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THE POTENTIAL USE OF CELLULAR PHONE TECHNOLOGY IN MAINTAINING AN UP-TO-DATE REGISTER OF LAND TRANSACTIONS FOR THE URBAN POOR

JF Whittal*

1 Introduction

This article proposes the use of cell-phone technology as a step towards a pro-poor and scalable solution to the problem of formal land parcels being transferred informally and hence off the formal property register. This is an increasing problem in South Africa, especially with properties previously granted through social housing programmes since the demise of apartheid in 1994 (RDP houses).

The concept is premised on a multi-stage process which presumes formal registration as a starting point, followed by a cell-phone-based alert system to communicate that a transfer has taken place, to be followed up by a further process of formal registration in accordance with the legal processes of land transfer. This article reflects a preliminary investigation into the problem of informal transfers, the possibility of using technology to address the problem, and institutional and professional challenges.

The concepts proposed in this article are of interest to government officials dealing with land and housing, CBOs and NGOs involved in land tenure issues, and the cadastral and conveyancing professional and research communities.

The proposals are interesting since they are aligned with the grand narratives of good governance, sustainable development, and the need for pro-poor and scalable solutions to urban land access and land tenure.¹ The proposed concept is innovative in that most electronic governance (e-governance) solutions involving registration are internet based, while the use of cell-phone technology is emerging as a tool in

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¹ United Nations 2006 www.gltm.net 4.

other disciplines such as banking. Public participation and e-democracy can be greatly enhanced by using the technology already in the hands of individuals, especially the poor.

2 Method

This article, being a concept contribution with the aim of exploring the use of personally-held technology in land administration, begins by investigating the background behind the need for the innovative use of technology for the formal registration of land. It then links the concept of electronic interaction and formal government systems to established theoretical research frameworks. The strides made internationally in e-governance and using technology to advance public participation in land administration processes are then highlighted. Possible impediments to implementation are identified and the next steps in developing the concept are formulated.

This article relies mostly on secondary data sources such as published papers, research reports, reports in the popular press and web pages. A further stage of research will incorporate interviews with key informers such as the registrar of deeds, researchers from Urban Landmark and the African Centre for Cities, and the conveyancing profession. The conclusions of this article are restricted to the concept rather than practical implementation of using cell-phone technology in the property registration process. It is acknowledged that the general use of such a system would require an incentive for the user and may be influenced by a variety of non-technical factors.

3 Background

3.1 *Social housing and property sales*

In South Africa, mass delivery of land for housing has been undertaken since the demise of apartheid in 1994.² These housing projects are linked to freehold land

² Lodge *Mandela to Mbeki* 57.

ownership for which there is a moratorium on transfer for a number of years after the date of the original grant (referred to as a pre-emptive clause). However, the value of property as a tradable commodity is often realised, as the poor need access to finance for burials, family rites of passage, and to cover the general cost of living.³ This has resulted in properties changing hands, sometimes without legal transfer.⁴

3.2 Formal and legal transfer processes

Legal and formal transfer processes in South Africa generally involve an estate agent to provide the connection between the buyer and seller and to negotiate, compile and manage the signing of an offer to purchase. The purchaser makes applications to banks for a mortgage loan. The ability of the seller to alienate the land is achieved through the engagement of the services of a conveyancer who draws up a deed of transfer. Rates clearance must be obtained from the municipality. The purchaser pays state transfer duty, and transfer of ownership is undertaken through the registrar of deeds signing the deed of transfer. The transfer of accounts such as local authority property tax, municipal services, fixed telephone lines etc. is the burden of the purchaser, as are other arrangements and the costs of moving.

3.3 Extra legal and informal transfer processes

Extra-legal and in many ways informal transfers generally follow a more socially mediated route involving fewer agents and professionals.⁵ The buyer and the seller may already know each other, may be part of the same family, or may make a connection using social networks. The local municipal officials and councillors play a role, as does information shared at local meetings.⁶ The sale price is negotiated personally and the social nature of the negotiation can affect the ability of the seller to make a profit.⁷ A further aspect of pricing is if the seller acquired the house and land free and if s/he invested in the property through improvements.⁸ The purchaser

³ Ashton 2010 allafrica.com 1.

⁴ Barry 2006 Habitat International 639.

⁵ Marx 2007 www.urbanlandmark.org.za 169, 174.

⁶ Marx 2007 www.urbanlandmark.org.za 163.

⁷ Marx 2007 www.urbanlandmark.org.za 36.

⁸ Marx 2007 www.urbanlandmark.org.za 36.

is vetted by social structures in the community and the transaction is approved. Money changes hands and the buyer and seller visit the municipal housing office or the police station where an affidavit of the sale is drawn up and witnessed (often by a local councillor or the police).⁹ The buyer is provided with a receipt/document/letter (in at least 33% of the cases).¹⁰ At times, only a verbal agreement of sale is made between the buyer and seller, and in some instances the physical title deed changes hands (about 16% of the cases in Delft and Manenberg).¹¹ Not surprisingly, municipal officials and police are involved in dispute resolution.¹² Outstanding municipal service charges are paid for out of the sale and thereafter these accounts are moved to the name of the new owner. Generally there is no fixed telephone line, and moving costs are kept to a minimum through the help of family and friends. The registered deed remains in the name of the previous owner. Although government officials (municipal officials and police) may participate in the process of land transfer at local level, relevant provincial and national government offices are not aware of the sale. Currently, there is no mechanism to alert the registrar of deeds as to the sale and no mechanism to compile or process a deed of transfer.

3.4 Aspects of formality in off-register transfers

A critical aspect of extra-legal transfers is the involvement of the state through local municipal offices or police stations.¹³ These transfers must therefore be considered to be semi-formal.¹⁴ Such an acknowledgement undermines arguments against semi-formal and staged processes of land transfer such as those proposed here.

3.5 Lack of use of formal transfer mechanisms

The poor are not using formal transfer for a variety of reasons. One of the most obvious is the difference between extra-legal and legal transfer processes in the amount of time they take. Extra-legal transfers are conducted over a few days to

⁹ Marx 2007 www.urbanlandmark.org.za 72, 100, 104, 132.

¹⁰ Marx 2007 www.urbanlandmark.org.za 132.

¹¹ Marx 2007 www.urbanlandmark.org.za 39.

¹² Marx 2007 www.urbanlandmark.org.za 134.

¹³ Rubin and Royston 2008 www.urbanlandmark.org.za 31.

¹⁴ Marx 2007 www.urbanlandmark.org.za 134.

weeks,¹⁵ leading to very quick change in possession, while legal transfers can be concluded only after several months. The use of local police, local municipal offices, councillors or community structures to resolve disputes over property rights¹⁶ also points away from the significance of registered title in land ownership disputes. The use of local offices is also far more convenient for the poor, whose housing is generally far from the central business district. Transport costs are minimised by using a local municipal or police office.¹⁷ There is no state transfer duty for properties below R600 000. Deeds Office fees for properties up to R150 000 are R70 only. However, conveyancing fees are roughly R3 500 for a property of value R40 000. The lack of use of formal transfer processes is linked to the time from identification until occupancy, effort and cost.

3.6 Off-register transfers of registered properties

The number of informal transfers of formal properties is largely unquantified, but small-scale research suggests that from those allocated an RDP house, or who bought an RDP house, close to 100% indicate that they do not have title.¹⁸ There is very little interest in holding a title deed,¹⁹ a situation which is exacerbated by the delay in provision of title deeds to those who have been granted houses as part of the government social housing programme.²⁰ The cause for the long delays in providing title deeds is the subject of a proposed investigation by Urban Landmark.²¹ Marx²² found evidence that about 14% of RDP properties were transferred in Delft in Cape Town over a 5 year period. Hence, it can be estimated that the property register is decreasing in accuracy at the rate of about 3% per annum in Delft.

¹⁵ Gordon 2008 www.urbanlandmark.org.za 11.

¹⁶ Marx 2007 www.urbanlandmark.org.za 31, 134, 178-179.

¹⁷ PNC on ISAD (nd) www.png.gov.za 1.

¹⁸ Gordon 2008 www.urbanlandmark.org.za 9.

¹⁹ Marx 2007 www.urbanlandmark.org.za 134.

²⁰ Marx 2007 www.urbanlandmark.org.za 38, 141, 166.

²¹ Urban Landmark 2010 www.urbanlandmark.org.za.

²² Marx 2007 www.urbanlandmark.org.za (i).

3.7 Loss of value

Properties sold off-register generally sell below their value in the formal market, and even below cost.²³ This is of concern since the value of the state investment in the land, dwelling, services and formal grant is therefore 'lost' since the registered land owner and beneficiary of the state housing programme fails to realise the full value of the property. A further issue is the difference between sale prices and the property valuations upon which property rates are calculated. Sale prices for properties transferred off-register are not included in the deeds registries database and are therefore not taken into account in municipal property valuation processes. Perceived property value, based on off-register sales prices in the area, can be much lower than municipal formal-market valuations²⁴ causing confusion and mistrust in the valuation system. The increasing numbers of formal properties now transferred 'off register' exacerbates these effects.

3.8 Policy and practice

Land administrators need to recognise that there is a disjuncture between national policy and local practice. Informality exists alongside and in partnership with formal structures and processes. The individual strategies of survival of the urban poor lead to a messy and non-homogenous approach to access to land. Unitary, formal systems of delivery do not and cannot be forced to service the diverse needs of society. There is ample evidence of a duality of land access in our cities as a result of historical influences on such processes, such as the country's colonial past and apartheid, and their concomitant western approaches to land and housing. Such systems and processes do not adequately service the poor. This is a challenge for policy makers in land and housing, and there is a move away from a one-size-fits-all approach²⁵ towards rental housing and other forms of delivery, and towards more flexible approaches to land tenure and registration. Innovative approaches to land administration are essential for maintaining complete, correct, and current data about

²³ Cole 2010 www.urbanlandmark.org.za 10.

²⁴ Cole 2010 www.urbanlandmark.org.za 17.

²⁵ Marx 2007 www.urbanlandmark.org.za (iii), 179

land markets, ownership, mobility and land access, which are essential for planning and the sustainable development of South African cities. A pro-poor approach to property transfer is required if the formal deeds register is to maintain its relevance as a primary tool of land administration.

4 Principles of good governance in land administration

Good governance in general is noted by the Secretary-General of the United Nations, Ban, as being critical for democracy.²⁶

...as we all know, infrastructure is not just a matter of roads, schools and power grids. It is equally a question of strengthening democratic governance and the rule of law. Without accountability, not only of the government to its people but of the people to each other, there is no hope for a viable democratic State.

The principles of good governance are interpreted as including

equity, participation, pluralism, transparency, accountability and the rule of law, [and these are to be implemented] in a manner that is effective, efficient and enduring.²⁷

Furthermore,

Democratic governance advances development, by bringing its energies to bear on such tasks as eradicating poverty, protecting the environment, ensuring gender equality, and providing for sustainable livelihoods. It ensures that civil society plays an active role in setting priorities and making the needs of the most vulnerable people in society known.²⁸

These general principles of good governance underpin those in land administration. These should guide all interventions, including innovative approaches. The FIG Statement on the Cadastre²⁹ is considered a standard set of goals for good governance in cadastral development. It identifies a number of key ingredients for a successful juridical cadastre and has been extended to include the fiscal cadastre in Whittal³⁰ with reference to McMaster,³¹ Bahl and Linn,³² Eckert, Gloudemans and

²⁶ Ban 2009 www.un.org 1.

²⁷ United Nations (nd) www.un.org 1.

²⁸ United Nations (nd) www.un.org 1.

²⁹ FIG 1995 www.fig.net.

³⁰ Whittal 2008 www.ucalgary.ca 49-51

³¹ McMaster Urban Financial Management 44-47.

Almy³³ and McCluskey and Williams.³⁴ The inclusive list of good governance goals is as follows:

4.1.1 *Security*

The cadastre should be "tamper-proof" and free from corruptive adaptation; the correctness of data is essential for efficiency and effectiveness; backup systems should be in place to ensure data is not lost.

4.1.2 *Clarity and simplicity*

The general public should understand the system used; principles underlying the supporting legislation should be meaningful to the general public and simple, lean processes should be put in place; public relations should be actively pursued; simplicity is linked to reduced costs and fair access to information.

4.1.3 *Timeliness*

The information should be up-to-date and complete; information should be available in a timely manner on request.

4.1.4 *Fairness/equity*

Objectivity is important; equitable access should be possible by all, 'in development and in operation of the system should be both fair and perceived to be fair'.³⁵

4.1.5 *Accessibility*

Within the constraints of cultural sensitivities, legal and privacy issues, the system should be capable of providing efficient and effective access to all users.³⁶

³² Bahl and Linn *Urban Public Finance* 470-480.

³³ Eckert, Gloudemans and Almy (eds) *Property Appraisal* 21-29.

³⁴ McCluskey and Williams "Introduction" 3-4.

³⁵ FIG 1995 www.fig.net s 6.1.

4.1.6 *Cost*

Cost-effective and low-cost solutions are required; adequate budget allocations are essential; cost is linked to equity and accessibility.

4.1.7 *Sustainability*

Maintenance of the system is essential - organisation, management, procedures, technologies, education levels and professional competence need to be adequate.

4.1.8 *Transparency*

Principles, policies and processes should be available to all for information and interrogation; proactive communication is required.

4.1.9 *Efficiency and effectiveness*

Efficient and effective cadastres are key to investment, economic efficiency and production, export/trade and economic growth, poverty alleviation, and income generation through property taxation.³⁷

4.1.10 *Completeness and inclusivity*

Data completeness and currency is essential.

4.1.11 *Empowerment*

Knowledge and skills should be transferred to affected and interested persons; communication and transparency are linked to empowerment.

³⁶ FIG 1995 www.fig.net s 6.1.

³⁷ Hendrix and Logan 1996 *Geomatica* 59.

4.1.12 Use of world-class technology

Electronic technology and modern tools/techniques should be employed effectively.

4.1.13 Adherence to international standards

The use of effective internal controls: internal and external audits are important and provide feedback which is essential for adaptation to an often changing and complex organisational and external environment.

4.1.14 Maintenance of capacity and capacity building

This includes effective staff training, the recruitment of competent staff and staff redeployment.

4.1.15 Legality

The legal framework should reflect good governance principles and underpin their delivery.

4.1.16 Local

There should be local input to and local benefits from the system.

These goals illustrate a diverse range of principles which span the material/technical, social and personal aspects of a socio-technical system. Although these are framed as ideals rather than achievable objectives, they should guide and inform the development of land administration initiatives such as those proposed in this article with reference to the use of cell-phone technology to improve the land administration system.

5 Theoretical framework for e-governance

A move to e-governance is the primary policy framework through which the exploitation of technology by governments is argued. E-governance is a subset of electronic commerce (e-commerce) and is influenced primarily by the new public management (NPM) ideals and objectives of streamlining government, customer focus and cost-effectiveness as well as by the more general goals of good governance: efficiency, accountability, participation and equity.³⁸ E-governance is understood to include the functions of e-government, e-regulation, and e-democracy.³⁹ E-governance is about the use of information and communications technology (ICT) as a tool⁴⁰ to reform government processes and to achieve broad societal goals. The use of ICTs is thus largely positivist and follows an instrumental approach.⁴¹

However, the use of ICTs should not be seen as deterministic - they are not always successful in delivering on their goals.⁴² A complex mix of social, political and economic issues influences the use of ICTs, and their adoption can result in unintended consequences.⁴³ In particular, the use of ICTs in the developing world needs to take place in the context of local culture and should be designed to operate in a culturally-sensitive manner. Culture should also be recognised as constantly changing.⁴⁴ The integration of local knowledge with scientific knowledge is important in realising successful use.⁴⁵ Local meanings, existing practices, institutional contexts, and socio-technical changes over time need to be included, particularly when developing pro-poor and gendered tools in the developing world.⁴⁶ In the light of the above, a critical realist perspective should inform the development of a cell-phone-based land administration tool since this allows for a mix of positivist and

³⁸ Sangita and Dash 2005 www.isec.ac.in 2.

³⁹ Finger and Pécoud 2003 *Electronic Journal of e-Government* 5.

⁴⁰ Sangita and Dash 2005 www.isec.ac.in 2.

⁴¹ Whittal and Barry "Theoretical Approaches" 3.

⁴² Whittal 2008 www.ucalgary.ca 83-84.

⁴³ Walsham, Robey and Sahay 2007 *MIS Quarterly* 322.

⁴⁴ Walsham, Robey and Sahay 2007 *MIS Quarterly* 319.

⁴⁵ Puri 2007 *MIS Quarterly* 373.

⁴⁶ Walsham, Robey and Sahay 2007 *MIS Quarterly* 322.

interpretive approaches and supports the use of mixed methods.⁴⁷ A social systems approach to design allows for the inclusion of organisational, political, social, economic and technological aspects to be included.⁴⁸

Research on e-governance and the use of ICTs is sparse, while investigation into the use of specific technologies (except for GIS) needs to be undertaken.⁴⁹ Gaps in the available research of relevance to this project can be found in the use of open source/free software, addressing society-wide critical issues, gender issues and action research.⁵⁰ Investigations into the use of cell-phone technology in the maintenance of the property register in South Africa could contribute to these areas of knowledge.

E-governance includes interaction between governments and their citizens and business communities (called G2C/C2G or G2N for NGOs, G2B for business), and between different spheres of government (called G2G).⁵¹ The simplest model of e-governance concentrates on one-way communication of information from the government to the citizenry, and is not interactive. More complicated models allow for interactive engagement with government processes, thus aligning the system to the goal of public participation, inclusivity and e-democracy.

The principles of development of a system using cell-phones to improve land administration are broadly in line with the Millennium Development Goals (MDGs). They are specifically in line with the goals of the UN Habitat's Global Land Tool Network (GLTN) to develop tools of land administration which are pro-poor, scalable, gendered, and based on a human rights framework. In addition, they are in line with the broad goal of sustainable development since the proposed system is geared to maintain and sustain a formal system of land administration which is linked to sustainable development.⁵²

⁴⁷ Whittal 2008 www.ucalgary.ca 86-94.

⁴⁸ Whittal 2008 www.ucalgary.ca 102.

⁴⁹ Walsham, Robey and Sahay 2007 *MIS Quarterly* 323.

⁵⁰ Walsham, Robey and Sahay 2007 *MIS Quarterly* 323-324.

⁵¹ Sangita and Dash 2005 www.isec.ac.in 2-3.

⁵² Williamson et al *Land Administration* 84-86.

6 E-governance in South Africa

Growth in e-commerce is promoted internationally through policy (eg by the OECD, UN, WTO) and legislation and includes e-education, e-medicine, e-transport, e-police, e-court and many other areas of application. E-banking is now well accepted in South Africa and mobile/cell banking (called m-banking) is on the increase with a system such as WIZZIT,⁵³ which uses SMS to offer many banking services to those who have cell-phones but do not access banks. These private-sector initiatives demonstrate the usefulness of technology in extending services, but they are not government driven and so are not seen as e-governance initiatives. In India, e-governance using the internet and cell-phone/mobile phone technology (m-governance, which is a subset of e-governance) is on the increase,⁵⁴ driven by technological innovation and by the principles of good governance.⁵⁵ E-governance in South Africa is limited mostly to desk-top computer access to the internet and web-page-based interfaces (eg the e-Filing online tax collection system and the e-NaTIS motor vehicle registration, driver licensing and vehicle fine system).

In South Africa, e-governance is highlighted by national legislation in the *Electronic Communications and Transactions Act 25 of 2002* (hereafter the *ECT Act*).⁵⁶ This follows the principles outlined in the *Green Paper on Electronic Commerce for South Africa* of November 2002. Pro-poor access to ICT is highlighted in the Act, and e-government services are the subject of Chapter IV. This is followed by the e-Mzansi Information Society and Development Plan, a government IT/IS policy, which was adopted in 2007. Ten pillars are identified as key drivers for economic transformation to an information based knowledge economy.⁵⁷ This plan is focussed on five priority focus areas: education, skills development and training, e-health, government service delivery, ICT and SMME development, and local content development. Of relevance to this article are the ideals of universal access and inclusivity as well as G2G transformation through realignment and IT.⁵⁸ These objectives are mirrored in

⁵³ Ivatury and Pickens 2006 www.cgap.org 1.

⁵⁴ Sangita and Dash 2005 www.isec.ac.in 1.

⁵⁵ Singh 2005 *Electronic Library* 684, 685.

⁵⁶ Chapter IV *Electronic Communications and Transactions Act 25 of 2002 (ECT Act)*.

⁵⁷ PNC on ISAD 2007 www.pnc.gov.za 21-54.

⁵⁸ PNC on ISAD 2007 www.pnc.gov.za 26-32, 69.

the Department of Communication's medium-term Strategic Plans for 2009-2012⁵⁹ and for 2010-2013.⁶⁰ They also highlight participatory democracy, the creation of an inclusive information society (IIS), G2G and G2C systems, and also G2A and G2W (government to African and government to World) relationships. The Strategic Plan of 2009-2012 has an associated budget of R2.2 billion per annum. This includes only the expenditure of one Department and not others such as the Department of Rural Development and Land Reform (hereafter referred to as the DRDLR). There is a plan to draft an Integrated ICT Policy Framework and associated legislation by the Department of Communications.⁶¹ One of the objectives of this policy framework will be to encourage e-commerce activities and expand ICT infrastructure, linking rural and urban communities as well as uplifting the poor. A key outcome of the Framework will be the proposed integrated national *ECT Act*.

7 E-cadastre projects in South Africa

The DRDLR has concentrated its efforts in e-governance in the arena of intra-governmental information sharing (G2G) and providing information to citizens via the internet (G2C). The functions of the DRDLR of relevance to this article are managed by the Chief Directorates of Cadastral Surveys, Deeds Registration, Surveys and Mapping and Spatial Planning and Information.

The digitisation of both diagrams and deeds and making this information available over the internet falls within the e-cadastre and is managed via the Auto-emailer system of the Offices of the Surveyors-General and the DeedsWeb system of the Offices of the Registrars of Deeds. In addition, the submission of surveyors' diagrams and documents can now be undertaken electronically, while a project to allow electronic conveyancing has begun (e-DRS).⁶²

The Auto-emailer system was established by the Cape Town Office of the Surveyor-General (SGO) and has now been extended to all other SGOs. This system is designed primarily for professional land surveyors but is used by many others. A

⁵⁹ Department of Communications 2009 www.ellipsis.co.za slides 8, 11, 13.

⁶⁰ Department of Communications 2010 www.pnc.gov.za 10-11.

⁶¹ Department of Communications 2009 www.doc.gov.za 50.

⁶² Chief Registrar of Deeds 2009 www.docstoc.com.

Microsoft Excel spreadsheet programme is downloaded to a PC. Completion of a form allows the user to request data in the form of noting sheets, survey diagrams, and surveyors' records by email. These data are then automatically sent to the user as email attachments. This system saves a visit to the SGO and associated travel and parking costs as well as time. Surveyors can now also submit their diagrams and records to the SGO by email in digital form. This is termed e-lodgement.

The e-DRS project has been approved by the deeds registry and will promote a move towards electronic registration of land.⁶³ This e-conveyancing project envisages a process of reform to accommodate the electronic submission of deeds of transfer by registered conveyancers and the electronic processing and approval of documents with the substantial involvement of deeds registry officials and examiners. Already, electronic access to deeds is possible through DeedsWeb/View. This system requires the registration of users and payment for the services rendered, and is not Open Platform, requiring proprietary software in the form of Microsoft Internet Explorer. The proposed e-DRS system is aligned to the *ECT Act*.⁶⁴ However, this Act specifically omits the validity of electronic transactions relating to the alienation of immovable property and to agreements for long-term leases of immovable property for 20 years or more. Both are covered in the *Alienation of Land Act* 68 of 1981.⁶⁵ This article does not propose the formulation of an alternative land registration/transfer mechanism to that conducted through paper deeds, but rather to investigate a system to alert government to extra-legal property transfers. It may well be that, in the course of time and ICT development in SA, these exclusions will be challenged. In order to give effect to the e-DRS, some changes to the *Deeds Registries Act* 47 of 1937⁶⁶ could be required, but the policy document of the e-DRS⁶⁷ does not note any conflict with the *ECT Act*.

The Surveys and Mapping Offices of the DRDLR also have a G2C focus. Maps and associated products can be purchased online, while the surveying community has

⁶³ Chief Registrar of Deeds 2009 www.docstoc.com 1.

⁶⁴ *Electronic Communications and Transactions Act* 25 of 2002.

⁶⁵ *Alienation of Land Act* 68 of 1981.

⁶⁶ *Deeds Registries Act* 47 of 1937.

⁶⁷ Chief Registrar of Deeds 2009 www.docstoc.com.

internet access to global positioning system (GPS) data from a national network of control stations.

The Spatial Planning and Information Directorate of the DRDLR is concerned mainly with electronic data storage and access and manages the National Spatial Information Framework (NSIF) governed by the *Spatial Data Infrastructure Act 54 of 2003*.⁶⁸ Its aim is to co-ordinate the development of the infrastructure needed to support the utilisation of spatial information in decision making. The NSIF supports e-governance since it promotes the use of digital spatial data.

The initiatives of the DRDLR support mainly the surveying and conveyancing professional communities, who are responsible for the maintenance of the juridical cadastre in South Africa, which is a primary aspect of any land administration system.⁶⁹ The other aspects of a land administration system are property taxation (the fiscal cadastre), use control/management and development planning (the regulatory cadastre). Administration of the juridical cadastre is a national government function, while administration of the fiscal and regulatory cadastres is mainly a local government function in South Africa. A general comment on the G2C products currently on offer by the DRDLR is that they often require proprietary software in the form of Microsoft products. They are therefore out of alignment with the government's commitment to open access to information and non-proprietary software products.

At the local government level, property valuation and taxation projects such as the General Valuation 2009 of the City of Cape Town (GV2009) use internet based applications which enable property owners to query property data and property valuations, and to submit objections to these. E-governance initiatives in the land-use control/management and development planning areas of land administration systems appear to be limited to G2G initiatives.

⁶⁸ Spatial Data Infrastructure Act 54 of 2003.

⁶⁹ Williamson et al Land Administration 121.

8 E-cadastre projects internationally

Many nations have successfully implemented the digitisation of all their cadastral records, while others are still in the process of reforming systems and structures. The most advanced e-cadastre projects are those which involve e-conveyancing with its associated problems of authentication and e-signatures, legal compatibility, and data synchronisation. The United Kingdom *Land Registration Act* of 2002 and the Province of Ontario Land Registration and Information System (POLARIS) are directed at e-conveyancing.⁷⁰ Some of the nations which have implemented e-cadastres are the Netherlands (Kadastre-on-line), New Zealand (LINZ) and Denmark. However, most of the advanced e-cadastre initiatives are to be found in developed nations. A novel project is the European Land Information Service (EULIS). This intends to create a European land information system to provide information to clients (G2C) across national boundaries and thus to stimulate foreign investment in land.⁷¹

8.1 India

India is at the forefront of the use of technology for e-cadastres and Indian experiences are highly relevant to South Africa since South Africa has recently been invited to join the Brazil, Russia, India, China (and South Africa) (BRIC(S)) economic group. The Indian government's SMART policy - simple, moral, accountable, responsible, and transparent governance - is behind the drive for e-governance, which is seen as the primary tool of policy implementation. IT policy in India drives the access to IT of all Indians, while the *Information Act*, 2002, secures each citizen's right to information.⁷² In one year alone about R ½ billion (Rs 3 billion) was spent on e-governance initiatives.⁷³ In Andhra Pradesh and Kerala⁷⁴ the computer-aided registration department (CARD) project provides computerised registration of all immovable property transactions, while a Multi-Purpose Household Survey project in

⁷⁰ Sandberg 2009 www.fig.net 4-6.

⁷¹ Sandberg 2009 www.fig.net 6.

⁷² Sangita and Dash 2005 www.isec.ac.in 3.

⁷³ Singh 2005 *Electronic Library* 685.

⁷⁴ Singh 2005 *Electronic Library* 687-688.

Andhra Pradesh keeps the data of all residents and the land records.⁷⁵ In Karnataka, known as Kaveri, there is a project to speed up the registration of land.⁷⁶ In Bhoomi, another project maintains land records and provides a kiosk-based ICT system through which local residents can obtain land records along with ownership and crop details.⁷⁷ In Madhya Pradesh the Gyandoot project is also kiosk based and is run by local unemployed youth trained to assist the public in acquiring many land-related data such as copies of land records.⁷⁸ These projects have reduced corruption, reduced the time taken to obtain data, and most importantly, are servicing more citizens, especially in the rural areas.

9 E-governance and pro-poor approaches in South Africa

Not all of the e-governance initiatives in South Africa are pro-poor since there are many barriers to the use of the technology, including a lack of access, knowledge and trust, and the prevalence of unequal social/power relationships. Some strides have been made in providing access to desktop computing through local libraries. The SmartCape team developed this facility, which now services 170 000 registered users. Most have no home/office internet access but now have access to the internet through at least 97 public libraries in Cape Town. The SmartCape team has also worked on similar projects in the metropolitan municipalities of eThekweni and Nelson Mandela, and has been approached by the City of Johannesburg to extend the model into their areas.⁷⁹

10 Cell/mobile phones for m-governance

m-Governance can be defined as

the strategy and its implementation involving the utilisation of all kinds of wireless and mobile technology, services, applications and devices for improving benefits to the parties involved in e-government including citizens, businesses and all government units.⁸⁰

⁷⁵ Sangita and Dash 2005 www.isec.ac.in 6-7.

⁷⁶ Sangita and Dash 2005 www.isec.ac.in 7.

⁷⁷ Sangita and Dash 2005 www.isec.ac.in 7.

⁷⁸ Sangita and Dash 2005 www.isec.ac.in 8-9.

⁷⁹ SmartCape 2009 www.smartcape.org.za History page.

⁸⁰ Kushchu and Kuscu 2003 www.mgovernment.org 3.

Mobile technology offers a new channel for governments to communicate with, deliver services to, and interact with citizens. There are general limitations such as the volume of information which can be transferred using mobile devices,⁸¹ but these are outweighed by the advantages of speed, scale and accessibility. A particular advantage of m-governance in developing countries is the transfer of critical information.⁸²

10.1 Access to cell-phone technology by the poor

Cell-phone technology is known to permeate poverty and by 2006 mobile phones had more users in developing countries than in developed ones.⁸³ By October 2009, it was estimated that cell-phone ownership amongst poor Africans was 48% - eight times the level of penetration estimated in 2000.⁸⁴ South Africa has a rate of cell-phone uptake by the poor (determined by residential area) of about 29-36%.⁸⁵ Many owners of formal properties in poor areas probably have access to a cell-phone via their family or social networks. Secure cell-phone booths in modified shipping containers provide cell-phone access to 80% of the poor⁸⁶ and also provide a cheaper call rate. The Short Message Service (SMS) communication is the cheapest form of communication and is used extensively.⁸⁷ Another form of communication which scores high on the pro-poor rating is the use of free "please call me" services offered by cell-phone providers.⁸⁸ These are essentially alerts and offer many possibilities in terms of alerts linked to e-governance.

10.2 How the SA poor use cell-phones

The use of cell-phones by the South African poor is largely socially driven. It serves the purpose of communication with distant relatives, and managing risk and

⁸¹ Ghyasi and Kushchu 2004 www.mgovernment.org 3.

⁸² Ghyasi and Kushchu 2004 www.mgovernment.org 3.

⁸³ Ivatury and Pickens 2006 www.cgap.org 1.

⁸⁴ Smith 2009 www.guardian.co.uk 1.

⁸⁵ Skuse and Cousins 2008 *New Media and Society* 16.

⁸⁶ Skuse and Cousins 2008 *New Media and Society* 16.

⁸⁷ Skuse and Cousins 2008 *New Media and Society* 17.

⁸⁸ Skuse and Cousins 2008 *New Media and Society* 17.

vulnerability. Women make 68% of the calls.⁸⁹ The phone also plays an important role as a reference to "self" for people who cannot make reference to formal postal addresses or telephone numbers on official forms, and for business communication.⁹⁰ There is also evidence of the use of cell-phones to gain access to land and housing.⁹¹ In poor areas, access to land and housing is often socially mediated. In other words, knowledge about available property and negotiations to purchase are accomplished through friends, friends of friends, or family members.⁹² Existing methods of gaining access to land are thus in line with the current use of cell-phone technology by poor South Africans. However, the use of cell-phones for interactive communication via the internet is limited. Even those with cell-phones capable of internet access do not always use them for this purpose due to a lack of knowledge⁹³ and probably also due to the cost.

10.3 m-governance in SA

The Presidential National Commission (PNC) has a policy of moving towards e-governance including the use of mobile technology.⁹⁴ The implementation of an efficient and effective government service is noted as a challenge which m-governance could begin to address. The minimal use of cell-phones by government is an opportunity for development, but there are some challenges⁹⁵. These are given below.

10.3.1 Cost

Government focus is on internet-based e-governance and not m-governance. Access to the internet is not within reach of many poor people.

⁸⁹ Skuse and Cousins 2008 *New Media and Society* 18.

⁹⁰ Skuse and Cousins 2008 *New Media and Society* 17.

⁹¹ Skuse and Cousins 2008 *New Media and Society* 23.

⁹² Smit 2008 www.urbanlandmark.org.za 65.

⁹³ Gitau, Donner and Marsden "i-Internet" 4.

⁹⁴ Department of Communications 2011 www.pnc.gov.za 1.

⁹⁵ PNC on ISAD (nd) www.pnc.gov.za 2.

10.3.2 Digital divide

The digital divide refers to inequalities in access to technology, including cell-phones.

10.3.3 Mobile mindsets

Cell-phones are used mainly for social purposes and cognitive changes will be required for users to understand the technology as a tool for business.

10.3.4 Trust/security

Trust refers to the perception of the citizenry as to the reliability/accuracy etc. of a system, whereas security refers to the ability of the system to prevent fraud, corruption etc.

10.3.5 Data overload

Data overload refers to a citizenry which is overloaded with information and hence is reluctant to engage with more information emanating from government.

Despite the challenges, current projects in South Africa using cell-phones span the range of G2C and C2G. G2C systems include the notification system of the Department of Home Affairs and the matriculation notification system of the Department of Education, both of which use SMS. C2G systems include the City of Johannesburg's traffic fine system, which deals with queries as to traffic fines etc. delivered by SMS. The information required is in the identity (ID) number of the person making the enquiry.⁹⁶ A similar service has been used by the Independent Electoral Commission for citizens to query if they are on the voters' roll. Data capture by cell-phone has been successfully implemented in a water monitoring system which enables the monitoring of rural borehole water quality using local operators⁹⁷

⁹⁶ PNC on ISAD (nd) www.pnc.gov.za 3.

⁹⁷ Loudon *et al* 2009 www.ukinit.org 48.

and also in a system to monitor the use of HIV/AIDS medications by citizens.⁹⁸ The last two systems adhere to Open Systems design principles and can be implemented and extended for other purposes without purchase cost.

11 Proposal for cell-phone alerts for off-register property transactions

This article has highlighted the need for a pro-poor and scalable tool for alerting the government of South Africa to the many cases of informal 'off-register' transfers in registered properties. It is apparent that meeting the needs of the poor in terms of poverty reduction, reducing vulnerability, empowerment, and education should be in part delivered with the assistance of ICTs. Initiatives which encourage public participation in government processes strengthen democracy and enhance a citizen's sense of belonging in a society which, for the poor, is especially alienating. This is evidenced by the reluctance of the poor to make use of the formal processes of land transfer.

The proposal, at this stage, is in concept form. It will require a great deal of work and engagement with role-players prior to a pilot study and implementation. Design and implementation should be undertaken with the understanding that interventions of this nature are subject to many varied and unpredictable factors.

11.1 First stage

Included in the first stage is a public information campaign. This should focus on the benefits of transferring property using formal title deed registration, and should also provide information on the proposed cell-phone-based property transfer alert system. However, should buyer and seller be unaware of this service, it is likely that current practices of visiting local municipal offices, councillors or police in order to effect property transfer will occur. This will present another opportunity to inform residents intending to transfer property of the value of formal transfer and the alert system. This first stage should also include information to dispel myths relating to property tax on formally transferred properties. The majority of properties in poor areas will

⁹⁸ Rivett and Tapson 2009 International Journal of Community Research and Engagement 86.

not incur additional costs of property tax if they are formally transferred since the property values are below the threshold value (currently R200 000 in Cape Town).

11.2 *Second stage*

Having made contact with a government official (a councillor, a policeman etc.) and/or having received information from an information campaign, the buyer and seller are made aware of the need to transfer the property legally through a deed of transfer. An SMS alert is sent to notify the deeds registry that a sale is under way.

11.3 *Third stage*

There are some options hereafter:

11.3.1 *More costly to the client*

An automatic response by SMS follows the initial alert. Following prompts, the client conveys the required data to the deeds registry via SMS:

- ID numbers of buyer and seller
- Erf number if known
- Street address
- Sale price

OR

11.3.2 *Registrar's cost*

An officer of the deeds registry uses the incoming cell-phone number to contact the buyer/seller using a voice call and requests the above information verbally.

11.4 *Fourth stage*

An officer of the deeds registry uses the incoming cell-phone number to make contact with the parties. Information is requested over the cell-phone, and an

appointment is made to visit the buyer and seller. The parties are instructed as to what information should be obtained for the meeting. At this visit all of the required documentation is collected, the identities of the parties are confirmed, and the transaction is verified.

11.5 Fifth stage

A government-employed or -appointed private conveyancer compiles a deed of transfer and processes the transaction in terms of the *Deeds Registries Act 47 of 1937*.⁹⁹

11.6 Sixth stage

The deed of transfer is sent to the local municipal office or police station for collection, or is sent directly to the purchaser.

11.7 Seventh stage

Performance evaluation is an essential part of implementing ICTs in developing countries. This process provides feedback to improve the processes or structures involved in this aspect of land administration.

11.8 Software

It is proposed that open-source software developed and used by Cell life in its water-quality project be investigated for the purpose of cell-phone alerts as to off-register property transfers off. Initial discussions with developers have been undertaken and there is every indication that the technical aspects of cell-phone alerts and prompted queries for information about the property and the buyer and seller could be easily accomplished. The cost of an SMS borne by the client could be an impediment to use. This is small in comparison to the security of tenure such a system would afford

⁹⁹ *Deeds Registries Act 47 of 1937*.

the client. As long as this is perceived to be of value, use of the system should not be a problem.

12 Social, socio-technical and economic aspects

There is a need to undertake some investigation into the social aspects of off-register property transfer and the proposed use of cell-phone technology as a means to improve the currency of land registration. Socio-technical issues (including gender and technology), drivers of behaviour relating to informal transfers, and economic factors relating to this and to cell-phone use need to be understood prior to implementation of such a project.

13 Legislative and organisational aspects

Legislative impediments to the implementation of cell-phone assisted land registration need to be identified. In addition, government readiness to embrace such a proposal needs to be gauged, as well as the ability and willingness of the conveyancing profession to participate in the conveyancing aspects of the proposed system.

14 Conclusions

This article has presented a proposal to explore the use of cell-phone technology to alert national authorities to unofficial transfers of land in South Africa. This proposal is underpinned by the principles of good governance in land administration and is framed in the context of e-governance and e-cadastres and the enabling government policies which promote such initiatives. It advances a people-based data-collection process and has the potential to empower the poor and enhance e-democracy. Furthermore, the proposal is aligned with the principles of the Global Land Tools Network of the UN Habitat in that, in proposing the use of cell-phone technology, it advocates a solution that permeates poverty, is largely without gender bias, is pro-poor and is scalable. It is recommended that the extent of the problem and whether or not it has a spatial aspect should be assessed, as well as the institutional, legal and professional impediments to implementation.

Bibliography

Bahl and Linn *Urban Public Finance*

Bahl RW and Linn JF *Urban Public Finance in Developing Countries* (Oxford University Press Oxford 1992)

Barry 2006 *Habitat International*

Barry M "Formalising informal land rights: the case of Marconi Beam to Joe Slovo Park" 2006 *Habitat International* 628-644

Eckert, Gloudemans and Almy (eds) *Property Appraisal*

Eckert J, Gloudemans R and Almy R (eds) *Property Appraisal and Assessment Administration* (International Association of Assessing Officers Chicago 1990)

Finger and Pécoud 2003 *Electronic Journal of e-Government*

Finger M and Pécoud G "From e-Government to e-Governance? Towards a model of e-Governance" 2003 *Electronic Journal of e-Government* 1(1) 1-10

Gitau, Donner and Marsden "i-Internet?"

Gitau S, Donner J and Marsden G "i-Internet? Intle' (beautiful): exploring first-time internet use via mobile phones in a South African women's collective" (Unpublished paper delivered at the 3rd International Development Informatics Association Conference Kruger National Park South Africa 28-30 October 2009)

Hendrix and Logan 1996 *Geomatica*

Hendrix SE and Logan RA "Cadastral and property registry modernization: ideas on public-private partnerships" 1996 *Geomatica* 50(1) 59-63

Lodge *Mandela to Mbeki*

Lodge T *Politics in South Africa: From Mandela to Mbeki* 2nd ed (David Philip Cape Town 2003)

McCluskey and Williams "Introduction"

McCluskey WJ and Williams B "Introduction: a comparative evaluation" in McCluskey WJ (ed) *Property Tax: An International Comparative Review* (Ashgate Aldershot 1999) 1-31

McMaster *Urban Financial Management*

McMaster J *Urban Financial Management: A Training Manual* (World Bank New York 1991)

Puri 2007 *MIS Quarterly*

Puri SK "Integrating scientific knowledge with indigenous knowledge" 2007 *MIS Quarterly* 31(2) 355-380

Rivett and Tapson 2009 *International Journal of Community Research and Engagement*

Rivett U and Tapson J "The Cell-Life Project: Converging technologies in the context of HIV/AIDS" 2009 *International Journal of Community Research and Engagement* 2 82-97

Singh 2005 *Electronic Library*

Singh SP "The role of technology in the emergence of the information society in India" 2005 *The Electronic Library* 23(6) 678-690

Skuse and Cousins 2008 *New Media and Society*

Skuse A and Cousins T "Getting connected: the social dynamics of urban telecommunications access and use in Khayelitsha, Cape Town" 2008 *New Media and Society* 10(1) 9-26

Walsham, Robey and Sahay 2007 *MIS Quarterly*

Walsham G, Robey D and Sahay S "Forward: Special Issue on Information Systems in Developing Countries" 2007 *MIS Quarterly* 31(2) 317-326

Whittal and Barry "Theoretical Approaches"

Whittal J and Barry M "Theoretical Approaches to Implementation of Technology for Cadastral Reform" (Unpublished contribution delivered at the *Commonwealth Association for Surveying and Land Economy (CASLE) Conference on Promoting Sustainable Land Management in Africa* in Bagamoyo Tanzania 14-17 March 2006)

Williamson *et al Land Administration*

Williamson I *et al Land Administration for Sustainable Development* (ESRI Press Redlands 2010)

Register of legislation

Alienation of Land Act 68 of 1981

Deeds Registries Act 47 of 1937

Electronic Communications and Transactions Act 25 of 2002

Spatial Data Infrastructure Act 54 of 2003

Register of internet sources

Ashton 2010 allafrica.com

Ashton G 2010 South Africa: houses for all - a concept in crisis allafrica.com/stories/printable/201011251052.html [date of use 9 Jan 2011]

Ban 2009 www.un.org

Ban K 2009 Remarks by the Secretary-General of the United Nations to the Security Council on Timor-Leste www.un.org/en/globalissues/governance/ [date of use 20 Apr 2010]

Chief Registrar of Deeds 2009 www.docstoc.com

Chief Registrar of Deeds 2009 Policy Document on the Electronic Deeds Registration System (e-DRS): Approved by the Chief Registrar of Deeds on 12 June 2009 www.docstoc.com/docs/18585373/Request-for-Proposal [date of use 4 May 2011]

Cole 2010 www.urbanlandmark.org.za

Cole J 2010 The struggle for property ownership in New Crossroads
www.urbanlandmark.org.za/research/x44.php [date of use Jan 2011]

Department of Communications 2011 www.pnc.gov.za

Department of Communications 2011 e-Government Initiative
www.pnc.gov.za/index.php/e-government/e-government-initiative [date of use
Jan 2011]

Department of Communications 2000 www.info.gov.za

Department of Communications 2000 A Green Paper on Electronic
Commerce for South Africa [www.info.gov.za/view/DownloadFileAction?
id=68917](http://www.info.gov.za/view/DownloadFileAction?id=68917) [date of use Jan 2011]

Department of Communications 2009 www.doc.gov.za

Department of Communications 2009 Annual Report 2009-2010
www.doc.gov.za/index.php?option=com_docman&task=cat_view&gid=71&Itemid=543 [date of use Jan 2011]

Department of Communications 2009 www.ellipsis.co.za

Department of Communications 2009 Strategic Plan 2009-2012 Presentation
Slides www.ellipsis.co.za/wp-content/uploads/2009/07/090611stratplan.ppt
[date of use Mar 2010]

Department of Communications 2010 www.pnc.gov.za

Department of Communications 2010 Strategic Plan 2010-2013 [www.pnc.
gov.za/index.php/isad-documents/cat_view/63-isad-documents](http://www.pnc.gov.za/index.php/isad-documents/cat_view/63-isad-documents) [date of use
Jan 2011]

FIG 1995 www.fig.net

FIG 1995 *FIG: Statement on the cadastre* [www.fig.net/commission7/reports
/reports.htm](http://www.fig.net/commission7/reports/reports.htm) [date of use Jul 2007]

Ghyasi and Kushchu 2004 www.mgovernment.org

Ghyasi AF and Kushchu I 2004 m-Government: cases of developing countries
www.mgovernment.org/resurces/mgovlab_afgik.pdf [date of use Jan 2011]

Gordon 2008 www.urbanlandmark.org.za

Gordon R 2008 Review of data on how the poor access, hold and trade land
www.urbanlandmark.org.za/research/x41.php [date of use Jan 2011]

Ivatury and Pickens 2006 www.cgap.org

Ivatury G and Pickens M 2006 *Mobile phone banking and low-income customers: evidence from South Africa* www.cgap.org/p/site/c/template.rc/1.9.2953/ [date of use Feb 2010]

Kushchu and Kuscu 2003 www.mgovernment.org

Kushchu I and Kuscu H 2003 From E-Government to M-Government: Facing the Inevitable www.mgovernment.org/resurces/mgovlab_ikhk.pdf [date of use Jan 2011]

Loudon *et al* 2009 www.ukinit.org

Loudon M *et al* 2009 A 'Human-in-the-Loop' mobile image recognition application for rapid scanning of water quality test results First International Workshop on Expressive Interactions for Sustainability and Empowerment (EISE 2009) 29-30 October 2009 in London UK www.ukinit.org/eise09 [date of use Feb 2010]

Marx 2007 www.urbanlandmark.org.za

Marx C 2007 Do informal land markets work for poor people? An assessment of three metropolitan cities in South Africa: Synthesis Report www.urbanlandmark.org.za/downloads/Operation_of_the_market_Synthesis_Report.pdf [date of use Jan 2011]

PNC on ISAD (nd) www.pnc.gov.za

PNC on ISAD (nd) m-Government for effective and efficient service delivery www.pnc.gov.za [date of use Mar 2010]

PNC on ISAD 2007 www.pnc.gov.za

PNC on ISAD 2007 Information and Society and Development (ISAD) Plan
www.pnc.gov.za/index.php/isad-documents/cat_view/63-isad-documents
[date of use Mar 2010]

Rubin and Royston 2008 www.urbanlandmark.org.za

Rubin M and Royston L 2008 Local land registration practices in South Africa:
Scoping study [www.urbanlandmark.org.za/downloads/Local_Land_Registration_Practices.pdf](http://www.urbanlandmark.org.za/downloads/Local_Land_Regis-tration_Practices.pdf) [date of use Jan 2011]

Sandberg 2009 www.fig.net

Sandberg H 2009 E-land conveyancing and registration - vision and risks:
2009 Conference on Surveyors Key Role in Accelerated Development FIG
Working Week 2009 in Eilat Israel www.fig.net/pub/fig2009/papers/ts03b/ts03b_sandberg_3178.pdf [date of use 7 Jan 2011]

Sangita and Dash 2005 www.isec.ac.in

Sangita SN and Dash BC 2005 Electronic governance and service delivery in
India: theory and practice - Working Paper No. 165 www.isec.ac.in/WP%20-%20165.pdf [date of use Jan 2011]

SmartCape 2009 www.smartcape.org.za

SmartCape 2009 Smart Cape Access Point Project www.smartcape.org.za/about-smartcape.html [date of use Feb 2010]

Smit 2008 www.urbanlandmark.org.za

Smit W 2008 Analysis of qualitative survey on accessing, holding and trading
land: synthesis report www.urbanlandmark.org.za/downloads/Additional_Qualitative_Analysis.pdf [date of use Jan 2011]

Smith 2009 www.guardian.co.uk

Smith D 2009 Africa calling: mobile phone usage sees record rise after huge investment www.guardian.co.uk/technology/2009/oct/22/africa-mobilephones-usage-rise [date of use Jan 2011]

United Nations (nd) www.un.org

United Nations (nd) Global Issues - Governance www.un.org/en/globalissues/governance [date of use 20 Apr 2010]

United Nations 2006 www.gltn.net

United Nations 2006 Global Land Tools Network Themes and Issues www.gltn.net/en/general/about-gltn-4.html [date of use 20 Jan 2010]

Urban Landmark 2010 www.urbanlandmark.org.za

Urban Landmark 2010 Call for proposals: Investigation into the delays in issuing title deeds to beneficiaries of housing projects funded by the capital subsidy www.urbanlandmark.org.za/downloads/call_titledeeds.pdf [date of use 7 Jan 2011]

Whittal 2008 www.ucalgary.ca

Whittal J 2008 Fiscal cadastral systems reform: a case of the General Valuation Project 2000 in the City of Cape Town (PhD thesis University of Calgary) www.ucalgary.ca/engo_webdocs/MB/08.20272.JWhittal.pdf [date of use May 2010]

List of abbreviations

C2G	citizen to government
CARD	Computer-Aided Registration Department
CBO	community based organisation
Cell-phone	cellular phone/mobile phone
DRDLR	Department of Rural Development and Land Reform (formerly the DLA: Dept of Land Affairs)

DRS	Deeds Registries System
FIG	International Federation of Surveyors
G2A	government to African
G2B	government to business
G2C	government to citizen
G2G	government to government
G2N	government to NGO
G2W	government to world
GIS	Geographical Information System
GLTN	UN Habitat's Global Land Tool Network
GPS	Global Positioning System
GV2009	General Valuation 2009 of the City of Cape Town
ICT	Information and Communication Technology
ID	identity number
MDGs	Millennium Development Goals
MIS Quarterly	Management Information Systems Quarterly
nd	no date
NGO	Non-governmental Organisation
NPM	new public management
NSIF	National Spatial Information Framework
OECD	Organisation for Economic Co-operation and Development
PNC	Presidential National Commission
PNC on ISAD	Presidential National Commission on Information Society and Development
RDP	Reconstruction and Development Programme
SGO	Office of the Surveyor-General
SMME	Small, Medium and Micro Enterprises
SMS	short message service
UN	United Nations
WTO	World Trade Organisation