SUPPLEMENTARY MATERIAL

Table SM1. Main PCA dimensions for 2017.

2017	SJC			GRT		
	Dim.1	**Dim.2**	**Dim.3**	**Dim.1**	**Dim.2**	**Dim.3**
eigenvalue	10.476	3.924	0.848	4.068	1.416	1.150
% Cumulative variance	58.2	80.0	86.6	45.2	60.9	73.7
O_3	0.897	0.067	0.245	0.944	0.135	0.028
NO	-0.584	0.583	0.078	-0.598	0.474	-0.166
NO_2	-0.452	0.652	-0.466	-0.710	0.317	-0.429
WS	0.630	-0.279	-0.185	0.315	-0.679	-0.161
WD	-0.047	0.490	-0.602	0.117	0.600	-0.151
P	-0.478	-0.133	0.636	-0.367	0.258	0.843
RH	-0.824	-0.456	0.106	-0.878	-0.282	0.208
T	0.839	0.418	-0,079	0.896	0.266	-0.125
SR	0.715	0.203	0.602	0.700	0.191	0.345

Table SM2. Main PCA dimensions for 2018.

2018	SJC		GRT		
	Dim 1	**Dim 2**	**Dim.1**	**Dim.2**	**Dim.3**
eigenvalue	3.76	2.16	4.045	1.560	1.134
% Cumulative variance	41.77	65.83	44.95	62.28	74.87
O_3	0.926	-0.124	0.916	0.067	-0.153
NO	-0.585	0.520	-0.484	0.533	0.531
NO_2	-0.579	0.643	-0.626	0.546	0.302
WS	0.639	-0.225	0.738	-0.125	0.383
WD	-0.302	0.520	-0.291	0.258	-0.675
P	-0.018	-0.766	-0.051	-0.773	0.254
RH	-0.769	-0.570	-0.822	-0.470	0.091
T	0.880	0.332	0.872	0.260	0.019
SR	0.603	0.331	0.715	0.075	0.248

Table SM3. Main PCA dimensions for 2019.

2019	SJC			GRT		
	Dim.1	**Dim.2**	**Dim.3**	**Dim.1**	**Dim.2**	**Dim.3**
eigenvalue	3.746	1.486	1.101	3.742	1.368	1.111
% Cumulative variance	41.623	58.135	70.368	41.580	56.779	69.125
O_3	0.902	-0.097	0.043	0.931	-0.057	0.015
NO	-0.571	0.436	0.366	-0.552	0.513	0.143
NO_2	-0.376	0.728	-0.245	-0.451	0.703	0.027
WS	0.639	-0.280	0.173	0.447	0.014	0.360
WD	-0.085	0.195	0.879	0.045	-0.279	-0.797
P	-0.366	-0.652	0.097	-0.323	-0.612	0.460
RH	-0.885	-0.213	-0.007	-0.906	-0.193	0.090
T	0.828	0.409	-0.135	0.882	0.340	-0.042
SR	0.668	0.061	0.273	0.680	-0.019	0.321

Table SM4. Main PCA dimensions for 2020.

2020	SJC		GRT		
	Dim.1	**Dim.2**	**Dim.1**	**Dim.2**	**Dim.3**
Eigenvalue	4.606	1.528	2.739	2.264	1.390
% Cumulative variance	51.182	68.156	30.437	55.589	71.032
O_3	0.900	0.330	0.855	0.046	0.107
NO	-0.555	0.478	-0.467	0.717	-0.140
NO_2	-0.657	-0.262	-0.390	0.573	-0.528
WS	0.666	0.030	0.191	0.669	0.169
WD	0.043	0.736	-0.042	-0.343	0.574
P	-0.695	0.501	-0.274	0.584	0.608
RH	-0.905	0.150	-0.860	0.104	0.332
T	0.949	-0.123	0.690	0.514	-0.233
SR	0.639	0.539	0.556	0.489	0.434

GRT PC1 of 2017 (Fig. 6a1 and Table SM1) can be analyzed in a similar way to SJC PC1. By explaining 45.2 % of the original data, it can describe O_3 (0.994), T (0.896), P (-0.878) and SR

(0.700), based on the loading values. PC1 can thus be considered a measure of the air processed in the middle of the day, which is the time when there is the highest concentration of O_3. This time is also characterized by an increase in local temperatures and SR, which are directly related to the production of secondary aerosol.

The loading values for GRT PC2 for 2017 suggest there is an inverse relationship between WS (-0.679) and WD (0.600), which has a direct influence on the dispersion of NO, NO_2 and O_3. PC3 describes P (0.843) and is not directly related to the concentrations of compounds in the atmosphere, considering the other loading values.

The PC1 for SJC during 2018 (Fig. 6b1 and Table SM2) explains 41.77 % of the original data and makes it possible to measure O_3 (0.926), T (0.880), RH (-0.769) and SR (0.603), as these variables have the highest loading values. As for 2017, PC1 can thus be considered a measure of the air processed during the day.

The loading values for the PC2 suggest there is a relationship between P (-0.766) and WD (0.520), as well as with the pollutants NO (0.520) and NO_2 (0.643). The negative P loading value at PC2, shows the inverse relationship that this variable has regarding the others that have been mentioned. PC2 describes the behavior of NO and NO_2, while O_3 (0.044) tends to 0 without any strong influence. PC2 can thus be considered to be the description of the nighttime behavior of the atmosphere, which is the time when O_3 tends to have its lowest values because of the absence of sunlight. This prevents the photolysis process from taking place, and the atmospheric boundary layer is smaller and more stable and has higher pressure because of lower temperatures. Higher pressure values maintain the steady state of the atmosphere that is better suited to local pollution levels, whereas lower pressure values lead to the circulation of the atmosphere which can lead to dissipation.

GRT PC1 for 2018 (Fig. b2 and Table SM2) can be analyzed in a similar way to SJC PC1. By explaining 44.95 % of the original data, this is able to describe O_3 (0.916), T (0.872), PC (-0.822), WS (0.738) and SR (0.715), on the basis of the loading values. PC1 can thus be a measure of the air processed in the middle of the day, since this is the time when there are the highest values of diurnal tropospheric, characterized by an increase in local T and SR, and directly related to secondary aerosol production. GRT showed a greater relationship with WS and SR than the town of SJC and may be related to the location of the station, which is close to a green area, and free from being shaded by buildings. This allows a greater air circulation and hence leads to a greater concentration of secondary pollutants caused by traffic fumes.

The PC2 loading values suggest that there is an inverse relationship between P (-0.773) and NO (0.533) and NO_2 (0.546). PC2 tends to describe the behavior of the night period, when a) pressure values are higher (lower absolute values), b) the values of NO and NO_2 are still high due to the night conversion and c) O_3 (-0.153) is close to zero and shows no influence. PC3 describes an inverse relationship with the WD (-0.675) and is not directly related to any other variable.

The year of 2019 was a normal year (Fig. 6c1 and Table SM3), and there were no strikes or stoppages during the study period. SJC PCs can be analyzed in an analogous way to 2018. SJC PC1 explains 41.62 % of the original data. In addition to this, there are O_3 (0.902), T (0.828) and RH (-0.885), which are the highest loading values. PC1 is also influenced by WS (0.639) and SR (0.668). PC1 can be considered as representing the components throughout the day. The values are close to the results obtained for the year 2018.

The loading values for the PCJ of SJC suggest there is a relationship between the P (-0.652) and the pollutants NO (0.436) and NO_2 (0.728). The negative P loading value at PC2, shows the inverse relationship that this variable has regarding the others mentioned. PC2 describes the behavior of NO and NO_2, while O_3 (-0.097) tends towards 0 without any strong influence. PC2 can thus be the

description of the nighttime behavior of the atmosphere. This is the time when O_3 tends towards the lowest values because of the absence of sunlight and reduces the photolysis process; in addition, the atmospheric boundary layer is lower and more stable, as well as having a higher P owing to the lower T. The higher P values maintain the steady state of the atmosphere that is better suited to local pollution levels, whereas lower P values lead to the circulation of the atmosphere and allows dissipation from traffic fumes.

When the SJC PC3 is analyzed, the greatest influence is the wind direction (0.879), which might suggest there is possible pollution from traffic in other localities.

GRT PC1 explains 41.58 %of the original data and the highest loading values are divided between O_3 (0.931), T (0.882) and RH (-0.906). Likewise, PC1 can be regarded as a measure of processed air throughout the day or the times when O_3 concentrations are highest, which are closely related to SR (0.680), T and RH. Unlike 2018, the wind speed did not show loading values above 0.5 in 2019, or a clear relationship with other variables.

The loading values GRT PC2 suggest that there was an inverse relationship between P (-0.612) and the NO_2 (0.703) and NO (0.513) pollutants. PC2 generally describes the behavior of NO and NO_2, since O_3 loading (-0.057) tends towards zero. PC2 can thus be considered to be the description of nocturnal behavior, a time when there are lower ozone values owing to the lack of sunlight and higher P values (i.e. lower absolute values). However, these relationships show less intensity than those in 2018, when the loading values are compared.

PC3 has an inverse relationship to the WD (-0.797), as previously described, and does not have a close relationship with the other components, in light of the other loading values.

SJC PC1 for 2020 (Figure 6d1 and Table SM4) explains 51.18 %of the original data and is largely a measure of O_3 (0.900), T (0.949) and RH (-0.905). In the same way as for 2018 and 2019, the PC1 can be regarded as a measure of the air processed during the day and in the same way as in

2018, SR (0.639) and WS (0.666) play a key role in the concentrations of compounds in the atmosphere.

The loading values for SJC PC2 suggest the WD (0.736) had a strong influence, which it may be possible to attribute to the lower loading values than in previous years of NO (0.478) and NO_2 (-0.262), as well as the entrance of clean air to the region, which has a dissipating effect.

GRT PC1 explains 30.44 % and on the basis of the loading values of the original data, it describes O_3 (0.855), T (0.690), RH (-0.860) and SR (0.556). The GRT PC1 for 2020, in a similar way to other years, can also be regarded as a measurement of the air processed during the day, when the highest O_3 concentrations occur, which is related to photolysis, T rise and lower P values (i.e. the highest absolute value).

The loading values for GRT PC2 suggest there was a relationship between WS (0.669), NO (0.717) and NO_2 (0.573). PC2 describes the transport behavior of NO and NO_2 caused by the wind speed.

The relationship of the high P loading value (0.608) for GRT PC3 has not yet been described by PC1 and PC2.