RITE

MONTHLY NEWSLETTER

DEC 2021

Emerging On-Demand Mobility Services: On-demand Transit across the country

BY: MARYAM HASANPOUR

Providing transit services in low-demand and low-density areas has been one of the most controversial topics during the past decade in transportation studies. Because there are major issues associated with the existing fixed-route public transit (FRT) service, including very-low-frequency FRT's operation, limited operating hours, and insufficient coverage. On-demand transit has been proposed to overcome these concerns by replacing fixed-route with on-demand transit (ODT) services [1].

Along with all other developed countries, three cities in Canada are experimenting with On-demand transit and making on-demand transit a reality. Belleville is one of the first cities where ODT was applied in 2018. The city collaborated with a private sector partner to transform its late-night FRT service operated on route 11 (RT-11) into an ODT service [2]. The results of providing this type of transit are stunning so far; the number of registered riders for the service as well as the number of trips were significantly increased [3].

References:
1.Alsaleh, N., Farooq, B., Zhang, Y. and Farber, S., 2021. On-Demand Transit User Preference Analysis using Hybrid Choice Models. arXiv preprint arXiv:2102.08256.
2.Sanaullah, I., Alsaleh, N., Djavadian, S., Farooq, B. 2021. Spatio-temporal analysis of on-demand transit: A case study of Belleville, Canada. Transportation Research Part A: Policy and Practice 145, 284–301
3.The Bay Observer, FEBRUARY 27, 2021, accessed October 22, 2021
https://bayobserver.ca/2021/02/27/toronto-company-using-software-to-make-on-demand-transit-a-reality/

Students' Achievements & Accomplishments

BY: MOEEZ KAIF

Maryam Hasanpour

Ryerson University students have continued to excel at Transportation Engineering competitions and conferences. Our very own Maryam Hasanpour, a 2nd year Ph.D. student in Transportation Engineering, attended the Canadian Association of Road Safety Professionals (CARSP) Annual Conference held from August 22 to the 25th. The event was previously held across major cities in Canada, including Calgary, Victoria, and Toronto, however this year's conference was held virtually. The conference's theme was "Equitability: Road Safety for all through Vision Zero and Sustainable Safety". It highlighted the idea that everyone should feel safe on the road, regardless of the user, country, or economic status, and no loss of life is acceptable.

The CARSP Young Professionals' Committee held the annual scientific research paper competition and awarded the top submissions. Maryam placed 1st and won a $1,000 prize for her paper titled Assessment of Vision Zero Treatments Providing Equitability for Pedestrians – Leading Pedestrian Intervals Case Study. The article explores the concept of leading pedestrian intervals (LPI); opening pedestrian signals a couple of seconds before the parallel traffic signals. She examined the impact of implementing leading pedestrian intervals (LPI) on the vehicle level of service and pedestrian-vehicle conflicts. Congratulations to Maryam for her achievement and providing motivation for more students to participate in external Transportation Engineering competitions and conferences.

RITE Recent Events

TRANSPORTATION TALK

RITE hosted a "Transportation Talk" workshop on November 12th from 5-6:30pm with a panel of 3 alumnus, an industry leader and a faculty member. The guests provided useful insights on their path to the transportation industry and the resources they used to navigate the field. The students had the opportunity to ask questions and network with the panel.

The panel includes:

Dr. Bilal Farooq - Faculty Member

Julia Salvani - Senior Transportation Engineer (Industry)

Lama Alfaseeh - Transportation Planner at Stantec and PhD Alumni

Farah Samough - Traffic Designer at Consor Engineers and MSc Alumni

Raima Hussain - Project Coordinator at Hurontario LRT and BSc Alumni

RITE Monthly Seminar Series

BY: MOEEZ KAIF

The monthly RITE seminar for October was held on the 28th when the RITE team hosted Paul Pentikainen, a Senior Policy Planner at the Town of Innisfil. Paul is one of Ryerson alumni who completed his Master of Planning in Urban Development Degree in 2013. Paul presented the Town of Innisfil's modern and unique solution to an age-old problem: implementing transit services in small towns. The town was faced with a decision to develop a single bus route to satisfy the transit demands or take the road less traveled and provide an on-demand ridesharing transit service. Ultimately, in May of 2017 the Town of Innisfil launched a transit service in partnership with Uber to satisfy their public transit needs. This service gives locals access to discounted Uber trip fares, 2 free trips within the Innisfil boundaries, and 4 free trips to essential locations per month. The Innisfil Transit system has been an overall success with over 70% rider satisfaction rating and about 70% of trips occurring outside of the alternatively proposed bus route. One interesting takeaway was that due to its pay-as-you-use model, the recent pandemic and lockdowns did not impact Innisfil Transit in the same way that traditional public transit systems were. Public buses and trains were being used in extremely limited capacities but still required fixed operating costs regardless of rider numbers. On the other hand, the Innisfil Transit system never had to pay for any unused services since rides are initiated on an individual need basis.

During the Q&A session, participants asked great questions and were able to discuss different ideas with Paul. One participant asked about the challenges that Innisfil Transit is currently facing. Paul responded that currently there are more trips being requested than drivers available, resulting in longer than usual wait times. This is due to a decrease in drivers supply from the pandemic, but Paul says driver numbers are returning to normal and wait times are trending in the right direction. Another question asked about why the Town of Innisfil chose to partner with Uber over other rideshare services. Paul elaborated that there were not any other feasible rideshare service options available in the area in 2017 and that the customization of the Uber app to meet their specific needs was a particularly attractive feature. Paul was also asked about potential incentives to balance driver availability during high and low peak time. He explained that the driver and rider volumes usually balance themselves out, however there were incentives placed to encourage more drivers to make themselves available for early GO Train station trips. Overall, Paul's presentation about the Innisfil Transit system highlights the benefits of thinking differently and taking risks when brainstorming possible solutions to problems.

Recent Publications of Students

Seyed Mehdi Meshkani, a PhD candidate at the Laboratory of Innovations in Transportation (LiTrans), has recently published a research paper entitled "A generalized ride-matching approach for sustainable shared mobility" co-authored by **Dr. Bilal Farooq** in the journal of Sustainable Cities and Society. In this paper, Meshkai and Farooq proposed a novel graph-based many-to-one ride-matching algorithm for shared on-demand mobility services in dense-urban areas. The proposed algorithm performs one-to-one matching as a first step in which each request is assigned to one vehicle and then matches the assigned vehicles to increase the occupancy of the operated vehicles, reduce the total vehicle-kilometers travelled, and increase the efficiency of the service [1].

Seyed Mehdi Meshkani received his B.Sc. degree (2010) from the University of Sistan & Baluchestan, Iran, and M.Sc. degree (2013) in Roads and Transportation Engineering from Tarbiat Modares University, Iran. He is currently the PhD candidate at the Laboratory of Innovations in Transportation (LiTrans) at Ryerson university, Canada. His research mostly focuses on designing on-demand shared mobility systems. More precisely, He develops matching algorithms for large-scale application and assesses their impact on transportation network utilizing simulation and optimization methods.

Recent Publications of Students

Another PhD student at the Laboratory of Innovations in Transportation (LiTrans), **Nael Alsaleh,** has also recently published a research paper entitled "Interpretable data-driven demand modelling for on-demand transit services" co-authored by **Dr. Bilal Farooq** in Transportation Research Part A: Policy and Practice. Alsaleh and Farooq developed the first two steps of the 4-steps model, Trip Production and Distribution Models, for on-demand transit (ODT) services using machine learning algorithms. Moreover, they employed a post-hoc model analysis method to interpret the predictions and examine the importance of the explanatory variables. The results of this study provide useful policy recommendations to operators and municipalities for sustainable planning, design, and operation of new and ongoing ODT projects [2].

Nael Alsaleh is a Ph.D. candidate in Transportation Engineering at the Laboratory of Innovations in Transportation (LiTrans), Ryerson University, Canada. He is the President of Ryerson Institute of Transportation Engineers (RITE) for the 2021-2022 academic year. Nael completed his B.Sc. in Civil Engineering in 2015 and M.Sc. in Transportation Engineering in 2017, both from Jordan University of Science and Technology (JUST), Jordan. He started his Ph.D. in September 2019 under the supervision of Dr. Bilal Farooq, where his research focuses on travel demand modelling for Shared On-Demand Mobility Services.

References:

[1] Meshkani, S. M., & Farooq, B. (2022). A generalized ride-matching approach for sustainable shared mobility. Sustainable Cities and Society, 76, 103383.

[2] Alsaleh, N., & Farooq, B. (2021). Interpretable data-driven demand modelling for on-demand transit services. Transportation Research Part A: Policy and Practice, 154, 1-22.

Meet Our Team

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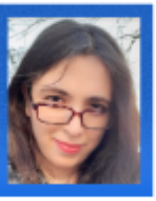

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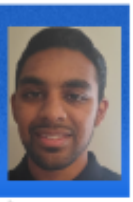

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