

# TG 9

## GENERIC GIS TEMPLATE FOR HERITAGE PLACES

F. RINAUDO ■ A. G. BILGIN ALTINOZ

## **‘CONSERVATION & MANAGEMENT OF HERITAGE PLACES’**

**is a critical and dynamic process, which aims to:**

- achieve integrated conservation, planning and management of the built environment & cultural landscape,
  - direct its physical, functional, social and economical development.

## **‘CONSERVATION & MANAGEMENT OF HERITAGE PLACES’**

**is a decision-making process based on survey, analysis and evaluation of the built environment & cultural landscape :**

- in the continual historical development process,
- in the natural, physical, cultural, social and economical context of the present day.

## **‘CONSERVATION & MANAGEMENT OF HERITAGE PLACES’**

**is a multi-criteria unstructured spatial decision problem**

- for which there is no single, definite solution and each case should be considered specifically within its own context,
  - for which it is not possible to define automated processes,
- which necessitates the expertise of the specialists to achieve the final judgment.

Likewise it has been for the decision-making process in management sciences, the quality of information utilized within the conservation decision-making process is of vital importance.

The properties defined for *useful information* in any decision-making process is applicable for the case of conservation as well:

‘up-to-date, sufficient, in necessary level of detail and aggregation, in appropriate format, understandable, bias free, decision relevant, comparable, reliable, utilizable, efficient, quantifiable’ information about the heritage resource.

SOURCE OF DATA

site survey / document / map / narrative / etc.

DATA ENTRY BY, ON

name of the person, date of data entry

DEGREE OF KNOWLEDGE

	EXISTENCE	LOCATION	DIMENSIONS & FORM	
1.	exactly known	exactly known	exactly known	→ <i>factual</i>
2.	exactly known	exactly known	not exactly known	
3.	exactly known	not exactly known	exactly known	
4.	exactly known	not exactly known	not exactly known	
5.	not exactly known	not exactly known	not exactly known	→ <i>hypothetical</i>

STATE OF SURVIVAL

	FOR SITES:	FOR SINGLE EDIFICES:
1.	intense remains reflecting a homogeneous tissue	whole, intact
2.	moderate remains reflecting a heterogeneous tissue	part of a whole
3.	sparse remains with no tissue character	remain
4.	gap	gap
5.	unknown state of survival	unknown state of survival

## main components / sub-systems of GIS

- Data collection, entry and correction: the translation of raw or partially processed spatial data
- Data storage, structuring and retrieval: the input of spatial data and structuring the database for efficient retrieval by the users
- Data manipulation and analysis: the data transformations for spatial analysis functions and queries internally while also by providing an interface between GIS and specialized spatial modeling systems
- Data visualization, output and reporting: the provision of views and outputs of processed, analyzed and queried data in different textual or graphical forms.

- 1** Define the project
- 2** Create the project model
- 3** Analyze the data
- 4** Present and share the results
- 5** Monitor the data



## 1 Define the project

Problem definition

Aim and objectives

Scope of the project

## 2 Create the project data model

## 3 Analyze the data

## 4 Present and share the results

## 5 Monitor the data

## 1 Define the project

## 2 Create the project data model

### Define the mental model (perception structure)

Consider the project area, problem definition, aim and scope

Consider the data sources and formats

### Design the database

Consider the criteria for the analysis

Identify the data required to support the analysis

### Define the logical data model of the project (reflection of mental model in terms of GIS structure)

Identify spatial object classes, geometric representation models and attribute data structure

### Manage the database

Gather and automate the raw data

Structure the data in data layers

## 3 Analyze the data

## 4 Present and share the results

## 5 Monitor the data

- 1** Define the project
- 2** Create the project data model
- 3** Analyze the data
  - Form thematic maps
  - Query attribute and spatial data
  - Create spatial models
  - Make surface analysis and models
- 4** Present and share the results
- 5** Monitor the data

- 1 Define the project
- 2 Create the project data model
- 3 Analyze the data
- 4 Present and share the results
  - Digital format
  - Hard copy
  - Publications
  - Web site
- 5 Monitor the data

- 1 Define the project
- 2 Create the project data model
- 3 Analyze the data
- 4 Present and share the results
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Review the data

Review the processes

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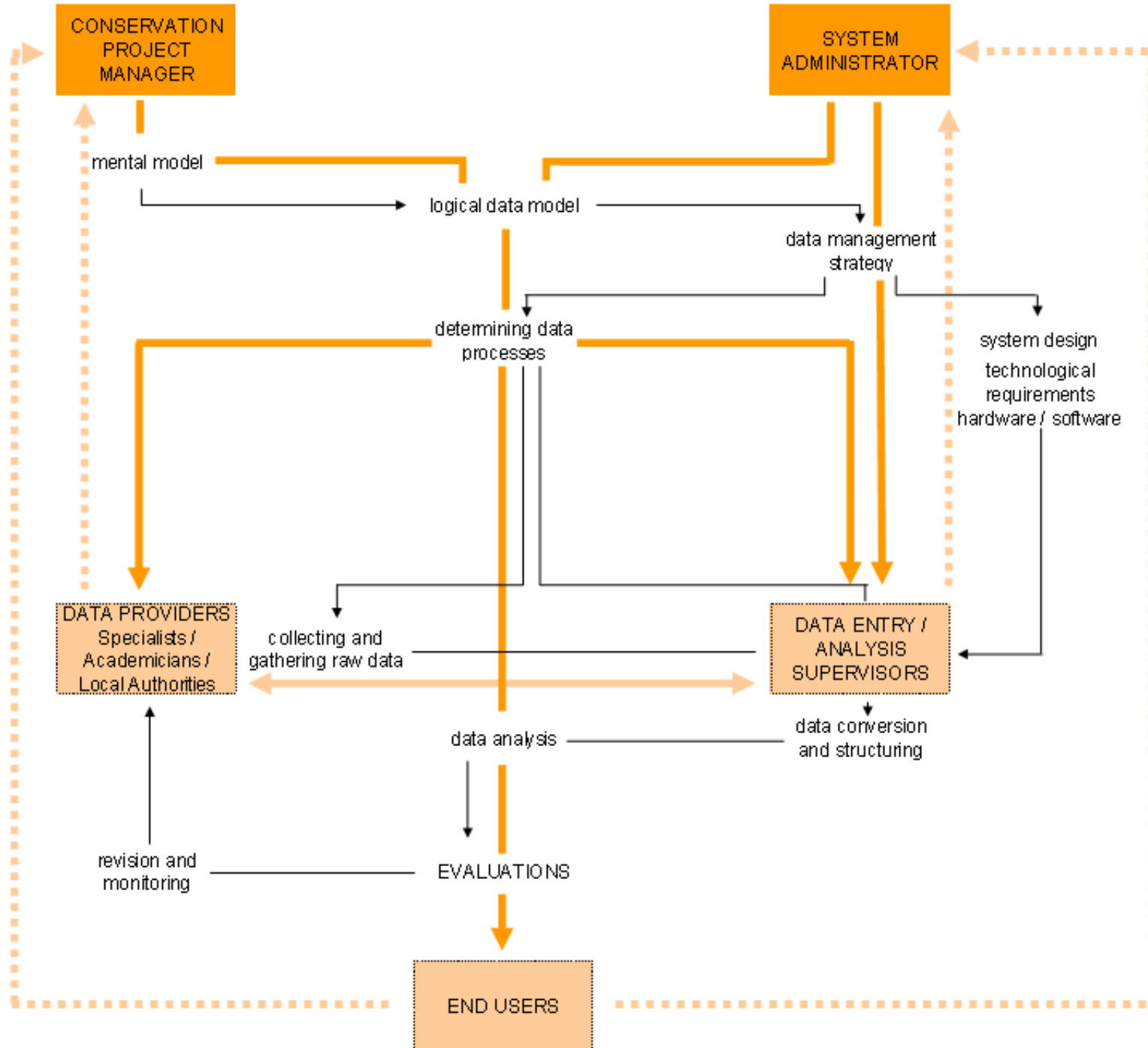
SPATIAL DATA (LAYER)	SPATIAL OBJECT CLASS	ATTRIBUTE DATA
Public Open Areas	Polygon	<b>TYPE</b> 1. Street 2. Dead-end streets 3. Street with stairs 4. Square 5. Park 6. Open Bazaar 7. Not used area
Public Open Areas//Cadastral map	Polygon	<b>ID. NAME</b>  <b>TYPE</b> 1. Street 2. Dead-end streets 3. Street with stairs 4. Privately owned lots used as a part of street 5. Privately owned lots used as a square 6. Privately owned lots used as a part of park 7. Privately used public areas 8. Open Bazaar 9. Not used area 10. Parks  <b>PAVEMENT</b> 1. Stone 2. Asphalt 3. Soil 4. Screed 5. Mosaic tile
Street Axis	Line	<b>VEHICULAR TRAFFIC DENSITY IN DAY TIME</b> 0. Streets with no vehicular traffic 1. Dead-end streets used only for car parking 2. Streets used rarely 3. Streets with high traffic density 4. Streets with extremely high traffic density  <b>VEHICULAR TRAFFIC DENSITY AT NIGHT</b> 0. Streets with no vehicular traffic 1. Dead-end streets used only for car parking 2. Streets used rarely 3. Streets with high traffic density 4. Streets with extremely high traffic density

		<b>PEDESTRIAN TRAFFIC DENSITY IN DAY TIME</b> 1. Dead-end streets used only for entering to lots 2. Streets used rarely 3. Streets with high traffic density 4. Streets with extremely high traffic density  <b>PEDESTRIAN TRAFFIC DENSITY AT NIGHT</b> 1. Dead-end streets used only for entering to lots 2. Streets used rarely 3. Streets with high traffic density 4. Streets with extremely high traffic density  <b>AXIS USED BY TOURIST</b> 1. Streets rarely used 2. Streets highly used
Entrances	Point	<b>TYPE</b> 1. Vehicular entrances to the site 2. Pedestrian entrances to the site 3. Tourist entrances to the site
Slope	Polygon	<b>SLOPE (%)</b> - Numeric Value
Street Elements-1	Line	<b>TYPE</b> 1. Water Channel
Street Elements-2	Point	<b>TYPE</b> 1. Electricity post 2. Electricity line (on wall) 3. Telephone post 4. Telephone box 5. Power station 6. Street lamp 7. Street lamp (on wall) 8. Manhole
Natural Elements	Point	<b>TYPE</b> 1. Tree 2. Greenery
Sidewalks	Polygon	<b>PAVEMENT</b> 1. Screed 2. Mosaic tile



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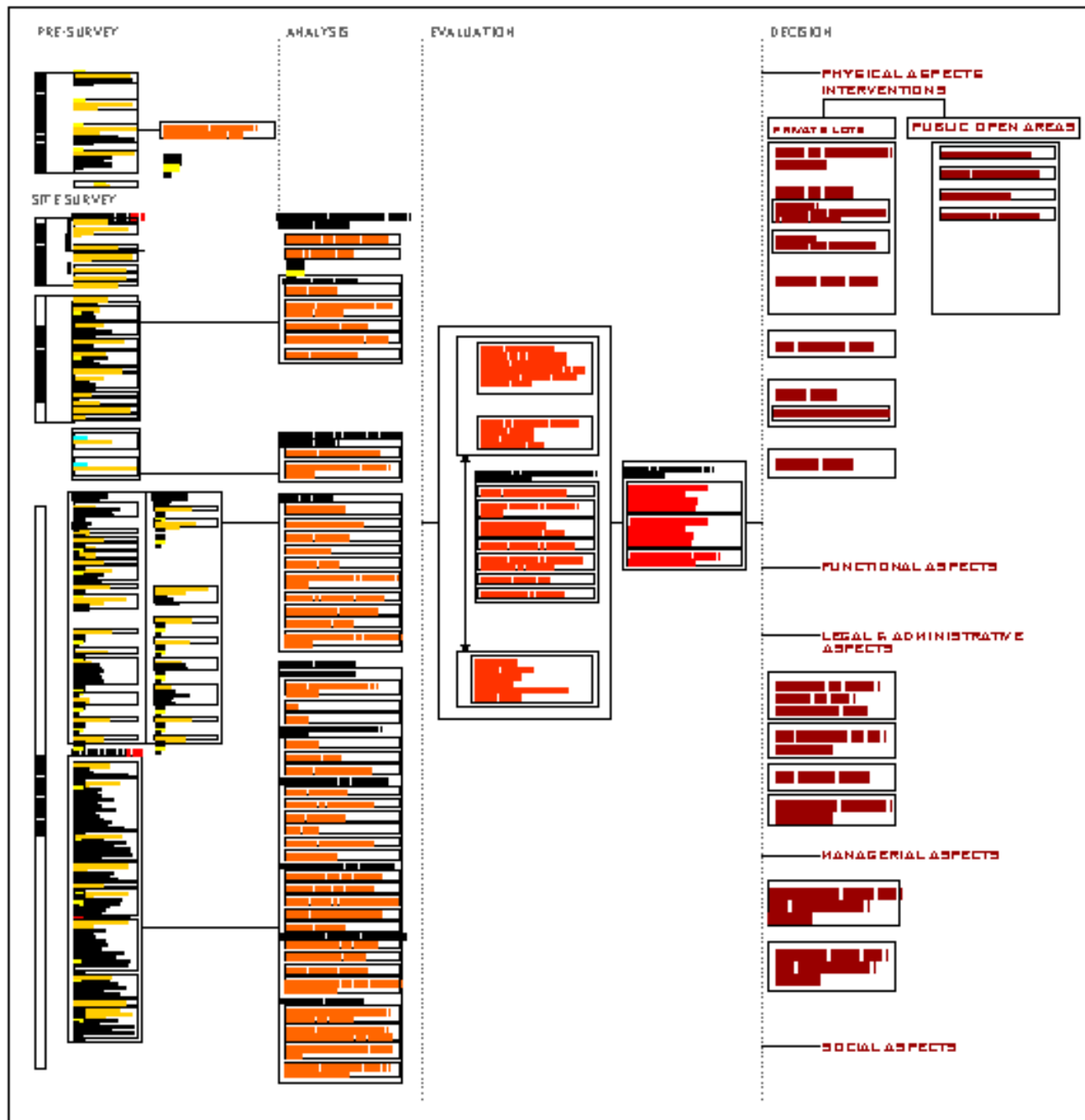
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	PROJECT NAME / COUNTRY (REFERENCES)	HERITAGE RECORD	ANALYSIS	EVALUATION	CRH	PREDICTIVE MODELLING
ARCHAEOLOGICAL HERITAGE	Gardenmaen Project / Norway (Blaaz, Uthaug 1993)					
	JADIS - Jordan Antiquities Database / Jordan (Munton 1993)					
	The British Archaeological Database / UK (Fraser 1997)					
	ICPD-Integrated Cultural Resources Database / USA (Baumann 1999)					
	Shenandoah Project / USA (Hurlbert 1998)					
	Cairo Project / Italy (Mascià 2000)					
	PanseaGIS / Greece (Smith 1998)					
	Shepton Mallet Project / UK (Drewitt et al. 1995)					
	Iowa Project / USA (Atuz et al. 1998)					
	ArchaeoDADA System (Arroyo-Behup, Lantada Zarza 1995)					
	C.A.R.T. System / Italy (Guarneri 2000)					
	SCALA Project / France (Gallot, Luroy 1995)					
URBAN AND ARCHITECTURAL HERITAGE	Mesaal Project / USA (Vilman 1990)					
	Montana Project / USA (Carmichael 1990)					
	NRN National Heritage Information System / UK (Robinson 1993)					
	The Mount Auburn Red Flag Model / USA (Abichal 1990)					
	Fort Drum Project / USA (Hesselsch, Reinick 1990)					
	Informazione Territoriale Interdisciplinare per il Comune di Roma / Italy (Cassinò 1988, Ippolito 1988, Ippolito 1985)					
	Etude de Potential Architectural et Analyse des Composants Architecturaux du Vieux-Québec / Canada (Wise, Simonsau 1998)					
	York, Environ and Archaeological Assessment Project / UK (Wiler 1995, Chartrand et al. 1993)					
	Fort Penn Project / USA (McCarty 1998)					
	SPRS Project - Informative System for the Reconstruction of Historic Settlements / Italy (Poggi 1992)					
URBAN AND ARCHITECTURAL HERITAGE - HISTORIC SITES	NRNPE Mapping and Preservation Inventory Tool / USA (McCarty 1998)					
	Management of Data Regarding Environmental Impact on Historic Materials and Structures / Greece (Vero poulo 2000)					
	L'informazione del Caratteristica dei Beni Architettonici Ambientali da Comune della Provincia di Milano / Italy (Warescotti 1999)					
	Progetto Cusi Ambiente & Progetto per Ripa di Genova / Italy (Poggi 1993)					
	Evaluation of Vernacular Architecture - Earthen Cob Buildings / UK (Ford et al. 1999)					
	SINGLE STRUCTURE	Chateau de Vincennes Project / France (Arroyo-Behup, Lantada Zarza 1995)				
Stone Conservation at Jefferson and Lincoln Memorials / USA (Joly et al. 1998)						

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	NAME / DATE	DEALERS	AIM	CONCERN	PHASES	WEB REFERENCE	REFERENCES
ROME / ITALY	Sistema Informativo Territoriale Interdisciplinare per il Comune di Roma (mid 1980s onwards)	USICS - Ufficio Speciale per gli Interventi sul Centro Storico di Roma	obtain an information base utilisable for different purposes by Communes of Rome and Superintendency	archaeological analysis data bank for historical centre	Data Collection Data Storage & Structuring		Cusumà 1988; Topolo 1988; Topolo 1989
GENOVA / ITALY	Progetto Cive Ambiente & Progetto per Rete di Genova (1987 - 1998)	Università di Genova Amministrazione Pubblica Soprintendenza ai Beni Archeologici Soprintendenza ai Beni Architettonici e Ambientali	support the conservation and planning decisions and implementation in different scales	historical development hydrological analysis buildings archaeology physical properties of existing buildings	Data Collection Data Storage & Structuring Analysis Evaluations		Polleggi 1999
MILANO / ITALY	L'informaticizzazione del Catastro dei Beni Architettonici e Ambientali dei Comuni della Provincia di Milano (1987 - 1998)	Politecnico di Milano; Istituto per la Storia dell'Arte Lombarda; Centro per i Beni Culturali e Ambientali della Lombardia; Centro Studi per la Programmazione Intercomunale dell'Area Metropolitana Provinciale di Milano	support territorial plan for the Province of Milan (Piano Territoriale di Coordinamento di Milano)	distribution and properties of cultural and environmental properties within the Province of Milan	Data Collection Data Storage & Structuring Analysis		Marescotti 1999
EMILIA ROMAGNA / ITALY	C.A.R.T. - Carta Archeologica del Regno Territoriale (1995 onwards)	Istituto Beni Culturali Regione Emilia-Romagna Soprintendenza Archeologica dell'Emilia-Romagna CNR - Centro Nazionale di Ricerca	support town & landscape planning policy support decision-making for archaeological research management obtain an information tool for archaeological researches foster cooperation between state and local agencies	assessment of archaeological evidences within the Emilia-Romagna Region	Data Collection Data Storage & Structuring Analysis Evaluations	<a href="http://www.beniculturali.it/regione/regione/regione.htm">http://www.beniculturali.it/regione/regione/regione.htm</a>	Guarienti 2000
YORK / ENGLAND	YAA - York Archaeological Assessment & York Environments Project (1991 onwards)	University of York York English Heritage Archaeological Trust North Yorkshire County Council	support the preparation and development of heritage management strategies provide an efficient tool for archaeological researches and studies	historical development of York and its environs, prediction, location, survival and range of archaeological sites within the area	Data Collection Data Storage & Structuring Analysis Evaluations		Charnand et al. 1993; Miller 1995
QUEBEC / CANADA	Étude de Potentiel Archéologique et Analyse des Composantes Architecturales du Vieux-Québec (mid 1980s onwards)	City of Québec & Provincial Culture and Communications Department	to integrate historic-period archaeological sites into the urban planning process to identify potential sites to guide development strategies in daily operations of municipal urban planning department	describing and evaluating the archaeological potential of the town as a part of the city's built heritage database	Data Collection Data Storage & Structuring Analysis Evaluations		Moss et al. 1998
VIRGINIA / U.S.A.	MAPIT - Mapping and Preservation Inventory Tool	Heritage Preservation Services, Branch of Mapping and Information Technologies, National Park Service	to contribute to Cultural Resource Management to support the decisions and implementation of State and Tribal Historic Preservation Offices (SHPOs and THPOs) to provide a preservation planning platform	identification of cultural resources and their contexts, state-wide distribution patterns and county-wide localized patterns	Data Collection Data Storage & Structuring Analysis		McCarthy, D. 1998
PORT PENN / U.S.A.	National Register Historic District Port Penn, New Castle County, Delaware	University of Delaware	obtain a multi-disciplinary forum about the historical and architectural values in Port Penn to be utilized for researches and planning activities	historical development process of the town and the buildings, changes in building functions and styles within the process	Data Collection Data Storage & Structuring		McCarthy 1998