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TOMTOM 2015 TRAFFIC INDEX: INDEPENDENT ANALYSIS REPORT

Overview of the TomTom Traffic Index

The TomTom Traffic Index Report is proving itself to be an invaluable tool to both decision-makers and practitioners alike, providing a snapshot of worldwide traffic conditions and putting information about congestion within easy reach. The Traffic Indices are calculated annually, allowing cities to track the yearly progression of travel conditions by observing the periodic change in congestion for an average day and in the morning and afternoon peak periods.

Traffic Indices are determined through comparison of congested travel time to free flow conditions particular to each city. Because the indices are calculated individually for cities, they take into account local conditions that could influence congestion, such as road class and layout, density of the population and travel distances. Additionally, since the TomTom Traffic Index is calculated as a ratio of local conditions per city, the individualised city congestion information is rendered comparable to other cities, thereby providing the opportunity to compare congestion levels between cities. The TomTom Traffic Indices essentially introduce a barometer of congestion conditions on a global scale.

Congestion in developing countries

Whilst congestion is a global challenge, it is apparent from the 2015 results that nine of the ten most congested cities are in developing countries. The table below summarises the congestion levels in the top ten congested large cities, according to the daily TomTom congestion level (note that where cities have a common daily congestion level, the order is denoted according to the highest peak Traffic Index values).

The Stellenbosch Smart Mobility Laboratory (SSML) researches mobility solutions within the developing country context and the TomTom dataset will become a valuable means of assessing transportation mobility in these countries, particularly as the Traffic Index database is extended to more developing countries. In the previous two years, TomTom has extended their Traffic Index report to include a number of developing countries, including China, Brazil, Turkey and Thailand. Representation of developing countries in the TomTom Traffic Index Report is important to provide a truly global representation of congestion. For example, Bangkok, which was the second most congested city in 2015, was not included in 2014 Traffic Index reports. TomTom is moving towards a more inclusive view of global traffic.

Table 1: Congestion Levels in the Top 10 Congested Cities

City	Country	Congestion Level	Morning Peak	Evening Peak
Mexico City	Mexico*	59	97	94
Bangkok	Thailand*	57	85	114
Istanbul	Turkey*	50	62	94
Rio de Janeiro	Brazil*	47	66	79
Moscow	Russia*	44	71	91
Bucharest	Romania*	43	83	87
Recife	Brazil*	43	72	75
Salvador	Brazil*	43	67	74
Chengdu	China*	41	73	81
Los Angeles	United States	41	60	81

* Classified as developing countries by the World Bank, 2014

The usefulness of the data can also be demonstrated when comparisons are done on a local or regional basis. In South Africa, for example, small cities have shown an increased rate of growth in congestion of nearly 7% per annum over the seven years that TomTom has been reporting on congestion in South Africa. This is far higher than the rate observed in larger cities in South Africa and worldwide (typically found to be between 1.5% and 3% per annum). This could reflect the rate of urbanisation in developing countries, particularly in smaller cities which are often closer to rural areas, and also highlights the urgent need for infrastructure and traffic management projects in these countries.

Observation of the impact of congestion interventions

The annual progression of the TomTom Traffic Index data clearly reflects the impact of intervention projects on congestion. Such a project is the recent major Freeway Improvement Programme implemented within the metropolitan areas of Johannesburg and Pretoria in South Africa. This project included upgrading of freeway infrastructure to increase physical capacity. A significant reduction in the Traffic Index is observed following the roll out of the freeway improvements between 2010 and 2012, as presented in the figure below for Johannesburg.

Between 2009 and 2012, there was an average annual decrease in the TomTom Traffic Index of 4.46% per year for the daily average index, and a 5.15% reduction per year in the afternoon peak period. The morning peak period also indicated a reduction in the Traffic Index over the four years but was less affected, perhaps because of latent demand for travel during this time period which filled the increased capacity as it was provided. Figure 1 also indicates that the morning peak hour has consistently higher congestion levels than the afternoon peak hour. A slow but steady increase of the Traffic Indices since 2012 of 1.94% per annum for the daily index and 2.37% in the afternoon peak, supports the adage that you cannot build your way out of congestion. As we watch congestion rates increase globally, as demonstrated by the TomTom Traffic Index on an annual basis, the need for sustained congestion mitigation through management of travel demand becomes clear.

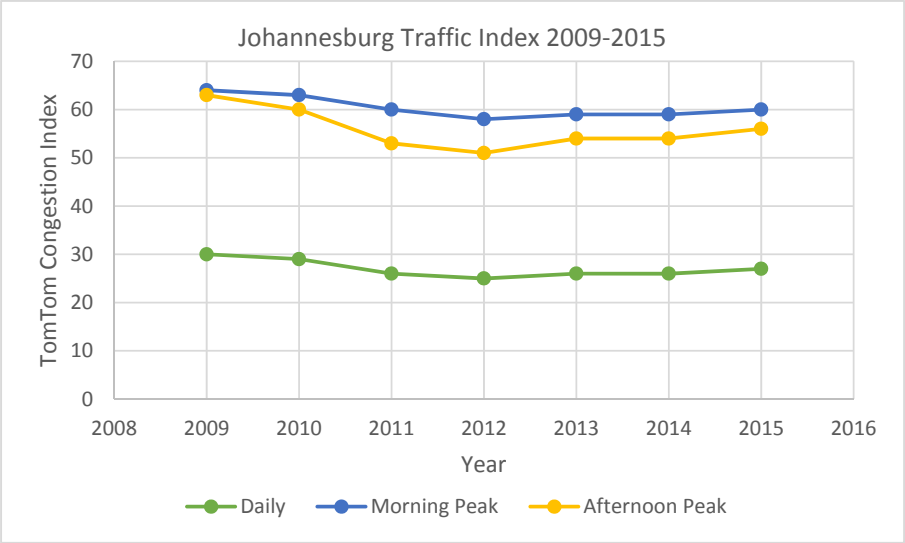


Figure 1: Traffic Index progression in Johannesburg, South Africa

Traffic Index sensitivity towards local conditions

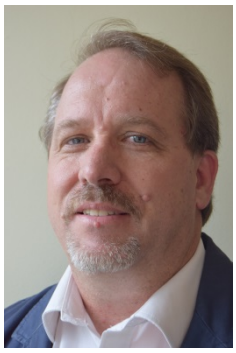
The indices emphasise the imbalance between congestion in the morning and evening peak periods in a number of cities. Countries in particularly the USA, Asia, and Scandinavian countries (Norway, Sweden and Finland), indicate the evening peak to be more congested, while in Australia, South Africa and Mexico, the morning peak is more pronounced (as evidenced in Figure 1 above). Various European countries portray a more even balance between the morning and evening peaks, suggesting a closer to optimum utilisation of infrastructure. This demonstrates that the data is sensitive to the peculiarities of each city and country.

The reason that some countries exhibit higher congestion during either the afternoon or morning peak hour is surely related to cultural aspects of the countries, and the behaviour patterns of the working force. In South Africa, it is known that there is a very condensed morning peak period, with high traffic volumes experienced over a relatively short period. During the afternoon peak traffic time, there are lower hourly traffic volumes, but the peak is spread over a longer time period. This is confirmed by the TomTom Traffic Index. Methods to reduce the morning peak, can be learnt from countries with an opposite peaking pattern.

Conclusion

Through publication of the TomTom Congestion Traffic Indices, not only is awareness raised regarding the extent of congestion worldwide, but it provides the impetus for the industry to challenge itself and measure improvement in the move towards providing more sustainable solutions in addressing congestion on a global scale.

Johann Andersen



Johann Andersen is an Industry Associate Professor in Intelligent Transportation Systems at Stellenbosch University, South Africa. He teaches ITS principles in both the graduate and undergraduate Civil engineering programmes and guides research activities in ITS.

Johann heads up the recently launched Stellenbosch Smart Mobility Laboratory (SSML), an industry-based initiative, creating a multidisciplinary research environment in the use of technology in transport applications. The vision of the SSML is to become a renowned Knowledge Centre for development of innovative and cost-effective solutions in ITS, not only in South Africa but also aimed at developing countries.

In his capacity as CEO of Techso, a specialist consultant company, he has gained extensive experience in ITS planning, design and implementation in the application areas of Freeway management systems as well as Advanced Public Transportation Systems. He is active in the local ITS industry and served as the first president of ITS South Africa.

Megan Bruwer

Megan Bruwer lectures transportation engineering at the Civil Engineering Department of Stellenbosch University. Megan has worked as a consultant, involved in public transport operations and traffic accommodation of developments. Her research interests include traffic flow theory and the application of ITS to measure and manage traffic flow. Megan coordinates projects at the Stellenbosch Smart Mobility Lab.