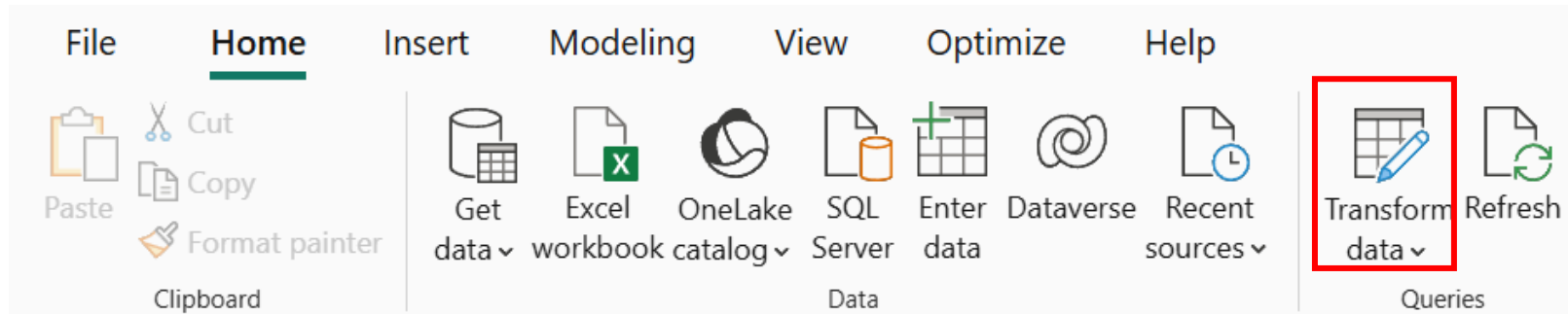
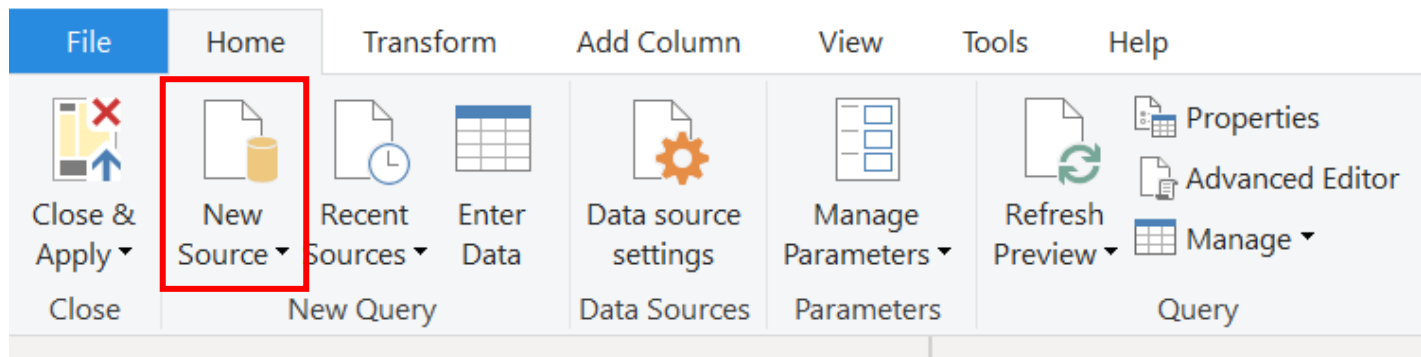


Appendix R: Example of mapping visualisation method (Microsoft Power BI)



New data source imported into Microsoft Power BI Power Query to cleanse and transform raw data.



New data source imported into Power Query as csv or Excel file as a new query.

Spatial Analysis - Where in the World is Western Sydney

FileHomeTransformAdd ColumnViewToolsHelp

New SourceRecent SourcesEnter DataData source settingsManage ParametersRefresh PreviewAdvanced EditorChoose ColumnsRemove ColumnsKeep RowsRemove RowsSortSplit ColumnGroup ByData Type: TextUse First Row as HeadersReplace ValuesMerge QueriesAppend QueriesCombine FilesText AnalyticsVisionAzure Machine Learning

CombineAI Insights

= Csv.Document(File.Contents("C:\Users\Gallahad\OneDrive - The University of Sydney (Students)\PLAN 9010 - 9011\Power BI\Data Sources\Qualtrics Data\Research Study_ _where in the

ABc Column1ABc Column2ABc Column3ABc Column4ABc Column5ABc Column6ABc Column7

1	StartDate	EndDate	Status	Progress	Duration (in seconds)	Finished	Recorded
2	Start Date	End Date	Response Type	Progress	Duration (in seconds)	Finished	Recorded
3	{"ImportId":"startDate","timeZone":"Australia/Canberra"}	{"ImportId":"endDate","timeZone":"Australia/Canberra"}	{"ImportId":"status"}	{"ImportId":"progress"}	{"ImportId":"duration"}	{"ImportId":"finished"}	{"ImportId":"recorded"}
4	2024-12-17 13:24:28	2024-12-17 13:27:50	Survey Preview	100	201	True	2024-12-17 13:27:50
5	2024-12-17 13:59:58	2024-12-17 14:02:32	IP Address	100	154	True	2024-12-17 14:02:32
6	2025-01-22 09:27:20	2025-01-22 09:42:37	IP Address	100	916	True	2025-01-22 09:42:37
7	2025-01-22 10:10:10	2025-01-22 11:42:54	IP Address	100	5564	True	2025-01-22 11:42:54
8	2025-01-30 11:39:04	2025-01-30 11:50:02	IP Address	100	657	True	2025-01-30 11:50:02
9	2025-01-30 11:40:17	2025-01-30 11:50:47	IP Address	100	630	True	2025-01-30 11:50:47
10	2025-01-30 11:36:44	2025-01-30 11:51:08	IP Address	100	863	True	2025-01-30 11:51:08
11	2025-01-31 16:56:22	2025-01-31 16:58:31	IP Address	100	129	True	2025-01-31 16:58:31
12	2025-01-31 22:34:44	2025-01-31 22:36:24	IP Address	100	100	True	2025-01-31 22:36:24
13	2025-01-31 22:33:13	2025-01-31 22:38:50	IP Address	100	336	True	2025-01-31 22:38:50
14	2025-02-01 15:05:30	2025-02-01 15:16:29	IP Address	100	658	True	2025-02-01 15:16:29
15	2025-02-01 15:10:04	2025-02-01 15:18:47	IP Address	100	523	True	2025-02-01 15:18:47
16	2025-02-01 15:08:45	2025-02-01 15:30:52	IP Address	100	1326	True	2025-02-01 15:30:52
17	2025-02-01 15:20:19	2025-02-01 15:37:43	IP Address	100	1043	True	2025-02-01 15:37:43
18	2025-02-01 15:54:14	2025-02-01 16:02:02	IP Address	100	467	True	2025-02-01 16:02:02
19	2025-02-01 15:51:58	2025-02-01 16:03:40	IP Address	100	702	True	2025-02-01 16:03:40
20	2025-02-01 17:06:27	2025-02-01 17:16:43	IP Address	100	615	True	2025-02-01 17:16:43
21	2025-02-01 21:38:28	2025-02-01 21:47:08	IP Address	100	519	True	2025-02-01 21:47:08
22	2025-02-01 23:25:17	2025-02-01 23:31:25	IP Address	100	367	True	2025-02-01 23:31:25
23	2025-02-02 09:04:56	2025-02-02 09:09:27	IP Address	100	270	True	2025-02-02 09:09:27
24	2025-02-02 09:55:40	2025-02-02 10:04:03	IP Address	100	503	True	2025-02-02 10:04:03
25	2025-02-02 11:19:30	2025-02-02 11:36:45	IP Address	100	1034	True	2025-02-02 11:36:45
26	2025-02-02 13:44:00	2025-02-02 13:53:24	IP Address	100	563	True	2025-02-02 13:53:24
27	2025-02-02 15:17:46	2025-02-02 15:27:19	IP Address	100	573	True	2025-02-02 15:27:19
28	2025-02-02 20:48:59	2025-02-02 21:01:24	IP Address	100	745	True	2025-02-02 21:01:24
29	2025-02-03 06:00:31	2025-02-03 06:08:44	IP Address	100	493	True	2025-02-03 06:08:44
30	2025-02-03 07:27:11	2025-02-03 07:39:22	IP Address	100	730	True	2025-02-03 07:39:22
31	2025-02-03 07:54:45	2025-02-03 08:04:40	IP Address	100	595	True	2025-02-03 08:04:40
32	2025-02-03 08:24:49	2025-02-03 08:29:32	IP Address	100	283	True	2025-02-03 08:29:32
33	2025-02-03 09:21:37	2025-02-03 09:58:47	IP Address	100	2229	True	2025-02-03 09:58:47
34	2025-02-03 09:05:02	2025-02-03 10:03:37	IP Address	100	3514	True	2025-02-03 10:03:37

Query Settings

PROPERTIESNameFact Table - Mapping Questions

APPLIED STEPSSourceChanged column typeReplaced Value3Replaced Value4Replaced Value5Replaced Value6Replaced Value7Replaced Value8Replaced Value9Replaced Value10Replaced Value11Replaced Value12Replaced Value13Replaced Value14Replaced Value15Replaced Value16Replaced Value17Replaced Value18Replaced Value19Replaced Value20Replaced Value21Replaced Value22Replaced Value23Replaced Value24Replaced Value25Replaced Value26Replaced Value27Replaced Value28Filtered rowsPromoted headersChanged column type 1Removed Top RowsRemoved ColumnsUnpivoted ColumnsRe

The above example shows raw Qualtrics survey data (Appendix Q) imported into Power Query as a csv ready for cleansing and transformation. This query is called ‘Fact Table – Mapping Questions’ and is used to represent survey respondents’ responses against the four mapping questions.

Spatial Analysis - Where in the World is Western Sydney

File Home Transform Add Column View Tools Help

Close & Apply New Recent Enter Data source settings Manage Parameters Refresh Advanced Editor Choose Remove Keep Remove Split Group Data Type: Text Merge Queries Text Analytics Append Queries Vision Combine Files Azure Machine Learning

Close New Query Data Sources Parameters Query Manage Columns Reduce Rows Sort Transform Combine AI Insights

Queries

Table.AddColumn(#"Renamed Columns1", "Regional Self-ID", each if [Resident LGA] = [LGA] then "Yes" else "No")

ResponseID	Attribute	Value	LGA	Mapping Question	Resident LGA	Regional Self-ID
1_R_9YruFhGmgZfJfPX	Q5_1		0 Hawkesbury	This is Western Sydney	Blue Mountains	No
2_R_9YruFhGmgZfJfPX	Q5_2		1 Blue Mountains	This is Western Sydney	Blue Mountains	Yes
3_R_9YruFhGmgZfJfPX	Q5_3		1 Wollondilly	This is Western Sydney	Blue Mountains	No
4_R_9YruFhGmgZfJfPX	Q5_4		1 Campbelltown (NSW)	This is Western Sydney	Blue Mountains	No
5_R_9YruFhGmgZfJfPX	Q5_5		1 Camden	This is Western Sydney	Blue Mountains	No
6_R_9YruFhGmgZfJfPX	Q5_6		1 Liverpool	This is Western Sydney	Blue Mountains	No
7_R_9YruFhGmgZfJfPX	Q5_7		1 Fairfield	This is Western Sydney	Blue Mountains	No
8_R_9YruFhGmgZfJfPX	Q5_8		1 Penrith	This is Western Sydney	Blue Mountains	No
9_R_9YruFhGmgZfJfPX	Q5_9		1 Blacktown	This is Western Sydney	Blue Mountains	No
10_R_9YruFhGmgZfJfPX	Q5_10		0 The Hills	This is Western Sydney	Blue Mountains	No
11_R_9YruFhGmgZfJfPX	Q5_11		0 Sutherland	This is Western Sydney	Blue Mountains	No
12_R_9YruFhGmgZfJfPX	Q5_12		0 Georges River	This is Western Sydney	Blue Mountains	No
13_R_9YruFhGmgZfJfPX	Q5_13		0 Bayside (NSW)	This is Western Sydney	Blue Mountains	No
14_R_9YruFhGmgZfJfPX	Q5_14		1 Canterbury-Bankstown	This is Western Sydney	Blue Mountains	No
15_R_9YruFhGmgZfJfPX	Q5_15		0 Burwood	This is Western Sydney	Blue Mountains	No
16_R_9YruFhGmgZfJfPX	Q5_16		0 Strathfield	This is Western Sydney	Blue Mountains	No
17_R_9YruFhGmgZfJfPX	Q5_17		0 Randwick	This is Western Sydney	Blue Mountains	No
18_R_9YruFhGmgZfJfPX	Q5_18		0 Waverley	This is Western Sydney	Blue Mountains	No
19_R_9YruFhGmgZfJfPX	Q5_19		0 Woollahra	This is Western Sydney	Blue Mountains	No
20_R_9YruFhGmgZfJfPX	Q5_20		0 Inner West	This is Western Sydney	Blue Mountains	No
21_R_9YruFhGmgZfJfPX	Q5_21		0 Sydney	This is Western Sydney	Blue Mountains	No
22_R_9YruFhGmgZfJfPX	Q5_22		0 Cumberland	This is Western Sydney	Blue Mountains	No
23_R_9YruFhGmgZfJfPX	Q5_23		0 Canada Bay	This is Western Sydney	Blue Mountains	No
24_R_9YruFhGmgZfJfPX	Q5_24		0 Parramatta	This is Western Sydney	Blue Mountains	No
25_R_9YruFhGmgZfJfPX	Q5_25		0 Ryde	This is Western Sydney	Blue Mountains	No
26_R_9YruFhGmgZfJfPX	Q5_26		0 Hunters Hill	This is Western Sydney	Blue Mountains	No
27_R_9YruFhGmgZfJfPX	Q5_27		0 Ku-ring-gai	This is Western Sydney	Blue Mountains	No
28_R_9YruFhGmgZfJfPX	Q5_28		0 Northern Beaches	This is Western Sydney	Blue Mountains	No
29_R_9YruFhGmgZfJfPX	Q5_29		0 Hornsby	This is Western Sydney	Blue Mountains	No
30_R_9YruFhGmgZfJfPX	Q5_30		0 Willoughby	This is Western Sydney	Blue Mountains	No
31_R_9YruFhGmgZfJfPX	Q5_31		0 Lane Cove	This is Western Sydney	Blue Mountains	No
32_R_9YruFhGmgZfJfPX	Q5_32		0 North Sydney	This is Western Sydney	Blue Mountains	No
33_R_9YruFhGmgZfJfPX	Q5_33		0 Mosman	This is Western Sydney	Blue Mountains	No
34_R_9YruFhGmgZfJfPX	Q11_1		0 Hawkesbury	This is where respondents live	Blue Mountains	No

Query Settings

PROPERTIES

Name

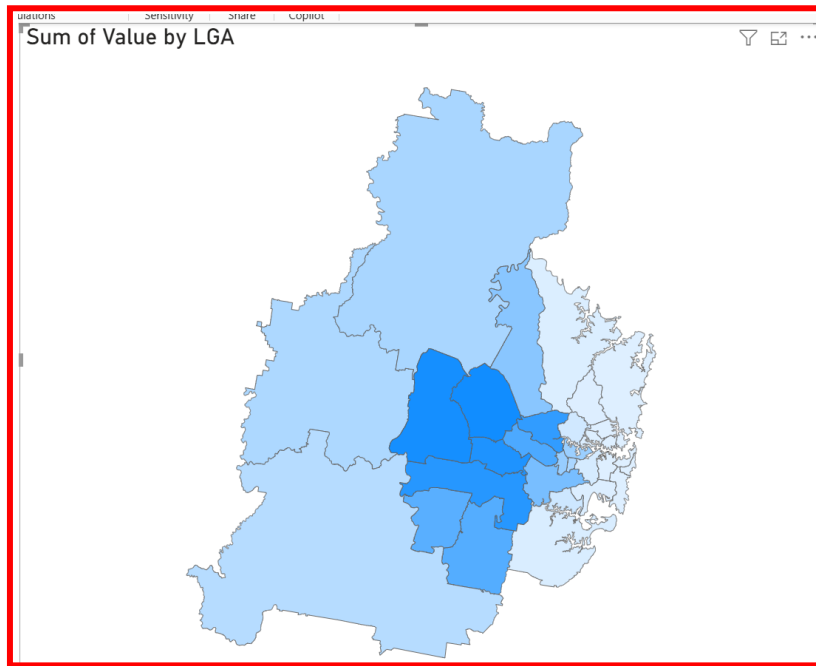
Fact Table - Mapping Questions

APPLIED STEPS

- Source
- Changed column type
- Replaced Value3
- Replaced Value4
- Replaced Value5
- Replaced Value6
- Replaced Value7
- Replaced Value8
- Replaced Value9
- Replaced Value10
- Replaced Value11
- Replaced Value12
- Replaced Value13
- Replaced Value14
- Replaced Value15
- Replaced Value16
- Replaced Value17
- Replaced Value18
- Replaced Value19
- Replaced Value20
- Replaced Value21
- Replaced Value22
- Replaced Value23
- Replaced Value24
- Replaced Value25
- Replaced Value26
- Replaced Value27
- Replaced Value28
- Filtered rows
- Promoted headers
- Changed column type 1
- Removed Top Rows
- Removed Columns
- Unpivoted Columns
- Replaced Value
- Replaced Value1
- Replaced Value2
- Changed Type
- Added Conditional Column
- Added Conditional Column1
- Renamed Columns
- Merged Queries
- Expanded Dimension Table - ...
- Renamed Columns1
- Added Custom

Each 'Applied Steps' represents coding in Power Query language M to transform data into a table that facilitates mapping onto a base map.

In the 'Fact Table – Mapping Questions', several steps have been implemented to cleanse and transform the data to count respondents' specific LGA selections in responses to the four mapping questions. The 'Attribute' column represents how the source data represented each respondent's response to each of the 33 listed LGA for Question 5 ('Q5_X') seeking representation of 'Western Sydney' by LGA. In the 'Value' column, 1 represents a 'Yes' response and '0' represents a 'No' response.



The base map is a shape map built to show the spatial boundaries of 2024 NSW Local Government Areas.

Filters

Search

Filters on this visual

LGA is (All)

Mapping Question
is This is Western Sydney

Filter type

Basic filtering

Search

☒ Select all

☒ This is Western Sydney 25806

☐ This is where respondents live 25806

☐ This is where respondents socialise 25806

☐ This is where respondents work or study 25806

☐ Require single selection

Visualizations

Format visual

Search

Visual General

Map settings

Map settings

Map type

Custom map

View map type key

Add a map type

LGA_2024_AUST_GDA94_BaseMap.json

Projection

Mercator

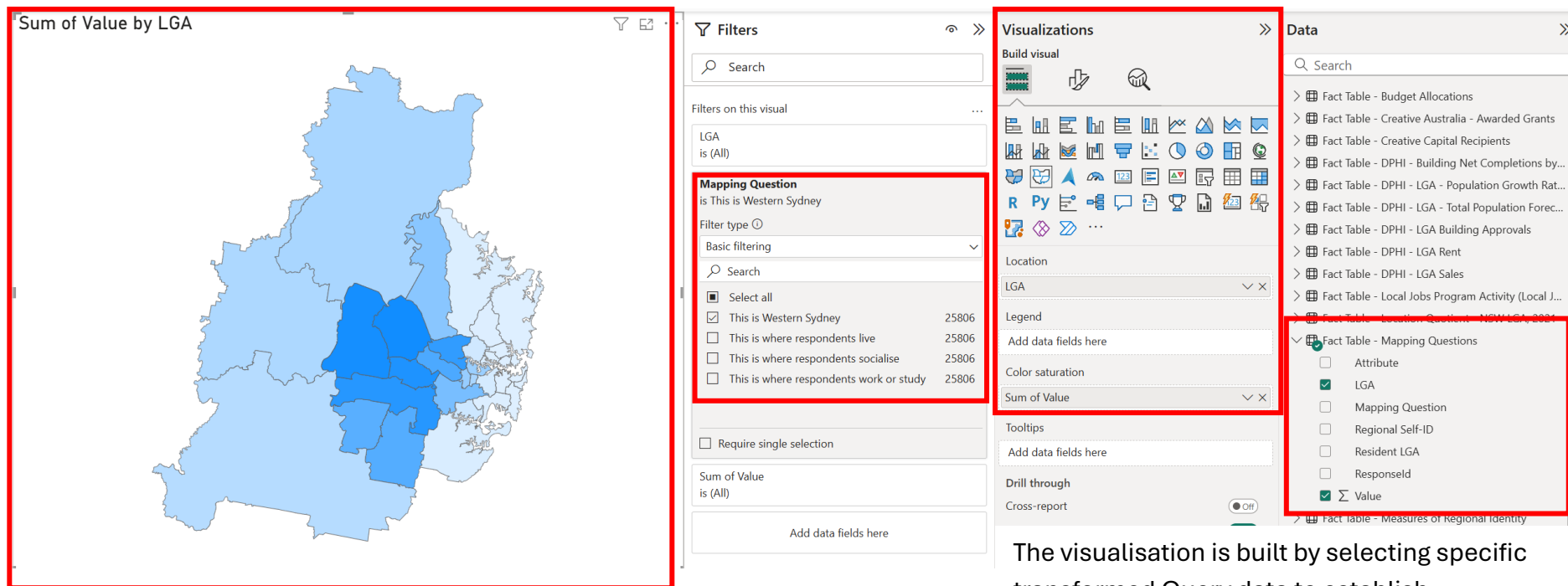
Data

Search

- > Fact Table - Budget Allocations
- > Fact Table - Creative Australia - Awarded Grants
- > Fact Table - Creative Capital Recipients
- > Fact Table - DPHI - Building Net Completions by...
- > Fact Table - DPHI - LGA - Population Growth Rat...
- > Fact Table - DPHI - LGA - Total Population Forec...
- > Fact Table - DPHI - LGA Building Approvals
- > Fact Table - DPHI - LGA Rent
- > Fact Table - DPHI - LGA Sales
- > Fact Table - Local Jobs Program Activity (Local J...
- > Fact Table - Location Quotient - NSW LGA, 2021
- > Fact Table - Mapping Questions
 - ☐ Attribute
 - ☒ LGA
 - ☐ Mapping Question
 - ☐ Regional Self-ID
 - ☐ Resident LGA
 - ☐ Responseld
 - ☒ Σ Value
- > Fact Table - Measures of Regional Identity
- > Fact Table - National Priority Funding (Local Job...

The spatial data used the base map's boundaries were downloaded from the Australian Bureau of Statistics' latest digital boundaries webpage.

In this example, NSW Local Government Area boundaries of 2024 are the base boundaries.

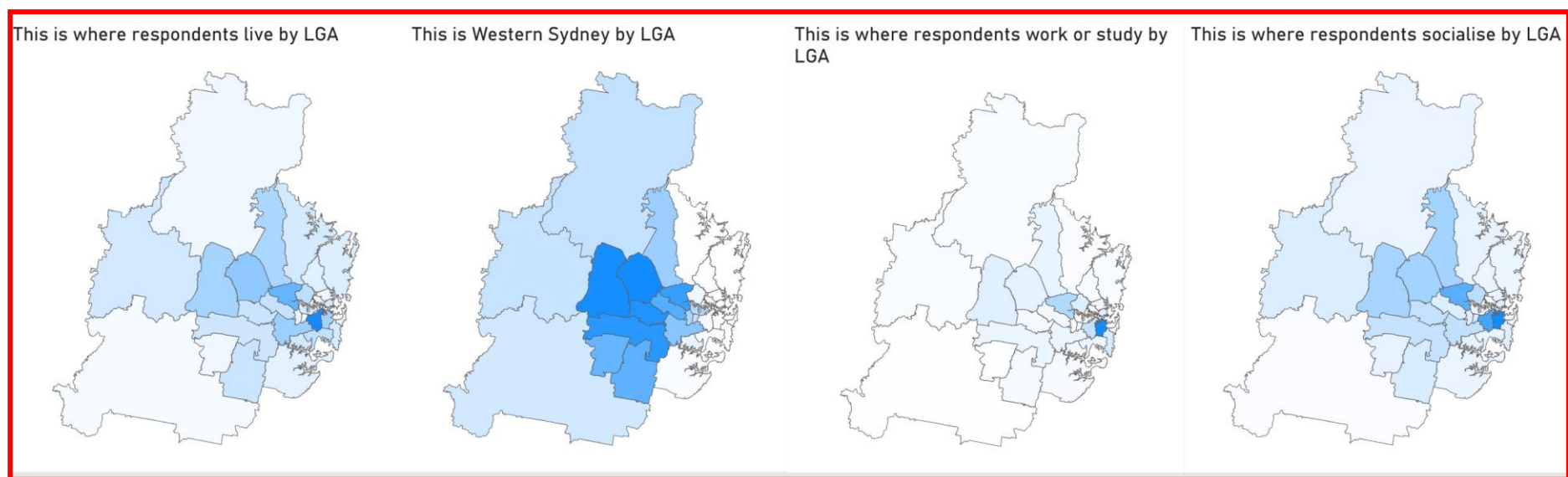


In the 'Fact Table – Mapping Questions' example, the filter is applied to show only responses to the mapping question 'where is Western Sydney' by counting all participants' selection of LGA to populate the base map.

Each of the 33 LGAs available for participants to select as responses to the four mapping question is coded to a specific index (see Appendix F).

The visualisation is built by selecting specific transformed Query data to establish datapoints used to populate the shape map.

In this example, 'Fact Table – Mapping Questions' column 'LGA' is used as a location reference and 'Value' refers to the total sum of all participants' selection filtered by response values of 'Mapping Question' that were coded as 'This is Western Sydney'.



By changing the filter selection of the 'Mapping Question' in Power BI's visualisation tool, results of each mapping question recorded in Qualtrics XM can be generated.