Toilets In Australia

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Our Role in Public Health

- As members of the Australian Department of Health and Aged Care (DHAC), we have a responsibility to the nation to preserve and improve **public health.**

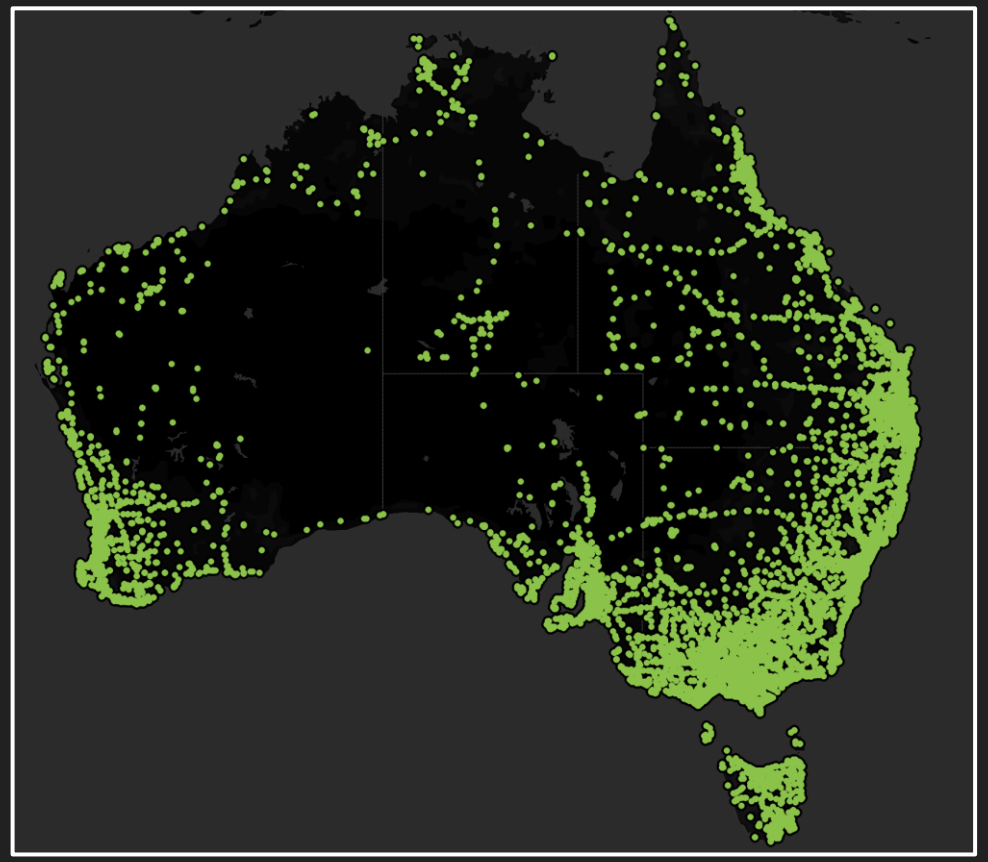
- One of the most effective ways we can accomplish this goal is improving access to **public toilets** that fulfill people's basic hygiene needs.

- By looking at the location of toilets in Australia, we can identify areas where hygiene needs are less likely to be satisfied. From here, we can delve into the availability of these toilets to **specific demographic groups**, as well as look into how these toilets are affecting **all peoples in the area**.

Toilet Locations

- Most toilets are clustered around the **coasts**, where the major population centers of Australia are.

- There are not a lot of toilets in the **center of Australia**, where the inhospitable nature of the Outback leads to low population density.



Toilets and Gender

How can we provide more universal access to basic hygiene for people of varied genders?

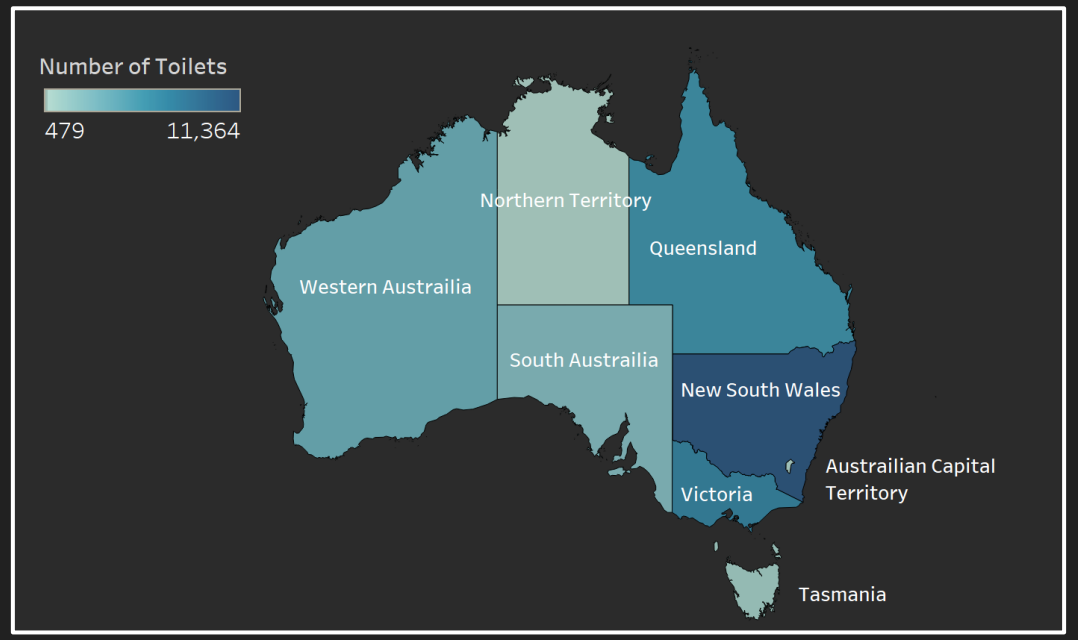
Understanding Gender

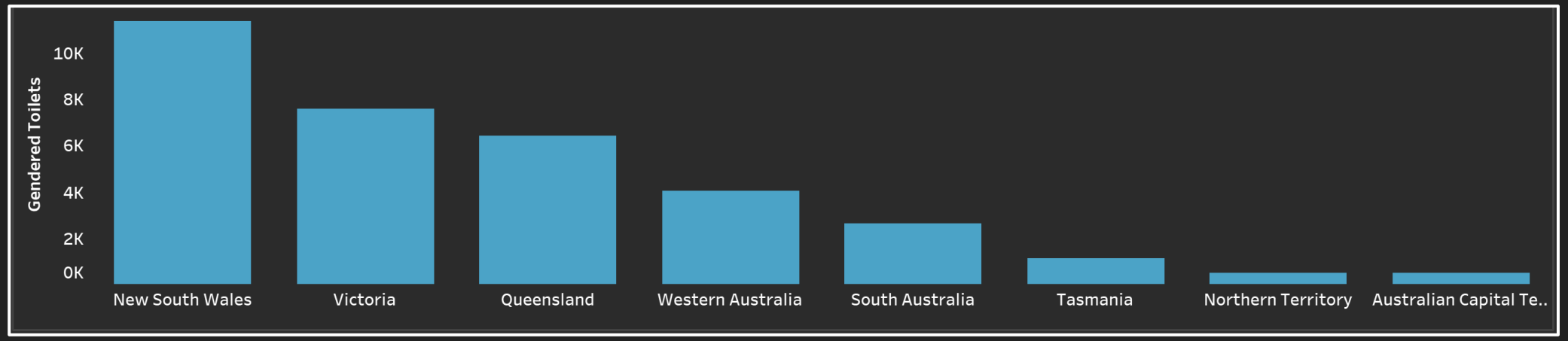
- Two types
  - Gendered = Male & Female
  - Unisex

- Looking into the prevalence of Unisex can reveal insights into what areas are more developed and even provide insights into local political climates

Where are **Gendered** Bathrooms?

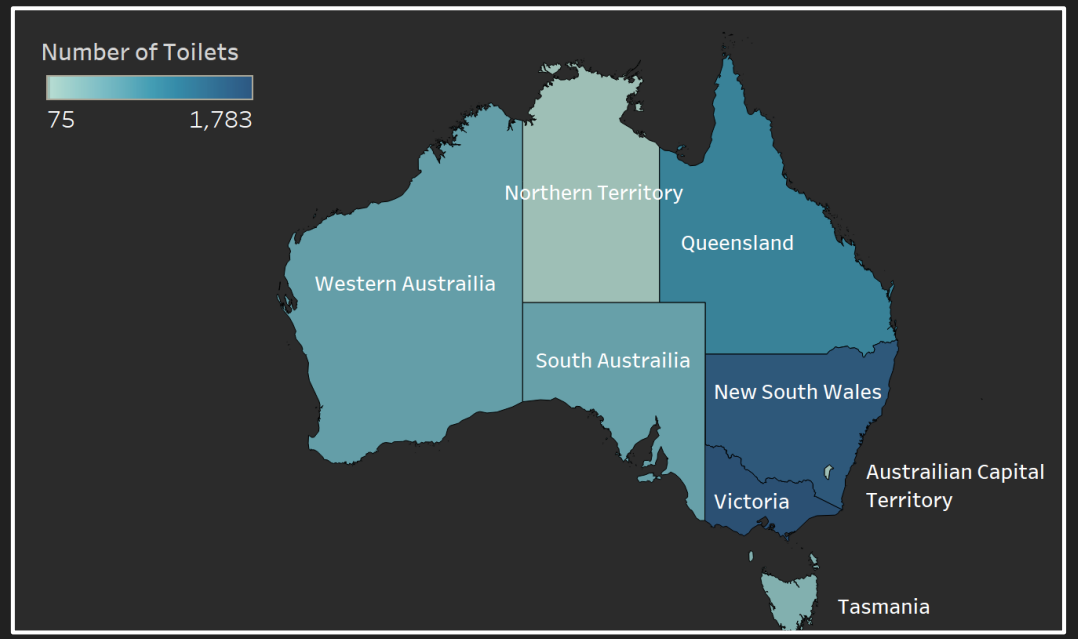
- Male and Female Toilets were equal throughout the country
- Toilets follow same distribution as Australian population

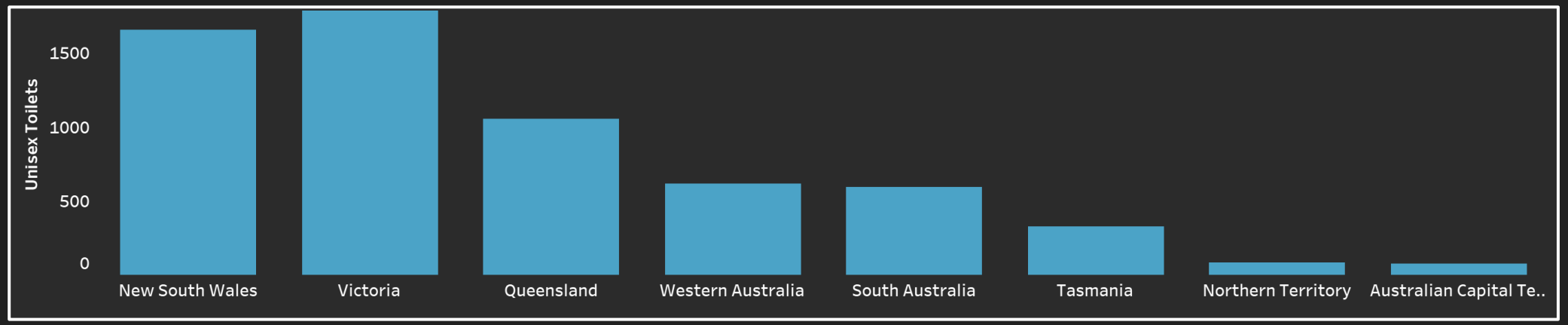




Where are **Unisex** Bathrooms?

- Unisex bathrooms number much less than the Gendered bathrooms
- Unisex bathrooms crowd in the states with cities
- Possibly due to more progressive views or a need for lower operating costs





Desired Action

- More Unisex Toilets
  - Less space
  - Cheaper to construct and operate
  - Functionally Identical

Toilets and Travel

How accessible are necessary hygiene facilities to travelers along our major roads?

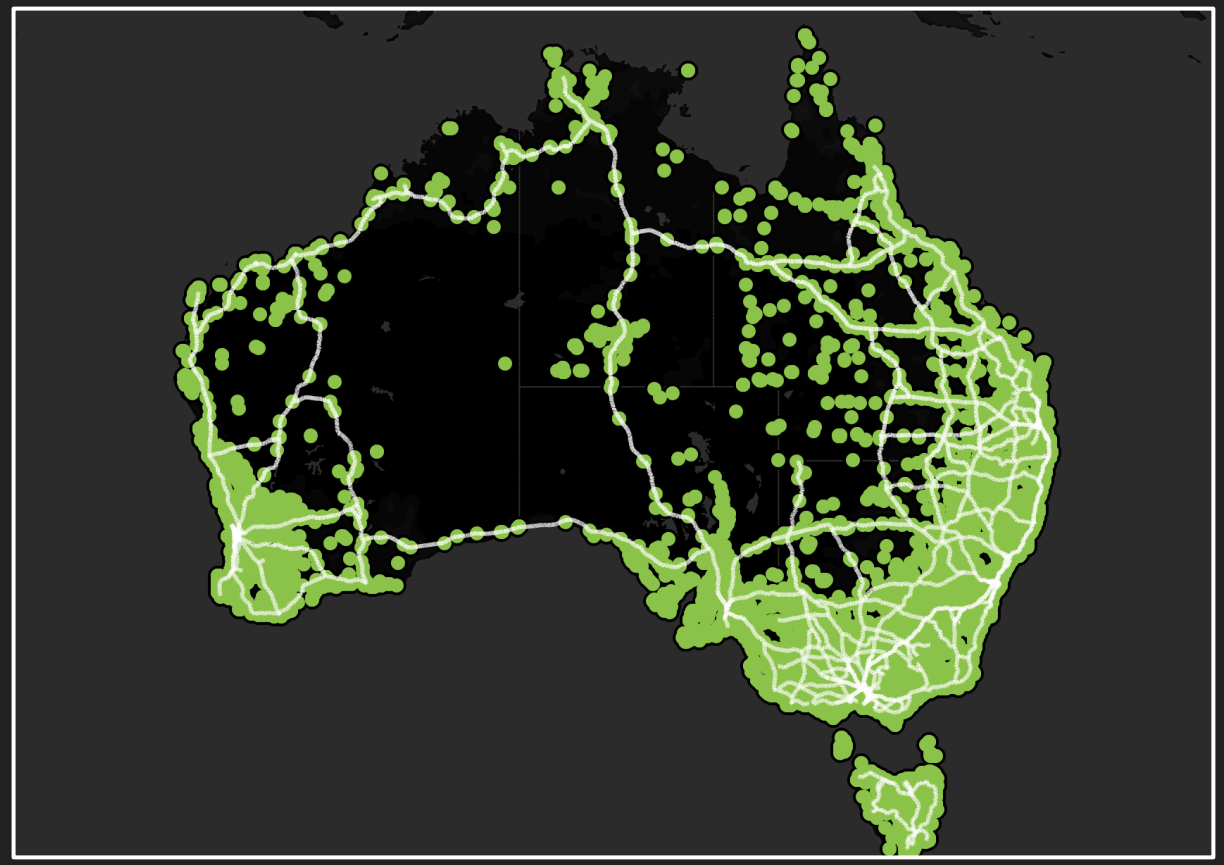
Understanding Travel

- Travelers along the **major roads** of our nation are an important group to look at when evaluating the availability of **public toilets**. This group doesn't have access to their personal toilets while on the road, so they rely heavily on public toilets to meet their hygiene needs.

- The most important aspects of a **public toilet** to traveler hygiene are:
  - **Showers**
  - **Dump Points** – Receptacles for emptying sewage, like from an R.V.

Where are the **roads**?

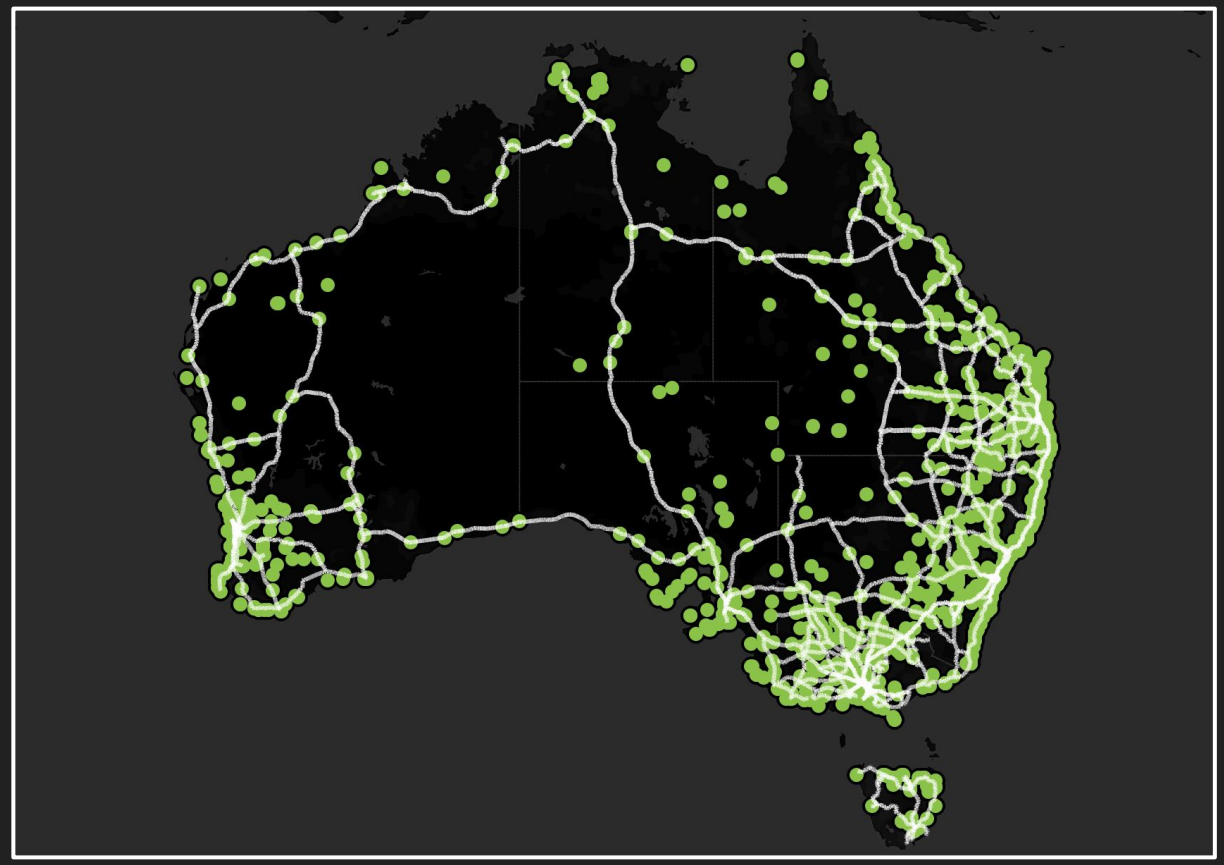
- More roads in **urban areas** than in **the Outback**.
- **Toilets** are present near all **major roads** but are much more common in **urban areas.**



Where are the **showers**?

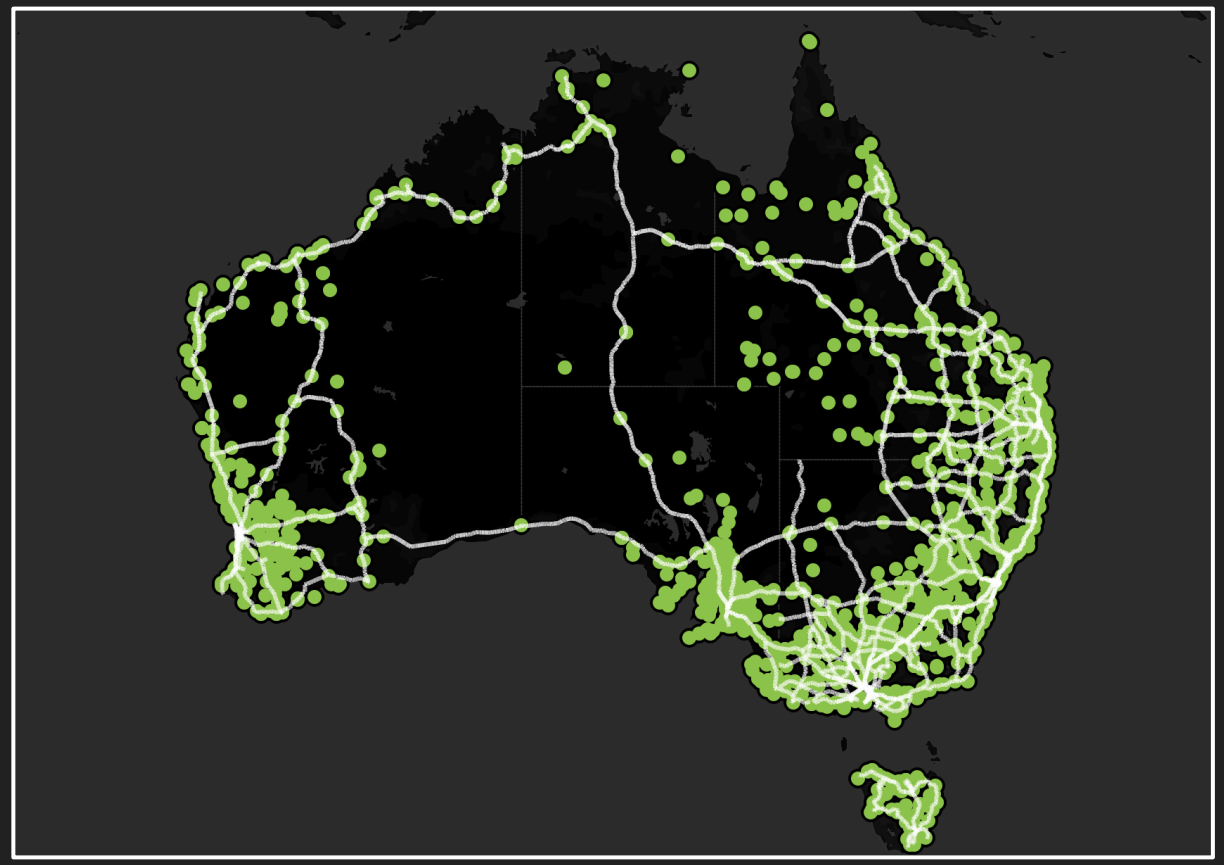
- Only **7.8%** of toilets have **showers**, and most of these toilets are **along the coast.**

- This leaves many major roads without a toilet that contains a **shower**.



Where are the **dump points**?

- Only **5.4%** of toilets have a **dump point** for sewage.
- As with showers, most of these toilets are along the **coasts**.
- As a result, travelers in **the Outback** are more likely to experience sewage overflows since they can't dispose of their waste frequently using a **dump point**.



Desired Action

- To ensure that travelers have consistent access to basic hygiene, we need to increase the number of toilets near **roads** in the **Australian Outback**, and we need to add the amenities of **showers** and **dump points** to these new facilities as well as old ones in the areas.

Toilets and Accessibility

How accessible are necessary hygiene facilities to people with disabilities?

Understanding Accessibility

Accessibility Features

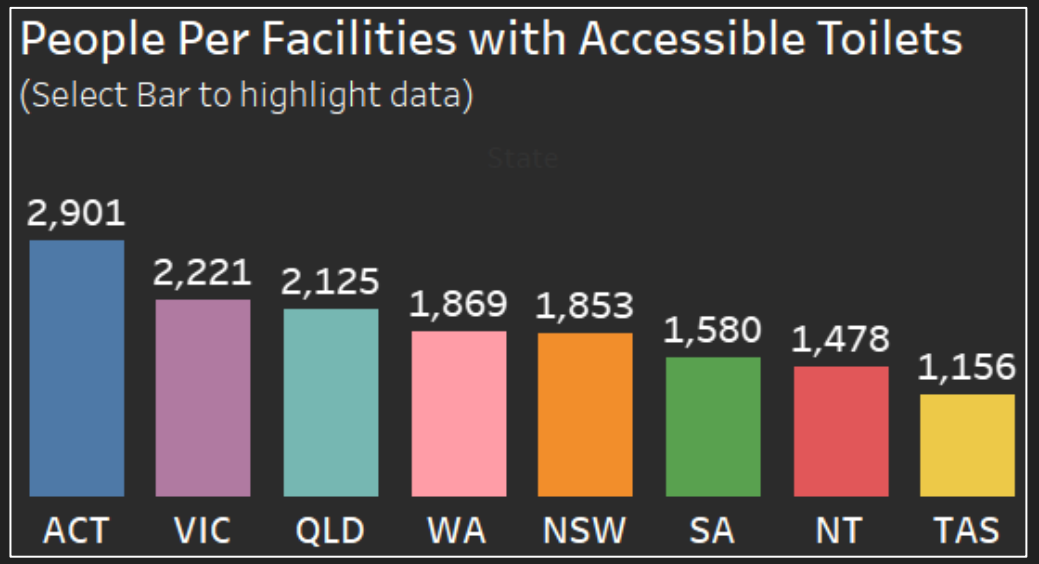
- Accessible Toilets
- Accessible Parking
- Adult Changing Rooms
- Left-Handed Rails
- Right-Handed Rails

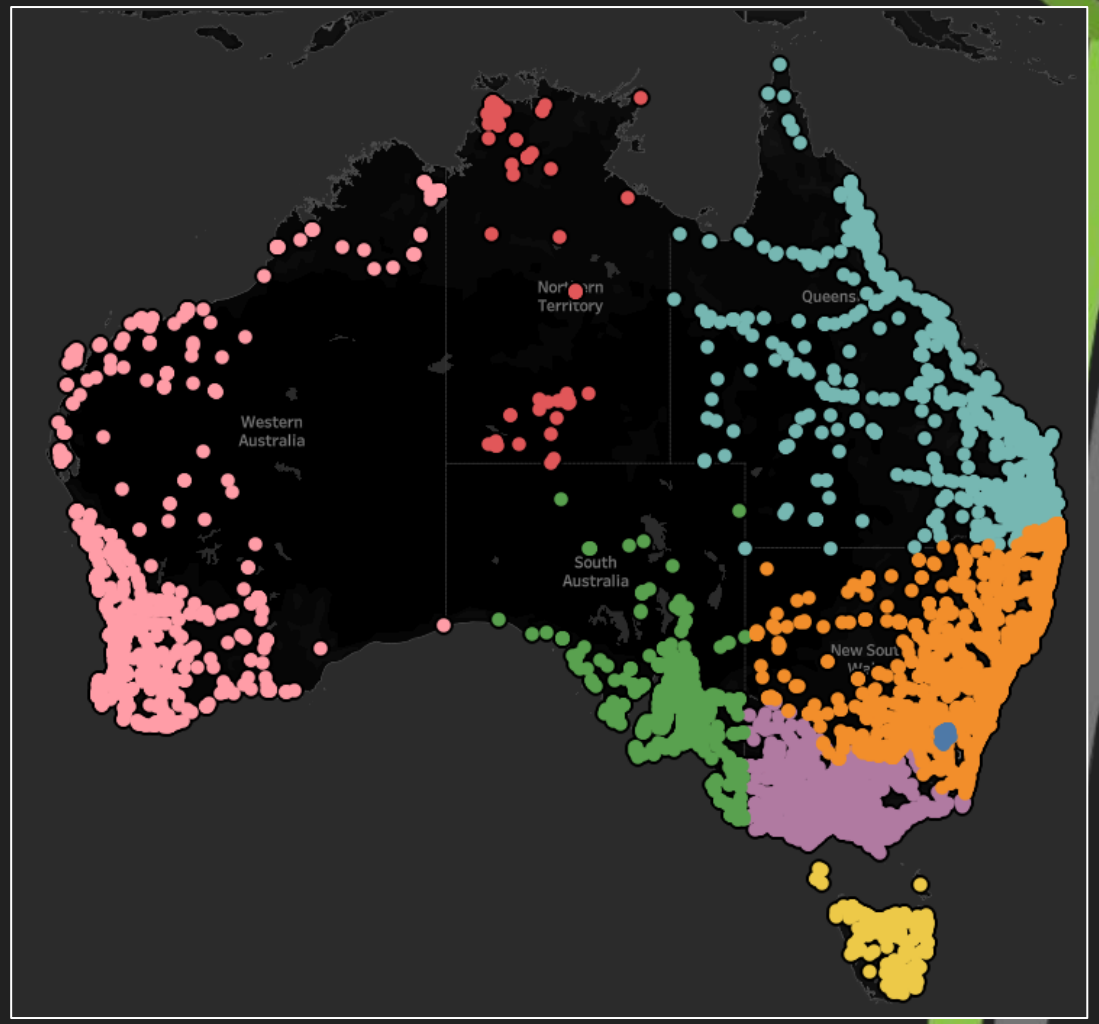
Importance of Accessibility

- Promotes Inclusion
- Legal Compliance
- Improves Usability
- Public Safety
- Enhanced Community Image
- Encouraged Participation

Facilities with **Accessible Toilets**

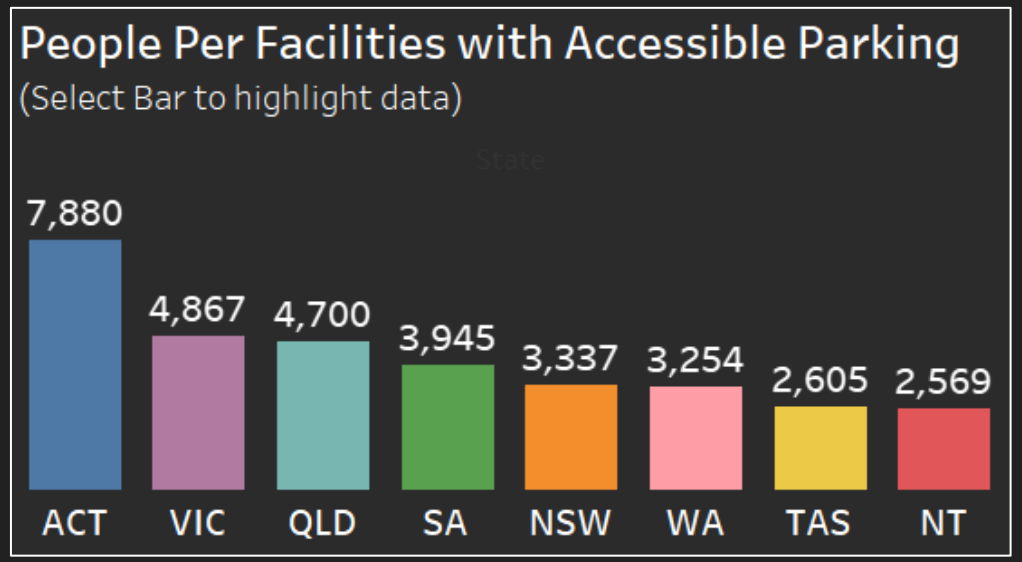
- **58 %** of Facilities have Accessible Toilets
- The **Australian Capital Region** shows the greatest need per capita
- Also consider central region, where access is limited by distance

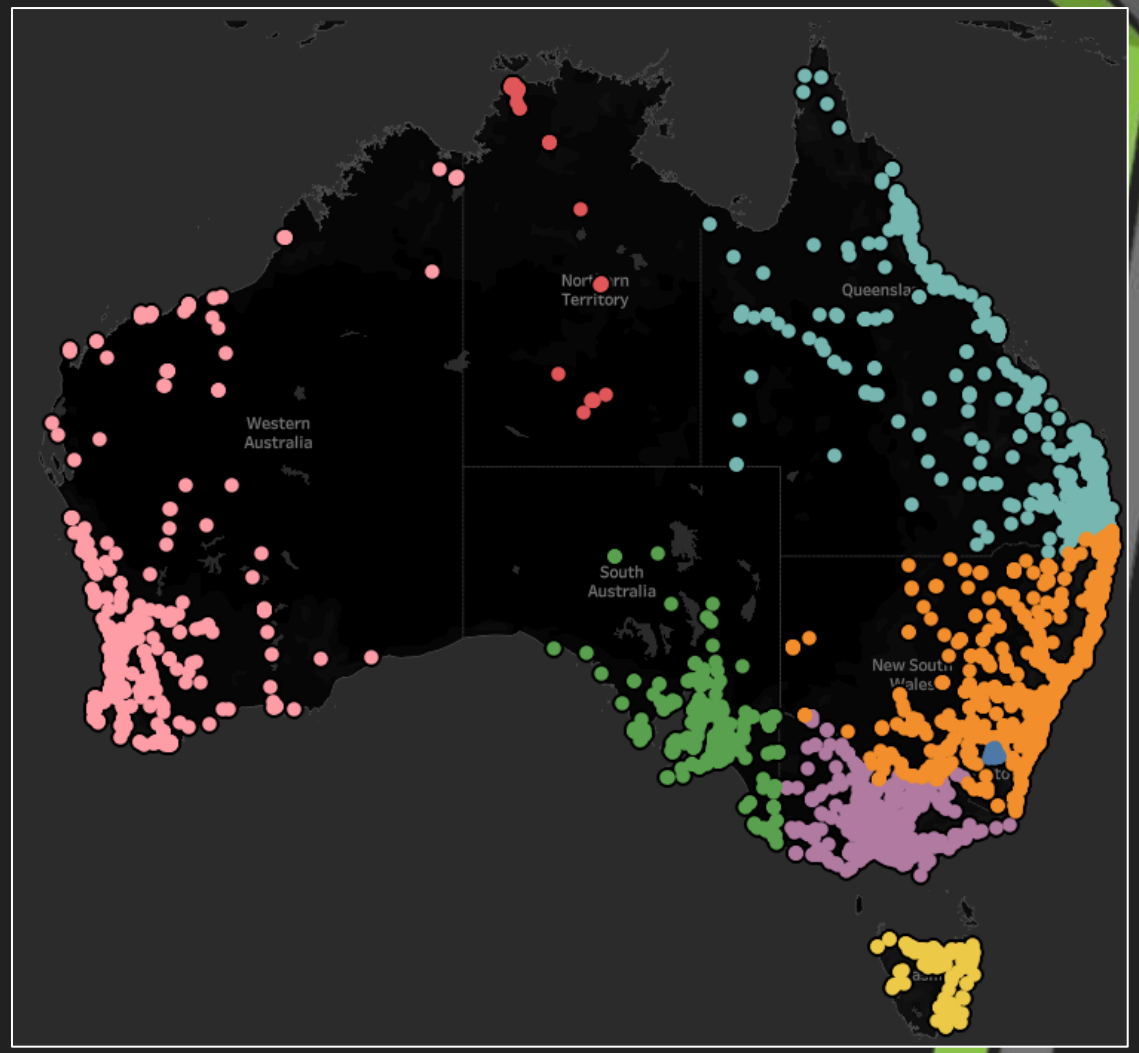




Facilities with **Accessible Parking**

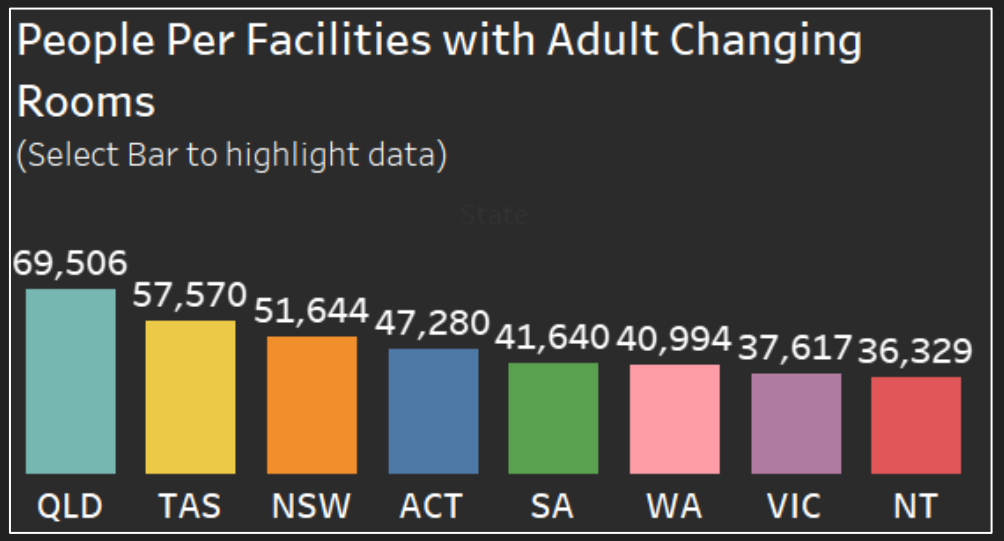
- **29 %** of Facilities have Accessible Parking
- **Only 43 %** of Accessible Toilets have Accessible Parking
- The **Australian Capital Region** shows the greatest need per capita

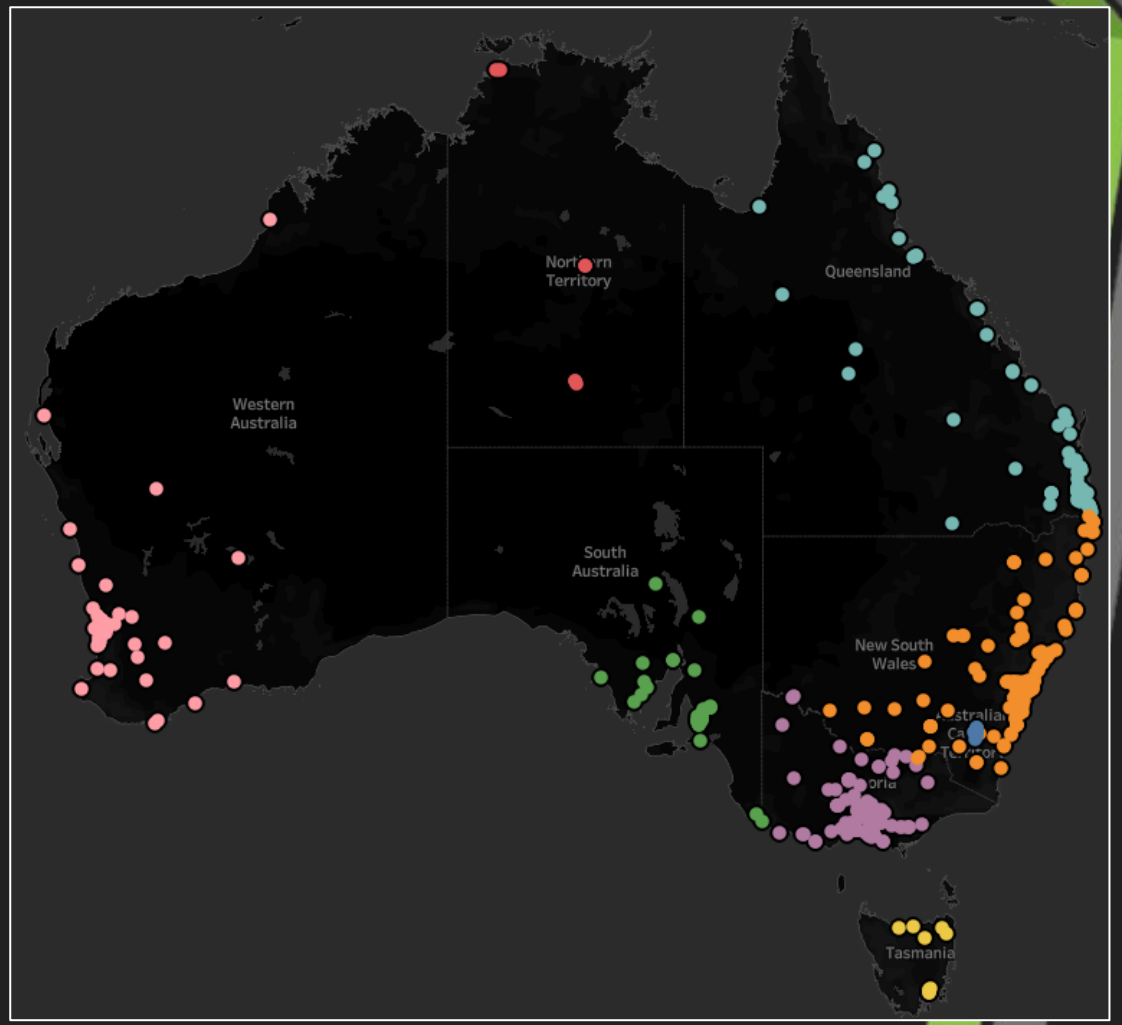




Facilities with **Adult Changing Rooms (ACR)**

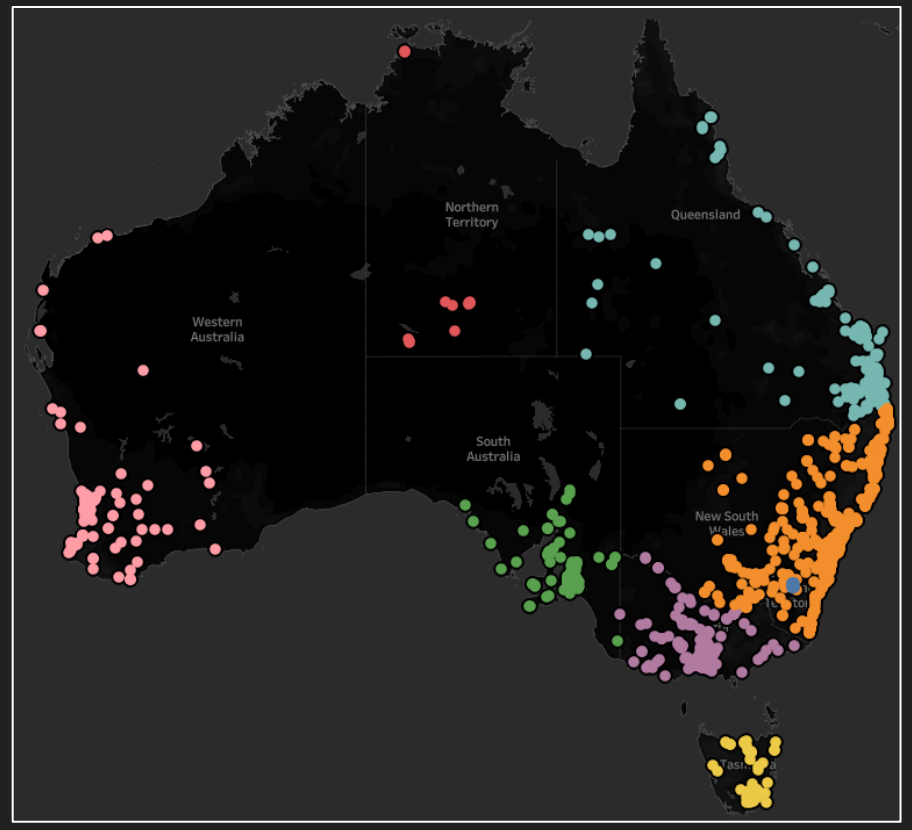
- **2.4 %** of Facilities have ACR
- **Queensland Region** shows the greatest need per capita, but lacking overall
- Rural citizens must travel great lengths to find one





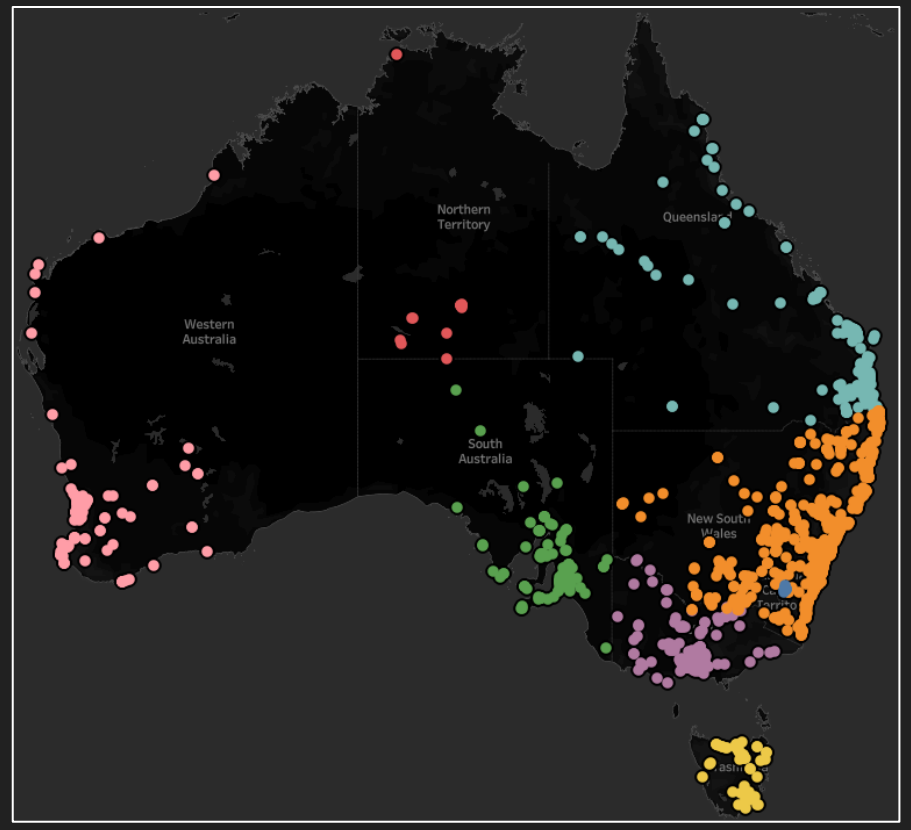
Rail Accessibility

Left-Handed



- **7.8%** of Facilities
- **Australian Capital Region** (~36,000/1)

Right-Handed



- **8.7%** of Facilities
- **Australian Capital Region** (~43,000/1)

Desired Action

- More Accessibility features are needed in two places:
  1. Population Dense Areas: to account for high usage/preventing overconsumption
  2. Rural Areas: promote locational access & cut down on travel time

Toilets and Pollution

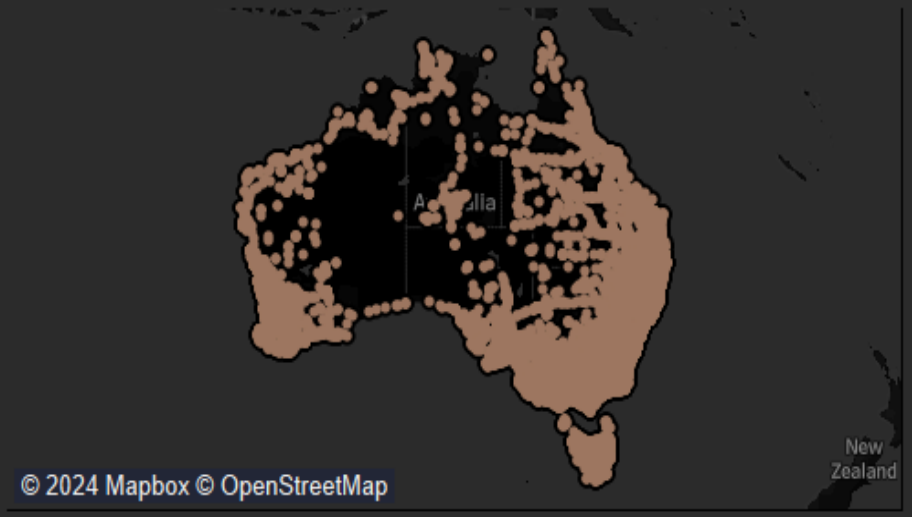
How are existing toilets impacting the environment?

Understanding Pollution

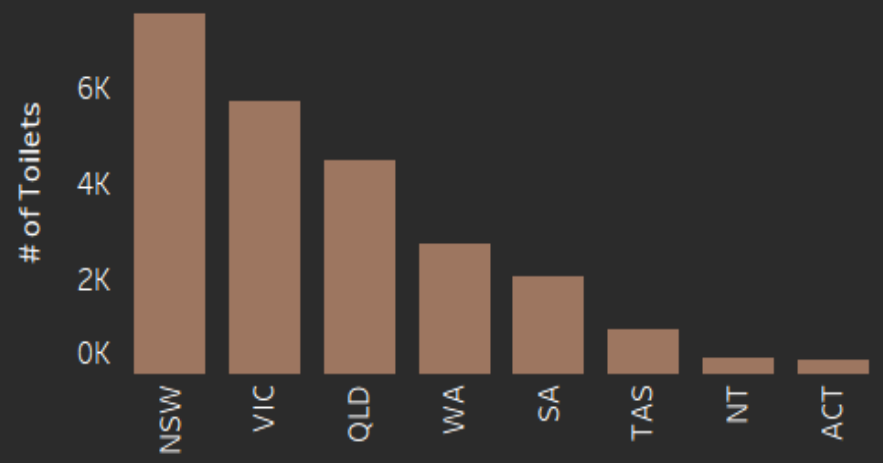
- There are three major types of pollution, all measured by emissions in kg/year.
  - **Air**
  - **Water**
  - **Land**
- Keeping pollution mitigation in mind is essential to construction in any case, including toilet infrastructure.

Air Pollution

Toilet Locations



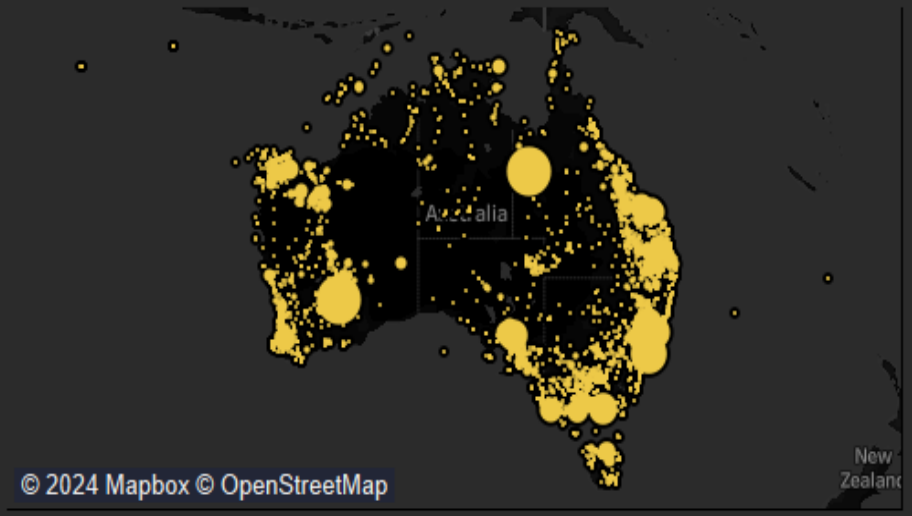
Toilet Counts by State



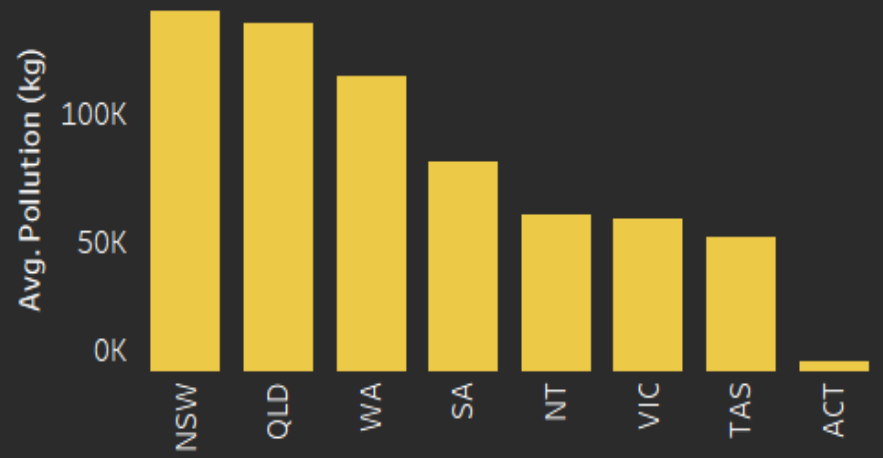
Correlation between Air Pollution and Toilet Location

0.6922

Average Air Pollution



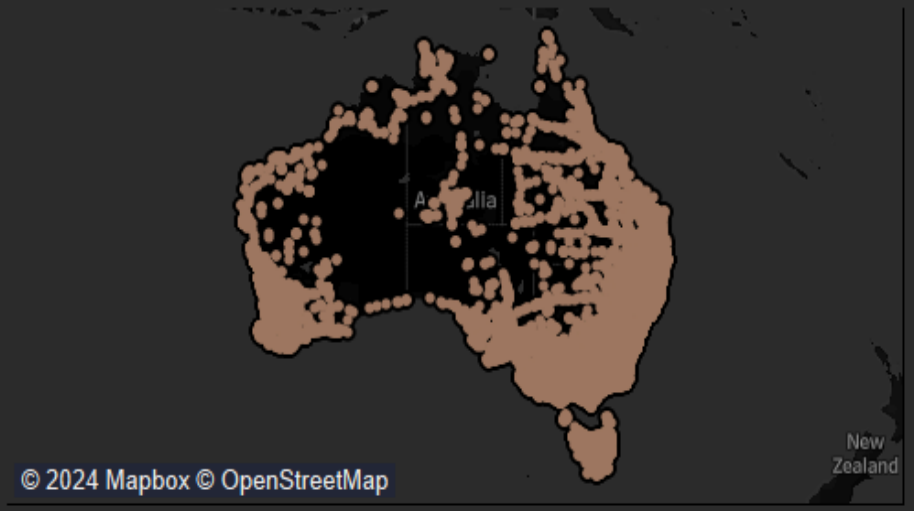
Air Pollution by State



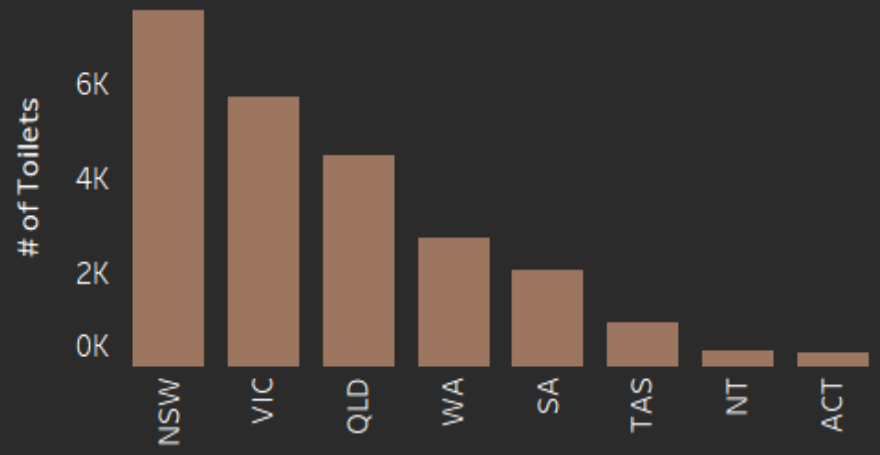
Air pollution and **toilet location** are well correlated. The states with the highest air pollution are **New South Wales**, **Queensland**, and **Western Australia**, which is quite similar to the states with the highest toilet counts. While this could be a factor of population concentration, it provides an area of improvement in air quality.

Water Pollution

Toilet Locations



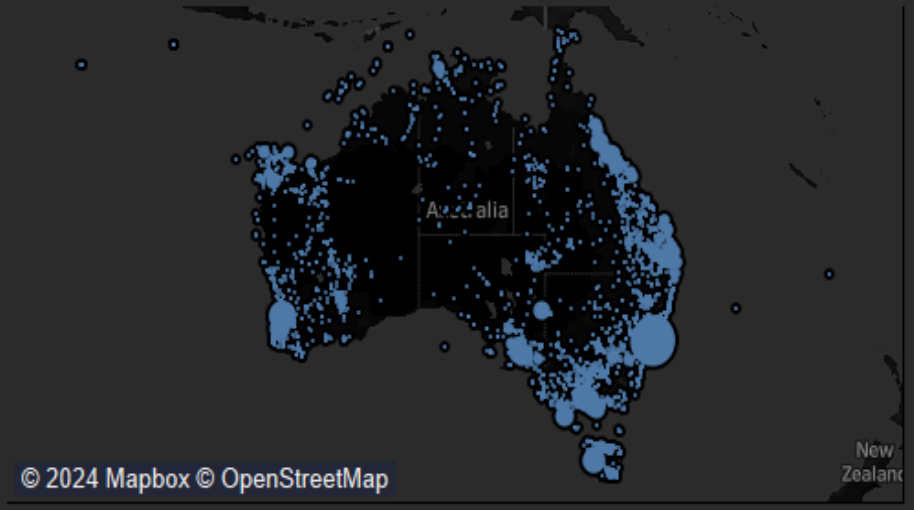
Toilet Counts by State



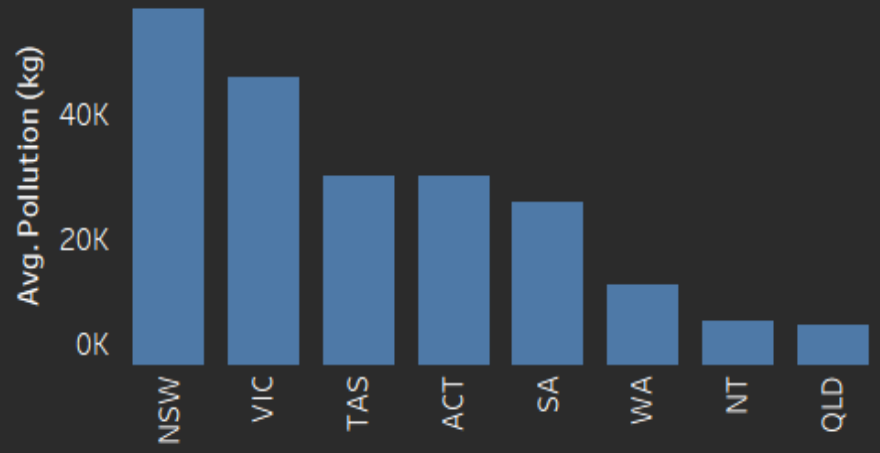
Correlation between Water Pollution and Toilet Location

0.5877

Average Water Pollution



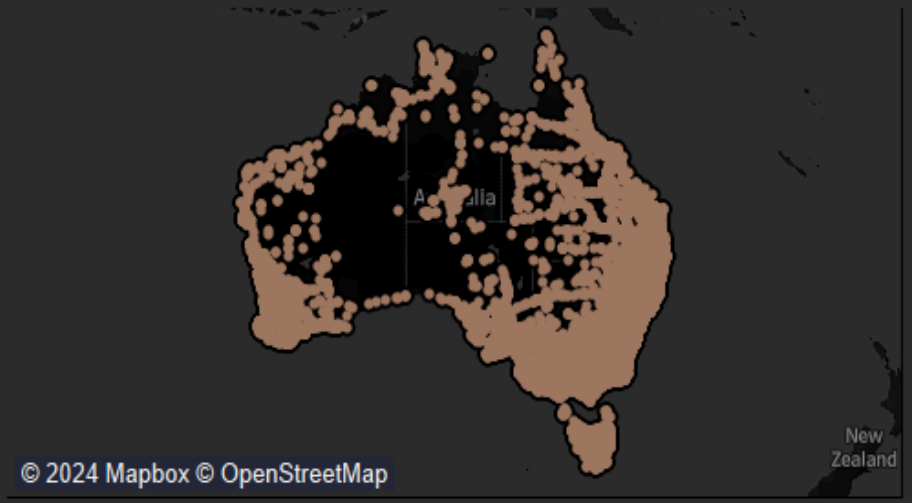
Water Pollution by State



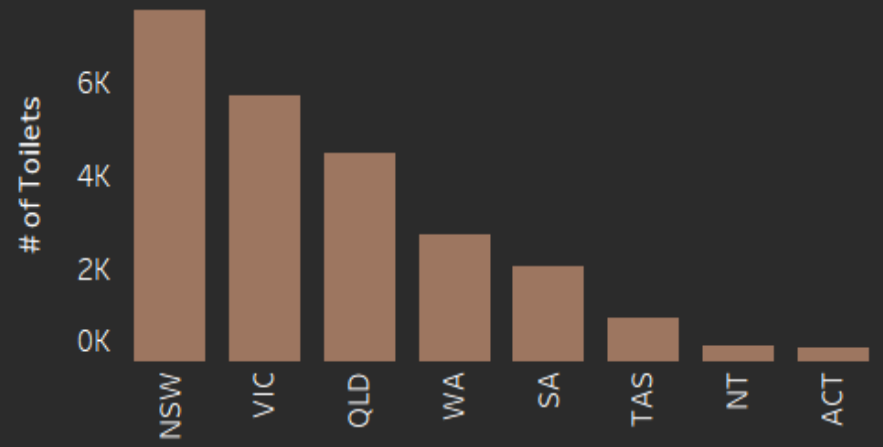
Water pollution and toilet location are not well correlated. The areas with the highest water pollution are surrounded by the sea: **New South Wales**, **Victoria**, and **Tasmania**. This is quite dissimilar from the distributions of toilets, showing that water pollution is not a major issue to consider in toilet infrastructure.

Land Pollution

Toilet Locations



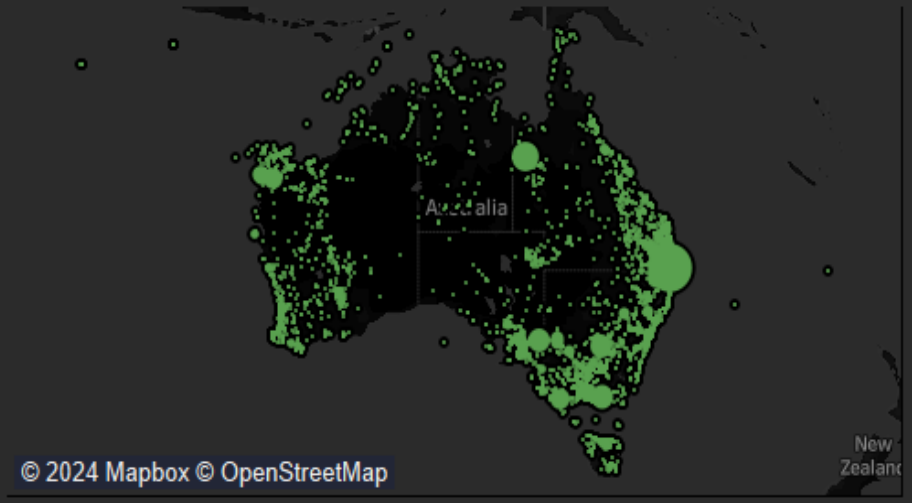
Toilet Counts by State



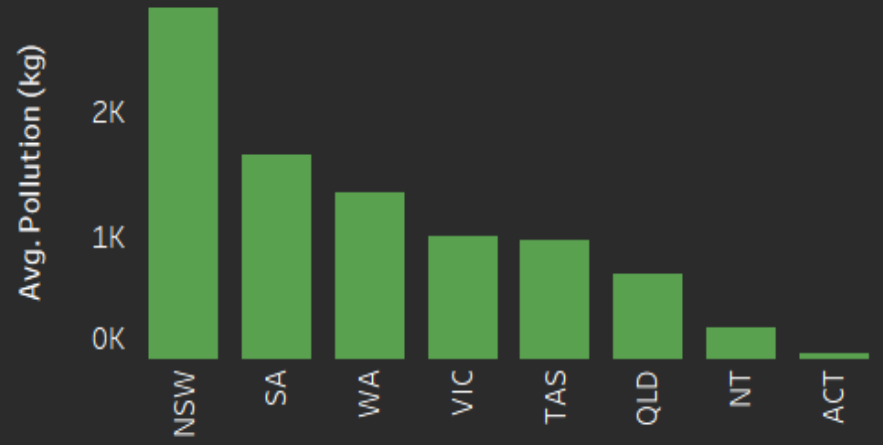
Correlation between Land Pollution and Toilet Location

0.7152

Average Land Pollution



Land Pollution by State



Land pollution and toilet location are the most correlated. The states with the highest land pollution are **New South Wales**, **Southern Australia**, and **Western Australia**. This similarity to toilet location may be a side effect of population concentration, but it can be leveraged to mitigate land waste and manage pollution better.

Desired Action

- **Water Pollution** does not correlate well to toilet location and does not need to be considered further in toilet infrastructure.
- **Air Pollution** and **Land Pollution** are more correlated and should be considered.
  - Higher quality filters for better airborne particle capture
  - More secure disposal measures for solid waste and seepage prevention

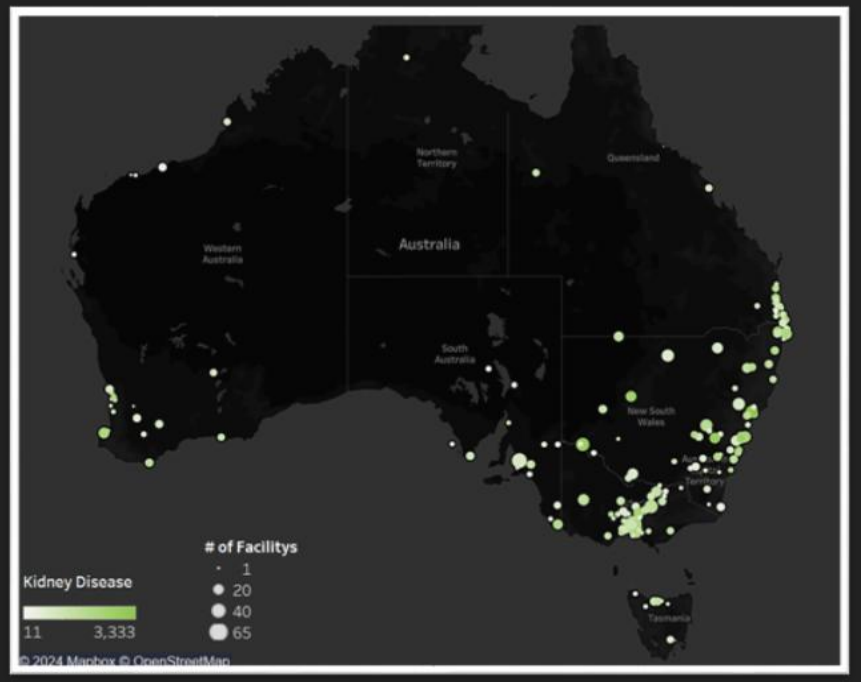
Toilets and Disease

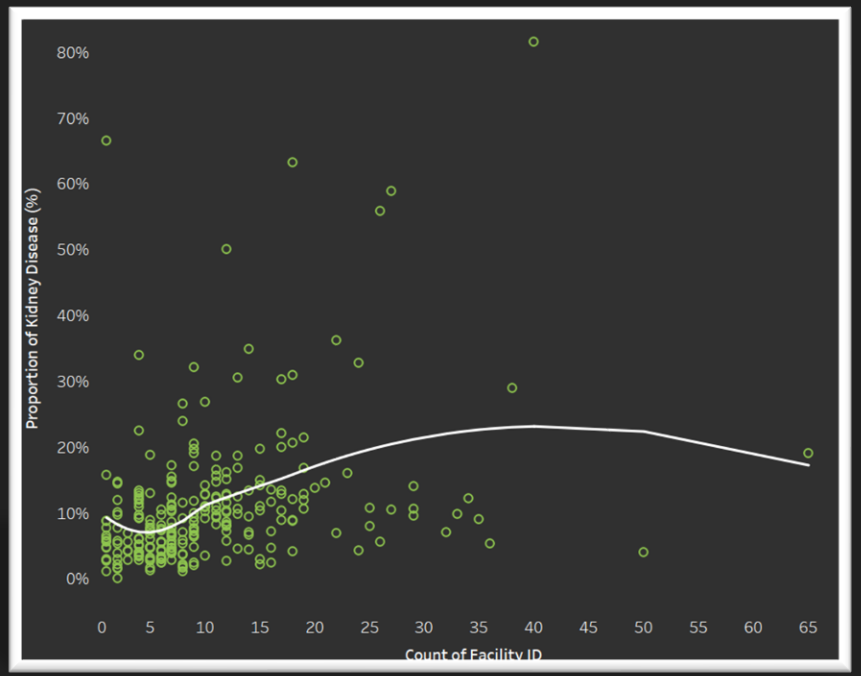
How are existing toilets impacting disease and mortality rates in nearby towns?

Understanding Disease/Mortality

To understand the relationship between toilets and disease/mortality, we looked at the following by town:

- Cardiovascular (Heart) Disease
- Kidney Disease
- Mortality Rates





Kidney Disease

Results Summary:

Scatter Plot Analysis:

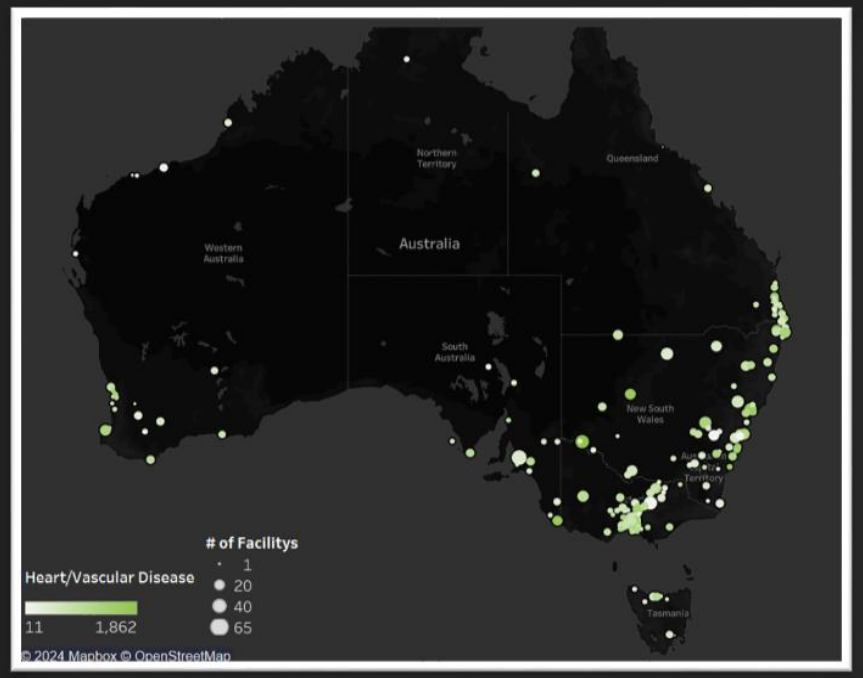
- Weak or no correlation between the number of facilities and the percentage of the population affected by kidney disease.
- LOESS smoothing trends were inconsistent.

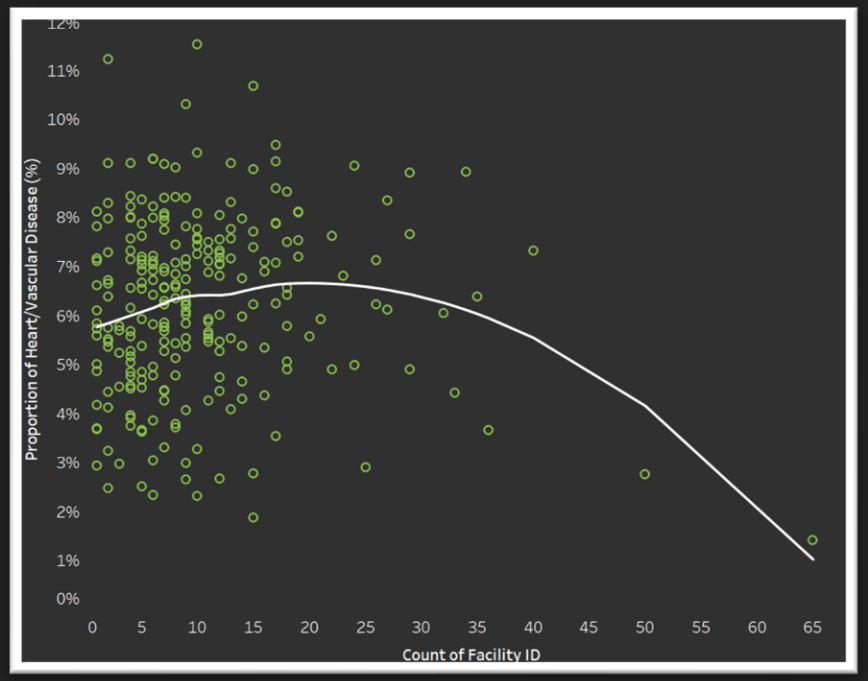
Map Analysis:

- Spatial distribution of public facilities showed no apparent relationship to kidney disease prevalence depending on number of facilities

Conclusion:

- Both scatter plot and map analyses suggest that the number of public facilities does not significantly influence kidney disease prevalence.





Heart/Vascular Disease

Results Summary:

Scatter Plot Analysis:

- No visible correlation between the number of facilities and heart/vascular disease prevalence.
- LOESS smoothing patterns were weak and inconsistent.

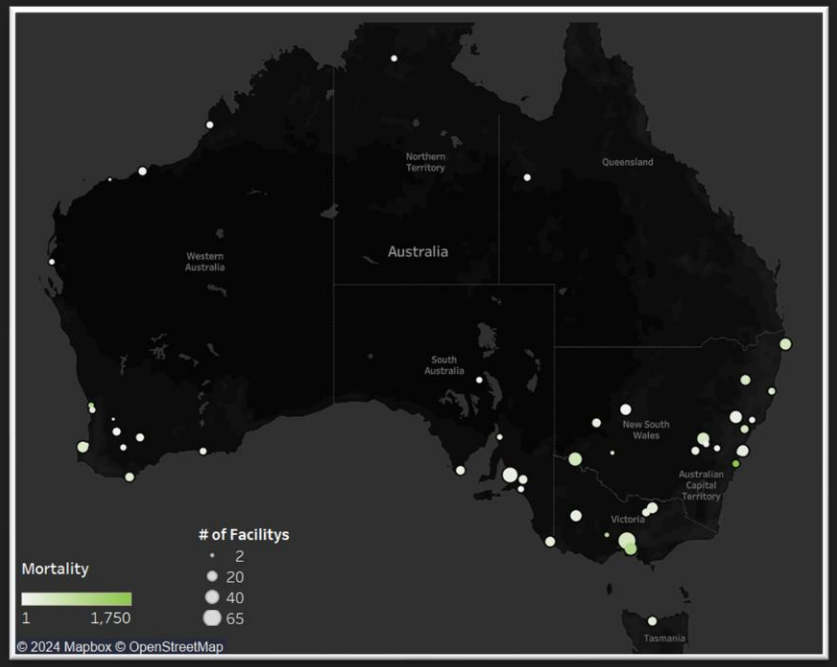
Map Analysis:

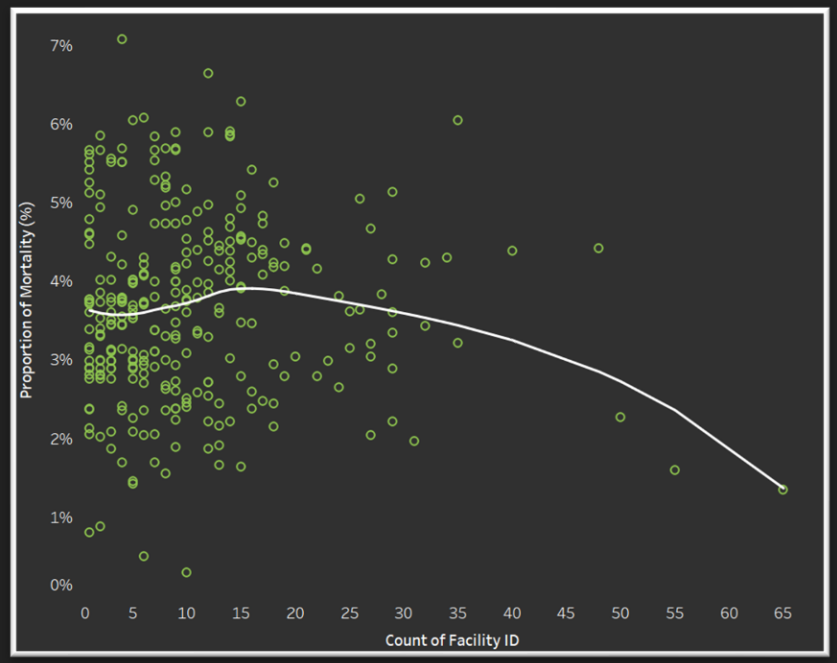
- No geographic patterns suggesting a relationship between facility number and heart/vascular disease prevalence.

Conclusion:

- Neither map nor scatter plot analyses indicate a measurable impact of facility counts on heart/vascular disease prevalence.

Mortality





Results Summary:

Scatter Plot Analysis:

- Minimal to no correlation observed between facility counts and mortality rates.
- LOESS trends offered no clear direction or pattern.

Map Analysis:

- Spatial distribution of public facilities did not correlate with mortality rates by number of facilities.

Conclusion:

- Both scatter plot and map analyses suggest no relationship between public facility counts and mortality rates.

Desired Action

Key Takeaways:

- The analysis shows **no significant correlation** between public facility counts and health metrics (kidney disease, heart/vascular disease, mortality rates).
- Simply increasing the number of public facilities is unlikely to directly improve health outcomes.

Next Steps:

- **Look into Facility Quality and Accessibility**
- **Investigate Confounding Variables**
- **Develop More Comprehensive Metrics**

Conclusion

What is our solution to increasing the availability of necessary hygiene facilities?

Solution

How do we increase access to basic hygiene across out nation?

- Using the location of **toilets** as an indicator of struggling areas, we can:
  - Create more **Unisex** toilets nationwide to promote gender inclusivity and reduce operating costs.
  - Increase the number of toilets near **major roads** in the Australian Outback with showers and dump points.
  - Increase the number of **accessible** toilets in the Australian Capital Region and central Australia by constructing or upgrading existing facilities.
  - Control the escape of **air and land pollutants** through the integration of high-quality particle filters and better disposal methods.
  - Further explore the connection between disease and **toilets** in our nation.

Thank You!

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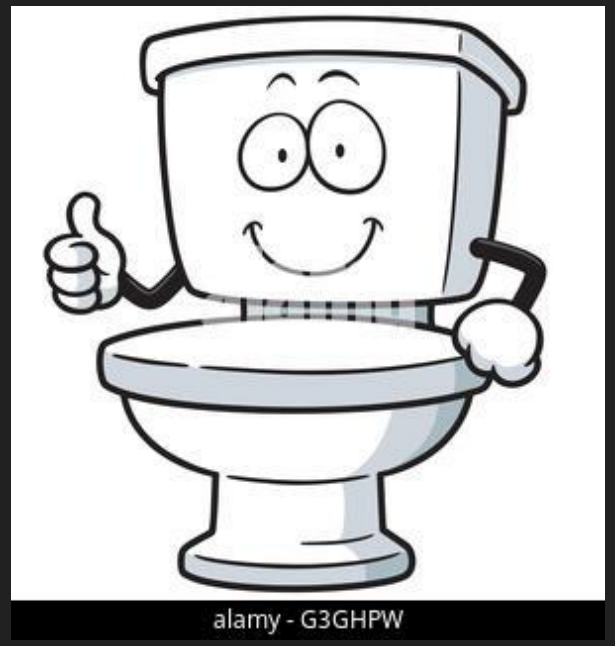

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