# TECHNICAL NOTE

## DARLINGTON STATION MULTI STOREY CAR PARK

GROWTH FORECASTS TECHNICAL NOTE

| IDENTIFICATION TABLE | |
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| **Client/Project owner** | Darlington Borough Council |
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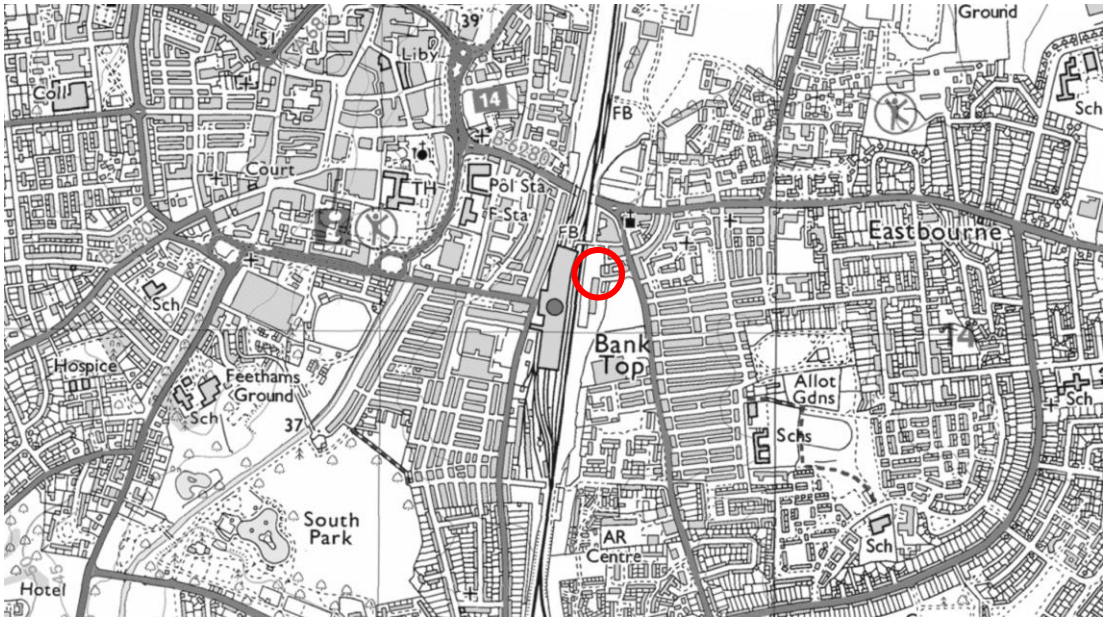
# 1. INTRODUCTION

1.1.1 Darlington Borough Council (DBC) have commissioned SYSTRA to carry out a demand study to examine the number of parking spaces which are likely to be required at a new Multi Storey Car Park (MSCP) located adjacent to Darlington Railway Station. Figure 1 below shows the approximate location of the proposed MSCP.

**Figure 1. MSCP Location**




1.1.2 Figure 2 below shows the predicted layout of the car park.

**Figure 2. Proposed Layout**

## 1.2 Background

1.2.1 The MSCP will form part of a wider redevelopment of Darlington Station. The aspiration of the wider scheme is to develop Darlington Station into an enhanced rail gateway that can accommodate future demands for national, regional and local passenger rail services as well as freight. Both of these needs were first articulated in the Darlington 2025 Masterplan.

1.2.2 Darlington is one of the Tees Valley's principal rail gateways and is strategically located on the East Coast Main Line (ECML). It is a regional transport hub that not only serves the Tees Valley

but also a much wider catchment including South Durham and North Yorkshire, providing access to key rail services.

1.2.3 The Strategic Outline Business Case (SOBC) for the wider scheme was completed in 2019. Within SOBC the number of spaces required in the MSCP was estimated to be approx. 682 spaces including disabled spaces. These would be spread across four storeys.

1.2.4 The car park will be accessed off the new public realm off Neasham Road and egress will be via an access onto Garbutt Square. It is expected that the new MSCP will operate on slimmer tariffs as the existing carparks surrounding the station.

1.2.5 It is understood that the new MSCP will replace most of the existing carparks around the station which currently comprises:

- Victoria Rd / Portico – 21 Spaces
- Parkgate Ramp – 40 Spaces
- Garbutt Square – 344 Spaces
- Station East Albert St – 43 Spaces
- Park Lane – 104 Spaces

1.2.6 This information was provided by DBC and shows that there are currently circa 552 spaces surrounding the station.

1.2.7 It is understood that the following spaces will remain with MSCP in operation:

- Victoria Rd / Portico – 4 Spaces (short stay / drop off)
- Parkgate Ramp – 0 Spaces
- Garbutt Square – 0 Spaces
- Station East Albert St – 0 Spaces
- Park Lane – 31 Spaces
- MSCP – 682 Spaces

1.2.8 In addition to the above it is understood that there will be 20 drop off / pick up spaces locate to the north of the MSCP these are shown on figure 2 above.

## 1.3 Previous Demand Calculation

1.3.1 The proposed number of parking spaces in the MSCP was calculated using an expected year on year passenger growth of approximately 3% which was provided by London North Eastern Railway (LNER).

1.3.2 During this project it came to light that the existing parking capacities used in the previous calculation did not match what was on the ground currently. Therefore, these calculations have been updated using the revised car park capacities received from DBC and on site audits.

1.3.3 The following table shows the results of that exercise.

Table 1. Previous Demand Calculation Summary

| DBC Audit No's - Estimated occupancy | | 2020 | | | 2025 | 2035 | 2050 |
|---|---|---|---|---|---|---|---|
| Car Park | Operator | Spaces | Occupancy % | Occupied places | | | |
| Victoria Rd/Portico | LNER | 21 | 100 | 21 | | | |
| Parkgate Ramp - Exec | LNER | 40 | 100 | 40 | | | |
| Garbutt Square | LNER | 344 | 70 | 241 | | | |
| | Total LNER | **405** | | 302 | 347 | 451 | 654 |
| **Station East Albert St** | **Private** | **43** | 100 | 43 | 390 | 507 | 735 |
| **Park Lane** | DBC | **104** | 100 | 104 | 494 | 642 | **931** |
| | TOTAL | **552** | | | | | **739 in 2040** |

1.3.4 Table 1 shows that by 2050 the demand was expected to be circa 931 vehicles using 3% year on year growth. Also as shown the expected demand in 2040 is shown to be 739 vehicles.

1.3.5 DBC has commissioned SYSTRA to carryout a demand study to confirm the likely number of vehicles requiring parking spaces in future years. The remainder of this report will set out the methodology used and discus the results found.

1.3.6 It should be noted that all of the carparks are expected to operate at 100% occupancy with the exception of Garbutt Square which will operate at 70% of capacity. These occupancy's have been provided by LNER / DBC and are thought to be representative of current utilisation.

# 2. METHODOLOGY

2.1.1 This section sets out the approach and data that SYSTRA has used to predict growth in car park usage at Darlington station. It follows the standard demand forecasting approach set out in the Passenger Demand Forecasting Handbook (PDFH).

## 2.2 Base Data

2.2.1 The base car park occupancies were provided by Darlington Borough Council and are shown in the table below, these values were used as the basis for the background growth calculations.

Table 2. Base Demand

| CAR PARK | 2020 OCCUPANCY |
|---|---|
| Victoria Road / Portico | 21 |
| Parkgate Ramp | 40 |
| Garbutt Square | 241 |
| Station East Albert Street | 43 |
| Park Lane | 104 |
| **TOTAL** | **449** |

## 2.3 Trip Distribution

2.3.1 The PDFH background growth methodology provides bespoke parameters for different flow types (e.g. based on trip distance or destination), it was therefore important to understand trip distribution to / from Darlington station in order to more accurately forecast background growth.

2.3.2 Up to date ticket sales data was provided to SYSTRA / Darlington Borough Council by LNER, however this data did not include a breakdown by ticket type.

2.3.3 The trip distribution analysis identified that 60% of trips are 'outbound' trips (where Darlington is the origin) whilst 40% of trips are 'inbound'. The top 5 origins / destinations for Darlington station are shown in the table below:

**Table 3. Rail Trips to / from Darlington**

| STATION | INBOUND | OUTBOUND | TOTAL | % |
|---|---|---|---|---|
| Newcastle | 356186 | 116267 | 472453 | 19% |
| York | 172622 | 92082 | 264705 | 11% |
| King's Cross | 125545 | 118732 | 244277 | 10% |
| Middlesbrough | 95384 | 46138 | 141522 | 6% |
| Durham | 79986 | 41313 | 121298 | 5% |

2.3.4 All destinations were then allocated to PDFH elasticity groups to be carried forward through the background growth process. This is discussed further in section 2.4.

## 2.4 Background Growth

2.4.1 Background growth was calculated following the PDFH v6 Simplified Framework (sections B2.6 and B2.7). This approach uses forecasts of GVA, population, employment and competing modes to predict future growth in rail demand. The data sources used in this analysis are shown in Table 4.

**Table 4. Background Growth Data Sources**

| FRAMEWORK PARAMETER | DATA SOURCE |
|---|---|
| GVA per capita | TAG forecast GDP |
| GJT trend | PDFH Table B2.6 |
| Population | NTEM forecasts (from TEMPro 7.2 dataset) |
| Employment | NTEM forecasts (from TEMPro 7.2 dataset) |
| Car cost | TAG fuel and non-fuel costs combined with UK government office region average speeds |
| Car time | Forecast average speeds by region and area type (large urban, urban or rural) |
| Bus travel time and headway | N/A = Assumed to stay the same |

2.4.2 In total 28 separate growth rates were calculated for different flow types, a weighted average was then calculated (based on trip distribution) to be applied to the car park occupancies identified in section 2.2.

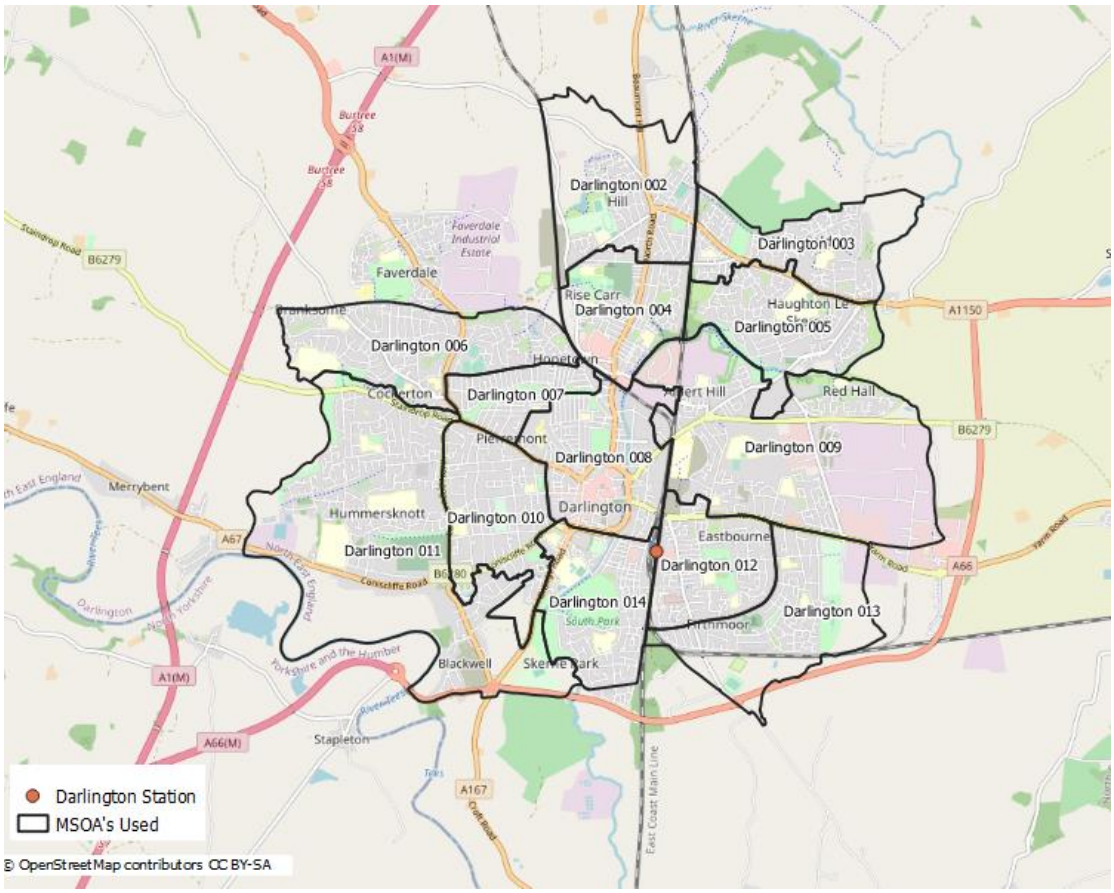
2.4.3 First, all trips were divided into 'season' and 'other' using the latest ORR Station Usage estimates. This was necessary as the PDFH framework requires different drivers to be used to estimate growth for different ticket types. 10% of trips to / from the station are 'season' trips whilst 90% are 'other trips'.

2.4.4 The outbound trips (Darlington as origin) were then combined into four PDFH flow groups:

- London flows
- Non-London <20 miles non-PTE (origin or destination is core or major)
- Non-London <20 miles non-PTE (origin or destination is not core or major)
- Over 20 miles

2.4.5 The catchment area shown in Figure 2 was used to select the appropriate population and employment forecasts for the station.

**Figure 3. Darlington Station Catchment**




2.4.6 Each individual destination was assigned to the most appropriate group to allow the most relevant background growth elasticities to be applied to the flows. Each group was also split into 'Season' and 'Other' trips using ORR station usage data. This data indicates that 10% of trips to / from Darlington are Season ticket trips whilst 90% belong to other ticket groups.

2.4.7 The flows identified as 'inbound' flows from the census data were combined into the 10 government office regions:

- North East
- North West
- Yorkshire and The Humber
- East Midlands
- West Midlands
- East of England
- London

- South East
- South West
- Wales

2.4.8 Data for each government office region was then used to calculate growth for these flows.

2.4.9 Once each individual growth rate had been calculated an overall weighted average growth rate (based on trip distribution) was calculated for Darlington station. The growth rates at 2025, 2035,2040 and 2050 are shown in the table below.

**Table 5. Growth Rates**

| | 2025 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| Growth Factor | 1.06 | 1.26 | 1.41 | 1.56 | 1.73 |

2.4.10 Table 5 shows that it is expected that demand will increase by 73% by 2050.

# 3. RESULTS

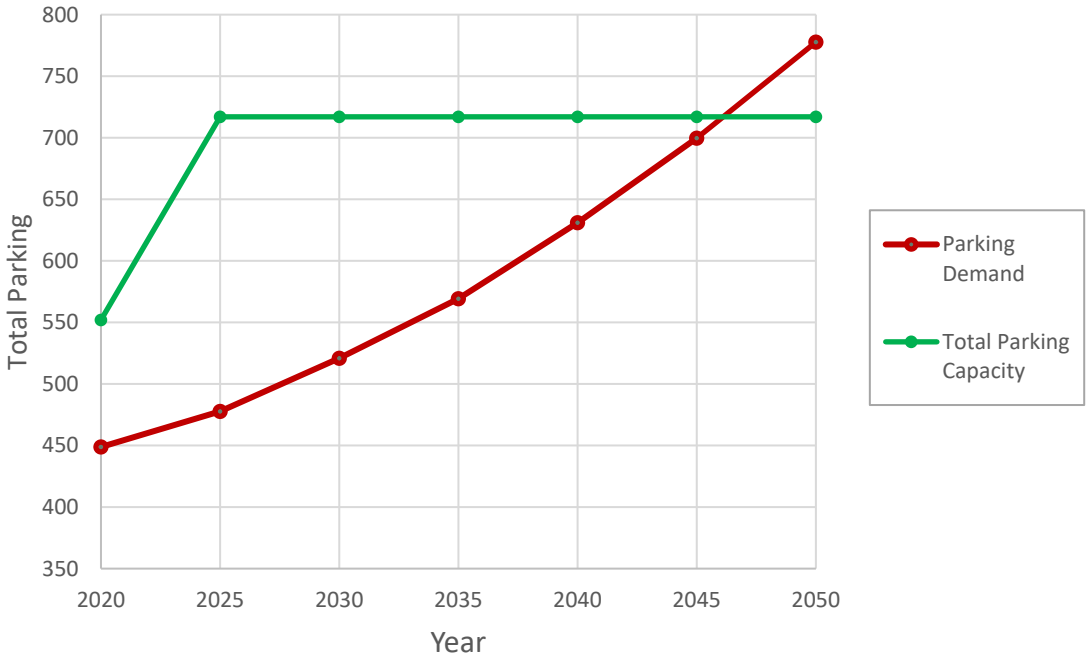
3.1.1 The growth rates presented in Table 5 were applied to the base (2020) demand in Table 2. The results of the calculation are shown below.

**Table 6. Results of Growth Rate Applied to Base Demand**

| CAR PARK | DEMAND | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2035 | 2040 | 2045 | 2050 |
| Victoria Road / Portico | 21 | 22 | 27 | 30 | 33 | 36 |
| Parkgate Ramp | 40 | 43 | 51 | 56 | 62 | 69 |
| Garbutt Square | 241 | 256 | 305 | 339 | 375 | 417 |
| Station East Albert Street | 43 | 46 | 55 | 60 | 67 | 75 |
| Park Lane | 104 | 111 | 132 | 146 | 162 | 180 |
| **Total** | **449** | **478** | **569** | **631** | **700** | **778** |

3.1.2 The parking capacity around the station will obviously increase with the MSCP coming online. The total number of spaces is expected to increase from 552 spaces to 717 spaces. This include the 35 existing parking spaces which will be retained around the station (see para 1.2.7 for the full breakdown). The MSCP is expected to be operational in 2023/2024. The total demand shown in Table 6 has been plotted on the chart below along with the total parking capacity by year to give a visual representation of the predicted increase in demand over the time period.

Chart 1. Demand Prediction (2020 – 2050)




3.1.3 It is shown that the parking demand is expected to exceed the capacity around 2047. By 2050 the parking demand is expected to be 778 vehicles while capacity will be 717 spaces.

3.1.4 The results of the calculation show lower volumes of predicted demand for parking than the previous calculation suggested. Table 7 below shows the difference for each year reported.

Table 7. Difference Summary

| | 2020 | 2025 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|
| 3% Year on Year Calculation | 449 | 494 | 642 | 739 | 835 | 931 |
| SYSTRA Demand Calculation | 449 | 478 | 569 | 631 | 700 | 778 |
| **Difference (No)** | **0** | **-16** | **-73** | **-108** | **-135** | **-154** |
| **Difference (%)** | **-0%** | **-3%** | **-11%** | **-15%** | **-16%** | **-16%** |

3.1.5 As shown in the table above using the methodology set out, in 2040 the number of spaces required would be 631 this is 108 lower than the 739 set out in the previous calculation using 3% year on year growth factor.

# 4. SUMMARY

4.1.1 DBC have commissioned SYSTRA to carry out a demand study to examine the number of parking spaces which are likely to be required at a new multi-storey car park (MSCP) located adjacent to Darlington Railway Station.

4.1.2 A previous calculation was undertaken for the SOBC using an assumed 3% passenger growth per annum for the next 30 years. SYSTRA were commissioned to carry out a demand study and compare the results with the previous calculation.

4.1.3 The methodology undertaken by SYSTRA follows the standard demand forecasting approach set out in the Passenger Demand Forecasting Handbook (PDFH). A weighted average growth rate has been applied to patronage based on destinations given in the LENNON data. This is

based on population, employment, car journey time / cost, GDP and is consistent with the standard PDFH methodology.

4.1.4 The results of this demand study indicate a lower level of demand than previously calculated.

| APPROVAL | | | | | |
|---|---|---|---|---|---|
| **Version** | **Name** | | **Position** | **Date** | **Modifications** |
| **1** | Author | Olivia Hockney | Senior Consultant | 01/10/2020 | DRAFT |
| | Checked by | Adam Hogg | Principal Consultant | 02/09/2020 | |
| | Approved by | James Quigley | Associate Director | 02/09/2020 | |
| **2** | Author | Olivia Hockney | Senior Consultant | 19/10/2020 | At the request of the client – 2040 growth scenario added. |
| | Checked by | Adam Hogg | Principal Consultant | 19/10/2020 | |
| | Approved by | James Quigley | Associate Director | 19/10/2020 | |
| **3** | Author | Olivia Hockney | Senior Consultant | 04/01/2021 | Baseline parking numbers updated |
| | Checked by | Adam Hogg | Principal Consultant | 05/01/2021 | |
| | Approved by | James Quigley | Associate Director | 05/01/2021 | |