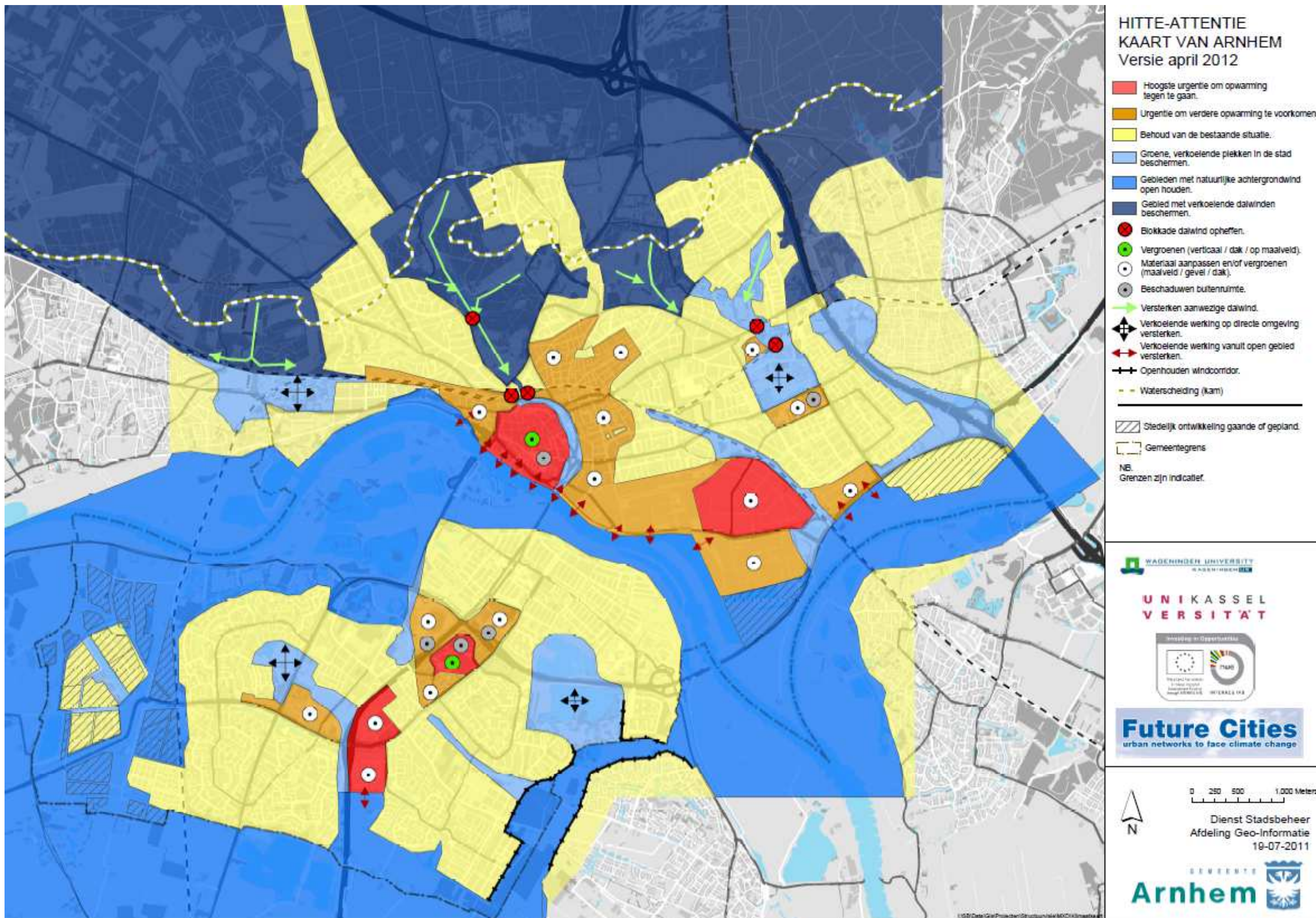


HEAT ATTENTION MAP OF ARNHEM including legend



LEGEND TO HEAT ATTENTION MAP OF ARNHEM

Note: legend only for the colours dark red, red, orange and red

Legend	Chance	Enhance	Actor
Woodlands / slopes Veluwemassief → dark blue	Cool air producing zones which could cool the city.	Protect and enhance the production of cool air in woodlands and the Veluwemassief: <ul style="list-style-type: none"> ▪ No (new) building ▪ Create varied green structures ▪ Prevent blokades due to dense green (i.e. trees/forest) ▪ Reduce pavement <ul style="list-style-type: none"> - 1st best: grass-covered pavement - 2nd best: use (concrete or clay) bricks - Use light coloured or painted roads (not black or dark coloured) material and use material which doesn't store heat 	Owners of the woodlands etc. Municipality
		Create possibilities that cool air from the Veluwemassief can flow well deep into the city to reduce up heating: <ul style="list-style-type: none"> ▪ Avoid blocking the flow of cool air ▪ Avoid close facades of buildings around woodlands so cool air can't flow into the city well ▪ Connect green structures in the city to create a wind path which make it possible for cool air to penetrate deep into the city. 	Municipality
Floodplains + open areas around the city → blue	Fresh air producing zones mostly around the city which could cool the city.	Protect and enhance the production of fresh air in the country site around the city: <ul style="list-style-type: none"> ▪ Reduce widespread building of the green areas. If building is necessary take account of wind / ventilation in orientation and construction. ▪ Create varied green structures ▪ Reduce pavement <ul style="list-style-type: none"> - 1st best: grass-covered pavement - 2nd best: use (concrete or clay) bricks - Use light coloured or painted pavement (not black or dark coloured) material and use material which doesn't store heat 	Farmers and other owners of land around the city (like the state, province and the municipality)
		Create possibilities that fresh air can flow well deep into the city to reduce up heating: <ul style="list-style-type: none"> ▪ Avoid close facades of buildings between the city and the country site so fresh air can't flow into the city well ▪ Connect green structures in the city to create a wind path which make it possible for cool air to penetrate deep into the city. 	Project developers Municipality
Large green areas inside the city boundaries (including parks) → light blue	Fresh air producing zones inside the city which could cool the city.	Protect and enhance the production of fresh air in parks: <ul style="list-style-type: none"> ▪ No (new) building ▪ Create varied green structures: <ul style="list-style-type: none"> - 1st best: trees - 2nd best: grass ▪ Reduce pavement <ul style="list-style-type: none"> - 1st best: grass-covered pavement - 2nd best: use (concrete or clay) bricks - Use light coloured or painted pavement (not black or dark coloured) material and use material which doesn't store heat 	Municipality
		Create possibilities that fresh air can flow well deep into the city to reduce up heating: <ul style="list-style-type: none"> ▪ Create a structure of small and spread green in the city ▪ Avoid close facades of buildings between the city and the country site so fresh air can't flow into the city well ▪ Connect green structures in the city to create a wind path which make it possible for cool air to penetrate deep into the city. 	Municipality

Zones of urban heat island

Legend	Problem	Measure	Actor	Phase
<p>Inner city + Shopping centre Kronenburg + Industrial ares</p> <p>= highest urgency to act to prevent up heating</p> <p>→ dark red</p>	<p>Zones with a moderate to maximum urban heat island which causes negative effects on work and wellbeing outside.</p>	<p>Scale of inner city:</p> <ul style="list-style-type: none"> ▪ Protect or enhance the green and blue structure ▪ More (small) green parks and squares ▪ Urban morphology: <ul style="list-style-type: none"> - Avoid blocking the flow of cool and fresh air into the estates - Adjacent building placement and create more dynamic configuration of buildings - Block the sun shine deep inside the buildings - Use natural ventilation <p>Scale of shopping centre:</p> <ul style="list-style-type: none"> ▪ Protect or enhance the green and blue structure ▪ More green → car park + on roof and walls shopping center ▪ use the 'right' materials ▪ Urban morphology: <ul style="list-style-type: none"> - Avoid blocking the flow of cool and fresh air into the estates - Adjacent building placement and create more dynamic configuration of buildings - Block the sun shine deep inside the buildings - Use natural ventilation <p>→ special attention to the living areas directly around the shopping center Kronenburg</p> <p>Scale of industrial area:</p> <ul style="list-style-type: none"> ▪ Protect or enhance the green and blue structure ▪ More green → trees, vertical green ▪ Urban morphology: <ul style="list-style-type: none"> - Avoid blocking the flow of cool and fresh air into the estates - Adjacent building placement and create more dynamic configuration of buildings - Block the sun shine deep inside the buildings - Use natural ventilation 	<p>Project developers Municipality</p>	<p>In areas with a remarkable or maximum heat island effect and areas with vulnerable people it is necessary measures been taken.</p> <p>In other areas action is needed to protect or enhance the quality of the area which provides it to heat up (see measures)</p> <p>When mean reconstruction is at hand, measures should be taken.</p>
		<p>Street scale:</p> <ul style="list-style-type: none"> ▪ Plant trees alongside streets: <ul style="list-style-type: none"> - 1st best: trees on both sides of the street, use deciduous trees which have large crown shape which create large shadow - 2nd best: trees on one side of the street and deciduous trees which have small crown shape which create small shadow ▪ Reduce pavement: <ul style="list-style-type: none"> - 1st best: grass-covered pavement - 2nd best: use (concrete or clay) bricks - Use light coloured or painted pavement (not black or dark coloured) material and use material which doesn't store heat ▪ Use streets as wind path to let flow cool or fresh air deed into the inner city or the shopping centre but avoid the negative effects of (hard or cold) wind ▪ Use round shape for building located at the entrance and the end of street canyon ▪ Façade of buildings alongside the street: tall buildings opposite tall buildings, use slanted roof and altering roofs shape arrangement ▪ Shade the buildings by plants and materials ▪ Use sunscreens when planting trees isn't possible ▪ Use fountains 	<p>Project developers City management Municipality</p>	
		<p>Building scale:</p> <ul style="list-style-type: none"> ▪ Use green roof (mainly good for the climate inside the buildings) ▪ Use green façade or walls (more effective than roofs on temperature street level) ▪ Use light coloured or painted (not black or dark coloured) material (albedo-effect) and use material which doesn't store heat 	<p>Building owners Hirer</p>	

Legend	Problem	Measures	Actor	Phase
Industrial areas + shopping areas + living areas = urgency to prevent further up heating → orange	Zones with a moderate to maximum urban heat island which causes negative effects on work and wellbeing outside.	Scale area, neighbourhood: <ul style="list-style-type: none"> ▪ Protect or enhance the green and blue structure ▪ More green: <ul style="list-style-type: none"> - Best : trees - Second best: small parks ▪ Urban morphology: <ul style="list-style-type: none"> - Avoid blocking the flow of cool and fresh air into the estates - Adjacent building placement and create more dynamic configuration of buildings - Block the sun shine deep inside the buildings - Use natural ventilation → more specific recommendations to specific areas as shopping malls	Project developer Park management Municipality	In areas with a remarkable or maximum heat island effect and areas with vulnerable people it is necessary measures been taken. In other areas action is needed to protect or enhance the quality of the area to prevent it to heat up (see measures) When reconstruction is at hand, measures should be taken.
		Street scale: <ul style="list-style-type: none"> ▪ Reduce pavement: <ul style="list-style-type: none"> - 1st best: grass-covered pavement - 2nd best: use (concrete or clay) bricks - Use light coloured or painted pavement (not black or dark coloured) material and use material which doesn't store heat ▪ Streets should have less than 0,25 ratio of H/W (widening the street or shortening the buildings' height) ▪ Use streets as wind path to let flow cool or fresh air deed into the estates 	Building owner Hirer Park management [Municipality]	
		Building scale: <ul style="list-style-type: none"> ▪ Use green roof (mainly good for the climate inside the buildings) ▪ Use green façade or walls (more effective than roofs on temperature street level) ▪ Use light coloured or painted (not black or dark coloured) material (albedo-effect) and use material which doesn't store heat 	Building owner Hirer	