



JPI URBAN EUROPE

URBAN EUROPE



Smart Cities
Member States Initiative

D5.3: Articles submitted to scientific journals

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Summary

This document, as part of the deliverables from the TRANS-FORM Smart transfers through unravelling urban form and travel flow dynamics project, lists the scientific output from the project in terms of oral presentations, externally published papers, and the deliverables from the project.

1. Introduction

This document, as part of the deliverables from the TRANS-FORM Smart transfers through unravelling urban form and travel flow dynamics project, lists the scientific output from the project in terms of oral presentations, externally published papers, and the deliverables from the project.

1.1. Purpose and Approach

The purpose of this document is to summarize the scientific output from the project by listing the presentations and papers that have been published related to the TRANS-FORM project.

1.2. Report Outline

Chapter 3 lists TRANS-FORM related presentations made by each partner organization. Chapter 4 lists publications made that are related to the TRANS-FORM project. The publications are listed by partner, Publications where the TRANS-FORM project is not acknowledged are marked in the lists. Chapter 5 lists the deliverables that have been produced during the project. Some of the deliverables are available directly from the project web page (www.trans-form-project.org), and the other are available upon request by email to the corresponding author, listed on the project web page.

2. TRANS-FORM related presentations

This section contains lists of presentations related to the TRANS-FORM project. A list is given for each project partner. All types of presentation are included, from local presentations to international conference presentations.

2.1. TU Delft

Below is a list of presentations given by the researcher from the TU Delft project partner. For each presentation, the venue/conference name, presenter and presentation title and location is given.

- Yap, M.D. JPI Urban Europe Projects Meeting (14 April 2016). TRANS-FORM: Smart transfers through unravelling urban form and flow dynamics. Amsterdam, the Netherlands.
- 9th Triennial Symposium on Transportation Analysis (TRISTAN 2016), Cats, O. (13-17 June 2016). Measuring passenger travel time reliability using smart card data. Oranjestad, Aruba.
- Yap, M.D., Nijenstein, S. & Van Oort, N. 96th Annual Meeting of the Transportation Research Board (TRB 2017), Yap, M.D. (10 January 2017). Improving predictions of public transport usage during disturbances based on smart card data. Washington D.C., USA.
- Yap, M.D., Cats, O., Van Oort, N. & Hoogendoorn, S.P. 3rd International Workshop and Symposium Transitdata 2017 (22-24 May, 2017). A data-driven approach to infer spatial characteristics and service reliability of public transport hubs. Santiago, Chile.
- TU Delft Research Exhibition, 6-8 June, 2017.
- Yap, M.D., Cats, O., Yu, S. & Van Arem, B. International Conference Series on Competition and Ownership in Land Passenger Transport (Thredbo) (13-17 August, 2017). Crowding valuation in urban tram and bus transportation based on smart card data. Stockholm, Sweden.
- Yap, M.D., Cats, O., Van Oort, N. & Hoogendoorn, S.P. 20th EURO Working Group on Transportation Meeting, EWGT 2017 (4-6 September 2017). A robust transfer inference algorithm for public transport journeys during disruptions. Budapest, Hungary.

- Yap, M.D. & Cats, O. *Modelling World 2018* (6 June 2018). *Modelling passenger behaviour during public transport disruptions using a mesoscopic simulation model*. Birmingham, UK.
- Yap, M.D., Cats, O. & Van Arem, B. *16th Annual Transport Practitioners' Meeting* (5-6 July 2018). *Crowding valuation in urban public transport route choice using big data*. Oxford, UK.
- Yap, M.D., Luo, D. & Cats, O. *14th International Conference on Advanced Systems in Public Transport (CASPT 2018)* (23-25 July 2018). *Where shall we sync? Using passenger flows to determine key interchange connections*. Brisbane, Australia.
- Yap, M.D. & Van Oort, N. *14th International Conference on Advanced Systems in Public Transport (CASPT 2018)* (23-25 July 2018). *Driver schedule efficiency vs. public transport robustness: A framework to quantify this trade-off based on passive data*. Brisbane, Australia.
- Brands, T., Van Oort, N. & Yap, M.D. *14th International Conference on Advanced Systems in Public Transport (CASPT 2018)* (23-25 July 2018). *Automatic bottleneck detection using AVL data: a case study in Amsterdam*. Brisbane: Australia.
- Yap, M.D., Cats, O., Van Oort, N. & Hoogendoorn, S.P. *7th Symposium on the European Association for Research in Transportation (hEART 2018)* (5-7 September 2018). *Controlling the propagation of passenger disruption impacts in multi-level public transport networks*. Athens, Greece.
- Yap, M.D. & Cats, O. *Operations Research 2018 Conference* (11-14 September 2018). *Controlling the propagation of passenger disruption impacts in multi-level public transport networks*. Brussels: Belgium.
- Yap, M.D. *Transport Ticketing Global 2019* (29 January 2019). *Communcation is key; how to improve the passenger experience (panel session)*. London, United Kingdom.

Future expected presentations:

- Yap, M.D. & Cats, O. *6th International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS 2019)* (5-7 June 2019). *Analysis and Prediction of Disruptions in Metro Networks*. Krakow: Poland. Status: presentation confirmed.
- Yap, M.D. & Cats, O. *Transitdata 2019: 5th International Workshop and Symposium* (8-10 July 2019). *Predicting and clustering station vulnerability in urban networks*. Paris: France. Status: presentation confirmed.

2.2. BTH/LiU

Below is a list of presentations given by the researcher from the BTH/LiU project partner. For each presentation, the venue/conference name, presenter and presentation title and location are given.

- RailLille – the *7th International Conference on Railway Operations Modelling and Analysis*. Sai Prashanth Josyula (April 5th, 2017). *Passenger-oriented Railway Traffic Re-scheduling: A Review of Alternative Strategies utilizing Passenger Flow Data*. Lille, France.
- *Annual retreat for KAJT 2018*, Sai Prashanth Josyula (April 17th, 2018), “TRANS-FORM – Smart transfers through unraveling urban form and travel flow dynamics: Parallelizing an algorithmic approach” Borlänge, Sweden.

Future expected presentations:

- RailNorrköping – the *8th International Conference on Railway Operations Modelling and Analysis*. Sai Prashanth Josyula (June, 2019). *Exploring the Potential of GPU Computing in Train Rescheduling*, Norrköping, Sweden.
- IRSA2019 - *International Railway Symposium Aachen 2019*, Sai Prashanth Josyula (November 2019). “A parallel algorithm for multi-objective train rescheduling”, Aachen, Germany.

2.3. EPFL

Below is a list of presentations given by the researcher from the EPFL project partner. For each presentation, the venue/conference name, presenter and presentation title and location are given.

- 10th Triennial Symposium on Transportation Analysis (TRISTAN X) Molyneaux, N. (20 June 2019). *Improving pedestrian dynamic by preventing counter flow*. Hamilton Island, Australia.
- 19th Swiss Transport Research Conference (STRC), Molyneaux, N. (15-17 May 2019). *The impact on pedestrian walking times of counter flow*. Ascona, Switzerland.
- 7th Symposium of the European Association for Research in Transportation, Molyneaux, N. (5 September 2018). *Gating as a management strategy for controlling pedestrian flows*. National Technical University of Athens, Greece.
- International Conference on Operations Research, Molyneaux, N. (12-14 September 2018). *Reducing variability in passenger walking times with two management strategies inside transportations hubs*. Université libre de Bruxelles, Belgium.
- 7th International Symposium on Dynamic Traffic Assignment: Smart Transportation, Molyneaux, N. (6-8 June 2018). *Controlling pedestrian flows using a dynamic traffic management system*. The University of Hong Kong, Hong Kong.
- 18th Swiss Transport Research Conference (STRC), Jeanbart, C. (16-18 May 2018). *Multi-objective optimization of moving walkway networks in transportation hubs*. Ascona, Switzerland.
- 18th Swiss Transport Research Conference (STRC), Molyneaux, N. (16-18 May 2018). *Two management strategies for improving passenger transfer experience in train stations*. Ascona, Switzerland.
- Swiss Transport Research Conference (17-19 May 2017). *Nicholas Molyneaux, Riccardo Scarinci and Michel Bierlaire, Pedestrian management strategies for improving flow dynamics in transportation hubs*. Ascona, Switzerland

Future expected presentations:

- 8th Symposium of the European Association for Research in Transportation, Molyneaux, N. (September 2019). *The benefits of preventing pedestrian counterflow*. Budapest University of Technology and Economics, Hungary.

2.4. ETRA

Below is a list of presentations given by the researcher from the ETRA project partner. For each presentation, the venue/conference name, presenter and presentation title and location are given.

- Bellver Muñoz, P., Cats, O., Laumanns, M., Rydergren, C., Scarinci, R., & Törnquist Krasemann, J. (2018). *Unravelling travel flow dynamics: A multi-level analysis of public transport demand and passenger reliability*. Presented at the 7th Transport Research Arena TRA 2018, Vienna, 16-19 April 2018.

3. Published work

This section contains lists of published work within the TRANS-FORM project. Conference proceedings as well as journal papers, book chapters as well as “popular scientific publications” are included. For each publication an indication of if the publication is peer reviewed or not is given.

3.1. Joint publications

In this subsection, joint publications, which include authors from more than one of the project partners.

- Bellver Muñoz, P., Cats, O., Laumanns, M., Rydergren, C., Scarinci, R., & Törnquist Krasemann, J. (2018). *Unravelling travel flow dynamics: A multi-level analysis of public transport demand and passenger reliability*. Presented at the 7th Transport Research Arena TRA 2018, Vienna, 16-19 April 2018. <https://doi.org/10.5281/zenodo.1483377>

3.2. TU Delft

This subsection lists publication from the TU Delft project partner. The list includes published articles (journals papers, proceedings and book chapters), as well as future expected publication (listed separately). Please note: publications listed with • do not include any acknowledgements to TRANS-FORM.

- Yap, M.D., Luo, D., Cats, O., Van Oort, N. & Hoogendoorn, S.P. (2018). *Where shall we sync? Clustering passenger flows to identify urban public transport hubs and their key synchronization priorities*. *Transportation Research Part C*, 98, pp. 433-448.
- Yap, M.D. & Munizaga, M. (2018). *Workshop 8 report: Big data in the digital age and how it can benefit public transport users*. *Research in Transportation Economics*, 69, pp. 615-620.
- Yap, M.D., Cats, O. & Van Arem, B. (2018). *Crowding valuation in urban tram and bus transportation based on smart card data*. *Transportmetrica A*, pp. 1-20. DOI: 10.1080/23249935.2018.1537319.
- Yap, M.D., Cats, O., van Oort, N. and Hoogendoorn S.P. (2017). *A robust transfer inference algorithm for public transport journeys during disruptions*. *Transportation Research Procedia*, 27, pp. 1042-1049.
- Van Oort, N., Cats, O. and van Leeuwen, R. (2016). *Betrouwbare OV netwerken: Reizigersperspectief centraal dankzij anonieme chipkaartdata (in Dutch – Reliable public transport networks: Passengers perspective is put in the center thanks to anonymous smartcard data)*. *NM Magazine*, 37-39.
- Hanseler, F. S. and van den Heuvel, J. P. A. and Cats, O. and Daamen, W. and Hoogendoorn, S. P. (2017). *Estimation of passenger distributions on platforms and in trains from smart card data*, submitted to *Proceedings of Traffic and Granular Flow '17*.
- Yap, M.D., Van Oort, N., Van Nes, R. & Van Arem, B. (2018). *Identification and quantification of link vulnerability in multi-level public transport networks: a passenger perspective*. *Transportation*, 45, pp. 1161-1180.
- Yap, M.D., Nijenstein, S. & Van Oort, N. (2018). *Improving predictions of public transport usage during disturbances based on smart card data*. *Transport Policy*, 61, pp. 84-95.
- Lee, A., Yap, M.D. & Van Oort, N. (2017) (Dutch). *Overstappen en onbetrouwbaarheid in het OV: Een methode voor kwantificering van reizigerseffecten in een netwerkcontext*. *Tijdschrift Vervoerwetenschap*, 53(1), pp. 36-53.
- Van Oort, N., Brands, T., de Romph, E. & Yap, M.D. (2016). *Ridership Evaluation and Prediction in Public Transport by Processing Smart Card Data: A Dutch Approach and Example*. Chapter 11, *Public Transport Planning with Smart Card Data*, eds. Kurauchi F., Schmöcker, J.D., CRC Press.
- Yap, M.D. (2017). *Wachten op de cijfers van Menno (in Dutch)*. AD newspaper 23th August 2017.

Please note: publications listed with • do not mention TRANS-FORM in the acknowledgements.

Future expected publications:

- Yap, M.D., Cats, O., Van Oort, N. & Hoogendoorn, S.P. (2019). Controlling disruption propagation in multi-level public transport networks. To be submitted May 2019.
- Yap, M.D., Van Oort, N., Cats, O. & Hoogendoorn, S.P. (2019). Quantification of the trade-off between driver schedule complexity and public transport robustness. To be submitted June 2019.
- Yap, M.D. & Cats, O. (2019). Predicting and clustering disruption exposure and impact for urban public transport networks. To be submitted July 2019.

3.3. BTH/LiU

This subsection lists publication from the BTH/LiU project partner. The list includes published articles (journals papers, proceedings and book chapters), as well as future expected publication (listed separately). Please note: publications listed with • do not include any acknowledgements to TRANS-FORM.

- Josyula, S., & Törnquist Krasemann, J. (2017). Passenger-oriented Railway Traffic Re-scheduling: A Review of Alternative Strategies utilizing Passenger Flow Data”. Peer-reviewed conference paper in the proceedings from RailLille - the 7th International Conference on Railway Operations Modelling and Analysis, Lille, France, April 4-7th, 2017. [Fulltext](#)
- Josyula, S., Törnquist Krasemann, J., Lundberg, L., (2018). "A Parallel Algorithm for Train Rescheduling”, *Transportation Research Part C* 95, pp. 545-569.
- Lamorgese, L., Mannino, C., Pacciarelli, D., & Törnquist Krasemann, J., (2018), Train Dispatching, In (eds.) Borndörfer, R., Klug, T., Lamorgese, L., Mannino, C., Reuther, M., Schlechte, T., *Handbook of Optimization in the Railway Industry*, International Series in Operations Research & Management Science 268, Springer, https://doi.org/10.1007/978-3-319-72153-8_12.

Future expected publications:

- Sai Prashanth Josyula, “Parallel algorithms for real-time railway rescheduling”, Licentiate thesis, Blekinge Institute of Technology, 2019.
- Josyula, S., Törnquist Krasemann, J., Lundberg, L., (2019). “Exploring the Potential of GPU Computing in Train Rescheduling”, Peer-reviewed conference paper in the proceedings from RailNorrköping – the 8th International Conference on Railway Operations Modelling and Analysis. To be submitted for journal publication.
- Josyula, S., Törnquist Krasemann, J., Lundberg, L., (2019), “A parallel algorithm for multi-objective train rescheduling”, submitted to IRSA2019 (International Railway Symposium Aachen 2019) for peer-review.
- Törnquist Krasemann, J., Rydergren, C., “An integrated optimization approach for passenger-oriented public transport disturbance management”, to be submitted for peer-review.

3.4. EPFL

This subsection lists publication from the EPFL project partner. The list includes published articles (journals papers, proceedings and book chapters), as well as future expected publication (listed separately).

- Molyneaux, N., Scarinci, R., and Bierlaire M. (2019) *Improving pedestrian dynamic by preventing counter flow. Proceedings of the 10th Triennial Symposium on Transportation Analysis (TRISTAN X)*, 17-21 June 2019. Peer-reviewed.
- Molyneaux, N., Scarinci, R., and Bierlaire M. (2019). *The impact on pedestrian walking times of counter flow. Proceedings of the 19th Swiss Transport Research Conference (STRC)*, 15-17 May 2019, Ascona, Switzerland.
- Molyneaux, N., Scarinci, R., and Bierlaire M. (2018) *Controlling Pedestrian Flows Using a Dynamic Traffic Management System. Proceedings of the 7th International Symposium on Dynamic Traffic Assignment: Smart Transportation*, 6-8 June 2018. Peer-reviewed.

Future expected publications:

- Molyneaux, N., Scarinci, R., and Bierlaire M. Tentative title: *Design and analysis of control strategies for pedestrian flows. To be submitted to a peer-reviewed journal during summer 2019.*

4. Public TRANS-FORM deliverables

The TRANS-FORM project is structured as six work packages, where all work packages except Work Package 6: Project Management, have one or several deliverables connected to them. Some of the deliverables are available directly from the project web page (www.trans-form-project.org), and the other are available upon request by email to the corresponding author.

Work Package 1: Unravelling form and flow dynamics (Data analysis)

D1.1 Big travel demand data analytics support tool

Abstract available of project web page, document available by request to riccardo.scarinci@epfl.ch.

D1.2 Form and flow dynamics at interchange, urban and regional network layers

Abstract available of project web page, document available by request to yuki.oyama@epfl.ch

D1.3 Graphical analysis interface of travel demand flows

Available at project web page: http://www.trans-form-project.org/wp-content/uploads/D1.3_Final.pdf

Work Package 2: Measuring and modelling passenger interchange activities (Passenger flow modelling)

D2.1 Passenger-focused Indicators of Service Variability

Available at project web page: <http://www.trans-form-project.org/wp-content/uploads/2018/06/D2.1-final.pdf>

D2.2 Multi-layer Passenger Flow Network Model

Available at project web page: <http://www.trans-form-project.org/wp-content/uploads/2018/06/D2.2-final.pdf>

Work Package 3: Methods for planning and operating robust services (Smart transfer modelling)

D5.1: Articles submitted to scientific journals

D3.1 *A toolbox of real-time strategies for smart transfers*

Abstract available of project web page, document available by request to johanna.tornquist.krasemann@bth.se

D3.2 *Algorithms for short-term prediction of passenger flows*

Abstract available of project web page, document available by request to yuki.oyama@epfl.ch

D3.4 *Tool for evaluating real-time strategies*

Abstract available of project web page, document available by request to nikola.obrenovic@epfl.ch

Work Package 4: Application and demonstration of smart transfer strategies (Smart cities demonstration)

D4.1 *Impacts of Smart Transfer Schemes under Various Scenarios*

Abstract available of project web page, document available by request to oded.cats@tudelft.nl

Work Package 5: Stakeholder cooperation, dissemination and exploitation

D5.1 *Case Study Set-up Descriptions*

Available at project web page: <http://www.trans-form-project.org/wp-content/uploads/2018/06/D5.1-final.pdf>

D5.2 *Exploitation and commercialization*

Abstract available of project web page, document available by request to pbellver.etraid@grupoetra.com

D5.3 *Articles submitted to scientific journals. This document.*