Municipal broadband access networks in the Netherlands

three successful cases, and how New Europe may benefit

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Outline

- Brief introduction
  - Municipal network examples in the Netherlands
  - Kenniswijk & OnsNet Nuenen
  - Wireless Leiden
  - Benefiting through BReATH

- Contact info
- Questions
Brief introduction

• In the last years, many municipal broadband access network initiatives have come up
• Some target business, some target non-profit and governmental institutes, some target home users, others target a combination of these
• In this work, we have analyzed three initiatives
  – Kenniswijk Eindhoven
  – OnsNet Nuenen
  – Wireless Leiden

Use of these analyses in the EU FP6 IST project BReATH

Presented together because of their interrelation
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• Municipal network examples in the Netherlands
  • Kenniswijk & OnsNet Nuenen
  • Wireless Leiden
  • Benefiting through BReATH

• Contact info
• Questions
Municipal network examples in the Netherlands

• Amersfoort
• Appingedam*
• Den Haag
• Deventer
• Dordrecht
• Eindhoven
• Enschede
• Gooi
• Haarlem
• Hillegom
• Hilversum

* Plans for municipal funding of this FttH network were recently prohibited by the EC regulator because “the municipality provides State Aid in a region where broadband is already available”

→ http://europa.eu.int/
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Kenniswijk & OnsNet Nuenen

Background

- Kenniswijk initiated by the DGTP in early 2000 to
  - Break the stalemate between infrastructure deployment and service provision
  - Create a ‘living’ testbed:
    - parties offer their innovative infrastructure and services
    - consumers use these and benefit from them
  - Strengthen the Netherlands’ international competitive position as a flourishing site for ICT companies
  - Gain, and share with other municipalities, the knowledge on effects of ICT on spatial, social and mobility patterns
- Project ended per 1 October 2005
Kenniswijk & OnsNet Nuenen

**Background**

- Area initially consisted of parts of the towns of Eindhoven and Helmond
- At the request of SRE, the Ministry of Economic Affairs decided in December 2003 to add the village of Nuenen
Kenniswijk & OnsNet Nuenen

**Business model**

- **Begin:** Kenniswijk.nl foundation organized the project, bringing together and supporting partners
- **From 02/2002:** Kenniswijk BV took over this role
  - Collaborative venture; private-public partnership of 27 parties
  - Proactively approaching companies & institutions to make use of available subsidy schemes
  - Facilitating, motivating and supporting organizations
- **OnsNet Nuenen**
  - launched in 2004, making use of Kenniswijk funding
  - using a cooperative model of demand aggregation to roll out the glass fiber infrastructure - an approach that was unparalleled in the world at the time
Kenniswijk & OnsNet Nuenen
Business model

- Village-wide glass fibre network
- 97% of households in Nuenen joined the cooperation
- Network exploitation company NEM Nuenen BV owns, manages and exploits the open network
- Shareholders of NEM: investment company, housing corporation and OnsNet cooperation
- NEM negotiates contracts with service providers
- Customer reaches agreement with NEM about network use, and with service providers for using their services
Kenniswijk & OnsNet Nuenen

Business model

- Government allocated € 45.5 M in Kenniswijk
  - € 12.5 M as infrastructure development subsidies:
    € 800 discount per user connection
    - room for > 15,000 connections
  - Another part as service development subsidies
    - Almost all Kenniswijk services utilized these subsidies
    - National subsidy: € 35 k for ‘small services’, € 400 k for ‘large services’, co-financing of > 50%
    - Regional subsidy: max. € 40 k, co-financing of > 40% or > 60%
OnsNet Nuenen:

- Costs per connection ~ € 2,100
- Members of cooperation requested Kenniswijk infrastructural subsidy of € 800, which was invested in NEM Nuenen BV to contribute to the installation and the costs for exploitation and Internet access in 2005
- Because of this, OnsNet Nuenen could propose the residents of Nuenen an extraordinary offer: “Become a member and you do not have to pay any connection costs. On top of that you will receive a 10 Mbps Internet subscription for free during the first year”; being Dutch, hardly anybody refused this offer
Kenniswijk & OnsNet Nuenen
Consumers and promotion

- Kenniswijk BV stimulating parties to use subsidy
- Kenniswijk Corners, volunteers giving support
- Kenniswijk Visitors Centre: fast PCs, demo area, video area
- Newsletters to 10k subscribers, every 2-4 weeks
- Test panel pool
  ~400 residents
- Website
- Helpdesk
- OnsNet Nuenen: extra visibility through tagging
Kenniswijk & OnsNet Nuenen

Broadband network

- Kenniswijk:
  - Various interconnected AON glass fiber networks installed by commercial companies, using the subsidies
  - > 7,000 dwellings connected
  - After the end of the Kenniswijk project, OnsNet Eindhoven (copy after OnsNet Nuenen) took over many of these networks

- OnsNet Nuenen:
  - Star-shaped glass fiber network connecting > 7,500 houses installed within 3 months
Kenniswijk & OnsNet Nuenen  
e-Services

- Subsidy schemes active since March 2002
- Yearly number of subsidy requests increased strongly
- In total ~1000 project ideas
- About 300 of these resulted in concrete project plans and subsidy requests
- Of these, 135 were approved
- Many developed services scaled up to national and even international level
  - Movie on Demand: taken up by KPN/Planet Internet and Casema cable operator
  - OntdekNet: pupils and ‘experts’ collaborating online
Kenniswijk & OnsNet Nuenen

**Problems**

- Bad economical situation in 2001-2002 delayed market investments
- Low amount of services, connections and subsidy requests until 2004; only with the creation of OnsNet Nuenen and its inclusion in the Kenniswijk project, the number of requests, connections, and launched services experienced a clear growth
- Legislation presented a number of problems because the housing corporation cannot pay for facilities outside the residence
  - In the meantime, regulations have been clarified
  - Housing corporations can now play an active role in glass fiber projects.
Kenniswijk & OnsNet Nuenen

Success factors

- The role that Kenniswijk BV played in strongly promoting the funding opportunities to infrastructure, service developers and other parties in the broadband value chain.
- Two enthusiastic individuals initiating OnsNet Nuenen by choosing a cooperative model, and the community sense of the inhabitants of the municipality.
- The housing corporation played a crucial role for the creation of OnsNet Nuenen; this raised much awareness about how broadband can benefit both renters and housing agencies.
Kenniswijk & OnsNet Nuenen

Outcomes

- Kenniswijk results: > 15,000 FttH connections and 135 services
- Many lessons learned on how to get companies to install infrastructure and get users to subscribe to a service

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<th>Building-phase</th>
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- Start Kenniswijk BV (Feb 2002)
- Final report

Mid-term review

FttH
Services
Status Sep 30th 2005

>15,000
135
116
Outcomes

• Subsidized first year in Nuenen ended in December 2005

• 80% (!) of households still use OnsNet Nuenen fiber connection now

• After success of infrastructure rollout in Nuenen, OnsNet Eindhoven was started in a neighbourhood in that town
  – Based on same approach
  – Housing corporations (co-initiators of the OnsNet project) already owned a large number of houses there
  – Primary glass fiber connection between Nuenen and Eindhoven already went right through Tongelre.
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Wireless Leiden
Background

• Wireless Leiden project is one of the world’s first and largest independent and completely wireless community networks
• In 2002, three Leiden residents tried to interconnect their homes using IEEE 802.11a outdoor antennas on their houses
• After this was successful, they wrote their plan for starting Wireless Leiden
Wireless Leiden

Background

- Create a cheap and fast wireless network for Leiden and surrounding area
- Network can be used both for internal communication and for Internet access
- Open network: all external service providers have access to the network on equal conditions
- Stimulate and facilitate commercial activities, such as spin-offs
Wireless Leiden

Background

- Leiden is a city with ~118k residents in the west of the Netherlands
- Leiden is part of Holland Rijnland: a collaboration of twelve municipalities, consisting of almost 400,000 residents
Wireless Leiden

Business model

- Wireless Leiden is set up as a not-for-profit foundation that owns the wireless network
- Use of cheap hardware, open standards, Open Source software and public knowledge, enabling the setup of a network at very low cost price
- Completely run by approximately 70 volunteers who build, expand, operate, maintain and promote the network and secure funding for their activities
- For the development of new technologies and applications Wireless Leiden cooperates with research institutes and the Leiden university
Wireless Leiden

Business model

- Founders used own financial resources to set up the network in the beginning
- Then Wireless Leiden built interest among individuals, companies and other organizations to sponsor installation and maintenance of the network
  - Financially
  - Through products
- Example: node with 1 access point and 3 interfaces to other nodes costs a sponsor around € 1,200.-
  - Covers all costs for the node
  - Leaves a little margin to Wireless Leiden, which it uses to cover other expenses
Wireless Leiden

Business model

- Example: connectivity measurements at home
  - Voluntary customer donation on average around € 10
- Example: donation of PCs, rack servers and network monitoring software by institutions and companies

- Use of Wireless Leiden is completely free, both internal communication and Internet access
- Wireless Leiden helps with the technology and organization of wireless community projects in surrounding municipalities, connected to Wireless Leiden
Wireless Leiden
Consumers and promotion

• Initial focus on connecting professional users
  – Companies wishing to offer VPN services to their employees at home
  – Multiple-site schools
  – Libraries with multiple sites and/or a library bus
  – Social and health care centres
• Later also home users were connected
• Promotion through lectures, weekly information meetings, website/wiki, press releases
  – All primary schools in and around Leiden interconnected; great promotion through children
Wireless Leiden
Broadband network

- IEEE 802.11b network:
  - ~100 nodes
  - Three 8Mbps gateways provided for free by commercial ISP
  - Static and local frequency planning; shift to dynamic, network-wide planning upcoming
Wireless Leiden

e-Services

- Services are not the main focus of Wireless Leiden, yet they do service experiments
  - Streaming of webcam video and local pop music
  - Jabber messaging
  - Time synchronisation
  - Game servers
  - H.323 VoIP
  - Additional external service providers welcomed, beside the ISP that currently offers its services
Wireless Leiden

Problems

• Wireless Leiden suffers from interference with private IEEE 802.11b access points and other ISM devices
• Recent tests done with IEEE 802.11a to overcome this problem
• Need for customized version of OSPF for routing
Wireless Leiden

Success factors

• Many enthusiastic and skilled volunteers
• Effective organization using a cooperative approach
  – enables free access to strategic locations for placing network nodes
• Not-for-profit setup
  – Governs the use of open standards, Open Source software and cheap, even home-made hardware
  – Results in low-cost network
• In many villages around Leiden ADSL was not available when Wireless Leiden started
Wireless Leiden
Outcomes

• Results and experiences published on website/wiki
  – Enabling other interested municipalities and parties to benefit.
• Community wireless IEEE 802.11b networks took off in municipalities around Leiden, built with the same business approach
• In 2003, Wireless Leiden won the Dutch Vosko Award for Young Network Warriors, a prize for the best business and innovation in ICT
Wireless Leiden

Outcomes

- In April 2004, a sandwich shop sponsored the installation of a network node at its location behind the Leiden railway station, which thus became the first in the Netherlands to have WiFi-covered platforms.
- In June 2005, Wireless Leiden helped with the construction of a municipal broadband wireless network in the Turkish region of Karaman.
- Various small spin-off companies, products and services related to WiFi technology have come to life around Wireless Leiden:
  - Ready-made solar-powered network nodes
  - Secure hybrid WiFi-GPRS nautical datacom systems
  - Rainpipe-based home outdoor WiFi antenna solution
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Benefiting through BReATH

- European FP6 IST project BRoadband e-services and Access to The Home
- Main objective: stimulate and support transfer of know-how and best practices in planning and delivering broadband e-services and access to the EU New Member States and Associated Candidate Countries
- Case studies and strategic modelling
- Dissemination at various events
  - Workshops Poland, Czech Republic, Slovenia, Greece
  - Special Interest Groups
  - Conferences and seminars
Contact information

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-= Thank you for your attention =-