Transportation Analytics
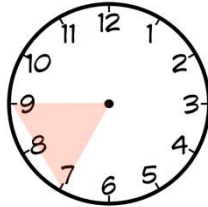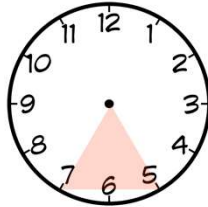Singapore MRT/LRT Network in July 2021

Credit: Photo from https://www.straitstimes.com/singapore/transport/major-mrt-faults-remain-at-record-high-but-overall-distance-based-reliability
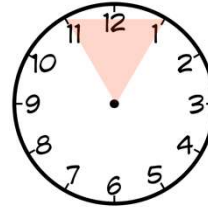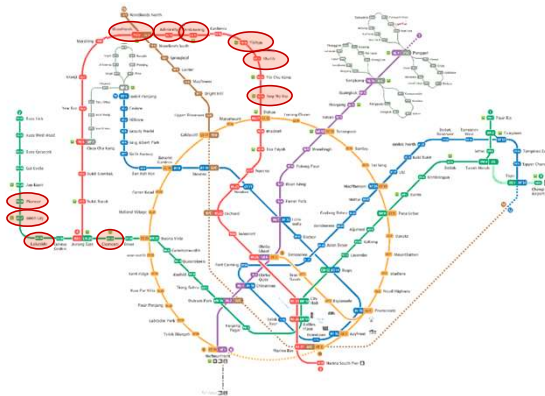
Overview

Weekday Morning Peak
Mon - Fri
7am – 9am

Weekday Evening Peak
Mon - Fri
5pm – 7pm

Weekend Leisure Peak
Sat - Sun
11am – 1pm

In this study the insights of MRT/LRT commuters was identified by clustering analysis. In this analysis, origin-destination commuting interaction clusters are determined based on 3 peak traffic periods – weekday morning, weekday evening and weekend leisure. The clusters statistics are interpreted and characteristics of the clusters will be discussed.
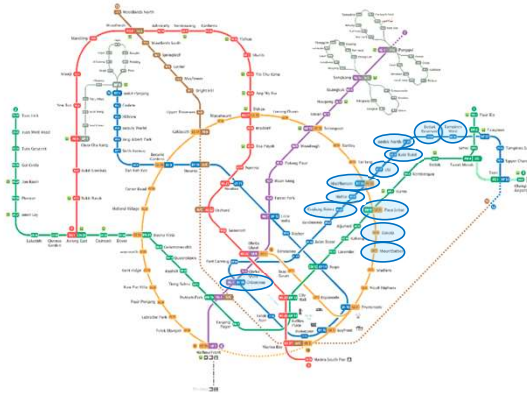
Weekend Day Peak Insights (1/2)

- High incoming commuter traffic from mature heartlands
- Travel to neighbouring industrial estates or major business parks.
- Older stations potentially less spacious than newer stations

Potentially high levels of commuters from mature residential estates during the weekday morning peak

The commuters from heartlands like Ang Mo Kio, Woodlands, Clementi is expected to be high from Cluster 14 and Cluster 16 in the weekday morning peak analysis. These commuters are potentially travelling to neighbouring industrial estates or major business parks. Furthermore, these train stations are the older configuration which may be less spacious than the newer stations. Hence, may recommend stakeholders to pay attention to stations in these clusters and apply the appropriate crowd control measures to alleviate potential congestion during the morning peak.
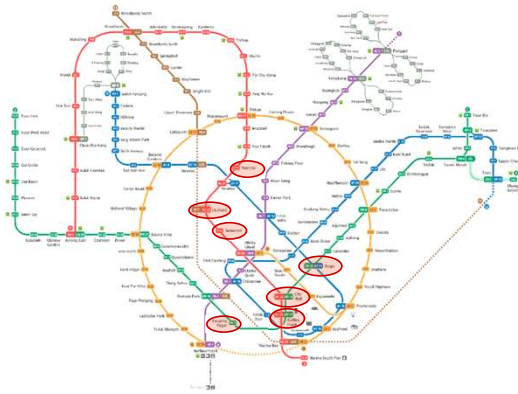
Weekend Day Peak Insights (2/2)

- Downtown Line fully operational since 4Q 2017

- Distinct cluster of incoming commuter traffic on downtown line from East to central

- Potentially take the strain away from other stations on the EW line

Introduction of Downtown Line may help to ease some commuter from East-West line during weekday morning peak

Majority of the stations in Cluster 5 South-East district of weekday morning peak is from the Downtown Line. Prior to which, commuters from locations like Bedok North, Tampines West may have to board from Bedok or Tampines on the East-West line to reach their destination. This can potentially debottleneck congestion in the Eastern stations of the East-West line, allowing passengers to enjoy a more pleasant journey.
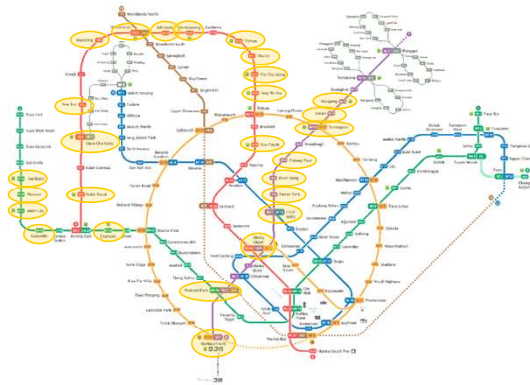
Weekday Evening Peak Insights (1/2)

- Central shopping district potential risk of congestion
- Incoming traffic from office workers who knock-off in the area
- Outgoing traffic from people running errands/social gatherings

Central shopping/business district potentially congested during weekday evening peak

The central shopping/business district includes stations Bugis, Raffles Place, City Hall, Somerset, Tanjong Pagar, Novena and Orchard (Cluster 12 of weekday evening). Other than offices in these areas for businesses, it also serves as a central destination for people to run errands or socialise with their friends after work. With the two-way traffic of office workers heading home, and other people heading to town for their personal needs, it can potentially become very congested during the weekday evening peak period. Hence, will suggest stakeholders to pay attention and apply the appropriate crowd control measures during weekday evening.
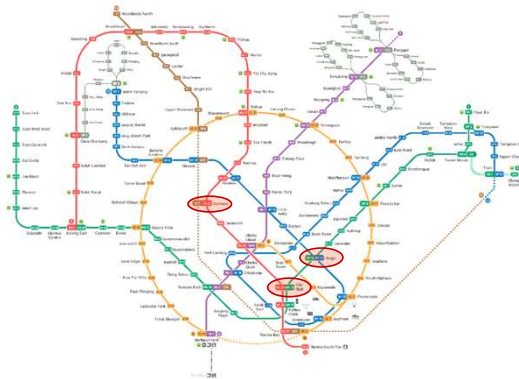
North-East, West and North high density residential locations may see high crowds during evening peak

Mix of industrial and residential areas like Hougang, Boon Lay, Yishun in Clusters 13, 9 and 7 of weekday evening dendogram respectively may potentially see high levels of commuters during the evening peak period, as many workers are heading back home. Therefore, it is advisable to also work out some decongestion measures in these locations to ease crowds.

Weekend Leisure Peak Insights (1/2)

- High levels of crowds potentially at central popular shopping districts

- People heading to town for shopping, social or leisure activities

Central shopping district stations expected to be congested during weekend leisure

The central shopping district in Bugis, City Hall, Somerset and Orchard of Cluster 12 of weekend leisure dendogram. This is expected as many locals head to town for shopping, social or leisure activities during the weekend, hence, crowds here are expected to be on the high side.

Potential visitorship to unconventional activities in Singapore during weekends with COVID-19 restrictions

An interesting cluster in the weekend leisure dendogram is Cluster 3, which depicts several areas all over the country. A commonality of these locations is that they contain unique activities for locals to embark on. For example, enjoying a walk at the Botanic Gardens, visiting heritage areas like Tanjong Pagar, enjoying lunch at ABC Brickworks, or even heading to nature reserves like Dairy Farm, Little Guilin in the West for a hike. These may be due to COVID-19 travel restrictions, which encourage locals to seek more unique things to do within the country, other than conventional leisure activities like shopping.

Actionable Recommendations (1/2)

Peak Period	Potential stations with high traffic
Weekday Day Peak	• Cluster 14: Clementi, Lakeside, Boon Lay, Pioneer
	• Cluster 16: Woodlands, Admiralty, Sembawang, Yishun, Khatib, Ang Mo Kip
Weekday Evening Peak	• Cluster 7: Bukit Batok, Yew Tee, Marsiling, Khatib, Choa Chu Kang, Woodlands, Admiralty, Sembawang, Yishun, Yio Chu Kang, Ang Mo Kio, Toa Payoh
	• Cluster 9: Clementi, Lakeside, Pioneer, Joo Koon, Boon Lay
	• Cluster 12: Bugis, Raffles Place, City Hall, Somerset, Tanjong Pagar, Novena, Orchard
	• Cluster 13: Little India, Boon Keng, Kovan, Hougang, Farrer Park, Serangoon, Dhoby Ghaut
Weekend Leisure	• Cluster 12: Bugis, City Hall, Orchard
	• Cluster 14: Little India, Boon Keng, Kovan, Hougang, Farrer Park, Serangoon, Dhoby Ghaut

Based on the cluster analysis conducted and insights, these are the potential stations that may see high volumes of commuter traffic during their respective peak periods

Actionable Recommendations (2/2)

1. Introduction crowd control measures to potential high congestion areas

2. Train services can consider advertisement placement and pricings based on potential crowd and its exposure rate

3. Continue to monitor the effect of Downtown Line and ease of congestion of the East stations on the East-West line

4. Anticipate potentially more commuters to unique and interesting locations during weekend leisure peak period