

GEOGRAPHY HIGHER LEVEL

LEAVING CERTIFICATE

The Human Environment Elective - Traffic Congestion



MICHAEL DORAN

About Michael:

Michael has been teaching Geography at The Institute of Education since 1995. He is an experienced Leaving Certificate examiner and has written many published articles on the subject. Michael is the author of the recently published 'Geography Extra!', an exam focused handbook, designed to help students achieve top marks in the Leaving Cert Higher Level Geography exam. Michael believes that the geography course can be a stimulating learning experience for both student and teacher.

Urban Problem – Traffic Congestion

Definition of Traffic Congestion

Traffic congestion occurs when the number of vehicles travelling on urban road networks becomes so great that the **movement of traffic slows down or even stops**. **Queues of vehicles** build up on roads. A long line of vehicles are **close together** but can only **move forward very slowly**. In the worst case, **traffic jams** or **gridlock** occurs. This leads to **longer journey times** and **delays**.

Causes of Traffic Congestion

- **Dependency on Cars** – The **most common vehicle** on roads is the **car**. In cities, the car is the **most common form of transport** for people. Car usage is greatest during morning and evening time, i.e., **rush hour**. This is **when most people are travelling to and from work**, school, etc.
 - In Co. Dublin, there are over 500,000 registered cars (2016). This accounts for over ¼ of all cars in Ireland. 75% of household in Co. Dublin have one or more cars. It is estimated that in Dublin, cars account for about 60% of all journeys. The **number of cars is likely to increase** as the population of the Dublin urban area increases and if the economy remains strong.

- **The Importance of the Central Business District** (CBD) – This is the **main commercial area** of a city. It is where many people work. It is also the location for other activities such as government administration, education, entertainment, for other activities. It is often the **focal point for the road network** with several roads converging on the CBD from different directions. The result of this is that **large numbers of people are travelling into the city each day by car**.
 - The CBD is often the **oldest part of the city**. Street patterns were designed before motor cars were invented. Many streets are **narrow** and **do not allow ease of movement**. Some streets have many **adjoining streets** linked to them creating **road junctions** and **traffic bottlenecks**.
 - In 2016, an average 60,000 vehicles drove into Dublin city centre area each day. The number of people travelling in cars was recorded at 65,000, i.e., most cars carried only one person.

- **Economic Activity** – Large urban areas are economic **core areas**. They are centres of employment. Many people **commute to work from the hinterland area**, mainly by **car**. This increases traffic volumes in urban areas. It also leads to traffic congestion in areas outside the CBD. This is because much economic activity is dispersed across the city in business parks and industrial estates. These areas tend to have a high proportion of **heavy goods vehicles** (HGV).
 - The Greater Dublin Area accounts for **50% of Ireland's economic activity**. Many people **commute** into the Dublin urban from the surrounding counties, e.g. Co. Wicklow, Co. Meath and Co. Kildare. This leads to heavy traffic volumes on the **M50** (daily traffic of 140,000 vehicles in 2016, i.e., a 30% increase since 2009). HGV's use it to access Dublin Port.

- **Urban Sprawl** – As cities expanded, **new residential areas** were built away from the from the old city centre. These areas are the **suburbs**. This created **longer commuting distances**. It created a greater dependency on cars if public transport was not provided. New facilities were developed, e.g., **schools, shopping centres**, etc. were built. This leads to more traffic in the suburbs.
 - In Dublin, many suburb residential areas are **low-density housing** estates. These are often **detached** or **semi-detached** with gardens with residential land use covering a wide area.
 - Many places are not directly served by public transport. This leads to heavy traffic at peak times at estate entrances, around schools and shopping centres, e.g. **Dundrum Shopping Centre**.

What Problems have Developed because of Traffic Congestion?

- **Economic cost** – traffic congestion leads to **longer travel times**, e.g., it can over one hour to travel from the outskirts of Dublin city to the city centre. This leads to a **loss of time/higher costs**.
 - The slow traffic movement, i.e. stopping/starting, **uses up fuel at a faster rate** than open road driving. This leads to a **higher level of fuel consumption** and costs commuters more money. (In 2018, it is estimated that traffic congestion costs a car driver an extra €_____ in travel costs)
 - It **damages** the efficient running of the economy. **Business costs increase** and makes Dublin **less attractive as a business location**. In 2017, it was estimated of €360 million was the economic cost to the Greater Dublin Area of traffic congestion (could rise to €2 billion by 2030).
- **Environmental impact** – Emissions from both petrol and diesel vehicles add to the problem of **air pollution**. Gas emissions include **nitrogen dioxide** and **carbon monoxide**. There are increased concerns over high levels of **particulate matter** emitted from **older diesel car engines**.
 - The concentration of emissions from traffic jams can affect human health. They lead to greater levels of **respiratory diseases** (asthma and bronchitis), **cancer risk** and heart problems. In London, it is estimated that car emissions pollution cause 40,000 early deaths per year (2018).

Solutions to Traffic Congestion

- **Improve Traffic Management** – Traffic flows can be made easier by improving the road system. This includes building new **roundabouts**, introducing **one-way streets, parking restrictions**, etc.
 - In Dublin, the Traffic Management Centre uses a network of over 300 CCTV cameras to monitor traffic volumes at key road locations. Traffic lights can be adjusted to ease congestion.
 - **Cycle lanes** can be developed to encourage people to change from car dependency onto bikes. An example in Dublin is the Canal Way Cycle Route (used daily by over 2000 cyclists).
- **Improve Public Transport** – This is essential in reducing car numbers on road. Car dependency will decline if public transport is made more accessible and cheap. Examples of this in Dublin are;
 - The development of 16 **Quality Bus Corridors** (By 2017, 140 million passenger journeys were made on Dublin Bus); the **LUAS** network has expanded, e.g. Luas Cross City; **DART** network improvements, e.g. Leap Card, has pushed passenger numbers to over 16 million.

Urban Problem – Urban Sprawl

Definition of Urban Sprawl

This is the **physical expansion of an urban area out into the surrounding hinterland/countryside**. It involves the **gradual outward movement of population from a central city area**. This results in the **spread of the built-up city area over more and more land**. A much larger urban area is formed.

- The term 'urban sprawl' is usually used when the expansion of a city is **not properly planned or co-ordinated**. The expansion is mainly a **reaction to pressures to build more residential land**. The lack of long-term planning **creates new social and environmental problems** for city residents.
- **Dublin** has experienced urban sprawl in the last few decades. The Dublin urban area now covers an area of _____ km². It extends from Shankill in south Co. Dublin to Swords in north Co. Dublin.

Causes of Urban Sprawl - Dublin

The outward movement of the urban area from the city central area has been caused by a combination of a **rising urban population**, a **concentration of economic activities** and **transport improvements**.

- **Increasing Population** – Dublin's urban population has **risen rapidly in modern times**. It has **doubled since 1950** to reach **1.173 million** in 2016 (a rise of 70,000 since 2011 census). This growth reflects the global trend of **urbanisation** (the increase in the proportion of urban population).
 - This has led to **ongoing demand for more residential land** but residential **development is restricted in much of the city centre**, i.e. building height limit of **24 metres** (six storeys).
 - **High purchase prices** and **rental prices** make many parts of the city **too expensive** for many people to live there. In 2018, the average price for a home in Dublin was **€440,000** (national average is € 230,000). Average rental prices in Dublin City are **€1,800** per month.
- To meet demand for housing, **urban planning strategies** have tended to focus on **rezoning land on the edge of the city**. Much residential development was of **low density large estates of detached and semi-detached houses**, e.g. **Lucan, Castleknock, Swords, Rathfarnham**, etc.
- **New Transport Infrastructure** – The **improvements in modern forms of transport**, i.e., **rail and motor car**, has led to the urban sprawl of Dublin over the landscape. The resulting development of a **transport infrastructure** has **added to the city's physical size** and **accelerated its expansion**.
 - In a typical modern city like Dublin, up to 25% of all land use is transport related. **More physical space** is now taken up by a larger **transport network of wide roads, railways, car parks**, etc.
 - Railways first allowed people to move out beyond the edge of the old, congested central area. New **suburban** residential areas developed. People could travel to work by rail, i.e. **commuters**. The city began to **expand along the coastline** of Dublin Bay **and beside inland tramlines**.
 - The increased use of **cars** in the 20th century saw a **rapid expansion of suburbs** at a greater distance from the central city area. Cars allowed a more flexible choice of residential location.

- The increased reliance on cars led to the building of major roads to allow easier access into and across the city. The largest of these is the **M50 motorway** which connects to other motorways, e.g., the **M1**, **M3**, etc. Urban planning strategies led to residential development near these routes.
- Transport development has led to an **expansion of urban settlement in Dublin's hinterland**, the Greater Dublin Area. This is Dublin's **commuter belt**. Towns such as Navan, Naas and Greystones have grown rapidly in the last twenty years as people tended to live outside the built-up city area.
- **Increased Economic Activity** – The Dublin Region is a **core economic region**. It accounts for over 40% of the Irish economy as there is a concentration of a **wide range of secondary and tertiary** activities. The physical need for space led to pressure to acquire land for economic activity.
 - The city centre area is restricted due to **traffic congestion, high land purchase/rental costs and lack of space** for expansion. In 2016, retail rents in Grafton Street reached € _____ per m²).
 - The focus of urban planning strategies has been to use land on the edges of the built-up area that are accessible, i.e. **near the M50**. These sites provide more space and are cheaper. Business parks/industrial estates have developed, e.g., **Sandyford Industrial Estate**, etc.
- The large suburban population has led to the development of **retail parks/shopping centres** on the edge of the city, e.g., **Dundrum Shopping Centre, The Park** (Carrickmines), **Liffey Valley**, etc.

Impact of Urban Sprawl - Dublin

The urban sprawl of the Dublin urban area has created a **new range of social and environmental problems**. This was often because urban development was **often not well-planned** or co-ordinated.

- **Problem 1 – Loss of Green Areas** – **Open natural landscape areas** – **Green Belt / Green Space** – have been lost due to the **pressure to rezone land** for residential or commercial purposes.
 - **Green Belt** is the land zone that marks the **end of the urban land area** and the beginning of the rural area. If rezoned, it represents a **loss of good farm land** and possible recreational space.
 - Loss of green belt has a **negative environmental impact** as it means the **destruction of the natural habitats** of a range of bird and animal species, e.g. wrens, robins, blackbirds, etc.
 - About 26% of the Dublin urban area is **green space**, e.g., **sports fields, public parks**, etc. Some green space has been **rezoned for residential housing**, e.g. near St. Anne's Park (2018).
- **Problem 2 – Increased Traffic Congestion** – Urban sprawl has led to many new residential and commercial areas are not well served by public transport. Most commuters are dependent on cars.
 - It has led to very high traffic volumes on the main routes coming into/around the Dublin urban area. In 2016, the M50 had a daily traffic volume of 140,000 vehicles (30% rise since 2009).
 - Commuting **journey times will increase** for those driving in from the enlarged suburbs and hinterland. In 2018, commuting from the hinterland involves often over 2 hours per day.
 - Long commuting times means that people have less time to become engaged in local community activities in the new suburban residential areas. This can **damage local community spirit**.