

VISUAL POLLUTION

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The term *visual pollution* is usually applied to describe the negative effects of man-made structures on people's perception and enjoyment of the surrounding environment. The concept is subjective, because it depends on one's aesthetic views, but is often related to aspects such as the disruption of visibility, irregular or incoherent patterns, clutter, juxtaposition of different types of visual elements, and predominance of certain shapes and colours.

The transportation system can be an important source of visual pollution. Large transportation infrastructure can have a disruptive presence in the visual environment, especially in the case of elevated highways and railways. Some features of the design of vehicles can also be regarded as visually unpleasant by some people.

Secondary elements in the transportation infrastructure, such as signs and billboards, can also reduce the aesthetical value of the travel experience for users of the infrastructure. The recognition of the negative impacts of transportation in terms of visual pollution has led to the introduction of laws and public policies to limit or to regulate the quantity and type of elements intruding in the landscape. Despite the recognised effects of visual pollution on human wellbeing, there is still relatively little research on methods for its measurement and evaluation.

Elevated highways have a considerable visual effect for people at street level. Because of their large size, they disrupt the perceptions human beings have of the surrounding environment. This is especially true in the case of major junctions, or areas with multiple elevated highways at different heights. Exposure to these effects can be particularly unpleasant in conjunction with exposures to other types of road pollution, such as air pollution and noise. In addition, measures for mitigating pollution (such as noise barriers) may also contribute to visual pollution due to their size, shape, or type of material used.

The scale of the infrastructure is a crucial factor in the aesthetic experience of people at the street level, as it contributes to the monotony of the visible landscape while they are walking. The size of the road and its position at a higher level can also be intimidating for pedestrians, especially when combined with vehicles at fast speed. The presence of transportation infrastructure also affects people's views from their houses and offices.

Elevated railways have similar visual aspects. The size and position of the infrastructure, combined with the speed of trains and their associated noise and vibration, can be intimidating for the people at the street level and for residents and workers in buildings facing the line.

While most research on visual pollution has focused on the effects of the infrastructure, the traffic on that infrastructure may also have negative effects on the visual environment. In the case of road traffic, important elements include the shape of cars and the reflections from their metallic and curved surfaces and from windscreens. These elements can be perceived as alien to the streetscape and, more generally, to the natural and built environments and can be alienating for pedestrians.

This factor may contribute to what some sociologists identify as the unequal relationship of power between car users and pedestrians. When moving at high speeds, vehicles can be intimidating for people at the street level. However, even when parked, cars also can be

perceived as a visual nuisance by the pedestrian. Lights from cars can interfere with the pedestrian travel experience and increase pedestrian accident risk when walking along or crossing roads.

Little research has been done on the positive or negative visual effects of other vehicles, such as trains, trams, and motorcycles on human wellbeing. The analysis of the case of trains and trams may provide interesting results, given the relative popularity of "trainspotting" as a hobby in some countries.

Certain types of road design can also be a source of visual pollution for pedestrians. The expansion of the road infrastructure usually creates traffic islands and other "no-go" areas for pedestrians, which tend to be perceived as visually unpleasant. Traffic furniture also causes visual pollution. In the case of highways, this effect is related to the number and concentration of traffic signs, road markings and billboards.

Together with other infrastructure, such as telephone and electricity poles, this furniture contributes to an aesthetically unpleasant clutter. Signs and billboards also disrupt the travel experience of pedestrians, because of their size, the types of material used, and the absence of meaning to them. In the case of railways, large depots and areas with multiple service lines also create an important footprint on the visual environment.

The degree of visual intrusion of transport infrastructure and traffic on pedestrians depends, however, on the context of each area, including its functional use (for example, residential, industrial, recreational, or other), the type of buildings (private houses or high-rise blocks), the presence of other positively pleasant elements, and the climate and other natural characteristics of area.

The negative visual impact of large transportation infrastructure and traffic on that infrastructure can influence human welfare at many levels. The long-term exposure to unpleasant or intimidating views can aggravate psychological conditions such as stress and depression. The effect is especially relevant in the cases of residents of buildings facing elevated highways and railroads. The problem may also affect residential satisfaction, because it has been reported in many studies as a factor explaining why people are not happy with the area where they live.

The visual footprint of transport infrastructure also contributes to the dividing of communities and to the isolation of some neighbourhoods, with negative resulting effects on community interaction and social cohesion. The visual element is especially important because people need to cross over or under the infrastructure to access nearby communities.

Footbridges place the individuals in close contact with the transport infrastructure and traffic, amplifying the negative aesthetical effects, while underpasses tend to be perceived as ugly and dangerous environments. Visual pollution also affects the levels and quality of mobility of pedestrians and cyclists. Recent research has shown that the negative visual aspects affect the propensity of people to walk, although it is not always possible to disentangle these aspects from the overall negative sensory experience of road traffic.

Visual aspects are also relevant to the users of the transport infrastructure. Because cars move at a fast speed, the aesthetic experience of car travel is associated with the size of the visual field. The presence of elevated highways reduces this visual field and is therefore disruptive. Elevated highways can also cause disorientation for car drivers and passengers, especially around major junctions.

The reduction in visibility caused by signs and billboards also raises safety issues for drivers, as these structures compete for their attention, despite the fact that the mission of some signs is to improve safety by alerting drivers to road conditions

Measurement

Due to its subjective character, the assessment of visual pollution is fraught with problems, which can prevent their inclusion in transportation project evaluation. The measurement of visual pollution has seen only a few developments, although authors have suggested measurements, such as the degree of intrusion of transportation infrastructure in the visual field.

The evaluation of the economic and social costs of visual pollution is also an under-researched field. A possible, though imperfect, method to estimate this value is to analyse differentials in residential prices and rents in areas with high and low levels of transport-related visual pollution. Because of the difficulties in measurement and evaluation, the issue may therefore not be considered a priority in road and urban planners' decisions, especially when compared with more tangible local environmental aspects, such as air pollution and noise.

Nevertheless, aesthetical issues have slowly been included at the level of the design of new transportation infrastructure. In some countries there are regulations regarding aesthetic elements, while professional bodies and researchers have also produced sets of recommendations to guide the visual arrangement of new transportation infrastructure.

These include, for example, the need to reduce clutter and to minimize the number of large traffic furniture. In the production of these regulations and recommendations, judgements are inevitable, especially regarding the definition of the features that are aesthetically unpleasant.

Recent developments in information technology could potentially contribute to the reduction of street clutter. For example, the use of technology such as Global Positioning System (GPS) can contribute to the reduction of the number of traffic signs, because it allows information to be passed directly from traffic control system to drivers.

See also: Highway Aesthetics; Highway Landscaping; Light Pollution; Noise Pollution and Cars; Pedestrian-Friendly Design; Road Signage.

Further Readings

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