



**KEEP
BRITAIN
TIDY.**



**PUTTING A STOP TO
SMOKING-RELATED LITTER
BASELINE LITTER SURVEY**

NOVEMBER 2022





NORTH AMERICA

EUROPE

ASIA

SOUTH AMERICA

AFRICA

AUSTRALIA

North Pacific Ocean

North Atlantic Ocean

South Pacific Ocean

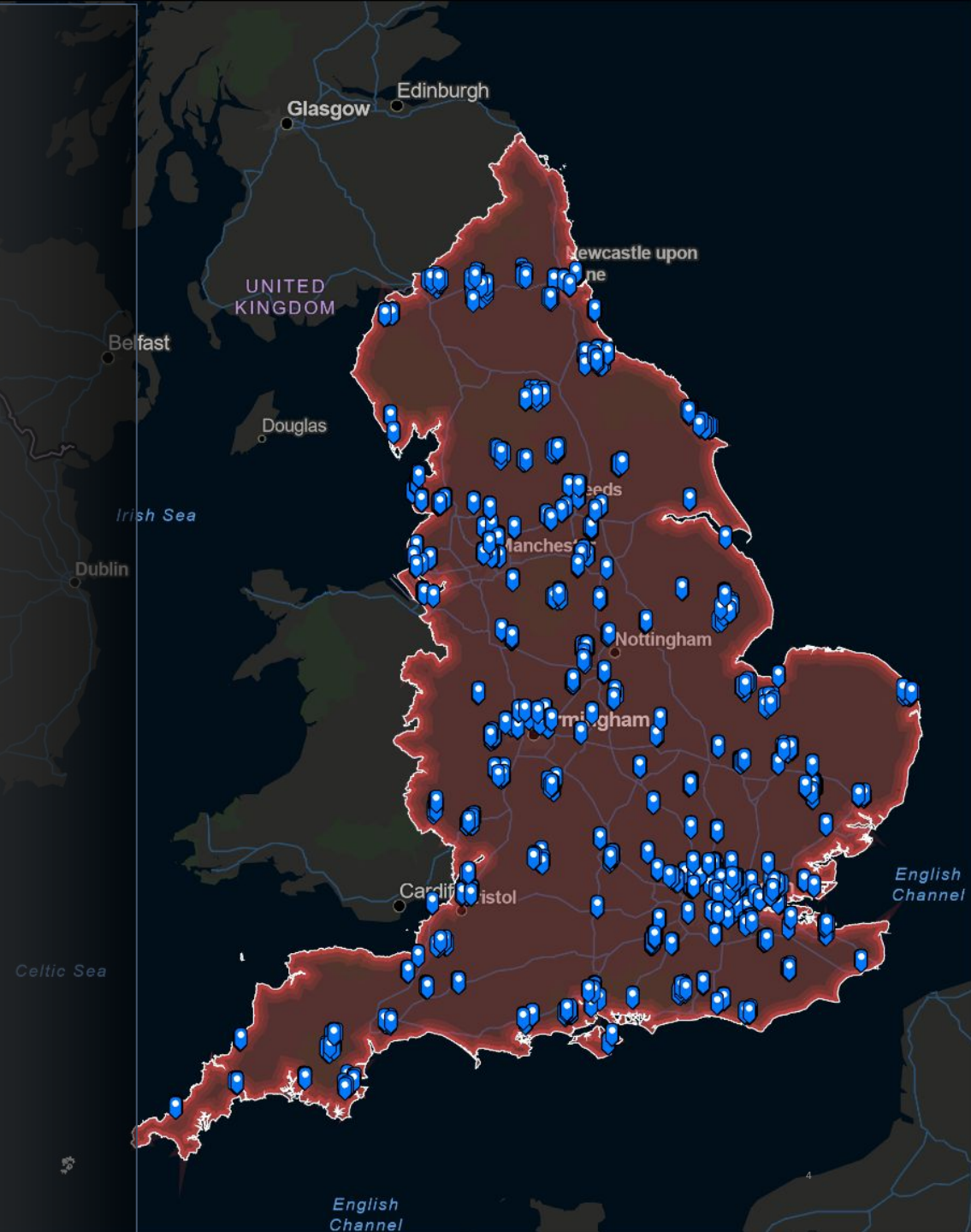
South Atlantic Ocean

Indian Ocean

3

Keep Britain Tidy
-
**Baseline Litter
Survey**

-
*England Update
November 2022*





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Executive summary

Keep Britain Tidy (KBT) is pursuing a national survey of **smoking related litter (SRL)** with the objective to create a baseline and an understanding of the relationship of SRL with people and places.

KBT and LITTERATI agreed on a sample of **248 Small Area Units (SAU)** across England.

The **Litterati App** was used to take **photos of litter** and a team of **Citizen Scientist Researchers (CSR)** recruited and trained locally. The researchers, using the App on their smartphones, collected litter data at about 15 spatially balanced locations per SAU.

This report describes the research that was performed over the last three months, highlights **key statistics** (SRL per meter, weight and volume), and compares these statistics across different **Regions, Indices of Multiple Deprivation, Land Use Types, Rural** and **Urban** areas.

- On average, **a piece of smoking related litter was observed every 7 meters!**
- **Cigarette Butts** account for **98% of all SRL**.
- There are **2.4 million Cigarette Butts** littered along High Streets and nearby retail areas in England.
- **The highest rate** of SRL was found in North West England at **0.61 pieces of litter per meter**.

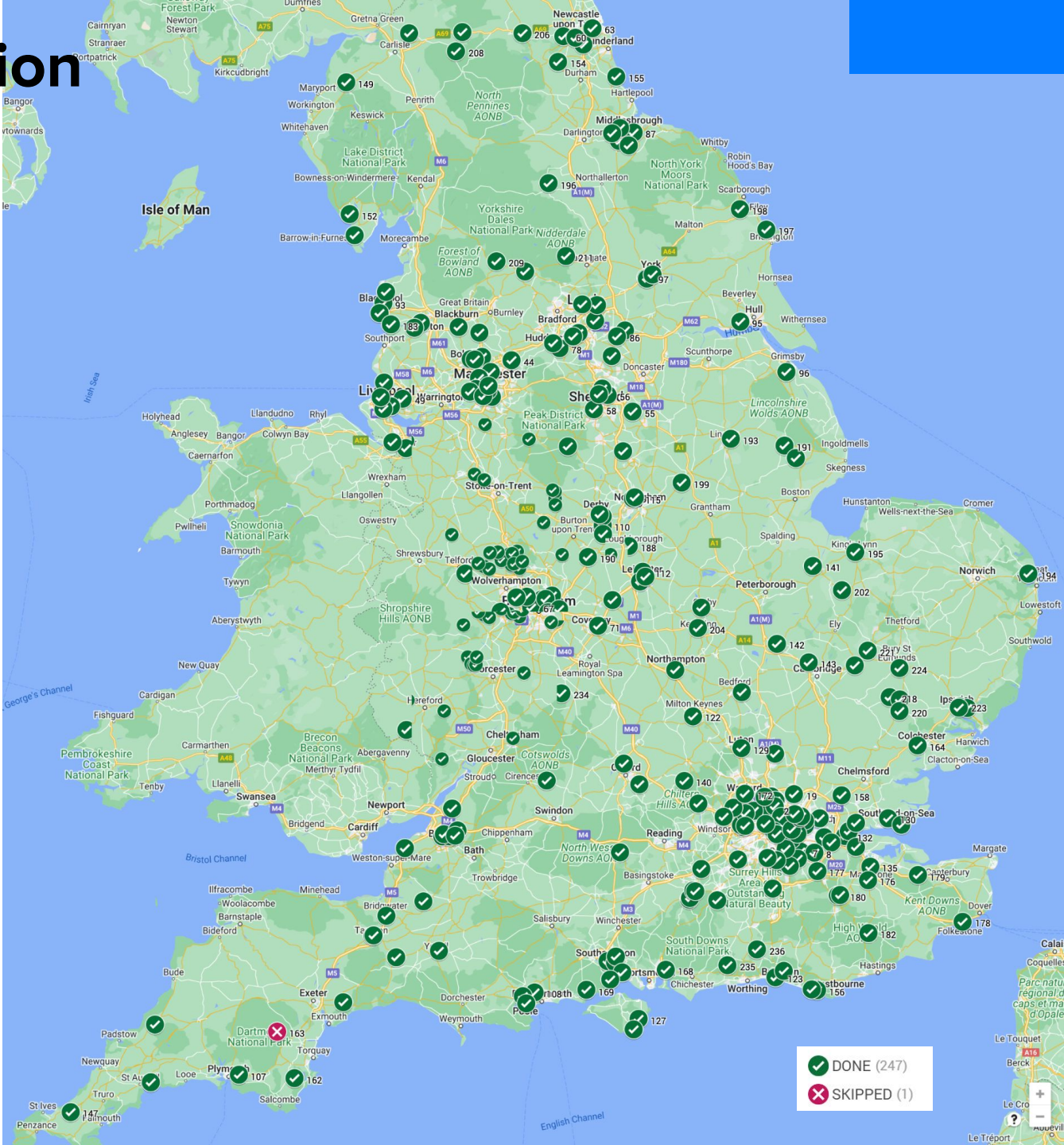
England SAU's research completion



NATION	SAU's Completed		SAU's Skipped		Total SAU's
England	247	99,6%	1	0.4%	248

HIGHLIGHTS

- 247/248 SAU's completed;
- 1 SAU skipped due to lack of network availability (Dartmoor National Park).



Results and Findings

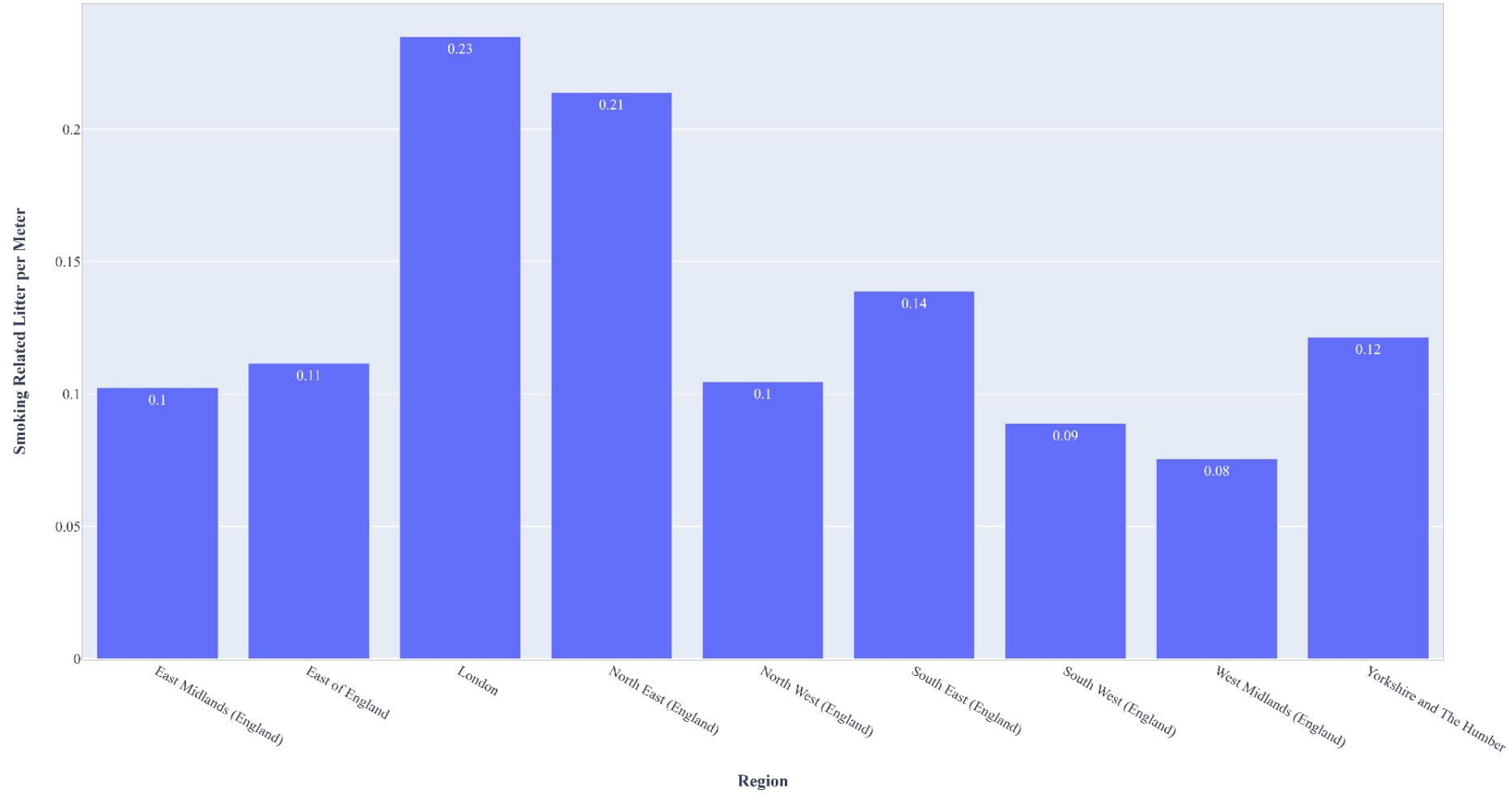
Smoking Related Litter in England: Key Descriptive Statistics*

- On average, there is a piece of smoking related litter every 7 meters!
- Cigarette Butts account for 98% of all Smoking Related Litter.

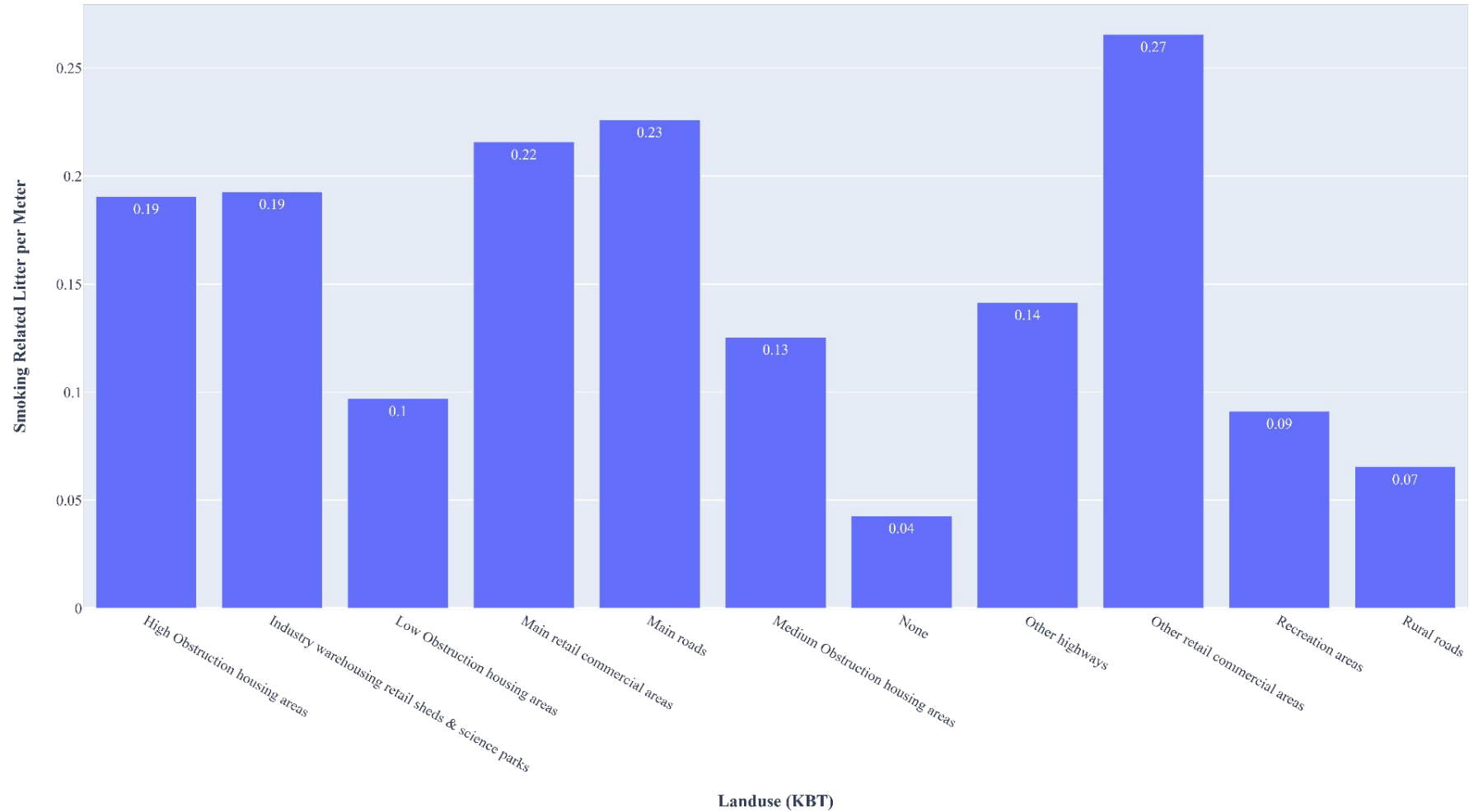
# Smoking Items per Meter	# Smoking Items	Weight (kilograms)	Volume (liters)
0.137	34,681	10.6	129

* Image Recognition @90%

Smoking Related Litter by Region



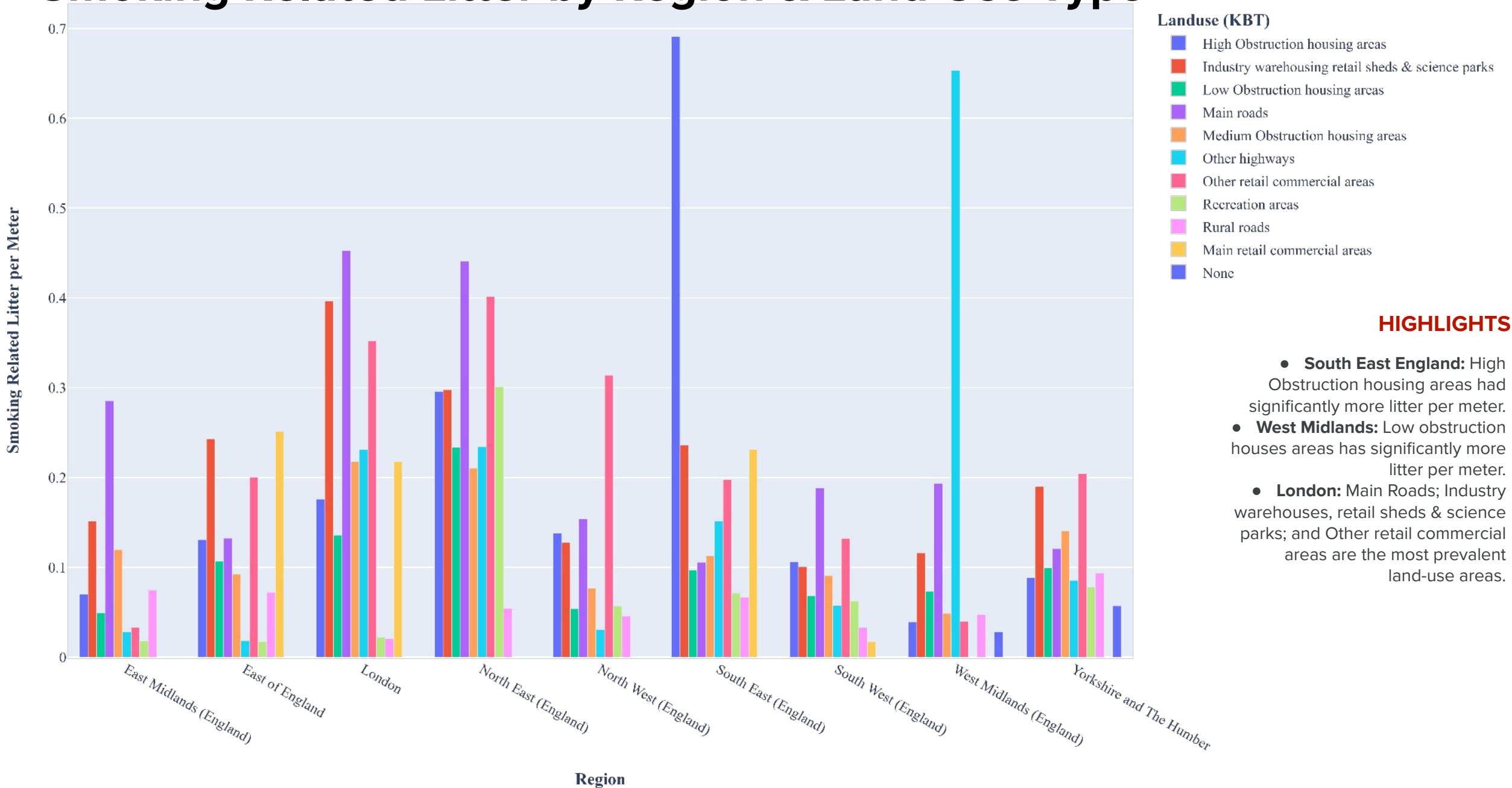
Smoking Related Litter by Land Use Type in England



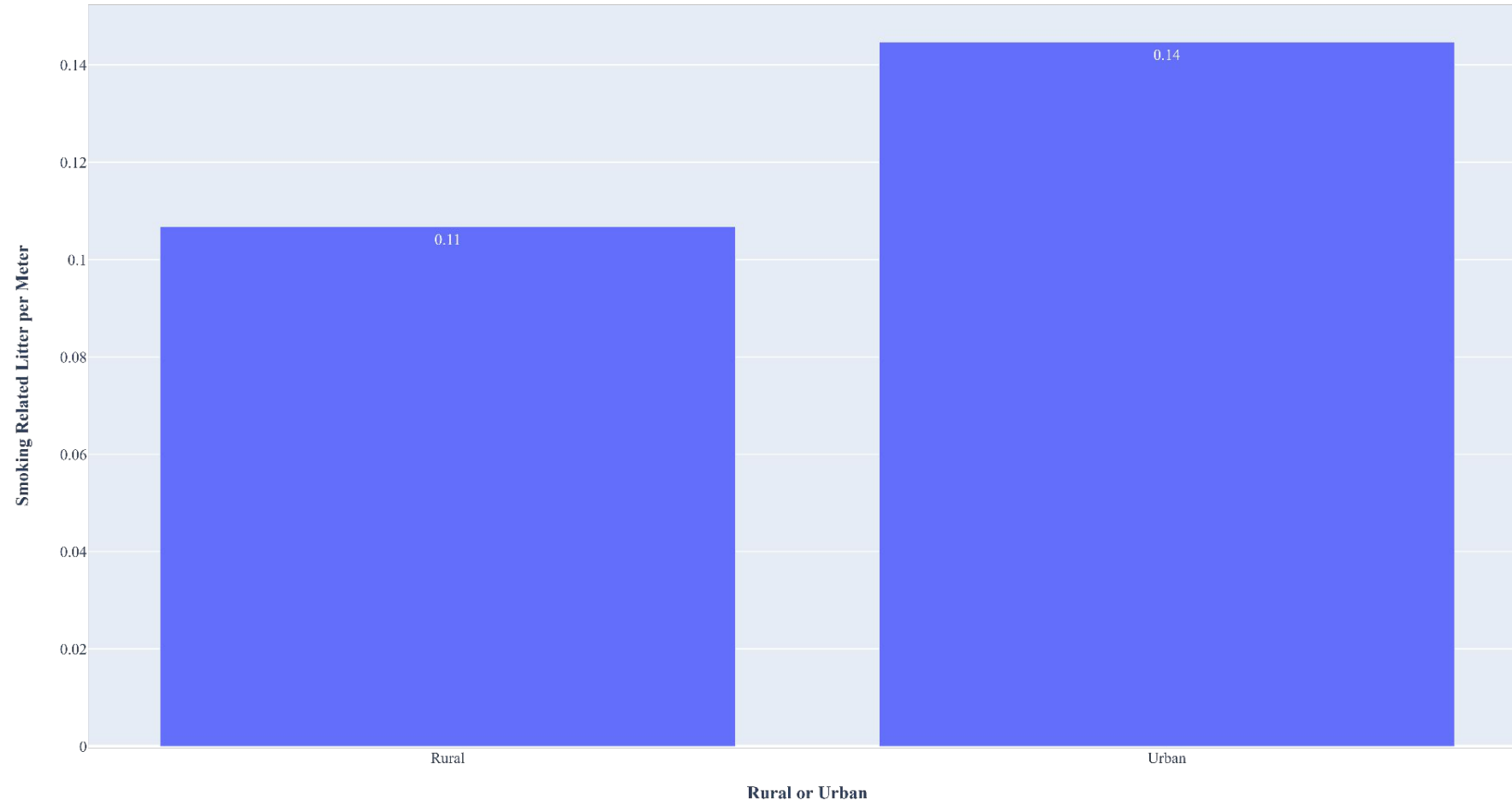
HIGHLIGHTS

A piece of SRL can be found every two meters along streets in these Urban Built Up Areas (Other Retail, Main Roads, and Main Retail, [link](#)).

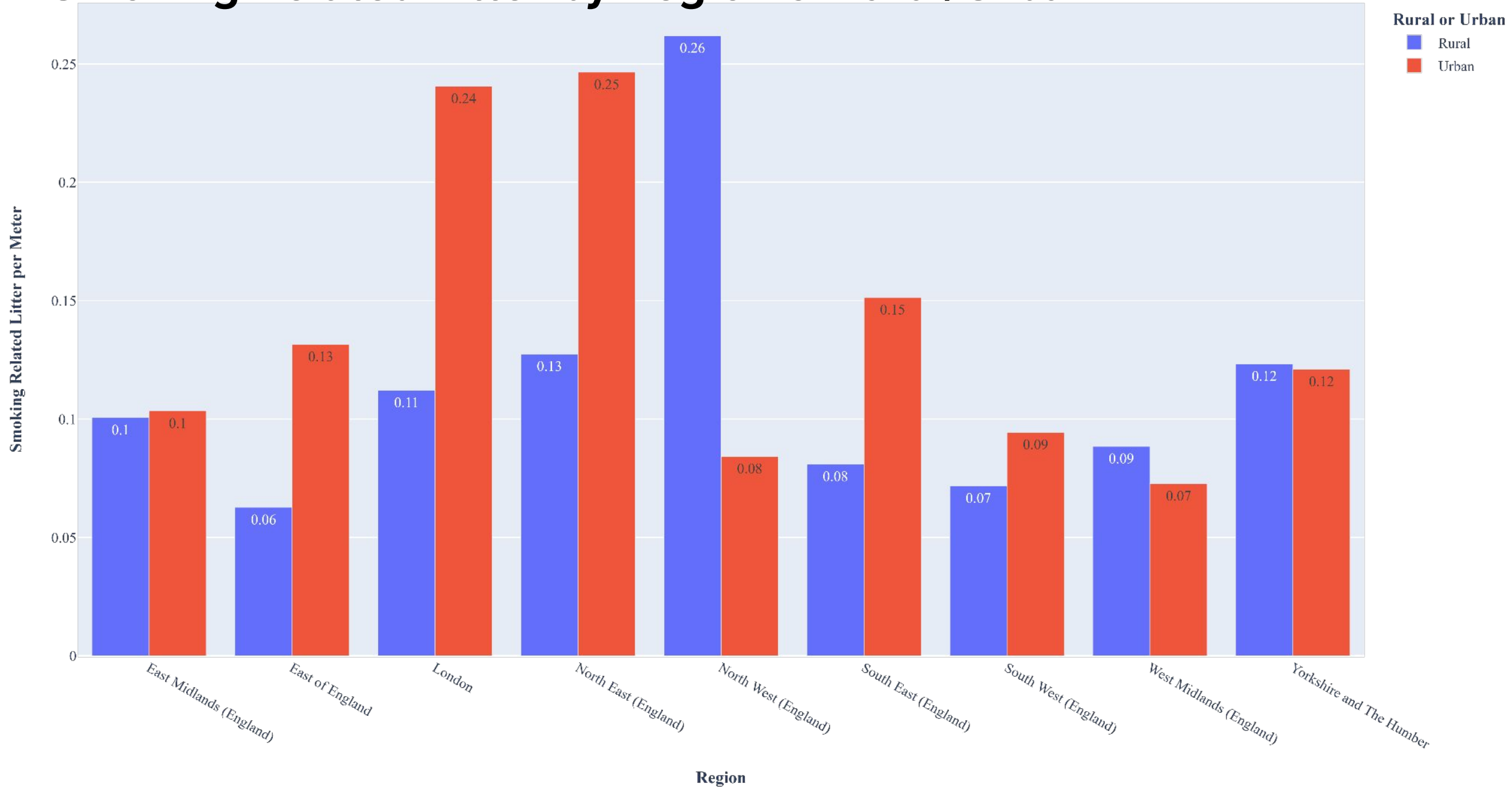
Smoking Related Litter by Region & Land Use Type*



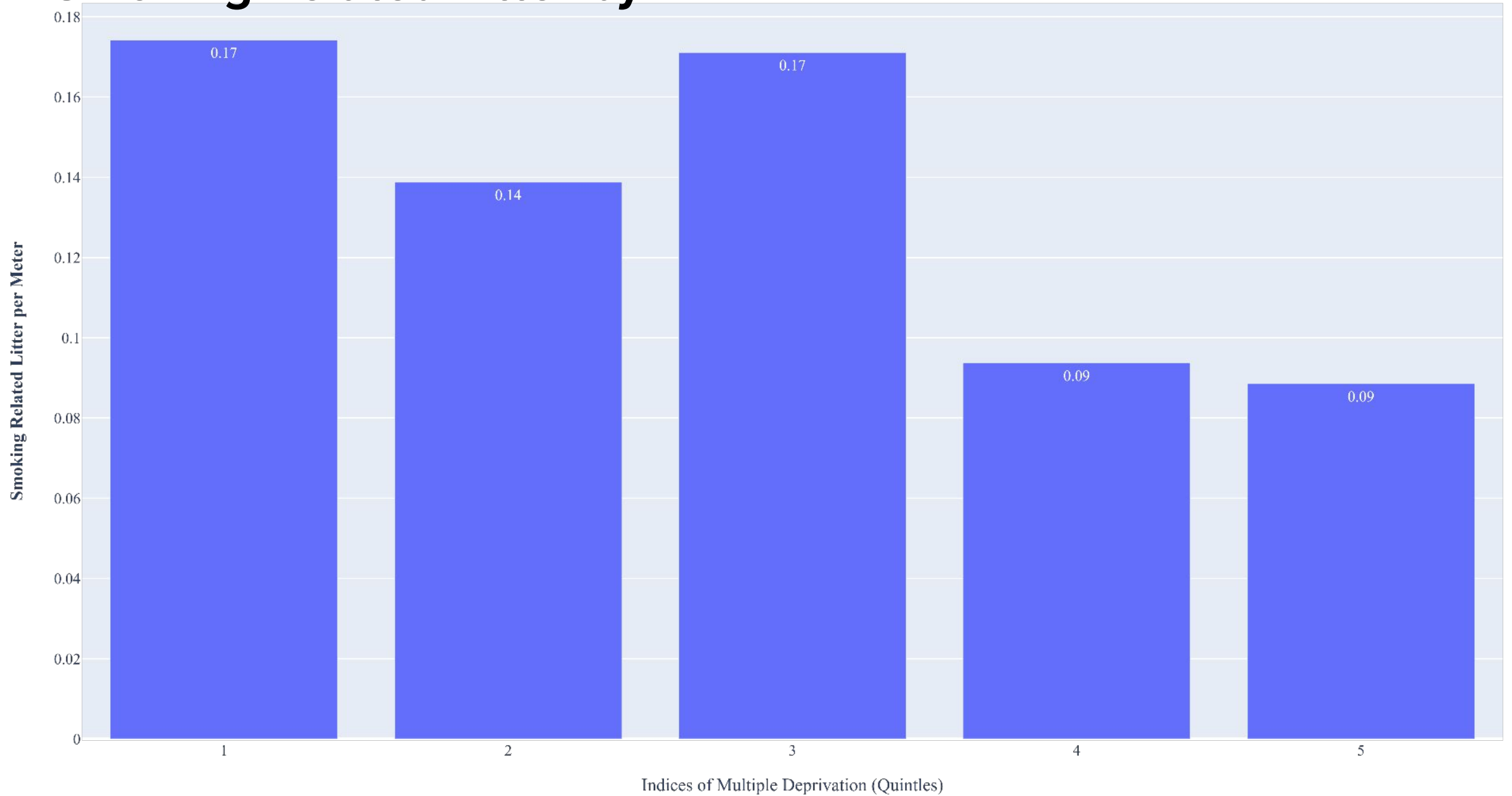
Smoking Related Litter by Rural/Urban



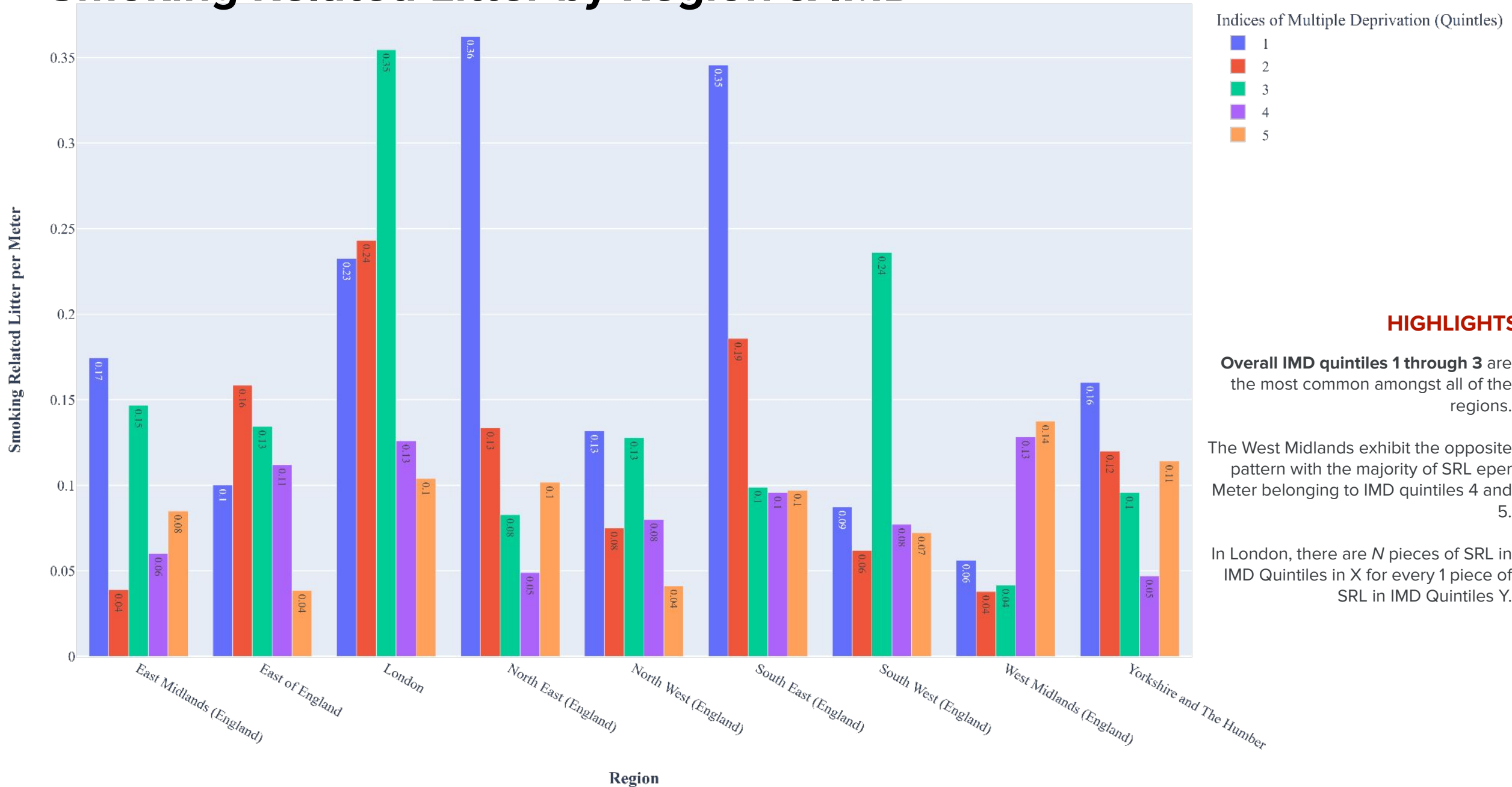
Smoking Related Litter by Region & Rural/Urban



Smoking Related Litter by IMD

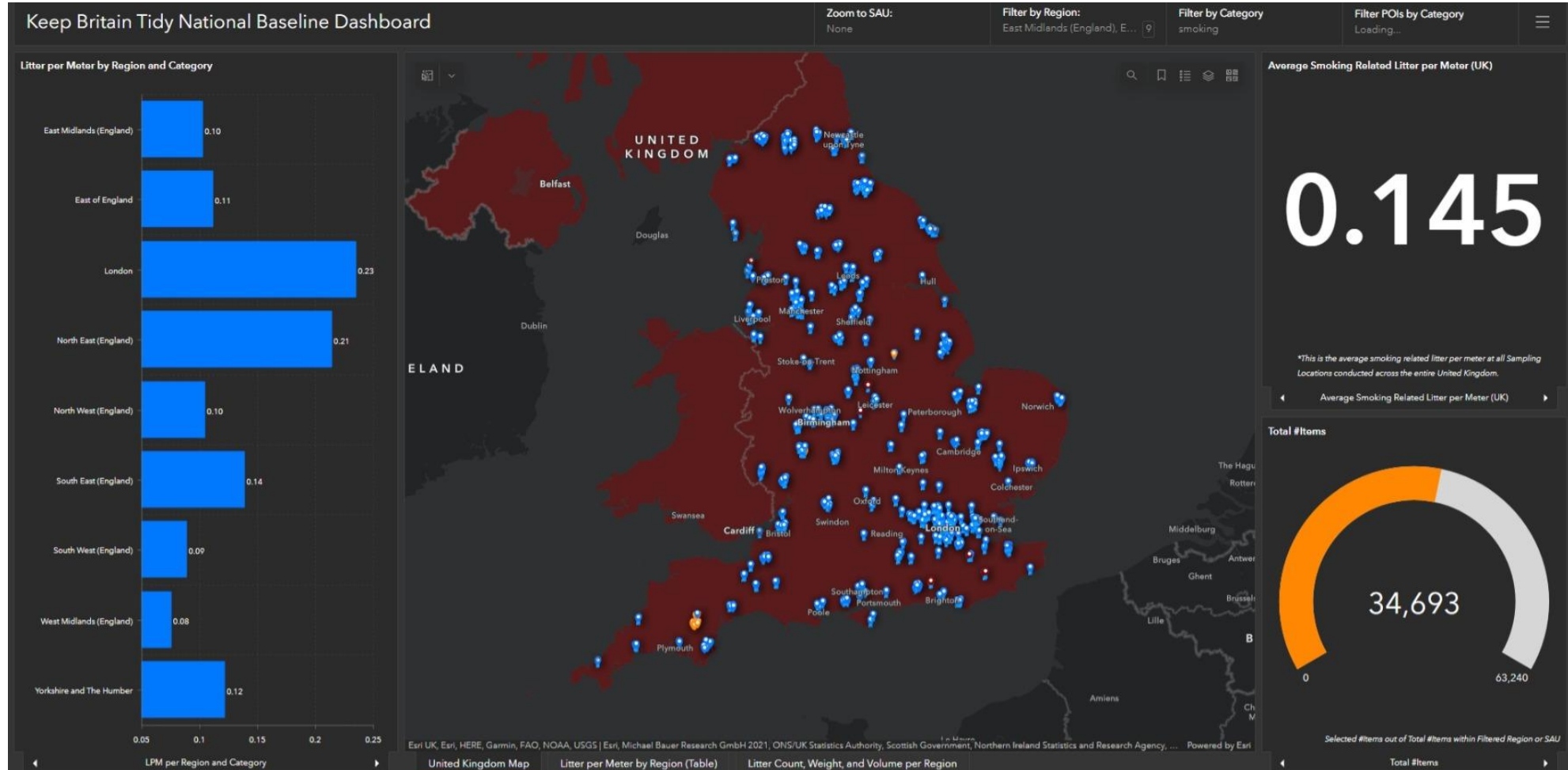


Smoking Related Litter by Region & IMD*



Insights & Dashboard

Keep Britain Tidy: National Baseline Dashboard



* View Additional Statistics (e.g, Litter per Meter by Rural/Urban) on the [KBT NBL - Dashboard](#).

HIGHLIGHT: There are 2.4 million Cigarette Butts littered along High Streets and nearby retail areas in England. (At any one time)



Find Point Clusters of at least 15 Retail/Restaurant POIs up to 150 meters apart using DBSCAN.

Calculate Average LPM of the 72 Sampling Locations within these Clusters: 0.42 pieces of litter per meter on the typical roadside.

Calculate Linear Meters of Roadway within these clusters: 2,851,001 meters.

- Note: It's pretty clear that this also includes minor roads that are located just off the high streets.

Estimate # SRL in England:

- Most roads in these commercial areas have two sides, it is therefore appropriate to multiply the result by 2.
- $0.42 \times 2,851,001 \text{ meters} = 1,197,420 \text{ Cigarette Butts}$
- $(0.42 \times 2,851,001 \text{ meters}) \times 2 = 2,394,840 \text{ Cigarette Butts}$

Estimate # SRL in High streets:

- On a typical high street expect to find between 168 to 420 SRL items.

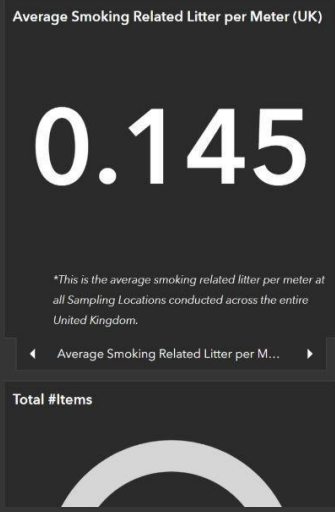
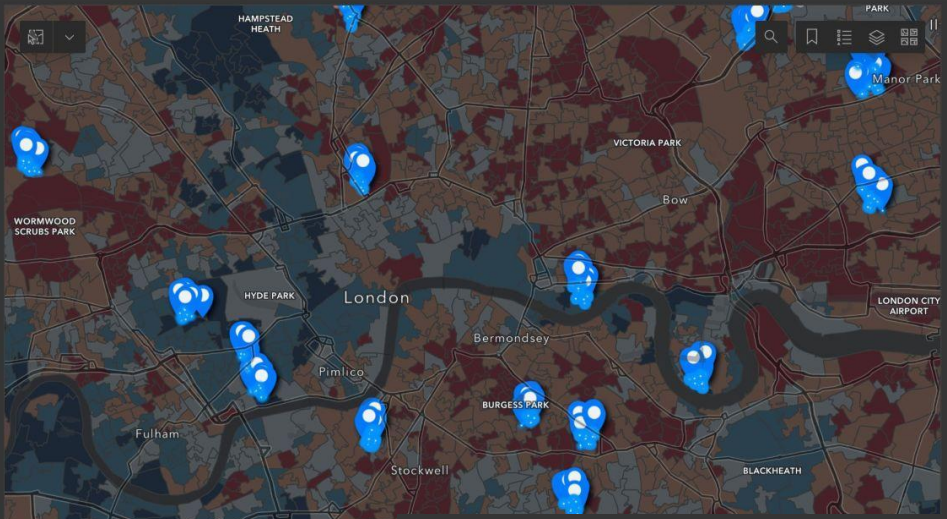
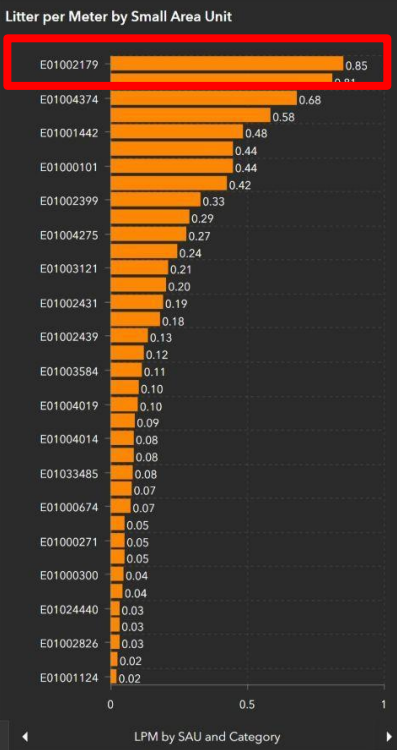
Keep Britain Tidy National Baseline Dashboard

Zoom to SAU: None

Filter by Region: London

Filter by Category: smoking

Filter POIs by Category: No category selected



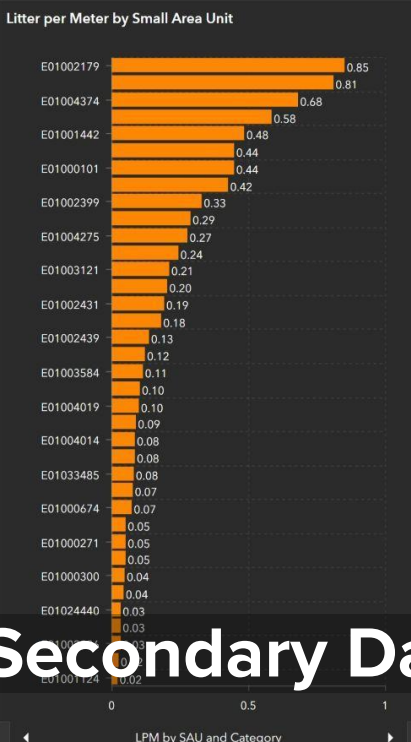
Keep Britain Tidy National Baseline Dashboard

Zoom to SAU: E01002179

Filter by Region: London

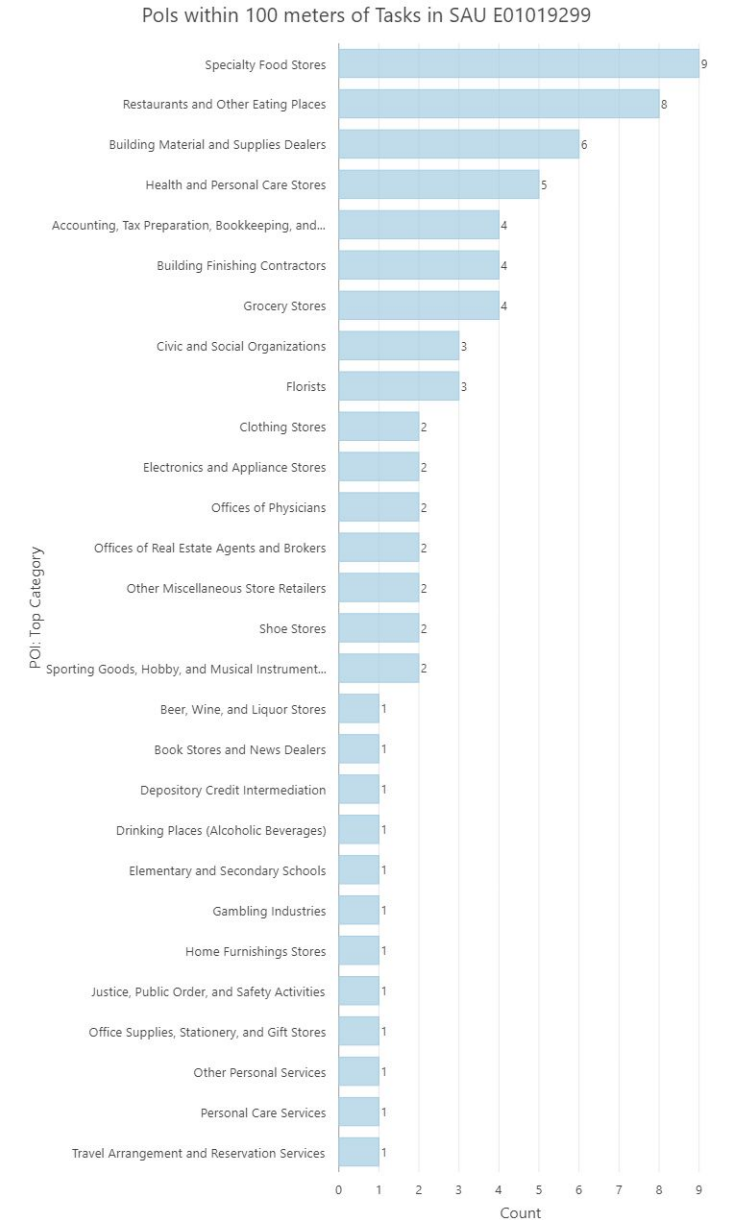
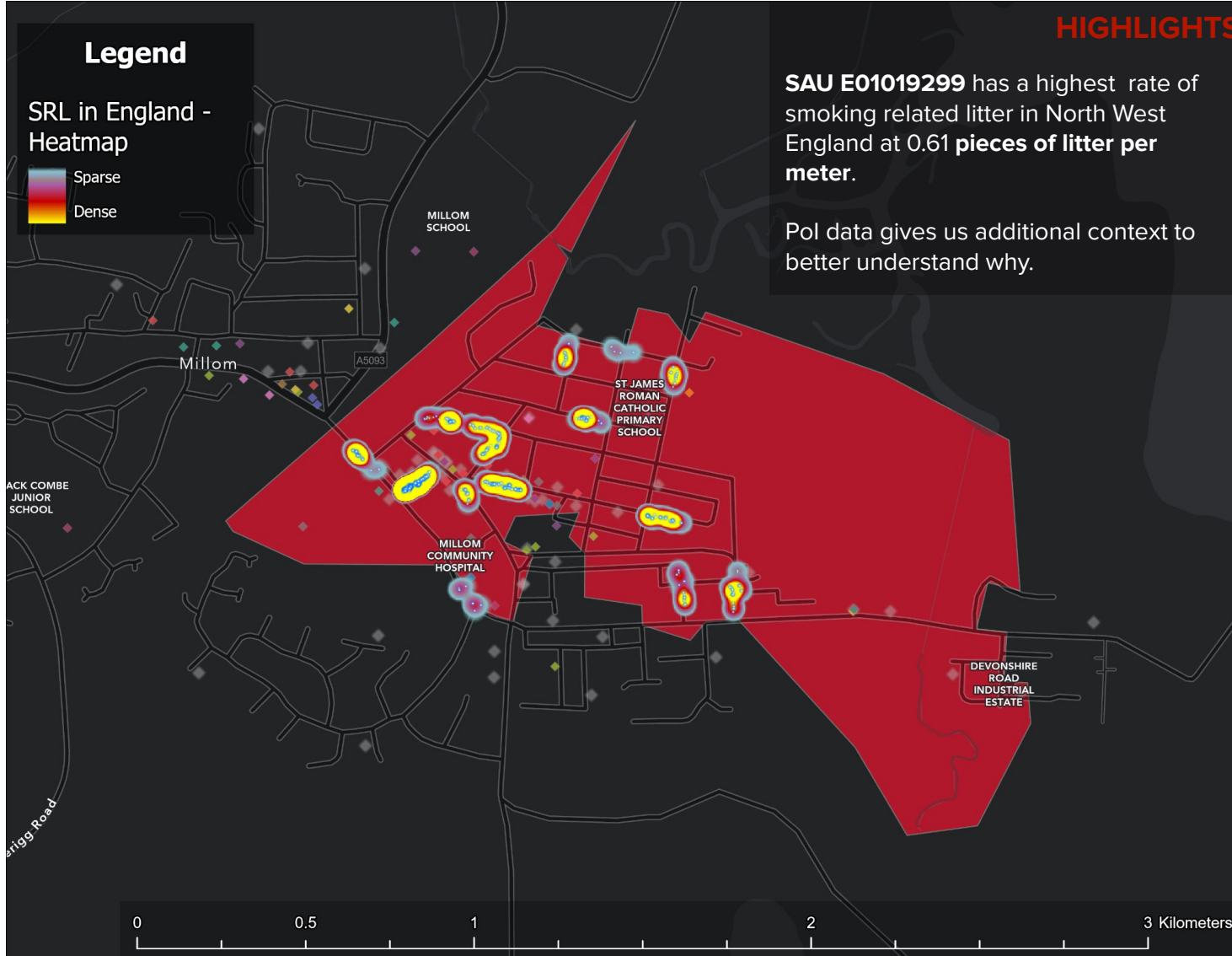
Filter by Category: smoking

Filter POIs by Category: No category selected

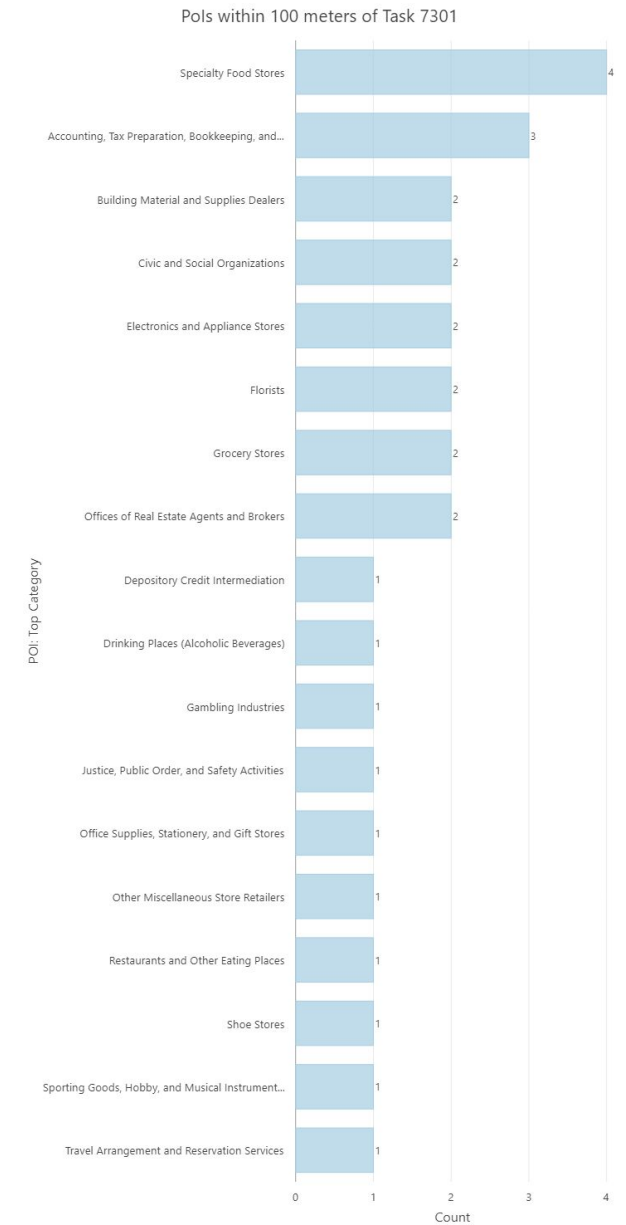
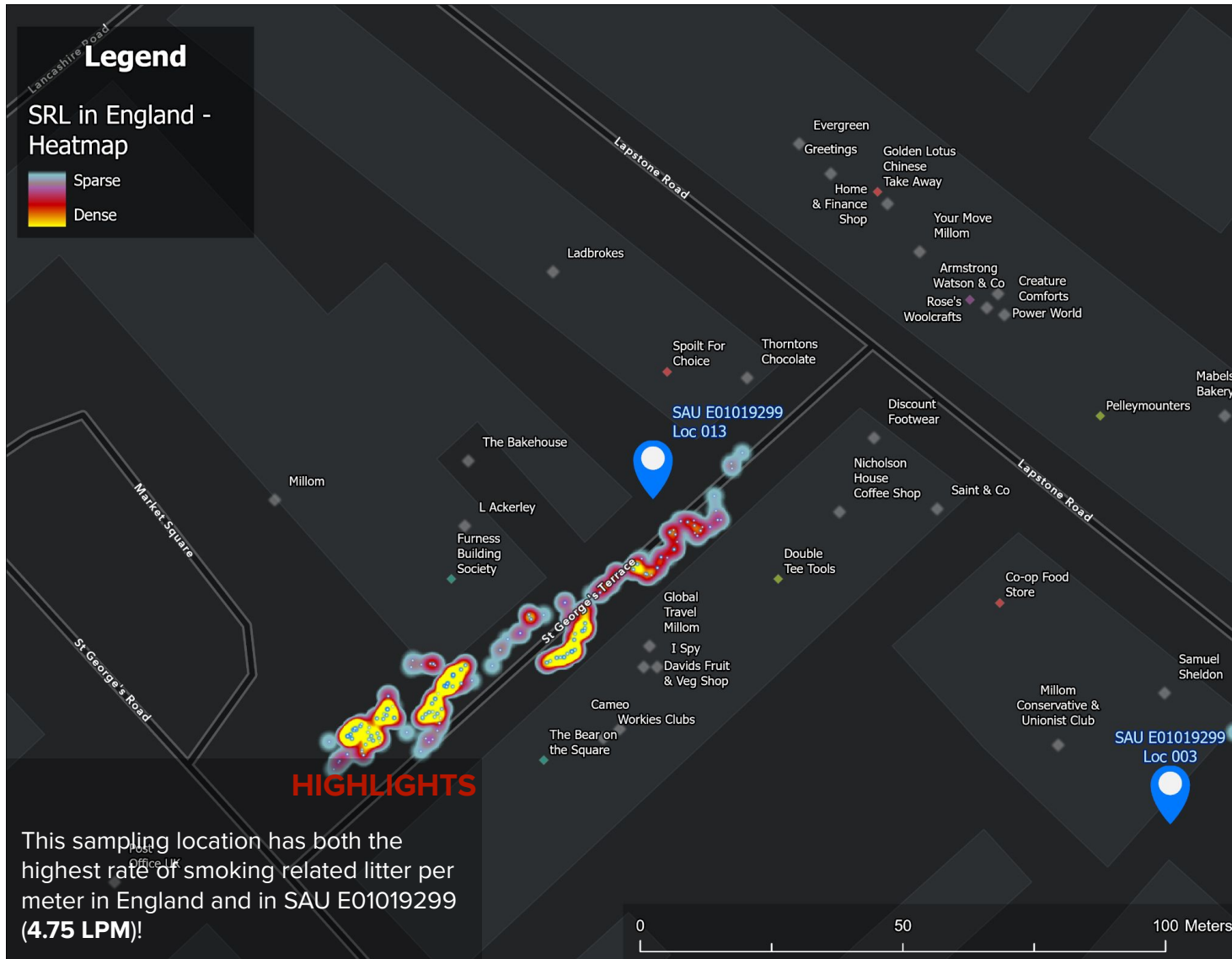


Explore Outliers and Secondary Datasets using the ArcGIS Dashboard

Pol Composition within 100 meters of Litter Hotspots



Pol Composition within 100 meters of Litter Hotspots



Appendix

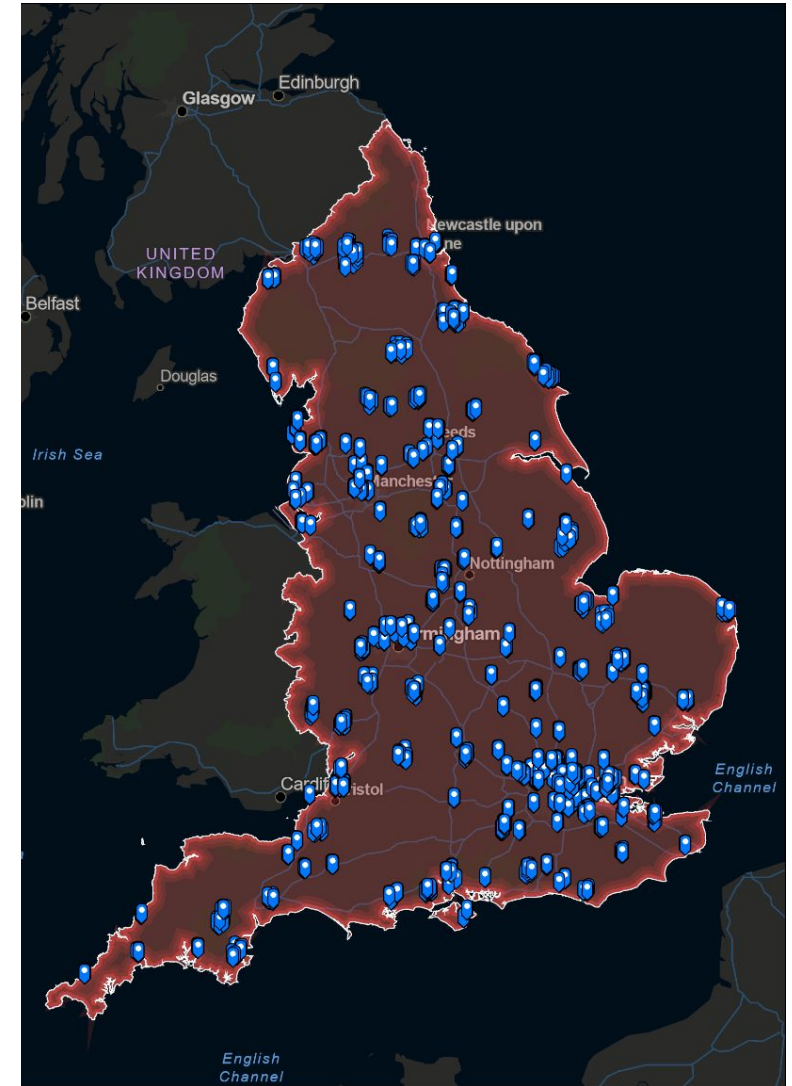
Context

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	ENGLAND
NUMBER OF SMALL AREA UNITS (SAU)	248



Project phases

Phase #1

Sampling Design

- a. SAUs selection
- b. Final survey locations

Phase #2

Research Execution

- a. Researchers Mobilisation
- b. Researchers Training
- c. Sampling Execution

Phase #3

Data Analysis & Reporting

- a. Data QA
- b. Data Analysis
- c. Interim Report
- d. Final Report

Research Task - Status Types

Assigned: The task has been assigned to a Researcher and will be made visible to them in the Litterati Mobile Application.

Submitted: The Researcher has completed the minimum number of required segments and has elected to submit those segments for review.

Accepted: The QA/QC Analyst has reviewed and approved enough segments associated with this task in order to approve it for inclusion in the final analysis.

Skipped: The Researcher has elected to skip a Task. This may happen if the Researcher determines that the location of the task is unsafe or otherwise inaccessible. For example:

- Locations in rural areas on highway or high traffic roads
- Locations in private areas
- Hostile behaviors towards the researcher

Segment/Transect definition

Main land use types



WE'VE GOT A
PLANET TO CLEAN

LIT[♦]T[♦]ERATI

JOIN US.



**KEEP
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