Science Question
How accurate are US urban self-reported greenhouse gas inventories?
Is the accuracy sufficient to support existing policy pledges?
What would an alternative system/approach be?

Analysis
City boundaries were used to extract individual urban FF$CO_2$ emissions from Vulcan version 3.0. 48 US urban self-reported inventories (SRIs) were compared to Vulcan where SRI methods were documented and allowed for direct comparison. Sector differences were isolated where possible. A variety of difference statistics were calculated.

Results
1. The mean relative difference (RD) is +18.3% (Vulcan > SRI) with a mean absolute (unsigned) relative difference (MAD) of 29.1%
2. The summed difference across all 48 cities is 19,076,760 tC/year, a value nearly equivalent to the 2015 Massachusetts state emissions
3. The most common differences are related to SRI omission of petroleum fuel use and point source emissions in the industrial/commercial sector, different accounting perspectives on marine shipping and airborne emissions, and different methods in onroad emission estimation.

Significance
The bottom-up Vulcan approach combined with top-down atmospheric measurements offers a prototype system that could be scaled to provide every US city with a state-of-the-art monitoring and reporting information system.
This will save cities resources and allow them to focus on emissions mitigation policies.

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