



Low carbon stations for low carbon cities

SPIN-UP Design & Human engineering of urban public (transport) space

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MISTRA
**URBAN
FUTURES**

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Sheraton

LAYER 1: Architecture & infrastructure related guidelines



Station environment

I. Urban Heat Island Effect:

Green Space

Create green spaces, visible or invisible for the travellers, whenever possible, ideally green spaces with permeable floor. In order to avoid they become nuisances or hazards to them the tree branches and bushes should not protrude into pedestrian corridors.

Effect:

improved shadow, lower temperatures, barriers against storm water erosion, increased water evaporation, less dust

the heat absorption and reflection properties of the building façades should be carefully selected in order to avoid unwanted heat gain on the building and/or polluting reflections (thermal or glare) projected towards neighbouring buildings, vehicles or pedestrians

Suggestions

1. promote light coloured, reflective facades (that reflect solar energy)
2. promote greening of façades
3. avoid heat absorbing façades (this is only interesting in warm-hot climates. in cold locations the opposite might be energy-wise)

Effects:

1. less heat retention in buildings allows for reduced artificial air conditioning inside building,
2. keep "reflected pollution" to a minimum

Green Roof Tops:

grow plants, shrubs, grasses, trees on roof whenever possible and sustainable

Effect:

lower temperature thanks to evapotranspiration and micro shadow



Porto



Brussels

Inclusiveness

II - Inclusive Urban Space

1. develop urban space that allows for different speeds of movement
2. driving, walking, cycling, sitting around
3. make sure the combination of the speeds of movement can be developed in a pleasant, safe and secure way.

These are essential safety concerns that drive the conventional traffic planning of cities: to design the safe coexistence of different modes (motorized and soft modes) with different typical speeds. they may foster the attractiveness of some modes and indirectly affect the carbon footprint of a given region.

Program the space with activities that can be shared by people of varying age groups, possibly in different capacities . this is the core proposition behind the concept of heterotopia as applied throughout spin-up



Los Angeles



1.1 General configuration of spaces

Layer 1

Guideline 1

The connection platform-control area-street shall be as short as possible, with the minimum possible amount of turns and changes in the walking direction of the clients. Climate allowing it is preferable to have clients walk longer stretches on street level/public domain rather than within PT premises. It might be necessary to improve the general condition of the lighting, cleaning or weather protection in the surrounding streets.

Effect

Provide efficient informal surveillance



Porto

Layer 1

Guideline 2

If several consecutive changes in the walking direction of clients are required along walkway from platform-control area to street level, we recommend to concentrate all changes inside a single open concourse where people can observe their own walkway without being confused.

Effect

Provide easy orientation and informal surveillance



Porto

Layer 1

Guideline 3

The structure of the station shall avoid perfect symmetry of forms as clients need special references to orient themselves within the station. This is particularly relevant in underground stations or stations without characteristic sights.

Effect

Provide easy and “natural” orientation



Naples



Stockholm

Layer 1

Guideline 4

The lay-out of the station shall promote the mutual visibility of clients (inside the station premises or in accesses to the station) with regards to pedestrians, motorists or residents on the streets or on buildings nearby.

Effect

Increase efficiency of informal surveillance, dissuade delinquency or criminal behaviour.



Porto

Layer 1

Guideline 5

The flow of clients (either on corridors, escalators, mezzanines, walkways, lifts or escalators) shall be concentrated in order to allow for a continued human presence even on off-peak hours. It is preferable to have a single large corridor to two parallel, narrow, or alternative corridors. A ramp is preferred to a staircase in combination with a separate lift to bypass a small elevation.

Effect

Enlarge the number of passenger crossings to make informal and formal surveillance more efficient. Avoid isolation of clients on low-traffic hours.



Stockholm



Naples

Layer 1

Guideline 6

Along their walking route within Metro premises clients shall be capable of observing (at least) the next 10 meters on their route, either walking in corridors, concourses or escalators. Wide passages, smooth angles between consecutive passages, rounded corners on corridors and open views on exits/entrances might help.

Effect

Avoid claustrophobic configurations and narrow views, turn ambushes difficult to accomplish, diffuse stress



Paris

Layer 1

Guideline 7

The geometric/convex lay-out of the station shall comprise the provision of a single (or restricted number of) “observations points” from which an observer can overview the activity of the station with the smallest possible amount of blind-angles. We recommend the observation points to correspond to ticket booths, control rooms or other facilities likely to be manned.

Effect

Increase efficiency of informal surveillance, dissuade delinquency or criminal behaviours.



Porto



Stockholm

Layer 1

Guideline 8

Whenever possible the lay-out of stations shall direct the flow of clients in order to avoid their proximity to walls. “Central-island-type” platforms and “floating overpasses” or flower-beds near walls are valuable solutions to keep walls pristine.

Effect

Retard degradation. Diminish surfaces available to vandalism



Porto

Layer 1

Guideline 9

All-year-around moisture, smell, sound, wind, sun-exposure and air temperature shall be taken into consideration and be positively influenced by the lay-out of the station so as to provide physically comfortable facilities.

Effect

Provide good conditions for the development of people's physical and psychological comfort.



Brussels

Layer 1

Guideline 10

Architectural proportion, shape and visual harmony of stations and their accesses shall induce tense releasing effects and stress-free attitudes amongst clients and staff.

Effect

Provide good conditions for the development of people's physical and psychological comfort. Tamper irritation or anxiety arising



Porto



Stockholm



Stockholm

Layer 1

Guideline 11

Individual elements of the station furniture shall not be in the line of sight of clients and workers so as to obstruct their view. Handrails, sign posts and light equipment shall be designed and placed to avoid sight obstruction. After business hours closing grids of shops in the stations shall avoid a full grey look, but be grated. The shops shall remain well lit until time of closure of the station.

Effect

Increase efficiency of informal and formal surveillance, dissuade delinquency or criminal behaviour.



Porto

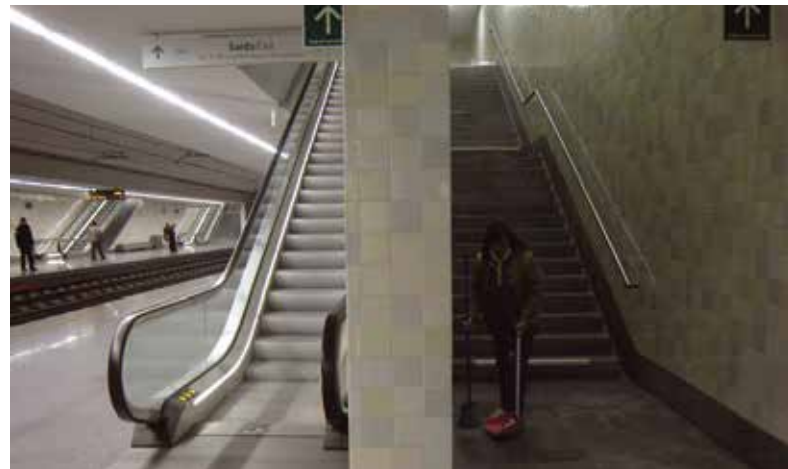
Layer 1

Guideline 12

The lay-out of the station shall allow for efficient maintenance of the premises – minimize areas inaccessible to cleaning/repair, minimize areas prone to dirt accumulation, provide easy access to cleaners and their equipment.

Effect

Foster a clean and pristine environment.



Porto



Brussels

1.2 Entrance and surroundings

Layer 1

Guideline 13

Stations and their entrances/accesses shall be highly visible in the landscape and cityscape. Visual obstacles (built elements, vegetation) shall be removed if impairing the signposting character of the station.

Effect

Provide easy and “natural” orientation.



Paris

Layer 1

Guideline 14

PT entrances/exits, bus stops shall be highly visible signposts in the city and easily recognizable by clients. Metro premises shall be easy to distinguish in the street and public domains.

Effect

Provide easy orientation and reinforce the implicit authority of the metro Operator.



Paris

Stations and their entrances/accesses shall offer easy access to first-aid/rescue/security vehicles.

Effect

Provide efficient and swift assistance in the event of emergency.



Helsingborg

1.3 Gate area

Layer 1

Guideline 16

The configuration of the control area of the station shall enable an easy distinction of clients on their way in or out, enable the implementation of easy ticket controls (automated or manned) and the creation of police barriers/filters in the event of an emergency.

Effect

Provide means for efficient screening



Porto - Oslo

Layer 1

Guideline 17

Ideally turnstiles or gates should be in the direct line of sight of the staff in ticket offices or control rooms, or in locations where informal surveillance by clients or passers-by exists. CCVR systems should cover these areas.

Effect

Enable efficient surveillance.



Paris



Stockholm

Layer 1

Guideline 18

ATVM (Automatic Ticket Vending Machines) machines and turnstiles/gates (if any) shall be placed in highly visible locations. In non-staffed stations these could be placed at street level, visible to passers-by.

Effect

Reduce feelings of isolation. Create the feeling of being taken care of. Increase efficiency of informal and formal surveillance, dissuade delinquency or criminal behaviour.



Paris

Layer 1

Guideline 19

ATVM (whenever possible) shall: a) be built in walls, b) have dedicated CCTV cameras nearby, c) have a "Wait your turn here" area painted on the floor, d) be positioned to allow the customer to observe the surroundings, e) be positioned to make difficult the 'catching by surprise' of the customer. See also guideline 85.

Effect

Diffuse the feeling of confinement.



Porto

Layer 1

Guideline 20

ATVM, ATM (Automatic Teller Machines), VM (Vending Machines) and phone booths shall be placed to turn their users/customers into involuntary observers of nearby premises.

Effect

Enlarge opportunities for clients to engage in informal surveillance along their routine.



Oslo

1.4 Corridors & vertical connections

Layer 1

Guideline 21

Corridors and passages shall be wide enough to avoid disturbing physical proximity between clients both on peak and off-peak hours.

Effect

Provide sense of spaciousness



Paris

Layer 1

Guideline 22

Spaces under escalators or staircases shall only exist if useful to create an interesting line of sight. Otherwise we recommend they are suppressed, hidden or cut-off with surrounding walls.

Effect

Avoid gloomy corners. Foster a clean environment



Oslo

Layer 1

Guideline 23

Elevators shall have transparent shafts, cabins and doors. If not fully transparent, at least the doors shall be equipped with transparent glass windows.

Effect

Increase efficiency of informal and formal surveillance, dissuade delinquency or criminal behaviour.



Porto

Layer 1

Guideline 24

The interior of elevator cabins shall be airy (light colored glass walls, light floor, high ceiling, powerful ventilation and lighting) and less prone to vandalism than ordinary stainless steel models.

Effect

Foster a clean and pristine environment. Dissuade vandalism.



Paris

1.5 Platforms

Layer 1

Guideline 25

In tunnel-shaped stations the built environment of the tracks shall be unhampered by visual obstacles; this space shall adopt the convex shape of a wide container or reveal simple geometry with almost all the internal surfaces visible to an observer standing in any location of the platform

Effect

Provide easy orientation and informal surveillance



Stockholm

Layer 1

Guideline 26

Platforms shall be wide and sized in accordance with the train lengths in order to allow clients waiting and walking at a reasonable distance from trains and tracks.

Effect

Avoid overcrowding and proximity to tracks



Oslo

Layer 1

Guideline 27

In tunnel-shaped stations ceilings should be high and spacious. In combination with the light reflected they can be suggestive of open-air or day-light situations.

Effect

Provide sense of spaciousness



Paris

1.6 Shops and complimentary facilities

Layer 1

Guideline 28

The hosting of non-transportation businesses and services should be encouraged within the PT premises, as long as:

- The activities generated are complementary or beneficial to the transportation service,
- The activities generated attract a mixed population to the PT premises around the clock, without disturbing peaks and lows,
- The activities generated are useful to passing-by clients and have the capability to attract more clients to the Metro. The activities help to promote the perceived quality of the station.
- The activities generated do not disturb the flow of PT clients, do not impair the cleanliness and peacefulness of the premises, and do not pollute the facilities with bad smells, smokes or sounds
- The corridors are wide enough to allow for both passing by and stopping and looking.
- The facilities used to host such activities are designed to ensure that its workers and customers can be involved in the informal surveillance of the PT premises,
- The facilities used to host such activities are designed to ensure that in the event of the shop/ counter being closed the Metro station is not affected nor a feeling of abandonment is created,
- The facilities used to host such activities are placed in public-access areas of the network beyond the ticket control line,
- The activities generated follow the Metro opening hours without (or the smallest possible) interruptions.
- The activities hosted within the network are perceived as enhancing the offer to clients.
- The activities hosted are a mix of public (e.g. post office, child care) and private initiative and are not all (of them) of strict commercial nature.
- The activities hosted foster the “heterotopic” environment.

Effect

Dissuade tension, increase the number of persons informally controlling the premises, balance the number of persons along the opening hours, promote “heterotopia” to create a more welcoming environment.



Stockholm



Oslo



Brussels

Layer 1

Guideline 29

Toilets are important facilities to clients in upgrade PT scenarios. Public toilets within the Metro network are a convenience to people and a potential generator of observation and surveillance by allocated staff. Nevertheless these shall only be provided if: a) continuous cleaning, b) permanent staff and c) access control are guaranteed.

Despite the type of access granted (paid, free, for passenger with valid ticket) the control by PT-staff shall be clearly visible.

Such facilities shall be conceived and built differently from traditional public or domestic toilets; they shall withstand the most severe use and maintenance techniques required by the PT-environment. A pleasant look is also required.

Effect

Provide convenience to clients.
Generate activity within the network.
Use staff to control surroundings.



Paris

Layer 1

Guideline 30

The station space shall comprehend a limited number of areas that could be occasionally used as short-term waiting/meeting point provided they are subject to intense formal or informal surveillance and that the flow of clients is not disturbed by individuals in the middle of walkways or hampering their line of sight. Meeting places can be a simple canopy at the station entrance.

Effect

Provide amenities to clients meeting a friend, waiting for a bus or sheltering from the weather.



Istanbul

1.7 Lighting concept

Layer 1

Guideline 31

Whenever possible natural light should be used to light the PT premises. However, in any event artificial lighting should be relied on as the main source of lighting. Artificial lighting shall be used all day through to compensate for the fluctuations in day/sun light.

Effect

Provide an airy feeling. Ensure stable lighting.



Paris

Layer 1

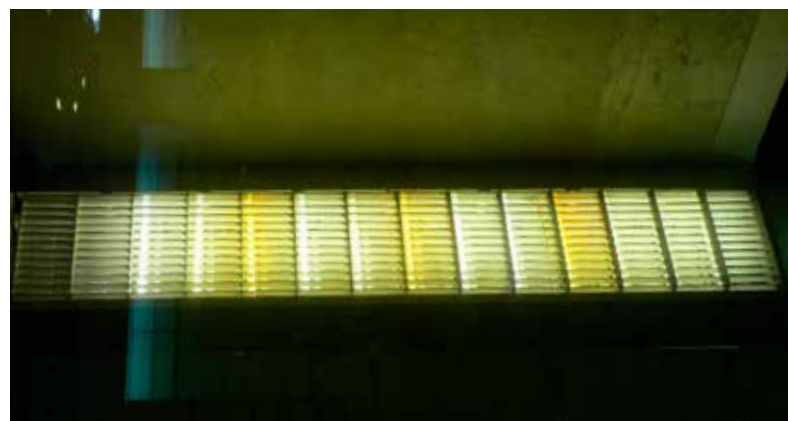
Guideline 32

PT networks shall be illuminated throughout in order to prevent dark and scary areas during service time. In critical areas (i.e. near ticket offices, information boards, turnstiles, ATVM, stairs, elevators, platforms, telephone booths, long corridors, entrances) the levels of light shall be higher than the network's average.

Lighting equipment of the premises shall be applied in line with sustainability standards as well as high expectations of comfort and visibility.

Effect

Provide airy environment, foster formal and informal surveillance, impair hidden/ambush places.



Paris

Layer 1

Guideline 33

The lighting design of the network shall take into consideration the depressing effect of coldly lit areas¹ on people. Metros are part of the daily routine of large populations and a good occasion to expose them to healthy circumstances. Special attention shall be paid to the lighting of stops at surface level.

Effect

Provide airy environment, provide stimulating surroundings, improve people's mood and alleviate depressive/aggressive mental conditions



Paris

Layer 1

Guideline 34

Differences in adjacent lighting levels shall be smooth to avoid violent² eye-accommodation likely to cause "momentary blindness" in clients; special attention shall be devoted to the transitions from street level to tunnels.

Effect

Foster formal and informal surveillance; make sure clients are always in control of their belongings and surroundings.



Porto

- 1 About these effects see the research developed by the Light & Health Research Foundation SOLG of the Eindhoven University of Technology, The Netherlands and Brainard, G.C., Effects of light on brain and behavior, In: T.W.Tibbitts (ed.), International Lighting in Controlled Environments Workshop, NASA US National Aeronautics and Space Administration, 1995.
- 2 About the effect of luminance contrast in visual perception see ISO 9241 standard.

Layer 1

Guideline 35

The main artificial lighting system adopted in PT networks should have a high color rendering index (CRI) level. Ideally the CRI of the stations should be higher than the one of the surrounding streets. Color temperature of the main lighting system in the station shall be within to the 3000-7000k spectrum.

Effect

Provide comfortable environment with “close to natural” light tone. Facilitate visual perception. Highlight the PT premises as regards the streets/the public domain.



Brussels



Brussels



Stockholm

Layer 1

Guideline 36

Artificial lighting levels shall be adjusted to the safety, functional, aesthetical and comfort requirements determined as appropriate to each specific PT Network. International standards in terms of levels of luminance might be used as guidance.³ Designers must keep in mind that luminaries usually suffer significant performance decline (up to -30%) due to aging and dust accumulation in PT environments.

Effect

Avoid signs of ageing or lack of maintenance.
Avoid shadowy environments.



Oslo

Layer 1

Guideline 37

Light equipment shall be placed thus as to avoid glare, dazzle, contrast or reflexes impairing vision to clients, workers or CCTV/CCVR systems, affecting the use of signage or ATVM, affecting special perception or inducing subtle irritation/stress to people. As general recommendation “polarized⁴” light equipment shall be adopted.

Effect

Foster formal and informal vigilance; ensure clients are always in control of their surroundings. Avoid irritability.



Paris

Layer 1

Guideline 38

The area surrounding the entrance to stations shall be highly lit by the PT company regardless of the existing street lighting.

Effect

Highlight the Metro entrance from the surrounding territory, facilitate orientation.



Helsingborg

Luminaries which emit almost all light rays in the same direction, within a narrow angle – effect commonly obtained by the use of reflectors or filters.

Layer 1

Guideline 39

Artificial lighting (in combination with natural lighting when possible) shall be used as relevant artistic/theatrical instrument to shape the stations “cultural and comfort envelopes” as long as the objective strict safety and security functions are not affected.

Effect

Provide a calming environment. Provide an agreeable environment.



Porto

Layer 1

Guideline 40

Artificial lighting inside rolling stock shall be kept on throughout operations to ensure constant light levels despite the external sources. Light equipment shall be located thus in order to avoid reflexes or glare that impair window transparency, CCTV/CCVR efficiency or clients' comfort.

Effect

Foster formal and informal surveillance; ensure clients are always in control of their belongings and surroundings. Avoid irritability.



Antwerp

Layer 1

Guideline 41

The pavement near the edge/rim of the platforms (in all types of stations) shall be well lit by means of artificial lighting to provide a uniform and constant visibility to clients, crossing, waiting for the train, boarding and descending.

Effect

Reinforces safety of areas prone to accidents and provides a warm welcome to users. Decreases sensation of precariousness. Increases perception that premises are being taken care of.



Brussels

1.8 Type of surfaces

Layer 1

Guideline 42

All surfaces targetable by graffiti shall be;

- easy to clean,
- easy to repair,
- self-sacrificing or,
- inefficient surfaces¹.

Graphic or other unwanted add-on can be avoided by illustrating or decorating the walls in a context harmonious way.

Effect

Dissuade vandalism, keep pristine and clean the environment.



Brussels



Porto



Brussels

Easy to clean surfaces are, in general, all the hard glazed surfaces with a smooth finishing (glass, glassed ceramic tiles, glassy painted metals). Easy to repair surfaces are, mainly surfaces that can be easily (swiftly and sometimes in-situ) recovered to their original condition by a thin layer of protective paint, varnish or self-adhesive film. Self-sacrificing surfaces are, mainly surfaces covered with a self-adhesive film or liquid used to protect an under-laying material. Inefficient surfaces are surfaces that due to their particular geometric shape, texture or corrugation require too much paint to cover in a visually effective way – thus absorbing too much resources to the “graffiti artist”- or are likely to damage pen-markers (asperous surfaces).

Layer 1

Guideline 43

The finishing of the station walls, floor and ceiling (if any) shall be designed to retard visible dirt accumulation. It shall be either I) easy to clean or repaint, II) not necessary to clean because the dirt will be hidden, or, IV) dirt-repellent - dirt can not stick to it easily. Special attention shall be paid to transparent elements. No surface is “self-cleaning” albeit claimed by its manufacturer.

Effect

Ensure efficient maintenance. Avoid signs of degradation and lack of care to clients.



Porto

1.9 Colors

Layer 1

Guideline 44

Colors help define peoples' moods and shall be used to emotionally influence PT clients. Objects, surfaces and light in the PT network shall be purposefully used to generate positive emotions to influence passenger's behaviour.

Effect

Provide an attractive/lively environment, drive clients flow along the network.



Brussels



Naples

Layer 1

Guideline 45

Color is more/than any other element in stations design, culturally defined. In PT environments it shall be used in compliance with conventional/formal codes (i.e. red for alarms/danger/prohibition, green for exits/permission)

Effect

Avoid misinterpretation and confusion. Facilitate orientation.



Antwerp

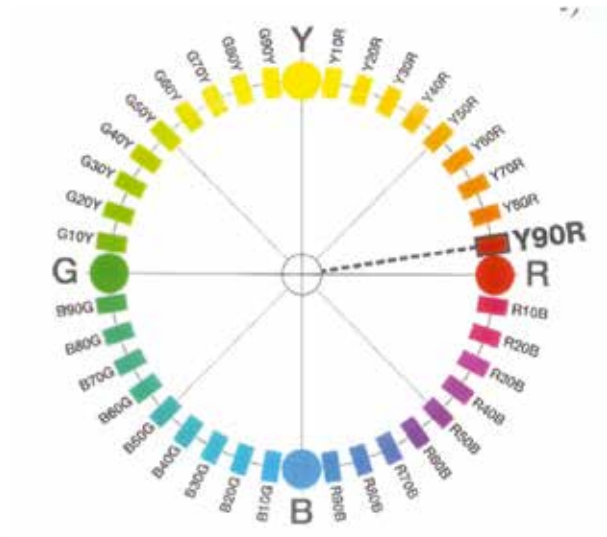
Layer 1

Guideline 46

When designing color schemes conveying feelings of security all visible surfaces available to the observer at any given point (scenario) should be considered as part of the chromatic equation. Special attention should be given to large surfaces (like walls, ceilings, floors) or critical interaction elements for the Metro passenger like signage, ticket offices, ATM or rolling stock. Due to the complexity of the task of designing color schemes involving large number of objects under varied light sources, specialized color artists/designers shall be required to take control.

Effect

Provide an inviting and harmonious environment.



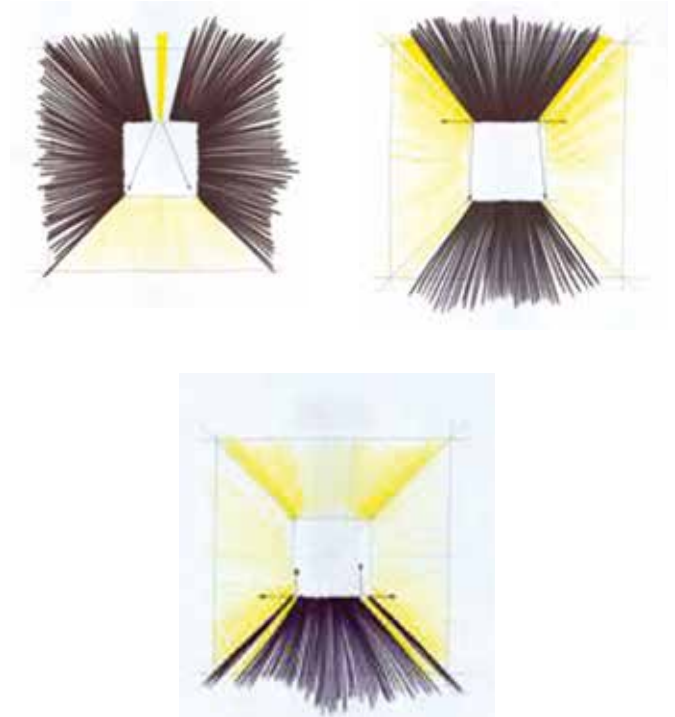
Layer 1

Guideline 47

Color has the capacity to affect the human perception of space and to drive peoples' moods. This capacity shall be used in accordance with the needs of each specific area of the PT network (i.e. to stimulate moving on in corridors, to relax/calm on platforms, to direct peoples' eyesight to a specific equipment, to reveal a concourse wider or narrower). Regardless of the desired effect the final result must involve a correct combination of colors to avoid repulsive or uncomfortable combinations of interiors. One of the three color harmony techniques must be followed: soft harmony, harmony in contrast or polychrome (see further)

Effect

Provide inviting and harmonious environment.



Paris

Layer 1

Guideline 48

Along their usual path clients should be exposed to a varied set of color schemes to avoid monotony and facilitate orientation. The final result of each exposure depends on the color combination offered to the visual field of the observer but the following effects of the presence of individual colors (plain or mixed with other shades) should be acknowledged:

White (physical); gives visual impression of increased space since it seems to move back the white surfaces. White has the same effect when added in large proportions to other colors. Surfaces with large proportions of white soften the intensity of surrounding colored surfaces.

White (psychological); causes impression of cleanliness, perfection, purity, emptiness, asepsis, isolation. Should be used to calm other colors effects.
Black (physical); makes surfaces dense, bring surfaces forward and, hence, narrows space. Absorbs all available luminosity. Added in large quantities to other colors it has the same effects.

Black/dark surfaces makes adjacent colored surfaces brighter, helps adjacent colors to be highlighted.

Black (psychological); generates feelings of oppression, unease, induces revolt, lifelessness and depression.

Red (physical); bring surfaces forward and, hence, narrows space. Tends to be easily detected by the human eye.

Red (psychological); pushes towards extroversion, action, movement. Impression of luxury, richness, and is powerful. Suggests a short time only. Symbolizes alarm, creates the desire of festivity and increases tension and excitement. Can induce hunger, revolt and aggressiveness.

Orange (physical); brings surfaces forward and, hence, narrows space, huge capacity to reflect light, makes space very bright.

Orange (psychological); feeling of warmth, cocooning, also favors movement and communication. Symbolizes lively and spirited moods.



Porto



Porto

Layer 1

Guideline 49

The design of color schemes shall consider the maintenance needs required by each individual surface (to be kept in pristine condition). Very light colors are only easy to keep in easy-to-clean materials or surfaces that are out of clients' reach. Some parts of the network and rolling stock are likely to accumulate dirt and be infrequently cleaned; these parts shall not be light colored.

Effect

Avoid visible signs of degradation or lack of maintenance.



Porto

Layer 1

Guideline 50

From a perceived security point of view color should be used to create environments within the PT network that generate overall confidence, awakening, relaxation, refinement, positive feelings and communication among clients and workers. The design of color schemes shall not be used to generate repressive/repudiating environments targeting the repulsion of potential delinquents or criminals.

Effect

Provide conditions favorable to informal vigilance and anxiety impairment.



Porto

1.10 Air and temperature controll

Layer 1

Guideline 51

Subtle physical or chemical stimuli like air temperature, sun exposure, moisture, sound, reverberation, air movement, vibrations, lighting levels and colors, smells and scents, shall be considered along the design of stations, rolling stock and service. These pervasive stimuli generated or enabled by the surroundings along the clients' trip inform him/her about the type and quality of premises and the type of use the premises are subject to. The perception generated by these stimuli is of the greatest importance once they are intimately registered. The design phases of all parts of the PT network and service shall assess its contribution to the final sensorial perception of clients.

Effect

Provide consistent signs of a comfortable, clean, healthy, relaxing environment.



Antwerp

1.11 Noise control

Layer 1

Guideline 52

Sound and noise (including the broadcasting of music) shall be kept to a level that does not interfere with normal speech levels between clients at close range (35dB A according to the World Health Organization¹), nor with broadcasting from public address systems, and the perception of space and moving elements (pedestrians approaching, trains).

Effect

Don't impair people's perception.

Location – Situation	Noise level in dB(A)
Simonis Station – outside	66
Simonis Station – central hall / ticket office (outside)	66
Simonis Station – underground corridor	71
Simonis Station – train arriving	90
Simonis Station – train waiting at platform	80 - 85
Simonis Station – doors closing	90
Simonis Station – train departing	90 - 95
Simonis Station – platform, normal activity	70 - 85
Louise Station – exit to outside (underground)	65
Louise Station – central hall (underground)	70
Louise Station – escalators	68
Louise Station – train arriving	100
Louise Station – train waiting at platform	80 - 85
Louise Station – doors closing	90
Louise Station – train departing	90
Louise Station – platform, light activity	63
Louise Station – platform, normal activity	70 - 75

By way of illustration, the following noise levels have been observed in a number of Brussels metro stations (their values are indicative of an order of magnitude, since the readings are only representative of a situation at a given location at a given time).

¹WHO-World Health Organization, Guidelines for community noise, WHO, Geneva, Edited by Berlund, Birgitta, 1999.

Layer 1

Guideline 53

Although noise pollution characteristic to PT stations (both underground and on surface, closed and open) and rolling stock are usually a short daily experience to each individual passenger, its effect is added to the impact of noise experienced throughout the day. Considering that the common noise levels on station platforms are above the 60dB(A) threshold and this has subtle but direct impact on blood pressure, heart rate, irritability and mental performance, the rail industry shall in the long term, develop and promote the noise-pollution reduction within their premises and rolling stock.

Effect

Seek a comfortable environment. Diffuse irritability.



Paris

1.12 Use of vegetation

Layer 1

Guideline 54

Vegetation is an effective element in the Metro environment to promote a calm and refreshing environment to clients. It is also a suitable resource to protect built elements from graffiti and vandalism, if only:

- Useful lines of sight are not impaired in any angle or dimension,
- Maintenance/gardening does not affect the operations of the network,
- Plants are kept in good condition all the time (i.e. evergreen species) and do not release unwanted amounts of seeds, flowers or leaves,
- Plants and the way in which they are implanted convey a sense of order, quality and corporate environment – as opposed to domestic environment,
- Plant-beds or containers (if any) are designed and maintained to prevent people from walking on them causing destruction or litter.

Effect

Provide pleasant and robust facilities



Paris



Alicante

LAYER 2: Equipment and human interaction

2.1 Equipment in general

Layer 2

Guideline 55

All equipment within the station premises (i.e. light equipment, furniture, information devices, public-address devices, floor/wall/ceiling covering, ATVM, booths, turnstiles, elevators) that are within clients' reach shall be resistant to careless use and abuse, reliable and difficult to break down under normal circumstances.

Effect

Contain damage and degradation. Contain maintenance needs.



Berlin

Layer 2

Guideline 56

All equipment within the station premises shall be designed to enable swift removal and replacement in case of damage or for maintenance purposes. Removal shall only be possible by maintenance teams. The absence of the parts/components removed for replacement/repair shall not impair the normal use of the station and shall not be easily recognisable to clients.

Effect

Ensure efficient maintenance. Avoid signs of degradation and lack of care to clients. Enable a maintenance policy of swift identification & intervention in case of damage.



Paris

Layer 2

Guideline 57

All equipment within the station premises shall be designed to avoid dirt accumulation and enable easy cleaning.

Effect

Foster a clean and pristine environment.



Paris



Stockholm

Layer 2

Guideline 58

All equipment within the station premises shall contribute to a human and relaxing environment.

Effect

Foster the development of clients and workers psychological comfort.



Paris

Layer 2

Guideline 59

All equipment within the station premises shall prevent or impair any type of use that might affect its functions or annoy clients (i.e. in open stations seats should be impossible to be used as sofas, handrails should be uncomfortable to sit on, the roof of ATVM's shall be impossible to use as trashbins).

Effect

Dissuade stress creating behaviours, tamper degradation, facilitate compliance with the code-of-conduct.



Paris

Layer 2

Guideline 60

All equipment in or around the PT premises (regardless of their age) shall contribute to a "seamless" and coherent visual environment; all elements shall positively support and contribute to the global image of the PT-operator.

Effect

Ensure a sound corporate identity.



Porto

Layer 2

Guideline 61

All equipment within the station premises (including the tracks) shall be unattractive to steal.

Effect

Reduce temptation and deny benefits to potential thieves/vandals. Avoid visible signs of degradation and lack of care to clients.



Porto



Brussels

Layer 2

Guideline 62

All equipment that does not need to be directly touched by clients shall be placed out of their reach (i.e. ventilation openings, light equipment, loudspeakers, signage, ceiling)

Effect

Tamper degradation, dissuade vandalism, keep pristine and clean environment.



Paris

2.2 Rolling stock

Layer 2

Guideline 63

Vehicles are a part of the PT- network and, thus, deserve the same design attention as premises regarding perceived security. Particular care should be devoted to the design of the vehicle's inner and outer parts in order to avoid aggressive or war-like looks (e.g. headlights that resemble angry eyes or rough/"heavy-industry looking" details).

Vehicle interiors should be developed to avoid unnecessary body contact between clients along their usual routine, and to avoid feelings of imprisonment. Interiors should provide means of telecommunication to enable clients communicating with the driver or a control room when in or out of the station. The ID number of each vehicle should be highlighted to clients to provide a sense of belonging to frequent travelers ("my coach") and facilitate the reporting of nuisances and/or reporting.

Effect

Offer clean and peaceful vehicles. Promote clients' esteem and confidence.



Brussels



Stockholm



Porto

Layer 2

Guideline 64

The design of all PT physical parts (facilities and rolling stock) is quintessential to enable an easy maintenance, capable of keeping the network safe, pristine, secure, caring. All parts subject to direct contact with clients or visible to them shall be designed to enact:

- a) Frequent and swift inspection to detect evidence of vandalism, dirt accumulation, breakdowns or malfunctioning,
- b) Easy daily cleaning,
- c) Swift repair or replacement of damaged parts (repair/replacement of train parts at-the-end-of-the-line and repair/replacement of station parts in-situ), or
- d) Swift removal or isolation of damaged/affected parts without affecting the operation of trains or stations, until full repair/replacement can be performed,
- e) A great part of the maintenance/repair/removal tasks being done with accessible resources; tools, replacement components, personnel,
- f) Keeping a sustainable stock of replacement components at the Metro premises or at nearby suppliers.

Effect

Implement efficient maintenance.



Paris

2.3 Signage

Layer 2

Guideline 65

Signage shall be unequivocal, robust, stand out from the background architecture, highly perceivable and highly legible.

Effect

Facilitate orientation, improve the flow of clients, tamper anxiety rising.



Paris - Brussels

Layer 2

Guideline 66

Station signage shall inform clients of their actual location, the location of the nearby services or parts of the station and directions to take.

Effect

Facilitate orientation, improve the flow of clients, tamper anxiety rising.



Paris

Layer 2

Guideline 67

Signage shall be located in order to maximize its efficiency; signs shall be located at overhead level. The repeating/next sign along passenger's path shall be at eyesight distance. Only detailed maps, timetables or long texts shall be located at eye's level.

Effect

Facilitate orientation, improve the flow of clients, tamper anxiety.



Paris

Layer 2

Guideline 68

At the station entrance signage shall clearly inform of the name of the station, its location on the network, available services within the station, opening hours and essentials of the code-of-conduct.

Effect

Facilitate orientation, facilitate compliance.



Antwerp

Layer 2

Guideline 69

The logo of the PT operator shall be posted with pride at all entrances of the stations.
A welcoming greeting to the clients might be associated with this (i.e. "Welcome to ...")

Effect

Marks the limits of the operator's premises, reinforces the authority of the PT Operator.



Helsingborg

Layer 2

Guideline 70

Signage shall be illuminated by specific lighting equipment.

Effect

Segregate signage from background, facilitate legibility and orientation.



Paris

Layer 2

Guideline 71

Signage shall be used to clearly mark the limits of the areas of the network accessible only to PT clients with a valid ticket.

Effect

Facilitate compliance, control disinhibitors to unwanted behaviours.



Paris



Paris



Paris

LAYER 3: Operations

3.1 Corporate policies

Layer 3

Guideline 72

Networks are, nowadays, prone to three common fear-generating scenarios: a) deserted premises, b) meeting unwanted individuals alone, c) lack of assistance when required.

These scenarios feed the sense of isolation of clients and keep wanted clients away.

To counterbalance this trend it is necessary to have a diverse (and thus friendlier) population invading the networks throughout operating hours. In short this requires attracting more people to PT during day and night time; to turn the service truly accessible to all age, income, gender, social and ethnic groups.

Corporate policies can participate in this;

- I) Fostering the design of the service, premises and rolling stock to turn it more attractive and easy to use by everyone,
- II) Fostering the colonization of the premises with non-transportation activities apt to positively populate the network (when, where and how it is most needed) and to participate in the network's maintenance and surveillance.
- III) Placing more PT-workers visible to clients, with or without strict passenger-assistance duties,
- IV) Increase the number of complimentary contacts with clients (written, audio, visual messages, personal contact, promotional/information campaigns) to increase the perception of customer friendly and highly caring PT-operator.
- V) Promote the perceived reliability of workers/staff by clients.
- VI) Promote the perceived human attitude & control by workers/staff.

Effect

Design service and facilities in order to impair sense of isolation.



Antwerp



Brussels

3.2 Communication

Layer 3

Guideline 73

PT operators shall develop assertive communication campaigns, aimed at clients, promoting the collective sense of ownership and engaging them in actively contributing to the surveillance of the network along their journey:

- inviting clients to report swiftly to the operator (through easy to use phone number or any member of staff) any nuisance, vandalism, incivility or criminal action detected, no matter who's the victim, thereof
- instructing clients on how to report swiftly, discretely and safely an ongoing event avoiding escalation,
- promoting HR-related personal posters that curb "bystander apathy" among clients and staff,
- welcoming all reports and protecting whistleblowers.

Effect

Promote the sense of partnership between operator and passenger



Paris - Stockholm - Brussels

Layer 3

Guideline 74

The standard PA shall prefer an associative tone of voice rather than polarize between operator and passenger.

Effect

Inspire confidence



Porto

Layer 3

Guideline 75

Audio/video public address systems shall be used as carriers of messages fostering the contact between clients and the PT operator; provide useful information, cultural agenda, instructions on how to use the network.

Effect

Foster communication.



Paris

3.3 Gate procedure

Layer 3

Guideline 76

The adoption of turnstiles or automatic gates to control client access is a positive measure; it facilitates the identification of fare dodgers (apprehension and penalty application becomes more efficient), dissuades some free-riding (due to social pressure or shame) and reinforces the concept of PT territory in the minds of clients. Despite technological progress in ticketing it is wise to keep alive a mandatory protocol at the entrance that requires clients to clearly manifest their intention to use the network for transportation purposes and their acceptance of the PT rules/code-of-conduct; gates are one form to enforce such protocol and understanding.

Effect

Set rules, stimulate conscience, controls disinhibitors, facilitates compliance, implement passenger screening.



Paris



Brussels



Brussels

Layer 3

Guideline 77

Turnstiles and gates shall not convey a message of “gated environment” but be part of the welcoming spirit of the PT premises. This equipment should be visually unobtrusive and should not evoke prison-style accesses. Operators shouldn’t fantasize about the possibility of turnstiles/gates being a fully impervious barrier to undesirable individuals, but investment should be driven to the design of user-friendly gates instead of infrangible barriers prone to stress creation among ordinary clients. Turnstiles or gates should be permanently under live or remote human supervision (via CCTV and audio telecommunication) to enable assistance to clients or reaction to an emergency. The installation of automatic turnstiles or gates for ticket screening does not need to comprehend every single entrance or exit of the network to improve the perceived security among clients. It is preferred to have a small number of dense traffic stations fully screened (ticket screening at the entrance and exit all the time with dedicated staff) and the less dense stations “open” than to have all the network “open”. In general its preferable to have a small number of control gates than none. Turnstiles or gated lanes are good locations to install eye-level CCVR cameras with dedicated lighting devices; this would enable a database of the faces of all clients entering the network, a powerful deterrent to possibly perceived impunity.

Effect

Avoids prison-like environments. Offers a reliable screening method.



Paris



Paris



Stockholm

3.4 Maintenance

Layer 3

Guideline 78

A relevant part of the PT operator's work volume shall be devoted to keep the premises and rolling stock spic-and-span - an ever rising demand of clients. This shall correspond to the provision of an environment free of unpleasant smells and with scents clearly associated with continued maintenance. Penetrating scents of industrial cleaning products or deodorants shall be avoided.

Effect

Foster non-aggressive environment.



Brussels

Layer 3

Guideline 79

The conjunction of intense cleaning of the premises and rolling stock with a "fresh smell" can be used as subtle but powerful clue that the PT Network is continuously staffed, taken care of and subject to survey.

Porto



Effect

Provide reassuring clues to clients.



Oslo

Layer 3

Guideline 80

Trash bins and ashtrays shall be provided to clients at the very entrance of the stations. Trash bins shall be provided along the network if the Operator's policy allows so. The dimension and frequency of trash collection shall be flexible and adjusted to avoid overflow.

Effect

Ensure efficient maintenance. Avoid signs of degradation and lack of care to clients.



Porto



Stockholm

Layer 3

Guideline 81

Trash bins shall be fire-proof, accept small volumes only, and easy to be visually checked and controlled by security officers.

Effect

Tamper degradation, dissuade vandalism, keep pristine and clean environment.



Paris



Brussels

3.5 Security

Layer 3

Guideline 82

In PT stations that correspond to “intermodal nodes” the surroundings of the station shall be regarded as part of the PT security environment.

Effect

Avoid “no-man’s land” around stations



Paris

Layer 3

Guideline 83

All forms of dead-ends (cul-de-sac) shall be cut off (recessed doors, corridors to elevators, mid-level mezzanines that are out of the – logical/intuitive – passenger flow)

Effect

Ensure easy orientation, avoid hiding places



Paris

Layer 3

Guideline 84

Employees wearing a uniform within or around a PT station, regardless of their duties, shall be provided with a walkie-talkie radio connected to a central control room. These workers shall be instructed on informal surveillance, on reporting relevant nuisances or events. These workers shall be available to help, or give assistance to any passenger if asked or revealing a need. Radios should always be on – its characteristic sounds provide subtle signs of activity and of a capability to bring in extra resources.

Effect

Increase efficiency of informal surveillance. Provide signs of efficient (round the clock) reporting and assistance request capabilities.



Antwerp

Layer 3

Guideline 85

Workers with direct-contact duties shall be trained:

- a) to provide customer assistance,
- b) to solve conflicts – deflecting, de-escalating, arranging solutions,
- c) about self-protection and self-preserving measures.

The professionalism of workers involved in real incidents is a sound sign (to passengers) of the ability of the PT operators to cope with future events.

Effect

Reinforce the authority of the PT operators and its employee's with real evidences – not only based on formally assigned authority.



Antwerp

Layer 3

Guideline 86

CCTV/CCVR systems are important dissuaders to unwanted behaviour and important tools to facilitate identification and apprehension of criminals/delinquents. The adoption of these systems on PT networks shall be followed by a sound policy to associate it with real action – otherwise CCTV/CCVR will be perceived as a dead-system. If any unwanted behaviour is captured by CCTV/CCVR cameras it is wise to promote visible action (cleaning or repairing of vandalism, dispatching of staff or police to crime/disturbance scenes, broadcasting of warnings or instructions through public address systems⁷, publication of CCTV/CCVR pictures of suspects or convicted individuals) that inform clients that the system is working.

Effect

Promote the successful effect of perceived permanent surveillance.



Layer 3

Guideline 87

Help-points (inter-communication devices enabling clients to ask immediate assistance from the PT operator) shall be available in all unmanned stations or in locations that are not in the usual line of sight of station staff. Help-points shall be assisted by CCTV/CCVR cameras. Phone-booths can be turned into valid Help/assistance-Points.

Effect

Reduce feelings of isolation. Enable clients to report immediately any disturbance using a proprietary telecommunications system.

The tone of voice of the public address should never have a panic effect.



Paris - Brussels - Oslo

3.6 Presence of PT staff

Layer 3

Guideline 88

Staffed ticketing offices, control rooms or information desks reassure clients that assistance from the PT-operator is available. This equipment should be designed in order to make them conspicuous, to provide workers with a raised observation point (above passenger heads), to facilitate the voice and visual communication customer-worker (although with a physical barrier between them), to allow a wide angle of vision to the staff inside (ideally 360°). Location should be selected in order to enable the surveillance of a widest possible area of the station.

Effect

Use ticketing offices or other manned facilities to provide extra eyes observing clients. Make sure clients are aware of this.



Antwerp

Layer 3

Guideline 89

Employees from different companies working within the metro premises that are accessible to clients shall be given an easily recognizable uniform, under the corporate image of the PT operator. Some maintenance, cleaning and inspection tasks, if not disturbing the normal operations, should be transferred to the network's standard opening hours in order to enlarge the number of visible workers and human presence.

Effect

Increase the perception of the workers presence and activity along the network. Show clients that the PT operator is committed to provide comfortable, safe and secure service. Dissuade vandalism.



Porto

Layer 3

Guideline 90

Clients shall have the means and spontaneity to communicate with PT staff at any time – the corporate attitude of the PT-operator and its staff shall be welcoming, trustful, available, comforting.

Effect

Foster communication between the PT-company and clients.



Antwerp

Layer 3

Guideline 91

The composition of the PT operator staff in direct contact with clients shall translate the local community. A heterogenic mix of genders, ethnic origins, cultural backgrounds and ages provides a better ground to communicate and to be cherished by clients. Helps the establishment of a “heterotopia”.

Effect

Promote “heterotopia”



Brussels



Antwerp

Layer 3

Guideline 92

Clients should feel the entire PT premises and rolling stock are under direct or remote permanent surveillance – the likelihood of a client meeting a member of the PT staff or personnel of other companies working within the network should be perceived as high.

Effect

Reinforce the perception of formal and informal vigilance and the perception of assistance if required.



Oslo

Layer 3

Guideline 93

PT workers shall be exposed to clients. The perceived presence of staff reassures clients that the network is manned and if needed assistance is available. Workers' uniforms, their work posts, work routine and attitude shall maximize their presence on client's eyes.

Effect

Increase efficiency of informal surveillance, increase opportunity to client-worker-staff communication, ensure swift assistance is available to clients if needed.



Porto



Brussels

3.7 Other forms of human presence

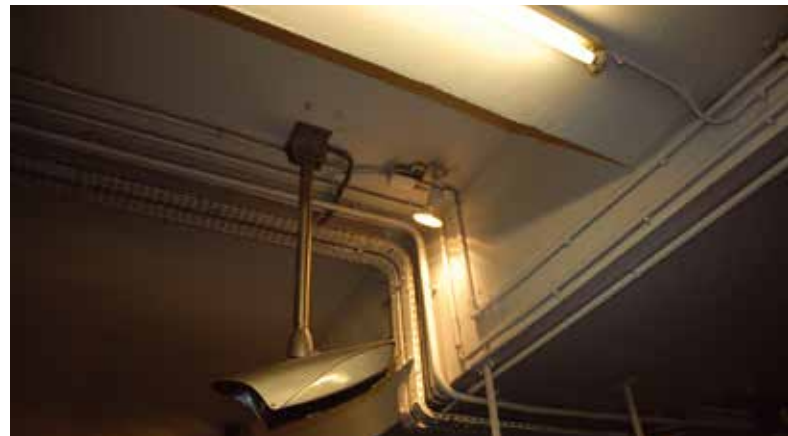
Layer 3

Guideline 94

Sound matters. It affects one on many different levels. Sound is a pervasive shaper of the human perception of the surrounding environment. PT operators' companies can easily make announcements on the audio public address systems to create the perception among clients that the network is manned and surveyed. To maximize this effect messages should be broadcast live, read by an employee, not be pre-recorded. The content of each message broadcast should be adapted with small local or time specific details to subtly reinforce the idea of a real person surveilling the area; it reassures clients that a person, not a machine, is in charge (i.e. when the driver announces the next stop or doors closing). The content of messages should not allude to security matters alone. In fact this should be the least common subject. Commercial contents, greetings, instructions, reminders of how to use the network or tickets, delays, or trains approaching should constitute the bulk of the information. The voice should be decided, warm and clear, it can be male or female.

Effect

Helps the formation of the perception that the premises are under real human surveillance.



Paris



Paris

Layer 3

Guideline 95

Sound and music shall be used to discreetly convey to the clients the feeling they are not on their own and that the PT operator is aware of their presence. Specific sounds can be coordinated with client's actions (i.e. broadcasted greetings or warnings at elevators and escalators).

Effect

Convey the message that clients are taken care of.



Paris

Layer 3

Guideline 96

Sound and music can be used to entertain clients (to foster relaxed, positive environment) as long as they do not impair clients perception. In order to avoid begging musicians it is recommended tot stage performances between specific time slots and in specific areas of the station.

Effect

Provide a relaxing environment.
Create an improved sence of identification.



Paris

Layer 3

Guideline 97

Advertisement (billboards, posters, placards, stickers/self-adhesive films and TV broadcasting or radio Ads) in PT networks can contribute to the increase of positively perceived security as long as:

- a) It is used to reduce the surface of the premises or rolling stock available to graffiti or vandalism,
- b) Its application does not impair the angles of sight of CCTV/CCVR cameras, the effectiveness of light equipment, the legibility and prominence of signage, the perception of space, clients' orientation and the transparency of windows and glassed partitions,
- c) Its application or broadcasting does not impair the understanding of PA announcements, the attentiveness of clients, people's speech, and the quietness of the premises,
- d) Its application or broadcast does not fade away the corporate identity of the PT operator and the easy recognition of PT property by clients,
- e) Its application or broadcasting does not degrade or ridicule the PT-system, its staff, the police authorities, or the PT-code-of-conduct.
- f) The content of the advertisements does not evoke or advocate for crime, violence, aggressiveness, incivilities or any ideology contrary to the "heterotopic" nature of the premises.
- g) The content of the advertisements do not degrade PT in favor of competing modes of transport.

Effect

Protect the premises and rolling stock from vandalism. Avoid an overwhelming presence of commercial advertisement's.



Paris

Layer 3

Guideline 98

Elevators shall have sound recorded messages broadcast in the cabin and outside (i.e. floor announcements, greetings).

Effect

Reduce feelings of isolation. Create the feeling of being taken care of.



Paris

Layer 3

Guideline 99

Use artificial lighting as a means to communicate activity or nearby human presence.

Effect

Reduce feelings of isolation.



Paris

Layer 3

Guideline 100

Entrepreneurs developing business/activities within the PT premises should be rewarded with special incentives (i.e. rent, access, power supply, publicity) for their mandatory participation in the surveillance and maintenance of areas adjacent to their shops/counters.

Guideline 100b

shops and other activities are in tune with the surroundings to the station.
and that the quality and the selection of brands available contributes to the recognisability of the station.

Effect

Promote activities within the PT premises capable of fostering a “heterotopic” environment and sense of ownership.

Different services and shops increase the recognisability of the stations and the diversity of the offer.



Oslo



Stockholm

Layer 3

Guideline 101

Non-permanent activities of cultural or artistic nature within or adjacent to stations boost the “PT image” and promote the positive perception of the PT by clients. These activities should be carefully screened to avoid disturbance of the normal operations of the network and to ensure positive participation in the “heterotopic” environment and reduce stress creation among passengers.

Effect

Promote activities within the PT premises capable of fostering a “heterotopic” environment and gratitude among clients. Diffuse tension. Create a human environment.



Paris

Layer 3

Guideline 102

The incorporation of different art expressions (visual arts, sculpture, music or video) is a useful tool to shape the perceived quality of a given environment. Artistic expressions are useful for the PT environment if carefully adapted (and placed) to the host site in order to prevent impairment of passenger flows and sense of orientation (“immersive” art forms might confuse clients); It is preferable to choose art considering the orientation, identification and/or sense it can convey to passers-by, to inhabitants of the surrounding neighbourhood (i.e. art related to the site).

Well chosen – **locally meaningful** - art reinforces the corporate image of the public transport, entertains and gives a positive feeling to clients, and might avert some forms of vandalism. Art or any other form of decoration can be wittfully applied to hide rather dull equipment or technical appliances. Attention should be paid not to install any physically violent nor aggressive expression of art.



Brussels

Effect

Provide a high quality environment

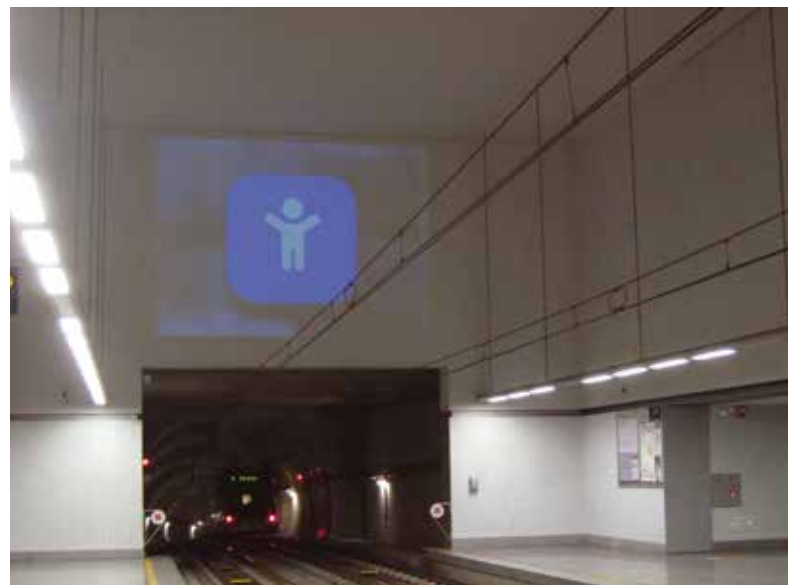
Layer 3

Guideline 103

Sound and music provided to clients shall enhance the “PT-operator’s image and signature”; the profile of the broadcasted messages, sound and music shall be perceived as of good quality, up-to-date and culturally sound by most clients. The broadcasting of standard radio programs or current hit playlists shall be avoided since the information cannot be controlled or clients might become to excited, hence difficult to control.. The “sound signature” of the PT-operator must be tailor-made (e.g. SNCF’s TGV tone), not a re-use of some generic product.

Effect

Porto



Layer 3

Guideline 104

The broadcasting of music or artistically generated sounds is an effective way to reinforce the PT-operator's corporate identity and might help to relax clients, urge them to walk or inform of station activities (i.e. approaching train, time, elevator arriving). It is particularly useful to broadcast specific messages upon specific passenger actions (i.e. greetings broadcast when the elevator cabin opens its door) to impair the sense of isolation.

Effect

Avoid sense of isolation. Reinforce the Operator's corporate identity.



Oslo

Layer 3

Guideline 105

Smells inform clients of the type of use the network is subject to and about the type and quality of maintenance the PT operator performs.

The design of all facilities and equipment shall be meant to curb the creation of places prone to urination/defecation or littering or the formation of puddles due to daily washing. Intense ventilations shall be adopted to avoid the concentration of moisture, bad smells and other unfresh odours in closed environments – stations or rolling stock. Smells from coffee shops groceries or flower shops can provide subtle and positive signs of human presence in off-peak hours. The "smell-signature" of the PT operators should be innocuous.

Effect

Provide convenience to clients.
Generate activity within the network. Provide pervasive signs of constant care and surveillance.



Antwerp



Helsingborg

Layer 3

Guideline 106

Powerful - whenever possible natural-ventilation (effective, quiet and comfortable) - shall be the backbone of the olfactory environment within the PT premises – particularly in confined spaces/ vehicles with high human presence, under high temperatures or moist conditions.

Effect

Foster a non-aggressive environment.



Porto

Layer 3

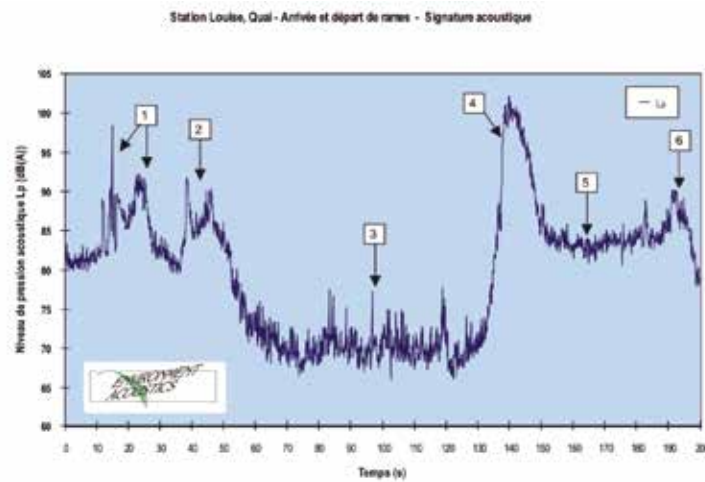
Guideline 107

Extreme temperatures (as well as very high sound levels) affect the human metabolism, clog intellectual reasoning, cut back outgoing and/or helping behaviour and attitudes and might increase irritability. PT-premises shall be designed thus to avoid the exposure of clients/clinets to extremely hot or cold environments, even for short time lapses in the event of an air-co break-down or extreme weather conditions. Special attention shall be paid to premises without air conditioning or large ventilation openings when outside air temperature rises to 27°C or above.

The temperature in closed/underground stations and in vehicles should be (artificially/naturally) regulated to avoid clients' discomfort. On outdoor platforms sun radiation/rain/wind shelters or heating lamps shall be available.

Effect

Keep clients physically relaxed.



Layer 3

Guideline 108

Sound and light can be used in permanent/short term art performances of PT-networks as long as their presence is barely space-consuming and enables the provision of “vandal-proof” art installations. The use of sound and light for aesthetic purposes shall not affect peoples’ perception of their environment and other people neither their ability to understand announcements, messages or read signs.

Effect

Entertain clients without bewilder their attentiveness and perception



Sao Paulo

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