I thank this reviewer for time and effort.

This manuscript presents review challenges. Sensors different to 'normal', deployed on a bicycle, potentially relevant across (at minimum) engineering (e.g. pavement durability), climate (causes and prevalence of urban heat islands/archipelagoes), hydrology (altered run-off), ecology (vegetation, migration corridors), etc. Reviewer wants consistency in uncertainty terms? Within topic (e.g. atmospheric temperature) I cite clear sensor uncertainties, list explicit correlation coefficients, include data sheets that allow readers make their own checks, and - for field checks - report as many intercomparisons as possible. If reviewer knows or prefers a different approach, one that covers temperature, lux, %, etc., I would gladly hear it.

Reviewer's comment about distance to standard weather station data: "In general, if a station is more than 10 miles or 100 feet different in elevation from the target location it is not considered a comparable record" provides neither assistance nor guidance. Can reviewer provide valid calibrated available data to back up this 'rule of thumb'? Data from NOAA's Climate Reference Network (check description and map), as used here, adhere to quality rather than artificial distance-based rules.. Weather services deserve enormous credit for maintaining reliable data sources amidst constant land use change (multilane highways, neighboring hotels, train stations, vast parking lots, runways, terminal buildings, constant traffic, nearby water, etc. If we adopted reviewer's 'rule-of'-thumb' qualification, we would relegate most regions, particularly mountain regions, of our world as data voids? To specify distance boundaries without citation or validation of source seems not helpful.

Reviewer apparently prefers less detail, discounts local sources, but wants more general discussion around uses of weather station data? Confusing. In any case: not appropriate topics for ESSD publication? I challenge reviewer to generate a second source that matches CRN data as well as match displayed in Fig 10 (Figure references refer to revised manuscript).

I likewise question reviewer's assertion that other better methods exist, even if one focuses solely on air temperatures. Drones, at least those that I know, generally require modification (at cost of additional weight) to measure air or pavement temperatures and operate within tight battery (15-20 minute) and weight limits; they seem unlikely to work in places or on patterns that bicycles can achieve. If reviewer knows alternate technology by which to observe and report underlying temperatures at better than 5 m

resolution, by which to take valid calibrated measurements across various surfaces, under vegetation canopies, along streams or across grasslands, at many times of day and in many seasons, free of flow distortion, I welcome suggestions! Manuscript as submitted addresses current satellite resolution (less than presented here by at least factors of 2) but, intentionally, did not call out very poor satellite overpass (repeat) patterns which themselves limit local application (Section 4). One hopes that bicycle sensor wavelengths and measurement patterns eventually match satellite verification needs. Very local GPS discrepancies (mis-registrations?), as exposed here, might offer a mutual challenge? Referee offers no discussion of GPS issues.

Reviewer suggests specially-constructed sites in "laboratory setting that provides an environment that could be controlled for wind, lighting, humidity, and other ambient atmospheric conditions,". . . Pomeranz et al. (2000, cited, working from US EPA and DoE funding), looked at pavement albedo at local sites around LBNL. They say upfront that albedo played almost no role in observed daily (two data points, both around 50C) surface measurements. They found no reliable relationship between albedo and pavement age. They converged, using observations (collected entirely on single sunny afternoon) plus models, on maximum albedo-induced surface heating of 0.6C over realistic range of pavement albedos. Too small to have serious impact on surface temperatures as reported here; they have never, to my knowledge, published data nor follow-up. A group at Arizona State University built an enviable fixed site array consisting of multiple surface plots covered by decent instrumentation but, again, published no data. WIll data offered in this manuscript stand up to scrutiny by those or other investigators? Reviewer mentions apparent mismatch recorded by these data and typical UHI (sun-warmed pavement heats overlying atmosphere) assumptions but assigns difference to wind or relative humidities. I include RH values in every file; with no apparent relation to any other variable. Users can check this assumption (e.g. Figure 15) or explore alternate hypotheses. Like most bicyclists I 'feel' wind (ahead, from either side, or behind), mostly its extreme variability. After several hundred rides at all times of day and in all seasons, exposed and oriented in all directions, I sincerely doubt any influence of local winds; users can - with my cautions - make their own explorations (as described in legend for Fig 2). Because disconnect between pavement heating (often 25C, occasionally 30C, warmer than air in summer, colder than adjacent atmosphere by ~14C in winter) and overlying air temperature represents a provocative feature of these data, lack of attention by this reviewer proves disappointing. What do we miss? Wider deeper roads? Sub-surface infrastructure? Buildings, parking lots,

vehicles? Larger expanses or abundance of any of these? Might these data prove valid and useful in raising such questions?

Many people would absolutely carry measurement systems on bikes; they invariably express curiosity and enthusiasm about my system. Bicyclists on campuses or in cities could, by modest efforts, achieve substantial improvements in understanding local surfaces, shade, daily heating, etc. Think of multiple bikes operating in multiple seasons in urban settings, sharing data. My bicycle-friendly proclivities contradict reviewer's pessimistic expectations. Cities devote substantial funds to bicycle infrastructure; each bike trip represents a success. How might bikes, e-bikes or E-scooters impact pavements, traffic and measurements? What if E-scooters automatically reported pavement and local air temperatures at completion of each rental? Review provides minimal assistance. I prefer to focus on accolades: extensive, extremely detailed, easily reproduced, well documented. Exactly what we hoped for ESSD.

I de-emphasized particular bicycle; moved description to Appendix. Emphasized temperatures of surface pavements and relation to UHI effects. Added slightly to UHI and bicycle literature. Please remember that under my explicit filters (free open access, measure both air and surface temperatures, cover range of seasons and road/path conditions, validate to best of ability) very little prior work qualifies.

Thanks for perspective and good efforts.