development has been adjusted to create a proxy effect to represent the development intent to increase dwell time of existing shoppers as much as generate new trips. Based on the premise that half the entertainment hub visitors are existing visitors to Freshney Place, the demand created for the entertainment hub has been halved but the duration of stay set to an average of 4 hours. Therein the existing shorter trips already in the model are taken to represent the new trips going straight to and only to the entertainment hub while the trips added as part of this process represent the trips that were previously just shopping trips to Freshney Place (with an average duration of around 2 hours) now being combined with a trip to the cinema or food court and having an average duration of 4 hours.

DEMAND PROFILE
The expected number of arrivals associated with this development is shown below, alongside the expected cumulative demand on parking provision induced by the development.
DURATION OF STAY

Trips added are those that are expected to be extending a shopping trip with a visit to the entertainment hub.

Duration Profiles
PURPOSE SPLIT

Due to the nature of the entertainment hub, it is assumed that 100% of visitors will be others throughout the day. Staffing volumes are not included.

PARKING PROVISION

It is not anticipated that any additional capacity will be provided. Visitors are expected to use the Freshney Place East car park.
C1 - GRIMSBY WATERSIDE

DEVELOPMENT TYPE
50,000 sq. ft of residential and non-food retail options for site (non-food retail (land use type A1) used for purposes of model).

POLICY CONTEXT
Invest North East Lincolnshire (March 2015) identifies a development opportunity for a residential, retail or leisure-based development.

TIMESCALE OF DELIVERY
The development is anticipated to be delivered within the next five years and the development will be included in the 2020 model.

DEMAND FROM DEVELOPMENT
The demand is based on TRICS data recorded for a non-food standalone retail development for Friday and Saturday. TRICS sites used have generated higher trip rates for Saturdays than weekdays. There is some expectation that this site will draw less weekday trade and within the town the weekday shopping footfall will comprise a higher proportion of bus travellers and those shopping who have parked for other purposes (most typically those shopping while in town for work). Further assessments of weekday and weekend demand from developers specific to this site may provide a secondary sensitivity test.

DEMAND PROFILE
Demand on parking provision induced by the development is expected to vary between weekdays and Saturdays. Demand on parking provision is expected to be considerably higher on Saturdays than on weekdays.

Expected number of arrivals

![Graph showing expected number of arrivals by time of day on weekdays and Saturdays. The peak hour for Saturday is 15:00-16:00, while for weekdays it is 14:00-15:00.]
DURATION OF STAY

The average duration in stay is assumed to be approximately 90 minutes for others. The chart below shows the duration profile of the standalone retail-only development. Employees are loaded into the model using an average stay of 8 hours to represent typical full-time working shift patterns.

PURPOSE SPLIT

For modelling, purpose split is determined over the day. The earlier trips are commuters to the retail-based development and then principally others later in the day, representing visitors to the retail area.
PARKING PROVISION

It is assumed that the retail development will provide capacity to match peak demand, and that free parking will be provided for retail users, while others may also use parking at the normal Grimsby centre charging rates. It is expected that the main retailer will provide 200 parking spots, and that there will be 350 spots in total on the site including other developments. Note that 42 spaces will be lost in the Heritage Square car park, and so this becomes a net gain of 308 spaces.
D1 – D4 GRIMSBY STATION QUARTER

DEVELOPMENT TYPE
Four developments comprised of a total of 45,000 sq. ft for non-food retail (land use type A1) and 10,000 sq. ft for restaurants (land use type A3)

POLICY CONTEXT
Invest North East Lincolnshire (March 2015) identifies a development opportunity for a mixed use retail scheme, including retail, food & drink and leisure. It also identifies the potential for the provision of up to 1200 parking spaces as part of the developments.

TIMESCALE OF DELIVERY
The developments are assumed to be delivered within the next five to ten years and will be included in the 2025 model.

DEMAND FROM DEVELOPMENT
The demand for all three land use types is based on TRICS survey data recorded for retail, food & drink and leisure-based developments.

DEMAND PROFILE
Demand induced by the developments on parking provision is expected to vary between weekdays and Saturdays, with a far greater number of trips for retail users on Saturdays.

Expected number of arrivals

<table>
<thead>
<tr>
<th>Time of day</th>
<th>Expected number of arrivals</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00-08:00</td>
<td>5</td>
</tr>
<tr>
<td>08:00-09:00</td>
<td>10</td>
</tr>
<tr>
<td>09:00-10:00</td>
<td>15</td>
</tr>
<tr>
<td>10:00-11:00</td>
<td>20</td>
</tr>
<tr>
<td>11:00-12:00</td>
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<td>12:00-13:00</td>
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<td>5</td>
</tr>
<tr>
<td>17:00-18:00</td>
<td>10</td>
</tr>
<tr>
<td>18:00-19:00</td>
<td>5</td>
</tr>
</tbody>
</table>

Weekday | Saturday
DURATION OF STAY
For non-food retail, an average duration of between 1-2.5 hours has been applied. An average stay duration of 8 hours has been used for employees (commuters) to reflect typical full-time shift working patterns at the development.

PURPOSE SPLIT
A time-specific profile has been applied to all day types. The earlier trips are expected to be commuters to the retail-based development and then principally others later in the day, representing visitors to the retail area.

PARKING PROVISION
The developments have potential to provide additional capacity, although it is assumed that no additional spaces will be provided in the first instance. A sensitivity test has been undertaken to assess the benefit of including additional capacity as part of these developments. 137 spaces will be lost due to development on the Garden Street car parks.
D6 - DUCHESS STREET CAR PARK

DEVELOPMENT TYPE
A 68,000 sq. ft affordable residential development (land use type C3).

POLICY CONTEXT
*Invest North East Lincolnshire* (March 2015) identifies an opportunity for a two to three story affordable residential development.

TIMESCALE OF DELIVERY
The development is expected to be delivered in five to ten years.

DEMAND FROM DEVELOPMENT
The residential development is not expected to add any additional demand to parking provision the town centre. For this reason, it is not included in the model.

PARKING PROVISION
It is assumed that no additional parking is necessary as part of the development. The development will result in a reduction in capacity of 225 parking spaces in the Duchess Street Car Park.
E2 - CARTERGATE NORTH CONTEXT

DEVELOPMENT TYPE
Planning permission has been granted for a 24,000 sq. ft office-based development (land use type B1).

POLICY CONTEXT
A planning application has been approved for a development of commercial nature, and the development is assumed to currently be in progress (Ref: DM/0203/15/FUL).

TIMESCALE OF DELIVERY
The development will be included in the 2020 model.

DEMAND FROM DEVELOPMENT
A Transport Assessment undertaken to analyse the impact of the development in transport terms has been used to provide trip generation volumes for peak hours. TRICS data has been used to provide a daily profile, controlled to the volumes within the Transport Assessment. Twenty four parking spots will be provided on-site as private non-residential parking. There are removed from the demand for public parking contained in the model.

DEMAND PROFILE
The development is predominantly office-based. Therefore, it is assumed that the demand associated with this development will be confined to weekdays in the model.

Expected number of arrivals

- 07:00-08:00
- 08:00-09:00
- 09:00-10:00
- 10:00-11:00
- 11:00-12:00
- 12:00-13:00
- 13:00-14:00
- 14:00-15:00
- 15:00-16:00
- 16:00-17:00
- 17:00-18:00
- 18:00-19:00

Time of day

Weekday
Saturday
DURATION OF STAY
An average duration of stay of 8-8.5 hours is assumed for commuters, while working travellers are assumed to have an average duration of stay of 86 minutes.

PURPOSE SPLIT
A non-time specific profile was applied as almost all visitors to the development will be commuters.

PARKING PROVISION
The provision of parking for the development is detailed in the approved planning application. Twenty four spots will be provided on site. A further allocation (and reduction in public capacity) will be included in the Cartergate car park of 48 parking spots. These spots will marked off for the exclusive use of the office tenant on weekday. They will be open to use by the public on Saturdays.
E3 - CARTERGATE SOUTH CONTEXT

DEVELOPMENT TYPE
Development of a 100-bed hotel (land use type C1).

POLICY CONTEXT
*Invest North East Lincolnshire* (March 2015) identifies plans for the
development of a 100-bed hotel on this site.

TIMESCALE OF DELIVERY
The development is assumed to be forthcoming within a time period
of five years. Therefore, the development will be included in the 2020
model.

DEMAND FROM DEVELOPMENT
The demand within the model is based on the hotel being 70% occupied generating a demand for parking
for 50 cars.

DEMAND PROFILE
The following demand is included for the hotel on both weekdays and Saturdays during the modelled
period.

**Expected accumulation at development**

DURATION OF STAY
Durations of stay have been coded to reflect a progressive reduction in accumulated demand in the
morning and the increase in accumulation from mid-afternoon.

PARKING PROVISION
It is assumed that no additional parking will be provided with the hotel development.
DEVELOPMENT TYPE
A mixed use development, comprising of a 5,000 sq. ft office-based development (land use type B1) and 2,500 sq. ft of restaurant (land use type A3).

POLICY CONTEXT
Invest North East Lincolnshire (March 2015) identifies an opportunity for a mixed use development, containing office/commercial uses, alongside retail or restaurant uses.

TIMESCALE OF DELIVERY
The development is assumed to be forthcoming within the next five years. Therefore, it will be included in the 2020 model.

DEMAND FROM DEVELOPMENT
The demand for office-based developments (land use type B1), has been derived from the assumptions that there will be one employee per 100 sq. ft and 65% of employees wish to drive. For this development, no provision for private non-residential parking is included.

In the case of the restaurant (land use type A3), the demand has been derived from survey data available in TRICS.

DEMAND PROFILE
No demand is included for the office/commercial use of the development on Saturdays.

Expected number of arrivals
DURATION OF STAY
An average duration of stay of 8-8.5 hours is assumed for commuters, while working travellers are assumed to have an average duration of stay of 90 minutes.

PARKING PROVISION
It is assumed that no additional parking capacity will be provided with this development.
DEVELOPMENT TYPE
A 40,000 sq. ft extension to the existing Primark store in Freshney Place. (non-food retail (A1))

POLICY CONTEXT
The extension to the Primark store is not identified by local planning policy. However, permission has already been granted for the extension to the centre (Ref: DC/645/13/WMA), and it is understood that the development is committed.

TIMESCALE OF DELIVERY
It has been included in the 2020 model.

DEMAND FROM DEVELOPMENT
A transport assessment was not available. The non-food retail TRICS data has been applied.

DEMAND PROFILE
Demand on parking provision induced by the development is shown for Saturdays.

DURATION OF STAY
The duration of stay has been assumed to be between 60-90 minutes for this development. The duration is based upon analysis of local interview data. For commuters, an average stay of around 8-8.5 hours has been applied to reflect typical shift working patterns. For others, an average stay of 90 minutes has been applied.
PURPOSE SPLIT

A time-specific profile was applied to both day types. The earlier trips are expected to be made by commuters (employees) and the later trips by others (visitors to the retail development).

PARKING PROVISION

No additional parking provision will be made as part of this development. The extension will reduce parking capacity of Freshney Place East by 120 spots.