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FORMATION « UN URBANISME FAVORABLE À LA SANTÉ »

SCRIPT

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Sommaire

1. Devant l'INET – Rue Edmond Michelet - Départ : devant le restaurant Taikin

Welcome everybody to this learning walk.

The goal of this learning walk is to help train urban planners and architects in creating urban spaces that promote health.

You will **experience just a part of this walk**, which, I hope, will give you an **idea of the tool** and the method we use.

This is a **practical example** to show you health factors along the walk. We will pay attention to the design of this area.

a) History of the Neighbourhood

To give you some **background** on the area, this neighbourhood is called the Danube ZAC (which means urban development zone).

It was established in 2008. The project was designed with the idea of b**uilding a little city within the city**. Previously, this site was home to a former gas production plant.

In 1999, GDF and after this, the project developer SERS, began the Environmental decontamination efforts for this area.

The project had several key goals:

- **To Encourage new forms of mobility**: the neighborhood has good access to public transport, as well as traffic-calming measures, and it is designed to make cycling easy and accessible.
- **To Foster community life**: the neighborhood was co-designed through 48 collaborative workshops and educational visits. This vision of community came to life through Shared public spaces, a nursing home (EHPAD), and student housing.
- **Promoting biodiversity**: local species were prioritized, no pesticides are used, and low-maintenance landscaping supports biodiversity.
- **Supporting residents' health**: soil quality was improved, air quality is monitored, and the core of the neighborhood is a shared zone designed for calm interaction. Detailed building guidelines also ensure careful planning of housing layouts, especially for bedrooms.
- **Saving energy**: urban forms were designed to optimize natural sunlight, car use is limited, and the area includes the ELITHIS positive-energy tower.
- **Managing rainwater sustainably**: there are no rainwater discharge into the sewer system. Instead, rainwater is absorbed through bioswales along the streets, green roofs, and flow-control systems that direct water back into those bioswales.

The area developed is 7 hectares, including :

- 650 housing units and affordable housing
- a nursing home
- 20,000 square meters of office, retail, and service space,
- and 6,000 square meters for public facilities.

Now we'll begin our walk**. Listen, observe**, take it all in...

b) the impact of environmental exposures on health

As we begin our walk I want to give you some context on **the impact of environmental exposures** on health :

According to the World Health Organization (WHO), nearly **a quarter of all diseases is caused by environmental exposures**. In fact, global health statistics released by the WHO in 2024 show that air pollution, both outdoor and indoor, was responsible for 6.7 million deaths in 2019. Of these, 4.2 million were due to outdoor air pollution, while 3.2 million were linked to indoor air pollution. In 2019, a staggering 99% of the global population lived in areas where air pollution levels exceeded the limits set by the WHO. For reference, the WHO recommends an annual concentration of fine particulate matter around 5 micrograms per cubic meter to protect public health.

In all countries of the WHO European Region, there are inequalities when it comes to environmental exposure and the health impacts caused by the environment, contributing to a lack of health equity. According to this report, environmental risk factors account for at least 15% of mortality in the region—approximately 1.4 million deaths each year, most of which are preventable.

c) the recent concept of exposome as considered in public health law,

The concept of 'exposome' defines the impact of an individual's physical, biological, and social environment from conception to the end of life.

Urban planners and builders also need to consider the exposome when designing or renovating spaces.

The way we shape our cities—whether through construction or rehabilitation—has a direct impact not only on the health of today's citizens but also on the health of future generations.

To illustrate this, we can think of the way a famine will impact the health of people for several generations.

For example, let's take the winter famine that struck the Netherlands during the Nazi occupation in 1944 to 45. Studies revealed that adults born from parents who suffered during that time were more likely to be shorter, to suffer from obesity, cardiovascular diseases or schizophrenia. According to studies, we can still detect epigenetic changes in adults born 60 years after this.

We are now going to walk to our second station on avenue du Rhin.

On the way, we can observe the following things:

- Streets lined with trees help create a tree cooling effect. This helps with the urban heat effect.
- Grass along the tram tracks helps reduce the noise from the tram as it is absorbing the sound.

2. Transit le long de l'avenue du Rhin

d) The social cost of air pollution and noise.

We are now on avenue du Rhin ; **Listen, and look** around you.

Avenue du Rhin is a **busy road with heavy traffic**. There can be as much as forty five thousand vehicles per day here.
This road has a **lot of air pollution**, mainly because of the traffic, and it is also very noisy.
The main pollutants from this traffic are nitrogen oxides (47%), fine particles (20%), and benzene.

The impact of a road on air quality can reach up to 200 meters away (for NO2), and this distance can change depending on the pollutants.

Overall, **air quality has improved each year** compared to the limits fixed by regulation. However, when we refer to the recommended values for health set by the WHO, 100% of the population on this street and in the Eurometropole was exposed to levels above the recommended threshold for nitrogen oxides in 2021.

However, Avenue du Rhin remains a problem area. You can see along the road that there are **balconies**, which are unnecessary AND they don't allow residents to use this space in healthy conditions. This is because of air pollution and noise.

The **purpose** of this learning walk is to **raise awareness** among planners that the balconies on this building, which they consider a selling point, is not relevant. Some balconies have even been turned into loggias to find a solution.

You can also see some vents on the street-facing side of the building: this ventilation is poorly placed and contributes to the problem.

In July 2015, the social cost of air pollution in France was 101 billion euros.

It also represents forty eight thousand premature deaths per year.

Another impact of air pollution is allergies : thirty percent of the French population has respiratory allergy.

e) The social cost of noise

The yearly social cost of noise in France is one hundred and forty seven million euros.

In France, we have **three categories** for sources of noise:

- The first one is Noise **from transport infrastructure** (road, rail, air)

- The second is Noise from **industrial establishments,**
- The third is **Neighbourhood noise**, which is divided into three categories: noise from professional activities (outside of industrial establishments) (for example, noise from a store's fans or a woodworking activity), behavioural noise (like partygoers, teenagers partying, or my neighbour's lawnmower), and construction noise.

Transportation noise makes up the largest part of the social cost (68.4%), which is 106.4 billion euros per year,

Neighbourhood noise represents 16.9% of the social cost. Neighbourhood noise is one of the most disruptive noises for people in France, while continuous road noise harms health (causing discomfort, stress, cardiovascular diseases, etc.).

3. École Danube et station de mesure ATMO

We are in front of the Solange Fernex elementary school.

Our **aim** for this third stop is to show the importance of improving our **understanding of exposure to outdoor pollution and noise** in development and construction projects.

a) Here, you will find an air pollution measurement station from ATMO Grand Est.

The station is part of the urban background measurement sites of EMS. The main pollutants measured at the station are NO2 and various particle sizes: PM10, PM2.5, as well as ultrafine particles (PM0.1).

The 'Danube' station meets the annual limits and the air quality objectives set by the French regulations. However, the WHO recommendations are exceeded for two pollutants.

b) Here is the Solange Fernex School

Environmental risks were taken into account to choose how to place the school.

Air quality was measured before the construction of the neighbourhood. This showed the significant impact of Avenue du Rhin on air quality in the area.

ATMO GE created an **air quality model** For the school before the construction This model showed a risk of exceeding the annual NO2 limit value in the schoolyard. As a result, the design was changed: **they added an extra floor to block the air pollution** from the traffic on the avenue.

The facade facing the avenue serves as a **barrier to pollutant dispersion**, this protects the schoolyard at the back of the building.

The air intakes for the buildings were also placed in less polluted areas to reduce the impact on indoor air quality.
This new configuration aims to keep pollutant levels below regulatory limits in the schoolyard.

- **Here is a map**

You can see on this map the two development scenarios – the model shows a big difference in pollution spread in the schoolyard depending on the architecture choices.

- **The solutions we recommend include:**

- first, to model the air and noise pollution for sensitive buildings (like those for children) to understand and reduce their exposure,
- to place fresh air intakes away from polluted areas,
- and to check that the ventilation systems are working properly before handing over the building to users.

c) Noise pollution

Noise pollution is also a problem on Avenue du Rhin.

According to a European directive, cities with more than 100,000 inhabitants must create strategic noise maps for transport infrastructure (air, rail, and road).

Next, the local government must create a Noise Prevention Plan. This plan sets a list of actions to reduce people's exposure to environmental noise and to protect quiet areas.

Strategic noise maps show how people and areas are affected by noise from transport infrastructure.

- Map A shows road traffic noise levels across the area.
- Map C shows the zones where noise levels go over legal limits.

- **Modeling Maps:**

These maps help us **plan and define building choices** for a block or a street. This includes building shapes and volumes. This task is more challenging when working on areas that need to be renovated.

But with these noise maps, we can **focus on areas where noise levels exceed legal limits** and take action. For example, install **soundproofing on facades**. We can also improve the acoustic performance of old buildings by replacing the insulation material with one that is both noise- and heat-insulating.

- **Ehpad or nursing home Map:**

In these two models (before and after development), we can see that the **noise pressure is reduced** by the buildings themselves (the centre of the block is quiet, as you can see). Originally, the nursing home, which was built first, was highly exposed to noise. When residential buildings were built around the nursing home, the air conditioning and ventilation equipment of this healthcare facility created noise pollution. The operator of this site was required to undertake major works to eliminate this noise pollution.

On our maps, the boulevard marked in purple is shown to be heavily exposed to noise. This is the street we walked along, which clearly shows that a balcony on this street would be incompatible.

The solutions to put in place are :

- To Model areas to be developed, as well as sensitive buildings and their equipment.
- To Identify the benefits and conflicts between air and noise modeling to guide planning choices and architectural designs.
- To work as much as possible to establish quality sound environments favoring the sound of the wind, birds, nature, etc.

4. Le Coeur du quartier

We are moving to the centre of the Danube neighbourhood.

Here, we see **a lot of plants**: there are swales that help absorb rainwater, bushes near the houses, and crops in raised garden beds, even on rooftops. The different layers of trees help make the area more comfortable and cooler.

a) Green spaces and health:

Here, green spaces help with:

- **Improving physical health** as they encourage physical activity,
- They **reduce exposure to air pollution** by absorbing pollutants (like NOx) ,
- And they can help **improve mental health**. Remember the 3/30/300 rule developed by a Dutch forester :
    - you need to see at least 3 trees from your home window
    - you neighbourhood needs to have at least 30% tree cover
    - you need to live less than 300 meters away from a parc or green space (that's a 5 to 10 minutes walk).
- They also **help mitigate the effects of urban heat islands**: vegetation improves comfort by lowering temperatures during heatwaves. The combined effects of evapotranspiration and shading significantly reduce air temperatures.
- They **reduce noise pollution**: green spaces lessen the impact of noise on health by reducing exposure through distancing from the source or acting as an acoustic barrier. It is pretty subjective though as a shrubbery would need to be 100 meters long to lower noise levels by 3 decibels.
- They **improve biodiversity**.

This neighbourhood **encourages walking and cycling** instead of driving: there are bike racks in buildings, bike lanes, and easy access to trams.

These measures help reduce noise, improve air quality, and improve health. Physical inactivity is a major risk for health problems worldwide.

It also helps **bring people together**, as walking makes it easier to meet others. Research shows that there is a link between a walkable neighbourhood and social cohesion, meaning neighbourhoods that encourage walking tend to have stronger community ties.

b) Proximity Shops

There are **some local** shops here and in the shopping centre near your hotel. Research shows that the types of food available in local stores can affect people's eating habits. Studies show that having access to healthy, diverse, and affordable food helps people eat better.

In this area, there is also a **nursing home** and a **centre for people with disabilities**. Access to healthcare and services is an important factor for good health, though it doesn't explain everything about people's health.

5. Devant le poulailler

At this point, we can observe a **chicken coop**. It symbolizes the **return of nature to the city**, as more and more residents are adopting chickens. However, this action is not without risks. The food given to the chickens can attract rats and other rodents. To prevent them from accessing the coops, measures can be taken during construction : A fine mesh fence (maximum 6 mm) with a height of 80 cm above the ground, an underground barrier with a horizontal return of at least 50 cm, or a concrete foundation of at least 20 cm deep can help.

These measures should prevent rodents from entering the chicken coop. Additionally, using rodent-proof feeders and installing proper drinkers are important. Building the city also means considering daily facilities and the elements that make life easier for residents, such as determining the number of trash bins for proper waste management, placing benches close together to help the elderly move around independently, and providing spaces for rest.

a) Marginal Species

Marginal species are those that **adapt well to human-made environments**, especially urban ones. These include rats, pigeons, as well as bedbugs, cockroaches, and mosquitoes.

b) Waste Management and Rodent Prevention

At this stop, we can observe burrows.

For rodents, their presence is closely **linked to the availability and abundance of food**. Green spaces can also become prime areas for rats to settle. Low or bushy plants create dense cover, which is ideal for rodents and burrow construction. Rats carry many diseases, like leptospirosis and salmonella.

c) Tiger Mosquito (cartes)

Tiger Mosquitos have been present in the Strasbourg Eurometropole since 2015. The tiger mosquito **can carry diseases** such as dengue, Zika, and chikungunya, but only if it is infected. It is not naturally a carrier of these diseases. **It gets infected** by biting a sick person who has recently travelled (that's an imported case). The mosquito remains contagious for several days and can then transmit the disease to healthy people nearby (that's a local case).

The tiger mosquito adapts particularly well to climate change. In addition to seeking small amounts of water to lay its eggs, it thrives easily in temperatures between 30 and 35°C. It is an urban mosquito.

- **Map:** Through this map, you can see the expansion of the tiger mosquito in the Strasbourg Eurometropole since 2014. All 33 municipalities in the region have been infested since last year.

Tiger mosquitoes **prefer artificial habitats** created by humans. To eliminate mosquito larvae, it's important for urban planners and architects to understand that architectural design and urban shapes can influence the development of tiger mosquitos.

This mosquito poses a **health risk** and causes nuisances as it bites throughout the day. To fight against this mosquito, we recommend:

- Properly designing rooftops to prevent stagnant water.
- Avoiding the use of raised terraces (on plots).
- Installing rainwater drainage systems (gutters, downspouts, etc.) and wastewater systems (drains, channels, and drainage).
- Installing draining layers at the location of rainwater collectors.
- Covering water reservoirs with mosquito netting.

We've received complaints from residents in this neighbourhood about the large presence of tiger mosquitoes. Rooftop terraces contribute to the development of this insect. Street drains, which collect rainwater, are also places where mosquito larvae can grow. That's why, here, these drains have been replaced with swales that allow rainwater to naturally infiltrate into the soil.

6. Aire de jeux et lieu de rencontre du quartier

d) Polluted soil management

Look around you: identify elements that are good or bad for health. The Danube area is an opportunity to talk about the management of polluted sites and soils.

The Danube neighbourhood underwent significant cleaning. After industrial activities ended, the previous operator started the first **cleaning actions** to make the site suitable for industrial use.

Later, the local authorities and developers continued the **cleanup to allow for current uses**, such as residential, office spaces, and sensitive facilities (like schools).

Specifically, **management measures** have been implemented in this eco-neighbourhood:

- You can see **raised garden beds** for gardening activities.
- The school building is constructed on a **ventilated crawl space**.
- There are structures in place to **monitor the pollution cleanup work**.
- There are **easements and usage restrictions** in the zoning regulations to prohibit or limit gardening and farming activities.

e) One goal of this neighbourhood is to promote social connection:

Planning public spaces with health in mind is important to prevent health problems. It's about creating a **pleasant atmosphere**, making people *feel safe*, and creating places where people can **meet and interact** as this helps with mental health.

Urban planning, and more specifically the design of public spaces, has an impact on social cohesion. 'A true quality public space is one that people want to visit regularly and where they can connect with others.' The key points to improve quality spaces are as follows:

- To **minimize the problems** or annoyances seen in the area.
- To **reduce the noise problems** caused by surfaces and work on the sound atmosphere of the area,
- To **Highlight the presence of nature** (water, plants, soil),
- To **provide sheltered areas** (for wind, rain, sun, etc.),
- To make the space **easier to understand** and navigate.

With these key points in mind, we arrive at the end of this learning walk. I hope you all had a good time and learned some things on how urban design can help promote health.

Thank you !