



York Civic Trust

York's Local Transport Strategy Metrics, Targets and Modelling 24th January 2024

At its meeting on 12th October 2023, the Council Executive agreed that the Local Transport Strategy, when published in November, should include a set of targets which the Strategy should aim to achieve. We submitted our own suggestions, as an input to that process, on 18th October. In practice, the only references to targets in the consultation draft were those of reducing carbon emissions from transport by 71% and car use by 20% by 2030, while at the same time doubling active travel and increasing bus patronage by 50%, all of which came from the 2022 climate strategy.

It is now proposed that this topic be discussed at the Expert Panel on 24th January. We learnt of this too late to be able to submit our proposals, but Tony May was able to speak to them then. This paper expands on our earlier submission of October 2023, which in turn drew on the proposals which we offered in Figure 5B of our 2022 *Transport Strategy for York*. We hope that it will be circulated to Expert Panel members following the meeting.

Metrics

Guidance on developing targets for transport strategies distinguishes between three types of metric, or indicator:

- Outcome indicators which measure performance against objectives (such as levels of carbon emissions from transport);
- Intermediate outcome indicators which measure changes in travel patterns which might in turn lead to the outcome indicators (such as levels of reduction in car use);
- Input indicators which measure actions taken to achieve the intermediate outcome and outcome indicators (such as numbers of public EV charging points provided).

The guidance recommends strongly focusing on outcome indicators when measuring performance of, and progress with, a strategy. It does so because it is the outcome indicators which demonstrate clearly the benefits of the strategy. Changes in travel patterns (the intermediate outcome indicators) only indicate the travel changes resulting from the strategy and do not, of themselves, measure any resulting benefits to society. Meanwhile, input indicators only signal what has been done, and say nothing about what has been achieved as a result.

Targets

A target is a given level of a specified metric or indicator to be achieved by a given date. As with metrics, targets can be of the three types listed above. Any target needs a base year and a level for that base year, neither of which is specified for the targets listed in the consultation draft.

In our proposals below we have focused on outcome targets for each of the ten objectives listed in the Council's Local Transport Strategy, rather than on intermediate outcome targets for use of different modes, for three reasons. Firstly, outcome targets for objectives indicate clearly the potential benefits of the Strategy, whereas targets for mode use do not. Secondly, modal targets are potentially contentious. People are already asking why a 20% reduction in car use is needed. That question needs to be answered by setting out what will be achieved as a result; those potential achievements are reflected in the outcome targets. Thirdly, it is easier to determine intermediate outcome targets for individual modes at a later stage in strategy formulation. This involves using a predictive model to identify the measures which will achieve the outcome targets for objectives, and noting the resulting changes in mode use. These changes will provide the intermediate outcome targets, which will then be known to be compatible with the outcome targets for objectives, and can be used for monitoring progress.

It is essential that any strategy is clear as to the horizon year(s) for which targets are being set. Most transport strategies look 15 to 20 years ahead, and we suspect that the Department for Transport might require something similar. They then typically have a medium target for, say, five years ahead. At present, the Council's draft strategy only refers to 2030, which is now only six years away.

Outcome Indicators (metrics) to measure performance

It is important to select one or more outcome indicators, or metrics of performance, for each of the Council's objectives. These need to be readily understood, to reflect what the Council wishes to achieve for York as a whole, and to be capable of being measured or estimated with limited resources. We offer our suggestions for each of the Council's ten objectives below.

Inclusive access

In our *Strategy* we proposed three indicators:

- % within 20 minutes (by sustainable modes) of key activities (by which we meant shops, primary schools, health facilities, and transport hubs);
- % with under-provision of public transport (as measured in the 2014 Council report);
- % dissatisfied with pavement quality (which Age Friendly York measures).

We suggest focusing on the first two of these, since the third relates to a specific policy measure. Further work is needed to decide how best to measure them.

Climate

There is a single relevant indicator: carbon emissions from transport, as used in our *Strategy*. It is most readily assessed from information on flows and speeds by vehicle type and data on the carbon emissions per km for each vehicle type. Such an indicator does not

include embedded carbon in those vehicles. It may be that the long-awaited DfT guidance will specify other indicators.

Economy

We did not attempt to offer an indicator for Economy in our *Strategy*, but suggested that it would be better determined by the Council's economic development team. It will be important to assess the impacts of transport through changes in access, reliability and environmental quality. We suggest that an annual survey of business perception of these impacts might be an appropriate indicator. Many transport strategies refer to an objective of increased transport efficiency, which can be thought of as a contributor to the economy. We cover this under the objective of reliability below.

Health

We did not attempt to offer an indicator for Health in our *Strategy*, but our analysis of problems focused on the importance of regular active travel. Exposure to air pollution is also relevant, but we consider this under local environment below. We suggest adopting an indicator of the percentage of residents walking or cycling for 20 minutes per day. This would need to come from surveys. It might also be possible to use school data on levels of obesity and asthma, though these will have other causes as well.

Safety

In our *Strategy* we proposed three indicators:

- all casualties (killed, serious and slight);
- active travel casualties;
- % thinking York safe to cycle.

The first two are recorded by the Police, though with some under-recording of single vehicle casualties. The third is surveyed by Sustrans, but not for York, since the Council has not commissioned the data. We suggest focusing on the first two.

Local environment

In our *Strategy* we proposed two indicators:

- NO₂ emissions;
- PM_{2.5} emissions.

Both are measured in the Council's Air Quality Annual Status Report, which also measures PM₁₀, which is of less immediate concern. It is important to stress that these are emissions from all sources, including transport. They are also specific to the critical links on which they are measured. Ideally, an assessment of the local environment would also consider noise, visual intrusion and other factors which reduce liveability, particularly in residential and shopping streets. We have not proposed indicators to cover these attributes.

Reliability

This is perhaps the most difficult of the quantifiable objectives for which to propose a simple metric. In our *Strategy* we used the percentage of bus services on time, but levels in 2017 were already at 87%, partly because bus operators use extended timetables to achieve greater reliability. We suggest, instead, four indicators:

- average journey time on the road network, which might be measured for key links, routes or areas, potentially separately for the peaks and inter-peak;

- ratio of peak to inter-peak journey time;
- the number of signalised junctions operating at capacity, again both for the peaks and inter-peak;
- the extent of queuing on critical links in the network, again both for the peaks and inter-peak.

Reductions in the first of these over time will suggest increased reliability, although care is needed to allow for re-routing to longer, but more reliable routes. Reductions in the second are a more direct measure of reliability, and are easily recorded and understood. They do not directly reflect variations within the peak, which would require the standard deviation. Reductions in the third will directly affect queue lengths and the potential for blocking of upstream junctions. The fourth offers an alternative to the third, which is more easily understood, in case it proves easier to measure. The first and second can be assessed from the Council's strategic model and local surveys; the third will come from the Council's real-time signal control facilities; the fourth could come from CCTV observations.

Heritage

This is a qualitative objective, which is not readily quantified. However, we tentatively suggest using the flow past key heritage sites, including Bootham Bar and Clifford's Tower, or in and around the city centre as a whole, as an indicator.

Future growth

The key here is the way in which new developments operate. Advice from RTPI and Transport for New Homes advocates achieving at least 60% of all journeys by sustainable modes. We suggest this as an indicator, and that levels in recent developments such as Derwenthorpe and Germany Beck are used as the baseline.

Resilience

This again is a qualitative objective, but National Highways uses a measure of the time taken for its network to recover from a disruptive event. The most frequent threat to resilience in York is flooding, and we might use a measure of the time which it takes before average travel times return to normal levels. Alternatively, a similar assessment could be made for travel time to access to the city centre by bus. This requires further thought, and we have not for the moment offered suggested targets.

Measurement and base levels

At present, some of the above are not measured at all, while others were last measured some time ago, or are defined against an earlier year. We recommend that steps are taken urgently to agree on how each of the above is measured, and to obtain base data for 2023/4. In the meantime, we have shown, in the annex, known base data for a known base year where it is available.

In completing this exercise, it would also be worth checking on the metrics and targets used by comparator cities such as Cambridge and Oxford.

Our tentative proposals

Based on the above, we offer the table in the annex, which shows, for each objective:

- the proposed indicator(s);
- the base level and year, where known;
- our suggested targets for:
 - 2027: the final year of the current administration;
 - 2030: the target year for the Council’s climate strategy;
 - 2037: a notional longer-term horizon year.

Modelling

The need for modelling

Simply setting targets and identifying policy measures does not tell the Council, public or funding bodies whether the proposed measures will be sufficient to meet the targets. To do so requires some form of analysis. Some such analysis will need to be completed before any Local Transport Plan is adopted. We strongly recommend that an initial analysis, at least, is conducted before the Council’s Executive approves the Local Transport Strategy in March, so that it can have confidence that its aims are likely to be met.

Analysis of impacts is not a straightforward process, because of the complex interaction between land use, transport, communications and behaviour. Faced with any change in transport, individual users potentially have a wide range of potential responses, including:

- not to travel, perhaps by using communications technology instead
- to travel to a different destination, including potentially making shorter journeys
- to travel at a different time of day
- to travel by a different mode of transport
- to travel by a different route.

Not all of these options will be available for all users and for all journey purposes, but the range of options is still complex.

Moreover, changes made by one set of users will change the circumstances experienced by remaining users, perhaps by adding to or reducing congestion, or making it harder to board a bus or find a shared vehicle. In some cases, third parties such as bus operators may make further changes to the transport available as a result of changes in usage.

In a city of the size of York, it is not possible to estimate the complex interactions resulting from a change in policy using simple spreadsheets. Instead, a range of computer models has been developed, based on empirical evidence, to support such analysis.

The models available

The Council has a new strategic model, created in 2019 based on VISUM software. It has some limitations, in that it was commissioned not to include active travel (which includes over a third of journeys, and is, like many similar models, not well designed to model freight or the choice between communications and travel. It is also worth bearing in mind that the 2019 travel data on which it is based is already out of date, since the pandemic and recent developments have resulted in significant changes in travel patterns. Even so, it is the most reliable tool available to the Council, and should be used at the very least to test two or

three policy options before Executive considers the Local Transport Strategy in March. A further potential shortcoming is that, as we understand it, there is only one member of Council staff with the skills to use the model, and the alternative of commissioning consultants is time-consuming and relatively expensive.

The Council has an older model, based on SATURN software, which we have used in our work on the Movement and Place Plan. It is no longer reliable as a predictor of absolute impacts, but it can potentially still be used for shortlisting of options to be tested using the new strategic model. It has the advantage that there is a wider group of people in York with the skills to use it, and could thus be used more intensively over the next month.

Many councils now use simpler “sketch planning” models to identify the broad impacts of different policy options. These use very simplified representations, for example of the road network, but enable the relative impacts of different policy packages to be assessed quickly. In some cases such models run in a few minutes, and can be used interactively, with decision-makers, to answer a range of “what if?” questions. It is now too late to procure such a model for analysis of the transport strategy, but it might still be worth consideration for input to the final Local Transport Plan.

Annex: Suggested Metrics and Targets

The 2027 and 2037 targets from our 2022 *Strategy* are in **bold**. We have interpolated targets for 2030 in ***bold italic***.

Objective	Metric	Base	Target		
			2027	2030	2037
Inclusive access	% within 20 min. of key activities	To specify	80%	<i>85%</i>	95%
	% with under-provision of buses	2014 = 17%	10%	<i>8%</i>	5%
Climate	Carbon emissions from transport	2005 = 100	-60%	<i>-71%^A</i>	-90%
Economy	To be defined				
Health	% walking or cycling 20 min. daily	To find	75%	80%	85%
Safety	All casualties	2019 = 433	-20%	<i>-25%</i>	-40%
	Active travel casualties	To find	-30%	<i>-40%</i>	-60%
Local environment	NO ₂ emissions	To find	-25%	<i>-35%</i>	-50%
	PM _{2.5} emissions		-10%	<i>-13%</i>	-20%
Reliability	Average travel time on network	To specify	-5%	-10%	-20%
	Ratio of (peak - inter-peak travel time) to inter-peak travel time	To specify	-20%	-30%	-40%
	Number of junctions at capacity	To find	-30%	-40%	-60%
	Queue lengths on critical links	To find	-20%	-30%	-50%
Heritage	Traffic flow past key sites or in and around the city centre	To find	-20%	-30%	-50%
Future growth	% journeys in new developments sustainable	To find	50%	60%	65%
Resilience	To be defined				

A. This 2030 target is from the climate change strategy, and is fixed.