

Transportation Committee

For the Metropolitan Council meeting of January 22, 2020

Subject: Real-Time Prediction Engine, Contract 18P322

Proposed Action

That the Metropolitan Council authorizes the Regional Administrator to negotiate Contract 18P322 with Cambridge Systematics, Inc. to provide real-time departure prediction software implementation, support, hosting and maintenance services in an amount not to exceed \$972,000.

Summary of Committee Discussion/Questions

Sterner asked how holiday schedules were reflected. Metro Transit publishes an updated schedule every week, which includes adjustments for holidays. Real-time information acts on this weekly schedule. Sterner asked if this was for Google only or if other applications can use the prediction data. Google is the most popular tool, but the data format is an industry-wide standard. In addition to Google, the prediction information will be available in other external apps (Apple Maps, Transit App, etc.) and in customer information tools Metro Transit manages (signs, trip planner, app, etc.). Chamblis encouraged Metro Transit to share news of this improvement with customers. Chamblis and Barber expressed appreciation for this service improvement.

Motion by Sterner, seconded by Cummings. Motion carried.

Transportation Committee

Meeting date: January 13, 2020

For the Metropolitan Council meeting of January 22, 2020

Subject: Real-Time Prediction Engine, Contract 18P322

District(s), Member(s): All

Policy/Legal Reference: 3-3 Expenditure Policy, Procurement of Goods and Services Greater than \$500,000

Staff Prepared/Presented: Wes Kooistra, General Manager, 612-349-7510
Bruce Howard, Director, Marketing and Transit Information, 612-349-7694
Laura Matson, Program Manager, Real-Time Customer Information, 612-349-7771

Division/Department: Metro Transit / Transit Information

Proposed Action

That the Metropolitan Council authorizes the Regional Administrator to negotiate Contract 18P322 with Cambridge Systematics, Inc. to provide real-time departure prediction software implementation, support, hosting and maintenance services in an amount not to exceed \$972,000.

Background

In 2008, Metro Transit began providing customers real-time departure predictions through the NexTrip system. In 2018, there were 80 million unique NexTrip requests via metrotransit.org, the Metro Transit app, the automated phone system, and SMS/text message. Additionally, NexTrip times are provided at over 200 real-time signs and push-button annunciators at stations and high-profile bus stops.

These customer information tools all use the same NexTrip prediction data. The current NexTrip prediction system is basic; it does not account for many factors that affect actual departure times and fails to provide predictions under various circumstances. Furthermore, current NexTrip predictions tend to perform worse when buses are delayed, which is when customers depend on this information the most.

High quality real-time information is a critical customer information need and expectation. Prediction accuracy and availability have been a persistent and significant source of customer complaints. In response to customer feedback, Metro Transit has pursued many strategies to improve prediction accuracy. A prediction engine software system that will use more inputs and deliver smarter predictions was identified as an essential strategy for improving prediction accuracy.

Rationale

The procurement process for this project was completed in two phases. The first, a formally advertised Request for Proposals issued January 7, 2019 with a Pre-Proposal meeting held on January 16, 2019, and proposals received on February 22, 2019. The Notice of Award for Phase 1 was issued to two vendors on April 18, 2019.

Phase 1 ran from July 1 to October 31, 2019. During this time, the two selected vendors set up and configured software to: (1) generate real-time departure predictions for all bus routes, trips, and stops; and (2) report on prediction accuracy and system performance. Additionally, the selected vendors advised Metro Transit staff on additional opportunities to improve prediction accuracy and data quality. During the fourth and final month of

Phase 1, Metro Transit evaluated the two vendors' predictions alongside the current system used to generate NexTrip real-time information and assessed accuracy performance. Results showed both vendors performed significantly higher in prediction accuracy than the current NexTrip system. After the completion of Phase 1, the two vendors submitted proposals for Phase 2, the long-term implementation, support and maintenance of the software and final accuracy reports.

The evaluation panel considered: the accuracy performance during Phase 1; the roadmap for ongoing improvements to prediction accuracy; system performance and availability during Phase 1; the ability to meet the technical requirements; and the Phase 2 proposals including cost, references, and ongoing support. The evaluation panel determined that Cambridge Systematics was the most advantageous solution for the Council.

Cambridge Systematics, Inc. will configure, implement, support, and maintain a prediction engine that will improve the accuracy, reliability, and availability of departure predictions for all bus service and Northstar.

Thrive Lens Analysis

The action advances the Thrive outcomes of Stewardship, Prosperity, Equity, Livability, and Sustainability. Improving the accuracy, accessibility, and availability of real-time information for transit riders addresses a key customer pain point and improves the reliability and attractiveness of transit.

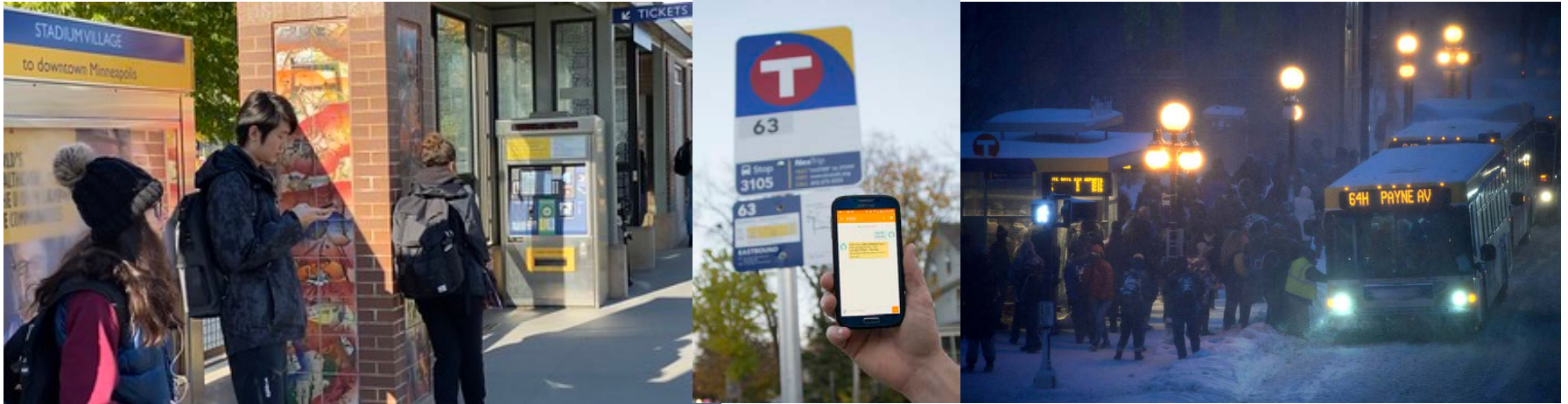
Funding

Funding for this contract is included in the Transit Information operating budget.

Known Support / Opposition

Improving prediction accuracy is a High Priority Initiative for Metro Transit and has widespread support. There is no known opposition.

Real-Time Customer Information Improvements: Business Items 2020-12 & 2020-9



Bruce Howard, Director, Marketing and Transit Information

Ben Rajkowski, Assistant Manager, Transit Information

Laura Matson, Program Manager, Real-Time Customer Information

Bre Grand, Project Manager, Transit Information

Customer Information Vision

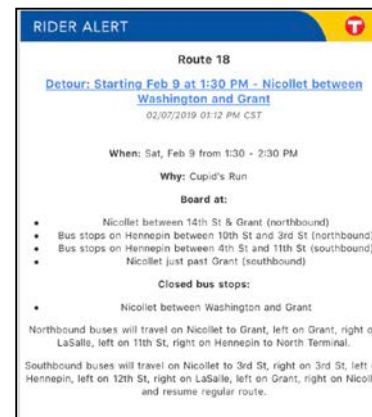
It is easy for diverse customers to understand where and when transit service operates because Metro Transit provides information that is **accurate, customer-friendly, accessible, robust, and professional.**



Today: Focus on meeting customers' expectations by improving real-time information

Customers Depend on Real-Time Information

- NexTrip
 - 80 million unique, trackable requests per year
 - Plus, over 200 real-time signs and annunciators, other apps and tools
- Rider Alerts
 - Over 34,000 subscribers
 - Over 21,000 unique alerts sent out in 2019



Real-time Information Challenges

- Major sources of customer complaints about information
 - Missing detour/disruption information
 - Inaccurate and incomplete NexTrip predictions
- Second lowest rated item in 2018 customer survey:
“I can find the information I need about detours”
- Alerts and real-time info are not available in most popular customer information tool: Google Maps

Business Items

- **2020-12**
 - **Real-Time Prediction Engine:** Improve the accuracy, reliability, and availability of NexTrip predictions for bus service and Northstar

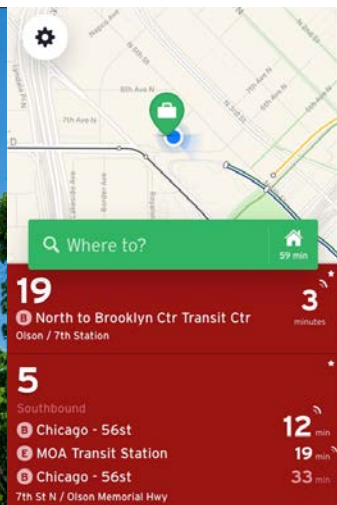
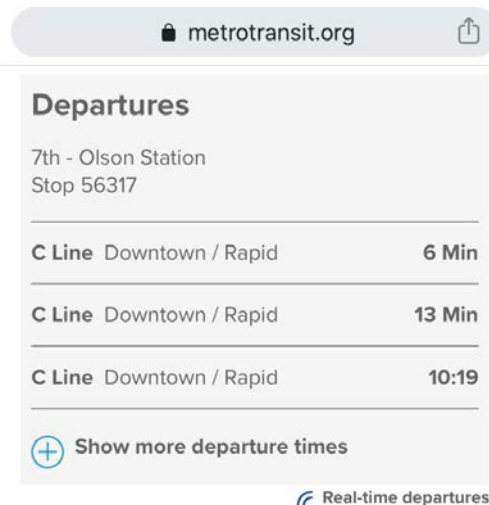
- **2020-9**
 - **Alerts Manager:** Streamline process for creating alerts; allow customers to receive more relevant, customized alerts; publish alerts in industry standard format
 - **Real-Time Concentrator:** Reconcile service alerts and real-time predictions so information is accurate and complete



2020-12: Real-time Prediction Engine

NexTrip Background

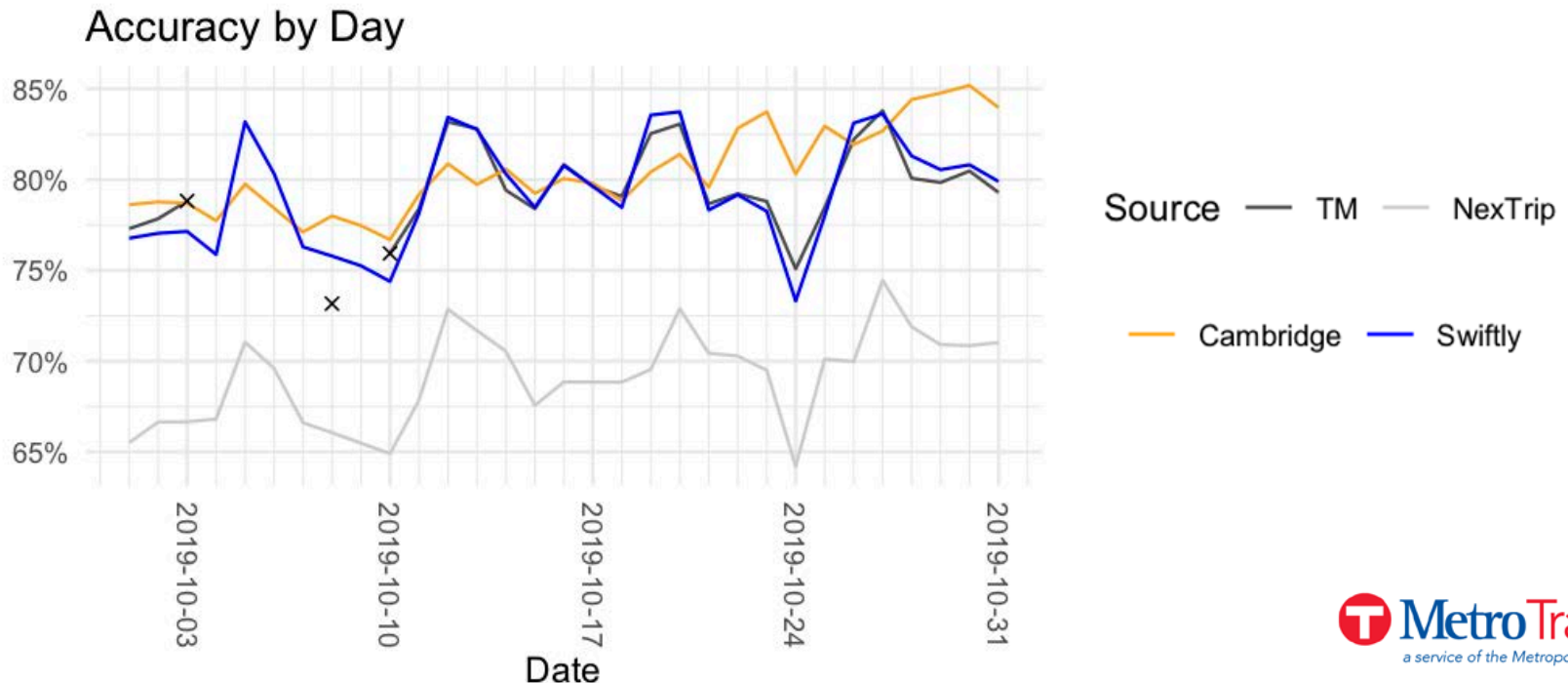
- 2008: Metro Transit on leading edge
- Customer expectations and technology have changed
- Prediction accuracy ~65-75% “acceptable” – deteriorates when there are delays, when customers need it most
- Not in industry standard format, not available in Google



2020-12: Real-time Prediction Engine

Approach

- Pilot two prediction engines
- Evaluate predictions alongside current system
- Identify best source for accurate predictions



2020-12: Real-time Prediction Engine

Benefits

- Improved prediction accuracy
- More robust system – eliminates and mitigates conditions that lead to bad predictions currently
- Includes maintenance and support for critical tool
- Industry standard, Google-ready data feed – information available in most popular customer tool
- Foundational to roadmap for ongoing improvements

Cost: Not to exceed \$972,000 for 4 years

Request: Authorize the Regional Administrator to negotiate and execute a contract with Cambridge Systematics

Business Item #2020-9

Alerts Manager & Real-Time Concentrator

Rider Alerts Program Background

- Based on customer feedback, Metro Transit launched initiative in 2014
 - Originally supported planned detours & disruptions during business hours only
- Leveraged existing email and text contract and internally built tools
- Program expansion
 - 2017: Communications Specialist position established in Transit Control Center
 - Added ability to send out alerts for cancelled trips
 - 2019: More staff, expanded coverage for sending out alerts (longer weekday and added weekend hours)

Current Gaps

- Manual processes to update alerts through multiple channels
- Alerts not reflected in NexTrip
- Alerts not reflected in Google and other third-party apps
- Trip planning tools do not reflect real-time trip cancellations
- Alerts sent at route level

Metro Transit @MetroTransitMN

Due to icy and hazardous conditions, we are suspending bus service at this time. We continue to monitor those conditions and will resume as soon as possible. Rail service continues to operate.

5:34 AM - 28 Dec 2019

267 Retweets 315 Likes

Ze Thao @zeliketheletter · 8h
Replying to @MetroTransitMN
Is there a way to display this on BRT stations so we're not all refreshing next trip thinking our bus is coming in "10 min"??

Route 6 Southbound Route 6D from 27th Ave. SE/University at 3:48 p.m. will not operate today Stops not being served include:... <https://lnks.gd/2/BJx8nD>

Route 6 Southbound Route 6B from 27th Ave. SE/University at 4:19 p.m. will not operate today Stops not being served include:... <https://lnks.gd/2/BJx9bq>

Route 6 Northbound Route 6 from Southdale at 5:14 p.m. will not operate today Stops not being served include:... <https://lnks.gd/2/BJxNVh>

RIDER ALERT

Route 6

Southbound Route 6B from 27th Ave. SE/University at 4:19 p.m. will not operate today

12/28/2019 03:47 PM CST

We found 2 trips for you

Trips shown are based on your selections and closest departure to 4:15 PM, Sat, Dec 28.

4:19 PM - 5:19 PM 6B > >

4:19 PM **Route 6B** France Av /Southdale / Via Woodale

Depart from 27th Ave SE & University Ave / 4th St Stop #56171 at 4:19 PM

Arrive at France Ave S & 53rd St W Stop #1144 at 5:19 PM

2020-9: Alerts Manager & Real-Time Concentrator

Alerts Manager Benefits

- Streamlines process for creating and distributing alerts
- Allow customers to choose more relevant alert options
- Alerts available in industry standard format (Google Maps and other tools)

Real-Time Concentrator Benefits

- Reconciles data from Alerts Manager and NexTrip, so customer information is accurate and complete

Cost: Not to exceed \$800,000 for 3 years

Request: Authorize the Regional Administrator to negotiate and execute a contract with IBI Group