We thank reviewer 1 and 2 for their constructive comments. Their suggestions have been incorporated in a revised version. Our detailed response to their comments is listed below.

Reviewer 1

General comment:

In the process of re-calculating the relative reduction of traffic counts we discovered a minor (inconsequential) error, by erroneously double counting heavy traffic vehicles. This causes changes of the relative reduction of traffic being slightly higher (i.e. changing from -61% to -64%). As a consequence the relative contribution of traffic vs RCP also slightly changed, but the overall results remain within our previously estimated confidence levels. We now find that traffic reductions accounted for 94% of the observed reductions of NOx fluxes.

Specific comments:

Reviewer 1 comment 1: The methods section is very short. I realize that the instrumental techniques are largely described elsewhere but I feel the readers of this ACP paper would benefit from a more enhanced description. Two things really stand out as missing. Firstly there is no mention of how NO2 is converted to NO for measurement in the 2 channel chemiluminescence instrument. There should be at least a brief description of the type of converter and discussion of any potential interferences. Secondly, there is no discussion of the uncertainty of the NOx, CO2 or NMHC measurement. Please could the authors add a short discussion on this?

Reply: We expanded the experimental section, moved parts of the information contained in the SI to the main manuscript and elaborate on the conversion issue and uncertainties. Briefly, the converter for NO2 was Molybdenum with a 98% efficiency. We recognize that there can be interferences from NOy when using Molybdenum converters, but we have previously assessed this by comparing with a direct NO2 method based on cavity ring down spectroscopy. In accordance with other studies we found that the two methods agreed well to within 6% for Innsbruck, suggesting the interference being small in an urban setting. Since our results mainly focus on NOx we consider the chemiluminescence measurement method robust. Errors arising from analytical uncertainty mainly stem from calibration procedures. For NMVOC these are estimated as 10% for aromatic NMVOC compounds based on a calibration standard (Apel & Riemer, USA), similarly the uncertainty of NO_x is 2%, and for CO_2 5%, respectively.

Reviewer 1 comment 2: There is also very little discussion of the eddy covariance flux methodology. Again I realize this is discussed at length in other publications, however I feel there are certain things specific to this study that should be described. For example, what filtering methods were used, how much of the data passed the filtering, did this cause any bias, were any corrections made for flux storage? Also, some mention should be made of the uncertainty of the calculated fluxes and how this carries through to the final results.

Reply: We expanded the section on the eddy covariance method and its uncertainties as suggested. In addition to raw data filters, we applied standard criteria using u* and the stationarity criterion for all species. We specifically do not apply tests on integral turbulence as parameterizations for urban areas are not available/accurate. It is noted that the urban heat island helps to prevent extremely stable conditions (even at night time). After applying the above mentioned filters 73% of the data were used for the training dataset, and 82% of the data were used for the intervention period. We have looked at storage terms, as an example for NOx and CO2 fluxes we find these are on the order of 5-7 % on average and therefore consider these minor for our analysis. The main advantage of our method is, that it is a relative method. That means that we do not necessarily only rely on absolute flux comparisons. As such the bias with and without criteria is mainly determined by the robustness of the regression model fit, which to the largest extent relies on the number of data used for the model training.

Reviewer 1 comment 3: On line 267 it is stated that average traffic loads in Innsbruck decreased by 60%. Could the authors provide more detail on this number? For example how was it measured? Is there any information on the change of fleet composition?

Reply: We thank the reviewer for this comment and re-examined the traffic data. We rely on a traffic count station along Innrain, a main street dissecting our flux tower footprint, which should be representative for traffic activity within the flux footprint. Traffic count data are measured using an inductive loop in both directions of the traffic flow. There is rudimentary information on light vs heavy duty vehicles available, and we recalculated the respective contributions. In this process we found a minor error in our previous analysis, where we double counted heavy vehicles. The overall reduction in traffic (all vehicles) is 64% vs previously 61%. The traffic data allow partitioning traffic into ‘all vehicles’, ‘truck-similar vehicles’, ‘HDV’ and ‘semi trailer trucks’. The reductions were 64% (all vehicles), 40% (truck-similar vehicles), 35% (HDV) and 21% (semi trailer trucks). Since it is an inner-city location the fraction of passenger cars dominate. In absolute numbers, the distribution is dominated by passenger cars amounting to 95% of all traffic, with the remainder attributed to the truck categories. Due to the low contribution of heavy vehicles it is hard to tease out any conclusion on this vehicle class. We added the above discussion to the manuscript.

Reviewer 1 comment 4: From 301, there is a discussion on the changes in time spent in residential 20% increase) and commercial / public sector (30% decrease) buildings. Could the authors expand this discussion to take into account how each of these sectors is heated. My thought would be that the residential sector is largely heated by biomass burning (either natural gas or solid fuels), whereas the commercial and public buildings are largely heated by electricity. Is this correct for Innsbruck and if so how does this split affect the findings.

Reply: Official inventory data apportion energy need in residential and ‘other’. The relative contributions to the energy mix for heating in these two broad categories are comparable. The residential energy supply for heating is comprised of 9% district heating, 34% oil, 34% natural gas, 16 % biomass, 6 % electricity and the remainder (1%) attributed to alternative energy. Since many commercial buildings (e.g. shops, restaurants, retail) are not clearly separable from residential buildings in European cities (e.g. upper floors are used for housing and ground floor houses shops or restaurants), it is hard to separate these in the urban core. The category ‘other’ (i.e. everything else) is comprised of 4% district heating, 37% oil, 42% gas, 11% biomass, 4% electricity, and the remainder (2%) attributed to alternative energy. As such heating by electricity plays a minor role. Due to the expansion of natural gas supply, electricity has not seen a huge growth in Innsbruck yet.

Reviewer 1 comment 5: add Squires et al., ACP, 2020.

Reply: ok we added the reference and fixed line 88.

Reviewer 2:

Reviewer 2 Comment 1: I would like to suggest to include information described in the supplementary section to the main text for readability. Particularly, the discussion about the flux footprint and what emission sources are distributed in the foot print is critical to evaluate the quantitative discussion on the emission reductions from different sectors.

Reply: We extended the discussion on flux footprint and emission sources with a particular focus on the different sectors. We also added more detailed figures of the flux footprint and landcover (as SI). For example sectoral analysis shows that buildings and roads account for 70-88% of the surface area, with slight differences between the east and west sectors. We have also expanded the discussion on energy use and moved parts of the flux description to the main manuscript. We added a discussion how the emission inventory was processed and included a more detailed summary of energy sources in the RCP sector. For example, heating energy supply in the RCP sector is comprised of district heating (8.7%), oil (34.5%), natural gas (34%), biomass (16%), electricity (6.1%), and alternative sources (0.7%).