Committees:	Dates:	
Streets and Walkways Sub-Committee	06 December 2016	
Projects Sub-Committee	12 December 2016	
Subject: City-Wide Pedestrian Model	**Gateway 6 Update Report**	**Public**
Report of: Director of the Built Environment		**For Decision**

Summary

Dashboard

- Project Status: Green
- Timeline: Gateway 6, first progress report following initial procurement
- On programme
- Spend and commitments to date: £171k (fully funded by TfL)

In August 2015 Members authorised officers to procure consultants to build a digital pedestrian model of the entire City of London. The purpose of this model was to enable the City to predict future pedestrian flows for a range of different scenarios. This would enable the City to understand the impacts of new developments or policy changes upon future pedestrian movement in the City.

The project has been successfully completed, on time and on budget. The City now has pedestrian models that predict levels of pedestrian movement on all streets in the City of London for the years 2016 and 2026. The model is a unique data source which provides a strong evidence base to underpin strategic planning of City streets to ensure that they meet the needs of future residents, workers and visitors. Using these models, we can:

- Identify where pedestrian movement levels are likely to experience most growth as a result of developments which are likely to be delivered over the next ten years;
- Identify areas of the City which have spare pedestrian capacity to absorb increased levels of movement;
- Identify where new pedestrian routes would be most beneficial in terms of relieving stress on existing footways; and
- Use the information above to inform our discussions with developers, and to inform future strategy planning.

At a recent meeting of the Senior Officer Working Party (the overall governance body for the project) it was determined that with further investment there is opportunity to further enhance the model. These enhancements would allow us to:

- Identify streets which are unlikely to have sufficient capacity to

accommodate projected growth in pedestrian movement;
- More accurately predict the impacts of future growth in rail-based commuting on City streets;
- Develop a cost-effective data collection method which will allow the model forecasts to be regularly updated and enhanced; and
- Use the model to better evaluate the impacts of a selected future scenario (provisionally the Eastern City Cluster).

The model has been developed by Space Syntax Ltd., using their purpose-built software. This model is larger and more complex than any model built to-date using this software. Space Syntax Ltd. is the only company with sufficient specialist knowledge of this modelling package to develop it in the way that we have specified. Therefore a waiver of standing orders is required to procure further development of the model directly from Space Syntax Ltd.

It is recommended that:

- *Members note the contents of this report*
- *Members authorise officers to extend the project budget by £137,600 in order to procure further enhancements to the model. This will be part funded by TfL (£80,000), and partly from departmental resources (£57,000).*
- *Members authorise a waiver of standing orders to allow officers to procure these services directly from Space Syntax Ltd.*

Main Report

1. Reporting period	1.1 August 2015 to October 2016 inclusive	
2. Progress to date	**Model Development**	
	2.1 In August 2015 Members authorised officers to procure consultants to build a computerised pedestrian model of the entire City of London. The purpose of this model was to enable the City to predict future pedestrian flows for a range of different scenarios. This would better enable the City to understand the impacts of new developments or policy changes upon pedestrian movement in the City.	
	2.2 Following the Committee approval, officers appointed consultants to build the model. The Consultants appointed, Space Syntax, constructed the model using their specialist software platform. This platform is widely recognised throughout the planning industry as a robust and effective pedestrian modelling tool.	
	2.3 Following construction of two base year models for the year 2015 (representing a typical weekday morning peak hour and a typical weekday lunchtime peak hour), the consultants then worked	

closely with officers to construct models representing a future year scenario. This scenario includes all development and infrastructure change that is anticipated to take place between now and the year 2026. As with 2015, morning peak and lunchtime peak models were constructed. Thus, these models represent the City's best estimate of likely pedestrian movement for the year 2026, and should be used to inform any decision making where pedestrian movement is likely to be affected.

2.4 The models were delivered to the City in April 2016, and are currently available as a series of GIS layers. Appendices 1-3 illustrate some sample outputs from the models:

- Appendix 1 illustrates 2026 morning peak hour predicted pedestrian flows;
- Appendix 2 illustrates the predicted increase in morning peak hour pedestrian flows between the years 2015 and 2026; and
- Appendix 3 combines 2026 morning peak hour predicted pedestrian flows with air pollution data, to illustrate the streets where high numbers of pedestrians will be exposed to highest levels of air pollution.

Emerging Policy and Themes

2.5 In parallel with the development of the pedestrian model, the Department of the Built Environment is in the process of updating the Local Plan. Through this process, high-level steering groups have been established, one of which deals specifically with issues relating to 'Place'. This working group has identified three key issues relating to Place in the City; these are:

- Connectivity;
- Capacity; and
- Character.

2.6 Officers have undertaken an assessment exercise to determine how the model can be applied in alternative scenarios. As part of this, it has been assessed how the models can be used to assess issues relating to Connectivity, Capacity and Character.

2.7 This exercise has revealed that whilst the models are already useful for the assessment of the Connectivity of streets, they are less able to assess either the Capacity or the Character. However, it was identified that through further model enhancement, the models could certainly be used for better assessment of street Capacity.

2.8 Also, it has been recognised that if utilised in conjunction with other data sources, the models could contribute towards better understanding of issues related to street Character. For example, it is envisaged that the model could be used in conjunction with Air Quality, Sunlight and Wind models.

Finance & Funding to Date

	2.9 All expenditure on the model has been fully funded by TfL. Expenditure to date is as follows: • Staff: £31,475 • Fees: £139,226 • Total: £170,701
3. Next steps	3.1 In developing the model to the original specification it became clear that significant additional benefits would be derived from further investment. Officers consider that the future enhancements to the model will add considerable value in terms of aiding our current and future assessment of Connectivity, Capacity and Character of City streets. It is therefore recommended that the following enhancements to the model are procured. *1. Developing a systematic approach to pedestrian movement data collection* 3.2 Models of this nature are extremely dependent upon large volumes of quality pedestrian movement data. Whilst producing the base pedestrian models, it became apparent that the model would benefit from the inclusion of much more pedestrian movement data, as it would permit more accurate assessments of future pedestrian movement. 3.3 The City already has access to large volumes of pedestrian data, either through data submitted to us by developers to support planning applications, or through data collected by the City to support individual projects. However, this data has not been collected in a systematic way that would enable us to incorporate the data into the model. Thus, this element of work seeks to set out systems and protocols that would ensure that in future, when we collect pedestrian movement data, it is collected in a consistent format, and that the data is captured by the pedestrian model. 3.4 As part of this element of work, the consultants will also undertake research into emerging data collection technologies, such as movement sensors, which could also link to the model. *2. Additional transport-related data collection* 3.5 The original models included information regarding rail station usage for all mainline and underground rail stations, including Crossrail stations. Given that a significant number of pedestrian journeys in the City will involve a rail-based journey, it is clear that the accuracy of the model would be enhanced by improving the model's estimates of rail travel. 3.6 It is proposed that the models should be updated to include

Railplan predictions of future rail usage. These predictions will allow much more accurate modelling of station-specific growth, which will improve the accuracy of the future year models (this was outside the scope of the original commission).

3. Street capacity risk assessment

3.7 The current models have pedestrian flow data for all streets in the City, for the years 2015 and 2026. By developing a tool that will combine the model with other geo-locational data, it is possible to use the model to provide an overview of pedestrian movement and footway widths. This add-on tool will allow us to quickly assess street capacity deficiencies.

4. Scenario testing

3.8 It has been identified that there are a number of major proposals where the model could be applied. The Eastern City Cluster is of particular interest, given the scale of the major tower applications in that area. It is proposed to utilise the models to undertake a scenario test to better understand the possible impacts of new developments in the Eastern City Cluster.

Budget Adjustment

3.9 The approved budget for the project to date is £170,701. The cost to undertake each of the above tasks is as set out below:

1. Scoping and definition of data collection: £36,490
2. Enhanced transport data collection: £8,028
3. Street capacity risk assessment: £62,892
4. Scenario Test: £10,191

3.10 In addition to the above, there will be staff costs expended on procuring, and managing the consultants. The staff cost is estimated at £20,000. This brings the total budget increase to £137,601.

3.11 Officers recommend that the budget for this project should now be increased from £170,701 to £308,302, to allow the procurement of the model enhancements set out in this report.

3.12 The funding of the additional £137k would come from the following:

- £80,000 TfL funding;
- £57,000 covered by departmental resources.

Waiver Requirement

3.13 As can be ascertained from the descriptions above, these

works can only be undertaken in an efficient and effective way by consultants that had a detailed knowledge of the workings of this model. This would only be possible for the consultants that developed the model. For that reason, it is proposed that we do not undertake a competitive tender process, as no other consultant would have the capability or understanding of the model to undertake this work.

3.14 In addition, given the importance of avoiding any underspend in LIP funding, it is imperative that the consultants are appointed as soon as possible. This would be virtually impossible were this piece of work to go to open tender.

Appendices

Appendix 1	2026 morning peak hour predicted pedestrian flows
Appendix 2	Predicted increases in morning peak hour pedestrian flows between the years 2015 and 2026
Appendix 3	2026 morning peak hour predicted pedestrian flows combined with air pollution data

Contact

Report Author	Jon Wallace
Email Address	Jon.wallace@cityoflondon.gov.uk
Telephone Number	020 7314 1589