

Appendix D: Renewal of Local Streets Programme Theory of Change

A detailed Theory of Change (ToC) has been developed to assist in the design of the Renewal of Local Streets Programme (RLS) as well as to provide a robust framework for its evaluation. The RLS ToC has been developed by consulting with key internal stakeholders to arrive at a consensus as to how the Programme will achieve its stated objectives. Initially, the logic maps and supporting tables were drafted by the council evaluators and then subsequently refined by other key internal stakeholders. The 'Theory of Change' has been strengthened by individual mechanisms of change inserted at key points to explain why particular linkages occur. Table 2 identifies these mechanisms for change while Table 1 itemises the exogenous contextual factors that could impact the RLS ToC. Table 2 also identifies which contexts may impact on which mechanisms. Table 3 describes what indicators can be used to determine to what extent these mechanisms are active as well as to track progress towards Key Outcomes, Impacts and objectives.

Figure 1 presents a logic map that articulates the RLS ToC. The map is chronological in nature and identifies the stages and linkages flowing from the initial context to the inputs, outputs, outcomes and eventual longer-term impacts. The Logic Map also shows which outcomes and impacts contribute towards the RLS objectives. The Outputs are based around the delivery of the three RLS Themes:

1. School Streets
2. Streets for People
3. Greener Streets

Any consequence that flows from their physical implementation is classified as an Outcome; for the most part this will be as a result of changed behaviour of those subject to the interventions but could also be of a more physical nature such as improved connectivity.

The mechanisms that enable the changes required to move from outputs to outcomes and impacts have been integrated into the logic maps. The mechanisms that have been identified try to balance the need for them to be defined and discrete with recognition, that if they were broken down into the smallest units, there could be double or triple the number. Thus, individual mechanisms occur at more than one place within the map. In general, the mechanisms have been inserted between Outputs, Outcomes and Impacts to explain how each step has been achieved.

It is also important to note that the above is an initial approach and that, upon Programme approval, the logic map will be reviewed in consultation with external stakeholders such as the DfT and their partners

Table 1 Exogenous contextual factors that may impact the Levelling Up Package Theory of Change

Ref	Context	Evidence base to support context
C1	Socio-economic characteristics	<ul style="list-style-type: none"> • Nottingham has a population of 333,000 (mid-year estimate 2019). • Approximately 35% of the population are from BME groups. • The City has a relatively young age structure but has a higher than average rate of people with a limiting long-term illness or disability. • Nottingham is ranked 11th most deprived district in England in the 2019 Indices of Multiple Deprivation (IMD). • Just under a third of super output areas in the City are in the worst 10% nationally (IMD 2019). • 34.2% of children and 25.8% of people aged 60 and over are affected by income deprivation. • A higher proportion of people aged 16-64 in Nottingham claim some form of benefit than regionally and nationally. • The unemployment rate remains higher than the regional and national average. • Nottingham has a higher proportion of people of working age with no qualifications, compared with the national average. • Residents who live in the City have a lower average income than people who work in the City. • There are high levels of child poverty in the City with around a third of children and young people living in workless households. • Rates of car ownership are low, particularly amongst pensioners living alone and lone parents.
C2	Relevant local transport policies	<p>The local transport policy background features extensive measures to encourage mode switch away from the car and the take up of more sustainable travel options. These initiatives include the Workplace Parking Levy (WPL) package, the Nottingham Cycle City Ambition Programme (NCCAP), The Future Transport Zone and the Transforming Cities package. Clearly, the success of these initiatives will impact on the effectiveness of the RLS Programme. Thus, this evaluation will need to refer to evaluation work being carried out for these initiatives and refer to them for context.</p>
C3	Population growth and demographic change	<p>This will partly determine trends in the demand for travel as well as mode choice.</p>
C4	National & local economic conditions	<p>Economic growth is linked to an increase in demand for transport and this will, therefore, impact on congestion and air quality in Nottingham.</p>
C5	Local trends in the relative costs of competing modes transport	<p>In accordance with economic theory, the relative cost of travelling by each mode will influence demand for that mode</p>
C6	Local congestion issues	<p>Nottingham City Council estimates, based on an independent study by WS Atkins, that congestion in the AM peak period costs the City's economy £160m pa (NCC 2011). This will manifest itself as a cost to business in lost time, increased transport costs, difficulties in access for the workforce and difficulty in accessing suppliers/customers.</p>

Ref	Context	Evidence base to support context
C7	National trends in congestion levels	Since 2011, DfT measures of congestion have seen a steady rise and this has impacted the ability of transport demand management interventions to realise a reduction in congestion. This trend has been disrupted by the Covid-19 pandemic although traffic levels are now nudging up to pre-pandemic levels
C8	National trends in cycle trip numbers	These background trends upon which Renewal of Local Streets Package is implemented will be important context.
C9	National and local trends in accidents involving cyclists	These background trends upon which Levelling Up Package is implemented will be important context.
C10	Suppressed demand for travel by private car	This is released by road space becoming free due to a reduction in congestion or, alternatively, by an increase in household disposable income.
C11	Covid-19 changes mode choices and thus relative demand for travel for each mode	Research suggests that there will be more demand for active travel going forwards and possibly a reduction in the demand for public transport. While there are clear indications that Covid will drive this change beyond the pandemic, the longevity and magnitude remains uncertain. The change in car use also appears uncertain, while the evidence suggests that at present public transport use is much lower than pre pandemic levels and the extent to which this will rebound in the future is also un clear at this time
C12	Covid-19 results in the medium to long term increase in the % of employees working from home thus decreasing the demand for travel	Research suggests that there will be more demand for homeworking in the future due to both employers and employees experience of this during the Covid-19 Pandemic. This will act to decrease the demand for travel into the workplace; however, it could increase the demand for more local journeys that could be conveniently undertaken by bike or foot.
C13	Continuing desire for social distancing. Covid-19 decreases acceptance of crowded public transport beyond the end of the pandemic decreasing the demand for travel by PT	It could be wrong to assume that the habit of social distancing will end once the population is vaccinated. This perceived issue with PT could drive demand for alternatives such as active travel or indeed the private car
C14	National Trends in carbon emissions and air quality	A concerted public policy effort is reducing carbon emissions and to some extent tail pipe emissions of NO2 and particulates, although an increase in the popularity of SUVs is working contrary to that. These background trends upon which Renewal of Local Streets Package is implemented will be important context.

Ref	Context	Evidence base to support context
C15	National trends in the take up of EVs	The take up of EVs is accelerating due to environmental awareness and national and local government policy. These background trends upon which Renewal of Local Streets Package is implemented will be important context.
C16	National Trends in health episodes related respiratory issues	These background trends upon which Renewal of Local Streets Package is implemented will be important context.

Figure 1 Renewal of Local Streets: Logic Map

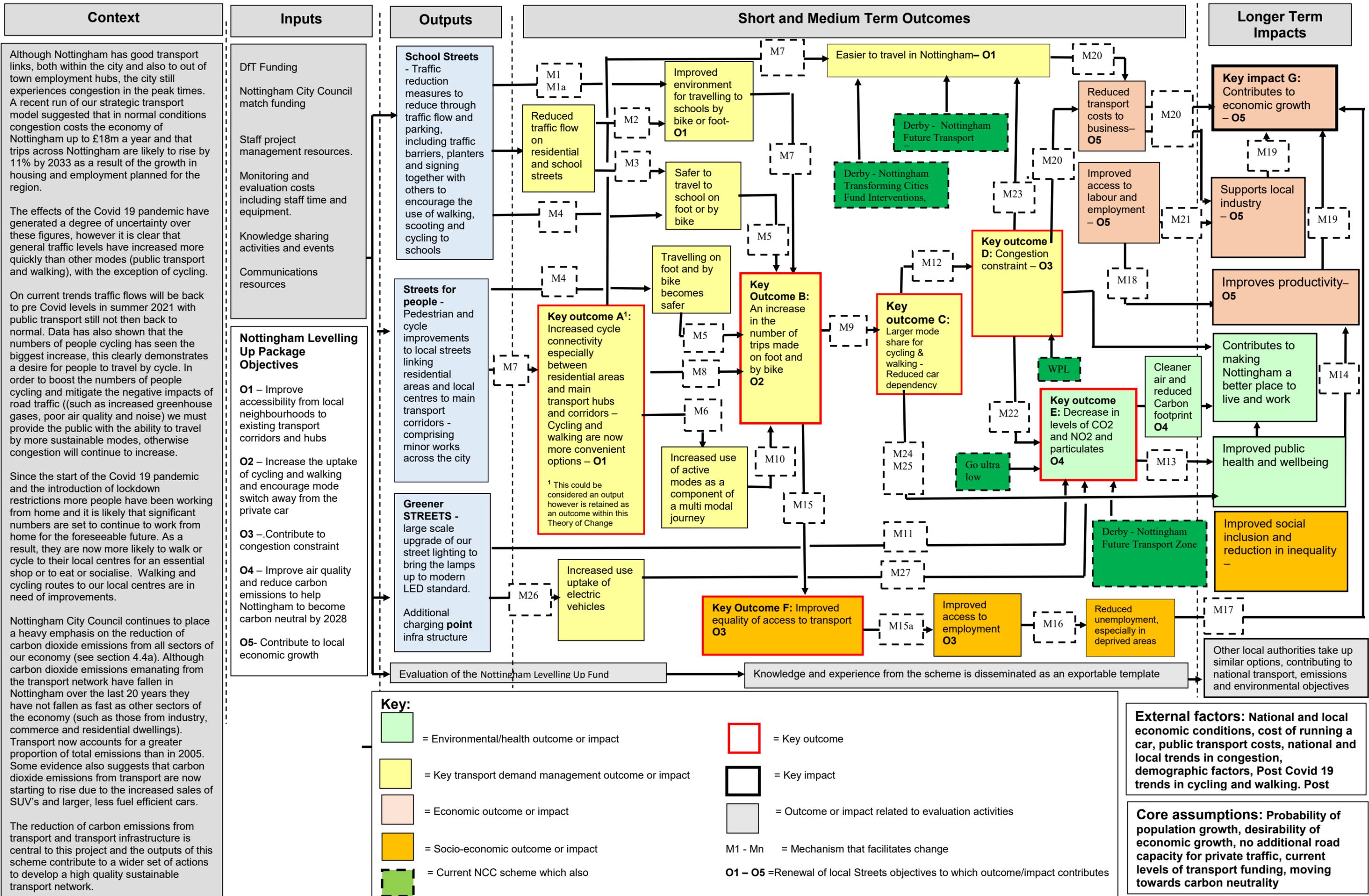


Table 2	Mechanism for change:	Relevant contextual factors see following table
M1	Provision of improved cycle and walking facilities improves the overall environment when using these modes	NA
M1a	Physical measures deter car traffic	NA
M2	Less traffic makes cycling and walking environment more attractive	C1, C2, C3, C4, C5, C10, C11, C12, C13
M3	Reduction in car traffic improves road safety	C1, C2, C3, C4, C5, C10, C11, C12, C13
M4	Provision of improved cycle and walking facilities improve road safety for cyclists and Pedestrians	C9
M5	Road Safety mechanism Cycling perceived as safer thus those who want to cycle but did not previously regard it as safe enough now switch mode to the bike	C11, C13
M6	Multimodal mechanism Incorporating active modes into non car trips now more practical due to high quality cycle links between local neighbourhoods and main cycle and walking and Public Transport corridors and hubs	C2
M7	Improved infrastructure mechanism Continuous routing, better surfacing and enhanced signing make cycling and walking easier, quicker and more convenient	NA
M8	Connectivity Mechanism Improved connectivity for active modes makes cycling and walking more attractive relative to other modes	C2
M9	Mode share mechanism More trips by bike and foot due to mode switch and additional demand for travel being catered for by bike leads to an increase in cycle/walking trips while trips by private car are constrained by existing network capacity and measures on residential street to restrict car use despite considerable suppressed demand for travel by this mode.	C1, C2, C3, C4, C5, C8, C10, C11, C12, C13
M10	Utilisation of active travel within multimodal trips increases the overall use of cycling and walking	C1, C2, C3, C4, C5, C8, C10, C11, C12, C13
M11	Less power required for street lighting	NA
M12	Reduction in demand for travel by car Constrains traffic growth and congestion	C1, C2, C3, C4, C5, C10, C11, C12, C13
M13	Improved air quality A reduction in nitrogen dioxide (NO ₂) and particulate matter reduces the impacts of transport on people's health, leading to a lower incidence of episodes of poor health, especially respiratory and cardiovascular conditions.	C16
M14	An improvement in public health Leads to a reduction in the number of days taken off sick within the workforce and then leads to an increase in productivity, a significant advantage of a low emissions economy. Health impacts upon people of working age have economic effects, for instance if they have to take days off work. It is estimated that in 2012, poor air quality had a total cost of up to £2.7 billion In UK, through its impact on productivity.	C16
M15	More efficient/greater use of cycling by the workforce Reduces transport costs thus improving accessibility to transport	
M15a	Better access to transport makes new employment opportunities viable due to greater accessibility.	C1, C2
M16	Greater mobility Connects people to jobs.	NA

Table 2	Mechanism for change:	Relevant contextual factors see following table
M17	Higher levels of employment Stimulates economic growth due to an increase in household income	C4
M18	Labour force effects Improved accessibility leads to an increase in the quantity and quality of labour and associated productivity improvements. This will also potentially lead to an increase in wage levels and disposable income as the existing labour pool seeks to use the new transport options to maximise their earnings and save on travel costs.	C1, C4
M19	General equilibrium effects ~Increased productivity, time and cost savings associated with increased transport capacity with increased usage of Public Transport and active modes and shorter journey times, cause a general economic improvement as a new equilibrium of increased economic activity is achieved.	C4
M20	Reduction in journey time and increased reliability Reduces costs of transport from suppliers and to customers and lowers business costs	C7
M21	Improved access to a larger pool of labour Makes Nottingham a more attractive place to do business	C4
M22	Less queuing traffic and less traffic overall, lowers emissions of NO2, carbon and PM2.5	C7, C14, C15
M23	Reduction in journey time and increased journey time reliability make it easier to travel around Nottingham especially in the peak periods	C7
M24	Increased levels of exercise lead to health benefits	NA
M25	Increased levels of exercise lead to higher levels of wellbeing	NA
M26	Provision of charge points on local streets makes EV use more practical	C15
M27	Switch from ICE powered vehicles to EVs reduces tail pipe emissions	C14, C15

Table 3 Performance Indicators and what element of the Renewal of Local Streets Theory of Change they measure

Ref	Performance Indicators	Data source	Summary of data collection methodology	Indicator for:		
				Key Outcome /Impact	Mechanism	Objective
I_1	Perception of active travel environment, Perception of Road Safety Trip Details Change in behaviour due to new facilities – Mode Switch Perceptions of accessibility to employment and	Stakeholder surveys: Cyclists	Post implementation surveys delivered by a combination of direct interview, hand out questionnaires and e-survey.	A, B, C, F	M1, M1a, M2, M5, M6, M7, M8, M9, M10, M15, M24, M25	O1,

Ref	Performance Indicators	Data source	Summary of data collection methodology	Indicator for:		
				Key Outcome /Impact	Mechanism	Objective
	services					
I_2	Perception of active travel environment, Perception of Road Safety Trip Details Change in behaviour due to new facilities – Mode Switch Perceptions of accessibility to employment and services	Stakeholder surveys: Pedestrian	Post implementation surveys delivered by a combination of direct interview, hand out questionnaires and e-survey.	A, B, C, F	M1, M1a, M2, M6, M7, M8, M9, M10, M15, M24, M25	O1
I_3	Perceptions of improved residential environment, Perception of active travel environment, Perception of Road Safety Trip Details Change in behaviour due to new facilities – Mode Switch Perceptions of accessibility to employment and services	Stakeholder surveys: Residents	Post implementation surveys delivered by a combination of direct interview, hand out questionnaires and e-survey.	A, B, C, F	M1, M1a, M2, M5, M6, M7, M8, M9, M10, M15, M15a, M16 M24, M25	O1
I_4	Frequency, and duration of use, change of charging behaviour	Stakeholder surveys: Charge Point Users	Data from provider	E	M26, M27	O4
I_5	Employment and unemployment data	Office for National Statistics	Monthly data published by Department of Work and Pensions	G	M17	O5
I_6	Average journey time/delay per vehicle mile	Inrix/C Track data from DfT	Calculated from Inrix/C Track GPS data supplied by the DfT and by data calculated from ANPR data and Google maps	D	M20, M21, M23	O3
I_7	Journey time reliability	Inrix/C Track data from DfT		D	M20, M21, M23	O3

Ref	Performance Indicators	Data source	Summary of data collection methodology	Indicator for:		
				Key Outcome /Impact	Mechanism	Objective
I_8	Modelled changes in NO2, PM2.5 and CO2 emissions	NCC Transport Strategy	Emissions savings due to the RLS interventions will be calculated based on readings from 5 real time air quality analysers, observed mode switch from the stakeholder surveys, traffic flow and composition and mode share surveys at key locations around Derby and Nottingham.	E	M22	O4
I_9	Number and % of ULEVs registered in the Derby-Nottingham travel to work area	Office for National Statistics	Quarterly data published by DfT	E	M27	O4
I_10	Mode share of travel across cordons in Derby and Nottingham	NCC Highway Metrics team	Annual manual count surveys of people movements across defined cordons in Derby and Nottingham by mode of travel	C	M9	O2, O3
I_11	Bespoke before and after mode share surveys in areas benefitting from RLS interventions and comparators	NCC Highway Metrics team	Manual count surveys of people movements across defined cordons by mode of travel.	C	M9	O2, O3
I_12	Before and after cycle and pedestrian counts around the locations relevant to the Renewal of Local Streets Programme	NCC Highway Metrics team	Manual and automatic counts of cyclists and pedestrians at council monitoring sites	B	M5, M6, M7, M8, M10, M24, M25	O2
I_13	Before and after traffic flows in locations relevant to the Renewal of Local Streets	NCC Highway Metrics team	Manual and automatic counts of traffic at council monitoring sites	C	M3, M12	O3

Ref	Performance Indicators	Data source	Summary of data collection methodology	Indicator for:		
				Key Outcome /Impact	Mechanism	Objective
	Programme					
I_14	GVA by local authority area,	Office for National Statistics	Annual data published by ONS	G	M19	O5
I_15	Productivity metrics by local authority area	Office for National Statistics	Annual data published by ONS, analysed by council Economic Research officer	G	M14, M18	O5
I_16	Estimate of car trips saved, based on observed mode switch	NCC Highway Metrics team	Analysis of mode share and stakeholder user surveys to calculate change	C	M12, M13	O3
I_17	Before and after accident and casualty rates among pedestrians and cyclists	NCC and DCC Road Safety teams	Standard data from Police records	A	M3, M4, M5	Not a direct measure of an objective
I_18	EV charge point usage measures	Chargemaster	This data is supplied by chargemaster, the provider of EV charge points in Nottingham	E	M26	Not a direct measure of an objective
I_19	Power Drawn By Street Lighting on Streets Subject to Greener Streets Theme	Energy Provider	Data from Energy Provider	E	M11	O4
I_20	Output Measure	NCC Project Manager	Process Evaluation data from project management records	A	None	O1