



Advancing Analytics

CEO Report Presentation

TTC Board Meeting: May 18, 2022

Five Year Corporate Plan (2018-2022)

Critical Path 5: Innovate for the Long Term

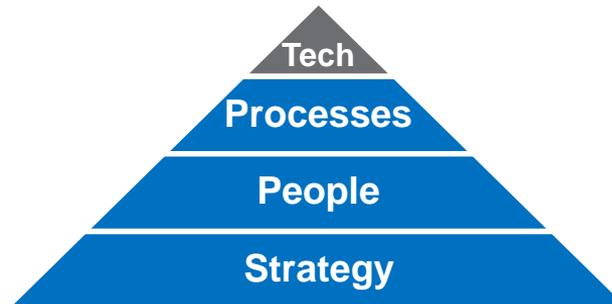
“The greater our ability to analyze, understand and act on that data, the more flexible and efficient we can be in meeting customer needs.”

Data Innovation: Beyond Technology

Data innovation: Moving Beyond Technology

TTC Core Systems

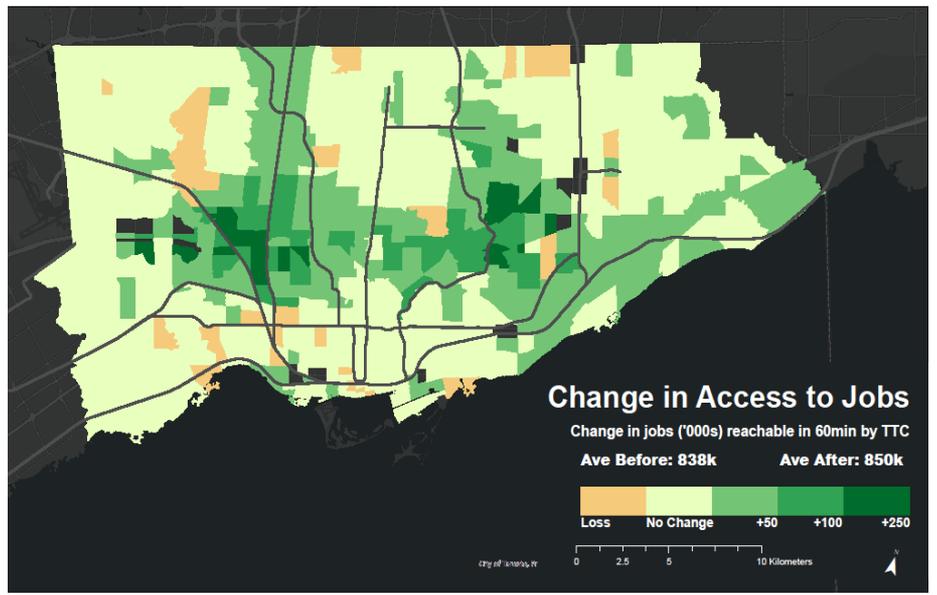
| | | | | | |
|--|--|--|---|---|--|
| VISION Bus and streetcar | Maximo Asset management | Trapeze Scheduling and crewing | PRESTO Customer use | SAP – HR Employee data, Payroll, Learning | SAP-Future Attendance, costing, procurement and assets |
| CSS Subway operations | SCS Crimes and ticketing | Giro/Init Wheel-Trans scheduling & | Automatic Passenger Counters | UDG Employee demographics | Brandwatch/ Google Analytics |
| Capital Projects Independent ecosystem - | Safety Connect Incidents and investigation | Esri/ArcGIS and Open GIS Geo-Spatial | Fare gates Customer station use | MS CRM CSCs and Wheel-Trans | Customer Research Panel & surveys |



Analytics Advancements: Developed an In-House “Access by Transit” Model

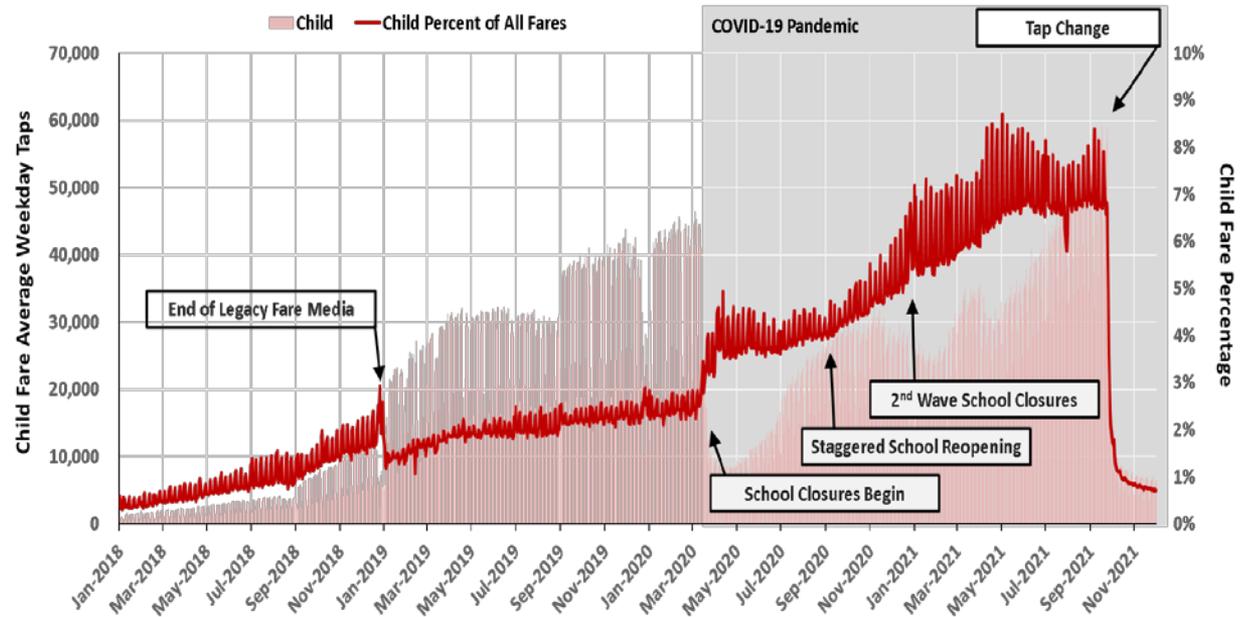
Based on the concept of “accessibility” – ease of reaching different kinds of opportunities by TTC in a set amount of travel time.

Answers the question “What can I get to by taking the TTC?” for every part of the City:



Analytics Advancements: Countering Misuse of the Child PRESTO Cards

- Mining PRESTO data, disproportional increase of Child Card use
- Child Card tap indicator changes introduced in September 2021
- Post-implementation monitoring to measure effectiveness of change



Analytics Advances: Innovative Demand Modelling to Prioritize Responsive Service

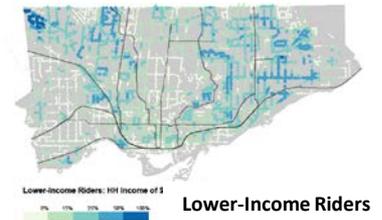
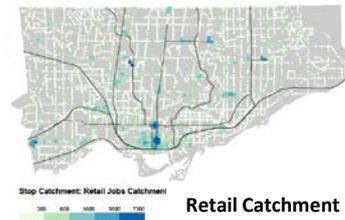
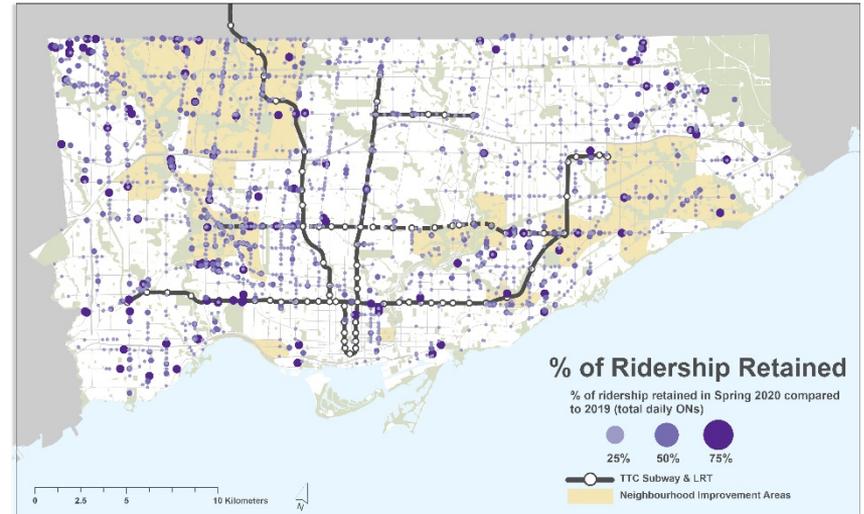
| Corridor / Time Period | % Trips > 50% Capacity | | | | | % Trips > 70% Capacity | | | | |
|-----------------------------|------------------------|------------|------------|------------|-----------|------------------------|-----------|------------|-----------|-----------|
| | AM | MD | PM | EE | LE | AM | MD | PM | EE | LE |
| Overall Average | 25% | 23% | 34% | 10% | 5% | 7% | 8% | 11% | 1% | 1% |
| 7 Bathurst | 24% | 17% | 39% | 9% | 0% | 10% | 6% | 15% | 0% | 0% |
| 32 Eglinton W | 33% | 21% | 43% | 8% | 1% | 15% | 7% | 15% | 0% | 0% |
| 34 Eglinton E | 19% | 33% | 36% | 8% | 4% | 3% | 7% | 12% | 0% | 0% |
| 36 Finch W | 16% | 11% | 28% | 6% | 9% | 4% | 4% | 8% | 1% | 0% |
| 102/902 Markham Rd | 42% | 27% | 33% | 12% | 7% | 19% | 10% | 10% | 2% | 2% |
| 116/905 Morningside | 28% | 24% | 32% | 14% | 8% | 11% | 11% | 8% | 0% | 2% |
| 24/924 Victoria Park | 25% | 37% | 40% | 8% | 2% | 5% | 13% | 13% | 0% | 0% |
| 25/925 Don Mills | 23% | 23% | 31% | 9% | 11% | 7% | 6% | 8% | 0% | 0% |
| 29/929 Dufferin | 16% | 22% | 43% | 5% | 4% | 5% | 5% | 18% | 0% | 0% |
| 35/935 Jane | 33% | 30% | 36% | 12% | 12% | 9% | 7% | 13% | 2% | 0% |
| 39/939 Finch E | 17% | 20% | 31% | 5% | 2% | 2% | 6% | 6% | 0% | 0% |
| 41/941 Keele | 18% | 16% | 27% | 5% | 0% | 3% | 5% | 4% | 0% | 0% |
| 52/952 Lawrence W | 48% | 48% | 46% | 16% | 14% | 18% | 20% | 20% | 6% | 5% |
| 53/953 Steeles E | 7% | 16% | 18% | 3% | 2% | 2% | 5% | 2% | 0% | 0% |
| 54/954 Lawrence E | 24% | 51% | 29% | 11% | 5% | 7% | 18% | 8% | 0% | 0% |
| 60/960 Steeles W | 24% | 8% | 37% | 7% | 9% | 6% | 2% | 13% | 0% | 0% |
| 84/984 Sheppard W | 38% | 18% | 46% | 15% | 4% | 10% | 5% | 17% | 3% | 0% |
| 85/985 Sheppard E | 13% | 15% | 13% | 5% | 1% | 2% | 4% | 1% | 0% | 0% |
| 95/995 York Mills | 23% | 23% | 27% | 13% | 4% | 6% | 7% | 9% | 0% | 0% |
| 96/165 Wilson / Weston Rd N | 36% | 34% | 52% | 26% | 7% | 11% | 12% | 25% | 4% | 2% |

- Forecasting Occupancy
- Merged Automatic Passenger Counters “APC”, PRESTO, Faregate, historical demand trends and soc-eco indicators
- Maximize bus service at critical locations and times of day
- Resources to Transit Control to deploy Demand Responsive Service



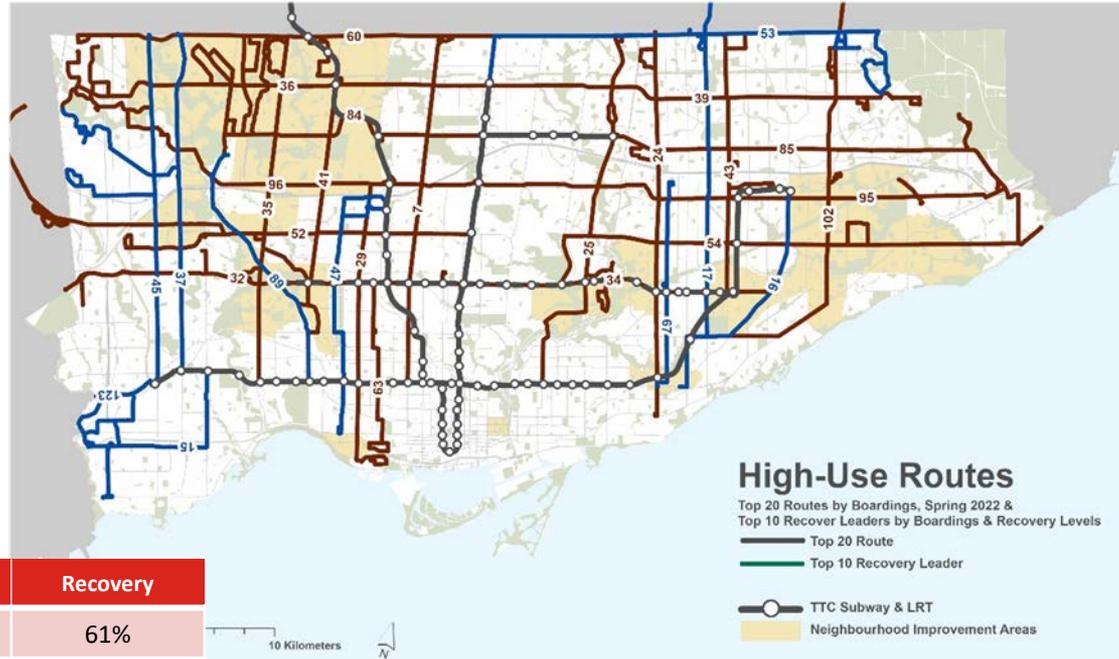
Analytics Advancements: Stop-Level Insights to Understand Equity Impacts

- Stop-level data using PRESTO fused with TTS-based demographic insights.
- Enables stop-by-stop recovery analysis at a finer scale.
- Demographic attributes allows for planning and equity analyses using variables like gender, income, and occupation.



Analytics Advances: Customer Recovery – Route-by-Route Insights

- Leverage VISION, APC, PRESTO, ArcGIS and Customer Research to understand COVID-19 travel
- Every bus route, time of day

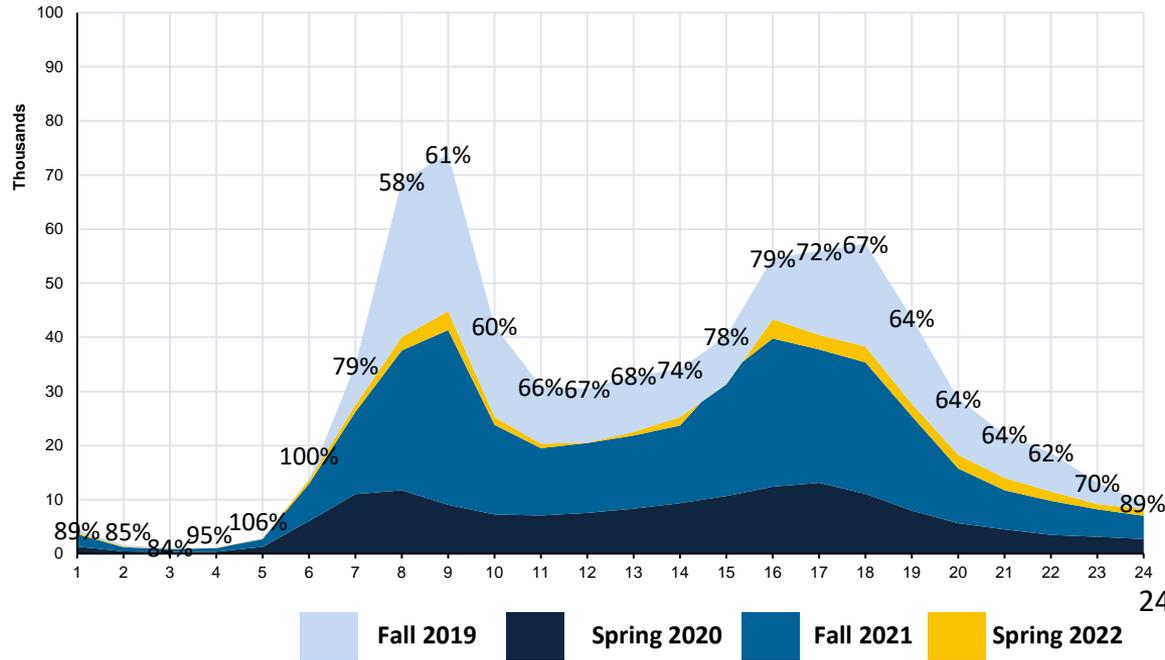


Average Weekday Boardings

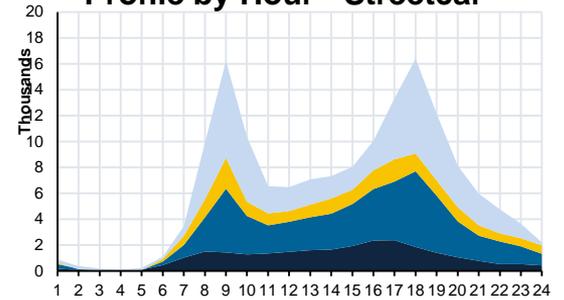
| Bus Route Recovery | Sum, Pre-Covid | Sum, April 2022 | Recovery |
|------------------------|----------------|-----------------|----------|
| Top 20 Route | 557,000 | 334,000 | 61% |
| Top 10 Recovery Leader | 109,000 | 72,000 | 69% |

Analytics Advances: Customer Recovery – Peak Hours

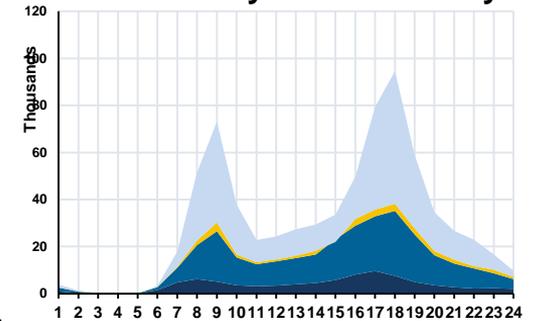
Profile by Hour - Bus



Profile by Hour - Streetcar



Profile by Hour - Subway



24-hours



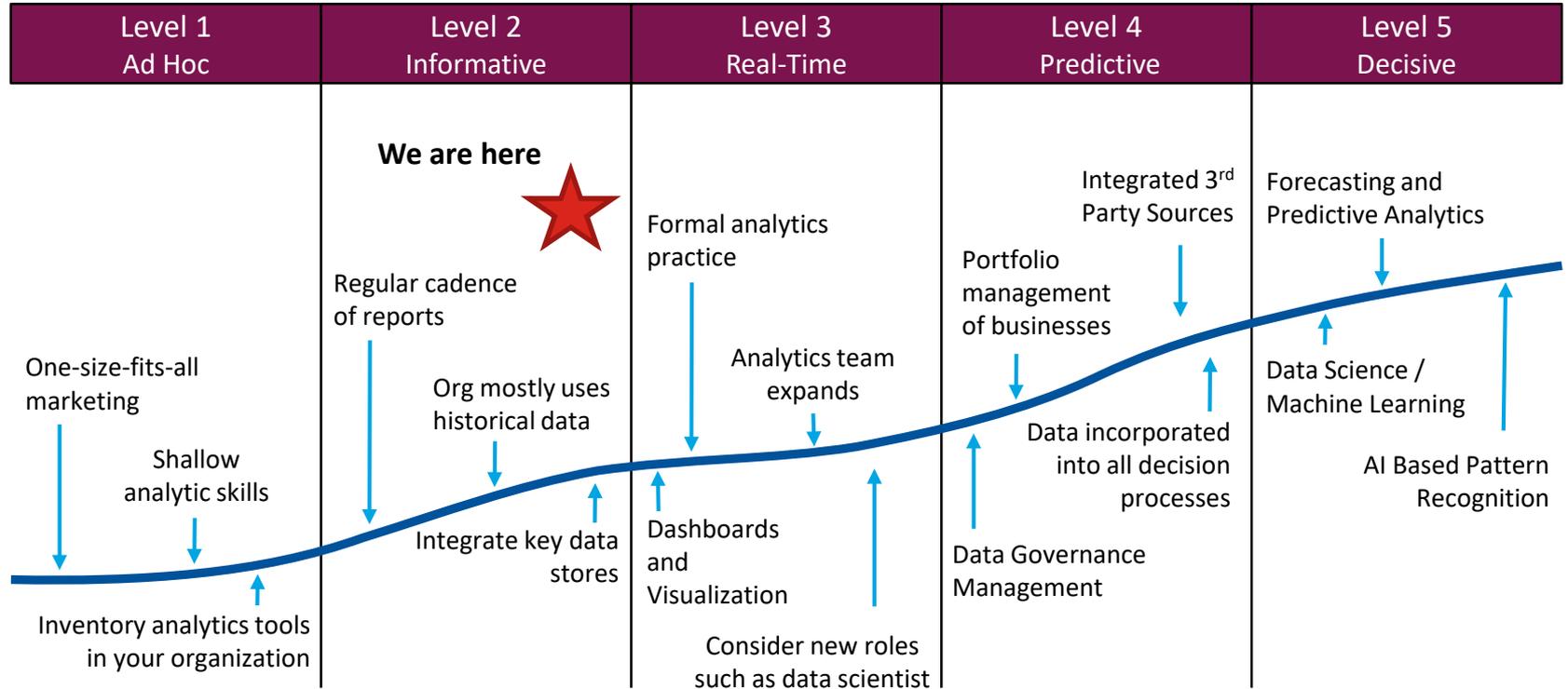
Analytics Advances: Wi-Fi – Safety & Innovation Demand Insights

- Station Overcrowding Alerts
- Passenger Travel Journey (Origin-Destination Matrix) – exploration
- Passenger Counting - exploration



**pre-pandemic photos*

Enterprise Business Intelligence and Data Maturity Model



Data & Analytics Centre of Excellence

Data Innovation: A new model for data analytics at the TTC

The Hub:

- Drive corporate data and analytics
- Cross-functional analytics
- Specialized skills
- Enablement
- Governance, privacy
- Data innovation

The Spokes (Business Units):

- Analytics embedded with subject matter expertise
- Data Stewards
- Cross-Functional Analytics Team

