



**Wireless Broadband Services  
and Broadband Demand Aggregation in the Milton Keynes Area**

**Outline Project Plans and Project Description**

**Executive Summary**

These project proposals have been created by the Milton Keynes Council I.T Service (Head of I.T Steven Jewell) to foster the introduction of wireless based broadband services within the MK area. The proposals follow months of research into the potential use of this technology involving discussions with the Acting Chief Executive of MKC (John Best), Ogier Electronics (Len Ogier), Regional Directors and Senior Managers in NTL, representatives of BT, MK Councillors, an MK MP (Brian White), the Radio Communications Agency, various senior officers in MKC, the Open University (Neil Roche), the MK Economic Partnership (Mike Geddes), SEEDA broadband specialists (Steve Coppins and Ray Mather) and various consultants.

We believe that new broadband internet services are a requirement within the MK area and many small businesses and citizens are already complaining about the lack of accessibility. The Council has a direct leadership role in solving this problem for its community and in fostering the economic well being of the area. Our analysis suggests that Wireless Broadband represents a cost effective way to deal with the accessibility problem.

We are proposing

- initial wireless broadband pilot (or pilots) for around 200 to 300 'customers' to receive wireless broadband internet services and,
- adapted use of broadband demand aggregation consultancy services to aid in the assessment of the pilot and to collate information on demand and opportunities for service delivery within the MK area.

The initial proving wireless broadband pilot(s) will run for around four months. During the pilot the broadband aggregation consultancy will run an evaluation of the pilot assessing the 'commercial' potential and the application of the technology (and other technologies) for use throughout the Milton Keynes area.

Exploratory discussions have enabled us to shape this proposal and to determine the basic business case for wireless broadband. We estimate that commercially competitive services can be offered, priced at around £25 per month for access by individual households (with speeds of around 512 kilobits per second at a contention ration of 20 – 1) and an offer of around 1megabit per second for a cost of around £50 per month for small to medium enterprises. The technological

equipment capabilities and services available from various companies have been explored and the funding arrangements required are understood. A brief 'illustrative' diagram and some background facts on examples of the technology are provided at Appendix 2.

In order to further assess the issues and ensure an element of competition in relation to our requirements a tender process will be run over the next weeks in order to select preferred partners for pilot implementations.

Two grants are immediately available from SEEDA to assist with the projects proposed,

- a wireless broadband grant of £25,000
- a broadband aggregation consultancy grant of £30,000

The project proposal following describes how these funds will be allocated and used.

## **1. Introduction and Background**

At present because of problems with the way the BT owned local loop infrastructure is engineered in Milton Keynes (mixtures of fibre and copper links and some aluminium for circuit connections) and distance issues (many properties more than 5.5kms from the nearest exchange) it has been estimated that a very significant part of the population in the MK area cannot gain access to ADSL based broadband services. Also from our research and discussions with telecommunications providers we understand that the costs of upgrading the cable infrastructure in the urban areas of MK (presently owned and managed by NTL) are very substantial (millions of pounds).

Our enquiries and discussions with telecommunications providers lead us to conclude it is unrealistic to expect that significant investments in the MK communications infrastructure will be forthcoming in the immediately foreseeable future. This creates a likely scenario of continuing inaccessibility to affordable broadband services unless the Council provides a lead for the community to develop new facilities and services in this area. It is our assessment that continuing inaction will foster the growing danger for MK that economic growth will become increasingly stymied with citizens and small to medium business enterprises (SME's) being restricted from gaining access to affordable broadband communications services.

## **2. Project Description – Why wireless broadband in Milton Keynes?**

Wireless broadband services represent an obvious option given the problems faced in the MK area. As already outlined, access to ADSL broadband services is very restricted and patchy within the Milton Keynes area. Satellite broadband services are relatively expensive and alternatives (new cable/fibre links) are anticipated to encounter technical, investment and price problems. Set against this backdrop the Council already has a successful proven track record of exploiting wireless broadband technology. The Milton Keynes Council National Grid for Learning, wireless network, was implemented over two years ago (in partnership with the Open University) and currently provides broadband services to around 70 of the MKC schools. We are also aware that other Council's that have implemented wireless broadband networks for their schools have seen the possibility of a 'logical jump' to extend their networks to provide services to SME's and to citizens. With this in mind exploratory discussions on joint network developments have already been held between MKC Officers and representatives of Bedfordshire CC.

The MKC I.T service have over many months, actively researched the requirement, assessed the business case issues, examined the technology and seen the potential for the extended use of affordable wireless broadband services in MK. The projects proposed, approach and implementation plans are described in the following section.

### **3. Project Description, Methods/Approach and Implementation Plans**

#### Aims:

To pilot and prove the implementation of a wireless broadband internet service for around 200 to 300 subscribers across the Milton Keynes area. The pilot(s) will run for at least 4 months. We aim to provide quality broadband internet access services with varying bandwidths (speeds), typically from 512kb up to 6mb.

During the pilot period consultant services will be used to assess the operational and commercial effectiveness of the service and to assess the demand for broadband (and the technology opportunities) across MK and surrounding areas.

If the pilots are successful (and the analysis proves the case outlined in this project proposal for a wide scale roll out of wireless broadband services) then the services will be implemented across the whole Milton Keynes area.

#### Methods and Approach:

Suitable transmission hub equipment will be installed in locations within the Milton Keynes area. Initially three locations have been investigated and other sites are being followed up. These are, The Cable and Wireless Tower at Linford Wood, Mellish Court in Bletchley and The Gables in Wolverton. Development Control and Planning issues are still being considered with regard to these sites and there is a temporary moratorium on developments affecting Mellish Court and the Gables. However, we understand that equipment can be installed using the Cable and Wireless Tower and will not require special planning permission.

Interested citizens and SME's will be invited to take part in the trial by the Council and by the selected implementation partner(s). Notice of the trial will be posted on the Council pages on MK Web. To further stimulate interest an advertisement may be placed in the local press. It will be a specific requirement for citizens taking part in the pilot to make themselves available at agreed times for the fitting of equipment at their premises.

Low rental charges may be made for citizens or SME's participating in the pilot (with no charges anticipated for the first month or so of the pilot). Customer premises equipment (CPE) with an estimated value of £58,000 including fitting charges will need to be installed, preferably without charge to citizens during the pilot period.

The final transmission points selected will require access to 'backhaul fibre' providing suitable capacity for access out into the internet.

A Council tender to select preferred partners (or consortium of partners) will be run in the coming weeks. The tender specification will hold open the option that the Council may run more than one pilot with different partners if there is sufficient interest.

A tender selection process will also be run for the broadband aggregation consultancy services, chiefly obtained via SCAT but also permitting one or two other specialist consultancies known to the Council to compete for this work (eg RJA Associates).

A collaborative working (partnership) approach is planned for the wireless broadband project. The broadband aggregation consultants and partners will be asked to work with the Council and will contribute expertise to undertake a range of tasks as outlined in the following task list;

Tasks:

- equipment and implementation expertise,
- assessments of equipment configurations,
- signal and line of sight planning,
- coordination of equipment installation (CPE),
- equipment installation and configuration (central sector antennae, router(s), backhaul etc)
- help and technical support services,
- market and commercial assessment services\*,
- legal services (governing risks etc)\*,
- Financial and business case analysis\*
- Demand assessments and service promotion\*

\*Consultancy assistance provided for these areas under the Broadband Aggregation Consultancy.

The Council will appoint a project manager who will work on the project for at least 2.5days per week for the entirety of the pilot phase and the Council's Head of I.T will maintain close oversight and coordination on the entire project.

The customers participating in the pilot phase will be asked to keep logs and records designed to assist in evaluating the success of the pilot and the effectiveness of the service created.

Success Criteria

Success criteria will be established for each service and project. Examples follow:

- Ease of customer equipment installation – typically should be achieved within 2.5 hours for an average installation. The target will be to achieve 50 CPE installs within a week and to complete the full CPE installs within 5 weeks.
- The service transmitted (network transmission only) must be available for at least 99.9% of the total time in the pilot period.
- Extent of and duration of support calls; no call should last longer than 15 minutes and each customer should generate less than 3 calls over the pilot period (maximum of 600 calls in total for the whole pilot period).
- Customer satisfaction with the service will be surveyed. Satisfaction levels must be scored out of 6 (1 poor up to 6 for very good). Eighty percent or more of customers must rate the service as either a 5 or 6.
- Customers will be surveyed on how much they value the service and their reactions to commercial propositions and service pricing will be tested. A successful outcome will be where customers state they are willing to pay at least £25 per month for the service.

The broadband demand aggregation consultants appointed will undertake work to assist in assessing whether the above stated success criteria have been achieved. The task list previously shown identifies generic work areas. This will form part of the overall consultancy support package envisaged which will also tackle the following main work areas,

1. providing advice input to the creation of a web based campaign (on MK Web) for broadband demand aggregation. The web based facility is anticipated to be similar to the 'campaign' created and run for the East of England Economic Development Agency.
2. providing assessments of the wireless broadband services delivered via the pilot,

3. undertaking an examination of the broadband telecommunications market sector within the MK area and assessing the commercial potential for wireless broadband (taking account of demand factors, financial factors and other relevant issues including supplier assessments and technological assessments),
4. providing an element of project support (general advice and guidance) for the wireless pilot project.

#### Assessment of Contribution of Partners

Until the tender phase is complete we cannot completely determine the respective contributions of the parties involved in the project. However, we have sought to provide a basic outline of the anticipated split including the respective 'resource/financial contributions' in the table following,

<b>Outline Project Contribution Planning Table</b>				
<b>Item/Activity Area</b>	<b>Council</b>	<b>Wireless Broadband Pilot Partner</b>	<b>Broadband Demand Aggregation Consultants</b>	<b>Financial and Resource Commitment</b>
Initial project planning, identification of sites for transmission equipment, consultations on planning issues, line of sight/signal planning etc	40%	50%	10%	£15K Time Commitments from each partner. Split 40/50/10
Supply and installation of transmission equipment, antennae, router(s), etc	Nil	100%	Nil	£20K <sup>Note 1</sup>
Provision of Backhaul Services and Equipment	Nil	100%	Nil	£4K <sup>Note 2</sup>
Supply of CPE	Nil	100%	Nil	£40K <sup>Note 3</sup>
Installation of CPE	100%	Nil	Nil	£18K <sup>Note 4</sup>
Gathering details of interested subscribers to use the services in the pilot phase and organising their sign-up including overseeing all arrangements for CPE installs	50%	Nil	50%	Time commitments at £10K split 50/50
Providing technical support and subscriber help	Nil	100%	Nil	£2K
Undertaking any subscriber billing (all income goes to Broadband Pilot Partner in Pilot Phase)	Nil	100%	Nil	£5K <sup>Note 5</sup>
Creating Assessment Processes for Success Evaluation; survey design etc	30%	Nil	70%	Time Commitments at £10K split 70/30 60% will be MK Web resources. £14K Split 10/30/60.
Design and creation of Broadband Demand Campaign on MK Web	10%	Nil	30%	
Market Assessment (task 3)	10%	20%	70%	£15k split 10/20/70
General Project Support and Management	50%	20%	30%	£15K split 50/20/30
Legal Assessments and inputs	60%	30%	10%	£15K split 60/30/10

Table Notes:

1. Transmission Antennae and router assumed to cost around £60k when purchased outright. Costs reduced to reflect a four month trial period and no permanent use commitment.
2. Assumption made of 10MB backhaul provision charged at £100 per MB per month.
3. Cost of CPE is assumed as £200 (includes cable modem and receiving dish). For 200 'subscribers' the cost is £40k. Due to costs of equipment recovery action, full capital cost is assumed to apply.
4. Installation costs are assumed to be £90 (including any local wiring) for each location where CPE is installed. 200 installations assumed.
5. The likelihood of actual billing has not been properly ascertained. From outline assessments it is anticipated that around £15k income could be billed.

The overall analysis of the split of contributions is

Council: £51.4k. In practice the Council will incur external expenditure of £25k and commit existing staff time for its other commitments.

Broadband

Partner: £109k. It is anticipated that the partner may have equipment that can be loaned for use in the pilot so will actually incur only minimal new external expenditure.

Demand

Aggregation

Consultants: £34.2 assessed from the table in terms of the likely time commitments. The Council will restrict this to the value of the SEEDA grant of £30k.

#### 4. Project Plan

An initial outline project plan has been created showing an example work breakdown structure. Resources have not yet been applied or the tasks properly sequenced or linked. This outline is attached at Appendix 1.

#### 5. Future Funding Requirements and Funding Mechanisms following a Successful Pilot

We have discussed possibilities in this area with SEEDA (Steve Coppins). We anticipate that a challenge with a wide-scale roll out will relate to the cost of the Customer Premise Equipment (CPE) comprising of a cable modem and a receiving dish. The dish is assumed to cost £170 and the cable modem £30. Estimates of possible take up of these services in the MK area vary between 5% and 20% of the resident household population. If we assume a higher end take up we (the Council and its partners) may have to fund the cost of 20,000 households using this equipment. Funding the cost of this CPE (infrastructure) equipment will require financial resources not presently available to the Council. However, such equipment provision is ideally suited to a SEEDA financial disbursement that is made to every citizen on an individual basis – but with the authority acting in the role of accountable public sector partner. The transaction process anticipated would involve the authority (or its appointed partner) in obtaining signed take-up commitments (probably a minimum of a 1 year rental commitment) from individual householders and then invoicing the Council for the supply of the equipment. On receipt of the contract and the invoice the Council would pass the required details/copies to SEEDA for issue of appropriate grant to the authority.

#### 6. Benefits and Joined Up Public Sector Working

These projects assume the creation of a new service delivery capability (a new network infrastructure), heralding an enabling ability for the Council (as a user in its own right) to link to other public sector agencies in the MK area – to the police, NHS trusts, fire services, voluntary sector agencies and to schools. Links between this network and the Council's existing wireless broadband network are planned. This will be quite simply achieved and initial technical analysis has been undertaken to verify this. The Council Officers have also held joint discussions with a networking specialist consultant working on behalf of Bedfordshire CC to examine the potential and benefits of linking our two National Grid For Learning (NGFL) networks. We see particular benefit potential in a number of areas. Difficult to reach schools and citizens in villages across both areas will become within reach of a broadband signal opening up accessibility. Costs savings across the two networks are apparent and include the potential for more efficient use of backhaul services.

## **7. Conclusions**

A wireless broadband pilot in the MK area for around 200 subscribers is proposed together with an associated broadband demand aggregation project. We anticipate both projects will prove highly successful. Initial indications suggest this will be a well received and much wanted service. The Council will not tackle this on its own but will engage with suitable qualified and experienced partners familiar with the technology. A competitive selection and evaluation process will be engaged and probity in all dealings will be observed.

Working cost analyses have been created to assess the requirement and the final total investment needed in relation to a wide-scale roll out will be substantial. However, a substantial and valuable business will be created and major e-government and social inclusion objectives will be facilitated that will place Milton Keynes amongst the foremost e-enabled communities within the UK.

**Steven Jewell**  
**Head of I.T**  
**Milton Keynes Council**  
**28<sup>th</sup> February 2003**

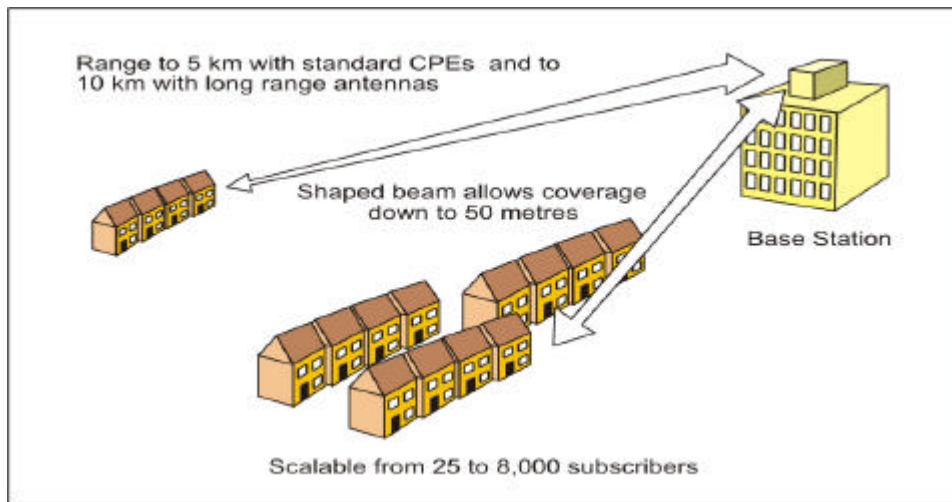
**Appendix 1  
Draft Outline Plan – Work Breakdown Structure**

ID	Task Name	Duration	Start	Finish	03 Mar	
					M	T
1	WIRELESS BROADBAND PILOT AND BROADBAND DEMAND PROJECTS	110 days	Fri 28/02/03	Thu 31/07/03		
2	Obtain Project(s) Approval and Secure Funding	3 days	Fri 07/03/03	Tue 11/03/03		
3	Complete initial analysis	1 day	Wed 05/03/03	Wed 05/03/03		
4	Assign Resources and commit time	2 days	Thu 13/03/03	Fri 14/03/03		
5	Finalise specification of requirements	2 days	Mon 17/03/03	Tue 18/03/03		
6	Issue Tender Documents (both projects)	1 day	Mon 10/03/03	Mon 10/03/03		
7	Place advertisements/put information onto MK Web	1 day	Fri 25/04/03	Fri 25/04/03		
8	Evaluate Tenders (both projects)	3 days	Fri 28/03/03	Tue 01/04/03		
9	Select Preferred Partners	2 days	Thu 06/03/03	Fri 07/03/03		
10	Plan project Meetings with Selected Partners	1 day	Mon 07/04/03	Mon 07/04/03		
11	Place Orders and Initiate Works	1 day	Tue 08/04/03	Tue 08/04/03		
12	Coordinate with Partners and Check Installations	5 days	Fri 11/04/03	Thu 17/04/03		
13	Check CPE installs	10 days	Mon 21/04/03	Fri 02/05/03		
14	Liase with Consultants and partners assessing satisfaction ratings	110 days	Fri 28/02/03	Thu 31/07/03		
15	Liase with SEEDA representatives	110 days	Fri 28/02/03	Thu 31/07/03		
16	Undertake commercial and legal assessments (BB Demand Project)	50 days	Mon 10/03/03	Fri 16/05/03		
17	Finalise Pilot Assessments	3 days	Fri 18/07/03	Tue 22/07/03		
18	Agree Roll Out Plans for MK Area	3 days	Mon 14/07/03	Wed 16/07/03		

**APPENDIX 2**  
**(Material Reproduced with Permission of Ogier Electronics)**

**Simple Outline of Typical System Configuration**

A typical system comprises a base station and a number of subscriber Customer Premises Equipments (CPEs). The design results in a number of benefits which simplify the deployment and eases the installation, both at the base station and at the customer premises. A complete base station to be installed and commissioned in a day or two. A CPE to be installed and operational in a few hours.



**Backhaul**

A large bandwidth internet connection (backhaul) needs to be available to at least one base station. This can be direct from a fibre network or via a wireless point to point spur. All the common WAN/LAN standards can be supported including ATM and fast ethernet. The simplest configuration uses IP to avoid the need for any protocol conversion.

**Repeaters**

Only in exceptional circumstances will there be a line of sight from each base station to all the subscribers. Even if the terrain is flat, buildings and trees can obscure the signal. Typically there is a 60 to 70% probability of a line of sight to any subscriber.

Simple repeaters, which relay the signals between the base station and the subscribers overcomes this problem. They can also extend the coverage of the base station by 50% or more. The repeater receives the transmissions from the base station and frequency converts them to another in-band channel.

**Emissions**

There is no radiation hazard to subscribers. The power leakage from the unit is typically 200,000 times lower than the power densities specified for mobile phones. Even in the worst, case they are some 2,000 times lower than the new most stringent safety specifications.