

ETSAB: Transit Communications

A Scan of Three Cities

Recommendation

That Administration provide a report to Committee on options to implement the communications improvements as outlined in the June 11, 2019, Edmonton Transit System Advisory Board report CR_7039.

Executive Summary

ETSAB has undertaken a scan of transit agency-to-passenger communications practices in cities of similar size to Edmonton, namely Frankfurt, Germany; Calgary, AB; and Austin TX, USA. It was our intention to examine communications practices in more cities, but we found the information to be difficult to find online, and much of our correspondence to transit agencies was not answered. In addition to the above, the subcommittee used anecdotal information from ETSAB members and acquaintances based on their own experiences when travelling.

Report

The subcommittee specifically investigated policies and operations regarding:

- **Communication of train departure times.** Are departure times indicated at locations other than just the platforms themselves, such as at overground entrances for underground stops, or landing & concourse levels? Are announcements given in both audible and visual formats, and as such accessible to a broad range of passengers?
- **Use of Advertising Space.** What is common practice regarding advertisements on screens and boards as compared to system-relevant information, such as real-time information and closures/detours/incidents?
- **Integration of Real-Time Information.** What is common practice regarding real-time departure boards at transit centres and bus stops? How is the information communicated?
- **Transfer Announcements on buses.** What is common practice regarding transfer announcements, such as for train lines or between different modes? Do announcements include landmarks/points of interest, like big arenas or popular museums?
- What is communication like regarding **where to purchase passes?** Currently, physical ETS sales outlets information is spread out over several PDF files, divided by quadrant, listing addresses.

- **Navigation within the LRT System.** How do other transit agencies facilitate travel on train/LRT/subway lines? E.g. via LED indicators on trains indicating where you are on the line, and where to transfer to other lines?
- **Emergency Communications.** What is common practice in communicating emergency messages?
- **Two-Way Passenger Communications.** Do other cities offer two-way communication between passengers and the transit agency? In what medium (phone, twitter, facebook)? What is it used for (trip inquiries, system issues,etc)?

The subcommittee came up with the following recommendations to improve communications:

- The addition of **more automatically generated transfer announcements** on buses and LRT trains (e.g. for transfers from Capital to Metro Line & vice versa), including those that include popular landmarks or tourist destinations (Rogers Place, City Hall,etc).
- Adding **colourful symbolic or iconic imagery to @takeetsalert tweets** that visualize the nature of tweets (such as a yellow train or bus for delays, for example), or that give additional information (such as a map visualizing a detour).
- Adding **map imagery to route detours on the ETS website**, in addition to the current text-only detour descriptions.
- Investigating **e-paper/e-ink technology**, and the possible installation of real-time boards using this technology, at busy bus stops and/or transit centres.
- Investigating a **silent customer contact/alarm option**, such as via text message, or two-way communication on twitter.
- Investigating whether select advertising screens/boards could be used to **display system-relevant messages interspersed with advertisements** in the case of an emergency or service disruption.
- As a further option for passengers who may not have access to a mobile phone or that may be visually challenged, ETSAB recommends **highlighting existing Information buttons** at LRT stations and transit centres that connect to 311, or a dedicated transit contact person, for trip planning and real-time information purposes.

Attachment

1. Report: Transit Communications: A Scan of Three Cities

ETSAB REPORT

TRANSIT COMMUNICATIONS: A SCAN OF THREE CITIES

Frankfurt, Germany	3
Communication of Train Departure Times	3
Use of Advertising Space	5
Real-Time Information at Bus Stops	5
Transfer Announcements	6
Where to Purchase Passes	7
Navigation within the Train System	8
Emergency Communications	9
Two-Way Passenger Communications	10
Austin, TX	10
Use of Advertising Space	10
Real-Time Information & Transfer Announcements	11
Navigation within the Train System	11
Where to Purchase Passes	11
Emergency Communications	12
Two-Way Passenger Communications	12
Calgary, AB	12
Communication of Train Departure Times	12
Use of Advertising Space	13
Real-Time Information at Bus Stops	14
Transfer Announcements	14
Navigation within the Train System	15
Where to Purchase Passes	15
Emergency Communications	16
Two-Way Passenger Communications	17
Addendum: Modern Bus Stop Signage - QR Codes & E-Paper	19
Tabular Overview of Communications Features in Cities Scanned	21
Recommendations	22
Acknowledgements	22

ETSAB has undertaken a scan of **transit agency-to-passenger communications practices in cities of similar size to Edmonton**, namely Frankfurt, Germany; Calgary, AB; and Austin TX, USA. It was our intention to examine communications practices in more cities, but we found the information to be difficult to find online, and much of our correspondence to transit agencies was not answered. In addition to the above, the subcommittee used anecdotal information from ETSAB members and acquaintances based on their own experiences when travelling.

The subcommittee specifically investigated policies and operations regarding:

- **Communication of train departure times.** Are departure times indicated at locations other than just the platforms themselves, such as at overground entrances for underground stops, or landing & concourse levels? Are announcements given in both audible and visual formats, and as such accessible to a broad range of passengers?
- **Use of Advertising Space.** What is common practice regarding advertisements on screens and boards as compared to system-relevant information, such as real-time information and closures/detours/incidents?
- **Integration of Real-Time Information.** What is common practice regarding real-time departure boards at transit centres and bus stops? How is the information communicated?
- **Transfer Announcements on buses.** What is common practice regarding transfer announcements, such as for train lines or between different modes? Do announcements include landmarks/points of interest, like big arenas or popular museums?
- What is communication like regarding **where to purchase passes?** Currently, physical ETS sales outlets information [is spread out over several PDF files](#), divided by quadrant, listing addresses.
- **Navigation within the LRT System.** How do other transit agencies facilitate travel on train/LRT/subway lines? E.g. via LED indicators on trains indicating where you are on the line, and where to transfer to other lines?
- **Emergency Communications.** What is common practice in communicating emergency messages?

-
- **Two-Way Passenger Communications.** Do other cities offer two-way communication between passengers and the transit agency? In what medium (phone, twitter, facebook)? What is it used for (trip inquiries, system issues,etc)?

Results for the three cities will be reported below, with a tabular overview of findings at the end of the document.

Frankfurt, Germany

The *Rhein-Main Verkehrsverbund* (Rhine/Main Regional Transportation Association - RMV) is one of the largest transit authorities in Germany, offering **S-Bahn** (urban rapid rail commonly running underground in city cores, then transitioning to overground service in suburban areas), **U-Bahn** (urban rapid rail that runs mostly underground), tram, and regional commuter rail in an area of 14,000 sqm, home to a population of roughly 5 million. The service area includes the metropolitan areas of Frankfurt am Main (population roughly 700,000), Wiesbaden (276,000), Mainz (209,000), Darmstadt (155,000), and several other, smaller cities. Transit mode share is estimated to have [increased from 20% to 23% between 2003 and 2013](#). Roughly [754 million passenger trips](#) are completed on the RMV system annually, translating into around 2.5 million trips per day. The fare system is integrated across all services offered, and, as such, RMV tickets and passes are accepted on all public transit routes and services on offer. For this report, the focus will be on urban public transit service in Frankfurt proper, i.e. mainly S-Bahn and U-Bahn service, which is closest to Edmonton's LRT system, and bus service.

The RMV was contacted in preparation for this report; unfortunately, a response could not be received by the time this report was finalized.

Communication of Train Departure Times

Departure times are generally given in audible and visual formats (via digital overhead departure boards) right on the platform for S-Bahn and U-Bahn trains; for examples, see the three panels in Fig. 1. Displays and announcements include information on the line, terminus, and important stops for the next train, as well as where the train will stop within the station. For this purpose, each station has clearly marked "sections," identified through a capital letter; on the digital display, the outline of the train and its cars identified where in relation to each section the train will stop. This information can be useful for passengers if a train has fewer

cars than usual, as it makes it possible for them to wait in a section that they know will be served by the next train. This can avoid passengers having to rush and run on the platform, which makes travel less stressful and hazardous for passengers, especially when the platform is crowded or for passengers that have mobility concerns.

Train arrivals and departures are communicated via audio announcements; as are delays or service disruptions. In addition, each station offers static information boards with printed train departure schedules.



Fig. 1: Examples of overhead display boards at U-Bahn (top) and S-Bahn (middle & bottom) stations.

At larger, hub-style stations, such as Frankfurt Central, which serves long distance and high speed rail destinations at street level in addition to urban and suburban rail underground, electronic display screens are installed on the middle (concourse) level. They are often mounted at eye level beside escalators, or at other central points within the station, to inform passengers of train departure times. The concourse level, which is located between the street and platform levels, often has small shops and stalls, allowing passengers to shop while keeping an eye on train departure times.

Use of Advertising Space

In Frankfurt, advertising and system-relevant information are largely kept separate on different screens, with most system-relevant screens and signs sporting a blue or occasionally yellow background.¹ Some advertising screens can be overridden with train arrival messages, especially at hub-style stations, a few seconds before a train enters the station.

Real-Time Information at Bus Stops

All bus stops offer a static, printed departures schedule, grouped by day of the week (i.e. Monday to Friday, Saturday, and Sunday service). Digital, real-time departure boards, which display estimated arrival and departure times for upcoming buses, are only available at select, busy bus stops (for an example, see the right panel of Fig. 3). Real time is displayed in minutes, i.e. "Route 62 - 3 minutes." Audio announcements for upcoming departures are not common; however, some stops now offer a push button for passengers with visual concerns, which, when pressed, triggers an audio announcement of upcoming bus departures. It has been noted that occasionally, if a particular bus has been cancelled, taxis come by the affected bus stops to inform passengers and to offer them a ride, if needed. In addition, select bus stops in the suburbs/satellite cities, which are connected to S-Bahn stations, display S-Bahn departure times in the bus bays.

RMV offers and actively advertises an [official app](#) for both Apple and Android devices, which offers trip planning (including alternative routes in case of a service disruption), information on real-time departures and delays, purchase options for electronic tickets and passes from within the app (for both urban/suburban and long-distance rail), and information on multi-modal connections, such as car and bike share locations.

Currently, half of all S-Bahn trains and some [express bus](#) routes are equipped with [free WiFi](#); the entire S-Bahn fleet is scheduled to be equipped by the end of 2019. [Regionally](#), RMV is equipping its 638 ticket machines at S-Bahn and regional train stations with free WiFi in an attempt to increase the attractiveness of public transit, as well as encouraging passengers to access trip information and purchase tickets online using their mobile devices. Using this free wifi service, passengers can use personal mobile devices to access real-time information should the stop or station not offer them. This is an especially attractive feature for tourists or

¹ As identified in ETSAB's Wayfinding report, consistent and easily visible signage is an important component of a well-designed transit station.

visitors from abroad who may not have purchased a roaming data plan for their trip, or for passengers who do not have access to a mobile data plan for other reasons.

Transfer Announcements

Transfer announcements on S-Bahn and U-Bahn trains are rather comprehensive overall, generally using a combination of audio announcements and visual displays. Audio messages are generated via speech synthesis. In addition to the upcoming stop, announcements and visual displays inform of transfer options to U-Bahn [and S Bahn routes](#) (including the platform they depart from), and which side of the train the platform will be on at the next station. Depending on the train model, screens include information on the next three stops as well, if not all remaining stops up to the terminus, with current estimated real-time arrival times. For examples, see Fig. 2 below.

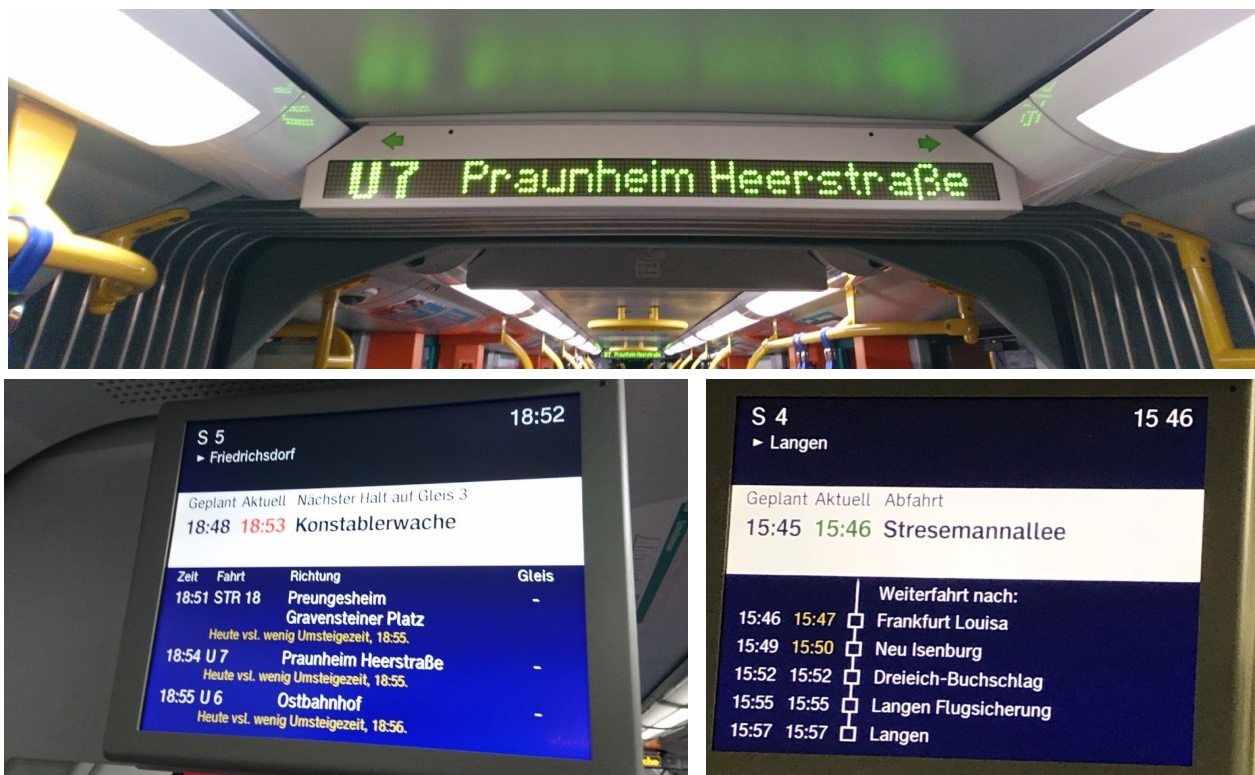


Fig. 2: Examples of electronic displays on train cars. The S-Bahn display (bottom row) cycles between several different information screens, showing for example: Route; current time; terminus; scheduled and actual arrival times at next station; platform that the train will use; and transfer options to other routes, with a note in yellow informing passengers of short transfer time (left screen); or: Route, terminus, next stop with planned and actual arrival time, and five further stops on the route with scheduled and real-time arrival times.

Landmarks and popular tourist destinations, such as Frankfurt Cathedral or the *Zeil* (the main pedestrian-only shopping area in the core), are often mentioned in stop announcements, unless the respective station already carries the name of the destination or landmark. Announcements that can be assumed to be targeted at visitors or tourists are now increasingly followed with the same announcement translated to English.

Buses generally use [automatically generated “next stop” announcements](#) that advise of transfer options to S- and U-Bahn trains, and to select bus routes; some buses are equipped with a screen similar to those on S-Bahn trains (see the left panel of Fig. 3).

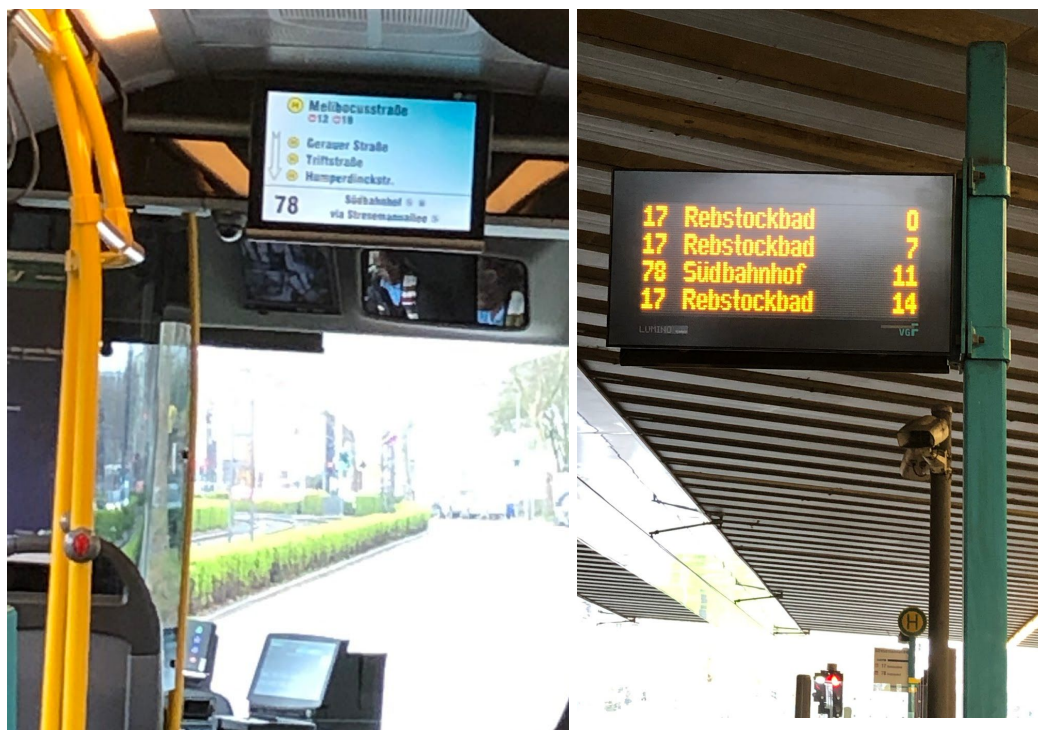


Fig. 3: Example of a large LCD screen on a bus (left), showing route, next stop, three further stops, and selected transfer options to train service (at the bottom of the screen), and a departure times board installed at a busy bus stop (right), indicating route, destination, and time in minutes remaining until departure.

Where to Purchase Passes

The RMV website offers an [interactive map](#) based on *OpenStreetMap*, where users can filter destinations for locations of interest (e.g. hospitals, universities, or tourist information offices), but also for buildings and offices related to transit and multi-modal travel (e.g. stations and stops, *Mobility Centers* [RMV ticket sale and information outlets], or car share stations). The interactive map includes a trip planner, which offers information on the cost of the trip for adults and children, amenities on the train selected for a trip (such as air-conditioning or

accessibility features), and system-relevant messages that may affect travel on the selected route. For an example, see Fig. 4

Tickets and passes can also be purchased via the RMV app.

The screenshot displays the 'Verbindungsdetails' (Connection Details) for a train journey. The destination is Marburg Hauptbahnhof, with an arrival time of 23:09. The date is 16.03.19, and the journey involves one transfer with a total duration of 1:35. The route starts at Frankfurt (Main) Hauptbahnhof tief (104) and ends at Marburg Hauptbahnhof (1a). The first leg is an S6 train from Frankfurt to Friedberg (Hessen) Bahnhof (7/8) from 21:34 to 22:11, featuring vehicle-bound boarding assistance, air conditioning, and a 30-330 minute frequency. The second leg is an RB41 train from Friedberg to Marburg from 22:17 to 23:09, also featuring vehicle-bound boarding assistance, air conditioning, and a 10-113 minute frequency. Ticket prices are listed as 16,00 € for an adult and 9,40 € for a child. A blue information box at the bottom notes a diversion for RB40 and RB41 services from 02.03. to 17.03. due to construction on the S-Bahn line between Friedberg and Frankfurt, with no stops and potential delays.

Verbindungsdetails	
Nach	Marburg Hauptbahnhof (Ankunft: 23:09 Uhr)
Datum	16.03.19
Umstiege	1
Dauer	1:35
Letzte Rückfahrt	
Frankfurt (Main) Hauptbahnhof tief	104
von 21:34 bis 22:11 S6	
Fahrzeuggebundene Einstiegshilfe vorhanden, Klimaanlage Takt: 30-330 Min.	
Friedberg (Hessen) Bahnhof	7 8
von 22:17 bis 23:09 RB41	
Fahrzeuggebundene Einstiegshilfe vorhanden, Klimaanlage Takt: 10-113 Min.	
Marburg Hauptbahnhof	1a
Einzelfahrkarte	16,00 €
Erwachsene:	
Einzelfahrkarte Kind:	9,40 €

RB40, RB41: Umleitung, Halte entfallen und Änderungen an den Wochenenden vom 02.03. bis 17.03.
Die Züge fahren an den Wochenenden zwischen Friedberg und Frankfurt eine Umleitung über Hanau. Halte entfallen, Fahrtzeiten ändern sich und es kann zu Verspätungen kommen. Grund dafür sind Baumaßnahmen zwischen Friedberg und Frankfurt für den viergleisigen Ausbau der S-Bahn-Linie S6.

Fig. 4: A screenshot from the RMV app, showing its trip planning capabilities, indicated amenities on the selected train (e.g. "Klimaanlage" - air conditioning), cost, and information on service changes in the blue box.

Navigation within the Train System

Most S-Bahn and U-Bahn trains, and some buses are equipped with electronic colour displays measuring approximately 20cm diagonally, which are used to display the line the vehicle is serving, its terminus, the next stop, and often, depending on the model of the train, [a number of additional upcoming stops](#) (often up to the terminus) as well, thus allowing passengers to plan their trip while on the go and orient themselves within the network.

Visual representations of the train network are available on trains, however only in a printed, static format, like on Edmonton's LRT vehicles.

Emergency Communications

RMV advises of detours and stop closures ahead of time on their [website](#), occasionally including changes in departure times down to the minute:

The screenshot shows a mobile application interface with a green header labeled "Verkehrsmeldungen". Below the header, there are four announcement cards, each with a circular icon and text detailing service changes:

- RE3: "Frankfurt Flughafen Regionalbahnhof" entfällt auf jeweils einer Fahrt am 16.03. und 17.03.** Auf der Fahrt um 22:25 Uhr ab "Frankfurt Hauptbahnhof" mit Ankunft um 01:12 Uhr in "Saarbrücken Hauptbahnhof" entfällt der Halt "Frankfurt Flughafen Regionalbahnhof". Grund dafür sind Tunnelarbeiten.
- RB34: Züge entfallen zwischen "Frankfurt Hauptbahnhof" und "Bad Vilbel Bahnhof" am 16.03.** Die Züge entfallen zwischen "Frankfurt Hauptbahnhof" und "Bad Vilbel Bahnhof" wegen Bauarbeiten. Ersatzweise können die S-Bahnen der Linie S6 auf dieser Teilstrecke genutzt werden. Fahrzeiten ändern sich dadurch.
- S2: Verspätungen und Halt "Frankfurt-Höchst Farbwerke" entfällt vom 18.03. bis 20.03.** In Fahrtrichtung "Dietzenbach Bahnhof" entfällt der Halt "Frankfurt-Höchst Farbwerke". Zusätzlich kommt es zu Verspätungen von bis zu zehn Minuten. Grund dafür sind Oberleitungsarbeiten in Frankfurt-Höchst.
- RB22: Halte entfallen und Verspätungen bei nächtlichen Fahrten an Wochenenden vom 09.03. bis 31.03.** Einzelne Züge entfallen zwischen "Frankfurt Hauptbahnhof" und "Niedernhausen Bahnhof". Ersatzweise bedienen Ersatzbusse die Haltestellen "Frankfurt Hauptbahnhof" und "Niedernhausen Bahnhof". Zudem erreichen einige Züge "Frankfurt Hauptbahnhof" bis zu 4 Minuten später. Grund dafür sind Bauarbeiten.

Fig. 5: Screenshot from [www.rmv.de](#) (15 Mar 2019), showing information on service disruptions and schedule adjustments.

Clicking or tapping the details of each announcement opens a new page, where users can locate the affected stop or area on a map. However, this feature is quite hidden and not too obvious, and can be misleading if a detour affects several stops, as the announcement will be displayed in one single location on the map.

At stops and stations, detours and closures are communicated via audio announcements and on information displays; although it has been reported that occasionally these announcements appear to lag behind the information available online, so that the app or website seems to offer the most up-to-date information at times.

Two-Way Passenger Communications

RMV offers customer service by phone around the clock, seven days a week. Their [facebook](#) and [twitter](#) pages offer two-way communication and customer support from 6am to 8pm on weekdays, and from 8am to 8pm on weekends and holidays.

Austin, TX

Capital Metro (CapMetro) and partner *Round Rock Transit* service the city of Austin, Texas (population 950,000), and the nearby cities of Round Rock (population 105,000, 15 miles north of Austin) and Leander (population 50,000, 28 miles northeast of Austin). In total, these transit authorities cover a 535 square mile service area with 82 routes and over 1600 bus stops.

The services provided include the following rail and bus services:

- **MetroBus** - Frequent-stop service with routes all over town and flyer routes with fewer stops and faster service.
- **MetroExpress** - Commuter bus service to and from downtown, designed to bring outlying residents into Austin's city center using managed lanes on the MoPac expressway.
- **MetroRapid** - Frequent service with a limited number of stops and faster travel times
- **MetroRail** - Commuter rail service to and from downtown designed to bring outlying residents into Central Austin. Nine stations located between Leander and downtown Austin.
- **High-Frequency Routes** - Convenient, frequent service that runs at 15-minute frequencies on 6 highly-traveled routes

Use of Advertising Space

CapMetro allows commercial advertising, advertising by non-profit and governmental entities, and Public Service Announcements under the Community Partnership Program. Signs and

displays vary in size from 28"x11" interior signs to full exterior bus wraps, and seem to be exclusively devoted to advertising.

Real-Time Information & Transfer Announcements

Exact real-time wait times are displayed on digital signage at every MetroRapid station, and are also available via the online Trip Planner and the CapMetro App. As the MetroRail has only one line, transfer announcements between lines are not applicable for CapMetro transit.

An automated stop announcement system in English and Spanish announces major bus stops on board buses and on trains at all MetroRail station stops. All buses and bus operators on CapMetro's services announce to riders the following information and orientation along the route and throughout the service area:

- Major stops/time points along the route
- Transfer locations and routes that serve them
- Major intersections

Bus stops do not seem to be equipped with departure boards; however, as all buses offer free on-board wifi, trip-planning and emergency information can be accessed by passengers via the web or the app, even if they do not have access to mobile data on their phones. Additionally, passengers can scan the QR code at the stop (see also the section on **Modern Bus Stop Signage** further below), or text or call a number while providing the stop ID, and receive real-time information for their stop in this manner.

Navigation within the Train System

MetroRail trains display a static, printed map of the line the train operates on. In addition, an LED sign displays the next stop and final destination of the train.

Where to Purchase Passes

Tickets and passes can be purchased via the CapMetro App. To do this, passengers are asked to set up an account with an email, password, PIN, and a valid credit or debit card. Purchasing a pass generates a QR code that can then be shown to an operator or fare inspector, or scanned on MetroRapid.

An online Trip Planner can be used to identify which route or routes are your best choice, the walking time to and from the bus stops, directions for how to locate the stop, and the option to print out or share the trip plan with someone else.

Emergency Communications

Rider alerts are available on the CapMetro web site; users also have the option to sign up for email alerts. The CapMetro web site can be viewed in English, Spanish, and an accessible text-only document with a 'read aloud' option for users with vision concerns.

Two-Way Passenger Communications

The CapMetro offers the *GO Line*, their Customer Service Line. Operators provide schedules, trip planning, and general assistance.

CapMetro has a twitter account that is staffed during work hours, which appears to be used for general service information and occasional communication with passengers.

The CapMetro board of directors holds regular public meetings; the public is welcome to attend to share ideas and feedback. Board meetings are streamed live and full board meetings are televised.

Citizens have the option to *Request a Meeting*, where a representative of CapMetro will come and speak to students, community group, or organization.

Via the *Unsolicited Proposal Program*, CapMetro encourages and welcomes unsolicited proposals with the goal of creating an open door for ideas and innovations that have the potential to improve their services.

Calgary, AB

Communication of Train Departure Times

As most of Calgary's C-Train track is at-grade, the majority of LRT stations are not underground. However, Tuscany Station, for example, has two floors, with the upper floor allowing access to the bus transit station, and the lower floor to the ground level train station. Train departure

times are not indicated visually inside the station; however, there are audio announcements when a train is arriving and about to depart.

Use of Advertising Space

Space for non-digital advertising is limited in LRT stations, since many of the stations are made with glass walls. Digital ads are in use on some of the TV screens that are installed in some stations.

There is a dedicated space for information regarding closures, detours, and a map of the system (see Fig. 6a). This space is kept separate from advertisements, giving passengers a predictable location to check for any service disruptions. It also appears that a poster indicating “no changes” is in use, which serves to remind passengers that the board is updated on a regular basis, increasing trust in the system.



Fig. 6a: A two-panel display board at a Calgary C-Train station that showcases a map of the train network and estimated travel times between stations (left), and maintenance messages (right).

TRIP TIMES BETWEEN STATIONS

ON NORTHBOUND TRAINS TO TUSCARY USE THESE HEADINGS

TRAVEL TIME IN MINUTES

TELERIDE STOP IDs	9390	9391	9261	9262	6801	6802	6803	6804	6805	6806	6807	6822	6825	n/a	6829	6819	6818	6817	6816
TELERIDE STOP IDs	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
TELERIDE STOP IDs	Summer/Adriano	Shawnessy	Fish Creek/Lanark	Capstan Meadows	Anderson	Southland	Heritage	Chinook	39 Ave. S	Edson/Stampede	Victoria Park/Stampede	City Hall	7 St. West	7 St. West northbound only	Stampede	SAIT/ACAD/Adriano	Lions Park	Randall Trail	University
Tuscarry (Z) 3641	60	58	56	54	51	49	47	44	41	38	37	32	32		21	19	17	15	13
Crowfoot (X) 3817	57	55	53	51	48	46	44	41	38	35	34	29	29		18	16	14	12	10
Dalhousie (W) 3960	53	51	49	47	44	42	40	37	34	31	30	25	25		14	12	10	8	6
Brentwood (V) 6815	50	48	46	44	41	39	37	34	31	28	27	22	22		11	9	7	5	3
University (U) 8566	47	45	43	41	38	36	34	31	28	25	24	19	19		8	6	4	2	
Randall Trail (Y) 8565	45	43	41	39	36	34	32	29	26	23	22	17	17		6	4	2		
Lions Park (S) 8564	43	41	39	37	34	32	30	27	24	21	20	15	15		4	2			
SAIT/ACAD/Adriano (R) 8563	41	39	37	35	32	30	28	25	22	19	18	13	13		2				
Stampede (P) 8562	39	37	35	33	30	28	26	23	20	17	16	11	11						
7 St. West (N) n/a																			
City Hall (M) 6831	28	26	24	22	19	17	15	12	9	6	5								
Victoria Park/Stampede (L) 8556	23	21	19	17	14	12	10	7	4	1									
Edson/Stampede (K) 8557	22	20	18	16	13	11	9	6	3										
39 Ave. S (J) 8558	19	17	15	13	10	8	6	3											
Chinook (H) 8559	16	14	12	10	7	5	3												
Heritage (G) 8560	13	11	9	7	4	2													
Southland (F) 8561	11	9	7	5	2														
Anderson (E) 9390	9	7	5	3															
Edson/Stampede (D) 9264	6	4	2																
Fish Creek/Lanark (C) 9387	4	2																	

Fig. 6b: A closeup of a chart displaying estimated travel times between Calgary C-Train stations.

Real-Time Information at Bus Stops

Real-time departure boards are constructed not based on passenger volume, but based on the line. The most recently implemented BRT line, called the MAX line, is an example of a bus route where real-time information is displayed at bus stops. Most regular bus stops do not include real-time departure boards; however, passengers can call or text Teleride to inquire about upcoming departures.

Calgary Transit collaborates with Pattison, a provider of marketing solutions. In places where there is a digital sign, such as the newer BRT stations, departure times are updated and displayed using these boards.

Transfer Announcements

The static map that is displayed at each station indicates one to three popular destinations that are located in the vicinity of the respective stop. In addition, the buses that can be accessed from the respective LRT station are listed on this display board as well; see Fig. 7.

Audio announcements on the C-Train includes a message on which side the doors will open (“Arriving at _____ station, the doors usually open on the left/right”), and occasionally friendly reminders targeted at disembarking passengers, such as “please ensure you have all your belongings before you disembark”.



Fig. 7: An excerpt of the Calgary C-Train map, where connecting bus routes are indicated for each stop.

Navigation within the Train System

On board the train, Calgary Transit uses static maps of the train system that indicate transfer points to other lines (see Fig. 8). Some newer vehicles, on top of having a static map, also have an LCD display (see Fig. 9) that indicates where the vehicle is on the route, plus the next two or three stops. A clock on the side of the display provides passengers with an easy way to plan their transfers.

Audio announcements are used as well to communicate the information that is displayed visually.

Where to Purchase Passes

In addition to from vending machines at C-Train stations, physical [Calgary Transit tickets and passes](#) can be purchased at a service centre, at City Hall, many convenience or grocery stores, or City Online.



Fig. 8: An excerpt of the Calgary C-Train map displayed onboard all trains.

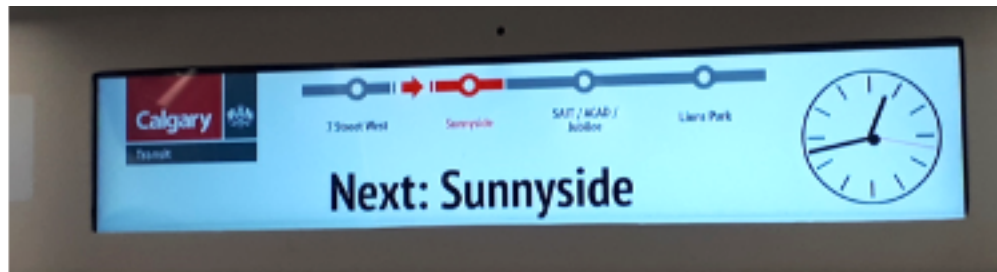


Fig. 9: An example of the digital display in use on newer model trains, displaying the next stop, the prior and two upcoming stops, and a clock.

Emergency Communications

Calgary Transit has an emergency communications plan in place that consists of several steps. After information about the emergency is received, the following takes place:

1. Information is posted on Twitter (see Fig. 10 for an example). Note the use of an image with the tweet, making the posting stand out and increasing the impressions and interactions on the post.
2. Audio announcements are made at LRT stations and repeated every five minutes.
3. In places where there are digital advertising boards managed by Pattison, messages are displayed there as well.
4. Internally, staff are informed about the emergency.
5. Calgary Transit Call Centre staff are informed, as well as relevant departments.

6. In the instances of service interruption that involve sensitive details and/or an ongoing crisis, (such as an injury from a person who jumped on the tracks, active shooting, ongoing attack, etc.) all the five steps above are implemented, while the details are kept confidential.



Fig. 10: An example of a Calgary Transit tweet (left), notifying passengers of a delay. Note the bold red colour image, drawing attention to the tweet in users' feeds; and the Service Updates section on calgarytransit.com.

The Calgary Transit website also has a dedicated section for service interruptions, sectioned by buses, C-Train service, and stations (see Fig. 11).

Two-Way Passenger Communications

Calgary Transit Stations are equipped with a Help phone that passengers can use. Passengers have to press the button, wait for the light to turn green, and speak to the operator about their concern.

In April 2019, Calgary Transit launched a texting service as a convenient way to report concerns (see Fig. 11), especially involving safety and security. ETSAB notes this as a recommendable, discreet way to ask for assistance, especially in situations where drawing attention to oneself may put one in danger.

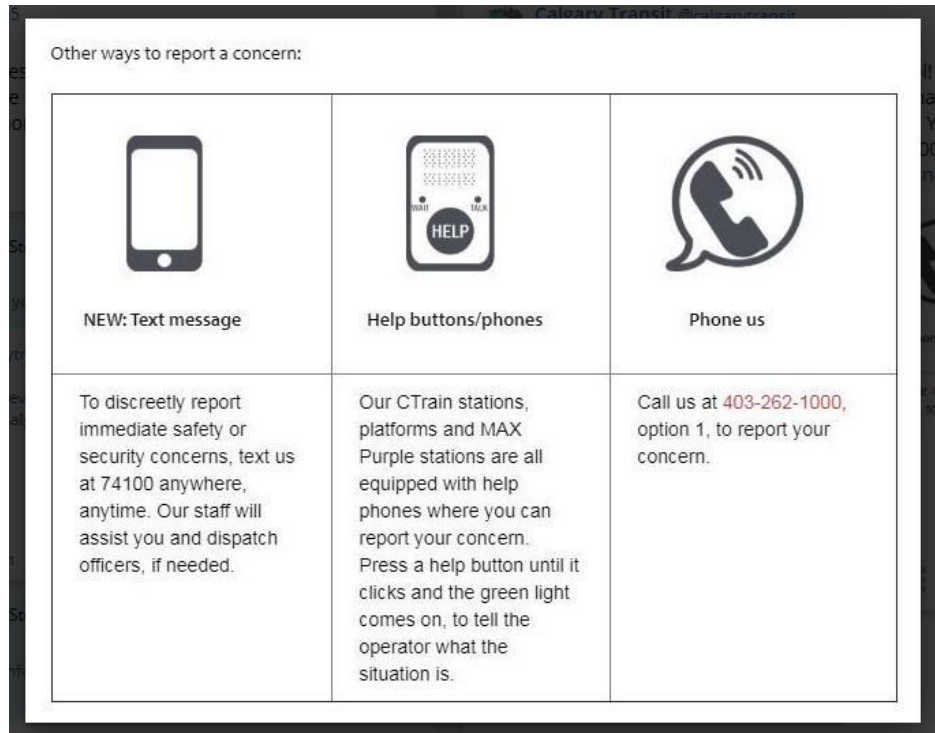


Fig. 11: A screenshot of *calgarytransit.com*, illustrating three different ways to call for help within the transit system. Note the new text message option on the left.

Calgary Transit's Twitter account offers two-way communication with passengers, who regularly tweet about various concerns, such as bus delays, comments on facilities, and positive comments about the service, all of which are responded in an almost immediate manner (see also Fig. 12). The Calgary Transit twitter account has approximately 122,000 followers, after 201,000 tweets and replies since the account opened in 2009.



Fig. 12: An example of a twitter conversation involving Calgary Transit.

Addendum: Modern Bus Stop Signage - QR Codes & E-Paper

As the topic was brought up during ETSAB's annual Councillor Luncheon, ETSAB also investigated the use of QR codes located at stops, so that passengers can scan them with their smartphones for additional information (such as real-time data). In Canada, [Winnipeg, MB](#), and [Windsor, ON](#) have been testing QR codes at stops, linking to a website with real-time departures (no word on the success of the approach, or whether they're still doing that). Several US cities have been using them as well, such as [Santa Clarita, CA](#), the [SunMetro, El Paso, TX, and DC](#).

As this type of QR code requires the presence of both a smart phone and wifi or a mobile data plan, ETSAB does not view this type of QR code as adding any information that a smart phone with a data connection cannot already supply.

However, while doing research related to QR codes, ETSAB has noticed that the past few years have seen a new type of technology for use in signs for bus stop, namely e-paper technology, which is similar to the technology used in e-book readers. Bus stop signs employing this e-paper technology are also occasionally called "[Digital Bus Stops.](#)"

The stated advantages of this type of sign is that it is less expensive to install and maintain than an LCD screen; the display can be easily read in any light conditions; it uses solar power and is therefore not dependant on a connection to the electricity grid; and the signs can be easily updated from a central location to provide information about delays, cancellations, or detours.

The signs are said to be very robust and suitable for all weather conditions. There appears to be some good support for the use of these signs as opposed to the traditional LED signs: After a trial period in which the signs were tested on a few bus stops in Sydney, Australia, their transportation administration decided to use these signs system-wide. E-paper signs are also being used in London, England, as well as a few American cities, including Washington, Chicago, Austin, Los Angeles, and Santa Clara. Given that this is a new technology and not yet in widespread use, a careful assessment of it may be useful to see whether or not it meets the stated expectations.

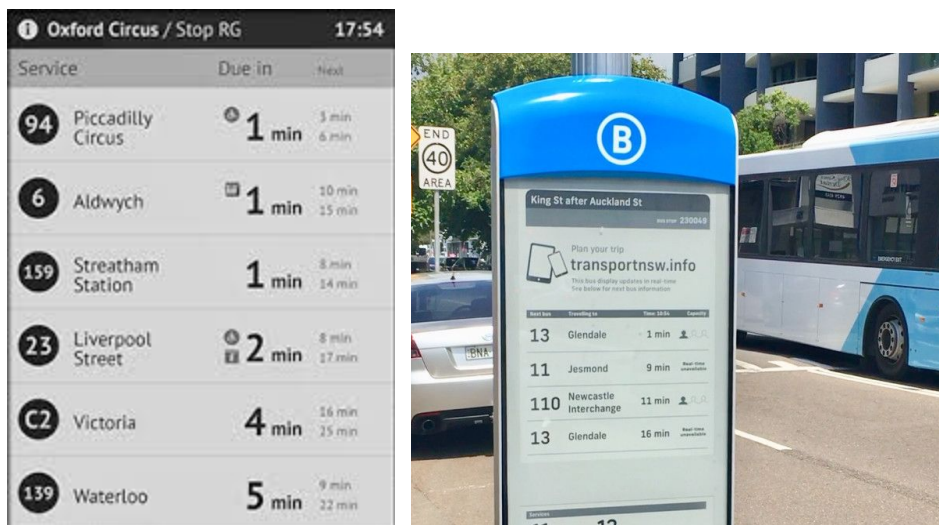


Fig. 13: Examples of E-Paper sign technology in use in [London, England \(left\)](#) and [Newcastle, NSW, Australia \(right\)](#), showing real-time departure information.



Tabular Overview of Communications Features in Cities Scanned

		Edmonton <i>status quo</i>	Frankfurt GER	Calgary AB	Austin TX
real-time boards	at train stations	yes	yes	yes	yes
	at bus stops	no	some	newer stops on special lines only	no
transfer announcements	on trains	no	yes	yes	N/A
	on buses	some	some	some	some
two-way passenger comms	via phone	yes, 311 24/7	yes, 24/7	yes, during working hours	yes
	on social media	occasionally	social: during working hours	yes; social media during working hours	social: occasionally, during working hours
	via text	no	no	yes	no
advertising space used flexibly		rarely	rarely	occasionally, for emergency messaging	?
tickets & passes purchase options	physical (beyond at stations or from operators)	at locations identified in text format	at locations identified in interactive map	at locations identified in text format	?
	digital	no	via app	no	via app
emergency comms	audio & displays on platforms	yes	yes	yes	?
	online (web, social)	yes; often text only	yes; often text only	yes; often with imagery	yes; often text only

Recommendations

To improve ETS-to-passenger communication and to facilitate travel on Edmonton's transit system, ETSAB recommends:

- The addition of **more automatically generated transfer announcements** on buses and LRT trains (e.g. for transfers from Capital to Metro Line & vice versa), including those that include popular landmarks or tourist destinations (Rogers Place, City Hall, etc).
- Adding **colourful symbolic or iconic imagery to @takeetsalert tweets** that visualize the nature of the tweet (such as a yellow train or bus for delays, for example), or that give additional information (such as a map visualizing a detour).
- Adding **map imagery to route detours on the [ETS website](#)**, in addition to the current text-only detour descriptions.
- Investigating **e-paper/e-ink technology**, and the possible installation of real-time boards using this technology, at busy bus stops and/or transit centres.
- Investigating a **silent customer contact/alarm option**, such as via text message, or two-way communication on twitter.
- Investigating whether select advertising screens/boards could be used to **display system-relevant messages interspersed with advertisements** in the case of an emergency or service disruption.
- As a further option for passengers who may not have access to a mobile phone or that may be visually challenged, ETSAB recommends **highlighting existing Information buttons** at LRT stations and transit centres that connect to 311, or a dedicated transit contact person, for trip planning and real-time information purposes.

Acknowledgements

ETSAB would like to thank Fenja Seither, Daniel Seither, Melanie, R.S., and a number of (anonymous) contributors "on the ground" in Frankfurt for their time and effort in answering our questions. Many thanks also to Daniel Seither and R.S. for kindly supplying us with the imagery in this report depicting trains and stations in Frankfurt.