



Supplement of

Seismic noise variability as an indicator of urban mobility during the COVID-19 pandemic in the Santiago metropolitan region, Chile

Javier Ojeda and Sergio Ruiz

Correspondence to: Javier Ojeda (jojeda@dgf.uchile.cl)

The copyright of individual parts of the supplement might differ from the article licence.

1 Additional information

This supplemental file contains Tables S1 and S2, and Figures S1, S2, S3, S4, and S5, mentioned in the manuscript.

Table S1. Step by step gradual reopening of the country, presented as a public health policy to mitigate the virus spreading. Applicable only from 19 July 2020.

Step	Name	Brief description
Phase 1	Quarantine	Full Lockdown. Only essential business allowed.
Phase 2	Transition	Lockdown is maintained on weekends and holidays. Opening of shops and going to work is allowed. Indoor gathering of up to five persons are permitted.
Phase 3	Preparation	Open full week. Although is not possible to transit to go to a quarantined place. Meetings and events allowed for a max. of 25 people indoor and 50 people outdoor. Restaurant and cafés allowed to work in open spaces but keeping social distance.
Phase 4	Initial opening	Open full week. Cinema, theatres and similar may operate at 25% of their capacity. School classes may return.
Phase 5	Advanced opening	Open full week. Pubs, discotheques, gyms and similar may open up to 50% of their capacity.

During the period analysed (1 Dec 2019 - 1 Oct 2020), none of the cities presented in this study advanced to Phase 4 or 5.

Table S2. Seismic stations used in this work, we added the information about location and dates when lockdown (LD) or other phases were implemented during the period analysed (1 Dec 2019 - 1 Oct 2020).

Station	City	LD1	end LD1	LD2	Phase 2	Phase 3
MT01	Daracena - Melipilla	12 Jun	-	-	10 Aug	-
MT02	Curacaví	12 Jun	-	-	10 Aug	-
MT03	UAI - Peñalolén	8 May	-	-	24 Aug	28 Sep
MT04	Olivares	12 Jun	-	-	24 Aug	2 Sep
MT05	Cerro Colorado - Renca	8 May	-	-	-	-
MT07	Cerro El Roble	12 Jun	-	-	28 Jul	28 Sep
MT08	Bocatoma Colorado	12 Jun	-	-	24 Aug	2 Sep
MT09	Talagante	26 Jun	-	-	31 Aug	28 Sep
MT10	Hacienda Santa Martina	15 May	-	-	28 Jul	-
MT12	Pirque	-	-	-	-	-
MT13	San Alfonso	12 Jun	-	-	24 Aug	2 Sep
MT14	Cerro Calán - Las Condes	26 Mar	16 Apr	15 May	28 Jul	2 Sep
MT15	Las Vizcachas	8 May	-	-	28 Sep	-
MT16	CCHEN - Las Condes	26 Mar	16 Apr	15 May	28 Jul	2 Sep
MT18	Casona - Santiago	26 Mar	13 Apr	5 May	17 Jul	28 Sep
TA02	Iquique	15 May	-	-	-	-
CO05	La Serena	29 Jul	-	-	28 Sep	-
VA01	Valparaíso	12 Jun	-	-	-	-
CCSP	San Pedro - Concepción	6 Apr	16 Apr	11 Sep	-	-
MG01	Puerto Williams	25 Mar	6 Apr	-	-	-

-: Not applicable dates during the period analysed.

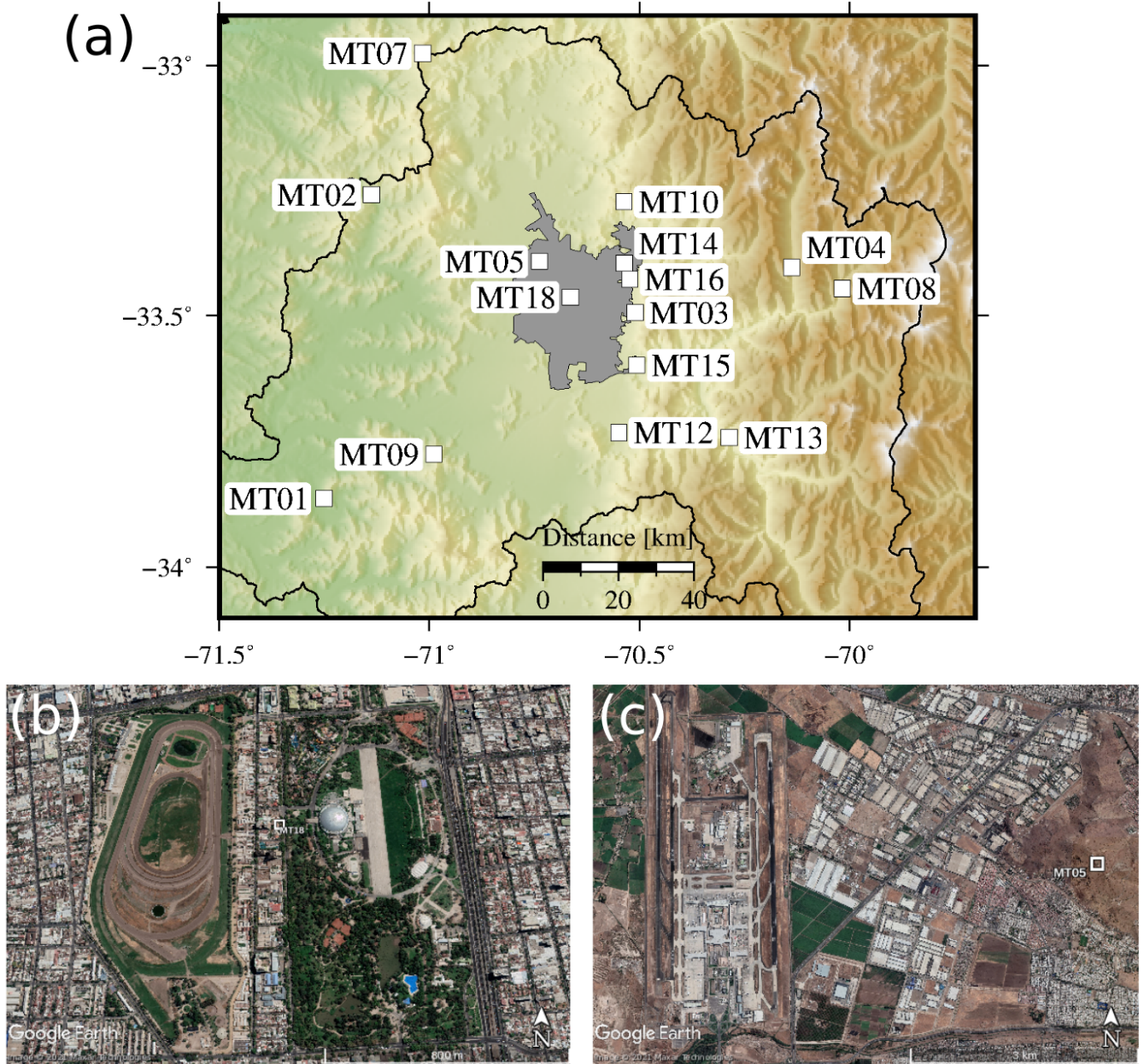


Figure S1. (a) Map of the Metropolitan region with 15 stations analysed in this study. Note that only stations MT05, MT18, MT14, MT16, MT03, and MT15 are stations in the Santiago city urban area (grey surface). (b) Close view to vicinity of MT18, in which we can see the hippodrome "Club Hípico de Santiago" on the left and the O'Higgins Park on the right. (c) Close view to the vicinity of MT05, in which we can see the Airport on the left. Photos from ©Google Earth.

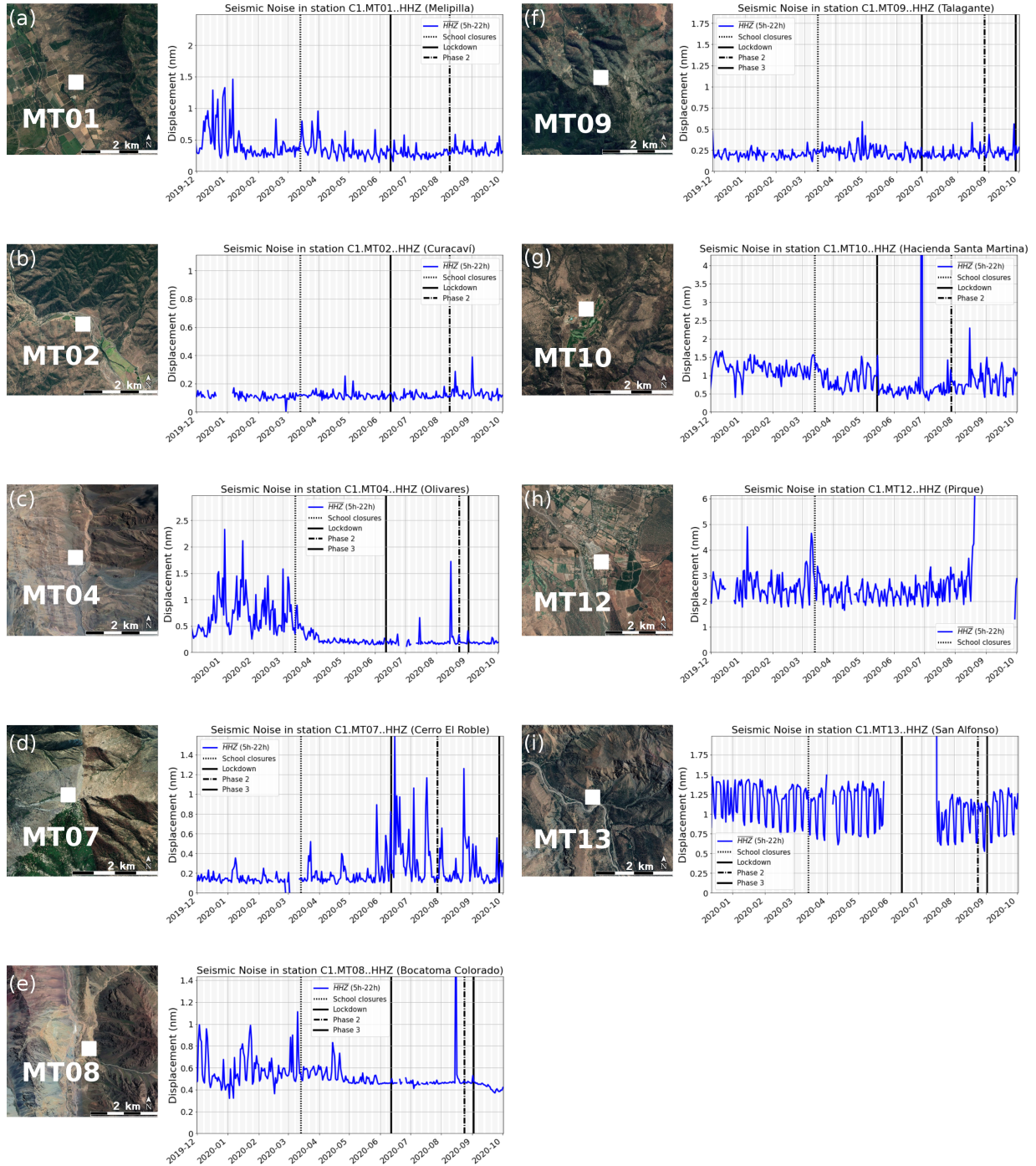


Figure S2. Changes in high-frequency seismic ambient noise amplitudes at stations (a) MT01, (b) MT02, (c) MT04, (d) MT07, (e) MT08, (f) MT09, (g) MT10, (h) MT12, and (i) MT13. The vertical black lines indicate the time of public restrictions implemented in the Metropolitan region. Each municipality inside the region had different lockdown periods or phases despite the proximity between them (see Table S2). Photos from ©Google Earth.

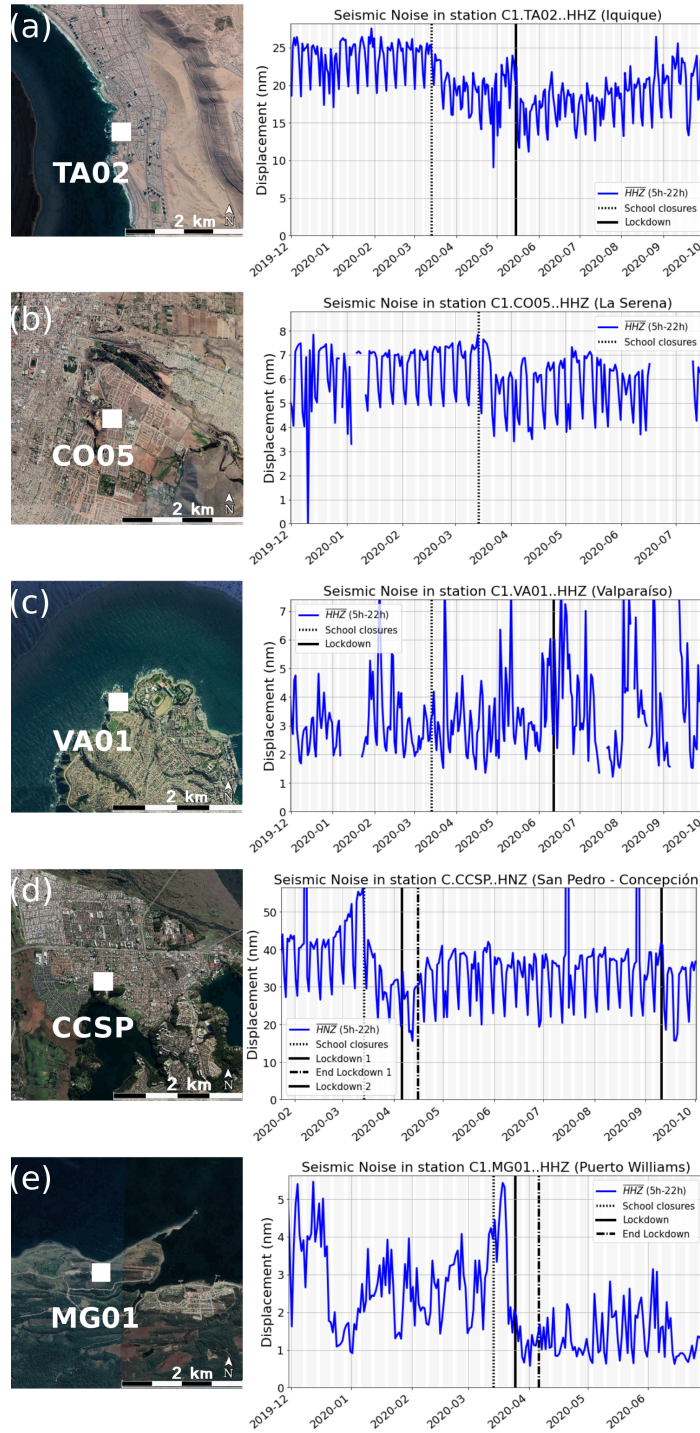


Figure S3. Changes in high-frequency seismic ambient noise amplitudes at stations (a) TA02, Iquique, (b) CO05, La Serena, (c) VA01, Valparaíso, (d) CCSP, San Pedro Concepción, and (e) MG01, Puerto Williams. The vertical black lines indicate the time of public restrictions implemented in each region. Photos from ©Google Earth.

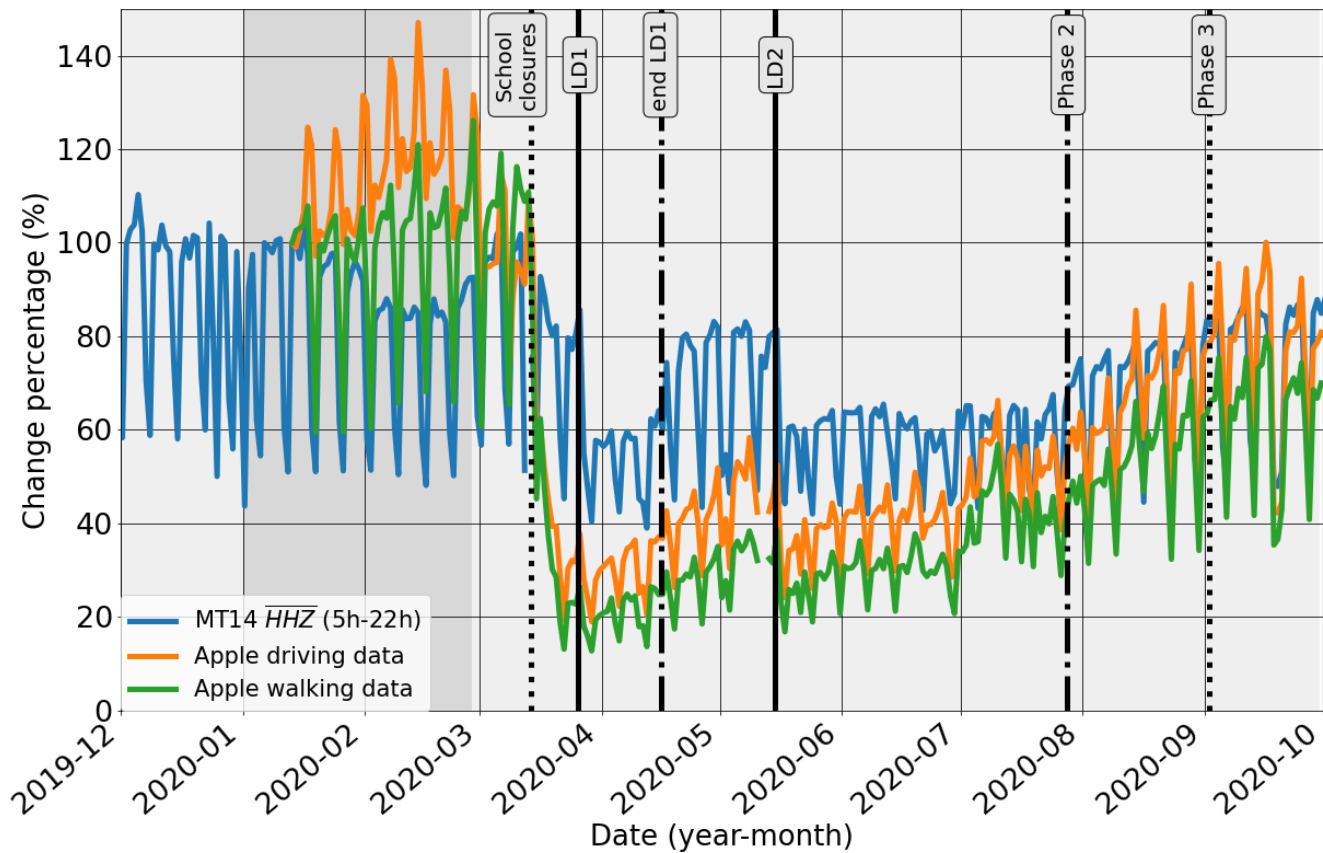


Figure S4. Comparison between noise evolution of station MT14 (blue line) and the Apple mobility data, specifically driving (orange line) and walking data (green line). The vertical black lines indicate the time of public restrictions implemented in Las Condes. The ASN amplitudes and Apple mobility data are normalised by a baseline value of the 13 January 2020. The grey background between January and March corresponds to the Summer holiday season in Chile.

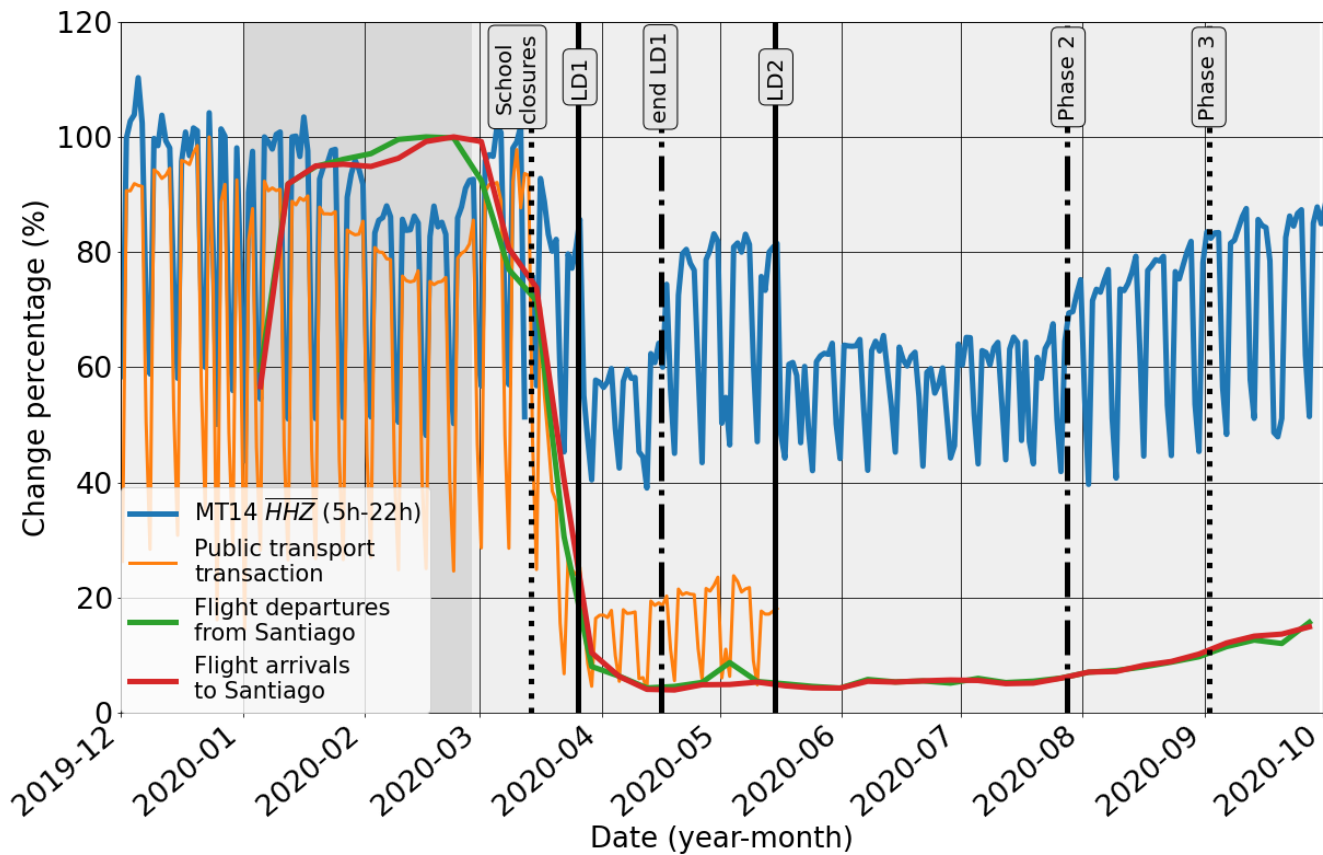


Figure S5. Comparison between noise evolution of station MT14 (blue line) and other mobility data, specifically public transport transactions (orange line), flight departures from Santiago (green line), and flight arrivals to Santiago (red line). The vertical black lines indicate the time of public restrictions implemented in Las Condes. The grey background between January and March corresponds to the Summer holiday season in Chile.