

---

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>.....</b>	i-iv
<b>ACKNOWLEDGEMENTS</b>	<b>.....</b>	v
<b>CHAPTER 1</b>	<b>Introduction</b> .....	<b>1</b>
	1.1 Introduction .....	1
	1.2 Differing approaches to informal settlement upgrading .....	1
	1.3 Types of informal settlements and their impact on the choice of upgrading methodology.....	2
	1.4 Urban poverty and the different rationalities of development.....	4
	1.5 Understanding urban poverty and its role in informal settlement upgrading .....	5
	1.6 Poverty alleviation as the basis for development.....	10
	1.7 Poverty alleviation planning and informal settlement upgrading .....	12
<b>CHAPTER 2</b>	<b>Developing the broad approach to upgrading</b> .....	<b>13</b>
	2.1 Introduction .....	13
	2.2 A new spatial form.....	13
	2.3 The information management system.....	17
	2.4 The structure of the report .....	20
<b>CHAPTER 3</b>	<b>Generating the image and the base data set</b> .....	<b>22</b>
	3.1 Introduction .....	22
	3.2 The helicopter survey.....	22
	3.3 Image conversion .....	24
	3.4 Conclusions on the use of helicopter photography .....	26
	3.5 Data capturing and processing techniques employed .....	28
	3.6 The role of shack numbering in informal settlement upgrading .....	29
<b>CHAPTER 4</b>	<b>Technical and spatial data</b> .....	<b>33</b>
	4.1 Introduction .....	33
	4.2 The information management system.....	33
	4.3 Building the filing system for the information management system .	34
	4.4 Structuring the relationship between data sets .....	35
	4.5 Managing the warehouses via the GeoWorkspace.....	37
	4.6 Physical and spatial data collection.....	37

---

	4.7	Vector data from the geo-referenced raster images .....	37
	4.8	Cadastral data .....	38
	4.9	Geotechnical data .....	39
	4.10	Attached data.....	40
<b>CHAPTER</b>	<b>5</b>	<b>The social and economic environment.....</b>	<b>43</b>
	5.1	Defining the objectives for social and economic information .....	43
	5.2	Developing the questionnaire.....	43
	5.3	Building the database.....	46
	5.4	Populating the database.....	51
	5.5	Ownership and disseminating of the social and economic data.....	52
<b>CHAPTER</b>	<b>6</b>	<b>Thematic mapping .....</b>	<b>54</b>
	6.1	Introduction .....	54
	6.2	Structural development .....	54
	6.3	Social development.....	57
	6.4	Economic development .....	59
	6.5	Gender equity.....	61
	6.6	The importance of social and economic data .....	64
<b>CHAPTER</b>	<b>7</b>	<b>The institutional framework for informal settlement upgrading .....</b>	<b>65</b>
	7.1	Introduction .....	65
	7.2	The relationship between the community and the wider society.....	66
	7.3	Gender equity.....	68
	7.4	The partnership between the community and the local authority.....	70
	7.5	Internal organisational relationships .....	71
	7.6	The social support system .....	73
<b>CHAPTER</b>	<b>8</b>	<b>The urban design process .....</b>	<b>76</b>
	8.1	Introduction .....	76
	8.2	Developing an access framework .....	76
	8.3	Urban design.....	81
	8.4	Implementing the minimum relocation policy .....	83
	8.5	The provision of infrastructure services.....	84
<b>BIBLIOGRAPHY</b>		.....	<b>87</b>

---

**LIST OF TABLES**

<b>Table 1.1</b>	Contrasting tendencies in professionals' and poor people's realities.	7
<b>Table 2.1</b>	Key points of difference in the development of Greenfield and informal sites.....	13
<b>Table 2.2</b>	Key points of a poverty-stricken environment.....	14
<b>Table 5.1</b>	The attribute data types captured from the New Rest questionnaire	45

**LIST OF FIGURES**

<b>Figure 2.1</b>	Flow diagram of the database structure .....	18
<b>Figure 3.1</b>	The flight plan constructed on the 1996 aerial photography.....	23
<b>Figure 3.2</b>	The camera mount that was set up for the helicopter survey.....	24
<b>Figure 3.3</b>	Mosaic generated by cumulative matching of photographs to the control image .....	26
<b>Figure 3.4</b>	A comparison of shack vectors derived from a helicopter survey and a ground survey .....	27
<b>Figure 3.5</b>	Mosaic of warped 1999 helicopter images of New Rest .....	28
<b>Figure 3.6</b>	An illustration of the shack numbering system at New Rest .....	31
<b>Figure 3.7</b>	An illustration of the database linkage in GeoMedia .....	32
<b>Figure 4.1</b>	The file structure employed for the Urban GIS system at UCT .....	35
<b>Figure 4.2</b>	Example of different warehouse connections for New Rest.....	37
<b>Figure 4.3</b>	Physical site data for New Rest obtained from the aerial survey.....	38
<b>Figure 4.4</b>	Cadastral data for New Rest superimposed on the image of the settlement and the shack vector data .....	39
<b>Figure 4.5</b>	The results of the geotechnical survey for New Rest superimposed on the shack vectors.....	40
<b>Figure 4.6</b>	A diagrammatic output of a trial pit linked to a feature of shack vector data, with the soil profile attached as a non-spatial attribute	41
<b>Figure 4.7</b>	A raster image (photograph) of a shack, plus shack details, all linked to a specific shack polygon as non-spatial attribute data.....	42

<b>Figure 5.1</b>	The structure, contents and linkages of the attribute database within GeoMedia .....	47
<b>Figure 5.2</b>	The Access database interface .....	48
<b>Figure 5.3</b>	The relationship table for the New Rest database .....	49
<b>Figure 5.4</b>	An example of over-extensive use of sub-tables as illustrated by the shack owner data table.....	50
<b>Figure 5.5</b>	The final hybrid database structure adopted for New Rest.....	51
<b>Figure 6.1</b>	Density distribution in New Rest.....	55
<b>Figure 6.2</b>	Age distribution in New Rest.....	55
<b>Figure 6.3</b>	Number of dependents (children under 18) in New Rest.....	56
<b>Figure 6.4</b>	Number of children of school-going age currently living elsewhere..	56
<b>Figure 6.5</b>	Number of tenants in New Rest .....	57
<b>Figure 6.6</b>	Household income distribution in New Rest.....	57
<b>Figure 6.7</b>	Length of stay in New Rest.....	58
<b>Figure 6.8</b>	Previous place of residence.....	59
<b>Figure 6.9</b>	Breakdown of employment by category in New Rest.....	60
<b>Figure 6.10</b>	Informal sector activity within New Rest .....	60
<b>Figure 6.11</b>	Standard of education .....	61
<b>Figure 6.12</b>	Gender breakdown of head of household in New Rest.....	62
<b>Figure 6.13</b>	Number of occupants.....	62
<b>Figure 6.14</b>	Average number of dependents (children under 18) living in New Rest, by gender of head of household .....	63
<b>Figure 6.15</b>	Average number of dependents (children under 18) living in New Rest and elsewhere, by gender of head of household .....	63
<b>Figure 6.16</b>	Household income distribution in New Rest by gender of head of household .....	64
<b>Figure 8.1</b>	Daily travel pattern of New Rest residents based upon a sample survey .....	78
<b>Figure 8.2</b>	Primary use of private vehicles.....	79
<b>Figure 8.3</b>	Traffic entering and leaving New Rest .....	79
<b>Figure 8.4</b>	Traffic count by entrance.....	80
<b>Figure 8.5</b>	The planned movement network for New Rest .....	83