

## Transport trends in the mega-city Santiago de Chile

14 June 2011

An international consortium of scientists, including transport researchers from the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), is examining the opportunities and risks of mega-cities and metropolitan areas. The primary research objective, based on the metropolis of Santiago de Chile, is to provide recommendations for strategic urban planning and to minimise problems such as traffic congestion and air pollution. Francisco Martínez, one of Chile's leading transport researchers, summarises the results and reasons for cooperating with DLR in the following interview. Martínez is a professor at the Universidad de Chile, and his work focusses on transport systems, urban development and modelling traffic behaviour. In a video made by the Helmholtz Center for Environmental Research, one of the other partners on this project, Francisco Martínez and DLR transport researcher Andreas Justen review the situation in this South American metropolis.

**Question:** You have been working very closely with transport researchers from DLR as part of the 'Risk Habitat Megacity' project. How did this collaboration come about?

**Francisco Martínez:** We started working together on this project back in 2006. The University of Chile – and especially the transport research group, of which I am a member – was a partner in this initiative. 'Risk Habitat Megacity', to give the project its official name, was a collaborative venture between five research bodies from the Helmholtz Association and six partner organisations in Chile. This was indeed a demanding and complex project; many researchers from a large number of disciplines were involved, each playing an integral role in this initiative and all needing to have their efforts coordinated. In total, the project brought together 60 researchers. In addition, a number of German and Chilean graduate students were also involved.

**Question:** What are the most important findings of 'Risk Habitat Megacity' in relation to traffic and air pollution?

**Francisco Martínez:** What we have found in the scenarios analysed for Santiago de Chile is, among other things, that the ownership and use of private cars will increase dramatically by 2030. In contrast, the use of public transport will, at best, remain constant, despite our assumption that the local transport network is going to continue to improve in the coming years. This is probably a consequence of the extended and enhanced road infrastructure. Furthermore, the central area of Santiago, in particular, is going to experience massive traffic congestion, something emerging in every scenario examined. At this point – in our view – the city administration will have no choice other than to introduce a congestion charge. An interesting outcome of our forecasts was that, despite the growth in traffic, air pollution in Santiago will not be a long-term problem. Air quality will actually improve by 2030 because vehicles will be employing substantially improved emission control technologies, which means that pollutant emission levels can be substantially reduced.

**Question:** How did you arrive at these results?

**Francisco Martínez:** For the calculation of traffic predictions, we made extensive use of mathematical and economic models of transport and land usage. For this, the city was divided into about 700 zones and the population was split into 65 socio-economic groups. In the land usage model, constructed and undeveloped areas of the city were mapped, including various types of buildings classified by surface area per storey and number of floors. The traffic model takes the relevant types of transport into account – cars, public transport, pedestrians and bicycles. Based on this, future scenarios were developed, together with benchmarks such as accessibility, journey times and emission levels. These enable us to estimate whether and, if so,

how, changes in the development of Santiago can favour sustainable urban development. This was our methodological approach. When estimating technological development, for example of motor vehicles, we took into account developments in other countries with a similar economic and developmental status to Chile.

**Question:** Where can these results be of practical use and what recommendations can you give?

**Francisco Martínez:** In Santiago, we closed with a large final conference attended by a large number of local stakeholders and decision-makers. The results of the project were presented and discussed here. In this case, the entities best able to benefit from these results are government and municipal authorities and institutions. We also used the presentation to draw attention to the measures we consider necessary and to motivate the decision-makers to define specific objectives for the future of each sector. Our proposals ranged from a congestion-charging scheme to setting rigorous emission standards for vehicles, giving priority to the construction of separate bus lanes and installation of information technologies in public transport, and the expansion of infrastructure for non-motorised means of transport. The last of these was directed at the increasing importance of bicycle traffic in Santiago.

**Question:** One other outcome of this project is a permanent collaboration with researchers at DLR. What form does this take?

**Francisco Martínez:** While the project was still running, we decided to continue our cooperation beyond the end of the project. To do so, we signed a joint agreement on the further development of traffic demand models. In other words, models that help to evaluate future transport developments and the resulting requirements. Four doctoral students – two in Germany and two in Chile – will be working alongside our researchers.

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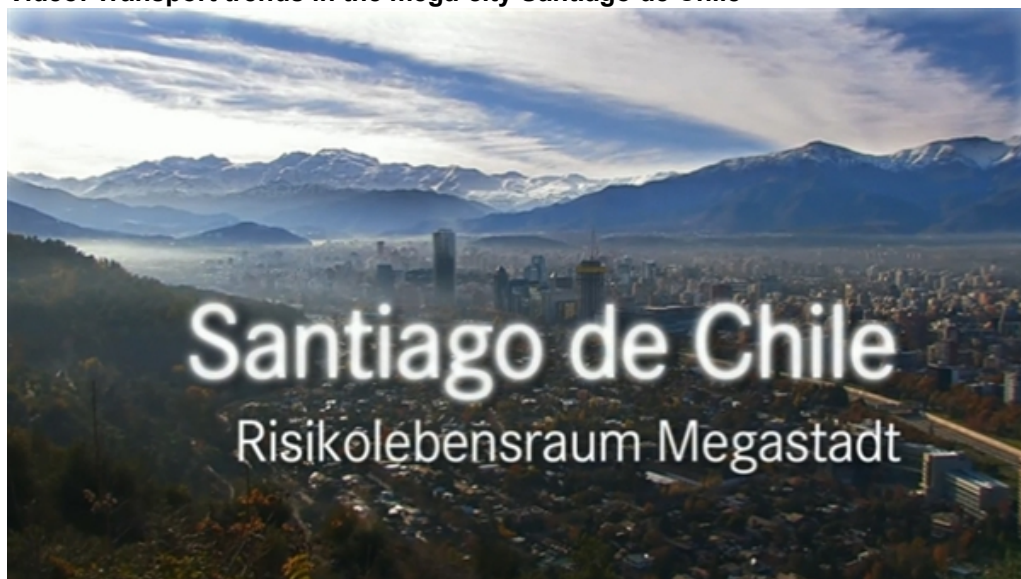
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## Video: Transport trends in the mega-city Santiago de Chile



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Credit: UFZ / Sebastian Höing.

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