IDENTIFYING THE CONNECTIONS OF LIVEABILITY IN UDAIPUR, INDIA
USING THE ARCGIS APPLICATION MATRIXGREEN

INGRID BOKLUND, LARS JOHANSSON, KAISA MUSTAJÄRVI AND BETTINA WANSHURA

RAMBOLL ENVIRON

LIVEABILITY CONNECTIVITY ECOSYSTEM SERVICES

A LIVEABLE CITY

Blue-green infrastructure + **Multifunctional spaces** = **Ecosystem services** **Biodiversity** = **Quality of life** **Healthy population**

A CONNECTED CITY

AN ECOSYSTEM SERVICE PERSPECTIVE

Carbon circle

Renewable energy

Food production

Recreation

Clean water

Stormwater regulation

Green structures

Health

MATRIXGREEN

WHAT IS MATRIXGREEN?

Input data:

- Geographical background data (biotopes, habitats etc.)

- Profile species data
  - Habitat requirements
 - Dispersal patterns

→ **CONNECTIVITY**
The connections and relations between green/blue/social areas of similar kind (e.g. habitats).

RAMBØLL ENVIRON
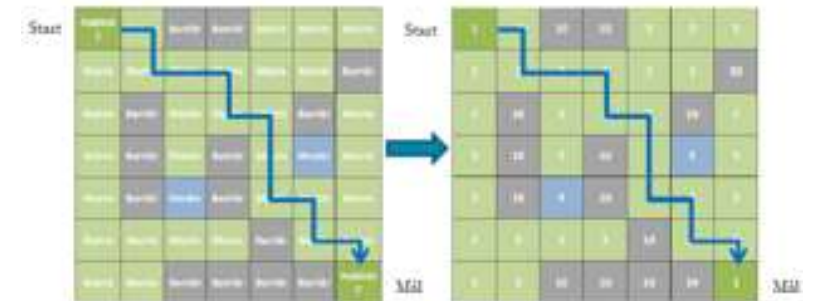
FOR WHAT CAN IT BE USED?

MatrixGreen can be used for:

- Identifying isolated segments in the landscape/city in terms of connectivity (component analysis)

- Identifying patches that are centrally situated within the network (betweenness centrality analysis)

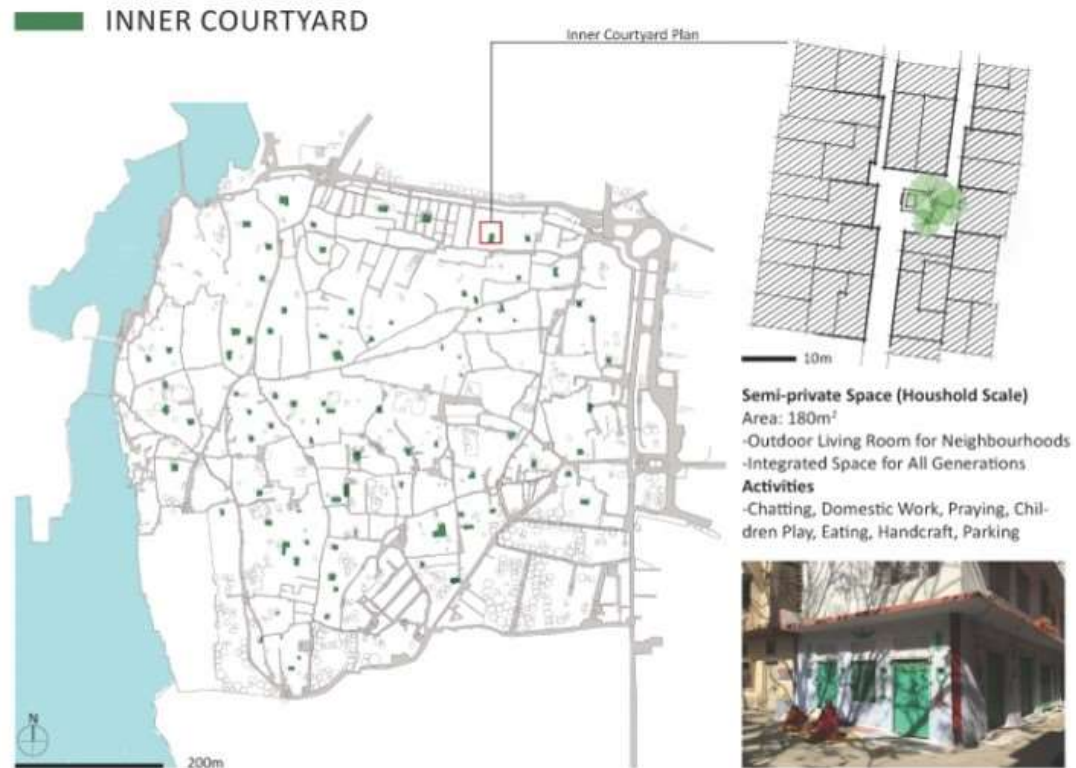→ Reconnecting a fragmented landscape
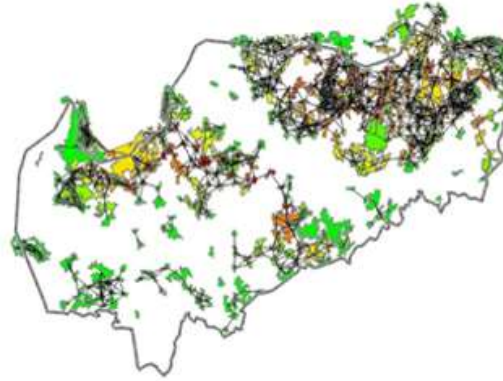
Ecological and social connectivity analyses

PILOT PROJECT UDAIPUR - RAJASTHAN, INDIA
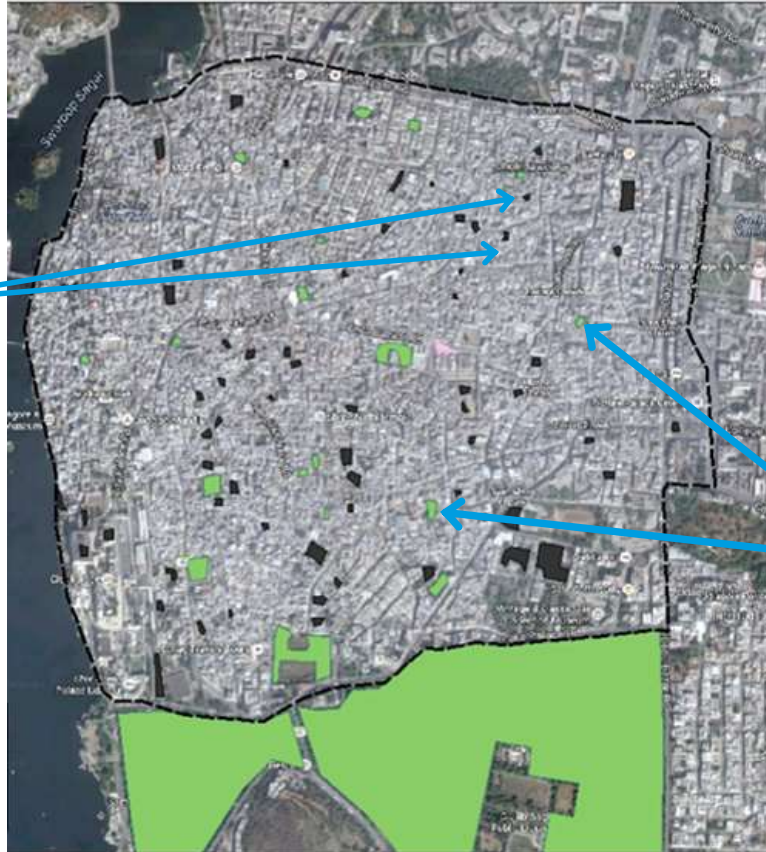
AN ECOSYSTEM SERVICE PERSPECTIVE

INNER COURTYARD

Inner Courtyard Plan

10m

Semi-private Space (Houshold Scale)
Area: 180m²
-Outdoor Living Room for Neighbourhoods
-Integrated Space for All Generations
Activities
-Chatting, Domestic Work, Praying, Children Play, Eating, Handcraft, Parking

200m

SHRINES
POTENTIAL PATCHES

Several flourishing shrines with high ecological and cultural values

Several neglected shrines with poor capacity to provide value to the city – but with great potential

RAMBØLL ENVIRON

THE URBAN NETWORK OF UDAIPUR

Connectivity framework:

- Patches with no more than 150m distance from each other are connected via links

Fragile urban ecological network → **Robust and connected ecological network**

Legend

- – – Walled City of Udaipur
- ▇ Udaipur Tomorrow – Working Green Space
- —— Links – 150m Edge-to-Edge

RAMBØLL ENVIRON
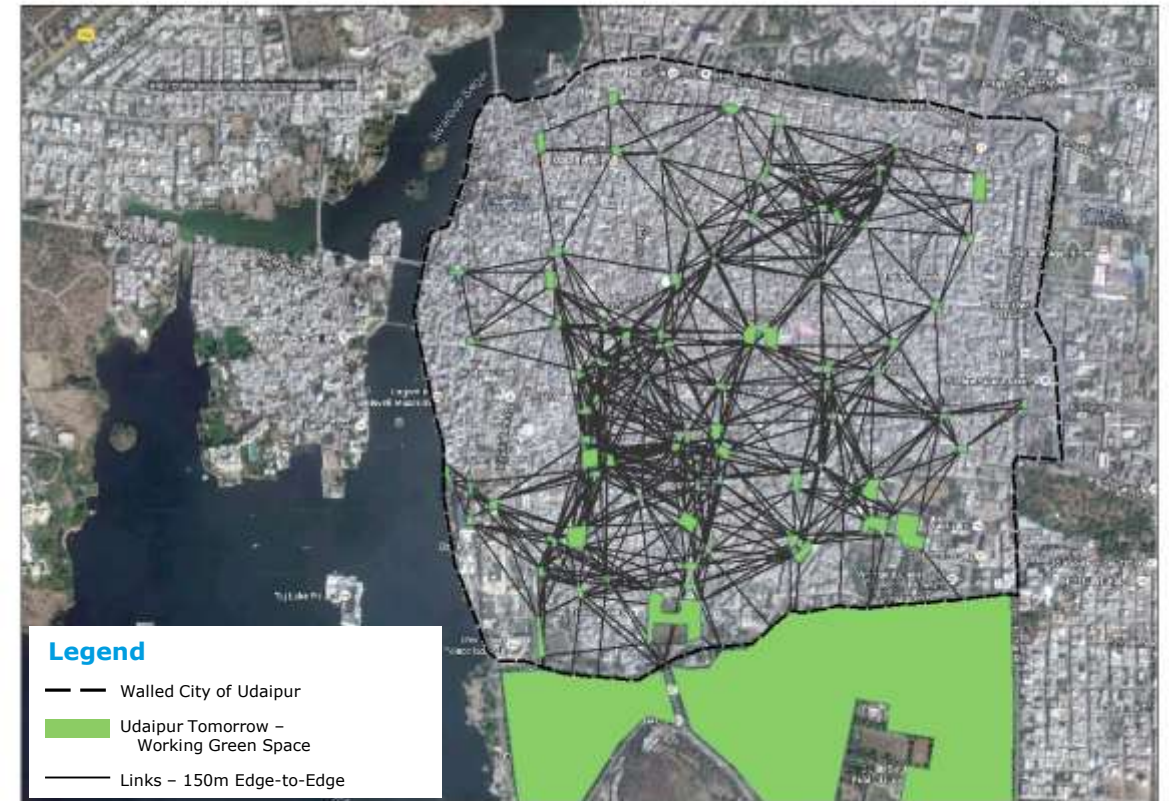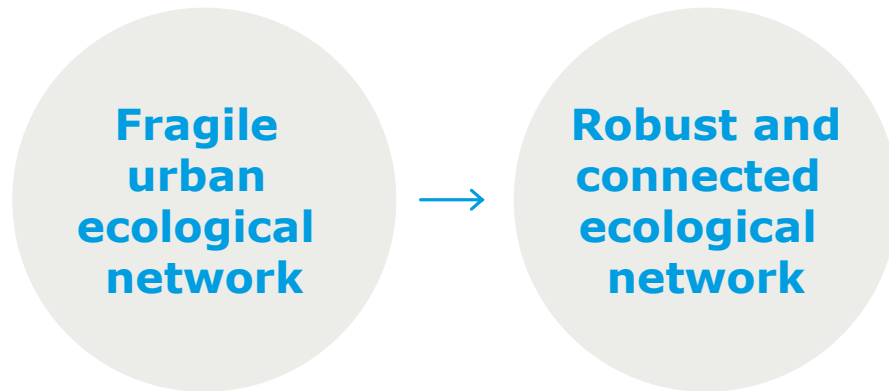
THE URBAN NETWORK OF UDAIPUR

Connectivity framework:

- Any patch within the component can be reached from any other patch within the component – but not from patches outside the component
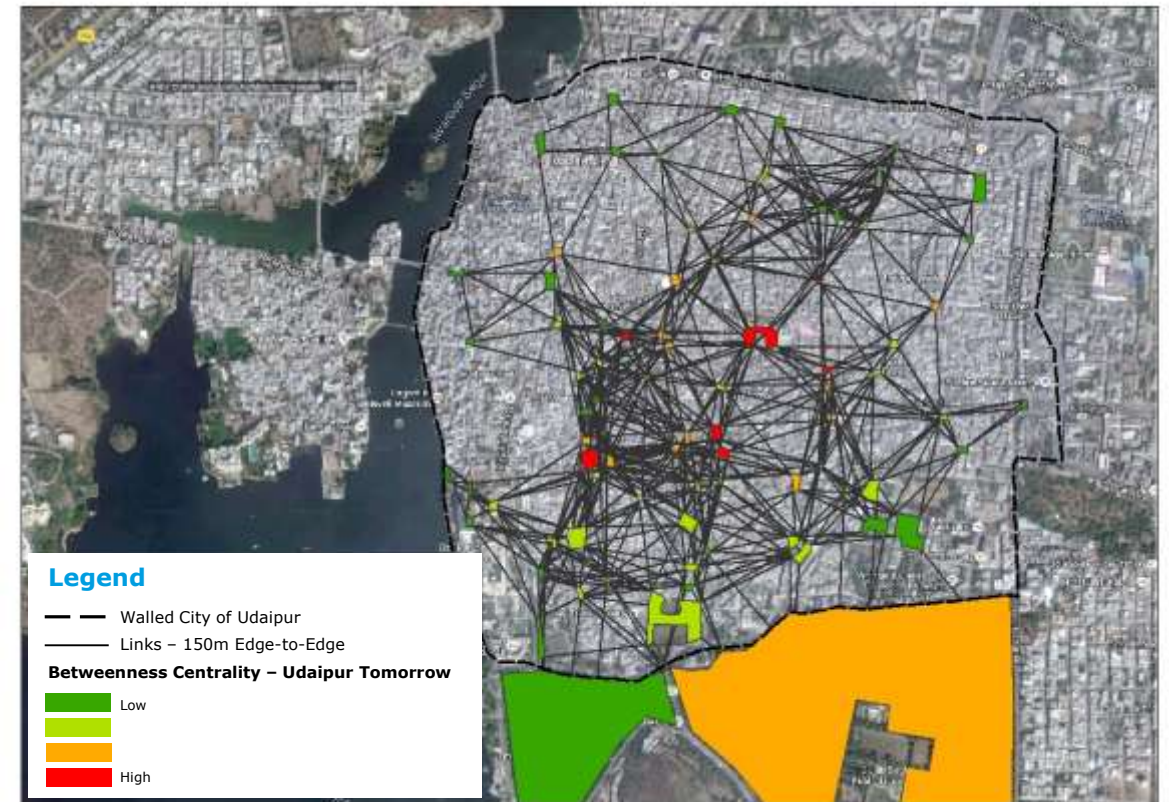
Isolated network components → **Connected network components**

Legend

— — Walled City of Udaipur

—— Links – 150m Edge-to-Edge

Component Analysis – Udaipur Tomorrow

▮ Network Component 1
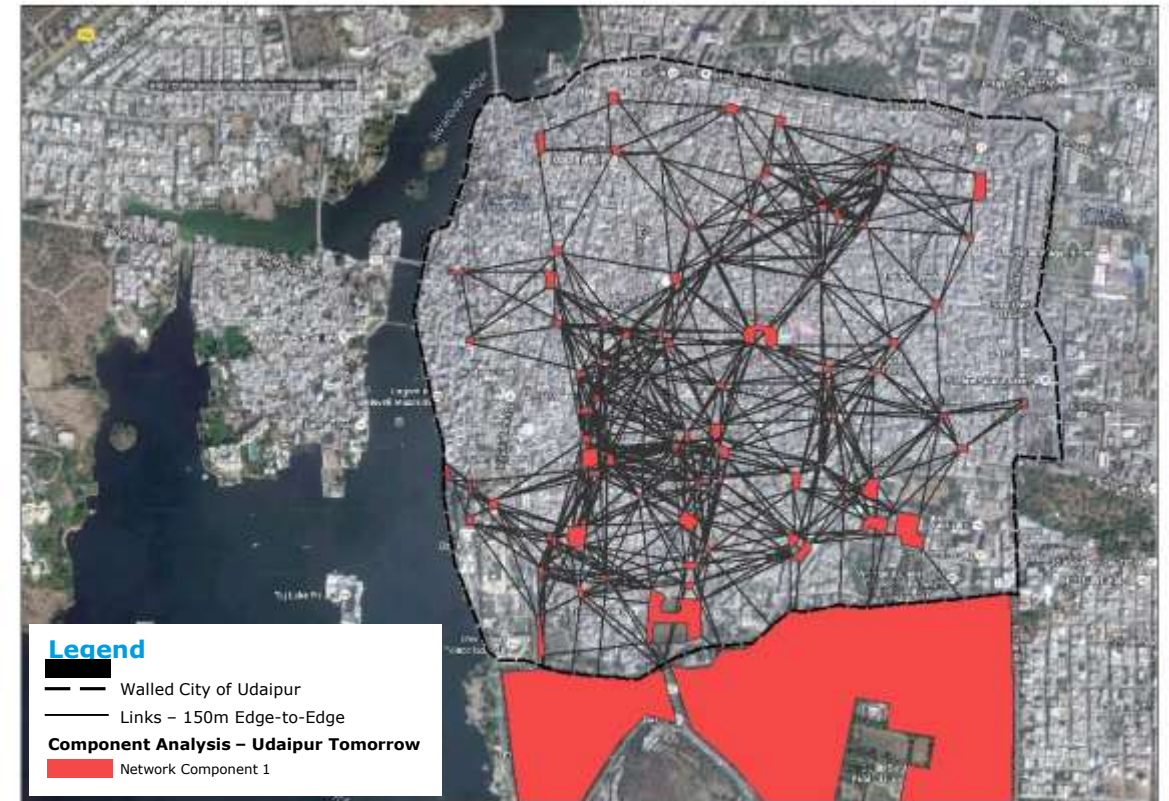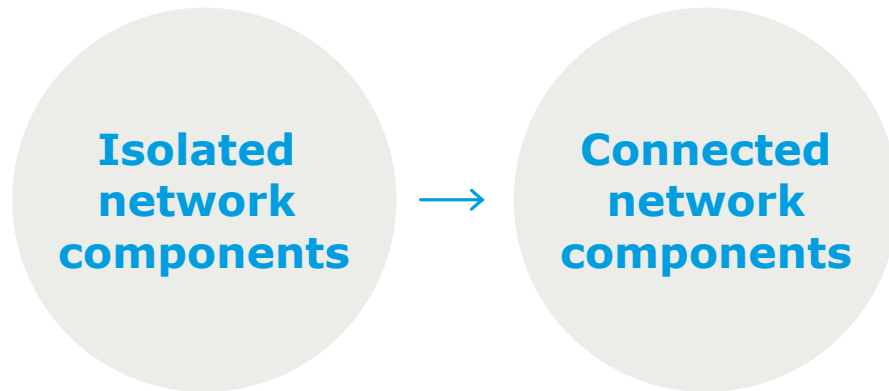
THE URBAN NETWORK OF UDAIPUR
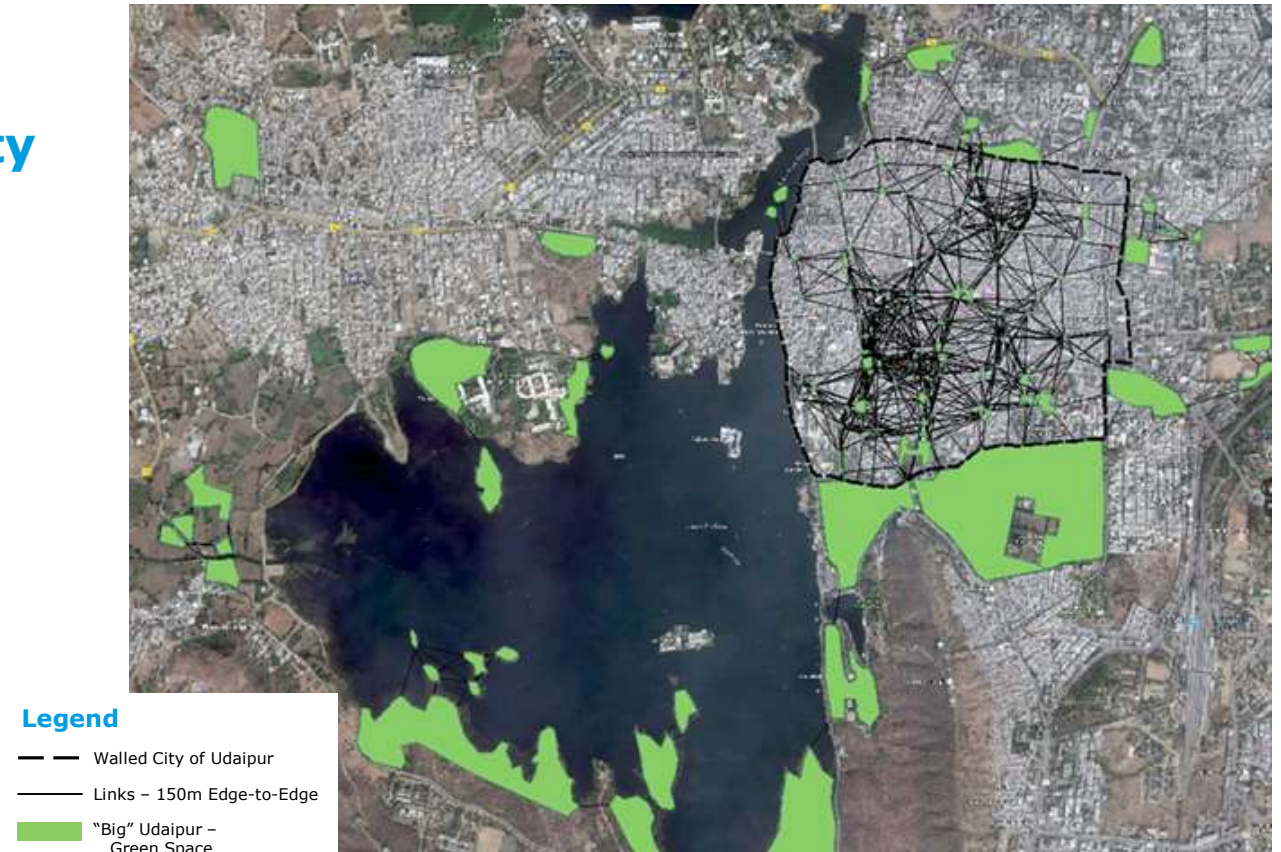
Connectivity framework:

- Patches with high BC-scores are situated in such a way that most of the links between any two patches in the landscape pass through these patches.

Important stepping stones are visualized

Legend
- — — — Walled City of Udaipur
- ——— Links – 150m Edge-to-Edge

Betweenness Centrality – Udaipur Tomorrow
- Low
- High

RAMBØLL ENVIRON

THE URBAN NETWORK OF UDAIPUR

By creating ecosystem services hotspots in the existing structures of the city, potential for biodiversity and connectivity will increase, supporting a liveable and resilient urban environment.

Legend

– – – Walled City of Udaipur

——— Links – 150m Edge-to-Edge

■ "Big" Udaipur – Green Space

RAMBØLL ENVIRON

FEEDBACK FROM CLIENTS

SMART AND HOLISTIC CITY PLANNING

Provide a system perspective on landscapes and cities

Lay the foundation for a holistic city and landscape development

Visualize resilience/lack of resilience in ecological systems

Enable smart, sustainable city and landscape planning

The analyses are transparent and easy to understand

The maps are being used by municipality planners as an indicator to how certain areas should be maintained/developed

The analyses help to explain the complexity of nature to the decision makers in a pedagogic and scientific way

THANK YOU!

01
02
04
03
05

01 Biodiversity

02 Spiritual values

03 Habitat

04 Clean air

05 Local climate regulation

CONTACT

Ingrid Boklund
Ramboll, Uppsala Sweden

+46 10 6151611
ingrid.boklund@ramboll.se

RAMBOLL ENVIRON