

MAXIMISE CYCLE SCHEME BENEFITS THROUGH ENHANCED MODELLING

Despite an explosion in two-wheeled transport during the pandemic, currently only 2% of the UK's population regularly get on their bikes. To tackle this, the government has committed to invest billions in improving cycling infrastructure and its take up over the next five years. With greater investment comes greater scrutiny. Active Travel England now has statutory powers to ensure travel schemes are high quality and best serve local communities. Modelling has to be fit for purpose to support business case development and appraisal as well as on-going monitoring. Yet current approaches to modelling cycle demand and routing are generally less advanced compared to modelling highway and public transport modes.



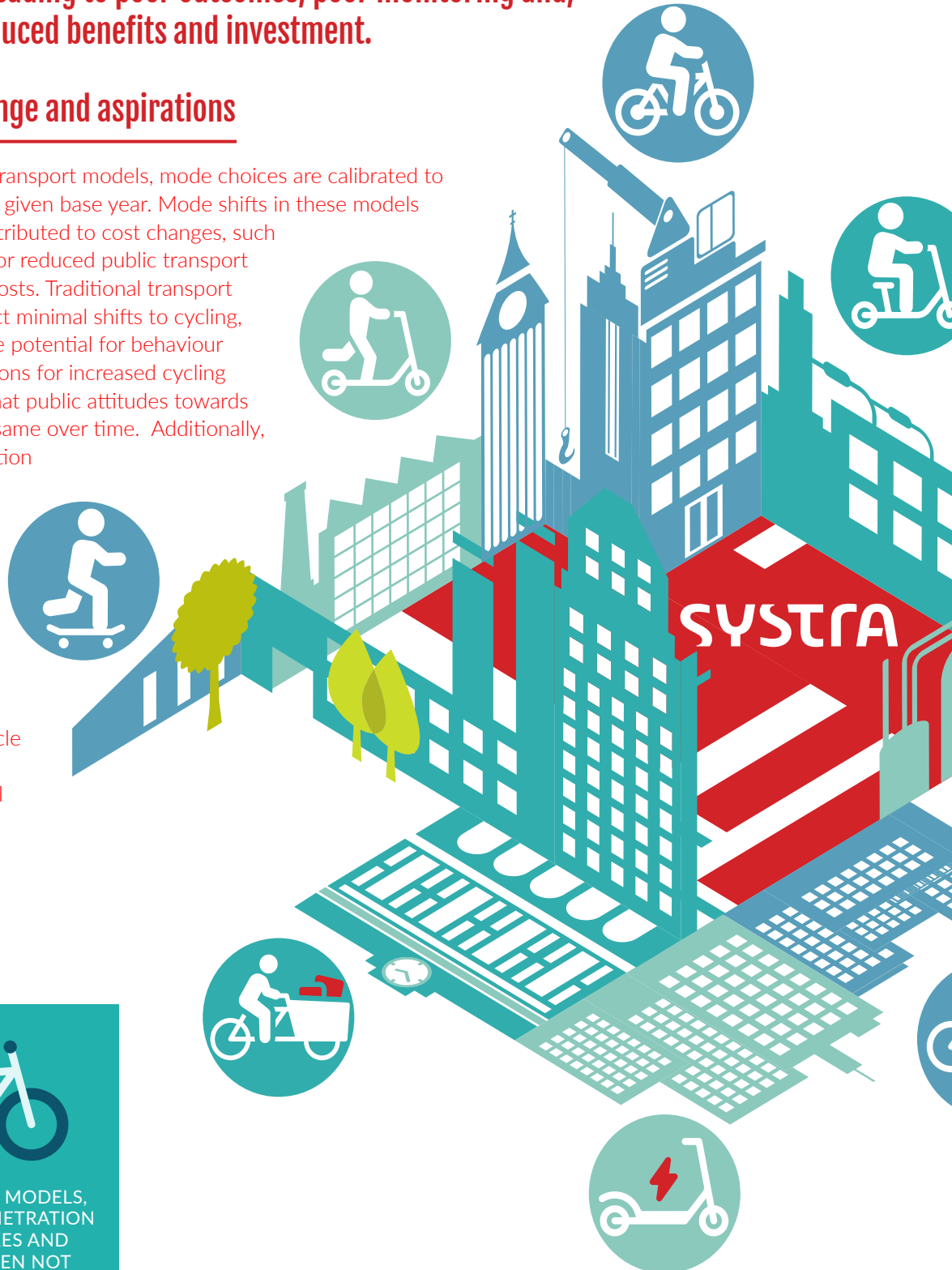
By Ian Burden & Neil Raha

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Without robust modelling, cycle interventions could be delivered ineffectively, leading to poor outcomes, poor monitoring and, ultimately, reduced benefits and investment.

Behaviour change and aspirations

In classic strategic transport models, mode choices are calibrated to observed data for a given base year. Mode shifts in these models are typically only attributed to cost changes, such as higher car costs or reduced public transport and active modes costs. Traditional transport models often predict minimal shifts to cycling, underestimating the potential for behaviour change and aspirations for increased cycling uptake, assuming that public attitudes towards cycling remain the same over time. Additionally, the market penetration of cargo bikes and e-bikes, which can remove some barriers, is not considered. The models also ignore improvements in facilities such as cycle parking, changing rooms or bike rental schemes.



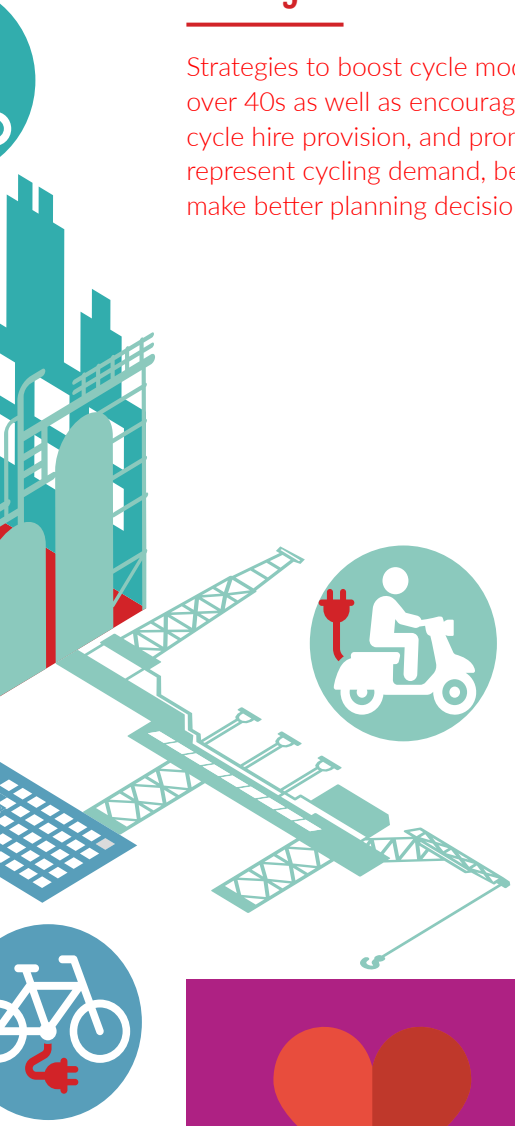
Cycle Propensity Tool (CPT)

To address these issues, SYSTRA developed its Cycle Propensity Tool (CPT). The CPT overcomes the limitations of existing transport models by incorporating behaviour change and providing insights into potential increases in cycle mode share based on person personas and their ability or propensity to cycle given the right conditions and infrastructure provision. In Dublin, we worked with the National Transport Authority (NTA) to support the development of the Greater Dublin Area Transport Strategy 2023-2038. By utilising data from the Irish National Household Travel Survey, the CPT tool worked with the existing transport model to identify individuals with varying propensities to cycle, demonstrating the significance of this as a predictor of cycle use.

The transport model demonstrated there is a high potential for cycling to increase in Greater Dublin but that the existing cycling network is fragmented and needs significant improvement. Raising the desire to cycle in the lower propensity groups to match that of the higher use group requires policies that address perceived barriers to cycling and foster positive shifts in attitude.

Strategies


Strategies to boost cycle mode share included increasing the share of females, targeting under 20s and over 40s as well as encouraging cycle use in lower income bands through purchase schemes, increased cycle hire provision, and promotional campaigns. By enhancing existing transport models to accurately represent cycling demand, behaviour change, and the influences that affect people's choices, we can make better planning decisions that build healthier, more sustainable communities.



CPT OVERCOMES THE LIMITATIONS OF EXISTING TRANSPORT MODELS BY INCORPORATING BEHAVIOUR CHANGE



TRANSPORT MODEL MUST TRY TO IDENTIFY INDIVIDUALS WITH VARYING PROPENSITIES TO CYCLING



STRATEGIES TO BOOST CYCLE MODE SHARE INCLUDED INCREASING THE SHARE OF FEMALES





Utrecht's cycling share

Transforming our car-choked urban areas into cycling sanctuaries like Utrecht or Copenhagen may seem the stuff of science fiction but with the right modelling, sustainable policies and targeted investment, it is possible. It has taken thirty years, but Utrecht's cycling share has risen by 56%, transforming it into a world-leading cycling city. Local planners in Utrecht used cycle modelling software to identify where to invest in active travel infrastructure and which specific segments of society needed the most encouragement to get on their bikes. Clearly, the results speak for themselves.

UTRECHT'S CYCLING SHARE HAS RISEN BY



56%



UTRECHT IS A WORLD-LEADING CYCLING CITY



THE RESULTS SPEAK FOR THEMSELVES

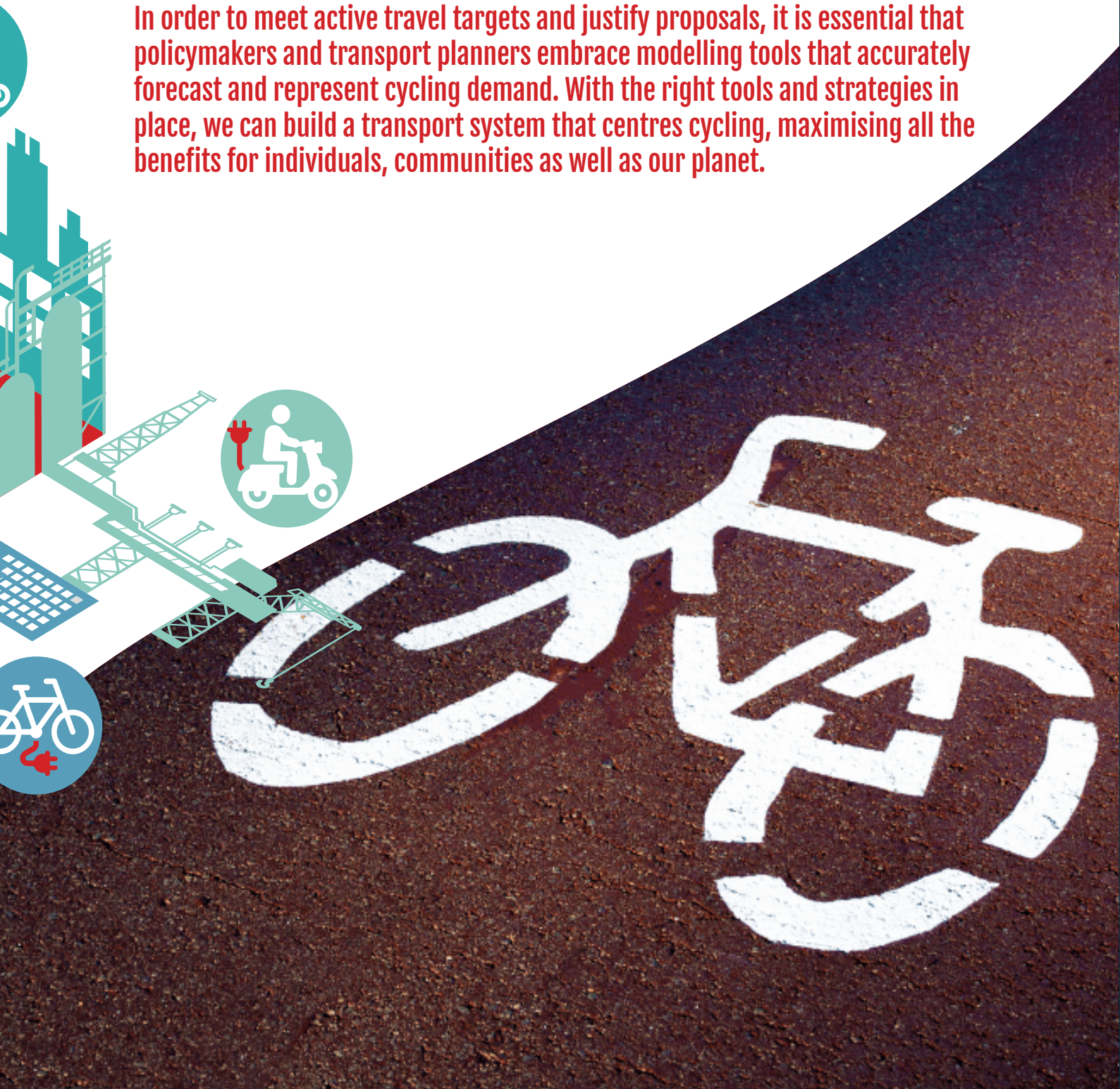


CYCLOPS

To help transport planners and decision makers optimise cycling networks, we developed CYCLOPS, a GIS planning platform that integrates active mobility data to optimise cycle networks. Data from various sources can be used including public datasets, survey data and user generated data from apps such as Strava. The platform then tests different scenarios and assesses key performance indicators such as travel time, demand, safety, health, and CO2 savings, identifying improvements required at a local level to increase the number of trips made by cycle and also by foot.

In Auckland, CYCLOPS was deployed on cycling catchment analysis for new light rail stations on Auckland's North Shore to identify the gaps in cycling infrastructure and facilities. The system analysed data on cycling patterns and usage to identify areas where new or improved cycling infrastructure was needed and would be most beneficial. The GIS system helps planners prioritise which routes to focus on first based on factors such as potential usage and safety. Ultimately, the goal was to make cycling a more viable and attractive option for people using the new stations in Auckland, helping reduce traffic congestion and improve air quality.

In order to meet active travel targets and justify proposals, it is essential that policymakers and transport planners embrace modelling tools that accurately forecast and represent cycling demand. With the right tools and strategies in place, we can build a transport system that centres cycling, maximising all the benefits for individuals, communities as well as our planet.



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