

Information from Email Sent on 24/04/2023

I will apologies that my original written submission was hastily made and lacked detail as well as academic references.

So, I would like to extend that submission and provide academic references/articles on the subject matters of suburban sprawl, low density residential in comparison to high density, car centric/dependent planning, zoning, walkability, and other relevant subjects. Here is my evidence, from peer reviewed academic studies. I have only briefly referenced or linked them, but please read them in full using the links provided.

Low density car centric suburbs like the proposed Birchs Village are terrible for the environment, society, and long-term economy. If the Selwyn District council cares about the environment, they should not let it go ahead.

On average personal transport usage (car usage) in low density areas is 3.7 times higher than in higher density areas. This also means 3.7 times more vehicle emission. People are forced to travel further distances to get places. More driving, more greenhouse gas emissions which are a major contributing factor to climate change [1].

In Low density suburbs distances are too far for people to walk, so most people are forced to drive. This is often made worse by euclidean/single use zoning typically found in low density suburbs. Not only is this bad for the environment, but also the economy and society.

It is difficult to provide quality public transit in low density suburban areas, as it is hard to provide ample coverage, as well as make the route economically sustainable [2]. Public transit that is not within walking distance is often considered unattractive by residents, and they chose to drive instead [3][4].

A 2015 report found that the average New Zealand commuter pays \$11,852.98 per annum in car ownership and running costs. This is a substantial amount of the average annual income. However, commuters who did not own a car and used public transportation to commute spent on average \$1,879.32 for transportation costs (saving of \$9,065.78). Car owners that used public transportation to only commute to work spent on average \$9,733.95 for transportation costs [5]. Car transportation costs have likely increased since. Car ownership and usage is extremely expensive. People need access to quality public transportation, but also the ability to live car-free in an urban/suburban environment. This is very important during a cost-of-living crisis, but also for improved long-term economic stability.

Since people living in low density car dependent areas drive more, they have transportation costs as they spend more on fuel and other car running costs. However, more money is also spent on roading infrastructure, parking, and road maintenance. There is also an economic loss from increased traffic congestion, crashes, and environmental impacts [6].

People living in low-density, single-zoned, and car dependent areas typically have low levels of physical activity, often below recommended levels. Since walking to destinations is unfeasible, and driving is the only option. This is linked to higher rates of obesity, and other health problems. Those in denser, more walkable areas mixed-use areas, with good access to public transport have higher and healthier rates of Physical Activity [7].

Car dependency strips the independent mobility of those who cannot drive. This often affects the elderly, people with certain disabilities, adolescents too young to legally drive, those who can afford to drive, people without access to a car and those who simply choose not to drive. Without access to walkable areas and public transport these people are forced to rely on others who can drive, which is often costly and not always feasible. People without independent mobility often unwillingly have sedentary lifestyles, as well as higher rates of loneliness, depression, obesity, and less of a sense of community [8][9][10][11].

Creating more greenfield car-dependent suburbs increases car traffic and congestion across area [12]. However, attempting to decrease congestion by expanding and widening the roading network leads to induced demand, meaning that overtime car usage will increase, and traffic congestion will become even worse [13][14].

While the supporting infrastructure (i.e., roading, water pipes, electricity) for Birchs Village will likely be paid for by the property developers (costs passed on to home buyers), overtime the council will be responsible for maintenance and other costs (costs passed on to ratepayers).

Low density areas have higher supporting infrastructure costs than denser areas, especially for long term maintenance and replacements. These costs put stress on both local councils and government. Rates are often increased, as well as more tax money is spent attempt to fix these problems. Sprawling low density is often deemed economically unsustainable [15][16].

Low density car dependent sprawl areas also negatively impact stress, productivity, and the rate of innovation, as people are spending more time commuting and higher amounts on transportation costs, leading to less free time and disposable income [17][18][19][20].

Selwyn District Council, and the greater Christchurch metropolitan does not need more low-density car-dependent greenfield suburban sprawl, like Birchs Villages. Instead of improving the economy, society, and lessening the impact on the environment, it needs intensification of existing urban/suburban areas, walkability, mixed-use zoning, and improved public transportation [21][22][23][24][25][26][27][28].

While I do not have exact evidence on soil quality for the area where Birchs Villages is planned, I know it is highly productive and viable soil. Also, it will lead to the destruction of native bird habits, and other negative environmental impacts [29][30][31][32].

The World Resource Institute put out a report in 2018 outlining many global and local benefits of switching to dense cities. Some of the main benefits included (note the calculations for these started in 2018, proper planning has not been implemented in all cities/countries since then):

1. \$17 Trillion USD in economic savings by 2050 from having to do less climate change prevention, countering, and carbon offsetting.

2. \$26 Trillion USD in general economic benefits by 2030. Denser, more walkable cities have higher GDPs, and are more productive. People also spend less time commuting, as well as spending less money on fuel and other car related costs.

3. \$3 Trillion USD reduction infrastructure costs. Low density areas and infrastructure cost more money, resources, and labour (both for utilities, residences, and other buildings).

4. 700,000 less premature deaths caused by air pollution. In well planned dense cities with good walkability and public transit people drive significantly less or not at all. This of cause cuts down on vehicle emissions.

5. 3.7 gigatons of CO2e savings will occur annually. This is like the CO2e of the EU. Once again this is due to people driving less.

[33]

Thank you very much for reading my submission. Please read the academic references I have provided, as well as other related topics. It will be the wrong decision to pass Private Plan Change 79, and allow Birchs Village to be built. It will only benefit the property developers, and negatively impact everything else.

Regards.

Benjamin Love

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Additional Material and Visualizations

Modal Share and Population Density of Metropolitan Areas

(Comparison of Christchurch Metropolitan Area to Other Metropolitan Areas with Similar Population)

A metropolitan area is a populated urban area/region that is located across multiple districts with separate local councils. They often consist of a core center, and multiple suburbs, neighborhoods, townships, exurbs, as well as satellite cities/towns. These areas have strong social and economic integration/co-dependence between districts. Thus, actions of individual councils can affect other districts, and the whole metropolitan area [a]. Parts of Selwyn and Waimakariri are in the Christchurch metropolitan area, including Prebbleton, Lincoln, Rolleston, and West Melton.

Modal share is the percentage of travelers or freight utilizing a certain type of transportation. Population density is how many people are living per unit land area.

Modal share for journeys to work in metropolitan areas:

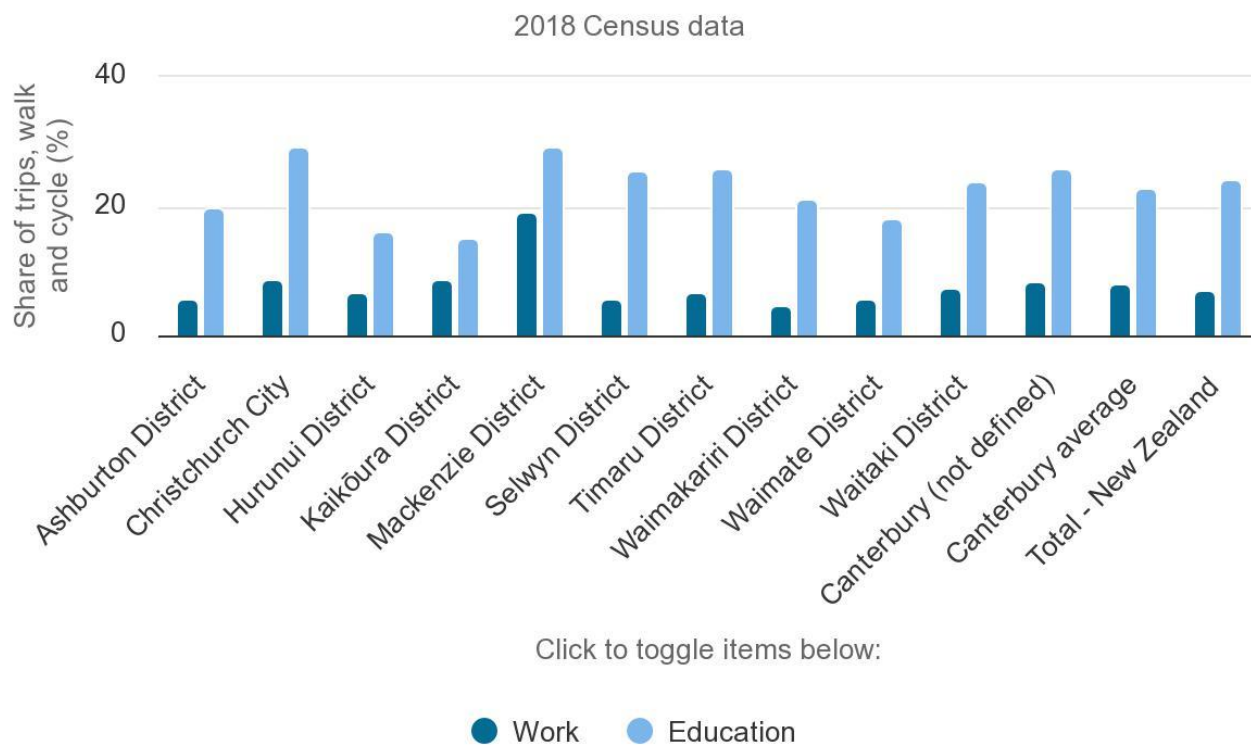
Metropolitan area	Metropolitan Population	Metropolitan Population Density	Walking	Cycling	Public Transport	Private Motor Vehicle
Christchurch, New Zealand	536,000	1,300/km ²	4%	6%	5%	84%
Wellington, New Zealand	434,900	1,400/km ²	21%	4%	23%	49%
Basel, Switzerland	559,011	3,838/km ²	33%	17%	27%	22%
Bern, Switzerland	425,608	1,551/km ²	30%	15%	32%	22%
Graz, Austria	652,654	2,300/km ²	19%	19%	20%	42%
Utrecht, Netherlands	656,342	2,192/km ²	25.3%	48.4%	5.4%	18.7%
Aarhus, Denmark	355,238	2,005/km ²	7%	27%	19%	43%
Malmö, Sweden	749,437	2,522/km ²	14%	26%	25%	34%
Brno, Czech Republic	696,413	1,600/km ²	5%	2%	57%	32%
Freiburg im Breisgau, Germany	656,753	1,500/km ²	29%	34%	16%	21%
Gent, Belgium	560,522	1,700/km ²	13%	33%	15%	40%

(Note: methods for data collection and calculations for population, population density, and mode share can vary)

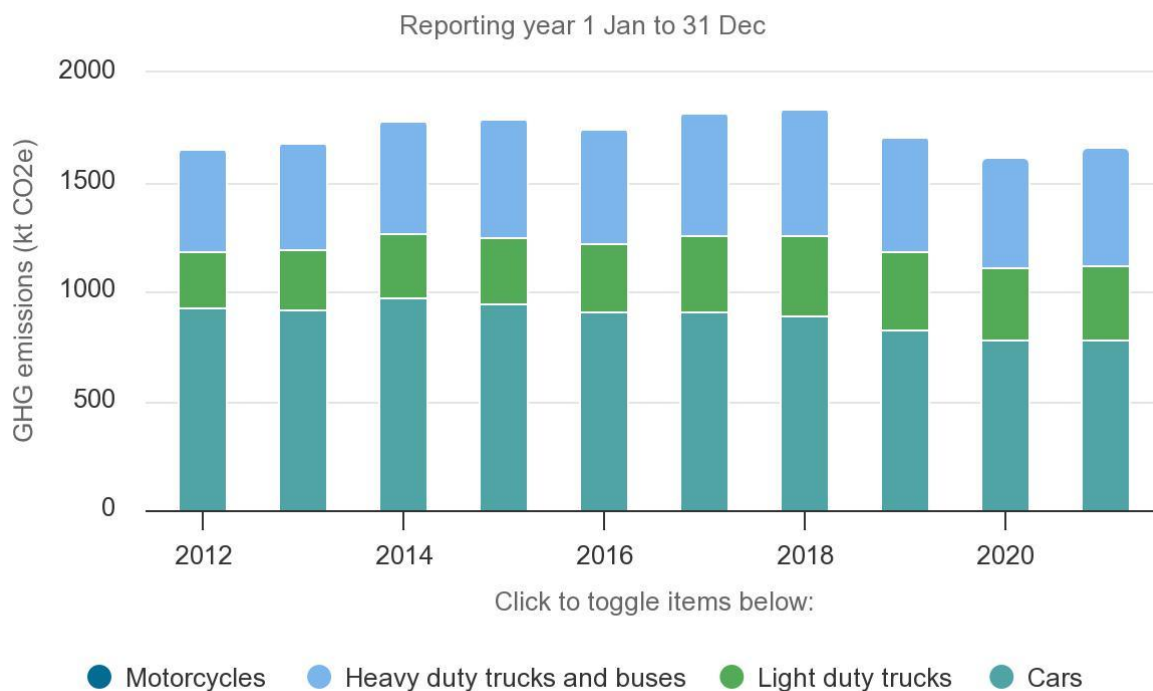
ECan Transport Graphs

According to ECan in 2018 1840 kt CO₂e land transport emissions were produced, 16% of Canterbury's emissions. Nearly 70% of transport emissions were from light vehicles (cars, SUVs, utes, vans, and light trucks), mainly personal vehicles [b]. However, in Christchurch transport accounts for 54% (36% land transport), around 1479 kt CO₂e (986 kt CO₂e for land transport). Buildings (i.e., housing, shops, offices) were 19% (520 kt CO₂e) [c].

Active travel (walk and cycle) mode share in Canterbury



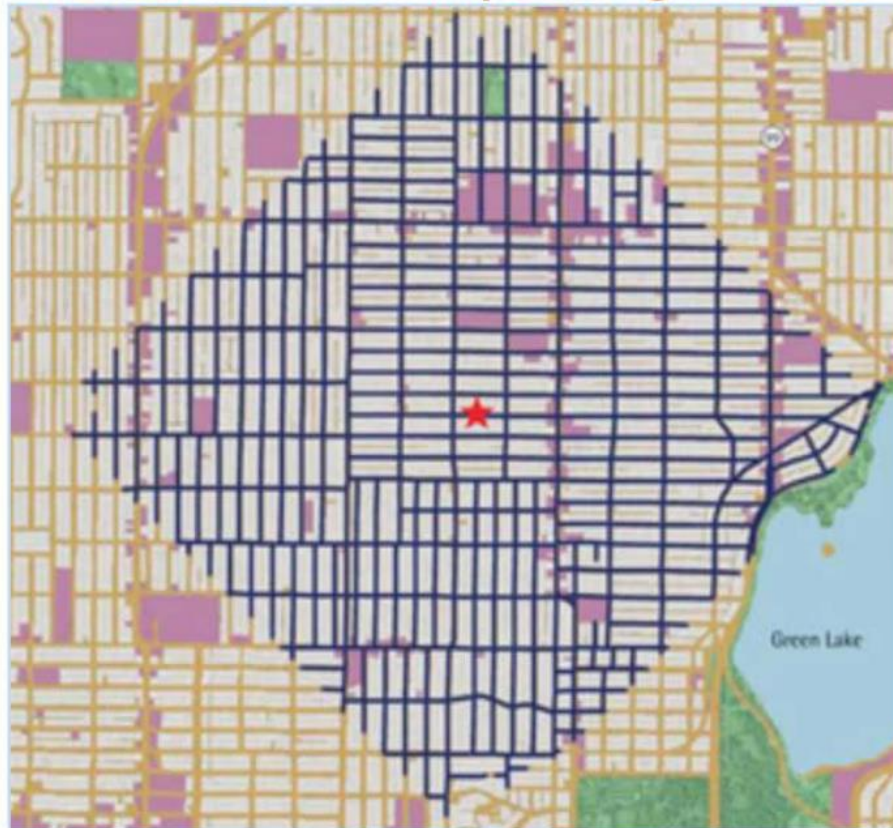
Road transport emissions in Canterbury – vehicle type



Street Layout Walkability

Though grid street layouts have their own issues and are not always suitable, they are significantly more walkable than typical low density suburban/cul-de-sac style street layouts. Often poor street layouts increase car dependence.

One-Mile Walk in a Compact Neighborhood



A one-mile walk in [Seattle's Phinney Ridge](#) takes you through a grid-like street network with a mix of residences and businesses.

One-Mile Walk in a Sprawling Suburb



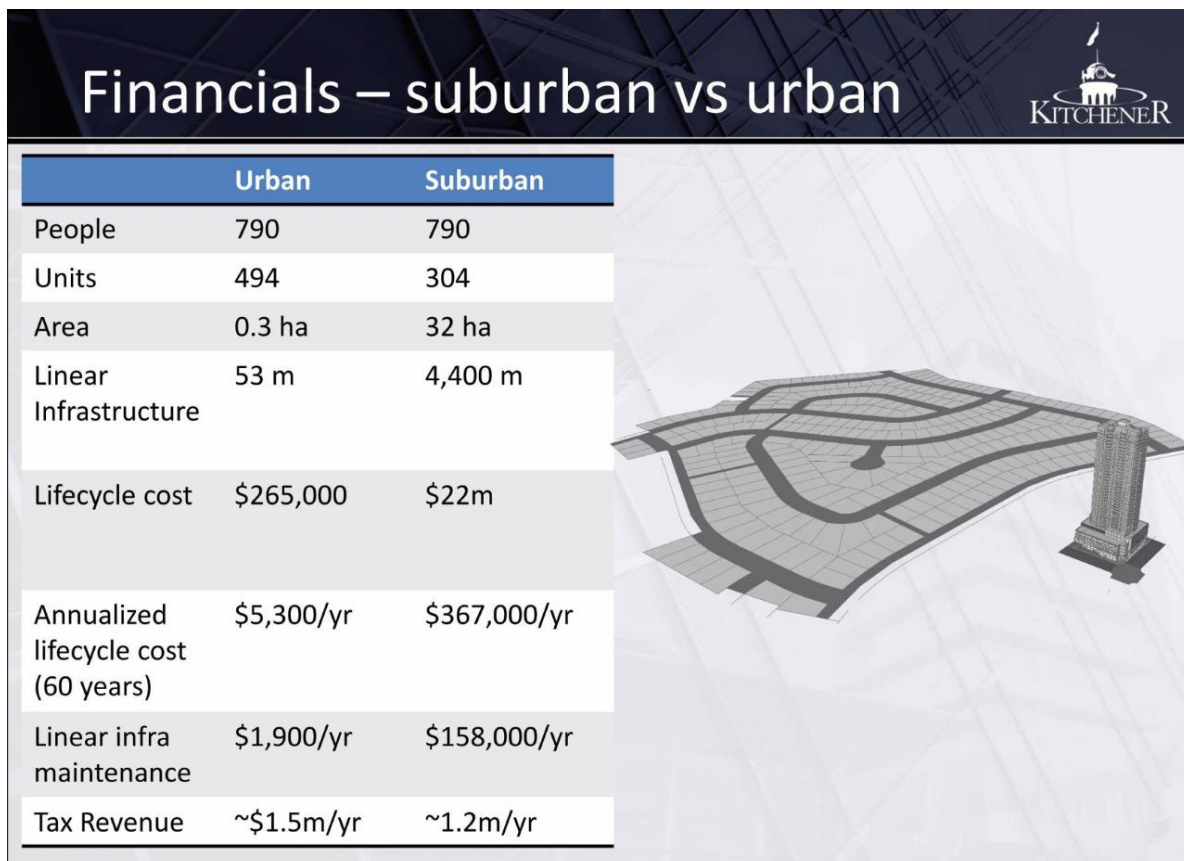
A one-mile walk in [Bellevue, WA](#) with cul-de-sacs and winding streets has few shops and services within walking distance.

Low-Density Vs High Density

Though definitely not suggesting constructing residential high-rises for Selwyn, future residential area planning in the district should preferably be mid-rise/medium-density intensification, focused around mixed-use business and transport hubs.

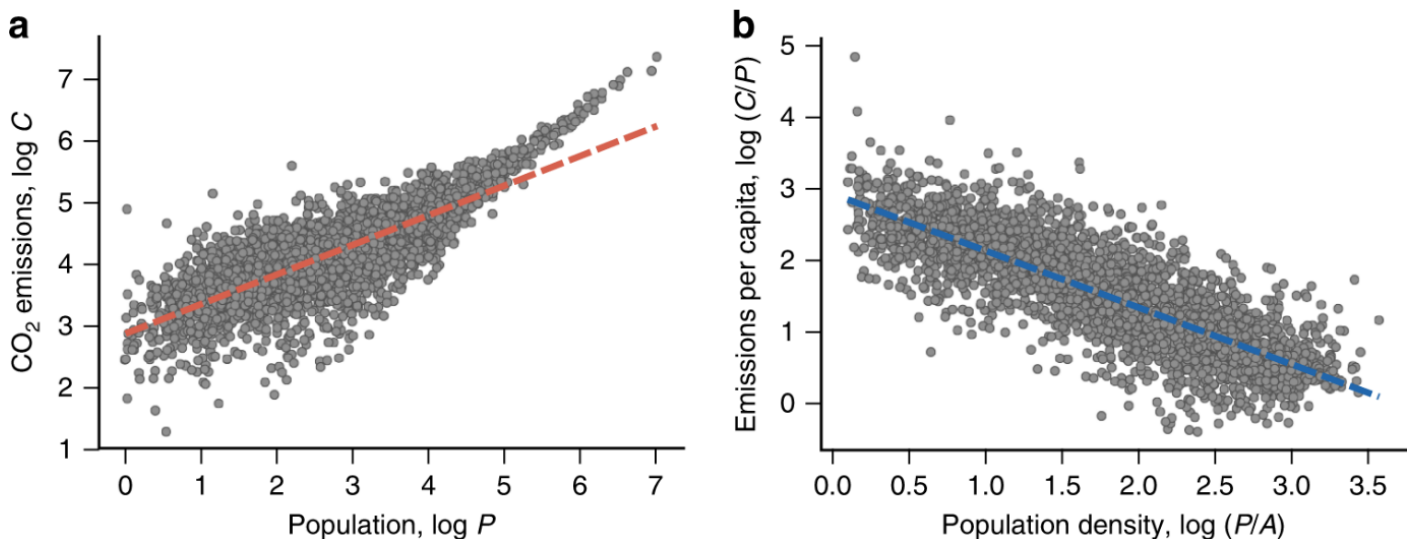
Kitchener, Canada

The city of Kitchener, Ontario, Canada (metro pop. 575,847) did a study to determine the most economically sustainable form of residential development.



Effects of changing population or density on urban carbon dioxide emissions

[d]



Japanese Zoning Laws That Allow for Good Mixed-use Zoning

Twelve categories of Land Use Zone provide a pattern for land-use zoning in each type of urban area. These can be generally categorized into residential, commercial and industrial uses. Each Land Use Zone has specifications concerning the uses of buildings which can be constructed in the zone. Land Use Zones are allocated according to a future vision of land-use pattern.

Category I exclusively low-rise residential zone



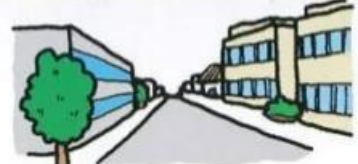
This zone is designated for low rise residential buildings. The permitted buildings include residential buildings which are also used as small shops or offices and elementary/junior high school buildings.

Category II exclusively low-rise residential zone



This zone is mainly designated for low rise residential buildings. In addition to elementary/junior high school buildings, certain types of shop buildings with a floor area of up to 150m² are permitted.

Category I mid/high-rise oriented residential zone



This zone is designated for medium to high residential buildings. In addition to hospital and university buildings, certain types of shop buildings with a floor area of up to 500m² are permitted.

Category II mid/high-rise oriented residential zone



This zone is mainly designated for medium to high rise residential buildings. In addition to hospital and university buildings, the permitted buildings include certain shops and office buildings with a floor area of up to 1,500m² to provide conveniences for the local community.

Category I residential zone



This zone is designated to protect the residential environment. The permitted buildings include shops, offices and hotel buildings with a floor area of up to 3,000m².

Category II residential zone



This zone is designated to mainly protect the residential environment. The permitted buildings include shops, offices and hotel buildings as well as buildings with karaoke box.

Quasi-residential zone



This zone is designated to allow the introduction of vehicle-related facilities along roads while protecting the residential environment in harmony with such facilities.

Neighborhood commercial zone



This zone is designated to provide daily shopping facilities for the neighbourhood residents. In addition to residential and shop buildings, small factory buildings are permitted.

Commercial zone



Banks, cinemas, restaurants and department stores are constructed in this zone. Residential buildings and small factory buildings are also permitted.

Quasi-industrial zone



This zone is mainly occupied by light industrial facilities and service facilities. Almost all types of factories are permitted excepting those which are considered to considerably worsen the environment.

Industrial zone



Any type of factory can be built in this zone. While residential and shop buildings can be constructed, school, hospital and hotel buildings are not permitted.

Exclusively industrial zone



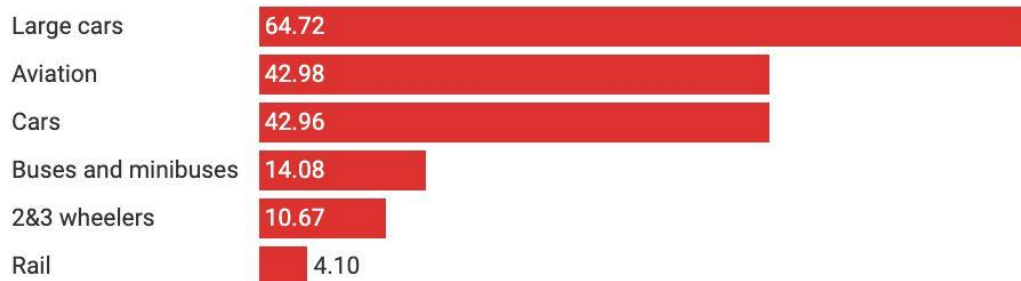
This zone is designated for factories. While all types of factory buildings are permitted, residential, shop, school, hospital and hotel buildings cannot be constructed.

Special Land Use District

A Special Land Use District is designated as a supplement to the land-use regulations on the Land Use Zone. It is designated within a Land Use Zone aiming at specific purposes, such as achieving more effective land use or a more pleasant environment. Regulations under Land Use Zone are applied uniformly nationwide. However, in the Special Land Use District, Land Use Zone regulations can be modified by municipal bylaw. In correspondence with the local characteristics, each municipality can stipulate the strengthening or relaxation of Land Use Zone regulations.

Energy intensity of different passenger transportation modes

TOE/million passengers-km



TOE is tonne of oil equivalent, a unit of measure to indicate the amount of energy released in burning one metric ton of crude oil.

Chart: The Conversation, CC-BY-ND • Source: [International Energy Agency](#) • [Get the data](#)

[e]

References for Additional Material and Visualizations

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