

Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.5.1.7462 © Copyright TRL Limited, 2019
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

**Filename:** Brigg Road Southern Access Road Roundabout.j9  
**Path:** Z:\Projects\3628 Barton Link Road\Data\Junction Capacity Modelling  
**Report generation date:** 28/02/2020 15:42:40

- »Proposed Layout - 2036 Future Year, AM
- »Proposed Layout - 2036 Future Year, PM

### Summary of junction performance

	AM					PM				
	Set ID	Q (PCU)	Delay (s)	RFC	LOS	Set ID	Q (PCU)	Delay (s)	RFC	LOS
Proposed Layout - 2036 Future Year										
1 - Brigg Road (N)	D1	0.2	2.89	0.18	A	D2	0.3	3.10	0.23	A
2 - Southern Access Road		0.2	2.74	0.15	A		0.1	2.55	0.08	A
3 - Brigg Road (S)		0.2	2.87	0.16	A		0.2	2.78	0.16	A
4 - Potential Future Residential Access		0.0	0.00	0.00	A		0.0	0.00	0.00	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle.

### File summary

#### File Description

Title	Southern Access Road/Brigg Road Roundabout
Location	Barton upon Humber, North Lincolnshire
Site number	
Date	20/02/2020
Version	
Status	
Identifier	
Client	NLC
Jobnumber	3928
Enumerator	LTP\MR
Description	

### Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

### Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queuing delay	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75				0.85	36.00	20.00

### Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2036 Future Year	AM	ONE HOUR	07:30	09:00	15	✓
D2	2036 Future Year	PM	ONE HOUR	16:45	18:15	15	✓

### Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Proposed Layout	✓	100.000	100.000

# Proposed Layout - 2036 Future Year, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - Potential Future Residential Access - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

## Junction Network

### Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Brigg Road/Southern Access Road	Standard Roundabout		1, 2, 3, 4	2.84	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description
1	Brigg Road (N)	
2	Southern Access Road	
3	Brigg Road (S)	
4	Potential Future Residential Access	

### Roundabout Geometry

Arm	V (m)	E (m)	I' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - Brigg Road (N)	3.17	7.30	23.5	20.0	50.0	38.0	
2 - Southern Access Road	3.87	7.17	29.8	20.0	50.0	39.0	
3 - Brigg Road (S)	3.15	7.29	26.0	20.0	50.0	40.0	
4 - Potential Future Residential Access	3.00	7.19	34.2	20.0	50.0	39.0	

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Brigg Road (N)	0.603	1712
2 - Southern Access Road	0.628	1851
3 - Brigg Road (S)	0.603	1723
4 - Potential Future Residential Access	0.612	1764

The slope and intercept shown above include any corrections and adjustments.

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2036 Future Year	AM	ONE HOUR	07:30	09:00	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Brigg Road (N)		ONE HOUR	✓	274	100.000
2 - Southern Access Road		ONE HOUR	✓	227	100.000
3 - Brigg Road (S)		ONE HOUR	✓	237	100.000
4 - Potential Future Residential Access		ONE HOUR	✓	0	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		1 - Brigg Road (N)	2 - Southern Access Road	3 - Brigg Road (S)	4 - Potential Future Residential Access
From	1 - Brigg Road (N)	0	44	230	0
	2 - Southern Access Road	125	0	102	0
	3 - Brigg Road (S)	173	64	0	0
	4 - Potential Future Residential Access	0	0	0	0

## Vehicle Mix

### HV %s

		To			
		1 - Brigg Road (N)	2 - Southern Access Road	3 - Brigg Road (S)	4 - Potential Future Residential Access
From	1 - Brigg Road (N)	10	10	10	10
	2 - Southern Access Road	10	10	10	10
	3 - Brigg Road (S)	10	10	10	10
	4 - Potential Future Residential Access	10	10	10	10

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Brigg Road (N)	0.18	2.89	0.2	A	251	377
2 - Southern Access Road	0.15	2.74	0.2	A	208	312
3 - Brigg Road (S)	0.16	2.87	0.2	A	217	326
4 - Potential Future Residential Access	0.00	0.00	0.0	A	0	0

### Main Results for each time segment

#### 07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	206	52	48	1683	0.123	206	224	0.0	0.2	2.678	A
2 - Southern Access Road	171	43	173	1743	0.098	170	81	0.0	0.1	2.518	A
3 - Brigg Road (S)	178	45	94	1667	0.107	178	249	0.0	0.1	2.660	A
4 - Potential Future Residential Access	0	0	272	1598	0.000	0	0	0.0	0.0	0.000	A

**07:45 - 08:00**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	246	62	58	1677	0.147	246	268	0.2	0.2	2.766	A
2 - Southern Access Road	204	51	207	1721	0.119	204	97	0.1	0.1	2.609	A
3 - Brigg Road (S)	213	53	112	1655	0.129	213	298	0.1	0.2	2.744	A
4 - Potential Future Residential Access	0	0	325	1565	0.000	0	0	0.0	0.0	0.000	A

**08:00 - 08:15**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	302	75	70	1670	0.181	301	328	0.2	0.2	2.894	A
2 - Southern Access Road	250	62	253	1692	0.148	250	119	0.1	0.2	2.744	A
3 - Brigg Road (S)	261	65	138	1640	0.159	261	365	0.2	0.2	2.870	A
4 - Potential Future Residential Access	0	0	398	1520	0.000	0	0	0.0	0.0	0.000	A

**08:15 - 08:30**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	302	75	70	1669	0.181	302	328	0.2	0.2	2.894	A
2 - Southern Access Road	250	62	253	1692	0.148	250	119	0.2	0.2	2.745	A
3 - Brigg Road (S)	261	65	138	1640	0.159	261	366	0.2	0.2	2.870	A
4 - Potential Future Residential Access	0	0	399	1520	0.000	0	0	0.0	0.0	0.000	A

**08:30 - 08:45**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	246	62	58	1677	0.147	247	268	0.2	0.2	2.769	A
2 - Southern Access Road	204	51	207	1721	0.119	204	97	0.2	0.1	2.610	A
3 - Brigg Road (S)	213	53	112	1655	0.129	213	299	0.2	0.2	2.747	A
4 - Potential Future Residential Access	0	0	326	1565	0.000	0	0	0.0	0.0	0.000	A

**08:45 - 09:00**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	206	52	48	1683	0.123	206	225	0.2	0.2	2.681	A
2 - Southern Access Road	171	43	173	1742	0.098	171	81	0.1	0.1	2.521	A
3 - Brigg Road (S)	178	45	94	1666	0.107	179	250	0.2	0.1	2.661	A
4 - Potential Future Residential Access	0	0	273	1597	0.000	0	0	0.0	0.0	0.000	A

# Proposed Layout - 2036 Future Year, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - Potential Future Residential Access - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

## Junction Network

### Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Brigg Road/Southern Access Road	Standard Roundabout		1, 2, 3, 4	2.89	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2036 Future Year	PM	ONE HOUR	16:45	18:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Brigg Road (N)		ONE HOUR	✓	342	100.000
2 - Southern Access Road		ONE HOUR	✓	128	100.000
3 - Brigg Road (S)		ONE HOUR	✓	240	100.000
4 - Potential Future Residential Access		ONE HOUR	✓	0	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		1 - Brigg Road (N)	2 - Southern Access Road	3 - Brigg Road (S)	4 - Potential Future Residential Access
From	1 - Brigg Road (N)	0	116	226	0
	2 - Southern Access Road	52	0	76	0
	3 - Brigg Road (S)	154	86	0	0
	4 - Potential Future Residential Access	0	0	0	0

## Vehicle Mix

**HV %s**

		To			
From		1 - Brigg Road (N)	2 - Southern Access Road	3 - Brigg Road (S)	4 - Potential Future Residential Access
	1 - Brigg Road (N)	10	10	10	10
	2 - Southern Access Road	10	10	10	10
	3 - Brigg Road (S)	10	10	10	10
	4 - Potential Future Residential Access	10	10	10	10

## Results

**Results Summary for whole modelled period**

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Brigg Road (N)	0.23	3.10	0.3	A	314	471
2 - Southern Access Road	0.08	2.55	0.1	A	117	176
3 - Brigg Road (S)	0.16	2.78	0.2	A	220	330
4 - Potential Future Residential Access	0.00	0.00	0.0	A	0	0

**Main Results for each time segment**
**16:45 - 17:00**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	257	64	65	1673	0.154	257	155	0.0	0.2	2.794	A
2 - Southern Access Road	96	24	170	1745	0.055	96	152	0.0	0.1	2.401	A
3 - Brigg Road (S)	181	45	39	1700	0.106	180	227	0.0	0.1	2.606	A
4 - Potential Future Residential Access	0	0	219	1630	0.000	0	0	0.0	0.0	0.000	A

**17:00 - 17:15**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	307	77	77	1665	0.185	307	185	0.2	0.2	2.915	A
2 - Southern Access Road	115	29	203	1724	0.067	115	181	0.1	0.1	2.461	A
3 - Brigg Road (S)	216	54	47	1695	0.127	216	271	0.1	0.2	2.676	A
4 - Potential Future Residential Access	0	0	262	1604	0.000	0	0	0.0	0.0	0.000	A

**17:15 - 17:30**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	377	94	95	1655	0.228	376	227	0.2	0.3	3.096	A
2 - Southern Access Road	141	35	249	1695	0.083	141	222	0.1	0.1	2.547	A
3 - Brigg Road (S)	264	66	57	1689	0.156	264	332	0.2	0.2	2.779	A
4 - Potential Future Residential Access	0	0	321	1568	0.000	0	0	0.0	0.0	0.000	A

**17:30 - 17:45**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	377	94	95	1655	0.228	377	227	0.3	0.3	3.097	A
2 - Southern Access Road	141	35	249	1695	0.083	141	222	0.1	0.1	2.547	A
3 - Brigg Road (S)	264	66	57	1689	0.156	264	333	0.2	0.2	2.779	A
4 - Potential Future Residential Access	0	0	321	1567	0.000	0	0	0.0	0.0	0.000	A

**17:45 - 18:00**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	307	77	77	1665	0.185	308	185	0.3	0.3	2.916	A
2 - Southern Access Road	115	29	203	1724	0.067	115	182	0.1	0.1	2.461	A
3 - Brigg Road (S)	216	54	47	1695	0.127	216	272	0.2	0.2	2.679	A
4 - Potential Future Residential Access	0	0	263	1603	0.000	0	0	0.0	0.0	0.000	A

**18:00 - 18:15**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Brigg Road (N)	257	64	65	1673	0.154	258	155	0.3	0.2	2.800	A
2 - Southern Access Road	96	24	170	1744	0.055	96	152	0.1	0.1	2.404	A
3 - Brigg Road (S)	181	45	39	1700	0.106	181	228	0.2	0.1	2.609	A
4 - Potential Future Residential Access	0	0	220	1630	0.000	0	0	0.0	0.0	0.000	A