



Using greenery to cool a residential area Merelbeke Tuinwijk Jan Verhaegen

Summary (max 100 words)

- Redundant connecting roads and concrete areas converted into attractive small green park with playground and wadi in the heart of a residential neighbourhood
- Contributes to neighbourhood climate resilience by reducing heat stress and water runoff, whilst also enhancing social cohesion, maintaining good access and improving neighbourhood appearance and real estate value.



Location

Merelbeke, is a municipality in East-Flanders, Belgium, with a population of 25 000 people, living on 37 km². The Northern part, Flora district, is affected by the urbanisation of the adjacent city of Ghent.

Site Description

Tuinwijk Jan Verhaegen (TWJV) is a typical post-war suburban residential neighbourhood, dating from the 1950s, comprising 77 houses and is largely paved and has little greenery. An overall plan for increasing urban greening and availability of publicly accessible green spaces across the Flora district

has been approved, “Groenbelevingsplan Flora”, which includes this site. The original design for TWJV focussed on cars, with two broad connecting roads, each with fully paved parking lanes and sidewalks. However, there were more parking places than needed and most of this paved surface is superfluous.

The decision-making journey

Early 2016: The aldermen, because of a question posed in 2015, demanded an integrated plan for urban greening, availability of public green spaces, opportunities for social interactions experiencing green outdoor spaces resulting in the “Groenbelevingsplan Flora”. The central connecting roads in TWJV were identified as having great potential for urban greening. Local residents asked for temporary closure of streets to traffic to enable children to play safely (a play street or “speelstraat”) so the administration and involved alderman sat down with them to discuss this and other possibilities. **September 2016 saw the beginning of a long participatory process:** The connecting roads were closed off for a weekend of stakeholder engagement, social events enhancing social cohesion and design workshops. Use of parking places was assessed in the following weeks proving many were redundant. Residents were consulted by questionnaire about four alternative designs, from banishing all traffic to just removing the connecting roads, revealing a discrepancy in the views of between younger and senior residents. **April 2017:** another weekend of stakeholder engagement and awareness raising on climate resilience and biodiversity in private (front) gardens. **May 2017:** A small, temporary, park was installed on top of the concrete surfaces to show the effect on mobility and to collect feedback without excessive costs. **February 2018:** saw the last round of stakeholder engagement with the strengths and weaknesses of the temporary park evaluated, the final design presented and discussed, and comments processed. **By the end of 2018:** the “Groenbelevingsplan Flora” was finalised and ratified by the council. **March 2019:** Definitive plans for TWJV approved by the council. **September 2019:** construction work began with the last plants added in 2020.



Figure 1: Leftmost: original situation of central connecting roads. Left-centre: temporary “test” installation. Centre right: final design. Rightmost: aerial photo after completion construction works, before finalising planting.



Figure 2: temporary measure: a temporary “test” park was placed on top of the concrete roads. This way neighbours could get used to the general idea, understand what was envisioned, and feedback could be gathered without excessive costs.

The final proposal

The transformation into a small green park with playful elements, using a climate resilient design that reduces heat stress, promotes rainwater infiltration, improving the area and providing public space to enhance social cohesion whilst also maintaining accessibility for the adjacent houses involved:

- Removal of 1000m² paved surface and replacing this with open ground
- The remaining paving was removed and replaced by:
 - Parallel concrete wheel guides for cars, with gravel-based grass in between and turning areas enforced with grass-concrete permeable paving
 - Paved parking lanes were either removed or replaced by water-permeable grass-concrete pavers
 - Concrete replaced by grass lawn with sustainable drainage system (wadi) to catch run-off water from the park and allow it to infiltrate into the ground.
 - Access for emergency vehicles was guaranteed by including a turning area constructed from recycled kerbstones.
- Trees and shrubs were added to the park, with additional trees with an understorey of shrubs added in beds along the main road.

Implementation

- This project enjoyed the support of local politicians as it developed in response to requests so there was little resistance from residents. Council members and aldermen were directly involved in the public participatory process.
- No permits were required as the site was an existing shared public space, and no paved surface was added (only removed).
- Time is an important issue! The seeds of this transformation were planted early in 2016 with the stakeholder engagement process kicked off in autumn 2016. Construction work started 3 years later. This long planning process was necessary to allow people to become accustomed to the change and appreciate the improvement.

- There were only little, very short-term mobility issues. Inhabitants from two adjacent houses could only access their homes by foot for approximately 3 weeks. Mobility was not affected in any other way. In March 2018 some neighbours submitted a petition to the council opposing the planned interventions, but negotiations led to the issue being resolved and the petition retracted.
- The project was submitted and accepted for a subsidy from the Flemish government (ANB) and won financing from VELT and BBL.

Indicative costs: please note that costs have been rounded and, while accurate at the time of implementation, can only be used as an indication of cost. All costs exclude VAT.

Capital Cost: preparatory work and temporary measures	€	£=€ 1.19
Participatory process: including workshops, public engagement weekends, producing, distributing, and analysing a resident feedback questionnaire.	Unknown	Unknown
Temporary 'pop up' park: importing soil and sowing grass onto of existing concrete. Adding a sandpit and edging the area with concrete blocks. Approx. € 4,000.00 (£ 3,360.00) materials + 120 man-hours (€35/h or £29.4/h), including mowing the grass 16/year for 2 years.	8,200	6,888
Removal of the temporary park: excavation of 160 m ³ soil (reused on site); removing sandpit	449	377
Total	8,649	7,265

Capital Cost: implementation	€	£=€ 1.19
Removal of 13m ² hard surfaces (incising pavement): Bituminous pavement (7m ²); Unreinforced concrete (6m ²)	212	178
Removal of 4,806 m ² hard surface, including asphalt, concrete and unreinforced cementitious foundations and sub-base, street (2400 m ²), kerbstones (1231 m) and storm drains (15).	13,569	11,398
Earthworks: Soil excavation and on-site reuse (210m ³), import (712m ³), excavation and removal off-site (376m ³), shaping play hills.	21,703	18,231
Removing stones/remnants of paving; sieving,	1,120	940
Construction: concrete parallel wheel guides (430.72m ²), incl. foundation	24,920	20,933
Construction: gravel-based grass between wheel guides (114.86m ²)	1,774	1,490
Construction: crushed stone/soil foundation and installation of grass concrete pavements for parking spaces and urning areas (265.85 m ²)	12,300	10,332
Construction: path through the park (20.04 m ²)	478	401
Construction additional elements: crushed stone foundation (1521m ² , € 13,294/£ 11,167), geotextile, storm drains and street gutters, pavements (€ 20,750/£ 17,430), speed bumps on roads (€ 27,382/£ 23,001), storm drains, street gutters and sewers (total project area, €17,141/£ 14,398), kerbstones.	114,506	96,185
25 Plants: <i>Corylus avellana</i> , <i>Viburnum opulus</i> , <i>Buddleja davidii</i> , <i>Acer campestre</i> , <i>Quercus robur</i>	300	252
Planting (plants mentioned above (approx. 15 man- hours, €35/h or £29.4/h)	525	441
Total	191,412	160,786

Annual maintenance Costs	€	£=€ 1.19
Mowing grass by contractor 16 x per year (approx. 0.5 man-hour, 1p, carried out by contractor €70/h or £58.8/h)	560	470
Mowing between shrubs 2 x per year (approx. 4 man-hours, 2p, €35/h or £29.4/h)	280	235
Tree maintenance: not needed as trees have ample space to grow.	-	-
Total	840	705

Concerns raised during the public consultation:	Reactions after completion:
<ul style="list-style-type: none"> • “The two ‘locked in’ houses need to have a parking space in front of their doors” • “Sandbox will turn into a large cat litterbox in no time” -> sandbox was taken out of the plan • Fear of vandalism (Some minor vandalism during temporary installation, none so far (18 months) on permanent implemented measures.) • Fear of attracting loitering teenagers • Fear of shortage of parking places. 	<ul style="list-style-type: none"> • Very positive, everyone, including those that initially opposed the plans, agrees it is aesthetically pleasing and uplifts the neighbourhood. • Unfortunately, some cars use the available central parking spots incorrectly. • When a car is parked in the central parking spot, the park is less kind on the eye. • “It is nice to have a new outdoor, green space where neighbourhood children can play together.” • “Very good to have more green and more possibilities for water to seep into the ground.”

Reflection: what went well/what could have gone better?

- We were able to implement a lot of cooling and other climate resilient measures in a former road and parking area without hampering mobility.
- The stakeholder engagement process was time consuming but was well worth while because it ensured a large supportive base among the residents.
- These central parking spaces are not always used in the correct manner resulting in aesthetically less pleasing sights and sometimes dangerous situations when cars back out onto the main road; further thought should have been given to this in the design.
- Inappropriately parked cars can block the passage for emergency vehicles. To avoid this, the deadend section with parallel concrete wheel guides, installed to avoid cut-through traffic, will be removed so cars can pass through in one direction. After this adjustment the situation will be re-evaluated.
- Some drivers drive over the edge of the park so tree trunks will be placed to stop this.
- Parents of young families were involved in the stakeholder engagement, but children themselves were barely involved. This resulted in playground facilities not well suited to the local children – in future children and young people should be directly involved. The play elements should cater a wide range of ages.
- The municipality applied for a subsidy from the Flemish government (Forest and Nature Agency) and were awarded €50.000. There was also some support from BBL¹ and VELT² for awareness raising. The remaining costs were met by the municipality.
- As the municipality owns the public space, the redesign could be managed in an integrated way and combined with local awareness raising.

¹ BBL= “Bond Beter Leefmilieu” (BE)

² VELT= “Vereniging voor Ecologisch Leven en Tuinieren” (BE)

MEASURE OF SUCCESS	EVIDENCE
Reduction of PET value (baseline vs result values, comparison with reference point)	Vegetated paving: 8.9 °C Oak tree in grass: 13.8 °C Newly planted field maple in grass: 5.2 °C Reflective paving: 1.1 °C
Size of the area (m ²) with improved heat resilience (the total area that benefits from the measures approximate this by using the same approach used for the initial estimation in the application form)	1950m ² of which 1000m ² was formerly paved.
Number of daily users benefitting from the intervention (if relevant/available: are there specific times of day or the year when there is heavy use?)	Depends on time of day/year and weather. More people spend time in the park in summer and at weekends with good weather. Numbers of passers-by are 10-20 daily throughout the year. Playing mostly occurs on Wednesday afternoon and in the weekend.
Co-benefits achieved: Biodiversity boosted Aesthetic improvement, increased property value Enhanced social cohesion, play area for children, uplifting neighbourhood Rainwater buffered and infiltrated locally, run-off reduced.	<i>"It is nice to see how buzzing insects are drawn to the flowering bushes, it brings a part of nature back to this residential area."</i> <i>"It gives a nicer look to the neighbourhood making houses here even more wanted"</i> <i>"It is nice to see the children play together. Even though all surrounding houses have their own garden, this is an option for children from several homes to play together."</i> Over 1000 formerly paved m ² no longer result in run-off water.

Technical and financial specifications

Plant species used:

- *Acer Campestris*, trees
- *Acer campestris*, shrubs (as underlayer with oak trees in beds along main road)
- *Quercus robur*, trees
- *Buddleja davidii*, shrubs
- *Viburnum opulus*, shrubs
- *Corylus avellana*, shrubs
- grass, not specified.

Gravel-based grass: "Grindgazon" by Acterra

Vegetated paving: Betonfabriek Coeck nv., 600*400*120 mm



Figure 3: Final design for central area in Tuinwijk Jan Verhaegen. Sandbox was not implemented.

References

<https://www.cooltowns.eu/nl/best-practice/klimaatadaptieve-herinrichting-tuinwijk-jan-verhaegen-merelbeke-be/>

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<https://www.bondbeterleefmilieu.be/artikel/een-tuinwijk-die-leeft-merelbeke-en-velt-samen-aan-het-werk>